



THE
UNIVERSITY OF
VERMONT

Bulletin | *April* **1969**

FOUNDED 1791 • BURLINGTON, VERMONT

Bulletin of

THE UNIVERSITY OF
V E R M O N T

THE CATALOGUE • 1968-1969
ANNOUNCEMENTS • 1969-1970

Cover photo: The Guy W. Bailey Library.
Photo by Eldred.

Inside back cover: Entrance to Bailey Library.
Photo by Eldred.

Cover design by John MacLeod.

Bulletin of the University of Vermont

VOLUME 66

APRIL 15, 1969

NUMBER 21

Published by the University of Vermont, 85 South Prospect Street, Burlington, Vermont 05401, 24 times a year: once each in August and June; twice in October, November, December, January, and May; and three times in September, February, March, and April. Second Class postage paid at Burlington, Vermont 05401.

V The University of Vermont

The University is located at Burlington, Vermont, overlooking an attractive tree-shaded city situated on the shores of Lake Champlain.

§ Burlington, the largest city in the State, with a population of 40,000, is 95 miles from Montreal, 230 miles from Boston, and 300 miles from New York City. The city has daily plane and bus service to these points.

§ Chartered in 1791, the University is the twentieth oldest institution of higher learning in the United States authorized to grant degrees and the second institution founded by state legislative action to offer instruction at the university level.

§ 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*.

§ Within the ten divisions of the University, instruction is offered in more than twenty programs leading to one hundred thirty different degrees.

§ The University is accredited by the following associations:

The New England Association of Colleges and Secondary Schools

The National Council for Accreditation of Teacher Education

National Association of Schools of Music

The American Medical Association

The American Dental Association

National League for Nursing

The Engineers Council for Professional Development

The American Chemical Society

V The Philosophy and Objectives of The University of Vermont'

Today, more than ever before, higher education is in need of a basic philosophy—one which will clarify its purposes and goals, and which, at the same time, will protect it from any loss of its essential characteristics. It is important to note well that a university, the home of higher education, is not a barometer of public opinion, and that it cannot conceivably bend to meet every demand of society if it is to carry out effectively its major responsibilities to scholarship and learning.

A university must be committed to scholarship, it must be dedicated to education in the very highest branches of learning, and it must aspire to the supreme level of excellence.

If, in the constantly changing environment of modern civilization, a university finds itself in the role of a service agency, ready to meet every demand that society may make upon it, then there is real danger that the vital purposes and goals of higher education may be lost. If the danger is recognized and guarded against, however, the integrity of our educational program will not be jeopardized.

What, then, is the basic purpose of the University of Vermont—what is its philosophy of education?

Basically, the University is an institution dedicated to pure learning in the humanities, the natural sciences, and the social sciences. Our responsibility is that of creating a community of scholars, both old and young; of providing an atmosphere for the discovery, exchange, and transmission of ideas; and of furnishing continuing generations with the intellectual means for leading full and purposeful lives.

Institutional Goals

Quite naturally there is a diversity of goals among American institutions of higher education, and inevitably there are differences in the goals of public and private institutions. As a publicly supported institution, the University has accepted the responsibility of providing an educational opportunity for all qualified men and women residing in the State of Vermont.

1. Cited from the President's Report, 1960.

The University continues to meet this responsibility at the same time that it is able to enhance the educational opportunity afforded Vermonters by the admission of students coming from many large and small communities outside Vermont's borders. This tradition, not enjoyed by many state universities, not only provides a heterogeneity of background and experience for all students, but also makes possible a breadth and depth of academic offerings which the University of Vermont otherwise might not be able to provide for Vermonters alone.

Thus our institutional goals are . . .

. . . to provide a liberal education through individual capacity for the making of intelligent decisions. Such an education becomes meaningful with a knowledge of our historical heritage; it becomes operational through the use of all disciplines, including mathematics and science; and it becomes influential through the art of effective communication

. . . to extend an opportunity for the development of a cultural life by virtue of the arts and the formulation of philosophical and moral values

. . . to provide skill training in preparation for specific professions and careers

. . . to create an atmosphere conducive to research and scholarship through the development of programs which will implement both undergraduate and graduate education

. . . to develop graduate programs leading to the master's and doctor's degree in areas supported by faculty, laboratory, and library facilities as a means of specialization and of complementing desired research and study in selected fields

. . . to carry on a program of adult education through the Evening Division, off-campus activities, cooperative extension, and modern communication media

. . . to provide services to state and local government where University personnel, data, or organization are particularly adaptable to a public need which otherwise may not be filled.

Institutional Means

Clearly, our institutional goals cannot be achieved without a faculty of distinction aided by an administration which recognizes that its obligation is both to provide the facilities and to help create the conditions in which the faculty and students can pursue their educational responsibilities.

One of the most important of the University's means to the desired end is the development of an undergraduate curriculum which provides a liberal education in every professional program. This is not to say that every student should matriculate in the College of Arts and Sciences. It does mean that the professional and vocational must not crowd out a liberal education simply because the subject matter of each professional field is increasing. It is impossible today to teach everything there is to know in the professions, whether in medicine, law, engineering, business, or agriculture. For this reason it is important that we continually review the curriculum to reevaluate, modify, and consolidate the fundamentals of professional education so that the teaching of effective communication—mathematics, history, science, and the arts—retains its central importance.

Facilitating this is the emphasis placed upon individual excellence, wherein the gifted student may advance more rapidly through small seminars, conferences, individual research assignments, the use of original sources, and student advisory services.

Further means include a constant reviewing of admissions requirements to insure an educational opportunity to those applicants who will receive the greatest benefit from a college education; a fostering of research projects which are related to the teaching program and to our established institutional goals, providing opportunity for research in the social sciences and the humanities as well as in the natural sciences; the development of a full graduate program as rapidly as resources permit; and finally, a sustained plan of university self study to provide a continuing evaluation of achievement and a basis for the consideration of new techniques and methods.

Basic to these means, of course, and a resource without which the institution ceases to be a university, is the library. To make our philosophy of education meaningful, to make our goals realizable, and to make our other means workable, a truly fine library is indispensable.

The University's philosophy of education, then, is to create a community of scholars and provide facilities and an environment for full educational development. Our goals are to ensure the undergraduate a well-rounded academic background, regardless of the field of concentration; to offer sound graduate programs at the master's and doctor's levels; to pursue a program of continuing adult education; and to provide the State and community with professional and cultural services.

CORRESPONDENCE

Admissions

Requests for a catalogue, or information concerning admission policies
and procedures, rooms and tuition *Director of Admissions*

Undergraduate Colleges *Dean of the College*

College of Medicine *Dean of the College of Medicine*

Graduate College *Dean of the Graduate College*

Evening Division *Director of the Evening Division*

Summer Session *Dean of the Summer Session*

Conferences and Institutes *Director of Conferences and Institutes*

Transcripts of Records *Registrar*

Student Personnel *Dean of Students*

Scholarships and Loans *Director of Financial Aid*

Employment of Seniors and Alumni *Director of Placement*

Matters of Alumni Interest *Director of Alumni Affairs*

Matters of General University Interest *The President*

THE CONTENTS

PERSONNEL	1
INTRODUCTION	28
STUDENT LIFE	39
THE ADMISSION OF STUDENTS	48
STUDENT EXPENSES	51
GENERAL INFORMATION	55
THE COLLEGE OF AGRICULTURE AND HOME ECONOMICS	61
THE COLLEGE OF ARTS AND SCIENCES	72
THE COLLEGE OF EDUCATION	83
THE COLLEGE OF TECHNOLOGY	89
DIVISION OF HEALTH SCIENCES	98
THE GRADUATE COLLEGE	108
CONTINUING EDUCATION	116
COURSES OF INSTRUCTION	118
THE ALUMNI COUNCIL	250
ENROLLMENT STATISTICS	253
DEGREES	256
LOAN FUNDS, SCHOLARSHIPS, AND PRIZES	272
GENERAL INDEX	284
ACADEMIC CALENDAR	287

V University of Vermont

Personnel

THE BOARD OF TRUSTEES

LYMAN SMITH ROWELL, M.S., L.H.D.

DEANE CHANDLER DAVIS, LL.B.

President }
Governor } *Ex-Officio*

March, 1964—March, 1970

LAWRENCE JAMES DOOLIN, B.S.

FLOYD MERLE JAMES, B.S.

GEORGE HAMILTON COOK, JR., B.S. (*March, 1968-March, 1970*)

*Wynnewood, Pa.
Burlington, Vt.
Leominster, Mass.*

March, 1965—March, 1971

WILLIAM THOMAS BURNS, B.S.

EDWARD RICHARDSON EURICH

LEO O'BRIEN, JR., B.A.

WALTER CABOT PAINE, A.B.

*Dorset, Vt.
Waitsfield, Vt.
South Burlington, Vt.
Woodstock, Vt.*

March, 1966—March, 1972

JOHN LUTHER BECKLEY, Ph.B.

KENNETH NASH SCOTT, B.S.

LEON DONALD LATHAM, JR., Ph.B., LL.B.

*North Caldwell, N.J.
Detroit, Mich.
Burlington, Vt.*

March, 1967—March, 1973

PETER GIULIANI

ELLWYN EDWARD MILLER, B.S.

ROBERT EMMETT O'BRIEN, B.S., M.D.

GEORGE HOWARD SLOAN, M.A.

*Montpelier, Vt.
Putney, Vt.
Winooski, Vt.
Rutland, Vt.*

March, 1968—March, 1974

BINGHAM JOHNSON HUMPHREY, B.S., Ph.D.

GEORGE EDWARD LITTLE, JR., A.B.

CHARLES THEODORE SCHECHTMAN, M.D.

*Mt. Carmel, Conn.
Burlington, Vt.
New Britain, Conn.*

March, 1969—March, 1975

C. DOUGLAS CAIRNS, S.B.

THOMAS HENRY CANDON, B.S.

ARTHUR HENRY JONES, B.S.

FRANCIS ROBERT PEISCH, A.B., LL.B.

*Burlington, Vt.
Rutland, Vt.
Morgan, Vt.
Burlington, Vt.*

V Officers of Administration

LYMAN SMITH ROWELL, M.S., L.H.D.

CLINTON DANA COOK, Ph.D.

MELVIN ALLEN DYSON, B.B.A., C.P.A.

EDWARD CLINTON ANDREWS, JR., M.D.

JOHN EMERSON BAKER, Ph.D.

THOMAS WHITFIELD DOWE, Ph.D.

Dean, College of Agriculture and Director of Agricultural Experiment Station

WARREN ORVEL ESSLER, Ph.D.

WILLIAM HOOPER MACMILLAN, Ph.D.

ROLAND DIETZ PATZER, M.A.

RAYMOND VIRGIL PHILLIPS, Ph.D.

ALFRED BROOKS ROLLINS, JR., Ph.D.

President

Vice President for Academic Affairs

Vice President for Financial Affairs

Dean, College of Medicine

Acting Dean, College of Education

Dean, College of Technology

Dean of the Graduate College

Dean of Students

Dean, Continuing Education

Dean, College of Arts and Sciences

Officers of Instruction

EMERITI

NELLE ALEXANDER ADAMS (MRS. W. R.), M.A.	Assistant Professor of Education
WILLIAM RITCHIE ADAMS, Ph.D.	Professor of Forestry
FLORENCE EMILY BAILEY, M.S.	Professor of Home Economics
HOWARD GORDON BENNETT, A.M.	Professor of Music
DAVID MARSH BOSWORTH, M.D.	Consultant Orthopedic Surgery
ALEC BRADFIELD, M.S.	Professor of Animal and Dairy Science
CHARLES E. BRAUN, Ph.D.	Pomeroy Professor of Chemistry and Dean of the Graduate College
LELAND LAWRENCE BRIGGS, M.B.A.	Professor of Economics
CONSTANCE LORRAINE BROWN, M.S.	Associate Professor of Chemistry
THOMAS STEPHEN BROWN, M.D.	Professor of Anatomy
ROY ORVILLE BUCHANAN, B.S.	Associate Professor of Electrical Engineering
FRED DONALD CARPENTER, Ph.D., L.H.D.	Professor of German
JOSEPH EDWARD CARRIGAN, A.M., LL.D.	Dean, College of Agriculture and Home Economics
RUPERT ADDISON CHITTICK, M.D.	Professor of Psychiatry
PAUL DENNISON CLARK, M.D.	Associate Professor of Clinical Pediatrics
FAYE CRABBE, Sc.D.	Professor of Nursing
LEON W. DEAN, A.B.	Associate Professor of English
JOHN BELLOWES DEFOREST, Ph.D.	Professor of Romance Languages
CHARLES GEORGE DOLL, Ph.D.	Professor of Geology
GEORGE DYKHUIZEN, Ph.D.	James Marsh Professor of Intellectual and Moral Philosophy
OLIVER NEWELL EASTMAN, M.D.	Professor of Gynecology
HOWARD BOWMAN ELLENBERGER, Ph.D.	Professor of Animal and Dairy Science
PAUL DEMUND EVANS, Ph.D.	Professor of History
JOHN LOUIS PHILLIPPE FOREST, M.D.	Instructor in Clinical Psychiatry
PERCY AUSTIN FRALEIGH, Ph.D.	Professor of Mathematics
PAUL KENDRICK FRENCH, M.D.	Professor of Clinical Medicine
FRED WILLIAM GALLAGHER, Ph.D.	Professor of Medical Microbiology
WILLIAM LAWRENCE GARDNER, B.S.	Associate Professor of Physical Education for Men
ALEXANDER GERSHOY, Ph.D.	Professor of Botany
RAYMOND AVERY HALL, A.M.	Associate Professor of Religion
DONALD CEDRIC HENDERSON, M.S.	Associate Professor of Poultry Science
CHARLES WILLIAM HOILMAN, M.S.	Associate Professor of Electrical Engineering
MURIEL JOY HUGHES, Ph.D.	Professor of English
GEORGE VINCENT KIDDER, Ph.D.	Professor of Classical Languages and Dean of College of Arts and Sciences
FLORANCE BEESON KING, Ph.D.	Professor of Home Economics
ELIZABETH KUNDERT, M.D.	Assistant Professor of Clinical Psychiatry
PETER PAUL LAWLOR, M.D.	Assistant Professor of Clinical Otolaryngology
CARL LUCARINI, A.M.	Assistant Professor of Chemistry
EDD RUTHVEN MCKEE, M.S.E.E.	Professor of Electrical Engineering and Dean of College of Technology
EDWARD DOUGLAS MCSWEENEY, M.D. ¹	Assistant Professor of Gynecology
MIRIAM NATILÉE MARSTON, A.M.	Assistant Professor of Music
SALLY BERRY MAYBURY, Ed.D.	Associate Professor of Commerce and Economics
JOHN TRUMBULL METCALF, Ph.D.	Professor of Psychology
ALVIN REES MIDGLEY, Ph.D.	Professor of Agronomy
PAUL ROBERT MILLER, M.S.	Dean of College of Agriculture and Home Economics
HENRY LEE MILLS, D.V.M.	Instructor in Public Health
PAUL AMOS MOODY, Ph.D.	Professor of Zoology
CHESTER ALBERT NEWHALL, M.D.	Thayer Professor of Anatomy
JOHN ALVIN NEWLANDER, Ph.D.	Professor of Animal and Dairy Science
GEORGE HUBERT NICHOLSON, M.A.	Associate Professor of Mathematics
LENA RAUB OAKLEY, M.A.	Associate Professor of Nursing

1. Deceased July 17, 1968.

HAROLD BARNARD PIERCE, Ph.D.	Professor of Biochemistry
JAMES EUGENE POOLEY, A.M.	Associate Professor of Classical Languages and History
WILLARD BISSELL POPE, Ph.D.	Professor of English
HERBERT EVERETT PUTNAM, Ph.D.	Associate Professor of History
WILHELM RAAB, M.D.	Professor of Experimental Medicine
LOUISE ADELE RAYNOR, Ph.D.	Associate Professor of Botany
ALBAN BENNETT ROONEY, M.S.	Associate Professor of Physics
LAURENCE FORREST SHOREY, M.S.	Associate Professor of Electrical Engineering
BERTHA MAY TERRILL, A.M., Sc.D. ¹	Professor of Home Economics
BENJAMIN BOOTH WAINWRIGHT, A.M.	Associate Professor of English
NELSON LEE WALBRIDGE, Ph.D.	Professor of Physics
MYRON ELLIS WITHAM, C.E.	Assistant Professor of Mathematics
FLORENCE MAY WOODARD, Ph.D.	Professor of Commerce and Economics
RICHARD S. WOODRUFF, M.D.	Assistant Professor of Pathology
LLOYD ABRAM WOODWARD, M.S.	Associate Professor of Physics
WILLIAM GREENHILL YOUNG, M.D.	Associate Professor of Psychiatry

FACULTY

*Dates after names represent the year of appointment, either original or following a lapse of service.
Asterisk indicates member of Graduate Faculty*

JOHN ABAJIAN, JR., M.D. (1940-42; 1946)	Professor of Anesthesiology
PATRICIA M. ABSHER, Ph.D. (1968)	Instructor in Medical Microbiology
RICHARD G. ABSHER, Ph.D. (1968)	Assistant Professor of Electrical Engineering
RUTH C. ADAMS, M.P.H. (1967)	Associate Professor of Nursing
*WILLIAM RITCHIE ADAMS, Ph.D. (1926)	Professor of Forestry
WENDELL HUGH AFFSPRUNG, M.A. (1967)	Instructor in English
PAUL COMSTOCK AGNEW, M.D. (Dec. 1964)	Assistant Professor of Psychiatry
WILLIAM STEWART AGRAS, M.B.B.S. (1961)	Associate Professor of Psychiatry
ROBERT BASCOM AIKEN, M.D. M.P.H. (1941)	Associate Professor of Community Medicine
CHARLES PETER ALBRIGHT, M.D. (Jan. 1965)	Instructor in Clinical Medicine
PETER D. ALDEN, M.D. (1964)	Assistant Professor of Clinical Medicine
CHRISTOPHER WHITNEY ALLEN, Ph.D. (1967)	Assistant Professor of Chemistry
MARIE FRANCES ALLEN, B.A. (1967)	Instructor in Romance Languages
SINCLAIR TOUSEY ALLEN, JR., M.D. (1948)	Associate Professor of Medicine
VIRGINIA O. ALLEN, M.A. (1968)	Assistant Professor of Technical Nursing
*ABBAS ALNASRAWI, Ph.D. (1963)	Associate Professor of Economics and Business Administration
*NORMAN ROLAND ALPERT, Ph.D. (1966)	Professor of Physiology
JANE P. AMBROSE (MRS. Z. P.), M.A. (1967)	Instructor in Music
*ZUELL PHILIP AMBROSE, Ph.D. (1962)	Associate Professor of Classics
ELLSWORTH LYMAN AMIDON, M.D. (1933)	Professor of Medicine
RICHARD WALKER AMIDON, M.D. (1949)	Assistant Professor of Clinical Medicine
ALISON LANE ANAND, M.A. (1967)	Instructor in Music
RICHARD ARNOLD ANDERSON, M.D. (1967)	Assistant Professor of Medicine
ALFRED JOHN ANDREA, A.B. (1967)	Instructor in History
*EDWARD CLINTON ANDREWS, JR., M.D. (1958)	Professor of Pathology
*HEINZ LUDWIG ANSBACHER, Ph.D. (1946)	Professor of Psychology
GABOR JANOS ANTONY, M.D. (1967)	Assistant Professor of Pediatrics
FRANK H. ARMSTRONG, M.F. (1968)	Assistant Professor of Forestry
EARL LEE ARNOLD, Ph.D. (1953)	Associate Professor of Agricultural Engineering
WALTER PAUL ASCHENBACH (1959)	Assistant Professor of Art
*HENRY VERNON ATHERTON, Ph.D. (1949-51; 1953)	Professor of Animal and Dairy Science
ELIZABETH FISK ATWOOD, M.S. (1966)	Assistant Professor of Home Economics
DAVID BABBOTT, M.D. (1967)	Assistant Professor of Medicine
FRANK LUSK BABBOTT, JR., M.D. (1963)	Associate Professor of Community Medicine
*JOHN EMERSON BAKER, Ph.D. (1963)	Professor of Education
DONALD JAMES BALCH, Ph.D. (1952-56; 1957)	Associate Professor of Animal and Dairy Science
*BETTY BANDEL, Ph.D. (1947)	Professor of English
RALPH JOHN BANNISTER (1950)	Instructor in X-Ray Technique
BERNARD BENJAMIN BARNEY, M.D. (1955-63; 1964)	Assistant Professor of Clinical Surgery
*HORACE GARDINER BARNUM, Ph.D. (1965)	Assistant Professor of Geography

1. Deceased December 23, 1968.

SISTER EVALINE I. BARRETT, M.S. (1968)	Assistant Professor of Professional Nursing
*RICHMOND JAY BARTLETT, Ph.D. (1958)	Professor of Plant and Soil Science
THOMAS CLINTON BATES, M.D. (1967)	Instructor in Pediatrics
ARTHUR ASCHER BAYER, M.A. (1967)	Assistant Professor of Economics and Business Administration
WILLIAM JOHN BECKETT, Ph.D. (1960) ¹	Assistant Professor of Philosophy and Religion
WARREN LAZELL BEEKEN, M.D. (1965)	Associate Professor of Medicine
JOHN FRYE BELL, M.D. (Jan., 1947)	Associate Professor of Orthopedic Surgery
JOYCE ROCKENBACH BELL (MRS. R. T.), M.S. (1958)	Instructor in Nursing
*ROSS TAYLOR BELL, Ph.D. (1955)	Associate Professor of Zoology
*HOWARD GORDON BENNETT, A.M. (1925)	Professor of Music
*GEORGE R. BENOIT, Ph.D. (1967)	Lecturer in Plant and Soil Science
MARVIN ROBERT BENSMAN, M.S. (1967)	Instructor in Speech
MARK B. BENSON, B.A., Captain, U.S. Army (April, 1968)	Assistant Professor of Military Science
*HENRY WEINBERG BERGER, Ph.D. (1965)	Assistant Professor of History
JOHN FRANCIS BERRY, M.S. (1968)	Associate Professor of Hospital Administration
EMIL BLAIR, M.D. (1966)	Professor of Surgery
JOHN HARDESTY BLAND, M.D. (1952)	Associate Professor of Medicine
*FRANCIS ROYSTER BLISS, Ph.D. (1966)	Associate Professor of Classics
JOHN DOUGLAS BOARDMAN, M.D. (1955)	Associate Professor of Obstetrics and Gynecology
*SAMUEL NATHANIEL BOGORAD, Ph.D. (1946)	Frederick Corse Professor of English
*BETTY MACHTEL BOLLER, D.E.D. (1960)	Associate Professor of Education
*WESSON DUDLEY BOLTON, D.V.M. (1950)	Professor of Animal Pathology
DAVID KENNETH BORAKER, Ph.D. (March, 1969)	Assistant Professor of Medical Microbiology
JOSEPH BORNSTEIN, M.S.	Assistant Professor of Agricultural Engineering
RICHARD EMILE BOUCHARD, M.D. (1955)	Associate Professor of Medicine
*BERTIE REYNOLD BOYCE, Ph.D. (1966)	Assistant Professor of Plant and Soil Science
SHIRLEY C. BRANDEN, M.A. (1968)	Instructor in Romance Languages
MARY EVELYN BREEN, B.S. (1957)	Instructor in Medical Technology (Pathology)
STEPHEN C. BROMLEY, Ph.D. (1965)	Assistant Professor of Zoology
GEORGE WILSON BROOKS, M.D. (1953)	Associate Professor of Clinical Psychiatry
T. ALAN BROUGHTON, M.A. (1966)	Assistant Professor of English
DEWEES HAROLD BROWN, M.D. (1963)	Instructor in Community Medicine
G. STEPHEN BROWN, M.D. (1968)	Instructor in Radiology
JOANNE CHANDLER BROWN, M.A. (1967)	Instructor in Mathematics
JOHN STEWART BROWN, JR., Ph.D. (1966)	Assistant Professor of Physics
MARION HUNTINGTON BROWN, M.S. (1942)	Associate Professor of Home Economics
HENRY POSEY BRUBAKER, M.A. (1966)	Instructor in Political Science
OTTO ANTON BRUSIS, M.D. (1967)	Assistant Professor of Community Medicine
ROGER TRUE BRYANT, M.Ed. (1965)	Assistant Professor of Physical Education for Men
CLARENCE EDWARD BUNKER, M.D.	Instructor in Surgery
R. CLAY BURCHELL, M.S. (1968)	Associate Professor of Obstetrics & Gynecology
LEGRAND CANNON BURNS, M.D. (1968)	Clinical Instructor in Medicine
LEO DANIEL BURNS, M.A. (1965)	Instructor in Mathematics
STANLEY LIVINGSTON BURNS, JR., M.D. (1960)	Associate Professor of Medicine
RACHEL T. BURROUGHS, B.S. (1968)	Instructor in Professional Nursing
ROY VEDDER BUTTLES, M.D. (1950)	Assistant Professor of Pathology
FRANCIS ARNOLD CACCAVO, M.D. (1960)	Instructor in Clinical Surgery
ROBERT NOLAN CAIN, M.D. (Jan. 1953)	Assistant Professor of Clinical Surgery
CHARLES LYMAN CALAHAN, M.S. (1948)	Lecturer in Plant and Soil Science
EDGAR JACOB CALDWELL, III, M.D. (1966)	Assistant Professor of Medicine
MARTHA MARIE CALDWELL, M.S. (1954-59; 1960)	Associate Professor of Home Economics
ANTHONY SAMUEL CAMPAGNA, Ph.D. (1965)	Assistant Professor of Economics and Business Administration
MARTIN JOHN CANNON, M.D. (1953)	Instructor in Clinical Obstetrics and Gynecology
HOWARD JULIAN CARPENTER, M.S. (1947)	Associate Professor of Mechanical Engineering
GEORGE W. CARTER, B.A. (1968) Major, U.S. Army	Assistant Professor of Military Science
PAULA JOYCE CELANO, M.S. (1967)	Instructor in Nursing
*ERLING WILLIAM CHAMBERLAIN, Ph.D. (1962)	Associate Professor of Mathematics
*ALFRED HAYES CHAMBERS, Ph.D. (1948)	Associate Professor of Physiology and Biophysics
JAMES PATRICK CHAPLIN, Ph.D. (1947) ²	Professor of Psychology
JAMES C. CHAPMAN, Ph.D. (1968)	Assistant Professor of Music

1. Sabbatical leave first semester 1968-69.

2. Sabbatical leave 1968-69.

OFFICERS OF INSTRUCTION

- MARILYN CHASE, M.Ed. (1965) *Instructor in Physical Education for Women*
 RICHARD XAVIER CHASE, Ph.D. (1966) *Assistant Professor of Economics and Business Administration*
 VICTOR EDWARD CHASE, M.B.Ch.B. (1964) *Assistant Professor of Psychiatry*
 OSVALDO CHINCHON, Ph.D. (1966) *Assistant Professor of Romance Languages*
 CHARLES CHRISTENSEN, JR., M.Ed. (1959) *Assistant Professor of Physical Education for Men*
 *WALLACE WAYNE CHRISTENSEN, Ph.D. (1967) *Professor of Forestry*
 BENJAMIN FRANKLIN CLARK, M.D. (1952) *Assistant Professor of Clinical Obstetrics and Gynecology*
 ELIZABETH ANN CLARK, M.D. (Feb. 1961) *Instructor in Clinical Pediatrics*
 VIRGINIA PRESCOTT CLARK (MRS. H. L.), Ph.D. (1963; 1965) *Assistant Professor of English*
 *JACKSON JOSHUA WALTER CLEMMONS, M.D. (1962) *Associate Professor of Pathology*
 *ROBERT WILLARD COCHRAN, Ph.D. (1954)¹ *Associate Professor of English*
 JULIUS GEORGE COHEN, M.D. (1950) *Associate Professor of Clinical Psychiatry*
 FRANCIS PEABODY COLBURN, Ph.B. (1942) *Professor of Art*
 GLADYS LAFLAMME COLBURN, Ph.B. (1967) *Instructor in English*
 JEAN AVERILL CONDON, M.A. (1967) *Instructor in Physical Education for Women*
 *CLINTON DANA COOK, Ph.D. (1946-48; 1952) *Professor of Chemistry*
 *PHILIP WILLIAM COOK, Ph.D. (1963) *Associate Professor of Botany*
 ROGER L. COOKE, Ph.D. (1968) *Assistant Professor of Mathematics*
 *ROBERT WILLIAM COON, M.D. (1955) *Professor of Pathology*
 JAMES P. COROLOGOS, M.Ed. (1968) *Instructor in Education*
 *REX DEE COUCH, M.D. (1962) *Associate Professor of Pathology*
 JEAN H. COUSINS, M.A. (1968) *Instructor in Sociology and Anthropology*
 WILTON WARNER COVEY, M.D. (1966) *Clinical Instructor in Psychiatry*
 JOHN EDWARD CRAIGHEAD, M.D. (1968) *Associate Professor of Pathology*
 ALBERT JAMES CRANDALL, M.D. (1939) *Instructor in Clinical Surgery*
 EDWARD BYINGTON CRANE, M.D. (Jan., 1961) *Instructor in Community Medicine (General Practice)*
 GRANT CRICHFIELD, M.A. (1968) *Instructor in Romance Languages*
 GEORGE CHAPMAN CROOKS, Ph.D. (1930) *Associate Professor of Chemistry*
 *ALBERT DARY CROWELL, Ph.D. (1955) *Professor of Physics*
 JOHN CHARLES CUNNINGHAM, M.D. (1949) *Shipman Professor of Ophthalmology*
 FLORENCE MARY CZERNIAWSKI, M.T. (1967) *Instructor in Medical Technology (Pathology)*
 *MALCOLM DANIEL DAGGETT, Ph.D. (1945) *Professor of Romance Languages*
 *ROBERT VINCENT DANIELS, Ph.D. (1956-57; 1958) *Professor of History*
 HANLYN WILKINS DAVIES, M.F.A. (1966) *Assistant Professor of Art*
 JOHN H. DAVIS, M.S. (Dec. 1968) *Professor of Surgery*
 PHILIP HOVEY DAVIS, M.D. (1958) *Assistant Professor of Clinical Orthopedic Surgery*
 ROBERT EARLE DAVIS, M.D. (1968) *Instructor in Obstetrics and Gynecology*
 *JEAN MARGARET DAVISON, Ph.D. (1955) *Associate Professor of Classical Languages and History*
 *JOHN AMERPOHL DAVISON, Ph.D. (1967) *Associate Professor of Zoology*
 WILLIAM EARL DAVISON, M.F.A. (Jan., 1966) *Instructor in Art*
 ROBERT STUART DEAN, M.B.Ch. (1967) *Assistant Professor of Surgery*
 WILLIAM NELSON DEANE, Ph.D. (1960) *Assistant Professor of Social Psychiatry*
 JANET MARIE DEARCOFF, M.Ed. (1967) *Instructor in Physical Education for Women*
 *LUBOMIR ATANASOV DELINESEFF DELLIN, J.S.D. (1957) *Professor of Economics and Business Administration*
 JEAN PIERRE DE LOESCHNIGG, M.A. (1965)² *Instructor in Romance Languages*
 ALINE LOUISE DEMERS, M.S. (1960) *Associate Professor of Nursing*
 GINO ALDO DENTE, M.D. (1950) *Associate Professor of Clinical Anesthesiology*
 DAVID ALLEN DEPATIE, Ph.D. (1967) *Assistant Professor of Physics*
 *ROBERT WARREN DETENBECK, Ph.D. (1967) *Associate Professor of Physics*
 WILLIAM MONTGOMERY DIAMOND, Ph.D. (1966) *Associate Professor of Economics and Business Administration*
 ALBERT INSKIP DICKERSON, JR., Ph.D. (1966) *Assistant Professor of English*
 MARY JANE PHILLIPS DICKERSON (MRS. A. I.), M.A. (1966) *Instructor in English*
 RAYMOND GEORGE DILLEY, M.A. (1965) *Instructor in Speech*
 DAVID KENNETH DIMOCK, M.S. (Jan., 1968) *Instructor in Mathematics*
 CARROLL WILLIAM DODGE, Ph.D. (1963) *Visiting Professor of Botany*
 RAYMOND MADIFORD PEARDON DONAGHY, M.D. (1946) *Professor of Neurosurgery*

1. Sabbatical leave first semester 1968-69.

2. Deceased, February 20, 1969.

- JOHN EDWARD DONNELLY, M.A. (1952) *Associate Professor of Physical Education for Men*
 *GERALD ALTON DONOVAN, Ph.D. (1960) *Professor of Poultry Science*
 HENRY MEADE DOREMUS, II, D.V.M. (1964) *Assistant Professor of Pharmacology*
 ROBERT KINGSLAND DOTEN, Ph.D. (1939) *Associate Professor of Geology*
 *THOMAS WHITFIELD DOWE, Ph.D. (1962) *Professor of Animal and Dairy Science*
 RICHARD NEAL DOWNER, Ph.D. (1967) *Assistant Professor of Civil Engineering*
 *HOWARD DUCHACEK, M.S.A.E. (1949) *Associate Professor of Mechanical Engineering*
 DAVID RICHARD DUFFELL, M.D. (Jan., 1968) *Assistant Professor of Pathology*
 RICHARD G. DUMONT, Ph.D. (1968) *Assistant Professor of Sociology and Anthropology*
 CHARLES ROGER DUNHAM, M.S. (1967) *Instructor in Civil Engineering*
 *FRED WILLIAMS DUNIHUE, Ph.D. (1936) *Professor of Anatomy*
 THOMAS CALVIN DUNKLEY, M.Ed. (1966) *Assistant Professor of Physical Education for Men*
 HERBERT ASHLEY DUFEE, JR., M.D. (1957) *Associate Professor of Obstetrics and Gynecology*
 WINFIELD BOOTH DURRELL, D.V.M. (1949) *Associate Professor of Animal Pathology*
 *ALEXANDER HARRY DUTHIE, Ph.D. (Feb., 1964) *Associate Professor of Animal and Dairy Science*
 JULIUS SOLOMON DWORK, Ph.D. (1954) *Associate Professor of Mathematics*
 *GEORGE DYKHUIZEN, Ph.D. (1926) *Marsh Professor of Intellectual and Moral Philosophy*
 OLIVER ROLFE EASTMAN, M.D. (1948) *Associate Professor of Obstetrics and Gynecology*
 ROBERT WEBSTER EASTMAN, LL.B. (Feb., 1952) *Instructor in Political Science*
 WINSTON MILO EDDY, M.D. (1960) *Assistant Professor of Clinical Medicine*
 JOHN WIER ELLENWOOD, M.A. (1963-65; 1967) *Assistant Professor of Speech*
 DAVID M. ELLIS, Ph.D. (1968) *Assistant Professor of Electrical Engineering*
 MARY JANE ELLIS, M.S. (Jan., 1966) *Assistant Professor of Home Economics*
 CAROL ANN ELMENDORF, B.S. (1967) *Instructor in Nursing*
 ROBERT HEALY ELWELL, M.D. (1966) *Clinical Instructor in Medicine*
 FRANK STONE EMANUEL, B.S. (1968) *Instructor in Home Economics*
 SYLVIA JANE EMANUEL (MRS. F. S.), M.S. (1966) *Assistant Professor of Home Economics*
 FAITH GRISCOM EMERSON, M.A. (1959) *Associate Professor of Nursing*
 ROBERT RICHARD ENGISCH, M.D. (1961) *Instructor in Clinical Neurology*
 WARREN WALTER EPINETTE, M.D. (1965) *Assistant Professor of Dermatology*
 ROBERT HODGSKIN ERDMAN, LL.B. (1967) *Instructor in Economics and Business Administration*
 LOUIS WILLIAM ESPOSITO, M.D. (1954) *Instructor in Clinical Urology*
 *WARREN ORVEL ESSLER, Ph.D. (1961) *Professor of Electrical Engineering*
 BUD ETHELTON, Ph.D. (1968) *Associate Professor of Botany*
 JOHN CLIFFORD EVANS, B.S. (1937) *Associate Professor of Physical Education for Men*
 *FREDERICK CHRISTIAN EVERING, JR., Ph.D. (1965) *Assistant Professor of Electrical Engineering*
 JON B. FACKLER, M.A. (1968) *Instructor in History*
 WILLIAM THOMAS FAGAN, JR., M.D. (1954) *Assistant Professor of Clinical Urology*
 DAVID SPERBER FAIGEL, D.S. (1954) *Instructor in Dental Hygiene*
 FRANK JAMES FALCK, Ph.D. (1957) *Associate Professor of Speech Therapy (Community Medicine)*
 VILMA TARASI FALCK, (MRS. F. J.), Ph.D. (1960) *Associate Professor of Audiology*
 KARL JORG FALKENBERG, M.D. (March, 1968) *Instructor in Ophthalmology and Otolaryngology*
 JOHN EDWARD FARNHAM, D.D.S. (1963) *Clinical Instructor in Dental Hygiene*
 SANDRA M. FARRELL, M.S. (1968) *Instructor in Physical Education for Women*
 HELEN ELIZABETH FARRINGTON, M.P.H. (1962) *Assistant Professor of Nursing*
 DOUGLAS PATTEN FAY, M.S. (1953) *Associate Professor of Civil Engineering*
 EDWARD JOSEPH FEIDNER, M.F.A. (1958) *Associate Professor of Speech*
 *JEREMY POLLARD FELT, Ph.D. (1957)¹ *Associate Professor of History*
 CHARLES LYNN FIFE, Ph.D. (Dec., 1966) *Assistant Professor of Agricultural Economics*
 CAROL A. FISCHER, B.S. (1968) *Instructor in Medical Technology (Pathology)*
 JOHN RICHARD FITZGERALD, M.D. (1961) *Instructor in Clinical Medicine*
 MARTIN EDWARD FLANAGAN, M.D. (1962) *Assistant Professor of Clinical Neurosurgery*
 *TED BENJAMIN FLANAGAN, Ph.D. (1961) *Professor of Chemistry*
 THEODORE ROSS FLANAGAN, Ph.D. (1953) *Assistant Professor of Plant and Soil Science*
 CURTIS M. FLORY, M.D. (1964) *Assistant Professor of Pathology*
 ARTHUR HOWARD FLOWER, JR., M.D. (1950) *Associate Professor of Clinical Dermatology*
 JOSEPH CLAYTON FOLEY, M.D. (1954) *Associate Professor of Clinical Radiology*
 *MURRAY WILBUR FOOTE, Ph.D. (1947-51; 1953) *Associate Professor of Agricultural Biochemistry*
 DOROTHY ELLEN FORD, M.D. (1968) *Assistant Professor of Rehabilitation Medicine*
 *DONALD GABRIAL FORGAYS, Ph.D. (1964) *Professor of Psychology*

1. Sabbatical leave second semester 1968-69.

- ROSE JULIET FORGIONE, M.A. (1964)
 ELIZABETH HERTA FORSBERG, M.D. (1968)
 BEN RALPH FORSYTH, M.D. (1966)
 DANIEL MARTIN FORSYTH, Ph.D. (1968)
 ELIZABETH HELD FORSYTH (MRS. B. R.), M.D. (1967)
 DONALD C. FOSS, Ph.D. (1968)
 HOWARD D. FRASER, B.S., Major, United States Army (1965)
 STEVEN LESLIE FREEDMAN, Ph.D. (1965)
 EDWARD ESAU FRIEDMAN, M.D. (1963)
 GERALD ROSS FULLER, Ed.D. (1968)
 ROBERT WEEKS FULLER, M.S. (Jan., 1966)
 *DANIEL WAYNE GADE, Ph.D. (1966)
 *JOSEPH HERBERT GANS, Ph.D. (1967)
 EDWARD CHARLES GANZ, A.M. (1967)
 WILLIAM GILBERT GARD, Ph.D. (1966)
 BRUCE ARTHUR GAYLORD, Ed.D. (Feb., 1960)¹
 THOMAS HOWARD GENO, M.A. (1965)
 STOKES GENTRY, M.D. (1962)
 ANTONIO ISAIAS GERMAN, M.D. (1965)
 THOMAS CHOMETON GIBSON, M.B., B.Chir. (Dec., 1962)
Associate Professor of Community Medicine and Associate Professor of Medicine
 *BRADY BLACKFORD GILLELAND, Ph.D. (1957)²
 HARRIET ELLEN GILLETTE, M.D. (1966)
 *ERLAND CHENEY GJESSING, Ph.D. (1954)
 *RICHARD WILLIAM GLADE, Ph.D. (1958)²
 ARTHUR GLADSTONE, M.D. (1933-36; 1941)
 MARIAN GILES GLEASON, M.S. (1967)
 CHARLES MORTON GLUCK, M.D. (1965)
 ROBERT JOHN GOBIN, Ph.D. (1965)
 RICHARD HERRON GOLDSBOROUGH, M.D. (1961)
Assistant Professor of Physical Education for Men
 *LYMAN JAY GOULD, Ph.D. (1953)
 CORNELIUS O. GRANAI, JR., M.D. (1967)
 *RAYMOND WALLACE GRANT, Ph.D. (1965)
 DUANE EDGAR GRAVELINE, M.D. (1966)
 DAVID HENRY GRAY, M.D. (1962)
 MARY JANE GRAY, M.D. (1960)
 GARETH M. GREEN, M.D. (1968)
 *DONALD CROWTHER GREGG, Ph.D. (1946)
 *EDWIN CHARLES GREIF, M.S. (1950)
 HAROLD ALFRED GREIG, M.P.E. (1962)²
 HOWARD THEODORE GUARE, M.D. (1952)
 ROBERT CESARE GUIDULI, M.D. (1966)
 DIETER WALTER GUMP, M.D. (1966)
 CHARLES RICHARD HADDEN, D.D.S. (1966)
 CARLETON RAYMOND HAINES, M.D. (1950-52; 1954)
Assistant Professor of Clinical Surgery (Oncology)
 PUZANT SETRAK HALEBIAN, D.D.S. (1965)
 MARY STARRITT HALL (MRS. R. W.), Ph.D. (1961-62; 1965)²
 *ROBERT WILLIAM HALL, Ph.D. (1957-63; 1964)²
 BURT HAMRELL, M.D. (1968)
 *SAMUEL B. HAND, Ph.D. (Feb., 1961)²
 PETER ROBERT HANNAH, Ph.D. (Jan., 1967)
 JOHN SHERWOOD HANSON, M.D. (1958)
 LAWRENCE S. HARRIS, M.D. (1968)
 JOHN FARWELL HARWOOD, B.S. (1964)
 *ROLF NORDAHL BRUN HAUGEN, Ph.D. (1947)
 WILLIAM A. HAVILAND, Ph.D. (1965)
 MARGARET ELLEN HAYES, M.S. (1966)
 RICHARD S. HEILMAN, M.D. (1968)
Instructor in Radiology
Assistant Professor of Nursing
Clinical Instructor in Psychiatry
Associate Professor of Medicine
Associate Professor of Psychology
Instructor in Psychiatry
Assistant Professor of Poultry Science
Instructor in Military Science
Assistant Professor of Anatomy
Clinical Instructor in Community Medicine
Associate Professor of Agricultural Education
Assistant Professor of Forestry
Assistant Professor of Geography
Associate Professor of Pharmacology
Instructor in German
Assistant Professor of History
Associate Professor of Agricultural Education
Instructor in Romance Languages
Assistant Professor of Clinical Pediatrics
Instructor in Pathology
Professor of Classical Languages
Associate Professor of Rehabilitation Medicine
Associate Professor of Biochemistry
Professor of Zoology
Professor of Clinical Surgery
Instructor in English
Instructor in Clinical Medicine
Assistant Professor of Political Science
Instructor in Obstetrics and Gynecology
Assistant Professor of Geology
Clinical Instructor in Medicine
Clinical Instructor in Community Medicine
Associate Professor of Obstetrics and Gynecology
Associate Professor of Medicine
Pomeroy Professor of Chemistry
Professor of Economics and Business Administration
Assistant Professor of Physical Education for Men
Assistant Professor of Clinical Radiology
Instructor in Ophthalmology
Assistant Professor of Medicine
Instructor in Dental Hygiene
Instructor in Dental Hygiene
Instructor in English
Professor of Philosophy and Religion
Instructor in Physiology and Biophysics
Associate Professor of History
Assistant Professor of Forestry
Associate Professor of Medicine
Assistant Professor of Pathology
Lecturer in Radiologic Safety
Professor of Political Science
Associate Professor of Sociology and Anthropology
Instructor in Physical Education for Women

1. Deceased October 28, 1968.

2. Sabbatical leave 1968-69.

3. Sabbatical leave first semester 1968-69.

- MARY CATHERINE HEININGER (MRS. P. L.), R.N. (1958) *Instructor in Dental Hygiene*
 PAUL LEHMANN HEININGER, D.D.S. (1950) *Instructor in Dental Hygiene*
 JOHN WILBUR HEISSE, JR., M.D. (1956) *Assistant Professor of Clinical Ophthalmology and Otolaryngology*
- *EARL BENNETTE HENSON, Ph.D. (1965) *Associate Professor of Zoology*
 *RAUL HILBERG, Ph.D. (1956) *Professor of Political Science*
 *DAVID BYRNE HILL, Ph.D. (1965) *Assistant Professor of Mathematics and Community Medicine*
 FRANKLIN THEODORE HOAGLUND, M.D. (Mar., 1968) *Associate Professor of Orthopedic Surgery*
 WILLIAM ELWIN HODGKIN, M.D. (1964) *Assistant Professor of Pediatrics*
 CHARLES WILLIAM HOILMAN, M.S. (1949) *Associate Professor of Electrical Engineering*
 ROBERT ADAMS HOLDEN, M.D. (1966) *Clinical Instructor in Medicine*
 HAROLD L. HOLLADAY, M.A. (1968) *Instructor in English*
 ANNE DODGE HOOPER, M.D. (1967) *Instructor in Pathology*
 *RICHARD JOHN HOPP, M.S. (1947) *Professor of Plant and Soil Science*
 EDWARD SCHURR HORTON, M.D. (1967) *Assistant Professor of Medicine*
 CHARLES SNEAD HOUSTON, M.D. (1966) *Professor of Community Medicine*
 GERALD E. HOWE, M.S. (1968) *Instructor in Surgery*
 JAMES ROBINSON HOWE, Ph.D. (1964) *Assistant Professor of English*
 DAVID CHARLES HOWELL, Ph.D. (1967) *Assistant Professor of Psychology*
 LUC HUANG, Ph.D. (1968) *Assistant Professor of Physics*
 ROBERT BRUCE HUBER, Ph.D. (1946) *Lawrence Professor of Forensics*
 HANS ROSENSTOCK HUESSY, M.D. (1960) *Associate Professor of Psychiatry*
 *MAHENDRA SINGH HUNDAL, Ph.D. (1967) *Associate Professor of Mechanical Engineering*
 *ALLEN STANDISH HUNT, Ph.D. (Feb., 1961) *Associate Professor of Geology*
 *LYMAN CURTIS HUNT, JR., D.Ed. (1966) *Professor of Education*
 ROBERT JACOB HUNZIKER, M.D. (Jan., 1963) *Assistant Professor of Clinical Radiology*
 PATRICK H. HUTTON, M.S. (1968) *Instructor in History*
 *BEAL BAKER HYDE, Ph.D. (1965) *Professor of Botany*
 ROBERT WELLS HYDE, M.D. (1967) *Associate Professor of Psychiatry*
 PETER R. INGOLD, M.A. (1968) *Assistant Professor of Geography*
 EDWARD SUTER IRWIN, M.D. (Jan., 1963) *Assistant Professor of Ophthalmology*
 YASHINORI ISHIKAWA, D.Ag.Sci. (1968) *Instructor in Biochemistry*
 *JOSEPH ANTHONY IZZO, Ph.D. (1956) *Professor of Mathematics*
 *JULIAN JOSEPH JAFFE, Ph.D. (1961) *Professor of Pharmacology*
 GLADYS M. JAMESON, M.Ed. (1968) *Assistant Professor of Home Economics*
 CLINTON DALES JANNEY, Ph.D. (1959) *Associate Professor of Radiologic Physics*
 RICHARD HARRY JANSON, Ph.D. (1958) *Professor of Art*
 CATHERINE M. E. JARRETT (MRS. D. W.), B.A. (1967) *Instructor in English*
 DAVID WILLIAM JARRETT, B.A. (1967) *Instructor in English*
 ALAN WRIGHT JOHNSON, M.S. (1968) *Instructor in Zoology*
 CLARK JOHNSON, Ph.D. (1964) *Assistant Professor of Sociology and Anthropology*
 SHIRLEY EVANGELINE JOHNSON, M.A. (1967) *Instructor in English*
 ELBRIDGE EUGENE JOHNSTON, M.D. (1951) *Assistant Professor of Clinical Medicine*
 *STUART LYNDE JOHNSTON, Ph.D. (1940-42; 1943-44; 1946) *Professor of Romance Languages*
 WILLIAM HERBERT JOHNSTON, M.D. (1952) *Instructor in Clinical Radiology*
 *DONALD BOYES JOHNSTONE, Ph.D. (1948) *Professor of Agricultural Biochemistry and Medical Microbiology*
- *LEONIDAS MONROE JONES, Ph.D. (1951) *Professor of English*
 WARNER EDRICK JONES, M.D. (Jan., 1968) *Instructor in Clinical Medicine*
 MARY H. JOSLYN, M.A. (1968) *Instructor in English*
 *DAVID WILLIAM JUNKER, Ph.D. (1964) *Professor of Physics*
 *ROY GEORGE JULOW, Ph.D. (1957) *Associate Professor of Romance Languages*
 HARRY HELMUTH KAHN, M.A. (1948-53; 1954) *Assistant Professor of German*
 COLLINGWOOD SOLOMON KARMODY, M.B.B.Ch. (1966) *Assistant Professor of Ophthalmology and Otolaryngology*
- ALBERT GUSTAV KASENTER, A.B. (1967) *Tutor in Radiologic Physics*
 IRWIN SEYMOUR KAYE, M.D. (1966) *Assistant Professor of Pathology*
 PHILIP CONBOY KELLEHER, M.D. (1963) *Associate Professor of Medicine*
 JAY EDGAR KELLER, M.D. (1950) *Assistant Professor of Clinical Surgery*
 ROBERT E. KENDALL, M.D. (Jan., 1969) *Associate Professor of Psychiatry*
 MARK CLARK KENNEDY, Ph.D. (1965) *Assistant Professor of Sociology and Anthropology*
 *RAMAKANT GOVIND KHAZANIE, Ph.D. (1965) *Assistant Professor of Mathematics*
 *DAVID LESLIE KINSEY, Ph.D. (1950) *Associate Professor of Music*
 THOMAS ROBERT KLEH, M.D. (1965) *Instructor in Ophthalmology*

- *RICHARD M. KLEIN, Ph.D. (1967) *Professor of Botany*
 STEPHEN CECIL KNIGHT, JR., M.S. (1952) *Associate Professor of Civil Engineering*
 RICHARD A. KNOLLER, M.A. (1968) *Assistant Professor of Political Science*
 ESTHER LUCILE KNOWLES, M.S. (1945) *Associate Professor of Home Economics*
 MAURICE EMILE KOHLER, Ph.D. (1965) *Assistant Professor of Romance Languages*
 MOLLY MOORE KOHLER (MRS. M. E.), M.A. (Jan., 1967) *Instructor in English*
 *ROY KORSON, M.D. (1950-52; 1954) *Professor of Pathology*
 *ANDREW PAUL KRAPCHO, Ph.D. (1960)¹ *Professor of Chemistry*
 *JOHN ERNEST KRIZAN, Ph.D. (1962) *Associate Professor of Physics*
 NANCY M. KRYGER, B.A. (1968) *Instructor in English*
 *MARTIN ERIC KUEHNE, Ph.D. (1961) *Professor of Chemistry*
 RAYMOND FRANK KUHLMANN, M.D. (1951) *Associate Professor of Clinical Orthopedic Surgery*
 ARTHUR SAUL KUNIN, M.D. (1957) *Associate Professor of Medicine and Biochemistry*
 EDWARD ANTHONY KUPIC, M.D. (Nov., 1966) *Assistant Professor of Radiology*
 *BERT KARL KUSSEROW, M.D. (1959) *Professor of Pathology*
 GENE E. LABER, Ph.D. (1968) *Assistant Professor of Economics and Business Administration*
 *DAVID CHIN LAI, Eng.D. (1965) *Associate Professor of Electrical Engineering*
 DENIS EMERY LAMBERT, M.A. (1964) *Assistant Professor of Physical Education for Men*
 *LLOYD MILTON LAMBERT, JR., Ph.D. (1965) *Associate Professor of Electrical Engineering*
 *MERTON PHILIP LAMDEN, Ph.D. (1947) *Associate Professor of Biochemistry*
 S. HENRY LAMPERT, D.D.S. (1963) *Instructor in Dental Hygiene*
 HELENE WANDA LANG, Ed.M. (1967) *Assistant Professor of Education*
 JANICE LYNN LANGE, M.S. (1967) *Instructor in Physical Education for Women*
 JOHN CLIFFORD LANTMAN, M.D. (1957) *Instructor in Community Medicine (General Practice)*
 H. PETER LAQUEUR, M.D. (1968) *Clinical Associate Professor of Psychiatry*
 ROBERT L. LARSON, Ed.D. (1968) *Assistant Professor of Education*
 JEAN-PIERRE LASCOUMES, LIC. (1964) *Instructor in Romance Languages*
 PETER LAWRENCE, D.D.S. (March, 1968) *Clinical Instructor in Dental Hygiene*
 *ROBERT BERNARD LAWSON, JR., Ph.D. (1966) *Assistant Professor of Psychology*
 GUY WHITMAN LEADBETTER, M.D. (1967) *Professor of Surgery*
 LESLIE RAYMOND LEGGETT, D.P.E. (1962) *Associate Professor of Physical Education for Men*
 OLGA LEHOVICH, M.A. (1968) *Instructor in Romance Languages*
 *HAROLD LEITENBERG, Ph.D. (1965) *Assistant Professor of Psychology*
 MICHAEL HEATON LEONARD, Ph.D. (1964) *Assistant Professor of English*
 *JONATHAN PORTER AARON LEOPOLD, M.D. (1966) *Assistant Professor of Psychiatry*
 EUGENE LEPESCHKIN, M.D. (1946) *Professor of Experimental Medicine*
 JULIA LEPESCHKIN (MRS. E.), M.A. (1962) *Assistant Professor of Home Economics*
 HYMAN BERNARD LEVINE, M.D. (1961) *Instructor (Clinical) in Community Medicine*
 ARTHUR MAURICE LEVY, M.D. (1963) *Associate Professor of Medicine*
 GORDON FIELDING LEWIS, Ph.D. (1961) *Professor of Sociology and Anthropology*
 JOHN D. LEWIS, M.D. (1968) *Assistant Professor of Obstetrics and Gynecology*
 WILLIAM J. LEWIS, Ph.D. (1954) *Professor of Speech*
 *FRANK WAYNE LIDRAL, Ph.D. (1960) *Professor of Music*
 *HARRY LIGHTHALL, JR., Ph.D. (1955) *Associate Professor of Mathematics*
 PETER CASTLE LINTON, M.D. (Jan., 1965) *Instructor in Surgery*
 RICHARD LEWIS LIPSON, M.D. (Dec., 1963) *Assistant Professor of Medicine*
 GEORGE THOMAS LITTLE, Ph.D. (1950) *Professor of Political Science*
 JACK ERNEST LITTLE, Ph.D. (1945) *Professor of Biochemistry (Agriculture)*
 JOYCE KENYON LIVAK, M.S. (1966) *Assistant Professor of Home Economics*
 *JOHN HUTCHISON LOCHHEAD, Ph.D. (1942) *Professor of Zoology*
 MARGIT LOCHHEAD (MRS. J. H.), Ph.D. (1954) *Instructor in Nursing*
 *NORMAN THEODORE LONDON, Ed.D. (1960) *Associate Professor of Speech*
 LITTLETON LONG, Ph.D. (1949) *Professor of English*
 ALBERT G. LOVELADY, M.A. (1968) *Clinical Instructor in Community Medicine*
 *JEROLD FRANCIS LUCEY, M.D. (1956) *Professor of Pediatrics*
 *WILLIAM HOSSFELD LUGINBUHL, M.D. (1960) *Professor of Pathology*
 *ELEANOR MERRIFIELD LUSE, Ph.D. (1947)¹ *Professor of Speech*
 THOMAS E. LUX, M.A. (1968) *Instructor in Sociology and Anthropology*
 JOHN HAMILTON MABRY, Ph.D. (1963) *Professor of Community Medicine*
 GEORGE BUTTERICK MACCOLLUM, Ph.D. (1966) *Associate Professor of Plant and Soil Science*
 JAMES NEIL MACDONALD, M.A. (1966) *Instructor in Speech*
 ALBERT GEORGE MACKAY, M.D. (1933) *Professor of Surgery*

1. Sabbatical leave 1968-69.

- *WILLIAM HOOPER MACMILLAN, Ph.D. (1954)
 JAMES FREDERICK MADISON, M.D. (Nov., 1964)
 JOHN VAN SICKLEN MAECK, M.D. (1950)
 FRANCES E. MAGEE, M.S.N. (1968)
 *FRANK MANCHEL, Ed.D. (1967)
 JAMES EDWARD MARCEAU, D.D.S. (1949-52; 1954)
 CARLTON DEAN MARSHALL, M.D. (1966)
 GILBERT ADAMS MARSHALL, M.S. (1947)
 KATHLEEN AUDREY MARSLAND, M.S. (1964)
 THOMAS WILLIAMS MARTENIS, M.D. (1967)
 HERBERT LLOYD MARTIN, M.D. (1954)
 LUTHER HOWARD MARTIN, S.T.M. (1967)
 FRANK MARTINEK, Ph.D. (1967)
 *JAMES WALLACE MARVIN, Ph.D. (1939)
 GUISTINO NICHOLAS MASTRO, B.S.M.E. (1966)
 ROBERT ARTHUR MAXWELL, Ph.D. (1962-65; 1967)
 ANTHONY JOHN MAYHEW, Ph.D. (1965)
 JOHN EDMUND MAZUZAN, JR., M.D. (1959)
 CHRISTOPHER PATRICK McAREE, M.B. (1962)
 *HERBERT CHRISTIAN McARTHUR, Ph.D. (1950)¹
 THOMAS GORDON McCARTY, M.A. (1967)
 JOHN JOSEPH McCORMACK, JR., Ph.D. (1966)
 MAXWELL L. McCORMACK, D.F. (1964)
 *H. LAWRENCE McCOREY, Ph.D. (1966)
 JAMES BISHOP MCGILL, M.D. (1952)
 GERALD FRANCIS MCGINNISS, M.D. (1962)
 *JERRY LEON McINTOSH, Ph.D. (1964)²
 ROBERT JAMES MCKAY, JR., M.D. (1949)
 MARION CLAIRE MCKEE, M.D. (1958)
 HUGH STRATTON MCKENZIE, Ph.D. (1967)
 RICHARD W. McLAY, Ph.D. (1968)
 E. DOUGLAS McSWEENEY, JR., M.D. (1964)
 CYRIL MEADOWS, B.A. (1968)
 HAROLD EDWARD MEDIVETSKY, M.D. (1937)
 CORNELIUS IRVING MEEKER, M.D. (1962)
 HAROLD AUSTIN MEEKS, Ph.D. (1964)
 WARD TINKER MELENDY, Ed.D. (1968)
 RICHARD WALLACE PAUL MELLISH, M.B. (1963)
 *DONALD BURTON MELVILLE, Ph.D. (1960)
 *BRUCE ELWYN MESERVE, Ph.D. (1964)
 *WILLIAM CRAIG METCALFE, Ph.D. (1963)
 *WILLIAM LAROS MEYER, Ph.D. (1962)
 GARY KEITH MICHAEL, M.B.A., C.P.A. (1965)
Assistant Professor of Economics and Business Administration
 *REGINALD VENN MILBANK, M.S. (1946-48; 1949)
 *EDWARD JERVIS MILES, Ph.D. (1962)
 RAYMOND LEE MILHOUS, M.D. (Feb., 1968)
 DONALD BARKER MILLER, M.D. (1951)
 GARY EARLE MILLER, M.A. (1966)
 JEAN BEATTIE MILLIGAN, M.A. (1953)
 ERNEST LEE MILLS, M.D. (1952-53; 1955)
 ISABEL CLARK MILLS (MRS. C. H.), M.A. (1932)
 JOHN HOLLISTER MILNE, M.D. (1964)
 HOWARD JAY MINDELL, M.D. (1967)
 GAGAN MIRCHANDANI, Ph.D. (1968)
 WILLIAM EDWARD MITCHELL, M.A. (1967)
 THOMAS JOHN MOEHRING, Ph.D. (Jan., 1968)
 MAUREEN KATHERINE MOLLOY, M.D. (1968)
 MAURICE EDWARD MONGEON, M.D. (1966)
 DALE BISHOP MONTGOMERY, D.M.D. (Feb., 1965)
 *PAUL AMOS MOODY, Ph.D. (1927)
Professor of Pharmacology
Assistant Professor of Clinical Dermatology
Professor of Obstetrics and Gynecology
Assistant Professor of Professional Nursing
Associate Professor of English
Instructor in Dental Hygiene
Clinical Instructor in Psychiatry
Associate Professor of Mechanical Engineering
Assistant Professor of Nursing
Instructor in Medicine
Associate Professor of Clinical Neurology
Instructor in Philosophy and Religion
Associate Professor of Mechanical Engineering
Professor of Botany
Instructor in Mechanical Engineering
Visiting Professor of Pharmacology
Assistant Professor of Psychology
Associate Professor of Anesthesiology
Assistant Professor of Psychiatry
Professor of English
Instructor in Classics
Assistant Professor of Pharmacology
Assistant Professor of Forestry
Assistant Professor of Physiology
Assistant Professor of Clinical Surgery
Assistant Professor of Psychiatry
Assistant Professor of Plant and Soil Science
Professor of Pediatrics
Assistant Professor of Clinical Pediatrics
Assistant Professor of Education
Associate Professor of Mechanical Engineering
Assistant Professor of Surgery
Instructor in Romance Languages
Assistant Professor of Clinical Medicine
Assistant Professor of Obstetrics and Gynecology
Assistant Professor of Geography
Associate Professor of Education
Associate Professor of Surgery
Professor of Biochemistry
Professor of Mathematics
Assistant Professor of History
Assistant Professor of Biochemistry
Professor of Civil Engineering
Professor of Geography
Instructor in Rehabilitation Medicine
Associate Professor of Clinical Surgery (Thoracic)
Instructor in English
Associate Professor of Nursing
Associate Professor of Clinical Anesthesiology
Associate Professor of Art
Instructor in Clinical Medicine
Instructor in Clinical Radiology
Assistant Professor of Electrical Engineering
Assistant Professor of Psychiatry
Assistant Professor of Microbiology
Instructor in Orthopedic Surgery
Instructor in Medicine
Instructor in Dental Hygiene
Howard Professor of Natural History and Zoology

1. On leave 1968-69.

2. Sabbatical leave second semester 1968-69.

- CHARLES THOMAS MORRISSEY, M.A. (1968) *Visiting Lecturer in History*
 DOROTHY JACKSON MORROW (MRS. R. C.), M.D. (1952) *Assistant Professor of Clinical Pediatrics*
 RUFUS CLEGG MORROW, M.D. (1951)¹ *Professor of Otolaryngology*
 *ELLEN HASTINGS MORSE, Ph.D. (1960) *Associate Professor of Home Economics*
 *DONALD EUGENE MOSER, Ph.D. (1960) *Associate Professor of Mathematics*
 HOWARD F. MOSHER, M.A. (1968) *Instructor in English*
 MICHAEL JEROME MOYNIHAN, M.D. (1966) *Assistant Professor of Medicine*
 HENRY NICHOLAS MULLER, III, Ph.D. (1966) *Instructor in History*
 BARBARA SPAULDING MURRAY, M.S. (March, 1968) *Instructor in Nursing*
 JOHN J. MURRAY, M.S. (1968) *Instructor in Pediatrics*
 DANIEL FRANCIS MURTHA, B.S. (1968) Major, U.S. Army *Assistant Professor of Military Science*
 RICHARD E. MUSTY, Ph.D. (Jan., 1968) *Assistant Professor of Psychology*
 HARRY EUGENE MYERS, M.A. (1966) *Instructor in Speech*
 *MILTON JOSEPH NADWORN, Ph.D. (1952) *Professor of Economics and Business Administration*
 *AMIR NEZAMEDDIN NAHAVANDI, Ph.D. (Jan., 1967)² *Professor of Mechanical Engineering*
 NARAYAN KRISHNACHARYA NARGUND, M.A. (1966) *Assistant Professor of Economics and Business Administration*
 RICHARD MILTON NARKEWICZ, M.D. (1966) *Clinical Instructor in Pediatrics*
 WILLIAM HOWARD NEDDE, JR., M.S. (1967) *Instructor in Physical Education for Men*
 GARRISON NELSON, M.A. (1968) *Instructor in Political Science*
 DAVID S. NEWCOMBE, M.D. (1967) *Associate Professor of Medicine*
 CHESTER ALBERT NEWHALL, M.D. (1929) *Thayer Professor of Anatomy*
 GEORGE HUBERT NICHOLSON, A.M. (1923) *Lecturer in Mathematics*
 ALEXANDER NIES, M.D. (1965) *Assistant Professor of Psychiatry*
 KAY MILLIGAN NILSON, Ph.D. (1966) *Assistant Professor of Animal and Dairy Science*
 DAVID ALAN NOBLE, A.M. (Jan., 1965) *Instructor in German*
 CHARLES P. NOVOTNY, Ph.D. (1968) *Assistant Professor of Medical Microbiology*
 MITSUO NUMOTO, M.D. (1962) *Assistant Professor of Experimental Neurosurgery*
 *ANDREW EDGERTON NUQUIST, Ph.D. (1938) *McCullough Professor of Political Science*
 *WESLEY LEMARS NYBORG, Ph.D. (1960)³ *Professor of Physics*
 *ELBERT AUSTIN NYQUIST, M.S., C.P.A. (1953) *Professor of Economics and Business Administration*
 ROBERT EMMETT O'BRIEN, M.D. (1955) *Associate Professor of Clinical Medicine*
 RICHARD WILLIAM OEHLER, B.Ed., Lt. Colonel, United States Army (1967) *Professor of Military Science*
 DONALD C. OLIVEAU, M.D. (1968) *Assistant Professor of Psychiatry*
 HERLUF V. OLSEN, JR., M.H.A. (1967) *Professor of Hospital Administration*
 *RALPH HARRY ORTH, Ph.D. (1959) *Associate Professor of English*
 CLARE MARSHALL O'SHEA, M.D. (1967) *Instructor in Medicine*
 MARILYN M. OSBORN, M.Ed. (1968) *Instructor in Home Economics*
 *JOHN OGDEN OUTWATER, Sc.D. (1956) *Professor of Mechanical Engineering*
 JAMES H. OVERFIELD, Ph.D. (1968) *Assistant Professor of History*
 JAMES STEVEN PACY, M.A. (1967) *Assistant Professor of Political Science*
 WILLIAM EDWARD PADEN, Ph.D. (1965) *Assistant Professor of Philosophy and Religion*
 PAUL PAGANUZZI, Ph.D. (1961) *Associate Professor of Russian*
 HAROLD GORDON PAGE, M.D. (1954) *Professor of Clinical Surgery*
 *IPPOCRATES PAPPOUTSAKIS, Mus.M. (1944) *Professor of Music*
 MALCOLM SKEELS PARKER, D.M.L. (1953)⁴ *Associate Professor of Romance Languages*
 RODNEY LAWRENCE PARSONS, Ph.D. (1967) *Assistant Professor of Physiology and Biophysics*
 MARY ELLEN PALMER (MRS. E. M.), M.S. (1953-56; 1958) *Associate Professor of Nursing*
 ALAN K. PASKOW, M.A. (1968) *Instructor in Philosophy and Religion*
 *WAYNE CURTIS PATTERSON, Ph.D. (Jan., 1965) *Associate Professor of Psychology*
 EDWIN MATTSON PAXSON, M.D. (1957) *Assistant Professor of Clinical Pediatrics*
 JEAN PRISCILLA PEARSON, B.A. (1968) *Instructor in Speech*
 MICHAEL PECK, JR., B.A., Major, United States Army (1965) *Assistant Professor of Military Science*
 NORMAN EUGENE PELLETT, Ph.D. (1967) *Assistant Professor of Plant and Soil Science*
 *MERVYN WILLIAM PERRINE, Ph.D. (1961) *Associate Professor of Psychology*

1. On leave 9-1-68 to 8-31-69.

2. On leave 1-1-69 to 12-30-69.

3. Sabbatical leave academic year 1968-69.

4. Sabbatical leave second semester 1968-69.

- *JAMES ALLAN PETERSON, Ed.D. (1966) *Assistant Professor of Education*
 OSCAR SYLVANDER PETERSON, JR., M.D. (1944) *Associate Professor of Clinical Radiology and Associate in Biophysics*
 MARY MARGARET PETRUSICH, Ph.D. (1962) *Associate Professor of Education*
 CAROL F. PHILLIPS, M.D. (1968) *Instructor in Pediatrics*
 CHARLES ALAN PHILLIPS, M.D. (1966) *Associate Professor of Medicine*
 RAYMOND VIRGIL PHILLIPS, Ph.D. (1961) *Professor of Education*
 RONALD CHESTER PICOFF, M.D. (1965) *Assistant Professor of Pathology*
 *SIDNEY BORIS POGER, Ph.D. (1962) *Assistant Professor of English*
 *WILLARD BISSELL POPE, Ph.D. (1934-36; 1937) *Professor of English Literature*
 CHARLES MARCEL POSER, M.D. (1968) *Professor of Neurology*
 ARCHIBALD THOMSON POST, Ed.M. (1929) *Associate Professor of Physical Education for Men*
 *BOYD WALLACE POST, D.F. (1963) *Associate Professor of Forestry*
 *MILTON POTASH, Ph.D. (1951) *Professor of Zoology*
 AGNES TERESA POWELL, M.S. (1963) *Assistant Professor of Home Economics*
 PLATT RUGAR POWELL, M.D. (1949) *Associate Professor of Clinical Urology*
 WILLIAM ARTHUR PRATT, M.D. (1954) *Instructor in Clinical Medicine*
 FAITH KENYON PRIOR, B.S. (1967) *Assistant Professor of Home Economics*
 JEAN L. PULESTON, M.A. (1968) *Instructor in Romance Languages*
 PHYLLIS MELVILLE QUINBY, B.S. (1950) *Associate Professor of Dental Hygiene*
 ANN PEMRICK QUINN (MRS. L. J.), M.A. (Jan., 1967) *Instructor in Nursing*
 *WILHELM RAAB, M.D. (1939) *Professor of Experimental Medicine*
 *DAVID WILLIAM RACUSEN, Ph.D. (1958) *Professor of Agricultural Biochemistry*
 LESLIE SUE RADCLIFFE, M.A. (1967) *Instructor in Romance Languages*
 CHARLES LEWIS RAVARIS, M.D. (1965) *Assistant Professor of Psychiatry*
 THOMAS LAWRENCE READ, D.M.A. (1967) *Assistant Professor of Music*
 JOHN ANDREW REDMOND, Ed.D. (1965) *Associate Professor of Education*
 ELMER MCCREADY REED, M.D. (1948) *Assistant Professor of Otolaryngology*
 PAUL T. REINHARDT, B.S.E. (1968) *Instructor in Physical Education for Women*
 *ERNEST MARVIN I. REIT, Ph.D. (Dec., 1965) *Assistant Professor of Pharmacology*
 JOHN DOWNING RICE, JR., M.D. (Nov., 1968) *Associate Professor of Pathology*
 LESTER EDMUND RICHWAGEN, B.S. (1965) *Professor of Hospital Administration*
 *HEATH KENYON RIGGS, Ph.D. (1953) *Professor of Mathematics*
 RUSSELL HOWARD RILEY, Ed.D. (1967) *Assistant Professor of Education*
 BENJAMIN ALBERT RING, M.D. (1959) *Associate Professor of Neuroradiology and Radiologic Anatomy*
 *SOL ALEXANDER RIPPA, Ed.D. (1960) *Professor of Education*
 DONALD S. ROBINSON, M.D. (1968) *Assistant Professor of Medicine*
 ALICE KELLY RODGERS, M.S. (1962) *Assistant Professor of Nursing*
 MARGARET DAMM ROLAND, Ph.D. (1966) *Assistant Professor of Art*
 *ALFRED BROOKS ROLLINS, JR., Ph.D. (1967) *Professor of History*
 DIRK ROMEYN, M.D. (1967) *Instructor in Clinical Obstetrics and Gynecology*
 THOMAS K. RONEY, M.A. (1967) *Instructor in Mathematics*
 *WILFRED ROTH, Ph.D. (1964) *Professor of Electrical Engineering*
 *HOWARD ROTHSTEIN, Ph.D. (1962) *Associate Professor of Zoology*
 LYMAN SMITH ROWELL, M.S. (1925) *Associate Professor of Zoology*
 *STANLEY RUSH, Ph.D. (1962) *Professor of Electrical Engineering*
 ELEANOR MARY RUSSELL, B.S. (1967) *Instructor in Medical Technology (Pathology)*
 JOSEPH N. RUSSO, M.D. (1968) *Assistant Professor of Obstetrics & Gynecology*
 CHARLES BRUSH RUST, M.D. (1948) *Associate Professor of Clinical Orthopedic Surgery*
 RICHARD ALAN RYDER, M.D. (1967) *Instructor in Medicine*
 THOMAS DUDLEY SACHS, Ph.D. (1962) *Assistant Professor of Physics*
 *ALBERT WILLIAM SADLER, Ph.D. (1956) *Professor of Philosophy and Religion*
 *JACOB ANTHONY SAMENFINK, Ed.D. (1961)¹ *Professor of Home Economics*
 *FREDERIC OBERLIN SARGENT, Ph.D. (1962) *Professor of Agricultural Economics*
 HERBERT SAVEL, M.D. (1967) *Assistant Professor of Medicine*
 WADI ISSA SAWABINI, D.D.S. (1952) *Assistant Professor of Oral Hygiene and Dental Medicine*
 JANET RUTH SAWYER, A.M. (1968) *Associate Professor of Nursing*
 ROBERT NEWTON SAXBY, M.D. (1954) *Instructor in Clinical Radiology*
 *LEONARD MICHAEL SCARFONE, Ph.D. (1963) *Associate Professor of Physics*
 GEORGE SCATCHARD, B.A. (1966) *Instructor in Art*
 WARREN IRA SCHAEFFER, Ph.D. (Dec., 1967) *Assistant Professor of Microbiology*

1. Sabbatical leave second semester 1968-69.

- NINA SCHEGLOW, M.A. (1968)
 *ARNOLD HAROLD SCHEIN, Ph.D. (1947)
 WILLIAM MURRELL SCHENK, M.A. (1965)
 ROBIN RUDOLF SCHLUNK, Ph.D. (1967)
 CARL L. SCHMIDER, M.A. (1968)
 *WOLFE WILHELM SCHMOKEL, Ph.D. (1962-64; 1965)
 EDWIN CALVIN SCHNEIDER, M.S. (1946)
 *NORMAN JAMES SCHOONMAKER, Ph.D. (1956)
 *HAROLD SEESSEL SCHULTZ, Ph.D. (1946)
 HERBERT LOUIS SCHULTZ, M.A. (1957)
 GEORGE ADAM SCHUMACHER, M.D. (1950)
 ROBERTA B. SCHWALB, M.A. (1958)
 Assistant Professor of Nursing and Obstetrics and Gynecology
 BENJAMIN F. SCHWEYER, LL.B. (1963) Instructor in Economics and Business Administration
 JO ANN SCRANTON, M.S. (1968) Instructor in Professional Nursing
 ROBERT MICHAEL SEKERAK, Ed.D. (1966) Associate Professor of Education
 ANTHONY DOMENIC SERRA, M.A. (1967) Instructor in Romance Languages
 MALCOLM FLOYD SEVERANCE, Ph.D. (1951-52; 1953)¹
 Associate Professor of Economics and Business Administration
 JAMES DOUGLASS SHARPE, M.D. (Jan., 1965) Instructor in Clinical Psychiatry
 WILLIAM IRELAND SHEA, M.D. (1952) Assistant Professor of Clinical Surgery
 MARVIN GODDARD SHEFFIELD, D.D.S. (1965) Clinical Instructor in Dental Hygiene
 ALLEN GLASS SHEPHERD, III, Ph.D. (1965) Assistant Professor of English
 PHILIP F. SHERIDAN, M.A. (Jan., 1967) Instructor in English
 TAMOTSU SHINOZAKI, M.D. (1967) Assistant Professor of Surgery
 *FERDINAND JACOB MORRIS SICHEL, Ph.D. (1937)² Professor of Physiology and Biophysics
 CLAUDE SIMARD, B.Ped. (1968) Instructor in Romance Languages
 *KENNETH ROGERS SIMMONS, Ph.D. (Jan., 1963)
 Associate Professor of Animal and Dairy Science
 MORRIS LEON SIMON, M.A. (1954) Assistant Professor of Political Science
 RENO T. SIMONE, JR., M.A. (1968) Instructor in English
 JAMES EDWIN SIMPSON, M.D. (1953) Assistant Professor of Clinical Orthopedic Surgery
 *ETHAN ALLEN HITCHCOCK SIMS, M.D. (1950) Professor of Biochemistry and Medicine
 WARREN FREDERICK SIMS, JR., M.D. (1966) Assistant Professor of Obstetrics and Gynecology
 *ROBERT ORVILLE SINGLAIR, Ph.D. (1953-55; 1956) Professor of Agricultural Economics
 JAMES HAROLD SINGLETON, M.B.A. (1966)
 Instructor in Economics and Business Administration
 ROBERT ERIK SJOGREN, Ph.D. (1967) Assistant Professor of Agricultural Biochemistry
 HOWARD DARRELL SLACK, D.D.S. (1950) Instructor in Dental Hygiene
 WILLIAM JOSEPH SLAVIN, M.D. (1942) Professor of Obstetrics and Gynecology
 MARY C. SLOANAKER, B.S. (1968) Instructor in Dental Hygiene
 JULIE JO-ANN SLOBODNJAK, Cert. (1968) Instructor in Dental Hygiene
 *WILSON GEORGE SMILLIE, M.D. (1962) Visiting Professor of Community Medicine
 *ALBERT MATTHEW SMITH, Ph.D. (1957) Professor of Animal and Dairy Science
 *DURWOOD JAMES SMITH, M.D. (1953) Professor of Pharmacology
 HOWARD MARSHALL SMITH, JR., M.S. (1947) Professor of Electrical Engineering
 JAMES WARREN SMITH, M.D. (1967) Assistant Professor of Pathology
 MARION W. SMITH, M.A. (1968) Instructor in English
 NEIL GIBSON SMITH, M.A. (1968) Lecturer in Speech
 DAVID LEE SOBERS, Ph.D. (1965) Assistant Professor of Philosophy and Religion
 SAMUEL SOLOMON, Ph.D. (1968) Visiting Professor of Obstetrics and Gynecology
 FELIX SOMER, M.D. (Jan., 1965) Instructor in Clinical Psychiatry
 *ARTHUR BRADLEY SOULE, JR., M.D. (1929) Professor of Radiology
 M. PHYLLIS SOULE, B.S. (1968) Instructor in Home Economics
 ALTON RICHARD SPARKS, B.A., Major, United States Army (1965)
 Assistant Professor of Military Science
 *THOMAS JOHN SPINNER, JR., Ph.D. (1957-59; 1962) Associate Professor of History
 *THOMAS SPROSTON, JR., Ph.D. (1946) Professor of Botany
 HORACE HARRISON SQUIRE, Ph.D. (1962)
 Assistant Professor of Economics and Business Administration
 JAMES WARD STACKPOLE, M.D. (1962) Assistant Professor of Clinical Pediatrics

1. Sabbatical leave 1968-69.

2. Deceased April 11, 1968.

- *ROLFE SEATON STANLEY, Ph.D. (1964) Associate Professor of Geology
 ERNEST STARK, M.D. (1945) Associate Professor of Pathology
 JOHN NEWHALL STARK, M.D. (Jan., 1967) Instructor in Psychiatry
 STANISLAW JAN STARON, Ph.D. (1961)¹ Associate Professor of Political Science
 BURDETT KINNEY STEARNS, Ph.D. (Nov., 1965) Assistant Professor of Civil Engineering
 *FRANK LESLIE STEEVES, Ed.D. (1958) Professor of Education
 RONALD ALBERT STEFFENHAGEN, Ph.D. (1966) Assistant Professor of Sociology and Anthropology
- WILLIAM MARK STEIN, M.S.E.E. (1967) Instructor in Mathematics
 DEAN FINLEY STEVENS, Ph.D. (1967) Assistant Professor of Zoology
 LORETTO ANN STEWART, M.A. (1966) Instructor in Mathematics
 *WARREN R. STINEBRING, Ph.D. (Dec., 1967) Professor of Microbiology
 PATRICIA ANN STONE, B.A. (1967) Instructor in Psychology
 ROBERT LEO STONE, M.A. (1964) Assistant Professor of Physical Education for Men
 WILLIAM HAYDN STOUCH, M.D. (1967) Instructor in Medicine
 *NEIL RALPH STOUT, Ph.D. (1964) Associate Professor of History
 NORMAN KENNETH STRASSBURG, M.Ed. (1946) Assistant Professor of Physical Education for Men
- MICHAEL J. STRAUSS, Ph.D. (1968) Assistant Professor of Chemistry
 DARBY JOHN MCGANNON STRONG, M.A. (1965) Assistant Professor of Romance Languages
 ROBERT ROLF STRUTHERS, Ph.D. (1964) Professor of Pediatrics
 WALTER ALVA STULTZ, Ph.D. (1937) Professor of Anatomy
 RALPH DANIEL SUSSMAN, M.D. (1946) Professor of Clinical Pediatrics
 DONALD REED SWARTZ, M.D. (1967) Instructor in Pediatrics
 *DAVID LUTHER SYLWESTER, Ph.D. (1965) Assistant Professor of Mathematics and Community Medicine
- BURTON SAMUEL TABAKIN, M.D. (1954) Professor of Medicine
 DAVID LATHAM TABER, M.D. (1953) Instructor in Clinical Obstetrics and Gynecology
 JOHN PETER TAMPAS, M.D. (1962) Associate Professor of Radiology
 AH TI TAN, Ph.D. (1968) Visiting Assistant Professor of Biochemistry
 *CHARLES FRANCIS TAYLOR, Ph.D. (Feb., 1964) Associate Professor of Electrical Engineering
 FRED HERBERT TAYLOR, Ph.D. (1943) Professor of Botany
 HOWARD CANNING TAYLOR, III, M.D. (1962) Assistant Professor of Pathology
 CHRISTOPHER MARLOWE TERRIEN, M.D. (1939) Associate Professor of Clinical Medicine
 LOUIS GEORGE THABAULT, M.D. (1939) Instructor in Clinical Surgery
 WILFRED LOUIS THABAULT, M.D. (1958) Instructor in Clinical Obstetrics and Gynecology
 JOHN WALTER THANASSI, Ph.D. (1967) Assistant Professor of Biochemistry
 MARY ELIZABETH THOMPSON, M.A. (1958) Assistant Professor of Nursing
 RICHARD STUART THOMSEN, M.A. (1966) Assistant Professor of Speech
 KLAWA THRESHER, M.A. (1968) Instructor in German
 *PETER THURNAUER, Ph.D. (1966) Assistant Professor of Physics
 CHARLES ALLEN TILLINGHAST, M.A. (1967) Instructor in English
 WILLIAM ALLAN TISDALE, M.D. (1965) Professor of Medicine
 HELENE WALLACE TOOLAN (MRS. J. M.), Ph.D. (1964) Associate Professor of Pathology
 JAMES MICHAEL TOOLAN, M.D. (1964) Assistant Professor of Psychiatry
 CEMALETTIN TOPUZLU, M.D. (1967) Assistant Professor of Surgery
 DAVID M. TORMEY, M.D. (1968) Associate Professor of Community Medicine
 THOMAS DERMOTT TRAINER, M.D. (1960) Associate Professor of Pathology
 KARL TREIAL, M.D. (1968) Clinical Instructor in Psychiatry
 *RAYMOND HERMAN TREMBLAY, Ph.D. (1953) Associate Professor of Agricultural Economics
 *JACK TREVITHICK, Ph.D. (1946) Professor of English
 KEITH FRANK TRUAX, M.D. (1932) Associate Professor of Clinical Surgery
 JUDITH HOLLENBACH TRUE (MRS. M. M.), M.A. (1967) Instructor in English
 MARSHALL MACDONALD TRUE, Ph.D. (1966) Assistant Professor of History
 CHARLES F. TSCHOPP, M.S. (1968) Assistant Professor of Otolaryngology
 ARTHUR FREDERICK TUTHILL, M.S. (1946) Professor of Mechanical Engineering
 JOHN CUSHMAN TWITCHELL, M.D. (1961) Instructor in Clinical Medicine
 MARSHALL COLEMAN TWITCHELL, M.D. (1942) Associate Professor of Ophthalmology
 MARY TWITCHELL, M.A. (1967) Instructor in English
 TONY C. TY, M.D. (1967) Instructor in Surgery
 LOUIS MALDONADO UGALDE, Ph.D. (1962) Associate Professor of Romance Languages
 HELENA A. URE, M.S. (1968) Assistant Professor of Professional Nursing

- ESTHER JANE URIE, M.A.T. (1968)
 HENRY CARMER VAN BUREN, M.D. (1962)
 FREDERICK WILLIAM VAN BUSKIRK, M.D. (1946)
 KENNETH EVERSON VARNEY, M.S. (1946)
 *HUBERT WALTER VOGELMANN, Ph.D. (1955)
 JUTTA VOGL, (1968)
 JAMES ANTHONY VOLLKOMMER, M.S. (1967)
 WILLIAM PHILIP WAGNER, Ph.D. (1966)
 *NELSON LEE WALBRIDGE, Ph.D. (1924)
 MARGARET B. WALKER, Cert. (1968)
 HAROLD JAMES WALLACE, JR., M.D. (1964)
 JULIAN A. WALLER, M.D. (1968)
 LESTER JULIAN WALLMAN, M.D. (1948)
 MAURICE J. WALSH, M.D. (Jan., 1968)
 JOSEPH FRANKLIN WARK, D.M.D. (Nov., 1964)
 RICHARD RALPH WARNER, M.A. (1967)
 *JAMES HARVEY WATERS, Ph.D. (1965)
 ROBERT JAMES WATSON, D.M.D. (March, 1968)
 LELON ASHLEY WEAVER, JR., Ph.D. (1962)
 GEORGE DAYTON WEBB, Ph.D. (1966)
 *FRED CLARENCE WEBSTER, Ph.D. (1951-53; 1956)
 SELINA WILLIAMS WEBSTER (MRS. T. M.), M.S. (1960)
 TRUMAN MARION WEBSTER, Ph.D. (1945)
 MAIDA EWING WEDELL, M.A. (1967)
 *JOHN GEORGE WEIGER, Ph.D. (1958-62; 1964)
 FRANCIS ALEXANDER WEINRICH, M.A. (1950)
 JAMES GRAHAM WELCH, Ph.D. (Jan., 1968)
 DAVID LLOYD WELER, Ph.D. (1967)
 JOSEPH WELLS, Ph.D. (1968)
 GEORGE WILLIAM WELSH, 3rd, M.D. (1956)
 EUGEN EMMANUEL WELTIN, Dr.sc.nat. (1966)
 EMMA FRANCA WENNBURG (MRS. J. E.), M.D. (1967)
 JOHN EGMONT WENNBURG, M.D. (1967)
 ALAN P. WERTHEIMER, Ph.D. (1968)
 PIETER WESSELING, M.A. (1967)
 WENDELL JENNISON WHITCHER, Ph.D. (1952)
 JAMES FELLOWS WHITE, Ph.D. (1955)
 *WILLIAM NORTH WHITE, Ph.D. (1963)
 *ROY ALVIN WHITMORE, JR., M.F. (1958)
 MARGARET BEACH WHITTLESEY, M.S.W. (1964)
 ELBERT BENJAMIN WHORTON, JR., Ph.D. (June, 1968)
 *SAMUEL CLAUDE WIGGANS, Ph.D. (Feb., 1963)
 JOHN GREGOR WILCOX, B.S., Captain, United States Army (1967)
 RAYMOND SCOTT WILKES, M.A. (1967)
 BLAIR WILLIAMS, M.S. (1946-48; 1949)
 WILLIAM C. WINTERS, M.D. (1968)
 SARAH ALLENE WISE, B.S. (1967)
 GLEN MEREDITH WOOD, Ph.D. (1950)
 NORMA LOWYN WOODRUFF, M.A. (1952)
 RICHARD S. WOODRUFF, M.D. (1950)
 *STUART COWAN WOODRUFF, Ph.D. (1961)¹
 WILLIAM ALOYSIUS ALFRED WOODRUFF, M.B. (1962)
 *ROBERT CUMMINGS WOODWORTH, Ph.D. (1961)²
 GERALD WOOLF, Ph.D. (1968)
 ROBERT KINGMAN WRIGHT, Ph.D. (1966)
 *CLAUS ADOLF WULFF, Ph.D. (1965)
 ALBERT WILHELM WURTHMANN, M.A. (1947)
 WILLIAM GREENHILL YOUNG, M.D. (1949)
 WILLIAM JOHNSON YOUNG, II, Ph.D. (May, 1968)
- Instructor in English*
Instructor in Clinical Medicine
Associate Professor of Clinical Radiology
Assistant Professor of Plant and Soil Science
Associate Professor of Botany
Instructor in Mathematics
Instructor in Geology
Assistant Professor of Geology
Professor of Physics
Instructor in Art
Assistant Professor of Medicine and Pharmacology
Professor of Community Medicine
Professor of Neurosurgery
Instructor in Community Medicine
Instructor in Dental Hygiene
Assistant Professor of Political Science
Assistant Professor of Chemistry
Clinical Instructor in Dental Hygiene
Assistant Professor of Psychiatry
Assistant Professor of Physiology
Professor of Agricultural Economics
Assistant Professor of Home Economics
Professor of German
Instructor in Art
Associate Professor of Romance Languages
Assistant Professor of Music
Associate Professor of Animal and Dairy Science
Assistant Professor of Agricultural Biochemistry
Associate Professor of Anatomy
Associate Professor of Medicine
Assistant Professor of Chemistry
Assistant Professor of Anatomy
Assistant Professor of Community Medicine
Assistant Professor of Political Science
Assistant Professor of Romance Languages
Associate Professor of Chemistry
Professor of German
Professor of Chemistry
Associate Professor of Forestry
Assistant Professor of Home Economics
Assistant Professor of Community Medicine
Professor of Plant and Soil Science
Assistant Professor of Military Science
Instructor in Speech
Associate Professor of Home Economics
Assistant Professor of Medicine
Instructor in Medical Technology
Associate Professor of Plant and Soil Science
Professor of Nursing
Assistant Professor of Pathology
Associate Professor of English
Associate Professor of Psychiatry
Assistant Professor of Biochemistry
Associate Professor of Speech
Assistant Professor of Mathematics
Assistant Professor of Chemistry
Assistant Professor of German
Associate Professor of Clinical Psychiatry
Professor of Anatomy

1. Sabbatical leave first semester 1968-69.

2. Sabbatical leave 1968-69.

LUTHER EUGEN ZAI, D.Sc.Tech. (Feb., 1963)¹
 MARJORIE V. ZEUCH, M.A. (1968)
 ELIZABETH K. ZIMMERLI, Ed.D. (1967)
 SALVATORE M. ZUMBO, M.A. (1968)

Associate Professor of Forestry
 Instructor in English
 Associate Professor of Physical Education for Women
 Instructor in Romance Languages

Associates in Instruction and Research

ROSEMARY C. BREWSTER, M.D.
 HARRY LIVINGSTON COLOMBO, M.D.
 JOHN PATRICK CORLEY, M.D.
 WILLIAM HENRY HEININGER
 HERMAN CONRAD HERRLICH, Ph.D.
 J. LORIMER HOLM, M.D.
 YOSHINORI ISHIKAWA, D.Ag.Sci. (1966)
 FREDERICK MITCHELL LAING, M.S.
 ELIZABETH K. LINCOLN, M.S.W.
 GEORGE LUCCHINA, M.D.
 GEORGE E. LUCIA, JR., M.D.
 JOAN MOEHRING, Ph.D.
 CHARLES E. MOISAN, JR., M.D.
 JOHN LOUIS SAIA, M.D.
 NAMIK K. UZSAY, M.D.
 LOUIS JOSEPH WAINER, M.D.
 MAURICE JAMES WALSH, M.D.

Clinical Associate in Psychiatry
 Clinical Associate in Medicine
 Clinical Associate in Medicine
 Clinical Associate in Medicine
 Research Associate in Experimental Medicine
 Clinical Associate in Radiology
 Research Associate in Biochemistry
 Research Associate in Botany
 Research Associate in Psychiatry
 Research Associate in Physiology
 Clinical Associate in Surgery
 Research Associate in Microbiology
 Clinical Associate in Medicine
 Clinical Associate in Medicine
 Clinical Associate in Medicine
 Clinical Associate in Medicine

Other Officers of Administration

DAVID RICHARD ABBOTT, M.A.
 EDWIN BARTLETT ABBOTT
 STEPHEN P. ADAMS, B.A.
 JANE PERLIS AMBROSE, M.A.
 RICHARD WALKER AMIDON, M.D.
 HAROLD C. AVERY, JR., B.S.
 DAVID BABBOTT, M.D.
 RICHARD BARWIN, M.A.
 THOMAS D. SEYMOUR BASSETT, Ph.D.

Assistant Registrar
 Auditor
 Business Manager, Department of Medicine
 Foreign Student Adviser
 Director of Student Health Services
 Associate Accountant
 Assistant Dean, College of Medicine
 Administrative Assistant, Dean's Office, Graduate College

JAMES HENRY BATES, M.Ed.
 NANCY BERRY, B.S.
 ROBERT F. BIRNEY, B.S.
 NORMAN ASHLEY BISHOP, B.S.C.E.
 NORMAN A. BLAIR, B.S.
 DALLAS BOUSHEY
 MARY BREEN, B.S.
 ARTHUR M. BRINK, JR., B.S. in Ed.
 HECTOR BRODEUR
 FLORENCE KROGMAN BRODIE
 OTTO BRUSIS, M.D.
 WALTER G. BRUSKA, B.S.
 JOHN LEWIS BUECHLER, M.A.
 STANLEY LIVINGSTON BURNS, JR., M.D.
 JOHN ROBERT BUSHEY, B.S.
 MITCHELL NELSON CALL, A.B.
 ROBERT WILLIAM CHAMBERS, B.A.

Curator, Wilbur Collection, Bailey Library and University Archivist
 Executive Assistant to Dean, College of Medicine
 Nursing Demonstrator, Regional Medical Program
 Staff Associate, Institutional Research
 Construction Engineer
 Assistant Auditor
 Demonstrator, Department of Anatomy
 Assistant Director, Regional Medical Program
 Alumni Secretary
 Associate Accountant, Accounting
 Assistant Director, Purchasing
 Project Manager, Heart Inventory, Regional Medical Program
 Director of Development
 Head of Special Collections, Bailey Library
 Assistant Dean, College of Medicine
 Director, Evening Division, Conferences and Institutes
 Assistant to the Director of Institutional Research

NORBERT FABIAN CHARBONNEAU, M.A.
 THOMAS PAUL CLAIRMONT, M.Ed.
 HAROLD SMITH CLARKE, M.Ed.
 GEORGE NAY CLERKIN
 ROBERT EDWARD CLIFFORD, B.S.
 HAROLD CAMPBELL COLLINS, B.S.
 ROBERT W. COON, M.D.

Writer-Editor for Social Sciences and the Arts, Public Relations
 Operations Manager, Computation Center
 Assistant Director of Admissions
 Registrar
 Treasurer
 Head Football Coach
 Director of Admissions
 Associate Dean, Division of Health Sciences

1. Deceased November 28, 1968.

JOHN HAMILTON COONS, M.S.	Associate in Development
NORMAN CRANFORD	Director, Print Shop
JAMES MICHAEL CROSS, B.S.	Head Hockey Coach
CECIL CUTTS, M.S.	Director of Financial Aid
RICHARD CZINA, B.E.E.	Educational Television Assistant Chief Engineer
ROBERT POWERS DAVISON, M.Ed.	Director, Agricultural Extension Service
MALIA WARDEN DEAN, B.A.	Assistant Director of Financial Aid
RICHARD deGRASSE, B.S.E.E.	Project Manager, Regional Medical Program
DAVID DANIEL DEMSKY	Superintendent of Buildings and Grounds
EIGIL DENEERGAARD, B.B.A.	Planning Coordinator, Regional Medical Program
RAYMOND GEORGE DILLEY, M.A.	Educational Television Director of In-School Services
JOHN EDWARD DONNELLY, M.A.	Director of Intercollegiate Athletics
GERALD ALTON DONOVAN, Ph.D.	Associate Director, Experiment Station
HENRY MEADE DOREMUS, II, D.V.M.	Director of Animal Services, Medical College
WILLIAM LINDSAY DUNLOP, M.L.S.	Head, Acquisition Department, Bailey Library
WALLACE KILBY EDWARDS	Educational Television Chief Engineer
WILLIAM TAFT EMERY, M.S.	Transfer Specialist, Technical Information Center
EDWARD JOSEPH FIEDNER, M.F.A.	Director of Drama
RUDOLPH J. FISCHER	Assistant Superintendent of Special Construction
ROBERT AUSTIN FORDHAM, M.A.	Coordinator of Federal Programs
JANET W. FORGAYS (MRS. D. G.), M.Ed.	Counselor, Testing Center
JEANNETTE HOLZAPFEL FORSYTH, Ph.D.	Project Manager, Regional Medical Program
CHARLES J. FOX, M.A.	Assistant Football and Hockey Coach
RITA B. GARANT, B.A.	Assistant to the Coordinator of Federal Programs
GERALD GOOLD, B.A.	Administrative Associate, Continuing Medical Education
JACKIE M. GRIBBONS, M.A.	Dean of Women
ROGER GRIFFITH, A.B.	Science-Writer-Editor, Public Relations
LINDA ELIZABETH HALSTED	Systems Programmer, Computation Center
DOUGLAS OLIVER HANAU, M.A.	Director of Placement
JOHN FARWELL HARWOOD, B.S.	Associate Radiological Safety Officer, Department of Radiology
ROLF NORDAHL BRUN HAUGEN, Ph.D.	Director of Government Research Center
GEORGE HEDENBURG	Director of Housing
FREDERICK OWEN HENEY	Manager of University Store
DAVID BYRNE HILL, Ph.D.	Director, Computation Center
DOUGLAS LEONARD HOLMQUIST, M.A.	Coach of Baseball
GEORGE HARMON HUNTER, B.L.S.	Medical Librarian
JOSEPH ANTHONY IZZO, Ph.D.	Assistant Dean, College of Technology
RICHARD HARRY JANSON, Ph.D.	Director of the Fleming Museum
LYNVILLE WALTER JARVIS, M.A.	Educational Television Producer-Director
RICHARD ALBERT JOHANNINGMEIER, B.S.	Assistant in Football
ALBERT GUSTAV KASENTER, A.B.	Tutor in Radiologic Physics, Department of Radiology
PAUL BLAKESLEE KEBABIAN, B.A., B.S.L.S.	Director of Libraries
DAVID E. KELLEY, B.S.	Assistant Director, Data Processing
A. GRANT KENNEDY	Director, Data Processing Center
GEORGE VINCENT KIDDER, Ph.D.	Assistant to the President
RICHARD ARNOLD KNOLLER, M.A.	Director of Institutional Research
BETTY MAY LAGRANGE, M.S.	Demonstrator, Department of Biochemistry
MICHAEL ALAN LAPIDES, M.Ed.	Assistant Dean of Men
ROBERT L. LARSON, Ed.D.	Assistant Dean, College of Education
HARRY LIGHTHALL, Ph.D.	Assistant Dean, College of Arts and Sciences
GEORGE THOMAS LITTLE, Ph.D.	Director of World Affairs Center
JACK ERNEST LITTLE, Ph.D.	Assistant Dean, Summer Session
ROBERT ALLAN LOBEL, B.S.	Director of Student Affairs
ARTHUR KENNETH LOCHE, B.S.	Head Basketball Coach
PROCTOR MAYO LOVELL, M.B.A.	Business Manager
WILLIAM HOSSFELD LUGINBUHL, M.D.	Associate Dean, College of Medicine
GEORGE LUHR	Director, Instrumentation and Model Facility
MURDO GLENN MacDONALD, M.D.	Staff Physician, Wasson Infirmary
ARTHUR JOHN MAHONEY, B.A.	
	Administrative Associate, Department of Obstetrics and Gynecology
DAVID BANGHART MATTHEWS, B.A.	
	Director of Sports Information and Writer-Editor Student Activities, Public Relations
JOHN D. MAZUZAN, M.D.	Assistant Dean, Regional Medical Program

HERBERT CHRISTIAN McARTHUR, Ph.D. ¹	Associate Dean, College of Arts and Sciences
GERALD FRANCIS McGINNIS, M.D.	Psychiatric Consultant, Wasson Infirmary
ELIZABETH L. MEIKLE, M.S.	Director of Rehabilitation Nursing, Rehabilitation Medicine
DARWIN GENE MERRILL, B.S.	Project Manager, Regional Medical Program
CHARLES WILLARD NEWELL, B.S., C.P.A.	Chief Accountant
WILBUR E. NEWTON	Assistant Superintendent of Maintenance
HELEN OUSTINOFF, B.A.	Assistant Director and Technical Services Librarian
DONALD LEROY OWENS, B.S.	Assistant Athletic Trainer
GORDON PATERSON, B.S.	Bursar
LOUIS MICHAEL PHILLIPS, B.F.A.	Educational Television Film Producer
DAVID CURTIS PINKHAM, B.C.E.	Director, Technical Information Center
MARJORIE NUTTING PORTER, Ed.M.	Instructor in Coronary Care Program, Regional Medical Program
RICHARD WAYLAND POWERS, A.B.	Dean of Men
FRANK H. PREBLE	Coordinator of Civil Defense
PHYLLIS MELVILLE QUINBY, B.S.	Assistant Director of School of Dental Hygiene
JAMES P. REUSCHEL, B.A.	Administrative Associate, Department of Surgery
DAVID JAMES ROBERTSON, B.F.A.	Educational Television Production Manager
ALBERT WILLIAM SADLER, Ph.D.	Consultant on Religious Programs
GEORGE SAUNDERS, B.S.	Director, Sponsored Projects Office
WADI I. SAWABINI, D.D.S.	Director, School of Dental Hygiene
KAY FRANCES SCHMUCKER, Ed.D.	Counselor, Testing Service
HERBERT LOUIS SCHULTZ, M.A.	Director of University Band
ROBERT MICHAEL SEKERAK, Ed.D.	Director of Audio-Visual Center
JOHN HENRY SENNING, B.S.	Mathematician, Regional Medical Program
GARRY C. SIMPSON, B.A.	Educational Television Program Director
HOWARD ODELL SKINNER, B.S.	Educational Television Station Manager
HERMAN EMERSON SMITH, M.S.	Assistant in Football
HOWARD MARSHALL SMITH, JR., M.S.	Assistant to the President
JOHN FRANKLIN SMITH, A.B.	Director of Photographic Center
CARYL J. STEWART, M.S.W.	Program Manager, Regional Medical Program
STEPHEN H. STODDARD	Assistant Director, Sponsored Projects Office
ROBERT R. STRUTHERS, MDCM	Assistant Dean for Regional Medical Affairs
GLORIA ANN THOMPSON, M.A.	Assistant to the Dean of Women
HENRY J. TYMECKI, B.S.	Director of Personnel
LAWRENCE E. VAN BENTHUYSEN, B.A.	Director of Public Relations
JAMES NICHOLAS VLAMIS, M.A.	Associate Director for Management Systems, Computation Center
DAVID EDWARD WAGNER, M.S.P.H.	Project Manager, Regional Medical Program
ALLEN LEE WALKER, A.M. ¹	Director of Financial Aids
HENRY ERNEST WARREN, M.P.A.	Associate Director, Government Research Center
PETER M. WATTS, B.E.E.	Project Engineer, Regional Medical Program
GEORGE DONALD WEAVER, B.S.	Director of Purchasing
MAIDA EWING WEDELL, M.A.	Assistant to Director of Fleming Museum
JOHN WEIGER, Ph.D.	Assistant Dean, College of Arts and Sciences
STEPHEN TOWNSEND WELCH, M.B.A.	Comptroller
JOHN EGMONT WENNERBERG, M.D.	Director, Regional Medical Program
ANNE ELIZABETH WILSON, R.N.	Director of Infirmary, Health Service
CHARLES LEWIS WOLF, M.A.	Budget Officer
NORMA L. WOODRUFF, M.A.	Director, School of Nursing
WILLIAM F. C. WRIGHTON	Project Manager, Regional Medical Program

Retired Officers of Administration

MARY OLIVE BOYNTON, Ph.B.	Librarian, Medical Library
HORACE BYRON ELDRED	Director of Audio-Visual Services
FORREST WILKINS KEHOE, B.S.	Superintendent of Buildings and Grounds, and Associate Registrar
LAURA LOUDON	Assistant in Public Relations
MARJORIE ELLINGWOOD LUCE, B.S.	State Home Demonstration Leader
MARY JEAN SIMPSON, Ph.B.	Dean of Women

1. On leave 1968-69.

Experiment Station Staff

AGRICULTURAL

The Agricultural Experiment Station has as its essential functions to conduct research in agriculture and home economics, to administer certain regulatory statutes, and to publish the results of such work.

THOMAS WHITFIELD DOWE, Ph.D.	Dean and Director
GERALD ALTON DONOVAN, Ph.D.	Associate Director
FRANK HARRIS ARMSTRONG, M.F.	Assistant Forester
WILLIAM RITCHIE ADAMS, JR., Ph.D.	Forester
EARL LEE ARNOLD, Ph.D.	Associate Agricultural Engineer
HENRY VERNON ATHERTON, Ph.D.	Dairy Bacteriologist
DONALD JAMES BALCH, Ph.D.	Associate Animal Scientist
RICHMOND JAY BARTLETT, Ph.D.	Soil Scientist
MALCOLM IRVING BEVINS, M.S.	Associate Resource Economist
WESSON DUDLEY BOLTON, D.V.M., M.S.	Animal Pathologist
BERTIE REYNOLD BOYCE, Ph.D.	Assistant Horticulturist
WALLACE WAYNE CHRISTENSEN, Ph.D.	Forester
ROBERT PATRICK CLARK, M.S.	Research Assistant
ELIZABETH NANCY DOWNER, Ph.B.	Administrative Assistant
WINFIELD BOOTH DURRELL, D.V.M., M.S.	Associate Animal Pathologist
ALEXANDER HARRY DUTHIE, Ph.D.	Assistant Dairy Chemist
MARY JANE ELLIS, M.S.	Home Economist Assistant
CHARLES LYNN FIFE, Ph.D.	Assistant Agricultural Economist
THEODORE ROSS FLANAGAN, Ph.D.	Assistant Agronomist
MURRAY WILBUR FOOTE, Ph.D.	Associate Biochemist
DONALD CUSHING FOSS, Ph.D.	Assistant Poultry Scientist
ROBERT WEEKS FULLER, M.S.	Assistant Wildlife Management Specialist
PETER ROBERT HANNAH, Ph.D.	Assistant Forester
RICHARD JOHN HOPP, M.S.	Horticulturist
BEAL BAKER HYDE, Ph.D.	Cell Biologist
DONALD BOYES JOHNSTONE, Ph.D.	Microbiologist
DONALD EUGENE KEYSER, Ph.D.	Assistant Biochemist
RICHARD M. KLEIN, Ph.B.	Cell Biologist
KARIN KRISTIANSSON (MRS. G.), M.A.	Associate Editor
FREDERICK MITCHELL LAING, M.S.	Research Associate
GEORGE BUTTERICK MACCOLLUM, Ph.D.	Associate Entomologist
JAMES WALLACE MARVIN, Ph.D.	Plant Physiologist
MAXWELL LELAND McCORMACK, D.F.	Assistant Forester
THOMAS JAMES McCORMICK, M.E.E.	Associate Editor
JERRY LEON McINTOSH, Ph.D.	Assistant Soil Scientist
SUSAN BREWSTER MERROW, M.Ed.	Associate Nutritionist
ELLEN HASTINGS MORSE, Ph.D.	Associate Nutritionist
ROGER WALTER MURRAY, D.V.M., M.S.	Associate Animal Pathologist
KAY MILLIGAN NILSON, Ph.D.	Assistant Dairy Products Specialist
BRUCE LAWRENCE PARKER, Ph.D.	Assistant Entomologist
NORMAN EUGENE PELLETT, Ph.D.	Assistant Ornamental Horticulturist
BOYD WALLACE POST, D.F.	Associate Forester
MILTON POTASH, Ph.D.	Associate Limnologist
DAVID WILLIAM RACUSEN, Ph.D.	Associate Biochemist
FREDERIC OBERLIN SARGENT, Ph.D.	Resource Economist
EDWIN CALVIN SCHNEIDER, M.S.	Agricultural Engineer
GERARD C. SHREWSBURY, M.S.	Research Associate
KENNETH ROGERS SIMMONS, Ph.D.	Animal and Dairy Scientist
ROBERT ORVILLE SINCLAIR, Ph.D.	Agricultural Economist
ROBERT ERIK SJOGREN, Ph.D.	Assistant Microbiologist

ALBERT MATTHEWS SMITH, Ph.D.
 JOHN WALLACE SPAVEN, B.S.
 THOMAS SPROSTON, JR., Ph.D.
 ENOCH HAROLD TOMPKINS, M.S.
 RAYMOND HERMAN TREMBLAY, Ph.D.
 TERRY LAWRENCE TURNER, M.S.
 KENNETH EVERSON VARNEY, M.S.
 KATHLEEN BEAVINGTON WEBB, B.S.
 FRED CLARENCE WEBSTER, Ph.D.
 JAMES GRAHAM WELCH, Ph.D.
 DAVID LLOYD WELLER, Ph.D.
 SAMUEL CLAUDE WIGGANS, Ph.D.
 BLAIR WILLIAMS, M.S.
 ROY ALVIN WHITMORE, JR., M.F.
 GLEN MEREDITH WOOD, Ph.D.
 *LUTHER EUGEN ZAI, Ph.D., D.Tech.Sci.

* deceased November 28, 1968

Animal Scientist
Editor
Plant Pathologist and Mycologist
Associate Resource Economist
Agricultural Economist, Farm Management
Assistant Forester
Associate Agronomist
Associate Editor
Agricultural Economist, Marketing
Associate Animal Scientist
Assistant Biochemist
Horticulturist
Home Economist
Associate Forester
Associate Agronomist
Associate Forester

ENGINEERING

WARREN ORVEL ESSLER, Ph.D.
 REGINALD VENN MILBANK, M.S.
 JOHN OGDEN OUTWATER, M.A., Sc.D.

Director and Electrical Engineer
Civil Engineer
Mechanical Engineer

RELATED SERVICES STAFF

The Related Services Division renders various services in the fields of agriculture and home economics, such as inspection of feed, seeds, and fertilizer; analysis of soils, milk, and other agricultural products on request; diagnosis of diseases of plants, poultry and other livestock, and analyses for the Vermont Pari-Mutuel Racing Commission.

THOMAS WHITFIELD DOWE, Ph.D.

Dean and Director

WESSON DUDLEY BOLTON, D.V.M., M.S.
 HOLLIS EARL BUCKLAND, B.S.
 WINFIELD BOOTH DURRELL, D.V.M., M.S.
 KENNETH STEWART GIBSON, M.S.
 ROGER WALTER MURRAY, D.V.M., M.S.
 KAY MILLIGAN NILSON, Ph.D.
 HARRY LEONARD SAWYER, JR., B.S.
 THOMAS SPROSTON, JR., Ph.D.
 JAMES ROGER WADSWORTH, V.M.D., M.S.
 ROBERT THOMAS WETHERBEE, M.S.

Animal Pathologist
Seed Analyst
Associate Animal Pathologist
Dairyman
Associate Animal Pathologist
Assistant in Dairy Manufacturing
Associate Chemist
Plant Pathologist and Mycologist
Animal Pathologist
Chemist

Extension Service Staff

The Cooperative Extension Service is a cooperative undertaking of the State of Vermont, the College of Agriculture and Home Economics, the United States Department of Agriculture, and the several counties of the State. It has a State staff, with headquarters at the University, and a staff of county extension agents in the University Extension Service Centers in each county. Its purpose is "to aid in diffusing among the people . . . useful and practical information on subjects relating to agriculture, home economics, resource development, community development and related subjects, and to encourage the application of the same." It also brings general University educational information to the people of the State. Its programs are available to all the people of the State, including both adults and youth.

THOMAS WHITFIELD DOWE, Ph.D.
ROBERT POWERS DAVISON, M.Ed.

Dean
Director

HENRY VERNON ATHERTON, Ph.D.
DONALD JAMES BALCH, Ph.D.
MALCOLM IRVING BEVINS, M.S.
CHARLES WHITNEY BIGALOW, M.S.
WILLIAM H. BINGHAM, M.S.
WESSON DUDLEY BOLTON, D.V.M., M.S.
CHARLES LYMAN CALAHAN, M.S.
MRS. ELIZABETH PERLEY DAVIS, B.S.
WARREN ALBERT DODGE, B.S.¹
DWIGHT KIMBALL EDDY, B.S.
NORRIS ARTHUR ELLIOTT, B.S.
JAMES ALBERT EDGERTON, M.Ext.Ed.
THEODORE ROSS FLANAGAN, Ph.D.
RAYMOND THOMAS FOULDS, JR., M.F.
BYRON THOMAS FRENCH, M.A.T.
KENNETH STEWART GIBSON, M.S.
VERLE RANDALL HOUGHABOOM, Ph.D.
ESTHER L. KNOWLES, M.S.
KARIN KRISTIANSSON (MRS. G.), M.A.
MRS. WINIFRED WOODBURY LANGTRY, B.Ed.
WILLIAM PATRICK LEAMY, M.S.
JOHN JOSEPH LINDSAY, M.S.²
GEORGE BUTTERICK MacCOLLOM, Ph.D.
THOMAS JAMES McCORMICK, B.S.
JERRY LEON McINTOSH, Ph.D.
JOHN DOTY MERCHANT, B.S.
LEONARD SMITH MERCIA, M.S.
GORDON ROY NIELSEN, Ph.D.
NORMAN EUGENE PELLETT, Ph.D.
MRS. JEANIE McDONOUGH PILLSBURY, B.S.
FAITH KENYON PRIOR (MRS.), M.S.
MARY PAULINE ROWE, M.E.
FREDERICK OBERLIN SARGENT, Ph.D.
EMERSON WARREN SHEDD, JR., M.S.
JOHN WALLACE SPAVEN, B.S.
DORIS HOSMER STEELE (MRS. B.), M.A.

Dairy Bacteriologist
Animal Scientist
Agricultural Economist
Extension Economist, Food Marketing
Area Resource Development Specialist
Animal Pathologist
Horticulturalist
Urban Youth Specialist
Dairyman
Agricultural Economist
Area Resource Development Specialist
Area Resource Development Specialist
Assistant Agronomist
Forester
Housing and Utilities Engineering Specialist
Dairyman
Agricultural Economist, Farm Management
Housing Specialist
Assistant Editor
Urban Specialist
Dairyman, DHIA
Recreation Development Specialist
Entomologist
Assistant Editor
Agronomist
Supervisor and Program Leader (Youth Work)
Poultryman
Entomologist
Ornamental Horticulturist
Health Education Specialist
Family Economist
Supervisor and Program Leader (Youth Work)
Resource Economist
Area Resource Development Specialist
Editor
Supervisor and Program Leader (Home Economics Work)
Supervisor and Rural Development Specialist

WILLIAM WILLARD STONE, M.A.

1. Deceased June 6, 1968
2. On leave September 1, 1968 to September 1, 1970.

KATHLEEN LeBARON STRASSBURG, B.S.
 ANDREW TESSMANN, B.S.
 NOAH THOMPSON, B.S.
 ENOCH HAROLD TOMPKINS, M.S.
 WILLIAM VERNON TUXBURY, B.S.
 JAMES ROGER WADSWORTH, V.M.D., M.S.
 WINSTON ARTHUR WAY, M.S.
 KATHLEEN BEAVINGTON WEBB, B.S.
 FRED CLARENCE WEBSTER, Ph.D.
 PAUL H. WILDASIN, B.S.
 CHRIS G. WOELFEL, Ph.D.

Clothing Specialist
Agricultural Engineer
Area Resource Development Specialist
Rural Sociologist
Rural Defense Information Specialist
Animal Pathologist
Agronomist
Associate Editor
Agricultural Economist, Marketing
RC and D Agricultural Resource Specialist
Dairyman

County Extension Agents

Addison County

LUCIEN DEMERS PAQUETTE, M.E.Ed.
 JOHN FRANKLIN STEPHENSON, M.E.Ed. (Associate)
 MRS. LEONA WARREN THOMPSON, B.S.
 BERNARD MAURICE NADEAU, B.S.

Middlebury
 Middlebury
 Middlebury
 Middlebury

Bennington County

JOHN CALVIN PAGE, M.S.
 MRS. MARION STONE HARRIS, B.S.
 NANCY ANTHONY, B.S.

Bennington
 Bennington
 Bennington

Caledonia County

PHILIP KAIR GRIME, B.S.
 MRS. ALICE JOHNSON BLAIR, B.S.
 LINDSAY THOMAS TOWNSEND, B.S.

St. Johnsbury
 St. Johnsbury
 St. Johnsbury

Chittenden County

ROBERT LACKIE CARLSON, B.S.
 MRS. F. ALINE COFFEY, B.S.
 MRS. MARGARET POOLE MacDONOUGH, B.S.

Essex Junction
 Essex Junction
 Essex Junction

Essex County

EARLE DRAKE CLARK, B.S.
 MRS. ELSIE L. M. DORR, B.E.

Guildhall
 Guildhall

Franklin County

ERDEN WELLS BAILEY, B.S.
 DONALD JAMES McFEETERS, M.S. (Associate)
 MARILYN S. WADE, B.S.
 MRS. MARJORIE ELAINE THOMAS, B.S.

St. Albans
 St. Albans
 St. Albans
 St. Albans

Grand Isle County

ROBERT ELLIS WHITE, B.S.

North Hero

Lamoille County

SILAS HAMILTON JEWETT, B.S.
 LOUELLEN WASSON, B.S.
 MRS. THELMA BELAIR, B.S.

Morrisville
 Morrisville
 Morrisville

Orange County

GORDON VOLNEY FARR, B.S.
 MRS. SHIRLEY HALL CUSHING, B.S.
 CURTIS BEVINGTON, B.S.

Chelsea
 Chelsea
 Chelsea

Orleans County

ROGER DAVIS WHITCOMB, B.S.
 JOHN ROBERT PRICE, B.S. (Associate)
 MRS. MARION McIVER BUCKLAND, B.S.
 WILLIAM TARBELL ZELLER, B.S.

Newport
 Newport
 Newport
 Newport

EXTENSION SERVICE STAFF

Rutland County

WILLIAM MICHAEL COREY, M.S.
DAVID PAUL NEWTON, M.E.Ed. (Associate)
MRS. BETHIA NOBLE MUNGER, B.S.
CHESLEY PECK HORTON, M.Ed.

Rutland
Rutland
Rutland
Rutland

Washington County

EDWARD L. BOUTON, B.S.
MRS. HAZEL C. BROWN, M.S.
DONALD ROBERT WHAPLES, M.S.

Montpelier
Montpelier
Montpelier

Windham County

RAYMOND IRVING PESTLE, JR., M.S.
MRS. RUTH DENSMORE HERTZBERG, B.S.
HOWARD HARRY SMITH, B.S.

Brattleboro
Brattleboro
Brattleboro

Windsor County

JOYCE WILLIAM SUMNER, B.S.
MRS. DOROTHY FLORENCE BENT, M.A.T.
EDWARD WALTER GOODHOUSE, B.S.

Woodstock
Woodstock
Woodstock

University Committees

SENATE STANDING COMMITTEES

Admissions Committee

H. K. Riggs, Chairman
W. W. Christensen
H. C. Collins¹
R. N. Haugen
R. G. Julow
Mrs. Marsland
Miss Powell
A. H. Schein
F. L. Steeves

Building and Grounds

W. Roth, Chairman
G. C. Crooks¹
Miss Knowles
L. R. Leggett
P. M. Lovell
E. J. Miles
E. A. H. Sims
H. M. Smith
H. H. Squire
K. Parker (Student Representative)

Ceremonies Committee

Miss Caldwell, Chairman
R. A. Whitmore, Acting Marshall
P. W. Cook
B. B. Gilleland¹
R. J. Gobin
L. Long
A. W. Sadler¹
J. P. Tampas
F. A. Weinrich

Curriculum Committee

W. J. Beckett, Chairman
D. C. Gregg, Chairman 1st Sem.
H. Duchacek
A. S. Hunt (Replacing Beckett 1st Sem.)
A. M. Levy

R. H. Riley
W. W. Schmokel
A. M. Smith

Library Committee

F. W. Lidral, Chairman
D. W. Gade
P. Kebabian¹
B. E. Meserve
W. Meyer
Miss Morse
R. H. Orth (replacing Woodruff
1st Sem.)
Miss Petrusich
N. R. Stout
S. C. Woodruff
L. Tesconi (Student Representative)

Policy Committee

R. V. Milbank, Chairman (Technology)
R. Hilberg (Arts & Sciences)
L. C. Hunt (Education)
M. J. Nadworny (Graduate)
S. A. Ripa (Education)²
L. J. Wallman (Health Sciences)
B. Williams (Agriculture & Home
Economics)

Research Committee

C. F. Taylor, Chairman
N. R. Alpert
R. T. Bell
F. R. Bliss
R. V. Daniels
R. N. Downer
A. H. Duthie
R. A. Fordham¹
E. C. Greif
L. C. Hunt
B. B. Hyde
M. A. Kuehne

¹ Ex-officio.

² On leave.

Student Excellence Committee

S. Poger, Chairman
 J. E. Baker
 H. S. Clarke¹
 R. W. Cochran
 C. D. Cook¹
 W. C. Metcalfe (Replacing Cochran
 1st Sem.)
 A. B. Rollins, Jr.
 R. O. Sinclair
 T. J. Spinner
 B. K. Stearns

Student Life Committee

J. A. Peterson, Chairman
 R. W. Amidon¹
 Miss Atwood
 Miss Gribbons¹
 Miss Hyatt (Student Representative)
 D. E. Lambert
 Miss Moninger (Student
 Representative)
 R. D. Patzer¹
 R. W. Powers¹
 J. A. Samenfink
 E. C. Schneider (Replacing
 Samenfink 2nd Sem.)
 T. M. Webster, Secretary

GENERAL COMMITTEES

Athletic Council

D. C. Gregg, Chairman
 M. D. Daggett
 P. H. Davis
 R. C. Moeller (Student Representative)
 D. G. Oakes (Student Representative)
 S. J. Pierce (Student Representative)
 A. L. Wilson (Student Representative)

Computation Center Advisory Committee

R. N. Downer, Chairman
 T. G. Cecchini (Student Representative)
 C. R. Chase (Student Representative)
 C. D. Cook¹
 M. A. Dyson¹
 D. M. Forsyth
 D. B. Hill¹
 M. S. Hundal
 R. A. Knoller
 G. E. Laber
 D. C. Lai
 W. H. Luginbuhl
 W. C. Metcalfe
 E. A. Nyquist
 R. W. Powers
 J. N. Vlamis¹
 S. T. Welch
 C. L. Wolf

Evening Division

R. V. Phillips, Chairman
 Betty Bandel

L. J. Gould
 J. A. Izzo
 A. B. Rollins, Jr.
 F. L. Steeves
 Blair Williams

George Bishop Lane Series

J. Trevithick, Executive Secretary
 E. J. Feidner
 F. W. Lidral
 G. Paterson
 L. E. Van Benthuyssen

Instrumentation and Model Facility

W. O. Essler, Chairman
 E. C. Andrews
 C. D. Cook¹
 T. W. Dowe

Institutional Grants

W. H. Macmillan, Chairman

Subcommittee A

R. Korson, Chairman
 J. H. Bates
 B. B. Hyde
 W. C. Patterson
 K. R. Simmons

Subcommittee B

D. W. Juenker, Chairman
 A. P. Krapcho
 G. F. Lewis

¹ Ex-officio.

M. S. Hundal

A. S. Hunt

Subcommittee C

S. N. Bogorad, Chairman

Z. P. Ambrose

N. T. London

H. S. Schultz

S. J. Staron

Jurisdiction Committee

R. J. Gobin

Miss Gribbons¹

R. W. Powers¹

Radiological Safety

O. S. Peterson, Jr., Chairman

J. F. Harwood, Secretary

C. D. Janney (Radiological Safety
Officer)

E. L. Amidon

S. L. Burns

J. J. W. Clemmons

A. D. Crowell

W. H. Luginbuhl¹

D. B. Hill

D. B. Melville

D. W. Racusen

F. D. Van Buskirk

Residence Committee

H. C. Collins, Chairman

S. L. Burns

G. N. Clerkin

L. D. Latham, Jr.

¹ Ex-officio.

V Introduction

The University of Vermont was founded in 1791, taking its place among the handful of colleges founded in this country in the eighteenth century for the higher education of young colonials and Americans of the first post-revolutionary generation. The University was the fifth New England college chartered, the second established by a state to grant the bachelor's degree, and the twentieth in the nation to do so.

Though it has enjoyed a long tradition which has seen it receive substantial private support, University development has been closely identified with that of the State since 1791, when Vermont's founding General Assembly granted a charter to the University and set aside about 29,000 acres throughout the State with the intent that rents from this land would support the new educational institution.

That same Vermont General Assembly established that the by-laws of the University should give no preference to any religious sect or denomination or discriminate against any, making the University of Vermont the first in this country and possibly in history to be on public record as supporting freedom of religion upon its campus.

Colleges and Curricula

The University consists of the College of Arts and Sciences, the College of Agriculture and Home Economics, the College of Technology, the College of Education, the Division of Health Sciences with its College of Medicine, School of Nursing, and School of Allied Health Services; and the Graduate College.

The College of Arts and Sciences

In common with the practice at most of the early universities, the original curriculum was based on languages, rhetoric, and mathematics, theology, and moral philosophy. Today, the College of Arts and Sciences, often considered the direct descendant of the original University, provides a general four-year curriculum leading to the degree of Bachelor of Arts, with opportunity for concentration in one or more of the following studies: anthropology, area studies, art, botany, chemistry, economics, English,

French, geology, geography, German, Greek, history, Latin, mathematics, music, philosophy, physics, political science, psychology, religion, sociology, Spanish, speech, and zoology.

Majors in the Department of Economics and Business Administration may specialize in options which include accounting; banking and finance; industrial management; and marketing and sales promotion. These programs lead to the degree of Bachelor of Science in Economics and Business Administration.

Students interested in continuing their studies beyond the bachelor's degree may, by making a proper selection of courses, meet all requirements for admission to graduate schools, and such professional schools and colleges as those of medicine, dentistry, law, theology, optometry, journalism, and social work. Those who have completed three years of premedical study at the University may qualify for the degree of Bachelor of Science after successfully completing one year of study in an approved college of medicine.

The College of Agriculture and Home Economics

In 1862, the Congress of the United States enacted legislation, fostered by Vermont Senator Justin Smith Morrill, which provided for the establishment of a system of colleges—one for every state—which would make possible college education for all who were qualified. These institutions came to be known as the Land-Grant institutions of America because the Morrill Act provided federal funds for each state which would set aside lands for the new colleges. Their aim was to make possible a new kind of education which combined and blended the agricultural and mechanic arts with education in the liberal and scientific courses. The State of Vermont moved to charter a land-grant institution, the Vermont College of Agriculture, in 1864, and this new college was joined with the University of Vermont in 1865. Under later federal legislation, the services of the land-grant colleges were expanded by the creation of agricultural research and service divisions—the Agricultural Experiment Station and the Agricultural Extension Service respectively.

Today the College of Agriculture and Home Economics offers four-year curricula leading to the degree of Bachelor of Science in Agriculture, Bachelor of Science in Agricultural Engineering, Bachelor of Science in Forestry, and Bachelor of Science in Home Economics. It also offers a two-year program in preveterinary science which prepares students for admission to other institutions for professional training.

The curriculum in agriculture provides options in general agriculture, agricultural economics, agricultural education, agricultural engineering management, animal and dairy science, botany, dairy industry, foreign agricultural service, plant and soil science, and poultry science.

The curriculum in home economics provides options in clothing, textiles and related art; family living, human development, preprofessional social work; food and nutrition; teaching and extension education; and housing and home management.

The College of Education

The University of Vermont has contributed teachers to its state, region and nation virtually since its founding. The evolution of formal professional education preparation resulted first in the department, then the School of Education in 1946, in 1951 the College of Education and Nursing, and in 1968 the College of Education. It offers four-year curricula leading to the Bachelor of Science degree in the fields of elementary education, secondary education, physical education, and music education.

Although approaches have varied, the primary concern of the education curricula has been to produce qualified teachers who have a strong background in academic subject matter and an adequate preparation in professional education.

The College of Technology

The University of Vermont was probably the first nonmilitary institution in America to offer instruction in engineering and was certainly the first of the present land-grant colleges to give any instruction in this area which was incorporated later into the Morrill Act. Engineering was taught in a separate department until 1911, when a College of Engineering was established. In 1946 the College of Technology was formed. Today it offers programs in civil, electrical, mechanical, and management engineering; professional chemistry; mathematics; and professional physics.

The Division of Health Sciences

The University has initiated a comprehensive reorganization of its programs in health education which will develop a brand new sequence of options open to the young man or woman interested in a career in medicine, nursing, or in one of the widening range of allied health professions which are an increasingly important part of the nation's health resources.

The School of Allied Health Sciences offers programs in Dental Hygiene, Medical Technology, and plans are underway for programs in Radiologic Technology and Physical Therapy. Associate in Science Degrees are awarded upon successful completion of the two-year programs. Two-year programs are offered in Dental Hygiene and Radiologic Technology; a four-year program in Physical Therapy is being planned. The Department of Medical Technology offers both two and four-year programs.

The School of Nursing, established in 1943 as a Department of Nursing in the College of Arts and Sciences and later moved to the College of Edu-

cation and Nursing, offers a four-year program leading to the degree of Bachelor of Science in Nursing which prepares qualified individuals for the practice of professional nursing in beginning positions in various health agencies, the home, and the community and provides a foundation for graduate study in nursing. The School also conducts a two-year curriculum leading to an associate degree, which will provide qualified students the opportunity to acquire competencies associated with direct care of patients in various settings where medical or nursing supervision is available. Graduates of both programs are eligible to take the examination for licensure as registered nurses.

The College of Medicine is historically almost as old as the University itself. Medical lectures became part of the offerings in 1804 and degrees were granted in medicine in 1822. There were some interruptions in the operation of the medical courses in 1836, but since 1853 qualified physicians have been graduated annually to serve Vermont and neighboring states. Today, the College of Medicine offers a four-year graduate curriculum leading to the degree of Doctor of Medicine and provides facilities for a limited number of candidates for other graduate degrees to take courses in its departments.

The Graduate College

Many academic departments of the University have a long history of providing formal graduate study for well qualified candidates. The Graduate College was formally established in 1952, and since that time has served to provide graduate study opportunities in academic fields in which University resources have made sound graduate programs possible. In recent years several doctoral programs have been inaugurated and more are being planned. The Graduate College administers all studies beyond the Bachelor's degree with the exception of the program of the College of Medicine leading to the Doctor of Medicine.

Scholarship aid fellowships, assistantships and special loan programs are available in increasing numbers for graduate study for the student who achieves a good academic record in his undergraduate program. Nationally, the demand for men and women with advanced training continues to be urgent.

A separate catalogue describing graduate programs at Vermont is available from the Office of the Dean of the Graduate College.

Continuing Education

The Summer Session and Evening Division programs of the University offer a wide range of courses both on and off campus.

Regional Cooperation

The University of Vermont is an active participant with the Universities of Connecticut, Maine, Massachusetts, New Hampshire, and Rhode Island,

in a program of regional cooperation aimed at increasing educational opportunities for the qualified young men and women of the New England states. Under the program New England residents are given admissions preference and resident tuition privileges in certain specialized curricula. The University of Vermont offers several programs in which qualified residents of other New England states may be granted admissions preference and resident tuition benefits. A special brochure detailing these specialized curricula, has been prepared by the New England Board of Higher Education and is available through the University of Vermont admissions office and from the other New England state universities.

The University of Vermont offers the following programs in which the Vermont in-state tuition rate is available for students from the states named.

Classics, Massachusetts, Rhode Island; graduate, Maine, Massachusetts and Rhode Island.

Dairy Manufacturing, Maine, New Hampshire, Rhode Island.

Foreign Agricultural Service, Massachusetts, Rhode Island.

Medical Electronics, graduate, Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island.

Microbiology, graduate, Maine, Rhode Island.

The Vermont Campus

The campus and present buildings had their origin in 1800, when Burlington was virtually still frontier territory.

The University's inaugural president and his first four students felled trees from ground which is today's College Green for timber for the first college building. From their labors and from financial contributions of the citizens of Burlington, the first college building rose. When, in the early 1820's fire destroyed this first structure, it was rebuilt, again through support of Burlington residents. General Lafayette laid the cornerstone in 1825 for that second building which still stands as today's Old Mill. A modern classroom addition, Lafayette Hall, was dedicated in 1958 with a direct descendant of General Lafayette present for the ceremonies.

Following its earliest tradition, much of the University's growth in terms of buildings has been the result of generous private philanthropy.

The Billings Library, now serving as a student center, was one of several structures dedicated in the late 1800's. A fine example of the work of Henry Hobson Richardson, the well-known American architect, the Library was the gift of Frederick Billings of Woodstock. The gift of Dr. and Mrs. Edward H. Williams of Philadelphia, Williams Science Hall, the first completely fire-proofed college building in this country, was built in 1896 to house the expanding departments of the several sciences. It was built and furnished at a cost of \$160,000. The effect of changing times is illustrated by the fact that a recent renovation of the chemistry department facilities in Williams Science Hall cost over \$400,000.

Converse Hall, an unusual design of Gothic architecture, was completed in 1895. John H. Converse, class of 1861, purchased the land on which

Converse stands, erected the building, and presented the completed gift to his alma mater. He also gave two houses for faculty members on the "south common".

The University dedicated a new \$3,000,000 physical education facility in 1962, with alumni and private philanthropy contributing \$1,000,000 of the total. The State of Vermont provided a \$2,000,000 bond issue, the major share of which will be repaid by student fees. The gymnasium is named to honor Roy L. Patrick, '98; the pool to honor Frank D. Forbush, '86; and the Field House to honor Albert L. Gutterson, a 1912 graduate who won in that same year an Olympic Gold Medal in the broad jump. The baseball facilities in the Field House Cage honor two Vermont alumni who achieved prominence in Major League baseball—Larry Gardner and Ray Collins, both members of the Class of 1909.

A new \$1,895,000 engineering building, made possible by a state appropriation, houses electrical, civil, and mechanical engineering departments. Opened in the spring semester of 1964, it is named to honor the late Josiah Votey, a graduate of the class of 1884, who served as dean of the then College of Engineering at Vermont from 1901 until his death in 1931.

Morrill Hall, named to honor Vermont's Senator Justin S. Morrill, father of the Land-Grant Act, was the first university building to be provided by an appropriation from the State of Vermont. It was erected in 1907 and houses administrative offices for the College of Agriculture and Home Economics.

The twentieth century has seen the construction of several buildings of Georgian architecture. The Ira Allen Memorial Chapel, with an imposing bell tower was completed in 1927. It was the gift of James B. Wilbur, who also made a generous gift to provide scholarships for Vermont residents. In 1955 a sixty-four-bell electronic carillon was installed in the tower, a gift of winter carnival funds, and dedicated to all men and women of the University who served in the armed forces. Mr. Wilbur's bequest also contributed to the building of the Fleming Museum. Named for Robert Hull Fleming, class of 1862, the Museum was made possible by a gift from Miss Katherine Wolcott of Chicago, Mr. Fleming's niece, and by gifts from other friends of the University. Completed in 1931, it houses the University's art collection, and a fine Arena Theater.

The Waterman Building, dedicated in 1941, was the gift of Charles W. Waterman, class of 1885, and Anna R. Waterman. It contains administrative offices, classrooms, laboratories, recreation facilities, and a dining hall. A language laboratory in Waterman offers tape-recording facilities and listening stations as an aid to pronunciation, aural comprehension, and pattern practice in French, German, Hebrew, Russian and Spanish. Also housed in Waterman are the Computation Center and Data Processing facilities. The I.B.M. 360, 1620, and 1130 model electronic computers are used for teaching, research, and administrative programs.

In 1949, a group of modern buildings, financed by state appropriation, was erected on the East campus. These include Hills Agricultural Science

Hall, named to honor Joseph L. Hills, for many years Dean of the College of Agriculture; the Bertha M. Terrill Home Economics Building, named in honor of the originator and first chairman of the department of home economics; and the Joseph E. Carrigan Hall which houses the department of animal and dairy science.

Alumni and private philanthropy has proven the key to a modern building program of the College of Medicine. Vermont medical alumni led the nation in terms of the total amount given in the first year of a three-year fund drive which saw alumni contributions more than match a federal grant which permitted completion of a \$1,200,000 first unit of a three-phase program.

So impressive was this record of alumni giving that it attracted the interest and support of private philanthropy which made it possible for the University to match a second federal grant in completing in 1962 the second \$1,500,000 unit of the program.

Construction of the \$8,700,000 third unit of the medical building program marks the successful completion of the most ambitious single building fund campaign ever undertaken by the University of Vermont. A \$2,000,000 gift from the Given Foundation, the largest single building gift ever received by the University was included in the total raised to match grants made under the Medical Facilities Act of 1964.

Development of the College of Medicine, together with the affiliated Medical Center Hospital, has meant the development in Burlington of a modern medical center which serves citizens of all three northern New England states, as well as many residing in upper New York.

In the fall of 1968, the University and the Medical Center Hospital of Vermont joined to dedicate three new facilities—a new hospital wing named to honor David G. Baird; the Given Medical Building, named to honor Irene Heinz Given and John LaPorte Given; and a new Life Sciences Building, named to honor George Perkins Marsh. New library and auditorium facilities of the Given Building are named to honor Charles A. Dana, and Harlow and Martha Carpenter, respectively. The auditorium of the Marsh Life Sciences Building is named to honor George Wyllys Benedict.

A new University Bookstore was completed in 1967 on the East Campus as an adjunct to this instructional area. Landscaping of this area accents the central Mall with the interconnecting plazas.

The Redstone campus for women was originally a large estate. The mansion and the carriage house now serve as Redstone and Robinson Halls. Mable Louise Southwick Memorial Building, another imposing Georgian structure, was completed in 1936 as a center for women's activities. A gift from the family of Miss Southwick, a University graduate in the class of 1905, a bequest from Miss Shirley Farr, federal funds, and a student subscription provided the building and its furnishings.

Slade Hall, built in 1929, is of Colonial-type architecture. Mrs. William G. Slade made a gift toward this building, in memory of her daughter,

Harriet Slade Crombie. In 1947, the Grace Goodhue Coolidge Hall, a residence hall for women, was built adjacent to Southwick. Grace Goodhue, class of 1902, was the wife of Calvin Coolidge, President of the United States.

Coolidge Hall and the three men's residence halls, Buckham, Chittenden and Wills Halls, were the first University residence halls to be financed by a bond issue guaranteed by the State of Vermont. Room rents are used to liquidate the bond issue.

Also built on these terms are the three residence halls for women south of Coolidge. Mason, Simpson, and Hamilton Halls were completed in 1957 and named to honor three distinguished women. Mason Hall and Hamilton Hall honor Vermont's first two women graduates, Lida Mason Hodge and Ellen Hamilton Woodruff, class of 1875, who were also the first women admitted to Phi Beta Kappa at the University. Simpson Hall honors Dean of Women Emeritus Mary Jean Simpson, class of 1913. A three-unit residence and dining facility for men is named to honor James Marsh, distinguished scholar who served as president of the University from 1826-33, and who introduced the works of Coleridge in this country; Professor Frederick Tupper, a noted scholar of Chaucer; and for Warren R. Austin, a Vermont graduate of the class of 1899, who served as the U. S. Representative to the United Nations from 1946-53. The units were completed in the fall of 1961 under the federal housing loan program. A unit for women, named to honor former Dean of Women Marian Patterson was also completed in 1961, and two new units, Wright and Christie, the former containing a dining hall, were added in September, 1964. These are named to honor Jessie Elvira Wright Whitcomb, a Vermont graduate of 1887, and Jean Alice Christie Chandler Bull, a graduate of 1886.

A new, three-hall unit, is under construction on the Redstone campus in 1967-1968. This will provide housing facilities for about 450 men or women.

Other buildings of interest include Grassmount, a gracious Georgian mansion which was the home of a former Governor of Vermont; Pomeroy Building, erected in 1829 for the medical department and now used to house the department of speech. The Wasson Infirmary, believed to have been an underground railway stop for escaping Negro slaves at the time of the Civil War, was purchased for the University in 1944 by a group of faculty and alumni, and named for the first dean of women, Pearl Randall Wasson. A modern home management laboratory, named to honor the late Miss E. Blundell, a member of the University's home economics faculty, was completed on the Redstone campus in 1961.

To support the teaching, research and Extension programs of the College of Agriculture and Home Economics, the University maintains animal, dairy and poultry science facilities on Spear Street in South Burlington, approximately a mile from the main campus; has entered into a contract with the U. S. Forest Service for establishment of a forestry research center nearby; maintains the Blasberg Horticultural Research Center off Shel-

burne Road in South Burlington; the Vermont Research Forest with units in Charlotte, Jericho, Williston, and Wolcott; the Proctor Maple Research Farm in Underhill; and the Weybridge Research Center and Morgan Horse Farm at Weybridge, about 35 miles south of the University's main campus at Burlington. The Weybridge facility attracts many visitors each year who come to admire, and many to buy, the University's Morgan Horses.

The University Libraries

The main Library, dedicated in 1961, is named to honor the late Guy W. Bailey, thirteenth president of the University. It holds the largest book collection in Vermont, and acquires regularly the major periodicals, scholarly journals and indexing and abstracting services. The University collections also include books in medicine and health-related sciences, and a strong collection in medical periodical literature, maintained in the Medical Library of the College of Medicine.

Support of the Library is derived mainly from University operating funds, with some additional income available from endowments designating the Library as beneficiary.

The Bailey Library is a depository for United States and Canadian government publications, and acquires newspapers, pamphlets, maps, and materials in microfilm. The collections include the books and manuscripts from the library of George P. Marsh, the Howard-Hawkins Civil War collections, and the Whittingham-Stevens collection of Chiswick imprints.

The James B. Wilbur collection, rich in books and manuscripts relating to Vermont, the Dorothy Canfield collection of books, correspondence and manuscripts, and the papers of Ira Allen, Henry Stevens, and Warren Austin are significant holdings of the Special Collections Department.

The Robert Hull Fleming Museum

The Museum, an integral part of the University's teaching program, provides a fourfold educational service to the University and the people of Vermont through its permanent collections covering the history of art, temporary exhibitions, the Fleming Museum Association, and children's classes.

The permanent collection is arranged to augment in so far as possible the University's teaching in varied fields. Particular galleries are devoted to ancient, medieval, and renaissance art; baroque and modern painting and sculpture; American art; primitive art; and the Orient. Two galleries are devoted to temporary exhibitions that survey various aspects of painting, sculpture, graphic arts, and architecture.

The Fleming Museum Association, open to the public, is composed of friends of the Museum whose support makes possible certain special exhibitions, guest lectures and films. Gallery talks related to exhibitions and the permanent collections are given from time to time and guide service

for schools and clubs is available. Children's classes offer instruction in art to youngsters of the community.

The Museum has a conference room, a lounge with a high-fidelity sound system, and a kitchenette available for meetings and social functions, a collection of several thousand photographs of painting and sculpture, and study area for courses in art.

The ground floor of the Museum houses an arena theater with about three hundred seats. The arrangement provides the intimate atmosphere of a small theater and has contributed much to the dramatic offerings of the college year. It also houses the annual summer Shakespeare Festival.

The George Bishop Lane Artists Series

The George Bishop Lane Artists Series is one of the largest collegiate artists series in the country. It was inaugurated in 1955 by a gift of over \$300,000 from the late Mrs. Lane, in honor of her husband, George Bishop Lane of the Class of 1883.

The Lane Series makes it possible for the University to bring to the campus and the community a continuing program of outstanding musical, theatrical, dance and other artistic productions for a moderate admission fee.

The Series is planned and produced by a student-faculty committee, with townspeople serving with student and faculty members on an advisory committee.

The Lane Series has presented many of the world's finest artists and groups, including the London Philharmonia, the Vienna Philharmonic, the Philadelphia Orchestra, the Cleveland Orchestra, the Chicago Symphony Orchestra, the Moscow Philharmonic Orchestra with David Oistrakh, the Royal Ballet of London, the American Ballet Theatre, Rudolf Serkin, Artur Schnabel, Van Cliburn, Isaac Stern, Nathan Milstein, Andres Segovia, The Vienna Choir Boys, the Weavers, the Robert Shaw Chorale, the Budapest String Quartet, Dave Brubeck, Errol Garner, Benny Goodman, Victor Borge, Al Hirt, Mantovani, Harry Belafonte, Joan Baez, Maurice Chevalier, Bill Cosby, Ella Fitzgerald, Henry Mancini, Sir John Gielgud, Roberta Peters, the New York City Opera Company, the Metropolitan National Opera Company, the D'Oyly Carte Opera Company, and a number of plays including *Tea and Sympathy*, *Li'l Abner*, *Camelot*, *Man for All Seasons*, *Look Homeward, Angel*, *J. B.*, and *Hello, Dolly!*

In addition to three major series presented during each academic year, the Lane Series also sponsors a Chamber Arts Series in the spring semester, the Lane Summer Series, several youth concerts and special events, and an extension series in St. Johnsbury.

Conferences and Institutes

An increasing number of groups hold educational conferences, institutes and seminars on the campus of the University of Vermont. Wherever it is

possible to do so, the University is pleased to cooperate in making its facilities available for this purpose. Nominal charges are made to cover costs to the University.

Further information may be obtained through the Office of Conferences and Institutes.

Educational Television

The University owns and operates Vermont Educational Television in behalf of all educational interests of the state. The state-wide network broadcasts in school, in service, and cultural programming over WETK-TV, channel 33, Burlington; WVTB, channel 20, St. Johnsbury; WVER, channel 28, Rutland; and WVTM, channel 41, Windsor; and on channels 74, 76, and 79 at Manchester, Wilmington, and Bennington.

V Student Life

The general welfare of students is the responsibility of the Office of the Dean of Students.

Student Personnel Services

Student Personnel Services are available to assist students in the development of individual or group goals. These services include the offices of Dean of Women, Dean of Men, Student Activities, Financial Aid, Placement, Health Service, Counseling and Testing and Foreign Student Adviser.

Extensive resources applicable to group goals, purposes and organizational problems are offered through consultation with these offices. The student personnel staff is trained to work with individuals and groups in an effort to obtain optimum educational objectives and experiences.

COUNSELING AND TESTING CENTER Individual counseling and testing, on a confidential basis, is available to students who have social, vocational, academic, or personal problems. Psychiatric counseling is available through the University Health Service.

PLACEMENT SERVICE To assist graduating Seniors and Alumni in exploring and selecting among various employment possibilities, the University operates an extensive Placement Program. A large number of representatives from business organizations, governmental agencies, and school systems come to the campus each year to interview for full-time positions. Related services include individual career planning and the preparation of confidential credentials. For undergraduates, occupational information is available in the Placement Office and career planning lectures are given during the semester.

VETERANS ADMINISTRATION BENEFITS Students who are eligible to receive educational benefits from the Veterans Administration under the provisions of Public Laws 634 (veteran's child), 894 (disabled veteran), or 89-358 (veteran who served on active duty with the Armed Forces after January 31, 1955) should present a "Certificate for a Program of Education" or a "Certificate of Eligibility" to the Office of the Dean of Men at the time of registration. If the student is presently in training at another institution, he should complete

a "Request for Change of School" form which may be obtained from his regional V.A. office. Questions regarding Veterans Administration benefits should be directed to the office of Financial Aid.

FINANCIAL AID The University Financial Aid office counsels students on financial problems, administers the University's Scholarship and Loan Funds, and assists students in obtaining part-time employment.

READING CENTER The University Reading Center provides a free program for students who wish to improve their reading, vocabulary, and study techniques. Some tutorial services are also available. The first semester classes are open primarily to freshmen whose college entrance examinations indicate such a need. However, other students who are in need of improvement are urged to enroll in the reading program. Students who enroll are expected to attend regularly throughout the semester.

SPEECH AND HEARING CENTER Services of the Speech and Hearing Center, located in Pomeroy Hall are free to students in the University who have problems of speech, language, voice, and hearing; for example, problems of articulation, dialect, stuttering, inefficient voice production, hearing loss, and those problems associated with such conditions as cleft palate and cerebral palsy.

Health Services

The University has complete resources for maintaining the physical well-being of members of the student body. The Health Service, with its headquarters at the Wasson Memorial Infirmary, provides medical, minor surgical, orthopedic and psychiatric care for all students. Major medical, surgical, orthopedic and psychiatric cases will be treated at the Medical Center Hospital of Vermont, adjacent to the campus, or if feasible, arrangements made for such care at a hospital nearer the student's home. Long-term psychiatric cases will be treated by a local psychiatrist outside the Health Service at the student's expense. Athletic teams are examined prior to activity and care of injuries in these sports is supervised by the Health Service.

The Health Service is staffed by a medical director, associate physicians, and psychiatric consultants, who have regular clinic hours. An orthopedic consultant holds a regular clinic at the infirmary.

The infirmary is staffed by an administrative director, full staff of registered nurses, a part-time laboratory technician, and physical therapists who are also the athletic trainers. The infirmary is never closed. One of the staff physicians is on call at all times in addition to the scheduled office hours. A student may employ a private physician at his own expense and use the infirmary facilities.

Parents are notified of illness by phone or letter, depending on seriousness of the illness or injury.

Every student who pays full tuition for the normal college year of nine months is entitled to a maximum of five days of infirmary care and such routine medical care as is needed and as the infirmary and health service can render during the academic year. Students who require infirmary care for more than five days in the college year are charged at the rate of \$12.00 per day.

Every student at the University is required to participate in the physical education program for two years. Normally this work is taken in the freshman and sophomore years, but may be postponed on the advice and authorization of the medical director, or the student's own physician, who must forward statements to the medical director concerning disability.

Housing

The University provides housing for all full-time undergraduate students except for commuting students and those who desire and are eligible to live off campus. Upper class students who are actives or pledges of a fraternity or a sorority may register for University residence hall housing or chapter housing. Men and women students who have completed six full semesters as of June 15 of the current year and also those who reach the age of 21 years as of December 31 of the current year may register for University residence hall housing or off-campus housing. The University is not responsible for the approval of off-campus housing facilities. The Director of Housing will furnish a listing and information on housing facilities that are available in the Burlington Area.

A. Residence Halls. All undergraduate men and all unmarried undergraduate women are eligible to live in University residence halls. Contracts for room and board are binding for the college year unless cancelled for due cause with the sanction of the Dean of Women or the Dean of Men. In August each new student will receive notification of a housing assignment and the date and hour of the opening of his or her residence hall. Rooms may not be occupied until the date specified. Each student is expected to leave the residence hall not later than twenty-four hours after his or her last examination at the close of each semester.

Facilities for doing personal laundry are provided in residence areas as well as space for the storage of trunks, baggage and skis. Bed linen and towels may be furnished by the student or rented from a commercial linen service which provides weekly delivery of two sheets, a pillow case, and three towels. Students provide their own window draperies, pillows, metal wastebaskets, bureau covers, desk and reading lamps. All students living in the residence halls must have board contracts in the appropriately assigned dining hall, with the exception of upperclass students who are members of fraternities or sororities who may elect to take their meals in the chapter house.

In order to facilitate maximum educational growth from the residence hall experience each residence hall will house a pro-rated number of residents from each of the four undergraduate classes. Each residence hall is under the guidance and direction of a Resident Adviser who is a member of the Student Personnel Staff. In addition, the Resident Adviser is assisted by a specially selected undergraduate Resident Assistant. These staff members encourage the development of intellectual, social, and cultural programs and assist the residents in their growth toward maturity and responsible self direction. Each student in the residence halls is a member of his residence hall student government organization which represents student opinion and which provides educational and social programs for its constituents.

B. Fraternities and Sororities. Chapters of Greek letter fraternities and sororities have long been recognized as part of the intellectual, social, and extra curricular life on the campus. These groups provide valuable experience for their members in the form of interfraternity athletic competition, interfraternity sings, dances, social work projects, house operations, meal service, and educational programs. Fraternities and sororities are under the jurisdiction of the Student Personnel Dean. Fraternity activities are coordinated by the Interfraternity Council and sorority activities are coordinated by a Panhellenic Council.

Usually only junior and senior women are permitted to live in sorority houses. Only upperclass fraternity men may contract for meals or a room in fraternity housing.

Student Activities

The University officially recognizes the activities of a number of organizations supplementing the social and recreational needs of students, developing their cultural and religious interests, providing them with valuable business and executive experience, and broadening their contacts. Because it is within this area that qualities of leadership may be developed, the University encourages participation consistent with its scholastic requirements. The students manage the affairs and finances of these organizations within the framework of the University's regulations.

RELIGIOUS LIFE Although the University cannot itself attempt to guide the religious life of its students, this work is carried out by several independent agencies: the B'nai B'rith Hillel Foundation; the Catholic Center; the Council for a Cooperative Ministry (sponsored by the American Baptist, Methodist, and Presbyterian churches, and the United Church of Christ); and the Episcopal Church at the University of Vermont. In addition, the Inter-Varsity Christian Fellowship, the Christian Science College Organization, and the Church of Jesus Christ of Latter-Day Saints are represented on campus. Students desiring information on any of these groups are referred to the office of the Consultant on Religious Programs.

THE BILLINGS CENTER The major function of this multi-purpose building, located in the former Billings Library, is to provide the "where" for co-curricular activities in an atmosphere consistent with the goals of the University for individual development. Billings provides facilities for lectures and other programs sponsored by the various student organizations; small group conference rooms; study and recreational lounges; and snack bar facilities in the Catamount Den.

As the focal point of many student activities, most campus organization offices are located in Billings. Included are the Director of Student Activities; Student Association; Women's Student Government Association; Panhellenic Council; Interfraternity Council; Student Committee on Discipline; Kake Walk; *Cynic*; *Ariel*; and Billings Center Governing Board.

UNIVERSITY LODGE Located near Madonna Mountain ski area in Jeffersonville, Vermont, the "Ski Lodge," as it is known to many on campus, is a facility that enhances the outdoor recreational program of the University.

The Lodge Advisory Board recommends policies for the operation of the Lodge which was built with the support of students, alumni, and friends of the Outing Club and the University.

The University Lodge provides overnight dormitory-style accommodations for sixty persons. Preference is given to: 1) "Charter Members" who have given financial support; 2) other students; and 3) "the University family."

UVM STUDENT ASSOCIATION All students enrolled in the undergraduate colleges and schools are charged a student activity fee and thus become members of the UVM Student Association. A Senate, consisting of elected officers and representatives, holds weekly meetings during the year and conducts the regular business of the association. However, the student body may be convoked by the Senate or by any group of students to hold a referendum or to conduct extraordinary business. There are many opportunities for students to participate in the work of the standing committees.

STUDENT COMMITTEE ON DISCIPLINE The judicial authority of the Student Association is vested in the Student Committee on Discipline, which consists of representatives of each of the undergraduate colleges. The Committee has exclusive jurisdiction in all cases concerning interpretation of the Constitution and By-laws of the Student Association and legislation enacted in pursuance thereof. The Committee hears cases referred to it by the Dean of Women, the Dean of Men or the Standing Committee on Jurisdiction.

WOMEN'S STUDENT GOVERNMENT ASSOCIATION Every woman who enrolls as an undergraduate student at the University becomes a member of the Women's Student Government Association. W.S.G.A. Council, elected by the women students,

works to educate students to become self-directing individuals, to respect the rights of others, and to develop into responsible citizens of the college community.

W.S.G.A.'s primary purpose is to promote the academic success and the social development of all women students, while at the same time respecting the personality and the worth of the individual.

HONORARY SOCIETIES National Honorary Societies represented on the University of Vermont campus include:

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. The local chapter was the first in Phi Beta Kappa to initiate women into membership.

Mortar Board is a national honorary society for senior women. Although membership in Mortar Board comes as a great honor for a University of Vermont woman 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 proved their ability to do research in one of the sciences and, if 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; Sigma Phi Alpha, dental hygiene; National Collegiate Players, dramatics; and Alpha Lambda Delta, freshman women's scholastic; Ethan Allen Rifles, outstanding students in the Reserve Officers Training Corps; Pershing Rifles, a military fraternity.

RECOGNITION SOCIETIES The several class societies recognize contributions to the University of Vermont and leadership in campus life. The Boulder Society, a local society for senior men, recognizes responsible student leadership, as does Mortar Board for senior women. Election to these societies is counted one of the highest honors that a University of Vermont man or woman can achieve. Other class recognition societies are Key & Serpent, a junior society, and Gold Key, a sophomore society.

The Staff & Sandal, recognition society for junior class women, and the Sophomore Aides, for women of the sophomore class, recognize leadership and scholastic achievement.

ATHLETICS AND INTRAMURAL PROGRAMS A program of intercollegiate competition for men is maintained in baseball, basketball, cross-country, football, golf, hockey, indoor track, rifle marksmanship, skiing, soccer, swimming, tennis, track. The athletic policies of the University are under the direction of the Athletic Council, composed of members of the faculty, the student body, and alumni. Ath-

letic relations are maintained with colleges and universities in New England and the eastern seaboard. The University is a member of the "Yankee Conference," which is composed of the State universities in New England, of the National Collegiate Athletic Association, the New England Intercollegiate Athletic Association, and the Eastern College Athletic Conference. The Department of Physical Education for Men offers an excellent program of intramural sports which provides for voluntary participation by men in all classes. Competition in nineteen different sports activities is arranged among fraternities, residence halls, independent groups, and individuals. In addition to regularly scheduled intramural contests, the facilities of Patrick Gymnasium are available at various times during the week for recreational free play in a wide variety of sports activities. Equipment for free play is provided by the University and is available on a loan basis by presentation of the student's ID card.

The Women's Recreation Association, open to all women students, sponsors intramural, extramural, and intercollegiate sports events for women in a variety of team sports, individual, dual, and recreational activities. Through its program, WRA endeavors to provide opportunity for leadership and to encourage participation in and administration of recreational activities and service projects for all women students.

The Outing Club sponsors mountain climbing expeditions, ski trips, and other outdoor activities for both men and women students.

FRATERNITIES AND SORORITIES Chapters of Greek letter fraternities and sororities have long been recognized as part of the intellectual, social, and extracurricular life on the campus. These groups provide valuable experience for their members in the form of interfraternity athletic competition, interfraternity sings, dances, social work projects, house operation, and meal service. Fraternities and sororities are under the jurisdiction of the Student Personnel deans. Policies regarding the establishment of new chapters and the operation of present groups on the campus are subject to the authority of the University Council. Fraternity activities are coordinated by the Interfraternity Council and sorority activities are coordinated by a Panhellenic Council. The following are active chapters of national and local fraternities: Acacia, Alpha Epsilon Pi, Alpha Gamma Rho, Alpha Tau Omega, Delta Psi, Kappa Sigma, Lambda Iota, Phi Delta Theta, Phi Mu Delta, Phi Sigma Delta, Sigma Alpha Epsilon, Sigma Nu, Sigma Phi, Sigma Phi Epsilon, Tau Epsilon Phi, Theta Chi and Delta Colony of Phi Gamma Delta. Chapters of the following national sororities are represented: Alpha Chi Omega, Alpha Delta Pi, Alpha Epsilon Phi, Delta Delta Delta, Gamma Phi Beta, Kappa Alpha Theta, and Pi Beta Phi.

KAKE WALK The outstanding social event of the year is the Kake Walk weekend in February. This unique celebration is UVM's gala occasion and many alumni attend annually. Festivities include a formal ball at which a king and queen are crowned, snow sculptures, and

athletic events. For two nights fraternity and independent teams compete with one another in original skits and in walking for the much prized "Kakes."

MUSICAL ACTIVITIES Opportunities for participation and appreciation are provided for students with strong musical interests. The University Band, the University Choir and Women's Chorus, the University Madrigal Singers, and the University Orchestra appear in public presentations many times during the year. An opera or musical show is generally presented each year and faculty, senior, and monthly departmental recitals are scheduled throughout the year.

The University Band appears at military reviews, Kake Walk, and football games, presents two formal concerts, and makes a spring concert tour. The University Choir and Women's Chorus give three annual concerts and the Madrigal Singers sing for various groups around the State. The University Orchestra presents two annual concerts, assists the Choir in a third, and plays for musical productions.

FINE ARTS FESTIVAL A Fine Arts Festival is held each spring primarily to show student talents and work in the fine arts. Among the highlights of the Festival are exhibitions of painting, sculpture, and arts and crafts. Productions include an opera, a dance program, and student directed plays, as well as choral and orchestral concerts. Exhibitions, lectures and movies are scheduled at the Fleming Museum.

DRAMA, DEBATING, TELEVISION, AND RADIO The Arena Theatre in the Fleming Museum is the home for the Season of Plays presented each year by the Department of Speech and Dramatics with the University Players, as well as the home for the annual Champlain Shakespeare Festival. The great periods of Theatre history are covered during the course of four years in the Major Play Series. Workshop productions of original and experimental theatre forms are also produced as part of the regular course work in Theatre as well as by students and faculty outside of the regularly scheduled course offerings. The Departments of Music, Speech and Dramatics, and Women's Physical Education collaborate periodically to produce a musical comedy or opera. Participation in drama activities is open to all members of the University.

The Lawrence Debate and Discussion Club provides opportunities for participation in all types of forensic activities—debate, discussion, oratory, after-dinner, and extemporaneous speaking. Members of the club appear before service clubs, farm organizations, high schools, and other groups throughout the state. The members of the club participate in more than three hundred intercollegiate debates annually, with the beginners getting as extensive an experience as the veterans. The club travels to various discussion programs and to outstanding tournaments in the East. Outstanding performers receive recognition by election to Delta Sigma Rho-Tau Kappa Alpha, the national honorary forensic fraternity.

Two radio stations and one television station are located on campus. WRUV-AM is a wired-wireless station which has been broadcasting primarily to the campus since 1954. It is managed and staffed by undergraduate students. WRUV-FM is a 10-watt-educational station which began operation in 1965. Under faculty supervision, students operate this station as an integral part of the academic program in broadcasting offered by the Department of Speech. The station serves the area within 10-15 miles of the University. Headquarters for Vermont's statewide educational television network are located at the University. Its studios will be utilized by students in the broadcasting curriculum. Additionally, the Public Relations Office currently produces four weekly radio programs which are distributed to fifteen radio stations in three states. Opportunity is provided for students to participate in the production of these programs.

STUDENT PUBLICATIONS A college newspaper, a literary magazine, and an annual yearbook offer interested students the opportunity for journalistic, literary, and editorial expression. The newspaper, the *Vermont Cynic*, is published twice a week by students. The *Ariel*, the annual yearbook, is published by members of the senior class. The annual *Freshman Record Book* for all incoming students is published by a committee of the Student Association. *Departure* is the student-supported literary magazine.

CLASS ORGANIZATIONS The members of each freshman class form a class organization which retains its identity throughout the undergraduate years of its members and extends through subsequent years as long as there are living alumni of the class. Members of each undergraduate class elect officers each spring, except that officers elected at the end of the junior year serve through the senior year and to the end of the first reunion. Each senior class conducts the events of Senior Week.

The Admission of Students

To be fully qualified for admission an applicant must have his completed application on file with the Director of Admissions before February 1 of the year in which admission is sought. Applications filed after this date can be considered only as curriculum and dormitory capacities allow. Forms for admission will be sent upon request. A non-refundable application fee of \$10 is required of all applicants.

Admission to the freshman class is selective and is determined after careful consideration of the high school record, rank in graduating class, recommendation of the high school principal, and scores on the College Entrance Examination Board Scholastic Aptitude Test. A personal interview may be requested by the Director of Admissions. The Scholastic Aptitude Test should be taken not later than the January testing date in the senior year.

Candidates for admission are expected to present not less than sixteen units from high school. These must include:

English	Four years
Mathematics (as specified below)	Two years
Foreign Language, ancient or modern	Two years of one
Science	Two years
Social Studies	Two years

The two years of mathematics should be one year of algebra and one year of geometry. One year of social studies should be European or world history; or European or world geography. Students planning to enter the College of Agriculture and Home Economics should present a second year of algebra for a total of three years of mathematics. Students who plan to specialize in engineering, forestry, mathematics or science should present both a second year of algebra and a course in trigonometry for a total of four years of mathematics.

Exceptionally qualified students may in some instances be admitted even though they do not meet the above requirements in full.

Additional courses in mathematics, history, science, the fine arts and music, and a third year in the foreign language are recommended as desirable preparation for college. Students who present such courses will be given preference for admission. A student planning to major in music must arrange for an audition and interview with the chairman of the music department during the year preceding entrance.

Types of Enrollment

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

NON-MATRICULATED STUDENTS Students who have presented minimum credentials and are permitted to enroll in one of the colleges of the University to undertake limited course work for a purpose other than the earning of a degree.

Students who have been dismissed for low scholarship must, if readmitted, enroll as full-time matriculated students.

Previously earned credits for non-matriculated students who later matriculate will be evaluated and included in the particular degree program if pertinent.

Non-matriculated students intending to use courses taken for graduate credit as a basis for admission to the Graduate College at some future time must contact the Dean of the Graduate College prior to enrollment.

Non-matriculated students must be officially enrolled and registered and are subject to all regulations of the University.

College Entrance Examinations

The College Entrance Examination Board will administer a series of tests during 1969 on November 1 and December 6, and in 1970 on January 10, March 7, May 2 and July 11. Complete information may be obtained from the College Entrance Examination Board, P. O. Box 592, Princeton, New Jersey, 08540.

Admission to Advanced Standing

All applicants for admission who have attended another collegiate institution are required to file with the Director of Admissions an official transcript of high school and college records. A confidential report from the college attended is also required.

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 completed with grade "D" or its equivalent, unless a more advanced course in the same subject has been passed with a higher grade in the institution from which the student transfers.

The 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.

Advanced Placement and Advanced Credit

The University of Vermont welcomes applications from high school students who have taken college level courses offered in their high schools

under the Advanced Placement Program of the College Entrance Examination Board. Departments will review Advanced Placement examinations and the scores received in order that qualified students may not be required to repeat work already covered adequately.

A student who has been granted Advanced Placement may, upon the recommendation of the department and the student's academic dean, use his Advanced Placement to satisfy distribution requirements for his concentration.

Students who receive Advanced Placement may also receive course credit toward graduation requirements, upon approval of the department and the student's academic dean.

Credit by Examination

A matriculated student who wishes to do so may, under the following conditions, receive credit for a course by taking a special 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 chairman of the department in which the course is given, and the academic Dean, in that sequence. The student must neither have audited, previously received a grade, nor have attempted a prior special examination in this course at the University of Vermont. Upon passing the special examination, as determined by the examiner and the chairman of the department in which the course is given, the student receives credit, but not a grade, for the course.

Pass-No Pass Option

Students, starting with the sophomore year, may elect to take certain of their courses on a pass-no pass option, with approval of their advisor.

Orientation Program

Entering students are required to take the College Entrance Examination Board achievement tests in mathematics and modern foreign language in all cases where these subjects are to be continued in the student's curriculum. The scores on all tests are used in advising students regarding the course of study and the selection of courses. New students are required to come to the campus in June for a two-day orientation and enrollment. Schedules and dates of these meetings are mailed with the Certificate of Admission. The student will plan his course program with the advice of his adviser and academic dean and complete his registration for the September opening of college.

V Student Expenses

The student expenses outlined in the following paragraphs are the anticipated charges for the academic year 1968-69. Changing costs, however, may require an adjustment of these charges before the opening of college.

APPLICATION FEE An application fee of \$10.00 is charged each applicant for admission to the University.

ORIENTATION FEE An orientation fee of \$21.50 is charged each new student to cover the costs of attending an orientation session.

DEPOSIT A deposit of \$50.00 is required of every applicant after he has received notification of his acceptance as a student at the University. This deposit is held until he graduates or discontinues his course of study, at which time the deposit minus any indebtedness to the University will be returned to him.

An applicant to an undergraduate college who gives written notice of cancellation of an application prior to July 15 will receive a refund of \$15.00.

An applicant to the Graduate College for a program beginning in July or September will receive a \$15.00 refund if the Dean is notified by May 1; if the program is to begin in January, the deadline is December 1.

TUITION The tuition charges are in accordance with the following schedule.

1. **VERMONT RESIDENTS**

All full-time students (twelve hours or more) \$ 600.00 per year

Part-time students (fewer than twelve hours) 25.00 per credit hour

2. **NON-RESIDENTS OF VERMONT**

All full-time students (twelve hours or more) \$2000.00 per year

Part-time students (fewer than twelve hours) 85.00 per credit hour

SPECIAL CONDITIONS Undergraduate students who, by reason of conditions over which they have no control, require more than four years to complete the requirements for a degree shall be charged no more than the full tuition for four years.

In the College of Medicine students allowed to repeat a year are charged full tuition for that year.

In the Graduate College a tuition fee of \$25.00 per semester is charged each graduate student who has completed all course requirements but who is in residence for the purpose of completing his thesis.

FEES FOR COURSES IN APPLIED MUSIC Private lessons are approximately one-half hour in length, fifteen being given in each semester. Students who enroll as regular full-time students in a music education curriculum, paying full tuition, are charged one-half the regular rates for applied music for such courses as are required in the curriculum. All others pay the scheduled charge.

One lesson a week	\$50.00 per semester
Two lessons a week	75.00 per semester

FORESTRY SUMMER PROGRAM The charges for the Forestry Summer Program (see page 67) are Vermont resident tuition \$136.00; non-resident tuition \$216.00. In addition there may be charges for transportation.

ROOM CHARGE Rooms in college residence halls are rented for the academic year and the prices are uniform in all residence halls. For each occupant of a room in a residence hall \$400.00 per year is charged. The charge for a single room, when available, is \$450.00. The residence halls are closed during the University recess periods and the University reserves the right to use student rooms to house University students in any of the residence halls during these recess periods. Normal charges for the use of certain electrical appliances may be levied upon occupants of the residence halls. A \$2.00 fee is charged each male dormitory resident to be used for the Residence Halls' activities program.

Written notice is required of any student cancelling his room contract. Any student cancelling his contract after June 30 will automatically be assessed a \$50 penalty.

BOARD All students who live in a University residence hall are required to have meal contracts for twenty meals per week at a cost of \$470.00 per year. Students with meal contracts will be assigned by the University to appropriate residential dining halls. Members of a university fraternity which provides meal service may contract for that service with their fraternity.

LIBRARY FEE A library fee of \$30.00 per year is charged to all full-time students except those registered in the College of Medicine. Students enrolled in less than twelve hours but more than three hours will be charged a fee of \$15.00 per year. Students enrolled in three hours or less are not subject to the library fee.

ATHLETIC FEE An athletic fee of \$30.00 per year is charged to all full-time students. Students have the privilege of using the facilities in the gymnasium at scheduled times and have free admission to intercollegiate home games.

STUDENT ACTIVITY FEE Full-time students enrolled in the Colleges of Arts and Sciences, of Technology, of Agriculture and Home Economics, and of Education, and undergraduate students in the Division of Health Sciences are charged a fee of \$8.75 per semester. This fee is assessed and allocated by Student Association toward the support of student organizations and student activities. First-year medical students who enter the College of Medicine after three years in the College of Arts and Sciences are charged this same fee.

Graduate students, part-time students, and students in the College of Medicine may, by paying this fee, become entitled to the benefits listed above.

MEDICAL STUDENT ACTIVITY FEE All students in the College of Medicine are charged a fee of \$10.00 per year. This covers the cost of the medical year book and other student activities.

PENALTY PAYMENT Failure to complete financial arrangements and registration by specified dates will result in a penalty of \$10.00.

ADVANCED DEGREE FEE A fee of \$35.00, payable during the semester prior to graduation, is charged degree candidates in the Graduate College. This fee includes the cost of thesis binding and the academic hood.

Estimated Expenses Per Year

Estimated expenses (excluding transportation, laundry and spending money), based on the regular tuition for undergraduate students include the following:

Resident Tuition	\$ 600.00
Non-Resident Tuition	2000.00
Meals (contract 20 per week)	470.00
Room (per person)	400.00
Library and Athletic Fees	60.00
Student Association Fee	17.50
Books and Supplies ¹ (estimated)	165.00
<hr/>	
Resident Total	\$1712.50
Non-Resident Total	\$3112.50

1. Engineering students add about \$50 for instruments. Dental hygiene students add about \$225, and nursing students should add about \$125 in the sophomore year, for uniforms and special equipment.

Payment of Bills

All fees and tuition for the semester (one-half of the above yearly total) are payable upon notification and not later than at the time of registration. Checks should be made payable to The University of Vermont. The University reserves the right to withhold all information regarding the record of any student who is in arrears in the payment of fees or other charges including student loans.

TIME PAYMENT The University of Vermont offers a time payment plan to students or parents. For further details contact the Bursar's Office.

Refunds

TUITION

1. In the event of voluntary withdrawal from college, during the first week of any semester the full tuition is refunded; thereafter, 20 percent is retained by the University for each week that has elapsed.
2. Any student who has paid in full the tuition for a semester and who withdraws for reasons of health or other causes beyond his control before the end of the semester, may, with the permission of his college dean and in lieu of any refund, elect to enroll for a ninth (final) semester without charge for tuition.
3. If a student is suspended, no cash refund is made; the student and his parents are informed that a credit balance for the amount actually paid for tuition by the student or his parents will be retained on the University's books and applied to his tuition charges, if he re-enrolls within three years of his suspension; no scholarship grants will be included in such credit.
4. If a student is dismissed for cause, a refund of tuition is made proportionate to the number of weeks remaining in the semester at the time of dismissal.
5. In case of death of a student, tuition paid is refunded in full.
6. A student who changes his status from full-time to part-time (fewer than

twelve hours) by an approved change of enrollment during the first three weeks of a semester may be entitled to partial refund of tuition, gymnasium, and library fees, since the charges will be adjusted to fit his new status.

OTHER CHARGES AND FEES

1. Refund of payments for board is made on a *pro rata* basis.
2. There is no refund of room rent.
3. There is no refund of student fees (Library, Gymnasium, Student Activity), except as noted under 6. above under TUITION.

Banking Facilities

An arrangement with the Howard National Bank and Trust Company of Burlington enables students to open and maintain regular checking accounts through the University Bursar's Office. Applications for new accounts, deposits to individual accounts, and orders for checkbooks are accepted during office hours in the Bursar's Office. The bank's normal charge of 12½¢ per check is made for this service. The University Store cashes small personal checks for students in good standing on presentation of a current student identification card.

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. The extent of need and the type of financial assistance which can be awarded is determined by the Director of Financial Aid.

New students should request application forms for aid from the Director of Admissions, the Director of Financial Aid, or from their principal if they are attending a Vermont high school. All applicants for financial assistance must submit a Parents' Confidential Statement to the College Scholarship Service in addition to the application for financial aid. These forms may be obtained from the local high school principal.

Applications for students entering the University should be filed before Feb. 1. Only in cases of emergency will applications after that date be considered.

A complete list of scholarships and loan funds will be found on page 270. A brochure presenting in more detail the types of aid available may be obtained from the Financial Aid office.

V General Information

Definition of "Vermont Resident"

The following rules of residence, adopted by the Board of Trustees on October 18, 1952, are used in determining a student's eligibility to benefit from the reduced tuition rate for residents of Vermont.

1. A student who is of age when he first enrolls in the University shall be deemed to be a Vermont resident if, and only if, he had his domicile in Vermont for a period of one year next preceding his first enrollment in the University, except as otherwise provided by these rules.

2. A student who is a minor when he first enrolls in the University shall be deemed to be a resident of Vermont, if, and only if, his parents had their domicile in Vermont for one year preceding his first enrollment at the University, except as otherwise provided in these rules.

3. A student, who, at the time of his first enrollment at the University, has his domicile fixed by a special rule of law (as a student under guardianship, a married woman, etc.) shall be deemed to be a resident of the State of Vermont if, and only if, the governing rule of law made Vermont his residence for a period of at least one year preceding his first enrollment.

4. In all cases in which a nonresident student claims that he has become a resident of the State of Vermont by reason of the application of a special rule of law (resulting from the appointment of a guardian, marriage of a woman student, etc.), the circumstances claimed to have made the student a resident must have taken place at least one year prior to the next regular student enrollment. In such cases, the new resident status of the student shall take effect at the time of the next regular enrollment.

5. Whenever a resident student shall lose his Vermont domicile (as in the case of a minor whose parents move from the State and excepting women who marry nonresidents), the student shall immediately be reclassified as a nonresident.

6. It shall be incumbent upon any student whose status changes from resident to nonresident, to inform the dean of his college, or the Registrar, promptly, of the facts relating to his residence.

7. The burden of proof shall, in all cases, rest upon the student claiming a residence of the State of Vermont.

8. The Board of Trustees may, whenever justice requires, make exceptions to these rules.

The Committee on Residence has been authorized by the Board of Trustees to consider exceptions as stated in rule 8 above. Appeals from the decision of the committee may be made to the Board of Trustees.

Application for change of residence classification should be made to the Director of Admissions who is chairman of the Committee on Residence.

Academic Discipline

CONDUCT The general principle governing the conduct of students is set forth in the following "ancient law" of the University:

The conduct of the students toward all men is to be regulated by those plain rules of politeness, honor, and religion which are binding on every free and virtuous community. They are to conform to every requirement of the faculty, which may arise from their relations as instructors, counselors and guardians, and as upright men and good citizens they shall use all lawful exertions to prevent and expose all violations of the laws of God and of the country, and whatever is at variance with the objects of the University.

Toward this end, 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 all local, State and Federal 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 he considers proper, this authority may be delegated to the several deans and to appropriate judicial bodies. The continuance of each student at the University, the receipt by him of academic credits, his 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 his registration at any time on any grounds, if it considers such action to be for the welfare of the institution.

University students and their parents are referred to the booklet *Privileges and Regulations for Students* in which University rules concerning discipline and academic procedures are given in detail. Each student is responsible for knowledge of these.

Use of English

Correct English usage is demanded by all departments in 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 contents. Students whose written work falls below the standard of correct usage may be remanded 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 on the college level.

Reserve Officers' Training Corps

The mission of the Army ROTC is to produce qualified leaders with the training and attributes essential to their progressive development in the United States Army as reserve officers or as career officers. The objective is to prepare college students for positions of responsibility commensurate with their education.

The University offers Military Science as an important contribution to national defense. The U. S. Army ROTC is a recognized part of the University's organization, and all qualified male students are encouraged to satisfy in part, their military obligation under the Universal Military Training and Service Act by participating in the program on a voluntary basis.

The Military Science curriculum is designed to provide a basic education in military subjects and to develop the leadership potential of the student. Instruction is given in subjects common to all branches of the Army with emphasis on national security policy, military technology, U. S. military history, military management, logistics, instruction, and the exercise of command. Qualified graduates are commissioned as lieutenants of armor, army security and intelligence, artillery, engineers, finance, infantry, medical service, signal, ordnance, quartermaster, transportation, or other branch, depending upon aptitudes, the individual's choice, and the needs of the Army.

ROTC SCHOLARSHIPS Students motivated toward a career as an Army officer may qualify for one of the 5,500 Army ROTC scholarships authorized by Public Law 88-647 (ROTC Vitalization Act), which provides

full payment of tuition, books, laboratory fees, and similar educational expenses, plus \$50.00 a month subsistence pay. Grants are made on a competitive basis for a two-year or a four-year period, but are contingent on enrollment in the four-year ROTC program. Student agrees to serve on active duty for four years.

Applications for the four-year scholarships are made during the senior year in high school. Normally the cut-off date for submission is in January. News media keep the public informed as to the exact date. Interested students should request application forms from the U. S. Army Headquarters nearest to their home. Students living in the Eastern United States should write to: Commanding General, First United States Army, ATTN: AHAAG-CE, Fort George G. Meade, Maryland 20755.

OPTIONAL PROGRAMS Two programs are offered: (1) A four-year program comprising 90 hours of classroom and laboratory work per academic year during the freshman and sophomore years (basic course) and 120 hours during the junior and senior years (advanced course). (2) A two-year program (advanced course) identical to the junior and senior years of the four-year program, with the following prerequisite: a student who wishes to enroll in the two-year program is required to attend a basic ROTC camp for six weeks during summer vacation at one of the five U. S. Army Basic Training Centers located regionally throughout the United States. Basic camp pay is approximately \$160.00, plus travel and major living expenses. The basic camp must be completed prior to entering the junior academic year.

Advanced course students become members of the Army Reserve during the period of enrollment, receive \$50.00 a month subsistence pay during the junior and senior years, and are required to attend an advanced ROTC camp for six weeks during summer vacation at the end of their junior year. A student normally attends a camp within the army area in which his home is located. Camp pay for advanced course students is approximately \$260.00, plus travel and major living expenses. The advanced course camp may be deferred for one year for cogent reasons when approved by the department.

ADVANCED PLACEMENT With the concurrence of the Military Science Department, advanced placement may be granted for equivalent training as substantiated by a military training certificate issued by an accredited military or secondary school.

UNIFORMS Uniforms are furnished without cost to each student enrolled in the ROTC program. Upon graduation he receives a uniform allowance of \$300.00 which is ample to meet the initial cost of uniforms required of an Army officer on active duty.

FLIGHT TRAINING PROGRAM The Army ROTC Flight Training Program is open to qualified seniors. It is designed to train a reserve pool of Army aviators and affords students the opportunity to qualify for a Federal Aviation Agency private pilot's license. On-campus ground and flight instruction under FAA licensed instructors is provided without cost.

DISTINGUISHED MILITARY STUDENTS Members of the senior class, including ROTC scholarship students, who have demonstrated outstanding motivation toward a military career, and whose academic standing is

well above average, may be designated Distinguished Military Students and offered a commission in the Regular Army.

POSTGRADUATE DEFERMENT Upon graduation, ROTC students are normally commissioned as officers in the U. S. Army Reserve and agree to serve on active duty for two years, subject to call to such duty. However, active duty may be deferred for as many as four years for those who wish to pursue an advanced degree while studying as full-time graduate students.

Physical Education

Two years of physical education, normally completed during the freshman and sophomore years, are required of all undergraduate students. 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 Student Health. Students twenty-five years of age or older are exempt from physical education requirements. The semester hours listed for physical education are in addition to the total number of hours required for graduation in a specific curriculum.

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 Service.

Student Health Insurance

Through an arrangement with the John C. Paige and Company, insurance, students are able to procure a health and accident insurance policy providing for payment up to \$1,000.00 for each accident and \$500.00 for each illness. The cost for one year's coverage is \$22.00. Further details may be obtained from the Treasurer's office.

Enrollment and Registration

Every student is required to enroll and register at the time and in the manner designated by the Registrar. All charges for the ensuing semester must be paid, or otherwise provided for, before registration is complete.

Changes in Enrollment

Any changes in enrollment must be authorized by the dean of the college in which the student is registered. A student may add a course only during the first week of classes, but may drop a course without academic penalty during the first three weeks of classes. Change of enrollment forms are obtained from the departmental offices or advisers.

Auditing Courses

With the approval of the Dean and the instructor concerned, a regularly enrolled student carrying a normal program may audit a course. Others who do not wish to receive credit, or who have not met admission requirements, may also

register as auditors. Auditors have no claim on the time or service of the instructor, the course is not entered on the permanent record, and no grade credit is given for the work. For students paying full tuition, no additional charge is made; for all others, 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 Office of Continuing Education is necessary for auditing courses in the Evening Division and Summer Session.

Undergraduate Degree Requirements

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

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

To be eligible for graduation, a student must have attained a cumulative average of 1.70 or higher in the courses for which he has been officially enrolled. 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 42 semester hours of credit 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 on recommendation of the Academic Council and in cases of undue hardship. 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 in addition to that taken to qualify for the first degree.

Honors

The Bachelor's degree 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*. In the College of Medicine, the five students who have attained the highest average of marks during the entire four years' course are graduated *cum laude*. The names of those who receive these honors and of those who win academic awards are printed in the commencement program.

Dean's List

The deans of the undergraduate colleges publish at the beginning of each semester the names of those full-time students who have attained an average of at least 3.0 in their college credit courses during the preceding semester.

Grades and Reports

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

	Grade	Quality points
Excellent	A	4
Good	B	3
Fair	C	2
Poor	D	1
Failure	F	0

Other grades are:

- Inc This temporary grade indicates that some work required in a course has not been completed for an acceptable reason, such as illness. It can be recorded only by permission of the student's college dean. A time limit is set by the instructor and the dean within which the work is to be completed. This shall not be later than the beginning of the corresponding semester of the next academic year. If the work is not completed within the time set, the course is regarded as failed, unless the dean rules otherwise.
- NP Not passed. The grade is omitted in averaging.
- P Passed. The grade is omitted in averaging.
- W The student was permitted by the dean to withdraw without penalty. The grade is omitted in averaging.
- WF The student withdrew with failure. The grade is weighted as an "F" in averaging.

A quality point average of 1.70 is the minimum graduating average. All students enrolled in the undergraduate colleges receive reports of final grades from the Registrar after the close of each semester. These reports are also sent to the parent or guardian of each freshman student and to the principal of the secondary school from which he was graduated. Reports of upperclass students are sent to parents only upon request. Special reports of low standing are sent by the deans' offices about the middle of each semester to the students concerned.

Each student, former student, or graduate student may procure one photostatic transcript of his record without charge. For additional orders the charge is one dollar when one transcript is ordered. When more than one transcript is ordered at a time, the charge is one dollar for the first copy and fifty cents for each additional copy.

V The College of Agriculture and Home Economics

The College of Agriculture and Home Economics performs four public functions: it teaches resident students; investigates problems; disseminates information; and performs related services. These four areas of work are performed respectively by the resident instruction division, the research division (Vermont Agricultural Experiment Station), the extension division (Vermont Agricultural Extension Service), and the Related Services Division.

The curricula of the resident instruction division prepare students for professional careers. Upon receiving the bachelor's degree, students are offered employment in management, specialized services, education, and research—all these in areas related to agriculture, family and consumer science, conservation, recreation, and international service.

The evolution of society necessitates continual progress and change, especially in technology, management of natural resources, and human relationships. Thus the challenge of preparing students to excel now, yet adjust to future changes, is being met through curricula designed to give a foundation in the social sciences and humanities plus a fundamental technical education. These curricula, which include many options, encompass agriculture, forestry, home economics, and a two-year program in preveterinary medicine.

Most options in the College of Agriculture and Home Economics leading to the Bachelor of Science degree require 130 semester hours of prescribed and elective courses, plus credit for required courses in physical education. The Forestry Curriculum requires 138 semester hours of prescribed and elective courses, eight hours of which are earned during an eight-week summer program of instruction between the sophomore and junior years. (See page 51 for expenses.) The normal semester program includes fifteen to eighteen credit hours of courses plus physical education.

In each field certain courses are prescribed, with allowance made for the election of additional courses, to provide a well-balanced and integrated educational program and to insure reasonable concentration. Faculty advisers counsel students in the selection of elective courses and other educational problems.

Students should work in their field of specialization sometime during their college career. Such opportunities are often provided by departments in the College of Agriculture and Home Economics.

A student may transfer from one curriculum, option or program in the

College to another, provided the established course requirements are satisfied. Arrangements may be made for transfer within the College through counsel with the student's faculty adviser.

THE HONORS PROGRAM

This program of the College of Agriculture and Home Economics is designed to help the superior student. It provides an environment for such students which will insure that they are constantly challenged by the most advanced work their talents will allow.

Students are selected on the basis of their academic performance—usually after the completion of the sophomore year. Their curricula are developed in consultation with an honors committee and are relatively free of the customary restrictions. Special colloquia or consultations may be arranged in lieu of regular class work. Prerequisites may be waived, and in general the student is encouraged to work as an individual.

THE CURRICULUM IN AGRICULTURE

The degree of Bachelor of Science in Agriculture is awarded in each of the following departments and programs:

Agricultural Economics
Agricultural Education
Agricultural Engineering
Animal Sciences

Botany
General Agriculture
Laboratory Animal Technology
Plant and Soil Science

The curriculum in agriculture is broad and flexible, with sufficient areas of concentration and electives to meet the specific needs and desires of the student. Therefore, responsible departmental advising is important in the development of each student's program.

Every candidate for this degree, in consultation with his adviser, must choose an area of concentration within one of the above departments or programs upon entering the College. The candidate must then fulfill the requirements stated below and complete a total of 130 semester hours of credit, which may include not more than 16 semester hours of military science, plus credit for required courses in physical education.

Required of All Students

- A. Four courses in communications, of which two shall be Freshman English.
- B. Two courses in physical or biological sciences: botany, chemistry, geology, physics, zoology.
- C. Two courses in the social sciences and the humanities.
- D. Five credit hours in mathematics and statistics.
- E. Introductory Animal Science and Introductory Plant Science (must be in addition to any courses taken under B above).
- F. Option requirements: Specific courses to be taken in each option are listed in the descriptions following. Course programs within each option are developed in consultation with the student's adviser or the department chairman.

Department Options and Requirements

AGRICULTURE ECONOMICS *Agribusiness and Marketing:* In this option a student is prepared to meet the complex and challenging problems of administration and management of small businesses and agricultural firms

and to understand the marketing problems of such firms. Students selecting this option prepare themselves for work in business management, for graduate study, Extension work, sales, and market analyses. Each student in this option must complete 18 hours of course work in agricultural economics and 12 hours of course work in Economics and Business Administration, selected with the approval of his adviser.

Farm Management: This option prepares a student to manage a farm business or to work in many fields related to agricultural production. Students electing this option must complete 30 hours of credit in agricultural economics or general economics, 18 hours of which must be in agricultural economics. All courses will be approved by the student's departmental adviser.

Resource Economics: This option is an interdiscipline program with a focus in resource economics. It is designed to prepare students to do further graduate work or to fill positions in the fields of management, planning, and administration with respect to natural resources. Students selecting this option must complete 18 hours of course work in agricultural economics and 12 hours of course work in the social sciences. In consultation with the adviser, additional courses will be selected in forestry and other fields related to natural resource planning and administration.

Foreign Service: This option prepares students for work in foreign countries with one of the many foreign aid development programs or with businesses in foreign countries. Students selecting this option will take 12 credit hours in agricultural economics; 12 hours in economics and business administration; 12 hours in political science; 12 hours in sociology, anthropology, or psychology; and 6 hours of a foreign language above the elementary level. All courses are selected with, and have the approval of, the adviser.

AGRICULTURAL EDUCATION This option is designed to prepare graduates to enter the expanding vocational and technical education field in agriculture. The program prepares individuals to teach in high schools and area vocational centers. Students will receive the professional preparation in education required to effectively teach high school pupils, young adults and adults, as well as to advise youth organizations and young adult organizations. Students may concentrate their study of technical agriculture in areas such as farm production, agricultural supplies and services, agricultural machinery sales and services, ornamental horticulture, forestry or conservation and recreation.

Students completing this option may pursue many of the professional agricultural careers in education, business and industry, government agencies and foreign service.

Students are prepared to enter graduate programs in agricultural education leading to employment in universities, junior colleges or technical institutes.

Required courses: Each student majoring in agricultural education must satisfactorily complete 20 hours in agricultural education, including agricultural education 155 and 251. Additional courses to be selected by the student in consultation with and with approval of his departmental adviser.

AGRICULTURAL ENGINEERING TECHNOLOGY This option leads to the Bachelor of Science Degree in Agriculture. It provides the student with technical and practical instruction in agricultural engineering technology. It offers work in the areas of buildings, utilities, machinery, soil and water, and economics as well as the general education courses required of all

students in the College of Agriculture and Home Economics. The graduate is qualified for employment in agribusiness and public service. Some areas of employment are: Agricultural Extension; Farm Equipment Manufacture—Sales Liaison and Management; Farm Equipment Sales and Service; Agricultural Co-operative—Sales and Management; Building Construction and Materials Adviser; Power Company Adviser; Rural Area Development; Farm Management; Rural Contracting—Buildings and Services, and Earth Work; Banks—Agricultural Adviser; Government Agencies—State and Federal; Recreational Development.

Required courses: Each student selecting this option will be required to satisfactorily complete 15 semester hours in agricultural engineering, 121, 131, 140, 160, and 164. Also required are: engineering graphics 1, botany 4 or biology 1, chemistry 1-2, physics 5-6, plant and soil science 61, civil engineering 53, mathematics 110, economics 11-12, and farm shop 102 from which the student may be excused if found qualified on examination by the instructor. All courses must be selected in consultation with and have the approval of the student's departmental adviser.

ANIMAL SCIENCES Students interested in the animal sciences may elect to concentrate in one of four options. These options have been designed for men and women to provide a liberal education in the biological sciences with primary emphasis on the animal sciences. Sufficient flexibility exists in all options so that the program will be individualized to fulfill each student's needs.

Dairy Technology: This option has been designed to provide the scientific, technical, and practical instruction necessary to prepare the graduate for the numerous positions available in the dairy and food science field. The students who elect to place greater emphasis on the scientific aspect of Dairy Technology will find that they are prepared to work in quality control, research laboratories, and to do graduate study in dairy and food chemistry or bacteriology. The student who desires to place greater emphasis on business and the social sciences may become qualified for numerous supervisory and management positions in the dairy and food industry.

Basic Science: This option has been designed specifically for those individuals who are interested in careers in industrial research and development or university positions. The students who elect this program will be provided with the strong science background that is necessary for advanced study in such areas as physiology, nutrition, genetics, and related biological fields.

Animal Technology: This option provides formal training in the theories and practices of the animal sciences with special emphasis on management and technical competence. It prepares the student for employment as a farm owner, manager, or field work with state and federal extension services, breed associations, hatcheries, farm organizations, and various commercial companies.

Animal Industry: This option is primarily for those students who are interested in business. It prepares them for supervisory and management positions in industries related to Animal Science, such as those involved with the processing and sales of dairy, meat and poultry products; feed and fertilizer companies; farm equipment and supply agencies; advertising and public relations; and other areas of public service.

Required Courses: Satisfactory completion of eight semester courses in Animal Science, including at least five of advanced standing. Additional courses to be selected by the student in consultation with the departmental advisers in order that proper emphasis can be placed on the student's special field of interest.

BOTANY Botany is that subdivision of biology which is the foundation of the various branches of plant science, whether theoretical or applied. Students from both the Colleges of Agriculture and Arts and Sciences may select the botany option. The student receives general instruction in the physical and biological sciences while obtaining a liberal education. Such an undergraduate experience can be applied to many fields of future endeavor. A student takes beginning and general botany and physiology as prerequisite to four advanced courses. These courses are selected depending on the student's interest in any one of the fields which constitute botany. In these courses he is introduced to ideas, technics and appropriate modern scientific apparatus. Students have a variety of choices open to them upon receiving the bachelor's degree. Some go directly into agriculture, government services, applied research, or biology teaching in the secondary schools. Others enter professional schools or graduate school to prepare themselves for more advanced positions.

Required courses:

Biology 1, 2
Botany 4 or
Botany 103
Chemistry 131, 132
Physics 5-6

Principles of Biology
Introductory Botany
Plant Physiology
Organic Chemistry
General Physics

Three additional semester courses in botany. Six credit hours foreign language above the elementary level.

GENERAL AGRICULTURE This option is designed for students wishing to return to farming, to become farm managers, to enter off-farm occupations in agriculture; for those seeking a general rather than a specialized knowledge in the field of agriculture; for those desiring to prepare for county extension work. Through the proper selection of electives, a student may choose a field of concentration in agriculture, and at the same time select courses that contribute to a liberal education.

Required courses: Each student majoring in general agriculture must satisfactorily complete twenty-four hours in the College of Agriculture and Home Economics. All additional courses must be selected in consultation with and have the approval of the departmental adviser.

LABORATORY ANIMAL TECHNOLOGY This option in the Department of Animal Pathology provides fundamental training in the care and management of colonies of experimental animals used in scientific research. Humane methods of handling, space and temperature requirements, proper sanitation, feeding and maintenance are emphasized. Students are taught basic laboratory techniques used in examination of blood, urine, fecal and tissue specimens. Assistance with preoperative and postoperative care, recordkeeping, experimental design and problems of colony management are included. Senior students are assigned responsibility for groups of laboratory animals under the guidance of the professional staff.

Students satisfactorily completing the required courses receive the degree of Bachelor of Science in Agriculture. Graduates are eligible for certification by the examining board of the American Association for Laboratory Animal Science and are also eligible to apply for admission to colleges of veterinary medicine or further graduate training. Employment opportunities are available in the pharmaceutical industry, federal and state government agencies, diagnostic laboratories, and institutions engaged in biological research.

The freshman and sophomore years are identical to the preveterinary program. Additional courses required:

Animal Pathology 105
Agricultural Biochemistry 55
Chemistry 123
Animal Pathology 106
Animal and Dairy Science 105
Medical Technology 111-112
Animal Pathology 107-108
Animal Pathology 217-218
Animal Pathology 220

Anatomy and Physiology
Introductory Microbiology
Quantitative Analysis
Animal Diseases
Feeds and Feeding
Biochemistry for Med. Techs.
Laboratory Animal Techniques
Laboratory Animals
Laboratory Assignments

PLANT AND SOIL SCIENCE Students interested in economically important plants and how they are used for food, feed, fiber, recreation, ornamental purposes, or in soils may elect the Plant and Soil Science option. This program is designed for both men and women with either rural or urban backgrounds.

The Plant and Soil Science option includes basic biological and physical science courses and allows students to specialize in horticultural science, crop science, or soil science. It has been designed with sufficient flexibility so that the student may place his primary interest in either science or in agribusiness.

Students interested in technical positions or in graduate study usually select more of the basic science courses such as botany, chemistry, mathematics, and physics. These courses help lay good foundations for future teaching and research careers.

Students interested in careers in industry, business, marketing, sales, or production generally select several courses in marketing, economics, accounting, business, and management.

Required courses: Each student must take Introduction to Plant Science, Introduction to Soil Science, and two semesters of Plant and Soil Science Seminar, in addition to the courses in science and humanities required of all agricultural students. Majors in the department also are required to take four courses in Plant and Soil Science at or above the 100 level. These are usually courses concerned with horticultural crops, agronomic crops, or soils, depending on where the student wishes to specialize. Certain advanced courses in other departments may be taken in lieu of one or two of these four 100 level courses with the consent of the student's adviser.

The Agricultural Engineering Program

A. *Agricultural Engineering Technology* (see the Curriculum in Agriculture, page 65).

B. *Professional Agricultural Engineering*. This provides the first two years of study in a four-year professional agricultural engineering curriculum. The last two years of professional education must be taken at an institution which confers the degree of Bachelor of Science in Agricultural Engineering. Special arrangement with the University of Maine permits Vermont resident students in good standing to continue their agricultural engineering education at that university after completion of the two-year program. They will receive full credit for all courses passed and they will pay the same tuition as resident students in Maine. Transfers may be made to other institutions under the usual conditions. Non-

resident students enrolled in this program complete their last two years as transfer students to the University of Maine or to any other institution of their choice.

The graduate is prepared 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 student is also prepared for research and graduate study in agricultural engineering.

The Freshman Year	1st SEMESTER	2nd SEMESTER	The Sophomore Year	1st SEMESTER	2nd SEMESTER
Engineering Mathematics, Math. 13, 14	4	4	Engineering Mathematics, Math. 123	4	..
General Physics, Physics 17, 18	3	3	Differential Equations, Math. 211	..	3
English, 1-2	3	3	Physics 27, 28	4	4
Engineering Graphics, I-II, M.E. 1, 2	2	2	Plane Surveying, C.E. 53	4	..
Introductory Chemistry, Chem. 1-2	4	4	Statics, C.E. 24	3	..
			Thermodynamics, M.E. 113	3	..
			Dynamics, C.E. 130	..	3
			Programming and Elementary Numerical Methods, Math. 31	..	2
			Introduction to Plant Biology or Principles of Biology or Bot. 4 or Biol. 1	..	4

Note: The Junior and Senior years will be taken at the University of Maine under Regional Co-operation Program. (See page 30.) For a trial period through 1970-71, freshman admission (at the Maine resident tuition) to this curriculum at the University of Maine will be allowed for Vermont resident students.

The Preveterinary Program

This program offers preparation for entrance to colleges of veterinary medicine. Adjustments of individual programs may be made to meet the requirements of different colleges. Students completing the prescribed courses with good grades and suitable qualifications may expect consideration for admission to veterinary colleges. Six months of experience after the age of fourteen years on a farm with a variety of livestock is an important qualification for admission to some veterinary colleges. Opportunities are available for graduate veterinarians in general practice, the armed services, public health, teaching and research, and federal, state and municipal disease control work. Two years of work, totaling at least 60 semester hours, plus training in physical education, are required.

The Freshman Year	1st SEMESTER	2nd SEMESTER	The Sophomore Year	1st SEMESTER	2nd SEMESTER
Freshman English, Eng. 1-2	3	3	Heredity, Zool. 115	3	..
Introductory Chemistry, Chem. 1-2	4	4	Elementary Physics, Physics 5-6	4	4
Biology, Botany 1	4	..	Organic Chemistry, Chem. 131, 132	4	4
Biology, Zoology 2	..	4	Political Science or History	3	3
Mathematics	3	3	Public Speaking, Speech 11	..	3
Electives	1-4	1-4	Electives	1-4	1-4

The Forestry Curriculum

The curriculum leading to the degree of Bachelor of Science in Forestry provides a liberal education in the humanities and sciences and a professional edu-

cation in forest management or wildlife management. It is designed to prepare men for positions in forest management, in wildlife management, or for graduate study in the forest or wildlife sciences.

The curriculum emphasizes the science and technique of coordinating the management of forest and wild land for forest products, wildlife, water, and for recreation. Selection of the Forest Management option or the Wildlife Management must be made by the second semester of the sophomore year.

A minimum of 138 semester credit hours of prescribed and elective courses is required for graduation. Eight credit hours are earned for the summer program which immediately follows the second semester of the sophomore year.

Graduates are employed by Federal and State Conservation agencies, by forest products and related industries, or as private consulting foresters.

THE COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Forest Management and Wildlife Management

	1st	2nd		1st	2nd
	SEMESTER			SEMESTER	
The Freshman Year			The Sophomore Year		
College Algebra, Math. 9 ¹	3	..	Elementary Statistics, Math. 110	..	3
Trigonometry, Math. 2	..	3	Forest Fire Control, For. 31	2	..
Engineering Graphics, M.E. 1	..	2	Silvics, For. 122 ²	..	3
Freshman English, Engl. 1, 2	3	3	Dendrology, For. 5	4	..
Principles of Biology, Biol. 1, 2	4	4	Plane Surveying, C.E. 53	4	..
Introduction to Forestry, For. 1	3	..	Principles of Economics, Econ. 11, 12	3	3
Introductory Chemistry, Chem. 1, 2	4	4	Public Speaking, Speech 11	..	3
			Elementary Physics, Physics 5-6	4	4

Summer Field Program³

Forest Management Planning, For. 130	2
Forest Mensuration 1, For. 140	3
Forestry Problems, For. 100	3

A. Forest Management Option

	1st	2nd		1st	2nd
	SEMESTER			SEMESTER	
The Junior Year			The Senior Year		
Forest Mensuration 11, For. 141	3	..	Forest Economics, For. 151	3	..
Silviculture, For. 123	..	3	Forest Management, For. 136	..	3
Forest Entomology, P+SS. 108	..	3	Forest Recreation Mgt., For. 133	2	..
Wood Technology, For. 161	..	3	Timber Harvesting, For. 163	3	..
American Government, Pol. Sci. 21	3	..	Forest Pathology, P+SS. 110	..	3
Communications Elective	3	..	Forest Policy and Administration, For. 152	..	3
Electives ⁴	4-7	10-12	Seminar, For. 282	..	1
			Electives ⁴	8-10	6-8

B. Wildlife Management Option

	1st	2nd		1st	2nd
	SEMESTER			SEMESTER	
The Junior Year			The Senior Year		
Structure and Function, Zoo. 103, 104	4	4	Field Zoology, Zoo. 109	4	..
Silviculture, For. 123	3	..	Wildlife Mgt., For. 171, 172	3	3
Taxonomy, Bot. 110	..	3	Wildlife, Path., An. Path. 110	..	3
Plant Communities, Bot. 213	3	..	Fresh Water Biology, Zoo. 236	..	4
Environmental Zoology, Zoo. 102	..	4	American Government, Pol. Sci. 21	3	..
Forest Entomology, P+SS. 108	..	4	Electives ^{4, 5}	6-8	6-8
Communications Elective	3	..			
Electives ^{4, 5}	3-6	3-6			

1. Qualified students may substitute Math. 11 for Math. 9 and 2.

2. Wildlife Management majors take Avian Biology, Poultry Science 58.

Curriculum in Home Economics

The curriculum leading to the degree of Bachelor of Science in Home Economics provides a liberal education in the humanities and sciences and in subject matter related to home and family with concentration in a professional area of home economics. Specialization is provided through one of five options listed below:

Clothing, Textiles and Related Art
 Education—Secondary, Early Childhood, and Extension
 Family Living—Human Development—Preprofessional Social Work
 Food and Nutrition
 Housing and Home Management

Candidates for the degree must present 130 semester hours of credit including the requirements listed below, additional courses as indicated, and required courses in physical education. Elective courses allow a student to pursue a special area of interest for the completion of the degree requirements.

- | | |
|----------------------------------------------------------------------------------------------|----------------------------|
| A. <i>Language and Fine Arts</i> | Total Credits: 15 |
| English 6 | |
| Speech 3 | |
| Choose 6 hours from the following: | |
| Art, English, Foreign Languages*, Classics, Music, Speech. | |
| B. <i>Social Sciences</i> | Total Credits: 18 |
| Choose from 3 or 4 of the following areas: | |
| History | Sociology and Anthropology |
| Political Science | Philosophy |
| Economics | Religion |
| Psychology | Geography |
| C. <i>Laboratory Sciences</i> | Total Credits: 8(6) |
| Two semesters of a Laboratory Science ¹ | |
| (Chemistry, Physics, Zoology) | |
| | Total 39-41 |
| The selection of the above courses may be determined by certain requirements of each option. | |
| D. <i>Home Economics:</i> | |
| Orientation required of all Freshmen. | 1 |
| 15 Design | 3 |
| 20 Introduction to Textiles and Clothing | 3 |
| 35 Nutrition ² | 3 |
| 51 Housing | 3 |
| 56 Principles of Management | 3 |
| 163 Dynamics of Family Development | 3 |
| | 19 |

- Courses in the eight-week program immediately following the second semester of the sophomore year.
 - Nine credit hours of electives must be from approved courses in the Arts, Humanities, Languages, Social Sciences or Mathematics. Not more than 4 credits of Military Science can be counted toward meeting this requirement. One course must be selected from the following areas: Climatology, Hydrology, Geology or Soils.
 - Wildlife Management majors must select two courses from Silvics, Forest Management, Policy and Administration, Photogrammetry, Recreation and Forest Economics.
- *This department accepts credit for 2 semesters of a foreign language.
- Certain fields of specialization have specific requirements within these areas.
 - Most fields of specialization require H.E. 35, Basic Concepts of Food and Nutrition—4 credits.

- E. Option requirements. Each student, not later than the sophomore year, should select one of the following options. Professional requirements and selected electives complete the 130 semester hours for the degree.

Options in Home Economics

CLOTHING, TEXTILES AND RELATED ART This option provides the opportunity for study in the field of fashion, textiles and design for clothing and the home. By the addition of selected courses to meet individual needs and goals the option can be used effectively as preparation for careers in merchandising, consumer research and counseling, the clothing and textile industries, writing, radio, television, and extension services. The program also provides a strong background for further work leading to careers in fashion illustration and textile designing. Graduate work will be necessary for jobs at certain levels, such as college teaching and textile research.

Professional Requirements: 24 additional credits in clothing, textiles, related art and housing selected in consultation with adviser and approved by the department.

EDUCATION—SECONDARY, EXTENSION, AND EARLY CHILDHOOD¹ This option provides a background which prepares students to teach home economics to elementary, junior and senior high school students and adults in Vermont and may be planned to meet requirements of other states. Students must have a 2.0 average in their home economics subjects to be eligible for student teaching during their senior year.

Through appropriate selection of courses, this option also prepares for Co-operative Extension work as Home Demonstration Agent, 4-H Agent or Specialist.

Professional Requirements: (1) Secondary and Extension, 23 credits in Home Economics Education and general education; 32 credits in Home Economics including advanced courses in subject matter and related professional areas to be selected in consultation with adviser and approved by the department. (2) Early childhood. See (1) under Family Living.

FAMILY LIVING—HUMAN DEVELOPMENT—PREPROFESSIONAL SOCIAL WORK This option prepares men and women in two areas of concentration: Pre-school Education—Human Development, and Preprofessional Social Work. Professional opportunities are found as preschool staff members, family consultants, and in work with hospitalized children. The Preschool Laboratory provides opportunity for a multidisciplinary study and experience in human development and family relations.

Preprofessional Social Work is available to students enrolled in any college of the University. It may be elected as a field of study in Home Economics or may be combined with a major in another department. Opportunities are provided for both field observation and experiences. The concentration in Preprofessional Social Work for students from other colleges is based on a broad Liberal Arts program including courses in sociology, psychology and human development, political science, history, and economics.

A student in this area may affiliate at the Merrill-Palmer Institute, Detroit, Michigan, for one semester. The cost of this semester, including transportation, is comparable to the cost of one semester at the University of Vermont.

1. See statement under College of Education for official admission to teacher education, p. 83, par. 5.

Professional Requirements: (1) Early Childhood Education, 33 credits in home economics selected in consultation with adviser and approved by the department. 3 advanced credits in psychology. (2) Social Welfare, 25 credits in home economics selected in consultation with adviser and approved by the department, 3 credits additional in speech, Sociology 41.

HOUSING AND HOME MANAGEMENT Professional careers in this option include work with public utility home service departments, magazines, newspapers, radio and TV. Students may prepare to become interior designers, consultants in homemaking rehabilitation, directors of homemaker services, housing managers or researchers in housing design, materials, furnishings or equipment.

Graduate study in this field prepares for college teaching and work as an Extension Specialist in Housing, Home Furnishings, Equipment, Home Management, Family Economics, Consumer Education.

Professional Requirements: 21 credits in home economics selected in consultation with adviser and approved by the department. Economics 121.

FOOD AND NUTRITION This option prepares students for positions in the fields of food testing and promotion, food service management and food demonstration. Academic requirements for membership in the American Dietetic Association are met. Those students interested in careers as administrative, therapeutic or clinic dietitians are advised to plan on an internship after completing their undergraduate program. Course work is planned to give a strong background for graduate study which will qualify the student for positions in college teaching, extension service, research, or public health nutrition.

Men find many opportunities in the fields of food and nutrition. They may prepare for them through this program.

Professional Requirements: 28 credits in home economics selected in consultation with adviser and approved by the department. Organic Chemistry 4 credits. Microbiology 4 credits. Selection sequence (a), (b), (c) below or 9 additional credits in Foods or Nutrition.

Additional courses to meet academic requirements for an American Dietetic Association Internship.

- (a) Therapeutic and Administrative Dietetics
Zoology 5-6, Education 3 credits, Economics and Business Administration 251, Agricultural Biochemistry 151, Home Economics 244, 239
- (b) Hospitality Industry—Food Service Administration
Economics and Business Administration 13-14, 141, 251, Home Economics 239
- (c) Science—Food and Nutrition
Education 7 or 202 or Home Economics 173, nine additional credits in Foods or Nutrition, Agricultural Biochemistry 151

V The College of Arts and Sciences

The College of Arts and Sciences aims to provide for young men and women the means and opportunity of fitting themselves intellectually to play a responsible part in the world of thought and action.

It devotes itself to the cultivation of ideas and of ideals. It seeks to encourage habits of clear, independent thinking and effective expression; to stimulate an appreciative understanding of the thought and achievement of man; to develop sound critical judgment and a spirit of tolerance; to arouse the intellectual curiosity which is the basis of continuing self-education.

The Liberal Arts Curriculum

The curriculum in liberal arts, leading to the degree of Bachelor of Arts, offers training in language, and in certain other subjects essential to an understanding of the various fields of human knowledge; and provides for further study of a chosen field of concentration.

Every candidate for this degree must fulfill the requirements stated in sections A, B and C below, and present a total of 120 semester hours of credit, plus credit in required courses in physical education.

A candidate for this degree who enrolls for the first time on or after September 6, 1966, must present at least 75 of his minimum 120 credit hours in subjects outside the major subject of his concentration.

The Studies Committee of the College will rule upon petitions for exceptions to the College regulations.

A. Required of all students

ENGLISH Freshman English the first year, and Sophomore Literature the second year.

FOREIGN LANGUAGE One-year course of at least intermediate grade in a foreign language, to be completed as early as possible in the college career.¹

SCIENCE One laboratory course, normally the first year, to be chosen from biology, chemistry, geology and physics.

PHYSICAL EDUCATION Two years of physical education for men and women.

FIELD OF CONCENTRATION Each student, in consultation with his adviser, must choose a field of concentration during his sophomore year. The specific courses making up the field, as well as the student's whole

1. Ordinarily a student who presents for admission two or more years of high school language study which have been completed within the three preceding calendar years will not receive credit for an elementary course in the same language at the college level.

program for the last two years, are chosen in consultation with the chairman of the department in which the major part of the work is to be taken and must have his approval. The following minimal requirements must be met.

1. The field must be a well integrated whole, adapted to the student's special interests.
2. It must include a minimum of twelve semester courses totalling not less than thirty-six semester hours, at least eighteen in one subject (the major) and at least twelve in another subject (the minor).¹
3. It must contain at least four semester courses (twelve hours) of advanced level in one subject and two semester courses (six hours) of advanced level in another subject.¹
4. Each student must take at least one course, normally an advanced course, in his field of concentration in each semester of his junior and senior years.

B. Requirements for Concentration in Divisional Fields

LANGUAGE AND LITERATURE, ART, OR MUSIC History (American, Ancient, Medieval, or European Civilization)² normally the first year; a second foreign language reaching the intermediate level³; at least a year's work in an additional social science. It is strongly recommended by the language departments that students who wish to choose modern foreign language as their field of concentration complete Intermediate Latin in college unless they presented four years of Latin for entrance. The English Department considers courses in Latin to be a distinct aid to students concentrating in English.

SOCIAL SCIENCE History (American, Ancient, Medieval, or European Civilization) normally the first year; at least a year's work in each of two additional social science areas, chosen from the following: economics, geography, philosophy, political science, psychology, religion, sociology, and anthropology.

SCIENCE AND MATHEMATICS Introductory or General Chemistry (except for students concentrating in mathematics), mathematics and physics as stated in departmental requirements, and a total of at least four semester courses (twelve semester hours) in departments other than the sciences and mathematics.

C. Specific Departmental Requirements for Concentration

AREA STUDIES Economics 11, 12; Geography 1, 2; History 12 or 13; Political Science 11, 12; Sociology 21; eighteen hours of advanced courses dealing with a selected foreign area, including six hours of advanced language

1. These minimal requirements are exceeded in every instance (except Area Studies) by the specific departmental requirements in the major field.
2. All students in Liberal Arts who are required to take History and who do not present for admission at least one course in European or World History, must take European History (11, 12 or the equivalent). Students planning to concentrate in a classical language may substitute Ancient or Medieval History.
3. Students concentrating in English substitute an advanced literature course in foreign language for the second foreign language. Those concentrating in Art, Music, or Theatre may choose this option, or substitute twelve hours of courses from this division, or meet the requirements of the social science division.

and literature, six hours of history, and six hours of other social science. Concentrations must be approved by the Committee on Area Studies. Areas in which students may concentrate are Canada, Latin America, Russia and Eastern Europe, and Asia.

ART 1, 2, 5, 6, and at least fifteen additional hours, including at least two advanced semester courses in studio and at least two advanced semester courses in art history.

BOTANY Mathematics 9, 2, or 7, 8 or 11; Physics 5, 6; Chemistry 131, 132; Biology 1, 2; Botany 2, 103, and four additional semester courses.

CHEMISTRY Mathematics 121 or 123; Physics 6 or 27; Chemistry 11-12 (or 1-2 and 123), 131, 132, 134, 141-142, 224, and two of the following three courses: 135, 143, and 212. No advanced related course is required. These are the minimum requirements for a concentration in chemistry. This program does not provide an adequate background for graduate study nor for a professional career in chemistry. Chemistry concentrators should consult advisers in the chemistry department as early as possible. Accreditation by the American Chemical Society requires completion of Chemistry 135, 143, 145, 212, 184, six additional hours in advanced courses, and German 11-12.

ECONOMICS Mathematics 12 or Economics 188; Economics 11, 12, 190, 286; plus twelve hours chosen from 141, 201, 203, 205, 285, or 295; plus six additional hours in Economics acceptable toward the B.A. degree. See page 76 for list of courses.

ENGLISH Eight semester courses of advanced level, chosen to meet departmental group requirements. The advanced related courses may be in language, music, or any course approved by the department; it is expected that this advanced related course will be taken in the senior year. An advanced literature course in a foreign language is required.

GEOGRAPHY Twenty-four hours which must include 1, 2, 71, and 281.

GEOLOGY Mathematics 11, 12 or 13, 14; Biology 1-2 may be substituted for Mathematics 12 or 14; Physics 5, 6 or 17, 18, 27; Chemistry 1-2 or 11-12; Geology 1-2, 11-12, 105, 106, 116, 125 (or an accredited summer field camp) and 206. Geology 1-2 may be waived if the student is well prepared in allied sciences and mathematics.

GERMAN Six semester courses of advanced level including 101-102. The advanced related course is normally in another foreign language or English.

GREEK 11-12 and fourteen additional hours in courses numbered above 100, including 111-112. Either 151 or 153 may be included, but not both.

HISTORY Twenty-four hours including:

- 1) 11 and 12, or 13 (unless offered advanced placement).
- 2) at least six hours in American history.
- 3) at least twelve hours in advanced courses, distributed so that no more than six of the required twelve are in any one of the following areas: U.S., Europe before 1600, Europe since 1600, special areas (Canada, Latin America, Russia, Africa, Asia).

4) at least six hours of the above must be in courses numbered above 200.

History 91 is strongly recommended, preferably in the sophomore year.

Honors and special projects courses are not counted in the basic 24 hours.

For history concentrators the Department approves minors in any of the Arts or Social Sciences; language and literature minors must include in their major the history of the appropriate country. Other minors may be approved on special request.

History concentrators should meet the language requirement in a language relevant to their advanced work in history.

LATIN Twenty-three hours in courses numbered above 100 including 111-112.

Either 152 or 154 may be included, but not both. Courses in Greek are strongly recommended, particularly to those who contemplate graduate work in classics.

MATHEMATICS Physics 5, 6 or 17, 18; Mathematics 102, 121, 124, and five additional semester courses numbered above 100.

MUSIC 1, 2, 5, 6, 105-106, 221, 222, and six hours of applied music including piano. It is recommended that the related course be an advanced course in a foreign language. Those who wish to qualify for recommendations for teaching positions or graduate study will also complete one of the following combinations:

(a) 203, 205, 223, 224, 225, and 226.

(b) 203, 205, 208, 215, and two advanced courses in music literature.

(c) 208, one advanced course in music literature, and twelve additional hours of applied music.

Candidates for honors may complete 281, 282 in lieu of two courses subject to approval by the department.

PHILOSOPHY Twenty-four hours including 1, 2, 3, 4, 107, 108, and 214.

PHYSICS Six semester courses numbered above 100 including 101, 116, and 271; one semester of mathematics beyond Mathematics 121; two semesters of chemistry. A student planning a concentration should take Mathematics 11, 12 or 13, 14 and Physics 17, 18 in the freshman year, postponing his language. German, French or Russian is recommended. A preprofessional program leading to the B.S. degree and requiring an intensive concentration in physics courses is available in the College of Technology for interested students.

POLITICAL SCIENCE Twenty-four hours including 11, 12 (or 21, 22 and either 51, 52 or six hours in comparative government), and at least six hours in courses numbered above 200.

PSYCHOLOGY Twenty-six hours including 1, 5, 109, 110, 123, and two courses numbered above 200 (225-226 is considered a single course).

RELIGION 1, 2; any two among 101, 112, and 122; 201 and three additional courses numbered above 200.

ROMANCE LANGUAGES Twenty-four hours of advanced level courses in French or Spanish, of which at least twelve must be in literature and at least twelve must be in courses numbered above 200.

SOCIOLOGY AND ANTHROPOLOGY Students may choose one of three options, as follows: Sociology: 21, 22, 251, and at least five additional semester courses in sociology; psychology 5. Anthropology: 21, 24, 26, 225, 290, and at least four additional advanced semester courses in anthropology. Combined concentration: 21; sociology 22, 251, 255, and at least two additional semester courses in sociology; anthropology 225, 290, and at least two additional semester courses in anthropology (including at least one advanced); psychology 5.

SPEECH AND DRAMA Students may choose one of five options:

General speech: 1, 11, 12 or 14, 31, 294; any two among 63, 74, and 39; nine additional hours at the advanced level.

Mass communication: 1, 11, 63, 161, 162, 165, 263, 264, and three additional hours.

Rhetoric and public address: 1, 11, 12, 111, 116, 214, 217, 221, and three additional hours.

Speech pathology-audiology: 1, 11, 74, 101, 270, 281, and eight additional hours.

Theatre: 1, 11, 39, and eighteen additional hours.

ZOOLOGY Mathematics 11 or 7 and 8 (Mathematics 7 and 8 should be chosen only by students certain that they will not wish to study branches of zoology in which mathematics is an important tool); Physics 5, 6; Chemistry 1-2 or 11-12 to be taken the freshman year if possible; Biology 1, 2; twenty-two hours in zoology in courses numbered above 100, and including 101, 102, 103, and 104.

Special Provisions Concerning Credit

Courses Offered in Other Colleges Acceptable for ¹²⁰all Credit
Toward the B.A. Degree¹

Agricultural Biochemistry 201: General Biochemistry

Agricultural Biochemistry 253: Microbial Biochemistry

Botany: all courses

Chemistry: all courses

Education 50: Introduction to Dance

Education 140: Art for the Elementary School

Education 145-146: Learning and Human Development

Education 190: History of Educational Thought

Education 202: Philosophy of Education

Education 205: History of American Education

Education 255: The School as a Social Institution

Forestry 208: Biological Statistics

Home Economics 15: Design

Home Economics 117: History of Costume

Home Economics 163: Dynamics of Family Development

Home Economics 166: Social Welfare as a Social Institution

Mathematics: all courses

Courses in Economics Acceptable Toward the B.A. Degree

Economics 11, 12, 13-14, 15, 16, 121, 141, 181, 183, 187, 188, 190, 201, 203, 204, 205, 216, 238, 241, 242, 256, 258, 277, 285, 286, 290, 291, 292, 293, 295, 297, 298.

1. Other courses may be approved in individual cases by the Committee on Studies.

Other Courses Acceptable Toward the B.A. Degree

A given student may count as free electives not more than fourteen semester hours from other University courses in commerce and economics or courses outside the College of Arts and Sciences. Only courses carrying at least three credits each are acceptable under this provision, except that a total of no more than eight credits may be earned for courses in military science.

The Business Administration Curriculum

The Department of Economics and Business Administration offers a specialized curriculum leading to the degree of Bachelor of Science in Business Administration. This program is recommended for those who are preparing for a business career. Students who desire a less specialized business orientation may take the liberal arts curriculum and receive the Bachelor of Arts degree.

The business administration curriculum is intended to provide a sound basic training in the various phases of business activity. The several areas of concentration enable students to emphasize such specialized studies as accounting, banking, industrial management, and marketing management. The Department of Economics and Business Administration cooperates with the Department of Mechanical Engineering in offering courses in the Management Engineering Curriculum. This curriculum is administered by the Department of Mechanical Engineering and is described in the section on engineering curricula.

The accounting option is registered with the University of the State of New York, The State Education Department, in Albany, N. Y. Students completing the requirements of the accounting option will thus be eligible for admission to the New York State licensing examination in Certified Public Accountancy.

A minimum of 126 approved semester hours is required for the Bachelor of Business Administration degree plus required courses in physical education. The normal program for the first two years is as follows:

The Freshman Year	1st SEMESTER	2nd SEMESTER	The Sophomore Year	1st SEMESTER	2nd SEMESTER
Economic History	3	3	Sophomore Literature, 27, 28	3	3
Freshman English, Eng. 1-2	3	3	Principles of Economics, Econ. 11, 12	3	3
Fundamentals of Mathematics, Math. 7, 8	3	3	Principles of Accounting, Econ. 13-14	4	4
Laboratory Science	4	4	Foreign Language, Mathematics, or Social Science	3	3
Foreign Language ¹	3-4	3-4			

After the first two years a student may elect various concentrations of courses to emphasize selected aspects of business administration. The following courses, however, are required of all candidates for the Bachelor of Science in Business Administration degree:

	Hours
Principles of Marketing, Econ. 121	3
Industrial Management, Econ. 143	3
Elementary Statistics, Math. 110 and Econ. 188	6
Macroeconomic Theory, Econ. 190 ²	3
Economic Analysis, Econ. 286 ²	3
Social Science	9

1. In place of the foreign language, students may choose mathematics 11, 12 (plane analytic geometry, differential and integral calculus).
2. Accounting majors will substitute 201 Money and Banking and 207 Corporate Finance for 190 and 286.

In addition to the courses listed above, a minimum of 21 more hours in Business Administration is required. These courses should be selected in consultation with an adviser from the department. In general, however, a student should plan on taking at least twelve of these hours in his chosen area of concentration. Suggested courses by area of concentration are listed below:

Finance

	Hours
Required: Money and Banking, Econ. 201	3
Required: Corporate Finance, Econ. 207	3
Basic Federal Taxes, Econ. 164	3
International Trade and Finance, Econ. 205	3
Principles of Investment, Econ. 206	3

Marketing Management and Sales Promotion

	Hours
Problems in Marketing, Econ. 122	3
Sales Management and Promotion, Econ. 130	3
Fundamentals of Advertising, Econ. 132	3
Current Marketing Developments, Econ. 228	3
Marketing Management, Econ. 229	3
Personal Selling in the Economy, Econ. 123	3
Research Methods in Marketing, Econ. 127	3

Industrial Management

	Hours
Labor Economics, Econ. 141	3
Collective Bargaining, Econ. 242	3
Personnel Administration, Econ. 251	3
Methods Engineering, M.E. 175	3
Plant Organization, M.E. 176	4
Scientific Management and Labor, Econ. 254	3
Executive Decision-Making, Econ. 252	3
Cost Accounting, Econ. 272	3

Accounting

All Accounting majors are required to take the following courses:

	Hours
Business Law, Econ. 109, 110	6
Intermediate Accounting, Econ. 161-162	6
Cost Accounting, Econ. 272, 273	6
Advanced Accounting, Econ. 266	3
Basic Federal Taxes, Econ. 164	3
Auditing, Econ. 271	3

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.

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, in mass communication, 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 which is requisite for admission, but the student is advised to include in his undergraduate course substantial elections in the fields of languages, literature, history, economics, political science, and philosophy.

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 and religion, psychology, and social studies.

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 (pages 30-31) Vermont residents may prepare for pharmacy school at Connecticut or Rhode Island. This is a five-year program with two years of preprofessional work which includes English, mathematics, botany, chemistry, zoology, physics, social science, a course in fine arts, and orientation to pharmacy.

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 a student desiring to enter medical college should during his sophomore year consult catalogues of colleges to which he expects to apply, and arrange to include in his program courses required by those schools.

Each student, in consultation with his adviser, 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) Mathematics 11, 12 (recommended for able students)
- (b) Mathematics 11 (adequate)
- (c) Mathematics 9, 11 or 9, 2 (adequate)
- (d) Mathematics 7, 8 (acceptable but not recommended for most students)

Chemistry, two years minimum, *with laboratory*

Chemistry 1-2 or 11-12 (Chemistry 1-2 preferred)

Chemistry 131, 132 (required)

Chemistry 123 (required by many medical colleges, including UVM)

Physics, one year minimum, *with laboratory*

Physics 5, 6 or 17, 18, 27 (Physics 5, 6 preferred)

Biology, one year minimum, *with laboratory*

Biology 1, 2

Zoology 2 or 41

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 two years of college work. In general, the minimum requirements given above should be used in planning a program leading to entrance into a dental school. A student should consult catalogues of the dental colleges to which he expects to apply in order to make certain all requirements are met.

SECONDARY TEACHING Students in the College of Arts and Sciences may, upon application to the Dean of Education, 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, including student teaching, can count as electives in the Arts and Sciences program (utilizing the right to count 14 hours in non-Arts and Science courses plus certain education courses that can be counted without restriction). Students completing this program are eligible for Secondary Teacher's Certification.

College Honors

The honors program at both the junior and senior levels 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. Such a student enters a program of reading, research, or creation under the direction of the department of his choice. A student may take honors in either or both years.

A student in the College of Arts and Sciences who, at the end of his junior year, has an average of 3.00 or above for the work of the sophomore and junior years may become an applicant for college honors in a particular subject. His 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 he must present a satisfactory written report and pass an oral examination on the field of special study.

A program called junior honors, which may be considered introductory to but distinct from college honors, is available to juniors who have a sophomore average of 3.00 or above and who have the permission of their department chairmen. The program for each junior honors candidate will be determined by the department concerned.

Departmental Honors

A senior whose overall average is 2.50 or above, or who has been specially recommended by the department in which he is concentrating, is eligible to take a comprehensive examination. Upon successfully completing the examination he will be granted his 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.

The Center for Area Studies

The Center for Area Studies is an inter-departmental activity of the University conducted by the Committee on Area Studies appointed by the President.

The purposes of the Center are to encourage and coordinate interdisciplinary study of selected foreign areas and to promote research and interest in foreign areas among all the colleges of the University. The staff and course offerings in the Center's program are included under the various academic departments.

The Center represents a permanent continuation of the interest in non-Western areas that was developed by the Program of Non-Western Studies under a five-year grant, 1959-1964.

The Center for Area Studies administers the program of concentration in Area Studies for the A.B. degree in the College of Arts and Sciences. Undergraduates concentrating in Area Studies choose one of the areas in which the Center currently approves an interdisciplinary program of social science and foreign language: Canada, Latin America, Russia and East Europe, and Asia. For the Requirements for concentration in Area Studies see under the College of Arts and Sciences.

Undergraduates interested in taking area studies should, as early as possible in their college careers, consult the Chairman of the Committee on Area Studies or the Dean of the College of Arts and Sciences.

Study Abroad

The Vermont Overseas Study Program at the University of Nice in France provides a year of study abroad for a selected group of undergraduates from the University of Vermont and from other Vermont colleges and universities. Intended primarily for students concentrating in French, the program is also open to qualified students from other fields, such as the fine arts or the social sciences. Student selection will be based on the following criteria:

1. Sophomore, junior, or senior class standing with a minimum grade point average of 2.0 (C).
2. A working knowledge of French.
3. An interest in and potential for capitalizing on a year of study abroad.
4. A sound educational program.
5. Creditable personal qualifications.

Upon the successful completion of his work, the student receives appropriate credit (usually thirty hours) toward his degree. For further information about the Vermont Overseas Study Program, an interested student should speak to his academic dean or to the director of the program.

A student wishing to attend a foreign university on his own or under another program and receive transfer credit should consult with his academic dean and obtain approval, in advance, of his plans. In general, to gain approval a student will be expected to have completed two full years of work, to have an average of at least 2.5, to have a valid academic objective, and to have a good working knowledge of the language of the country to which he proposes to go.

The Government Research Center

The Government Research Center, established in 1950 as the Government Clearing House, provides research and informational services for students, state and local officials, members of civic groups, and the public. Activities include the following: developing opportunities for students to become acquainted with,

and to gain practical experience in, the operation of government; maintaining liaison with state and local officials relative to the use of University resources in the study of problems in state and local government; operating a public affairs research center, conducting research projects, and publishing studies in state and local government; and preparing background materials for conferences on public questions.

Many of the activities of the Government Research Center are sponsored in cooperation with state officials, local officials, or civic groups. The annual Listers' Schools are sponsored jointly with the Governor and the Vermont State Tax Department. Many state and local officers participate in the series of one-day Town Officers Educational Conferences, which originated in the late 1930s and which are held annually in several locations throughout Vermont. A two-day conference on citizenship, in which high school juniors, high school faculty members and administrators, and University personnel participate, has become an annual event, with the cooperation of the State Department of Education and various educational associations.

A Public Affairs Library collection is maintained as a memorial to the late James P. Taylor, whose effort to expand citizen interest in effective government is well known throughout the State. The Government Research Center also sponsors the annual Taylor Town Report Contest in Vermont and cooperates with the New England Council relative to the region-wide contest.

The World Affairs Center

The World Affairs Center, located at 479 Main Street on the University campus, is the focus for programs and services in international education. The Center is staffed jointly by the University and the Vermont Council on World Affairs, a Vermont citizens' group concerned to further greater understanding of world affairs and responsible participation in U. S. foreign policy. A library on world affairs, national foreign policies, and international organizations is maintained at the Center for the use of University members and Vermont residents. Advice and services for international students and visitors are part of the Center's program.

The Center cooperates with the State of Vermont, the United States, the United Nations, and many other international, national, and local organizations in arranging speakers, programs, materials for distribution, hospitality for international visitors, and consultations with groups throughout Vermont on various aspects of international education. The Center serves as a coordinating agent and occasionally sponsors educational activities such as specialized conferences, non-credit courses, contests, and programs.

V The College of Education

The College of Education offers four-year curricula leading to the following degrees: Bachelor of Science in Education, elementary and secondary education; and the Bachelor of Science in Music Education.

These curricula are designed to prepare teachers for the kindergarten-elementary level, middle and junior high schools, and assignments calling for subject specialties in elementary, secondary, and twelve-grade situations. The programs provide a liberal education, specialization in a field of knowledge and professional understandings and experiences. Preparation for teachers is also concerned with developing insights about the school's role as a social institution and the nature of the learner and of the means for teaching him most effectively.

General education courses may be elected in the College of Arts and Sciences, Technology, and Agriculture and Home Economics. Professional courses are taken in the College of Education. Professional laboratory experiences are provided in the College of Education and in schools under the supervision of the College of Education.

The nationally accredited education curricula in the College of Education meet requirements for teaching certification in most of the states. Adjustments in individual programs may be made to fit special requirements for certification in specific states. If in doubt about certification requirements, students should consult with their advisers or with the dean of the college.

The Department of Education, in cooperation with an All-University Coordinating Committee for Teacher Education, has the responsibility for maintenance of standards approved by the National Council for the Accreditation of Teacher Education. Official admission to teacher education is made during the sophomore year, and all students enrolled in the College of Education or in other colleges are to make application for admission to specific curricula before the beginning of the junior year. Special tests in communication skills and other screening measures are administered during freshman and sophomore years. Official forms for application may be obtained from the office of the Dean of the College of Education. Accepted students must meet personal, academic, and professional criteria established for teacher education candidates.

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.
- (3) Candidates are admitted to the program by action of a faculty committee.
- (4) A maximum of twelve 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 thirty credits approved by a faculty adviser.
- (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 faculty adviser.
- (10) The program must be completed within seven years after the time of admission.

In addition to the planned program leading to the *Fifth-Year Certificate*, the Department of Education will arrange for college graduates special programs leading to qualification for teaching certificates in either elementary or secondary education. To be accepted for these special programs, candidates must have included appropriate academic courses in their degree curricula, and they must satisfy the Department of Education that they have desirable personal qualifications for teaching.

Requests for further information about fifth-year programs should be directed to the Dean of the College of Education.

Elementary Education

The elementary education program is intended to prepare teachers for any of the elementary grades and kindergarten. The Bachelor of Science in Education is awarded upon satisfactory completion of an approved program.

The elementary education curriculum includes a base of required academic courses, a planned sequence of professional courses, laboratory experiences, and elective academic courses. The student must use electives during the four years to build an academic major of twenty-four to thirty-three credits. Specific in-

formation about majors may be obtained from advisers, the department chairman, or the dean.

The foundation in general education includes required courses in the social sciences, in mathematics, in laboratory science, in English and literature, in psychology and in speech. Courses in fine arts and in languages may be elected.

The professional program begins with the introduction of the student to education as a field of study during his freshman year. Each student is made aware of the social foundations and relationships of education, introduced to the extensive resources available to him for learning about the field in depth, and impressed with the developmental need for his delving into the literature and research as a basis for making critical judgments concerning education. The characteristics of teaching as a profession are also stressed.

In the sophomore year, the students are offered field experiences with children's groups in the community. These experiences serve the dual purpose of giving first-hand information about children and of providing opportunity for determining the satisfaction which association with children of different age levels brings to the student.

The junior year emphasizes professional course work and special content courses for elementary teaching. Professional courses include classroom observation and participation in local elementary schools.

The senior year continues the professional methods courses and includes eight full weeks of student teaching in the elementary schools of the Greater Burlington area.

In each year of the program, the curriculum provides for elective courses from other colleges. Total electives approximate forty semester hours and open to the student in elementary education attractive majors in music, art, speech, language, literature, history, and other fields of study offered by the University.

	1st	2nd		1st	2nd
	SEMESTER			SEMESTER	
The Freshman Year			The Sophomore Year		
Foundations of Education	2	or 2	Sophomore Literature	3	3
Speech 11 or 31	3	or 3	U. S. History	3	3
Science	4	4	Mathematics 125, 126	3	3
Freshman English	3	3	General Psychology ¹	3	or 3
Philosophy 1, 2, 3 or 4 ¹	3	or 3	World Geography ¹	3	or 3
Sociology/Anthropology	3	or 3	Approved Electives	3-6	3-6
Approved Elective	3	or 3	(Field of Concentration)		
			Child and Community	1	or 1
	1st	2nd		1st	2nd
	SEMESTER			SEMESTER	
The Junior Year			The Senior Year		
Art for Elementary School	3	..	Teaching Mathematics and		
Music	3	3	Critical Thinking	3	..
Children's Literature and			Physical Education for		
Language Arts	3	..	Elementary Schools	2	or 2
Learning and Human			Health Education	2	or 2
Development	3	3	Student Teaching	8	..
Courses in Field of			History of Educational		
Concentration	6	6	Thought	3	..
Reading and Language Arts	..	3	Art (History or Appreciation)	..	3
Teaching Science and			American Government ¹	..	3
Social Studies	..	3	Approved Electives	..	6
			(Field of Concentration)		

1. Courses may be taken at different times in the four-year program to accommodate fields of concentration.

A minimum of 125 approved semester hours, plus credit in required courses in physical education, is required for the degree.

Secondary Education

The secondary education program is intended to prepare teachers for junior and senior high schools in Vermont and other states. The degree of Bachelor of Science in Education is awarded upon satisfactory completion of an approved program.

During the first two years the curriculum consists generally of basic courses in English, fine arts, foreign languages, mathematics, science, and social science. Sophomores begin concentration on majors and minors in *approved teaching* fields and are given opportunity to participate in teaching experiences in local secondary schools. The junior and senior years combine courses in the teaching fields, professional courses in education, and laboratory experiences in teaching.

PROFESSIONAL REQUIREMENTS Candidates for the degree in secondary education are required to complete with a high standard of scholarship at least twenty semester hours of course work in professional education.

TEACHING MAJORS AND MINORS Candidates for the degree in secondary education are required to complete approved courses in *two teaching fields common to secondary schools*, or in one of two broad fields combining either natural sciences or social sciences. Broad field majors include approximately fifty semester hours in related courses, single subject majors include at least thirty semester hours, and minors include at least eighteen semester hours. The major-minor program must include credits in advanced courses.

Students should choose majors and minors which bear logical relationships and which commonly occur as teaching combinations in secondary schools. Suggested major and minor fields are English, foreign languages, mathematics, physical education, social sciences, and the sciences. Advisers can assist students in making choices which are in accord with student aptitudes and interests and which are likely teaching combinations. Outlines of suggested course sequences for majors and minors may be obtained from advisers, from the department chairman, or from the office of the dean of the college.

Students are expected to maintain a high standard of scholarship in their major and minor fields. A grade of less than C may not be applied to the minimum required credits in majors and minors and professional courses.

EXPERIENCES IN PUBLIC SCHOOLS Students in secondary education have direct experiences in public schools at two points in the four-year curriculum. During the sophomore year students observe and participate as teacher assistants in local junior and senior high schools. During the senior year students devote seven continuous weeks to full-time teaching in public secondary schools. In most cases students must arrange to live off campus during the student teaching assignment.

Applications for all field experiences must be made well in advance of assignments, and the student must assume responsibility for meeting deadlines. Information about application and assignment procedures may be obtained from the department chairman or the dean's office.

		1st	2nd			1st	2nd
		SEMESTER				SEMESTER	
The Freshman Year				The Sophomore Year			
Foundations of Education		2	or 2	Literature		3	3
Laboratory Science		4	4	Psychology		3	or 3
English 1, 2		3	3	Participation		2	or 2
Foreign Language		3-4	3-4	Foreign Language ²		3	3
History or Political Science ¹		3	3	Approved Electives		6-9	6-9
Speech		3	or 3				
		1st	2nd			1st	2nd
		SEMESTER				SEMESTER	
The Junior Year				The Senior Year			
Learning and Human Development		3	3	Secondary Education Methods		3	or 3
Approved Electives in Teaching Fields	12-15	12-15		Special Methods		..	2
				History of Educational Thought		3	or 3
				Student Teaching		..	6
				Approved Electives		12-15	3-6

A minimum of 122 approved semester hours, plus credit in required courses in physical education is required for the degree.

Music Education

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. Graduates are qualified for positions as instructors and supervisors of music in the public schools.

		1st	2nd			1st	2nd
		SEMESTER				SEMESTER	
The Freshman Year				The Sophomore Year			
Theory I		3	3	Theory II		3	3
Survey of Musical Literature		3	3	Literature		3	3
English 1, 2		3	3	Social Science		3	3
Foreign Language (Intermediate)		3	3	Applied Music: Major, piano, voice and woodwind class		4	4
Applied Music: Major, piano ³ , and string class		3	3	Ensembles: Major, secondary, or chamber music		2	2
Major Ensemble		1	1	Participation		..	2
Foundations of Education		2	or 2	Speech		3	..
		1st	2nd			1st	2nd
		SEMESTER				SEMESTER	
The Junior Year				The Senior Year			
Orchestration		3	..	Student Teaching in Music		7	..
Counterpoint		3	..	Elementary and Secondary Music Methods		5	..
Conducting		..	3	History of Educational Thought		..	3
History of Music		3	3	Form and Analysis		..	3
Laboratory Science		..	4	Applied Music: Major, recital, percussion and repair class		..	4
Learning and Human Development		3	3	Ensembles: Major, secondary, or chamber music ⁴		..	2
Applied Music: Major, brass class		3	3	Electives		..	6
Ensembles: Major, secondary, or chamber music ⁴		2	2	Applied Music		1	..

A minimum of 130 approved semester hours, plus credit in required courses in physical education, is required for the degree.

1. If History is chosen, European Civilization is recommended.
2. An approved elective if intermediate language has been completed.
3. Until functional piano facility achieved (see Performance, page 210).
4. A second applied field may be substituted for one ensemble.

Physical Education

The teaching major in physical education, open to men and women, qualifies candidates to teach physical education in both elementary and secondary schools. Satisfactory completion of the program earns a Bachelor of Science in Education degree.

Candidates will include 30-36 credits in physical education and will be required to demonstrate competency in a variety of sports from the intermediate to advanced levels. Competency requirements may be satisfied by performance in regular activity courses, which are a part of the basic physical education program, or by demonstration of equivalent knowledge and skills in scheduled tests.

All physical education majors will be required to purchase a special instructor's uniform.

				1st	2nd					1st	2nd
				SEMESTER						SEMESTER	
The Freshman Year						The Sophomore Year					
Foundations of Phys. Ed.	3	..				Devel. of Motor Skills	..	2			
Science Elective ¹	3-4	3-4				English Literature	3	3			
English 1, 2	3	3				Foreign Language ²	3	3			
Public Speaking	3	or 3				Social Science Elective	3	3			
Gen. Psychology	3	or 3				Anatomy and Physiology	3	3			
Foreign Language	3-4	3-4				Health Education ³	3	..			
Foundations of Ed.	..	2				O and A of Phys. Ed. ³	..	3			
Phys. Ed. Activity	1	1				Participation	2	..			
Phys. Ed. Activity	..	..				Phys. Ed. Activity	1	1		
						Phys. Ed. Activity	..	..	
				1st	2nd					1st	2nd
				SEMESTER						SEMESTER	
The Junior Year						The Senior Year					
P. E. in the El. School	3	..				Phys. Ed. for the Atypical	3	..			
P. E. in the Sec. School	..	3				Coaching ³	3	..			
Kinesiology	3	..				C and P Athletic					
Physiology of Muscular						Injuries ³	2	..			
Activity	..	3				Tests and Measurements in					
Learning and Human						Physical Ed. ⁴	..	3			
Development	3	3				History of Ed. Thought ⁴	..	3			
Elective	3	..				Student Teaching	..	6			
Coaching ³	..	3				Elective	3	3			
Elective	3	3				Elective	3	..			
Phys. Ed. Activity	..	..				Elective	3	..		
						Phys. Ed. Activity	..	..	

A minimum of 122 approved semester hours, plus credit in required courses in freshman and sophomore physical education, is required for the degree.

1. Botany, Biology, Zoology, Chemistry, Physics.
2. An approved elective if intermediate language has been completed.
3. Recommended elective
4. Accelerated course

V The College of Technology

The College of Technology includes the Departments of Chemistry, Civil Engineering, Electrical Engineering, Mechanical Engineering, and Mathematics. It offers a number of specialized professional curricula in these fields, in medical technology, and in physics, leading to the degree of Bachelor of Science in the field of specialization. Details are given in the sections immediately following. In addition to the courses listed in the several curricula, all students must fulfill the general requirements in physical education and hygiene. Students whose curricula require them to take two years of mathematics are referred to the footnote under the offerings of the Department of Mathematics for information concerning the possible sequences of courses in freshman mathematics.

The Chemistry Curriculum

The Department of Chemistry offers a specialized curriculum leading to the professional degree of Bachelor of Science in Chemistry. This curriculum is designed to give a sound basic training in chemistry, to prepare the student for service in some branch of the chemical profession, and to qualify him adequately for advanced study in graduate school. The department is accredited by the Committee on Professional Training of the American Chemical Society, which has established minimum requirements for the training of chemists at the bachelor's level. In accepting accreditation, the department has planned a curriculum which permits the student to reach these minimum objectives and will qualify the graduate for certification.

Those who wish a less intensive training in chemistry may take the liberal arts curriculum with a concentration in chemistry and receive the Bachelor of Arts degree. These students may also qualify for accreditation by satisfactorily completing certain courses beyond the minimum required for concentration, and *only those who so qualify will be recommended as chemists by the department.* A student can elect to concentrate in chemistry at the end of the freshman year or even as late as the end of the sophomore year and still qualify for accreditation. However, the department strongly recommends that the student choose before the start of his sophomore year. In the first year, and to some degree in the second year, prescribed courses are such that a student can transfer into the curriculum from liberal arts, or vice versa.

		1st	2nd			1st	2nd
		SEMESTER	SEMESTER			SEMESTER	SEMESTER
The Freshman Year				The Sophomore Year			
General Chemistry 11-12		5	5	Organic Chemistry 131, 132		3	3
Freshman English 1-2		3	3	Organic Laboratory 134		..	2
Mathematics 11, 12 ¹		5	5	Physical Chemistry, 141		..	3
Physics 17, 18		3	3	Mathematics 121, 124 ¹		3	3
		—	—	Physics 27		4	..
		16	16	German ² or Elective		3-4	3-4
				Humanities and/or			
				Social Sciences ³		3	3
						—	—
						16-17	17-18
		1st	2nd			1st	2nd
		SEMESTER	SEMESTER			SEMESTER	SEMESTER
The Junior Year				The Senior Year			
Physical Chemistry 142		3	..	Advanced Chem. Elective ⁴		3	3
Physical Chem. Lab. 144		2	..	Senior Seminar 184		A ⁵	1
Organic Laboratory 135		3	..	Research 197, 198 ⁶ or Elective		2	4
Adv. Inorganic Chem. 212, 213		3	3	Electives ⁷		6	3
Inorganic Chem. Lab 214		..	2	Humanities and/or			
Instrumental Analysis 224		..	4	Social Sciences ³		6	3
German ² or Elective		3	3			—	—
Humanities and/or						17	14
Social Sciences ³		3	6				
		—	—				
		17	18				

A minimum of 131 approved semester hours is required for the degree in this curriculum, plus required courses in physical education.

The Engineering Curricula

The engineering curricula are designed to help students learn to approach and deal in a professional manner with problems and situations they will meet as engineers, citizens and individuals. From this basic preparation they should continue to learn from experience and to grow in stature throughout their professional life.

The Departments of Engineering offer instruction in four curricula, Civil, Electrical, Management, and Mechanical Engineering, each leading to the degree of Bachelor of Science in the field of specialization. Each curriculum includes the general subjects: mathematics, chemistry, physics, graphics, elements of electrical engineering, mechanics, thermodynamics, economics, and English.

The required courses in each curriculum are shown arranged for a four-year program. These courses may be arranged in a five-year sequence if desired. Also, the courses can be arranged to accommodate transfer from other curricula. Two years of physical education are normally required of all students.

1. Mathematics 11, 12, 121, and 124 or their equivalent is required.
2. German through the intermediate level (11-12) is required. Russian or French is advised as a second language for students proficient in German.
3. To be certified as a chemist, a student must complete 24 hours of courses in the humanities and social sciences in addition to the English and foreign language requirements.
4. Courses in biochemistry are acceptable as advanced chemistry electives.
5. An audit of Chemistry 381 (Graduate Seminar) is a prerequisite for 184 (Senior Seminar).
6. May be taken only with permission of the department.
7. Advanced courses in physics and mathematics are highly recommended.

All junior engineering students visit Northeastern industrial centers during spring vacation. This plant inspection trip is required for graduation. The expense for the trip of several days is borne by the student.

Students enrolled in the civil, electrical, and mechanical engineering curricula may 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, as each organization has authorized a student chapter at the University of Vermont. 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. These student organizations' meetings present opportunities for students to conduct activities similar to those of the national societies. These include: technical papers presented by students and engineers actively engaged in their profession; attendance at conventions; and inspection trips. These provide helpful contacts with engineering practice and assist in the development of leadership qualities essential to success in the engineering profession.

The curricula in civil, electrical and mechanical engineering are accredited by the Engineers' Council for Professional Development.

HUMANISTIC-SOCIAL STUDIES FOR ENGINEERING STUDENTS The objective of the program in humanities and social studies is to broaden the engineering student's understanding of man and the relationships in human society. Each student should plan, in consultation with his adviser in the second semester of his freshman year, an integrated sequence of courses to meet this objective.

A minimum of twenty-four credit hours is required in humanistic-social studies. To meet this requirement each student must satisfy the following distribution:

Required of all students	Minimum credit hours
1. English, 1-2 (must be taken the Freshman year)	6
2. Courses from at least two areas listed below	12
3. Courses from one additional area listed below	6
Minimum total	24

Elective Areas

Geography	Intermediate Classical Languages
History	Intermediate Romance Languages
Philosophy	Intermediate German
Religion	Intermediate Russian
Political Science	Advanced Literature courses
Psychology	Art (history courses only) ¹
Sociology	Music (history and Survey courses only) ¹
World Problems	Economics (history and theory courses only)
	Speech (history and literature courses only) ²

1. E. E. Department permits unlimited choice.

2. E. E. Department permits unlimited choice except for speech pathology courses.

The Freshman Year for All Curricula

	1st SEMESTER	2nd SEMESTER
Mathematics, 13 ¹ , 14	4	4
Chemistry, 1-2 ²	4	4
Engineering Graphics, M.E. 1, 2 ³	2	2
English, 1-2	3	3
General Physics, 17, 18	3	3
	16	16

Civil Engineering

The Sophomore Year	1st SEMESTER	2nd SEMESTER
Engineering Mathematics, 123	4	..
Applied Math. for Engineers and Scientists, Math. 201	..	3
Computer Programming, Math. 31	..	2
General Physics, 27	4	..
Introductory Modern Physics, 28	..	4
Statics, C.E. 24	3	..
Dynamics, C.E. 130	..	3
Surveying, C.E. 51	4	..
Geometronics, C.E. 52	..	3
Humanistic-Social Studies ⁴	3	3
	18	18

The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	1st SEMESTER	2nd SEMESTER
Mech. of Materials, C.E. 131	3	..	Reinforced Concrete, C.E. 155	3	..
Engineering Geology, Geol. 21	3	..	Sanitary Engineering I, C.E. 165	3	..
Electrical Engineering, Principles, 101	4	..	Soil Mechanics, C.E. 173	4	..
Transportation Engineering, C.E. 174	3	..	Structural Analysis II, C.E. 175	3	..
Thermodynamics and Heat Transfer, M.E. 113	..	3	Humanistic-Social Studies ⁴	3	3
Humanistic-Social Studies ⁴	3	3	Substructure Design, C.E. 158	..	4
Mech. of Materials Lab., C.E. 114	..	1	Sanitary Engineering II, C.E. 166	..	3
Engineering Contracts, C.E. 151	..	2	Adv. Structural Design, C.E. 176	..	4
Hydraulics, C.E. 162	..	4	Professional Elective ⁵	..	3
Structural Analysis I, C.E. 140	..	4		16	17
	16	17			

A minimum of 134 approved semester hours is required for the degree in this curriculum, plus required courses in physical education.

1. See footnote under course offerings of the Department of Mathematics.
2. Life Science course may be elected by E.E.'s with departmental approval.
3. E.E.'s take Engineering Analysis I, E.E. 2, instead of M.E. 2.
4. See distribution of Humanistic-Social Studies (Economics 11, 12 is recommended for C.E. students).
5. A course chosen from engineering, science, mathematics, or economics with the approval of the Civil Engineering Faculty.

Electrical Engineering

		1st	2nd
		SEMESTER	SEMESTER
The Sophomore Year			
Humanistic-Social Studies		3	3
Mathematics, 123		4	..
Elem. Probability, Math. 191		..	3
Physics, 27, 28		4	4
Laboratory, 81, 82		1	2
Engineering Analysis II, E.E. 3		3	..
Engineering Analysis III, E.E. 4		..	3
Programming and Elementary Numerical Methods, Mathematics 31		..	2
Engineering Computation, E.E. 32		2	..
		—	—
		17	17
		1st	2nd
		SEMESTER	SEMESTER
The Junior Year			
Humanistic-Social Studies	3	3	
Electromagnetic Field Theory, E.E. 143, 144	3	3	
Thermodynamics, M.E. 115	3	..	
Electronics I, E.E. 121	3	..	
Laboratory, 183, 184	2	2	
Signals and Systems, E.E. 171	3	..	
Electromagnetic Properties of Materials, E.E. 162	..	3	
Control Systems, E.E. 111	..	3	
Electronics II, E.E. 122	..	3	
	—	—	
	17	17	
The Senior Year			
Humanistic-Social Studies		3	3
Approved Mathematics Elective		3	..
Solid State Physical Electronics, E.E. 163		3	..
Laboratory, 185		2	..
Energy Conversion I, E.E. 113		3	..
Electronics III, E.E. 123		3	..
Information Transmission Systems, E.E. 174		..	3
Laboratory, E.E. 186		..	1
Laboratory, E.E. 188		..	1
Energy Conversion II, E.E. 114		..	3
Wave and Diffusion Analogies, E.E. 146		..	3
Elective		..	3
		—	—
		17	17

A minimum of 134 approved semester hours is required for the degree in this curriculum, plus required courses in physical education.

Mechanical Engineering

		1st	2nd
		SEMESTER	SEMESTER
The Sophomore Year			
Engineering Math. III, Math. 123		4	..
General Physics III, Physics 27		4	..
Manufacturing Processes, M.E. 53		3	or 3
Sophomore Literature, English 27 or 28 ¹		3	or 3
Statics, C.E. 24		3	..
Creative Design, M.E. 73		3	..
Programming and Numerical Methods, Math. 31		..	2
Introduction to Modern Physics, Physics 28		..	4
Kinematics and Dynamics, M.E. 133		..	3
Thermodynamics I, M.E. 92		..	2
Mechanical Instrumentation, M.E. 84		..	1
		—	—
		17	15

THE COLLEGE OF TECHNOLOGY

		1st SEMESTER	2nd SEMESTER			1st SEMESTER	2nd SEMESTER
The Junior Year				The Senior Year			
Mech. of Materials, C.E. 131		3	..	Industrial Materials I, M.E. 271		3	..
Thermodynamics II, M.E. 111		4	..	Advanced Fluid Mechanics, M.E. 243		4	..
Applied Math. for Engrs. and Scientists, Math 201		3	..	Systems Control, M.E. 137		2	..
Mech. Engineering Laboratory, M.E. 117		1	..	M.E. Elective ²		3	4
Electrical Engineering Principles, E.E. 101, 102		4	4	M.E. Elective ²		3	..
Heat Transfer, M.E. 266		..	3	Thesis, M.E. 192, or M.E. Elective ²		..	3
Fluid Mechanics, M.E. 142		..	3	Engineering Design Analysis and Synthesis, M.E. 294		..	4
Engineering Design I, M.E. 135		..	4	Humanistic-Social Studies ¹		3	6
Humanistic-Social Studies ¹		3	3			—	—
		—	—			18	17
		18	17				

1. See distribution of Humanistic-Social Studies on page 91. Econ. 11, 12 is required.
2. Any 200 level course with approval of the Mechanical Engineering Department.

A minimum of 134 approved semester hours is required for the degree in this curriculum, plus required courses in physical education.

Management Engineering

		1st SEMESTER	2nd SEMESTER
The Sophomore Year			
Engineering Math III, Math. 123		4	..
General Physics III, Physics 27		4	..
Creative Design, M.E. 73		3	..
Statics, C.E. 24		3	..
Manufacturing Processes, M.E. 53		3	or 3
Soph. Literature, English 27 or 28 ¹		3	or 3
Programming and Numerical Methods, Math 31		..	2
Intro. to Modern Physics, Physics 28		..	4
Kinematics and Dynamics, M.E. 133		..	3
General Psychology, Psych 1 ¹		..	3
Thermo. and Heat Transfer, M.E. 113		..	3
		—	—
		17	18
Junior Year			
Applied Math for Engrs. and Sc., Math 201		3	..
Principles of Economics, Econ. 11, 12 ¹		3	3
Principles of Accounting, Econ. 13-14		4	4
Electrical Engineering Principles, E.E. 101, 102		4	4
Statistical Methodology, Math 192		3	..
Elementary Statistics, Econ. 188		..	3
Fluid Mechanics, M.E. 142		..	3
		—	—
		17	17

1. See distribution of Humanistic-Social Studies on page 91. Econ. 11, 12 is required.

Senior Year	1st SEMESTER	2nd SEMESTER
Mechanics of Materials, C.E. 131	3	..
Methods Engineering, M.E. 175	3	..
Industrial Materials, M.E. 271	3	..
Personnel Admin., Econ. 251	3	..
Business Law, Econ. 109, 110	3	3
Plant Organization, M.E. 176	..	4
Engineering Design I, M.E. 135	..	4
Humanistic-Social Studies ¹	..	6
	15	17

1. See distribution of Humanistic-Social Studies on page 91. Econ. 11, 12 is required.

A minimum of 133 approved semester hours is required for the degree in this curriculum, plus required courses in physical education.

The Mathematics Curriculum

This curriculum is designed to provide sound basic training in mathematics, to prepare the student for a position in an area in which mathematicians are sought, and to qualify him for advanced study in graduate school. Students in the College of Arts and Sciences may also concentrate in mathematics and will receive the Bachelor of Arts degree. An adviser from the department will assist students in the determination of a program best suited to their individual needs and plans.

The Freshman Year	1st SEMESTER	2nd SEMESTER	The Sophomore Year	1st SEMESTER	2nd SEMESTER
English, 1-2	3	3	Sophomore Literature	3	3
Mathematics ² , 11, 12	5	5	Mathematics, 121, 124	3	3
Laboratory Science	4	4	Mathematics, 102	..	3
Approved Elective	3	3	General Physics, 17, 18	3	3
	—	—	Approved Electives	6	3
	15	15		—	—
				15	15
The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	1st SEMESTER	2nd SEMESTER
Mathematics Electives ³	6	6	Mathematics Electives ³	9	9
Physics 27	4	..	Advanced Science ⁴	3	3
Approved Electives	7	12	Approved Electives	3	3
	—	—		—	—
	17	18		15	15

1. See distribution of Humanistic-Social Studies on page 91.

2. See footnote under course offerings of the Department of Mathematics.

3. Beyond mathematics 102.

4. Physical science or engineering courses beyond the sophomore level, to constitute a minor specialization.

A minimum of 125 approved semester hours is required for the degree in this curriculum, plus required courses in physical education.

The Physics Curriculum

The Department of Physics offers a pre-professional curriculum leading to the degree of Bachelor of Science in Physics. This program is designed to give a strong background for future professional education in industry or graduate school. Students in the College of Arts and Sciences may also concentrate in physics and receive a Bachelor of Arts degree.

		1st SEMESTER	2nd SEMESTER			1st SEMESTER	2nd SEMESTER
The Freshman Year				The Sophomore Year			
English 1-2		3	3	Liberal Arts Elective		3	3
Mathematics ^{1,2} 11, 12 or 13, 14		4-5	4-5	Mathematics 121, 124 or 123, 124		3-4	3
Chemistry ^{2,3} 11-12		5	5	German, French or Russian ⁴		4	4
Physics 17, 18		3	3	Physics 27, 28		4	4
		—	—	Elective ⁵		3-4	3-4
		15	15			17	17
		or 16 or 16				to 19 to 18	
		1st SEMESTER	2nd SEMESTER			1st SEMESTER	2nd SEMESTER
The Junior Year				The Senior Year			
German, French or Russian ⁴		3	3	Physics 271, 272		3	3
Physics 117, 118		3	3	Physics 197, 198 or 201, 202		2-3	3-4
Physics 116, 173		3	3	Scientific Elective		3-4	3-4
Physics 101, 102		3	3	Mathematics Elective ⁶		3	3
Mathematics Elective ⁶		3	3	Elective ⁵		3-4	3-4
Elective ⁵		3	3			14	15
		—	—			to 17 to 18	
		18	18				

1. See footnote under course offerings of Department of Mathematics.
2. Chemistry 1-2 is acceptable for a student of limited background. A student wishing to continue a foreign language in the freshman year at the intermediate level may postpone chemistry until the sophomore year.
3. A student electing both mathematics 13, 14 and chemistry 1-2 would only be carrying 14 credits during each semester of the freshman year. Such a student might well consider an elective course in either or both semesters.
4. See footnote 2. In the junior year an elective may be taken if a language through the intermediate level has been passed in the freshman or sophomore years.
5. This elective may be either in a natural science, mathematics or in the arts, humanities or social sciences. The Department recommends at least a year in the latter category. A student emphasizing biology might include physics 122 or 222.
6. In general an undergraduate major should plan to take mathematics every semester. Various courses are possible depending on the interests of the student and the offerings of the Department of Mathematics. In some cases other courses might be substituted with the permission of the Department of Physics and of the Dean of the College of Technology.

A minimum of 129 semester hours is required for the degree in this curriculum, plus required courses in physical education.

The Technical Information Center

The Technical Information Center was authorized in February, 1967, by the Board of Trustees and began operations on October 2nd. It is the outgrowth of the University's expanding role of service to the people of the State of Vermont. The offices of the Center are located in the Votey Engineering Building on the University campus.

The Center provides Technical Library services to the industries of the State of Vermont. These services include searching for material on any technical subject, referring incoming technical literature to those desiring it in industry, and publishing periodic lists of new technology. The Library services utilize the resources of many federal information clearinghouses as well as the University's library and its inter-library loan capability.

The Center also provides Educational Extension programs as a means of training industrial personnel in modern or new technology. These programs are given as either conferences, seminars, short courses, or workshops. The subject areas include: Management for Engineers; Environmental Pollution; Mechanical Engineering as Related to Machine Design; New Technological Thrusts in Management; Manufacturing Methods, Materials and Processes; PERT/CPM Study Workshops and Dry Kiln Operations. Other subject areas will be covered as the need arises. The Educational Extension service utilizes experts from industry, universities, and colleges.

The Technical Information Center is supported in part by state and federal funds under the authority of the State Technical Services Act of 1965. The Act is administered in this state by the Vermont Office of Technical Services, Vermont Development Department, and nationally by the Office of State Technical Services, U.S. Department of Commerce, Washington, D.C. It is anticipated that industry will make contributions to the work of the Center.

The services of the Center are available as follows: The Technical Library Services are available to individual companies. A charge is made for any copies of technical material supplied to the company. The Educational Extension programs are available only to a group of companies or a segment of Vermont industry. All educational programs administered by the Center are partly supported by registration fees.

V The Division of Health Sciences

The Division of Health Sciences, authorized by the Board of Trustees, became effective July 1, 1968, bringing together several related programs in this important field. It includes the College of Medicine, the School of Allied Health Sciences, and the School of Nursing.

The School of Allied Health Sciences

The Program in Dental Hygiene

A School of Dental Hygiene was established in the fall of 1949 on authorization and a grant of money by the State Legislature, and became a Department in the School of Allied Health Sciences in 1968. Its purpose is to meet the increasing need for dental health services.

The Department offers a two-year curriculum leading to an Associate in Health Science degree and a Certificate in Dental Hygiene. A program offering a Bachelor of Science is being studied.

The program is accredited by the Council on Dental Education of the American Dental Association. Graduates are eligible to write the National Board Examination in Dental Hygiene and meet requirements for licensure determined by individual states.

The duties of a graduate dental hygienist are educational and preventive in nature and may be carried out in private dental practice, public institutions, hospitals and industrial clinics, and public health programs. Dental hygienists practice under the supervision of a dentist. The primary concentration of her skills is in oral health education, oral prophylaxis and inspection. However, she is qualified to perform procedures for the prevention of dental caries, expose and process dental radiographs, and assist in other phases of dental practice. The dental hygienist is a vital member of the health science professions, and her opportunities are practically unlimited.

Requirements for admission to study in the Dental Hygiene Program are identical with general University requirements, with the additional requirement that applicants write the Dental Hygiene Aptitude Test. Information and application forms for this test are available from the American Dental Hygienists' Association, 304 East 45th Street, New York, N.Y. 10017.

As this program of study is scientifically oriented, high school courses in algebra, chemistry, biology and physics are important prerequisites. Personal attributes essential to success in this program include good health, emotional stability, task orientation, high moral standards and an ability to relate well with society.

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. Clinic experience is obtained in the department's fourteen chair dental 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.

Students applying for this program should be interested in and have aptitude for scientific studies.

	1st SEMESTER	2nd SEMESTER		1st SEMESTER	2nd SEMESTER
The Freshman Year			The Sophomore Year		
Freshman English, Eng. 1-2	3	3	Introductory Microbiology, Bot. 55	4	..
Oral Anatomy 11 and Physiology	4	..	The Cultures of Man, Soc. and Anthropol, 21	3	..
Oral Histology and Embryology, 22	..	3	Oral Pathology, 53-54	2	2
Dental Hygiene 1	2	..	Radiology, 61-62	1	1
Dental Hygiene 2	..	3	Public Health, 74	..	2
Medical Emergencies, 31	1	..	Clinical Dental Hygiene, 81-82	5	5
General Psychology, Psych. 1	..	3	Dental Health Education, 72	..	2
Physical Education	1	1	Pharmacology and Anesthesiology, 51-52	1	1
Integrated Science	5	5	Assisting, Materials, Ethics and Office Management, 91-92	1	1
			Public Speaking, Speech 11	..	3
			Home Economics, F & N 87	3	..
			Periodontics, 55	1	..

The Curriculum in Medical Technology

The four-year curriculum, leading to the degree, Bachelor of Science in Medical Technology, is designed to provide the student with a background in the fundamentals essential for professional work in the field of medical technology. The curriculum is designed to meet the minimum standards set by the Council on Medical Education of the American Medical Association.

The student will begin his specific professional training during the junior year by taking specified subjects. This training will continue through the eight-week summer session. The senior year will concentrate on developing the professional medical technologist with didactic courses in the Division of Health Sciences and practical laboratory experience in the Medical Center Hospital of Vermont, Vermont State Health Department, and the Red Cross Blood Center.

After graduation the student may be eligible to take the examination for certification as a Medical Technologist, ASCP, on recommendation by the Director to the Registry of Medical Technologists of the American Society of Clinical Pathologists.

	1st SEMESTER	2nd SEMESTER		1st SEMESTER	2nd SEMESTER
The Freshman Year			The Sophomore Year		
Freshman English, English 1-2	3	3	Sophomore Literature English 27, 28	3	3
Introductory Chemistry, Chemistry 1-2	4	4	Quantitative Analysis Chemistry 123	4	..
*Mathematics, Algebra and Trigonometry	3	3	**Introduction to Organic Chemistry Chem. 16	..	4
Biology, Biol. 1-2	4	4	Elementary Physics Physics 5, 6	4	4
Orientation to Health Sciences, 1	1	..	Approved electives	5	5
Approved electives	..	3		16	16
	15	17			

The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	8 wk. Sum. Ses.	1st SEMESTER	2nd SEMESTER
Introductory Microbiology			Medical Technology			
Agr. Biochem. 55	4	..	101,102	8	4	..
***Physiology, Zool. 52	..	4	Medical Technology			
Biochemistry for Medical Technologists, 111-112	4	4	103	..	..	2
Approved electives	8	8	Medical Technology	..	6	..
	—	—	120	..		
	16	16	Medical Technology			
			110	..	4	8
			Practicum, 140	..	4	8
			Approved electives	..	3-4	3-4
				—	—	—
				8	17-18	15-16

Notes: Total credit hours required for graduation: 128 (excluding Physical Education).

*Math: One semester of Calculus may be substituted.

**Chemistry 131, 132 may be substituted for Chemistry 16.

***Zoology 41, 42 may be substituted for Zoology 52.

Medical Technology 201 recommended for students anticipating Graduate School.

The Program for Medical Laboratory Technicians

The two-year curriculum, leading to an Associate degree, offers a background of general education to enable the student to be an effective member of society, generally informed and socially sensitive, in addition to specialized courses to develop occupational skills. Although the majority of credits earned during the freshman year are through general courses offered in the University, the specialized courses during the second year are designed as terminal courses. After completion of the two-year program, the exceptional student may apply for transfer to the four-year baccalaureate program and consideration of transfer of credits will be granted on an individual basis.

The curriculum includes two semesters in the first year, an eight-week Summer Session, and two semesters the second year. Graduates of this program should be eligible for examination and certification by the Board of Registry of the American Society of Clinical Pathologists.

Clinical experience in laboratory techniques is acquired in the facilities of the Medical Center Hospital of Vermont, the Vermont State Health Department, and selected approved health facilities throughout the State. A tentative curriculum follows:

The Freshman Year	1st SEMESTER	2nd SEMESTER	The Sophomore Year	8 wk. Sum. Ses.	1st SEMESTER	2nd SEMESTER
Medical Technology 1-2	1	1	Medical Technology 20	8		
English 1-2	3	3	Botany 55		4	..
Psychology	3	..	Math 7		3	..
Sociology-History	..	3	Elective		3	..
Political Science			Medical Technology 3		1	..
Integrated Science	5	5	Practicum 140		4	8
*Freshman Laboratory Science	3	3		—	—	—
	—	—		8	15	8
	15	15				

*Taken concurrently with integrated science course.

A minimum of 60 approved semester hours is required for the Associate Degree in this curriculum, plus 1 year of required courses in physical education.

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 in Nursing. The Technical Nursing program is two years in length. Upon its completion the Associate in Science in Nursing is awarded. Direct transfers from one program to the other are not possible.

Professional Nursing Program

The Department of Professional Nursing offers a curriculum leading to the Bachelor of Science in Nursing. 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 for licensure as registered nurses, and may advance without formal education to positions which require beginning administrative skills.

The program objectives are designed to encourage the student in nursing to achieve progressively higher levels in the development of knowledge, skills, and understandings necessary to assist in meeting the physical, emotional, spiritual, and social needs of people; in the development of skill in establishing effective relationships by the understanding of behavior and its effect on interpersonal relations; in the development of an understanding of the responsibilities inherent in the professional practice of nursing and the profession's role in meeting the health needs of a changing society; and in the development of an appreciation of the thought and achievement of man as a basis for enrichment of personal life.

The curriculum, conducted in four academic years, provides an approximate balance in general and professional education. Courses in the humanities and sciences—biological, physical and social—serve as a foundation for the professional nursing courses which are begun in the second year with concentration in the third and fourth years. Faculty guided experience in the care of patients and families is secured through the facilities of the Medical Center Hospital of Vermont, the Burlington Visiting Nurse Association, Inc., the Vermont State Hospital, Waterbury, and other selected community resources.

The program is approved by the Vermont Board of Nursing and is fully accredited by the National League for Nursing, Inc. Applicants must satisfy the general admission requirements for the University. High School courses in biology, chemistry, and physics are highly recommended.

A minimum of 123 approved semester hours is required for the Bachelor of Science degree plus required courses in physical education.

The faculty reserves the privilege of altering the curriculum in accord with the outcome of its current study and in the best interests of the School and of the student.

A typical program of studies follows:

		1st	2nd			1st	2nd
		SEMESTER				SEMESTER	
The Freshman Year				The Sophomore Year			
Freshman English, Eng. 1-2		3	3	Sophomore Literature, Eng. 27, 28		3	3
Mammalian Anatomy and Physiology, Zool. 5-6		3	3	Introductory Microbiology, Bot. 55		4	..
Outline of Chemistry, Chem. 3-4		4	4	Home Economics, F & N 41		3	..
Public Speaking or Oral Interpretation of Literature, Speech 11 or 31		3	..	General Psychology, Psych. 1		..	3
The Cultures of Man, Soc. 21 or Principles of Sociology, Soc. 22		..	3	Nursing 21-22		6	6
Elective		3	3	Elective		..	3
		1st	2nd			1st	2nd
		SEMESTER				SEMESTER	
The Junior Year ¹				The Senior Year ¹			
Nursing 121, 122		9	9	Nursing 156		6	..
Human Development and Personality, Home Ec. 63		3	..	Nursing 176		6	..
Electives		3	6	Nursing 165		..	3
				Nursing 167		..	3
				Nursing 186		..	3
				Electives		3	6

1. The semesters may be reversed dependent on the student's program.

In addition to the general education courses found in the curriculum outlined above, specific courses in general education are required and additional courses are elected in accordance with individual need and interest and in consultation with the faculty adviser. These are:

Philosophy	3	History, Political Science,	
Fine Arts	3	Economics or Geography	6
		Electives	12

Students are encouraged to pursue the study of a foreign language if able to enter the intermediate level of instruction. Students desiring to learn a new foreign language will need to plan on summer sessions.

Technical Nursing Program

The two-year program in nursing is designed to prepare qualified individuals for technical nursing practice and to promote the development of the individual as a responsible member of society. The graduates of this program receive the degree of Associate in Science in Nursing, are eligible to apply for licensure as registered nurses, and are prepared to give direct nursing care to patients of all age groups, in partnership with the professional nurse in hospitals, clinics, nursing homes, and other health agencies.

The curriculum is two academic years and one six-week summer session in length. General education courses account for approximately one-half of the total required credits, and nursing courses for the remaining one-half. General education content includes courses in the humanities, behavioral and social sciences, and the biological and physical sciences. Nursing courses are taught concurrently with general education courses throughout the two years and include classroom instruction and guided experiences in giving nursing care to patients in the Medical Center Hospital of Vermont and other health agencies.

The Program is designed to meet the minimum standards for approval by the Vermont State Board of Nursing and for accreditation by the National League for Nursing. (A school of nursing is not eligible for National League for Nursing accreditation until the graduation of its first class.)

The tentative program of studies follows:

	1st	2nd		1st	2nd
	SEMESTER	SEMESTER		SEMESTER	SEMESTER
The Freshman Year			The Sophomore Year		
Freshman English, Eng. 1-2	3	3	Nursing 27-28	9	10
Integrated Science	5	5	Nursing Trends, Nurs. 30	..	2
Social Psychology	3	3	Electives	6	3
Introduction to Health Sciences	1	1			
Fundamentals of Nursing, Nurs. 11-12	4	4			
Physical Education	1	1			
Summer Session—6 weeks					
Nursing 14	4	credits			

A minimum of 64 approved semester hours, plus credit in required physical education courses, is required for the degree.

Admission of Registered Nurses

The School of Nursing will consider for admission to the baccalaureate program qualified registered nurses currently licensed to practice. Admission to the program is essentially the same as for other applicants to the University. In accord with University policy, the registered nurse student may apply for credit by examination in selected nursing and non-nursing courses.

Registered nurses planning to seek admission 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 other institutions.

General Information

Grades in nursing courses are based on achievement in theory and in laboratory practice. 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.

Financial aid is available in the form of scholarships, loans, prizes and employment (see page 54). Of special interest to students in nursing is the Nursing Student Loan Program. Anyone interested should make application for financial aid by February 1.

In addition to funds handled through the University, students in the baccalaureate program may apply for appointments in the Army Student Nurse Program or the Navy Nurse Corps Candidate Program at the beginning of their junior year. The appointments carry generous financial allowances. A student who participates twelve months or less serves on active duty in the respective service for twenty-four months. If two years of financial support have been received, thirty-six months of service are required.

Continuing Education

Continuing education is arranged to meet the demands of both employed and unemployed professional nurses. Special classes, seminars, institutes, and workshops are scheduled throughout the year, on the campus and in accessible communities of the state. These activities are designed to aid the nurse to keep abreast of new knowledge and to develop greater skill in nursing care. For more information, contact Continuing Education, School of Nursing, 538 Waterman, University of Vermont, Burlington, Vermont 05401.

PROFESSIONAL PERSONNEL IN COOPERATING AGENCIES

Robert B. Aiken, M.D., Commissioner of Health, Vermont State Department of Health

George Brooks, M.D., Acting Superintendent, Vermont State Hospital

Grace Buttolph, R.N., Director, Mary Fletcher Hospital School of Nursing, Medical Center Hospital of Vermont, Mary Fletcher Unit

Sister Duchesneau, R.H.S.J., R.N., Director, Jeanne Mance School of Nursing, Medical Center Hospital of Vermont, DeGoesbriand Unit

Mrs. Vera Hanks, R.N., Chief, Patient Care Services, Vermont State Hospital

Rosalie Lombard, R.N., Associate Director, Department of Nursing, Medical Center Hospital of Vermont, DeGoesbriand Unit

Elizabeth Mickle, R.N., Director of Rehabilitation Nursing, Vermont Rehabilitation Center

Sally Sample, R.N., Director of Nursing, Medical Center Hospital of Vermont, Mary Fletcher Unit

Mrs. Lisbeth Stouch, R.N., Executive Director, Burlington Visiting Nurse Association, Inc.

The College of Medicine

Requirements for Admission

The College of Medicine requires that an applicant complete the requirements for admission in an institution listed among the "Accredited Institutions of Higher Education," compiled and published by the National Committee of Regional Accrediting Agencies of the United States. The College of Medicine requires one year each of biology; English; physics, including laboratory; general chemistry; organic chemistry; a satisfactory one-semester course in quantitative chemistry or physical chemistry; and one year of fundamental mathematical principles at the college level.

The College strongly recommends that the applicant, while in college, study in depth one or more fields of interest to him.

Students must complete satisfactorily all requirements for admission to the College of Medicine by July 1 preceding the September admission. Ordinarily courses taken in other than a liberal arts college will not meet our admission requirements.

Eligibility of an applicant for admission to the College of Medicine is determined by the Admissions Committee of the College of Medicine on the basis of the following:

1. The scholastic record of the applicant in his premedical work.
2. Personality and general fitness of the applicant for the study and practice of medicine as determined by recommendations of the applicant's college teachers and others, and by personal interview with the Admissions Committee.
3. The applicant's scores on the Medical College Admissions Test. Such scores are taken into consideration but are not used as the final determinant in accepting students. Applicants are urged to take the Medical College Admission Test in May if a majority (all but one or two) of the required courses have been or will be completed by the end of that academic year.
4. Candidates invited for an interview are required to submit a health report completed by their college or university health service and not by their personal physician.

A maximum of seventy-five students is admitted to the entering class. Preference for admission is according to the following priorities:

1. Qualified residents of Vermont.
2. Qualified residents of other New England states having contractual arrangements with the College of Medicine through the New England Board of Higher Education. Contracts are presently in force with the states of Maine, New Hampshire, Massachusetts and Rhode Island.
3. Qualified residents of other areas.

Sons and daughters of the alumni of the College of Medicine of the University of Vermont are given special consideration within the framework of the above policy.

Candidates are urged to submit their applications by October 15. The final closure date for receiving applications is January 1 preceding the September admission.

An application fee of ten dollars, payable to The University of Vermont, must accompany all applications and is not refundable.

When an applicant who is not a Vermont resident is offered admission to the College of Medicine and wishes to accept the place offered, a deposit of \$100 must be paid not later than two weeks following notice of acceptance in order to reserve a place in the entering class. This deposit is refundable up to March 1, should the student release his place in the class. The deposit is applied toward the student's tuition in the first semester upon matriculation in the College of Medicine. Checks should be made payable to the University of Vermont and should be sent to the Admissions Office, College of Medicine, University of Vermont, Burlington, Vermont 05401.

THE CURRICULUM

The curriculum consists of three parts: the basic science core, the clinical core, and the major program.

Basic Science Core

The forty-eight weeks of instruction in the basic science core spans the freshman year and fall semester of the sophomore year. During this period students are instructed in the basic sciences that undergird clinical medicine. Emphasis is placed on that body of knowledge common to all types of medical practice, avoiding the minute details relevant only to individual specialties. Comprehensive clinics, seminars in Behavioral Science and the elective faculty tutorial program provide for the first-year medical student clinical contacts, an awareness of social, cultural and psychologic factors affecting health and illness, and insight into the major issues influencing the practice of medicine.

Clinical Science Core

The clinical core extends from January of the sophomore year until December of the junior year. During this twelve-month period each student receives twelve weeks of instruction in medicine, twelve weeks of instruction in surgery, eight weeks in pediatrics, eight weeks in obstetrics and gynecology, and eight weeks in psychiatry. There will be a brief summer vacation. During this year students will work within the hospitals and clinics and instructions will be based on the care of patients.

Major Program

The major program will extend from January of the junior year of medical school until graduation in May of the following year. During this period each student will pursue a course of study which is tailored to his individual interests and objectives. For example, students interested in family practice will pursue one course of study while students interested in surgery or a surgical specialty will pursue another. The senior major program will commence with a return to the basic sciences which are related to the student's area of interest. This return will constitute both a review and an extension of the material covered in the basic science core. Following this basic science study, students will take blocks of clinical work related to their interests. The basic science work will consist of approximately one-quarter and the clinical work approximately three-quarters of the major program.

The major program is not designed to supplant or duplicate any portion of residency training but is designed rather to prepare students more adequately for subsequent training for family practice, a medical specialty, or teaching and research. In this last regard the faculty is considering the option of allowing students to spend the entire period of time in a basic science department. The final details for the major program are currently under active development.

Further details are given in the Medical College bulletin.

Teaching Facilities

All departments of the College of Medicine are housed in a new building which was completed in 1968. Clinical facilities for teaching are in the Medical Center Hospital of Vermont, an institution with approximately 750 beds.

STATE SCHOLARSHIPS

The scholarships available to students in the College of Medicine are listed on pages 275 and 276, and information on loan programs may be obtained from the Director of Financial Aid.

Vermont residents in real need of financial assistance may receive up to \$800 in state scholarships and loans. Loan funds are also available. Contact the Assistant Dean's Office of the College of Medicine for further information.

V The Graduate College

The purpose 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. At present the College offers sixty different programs leading to the master's degree and ten programs leading to the degree of Doctor of Philosophy. Each student is expected to be familiar with the general regulations and procedures of the Graduate College, and with the specific degree requirements in his chosen field of study. *For more detailed information refer to the Graduate College Bulletin available from the Graduate College Office.*

Attention is also drawn to the special fifth-year program offered by the College of Education leading to a certificate of advanced study in Education.

Master of Education

The master of education degree is intended to give those who work in education the kind of background and professional preparation needed for leadership in teaching and functions related to it. Programs are planned on an individual basis with special attention to such fields as:

Reading—Elementary and Secondary
Guidance—Public School
Personnel Work in Higher Education
Administration and Supervision
Special Education
Elementary and Secondary Education

Master of Arts in Teaching

This degree is appropriate for teachers who are interested primarily in increasing their knowledge of their subject matter field and thereby the effectiveness of their classroom instruction. Programs are offered in the following fields:

Agriculture
Botany
Chemistry
English
French
Geography

Geology
German
Greek
History
Home Economics

Latin
Mathematics
Music
Physics
Spanish
Zoology

Master of Extension Education

This degree is designed to meet the needs of county agricultural agents, home demonstration agents, 4-H Club agents, extension specialists, professional co-operative and agricultural business leaders.

Master of Science

Programs are offered in the following fields:

Agricultural Biochemistry	Civil Engineering	Microbiology
Agricultural Economics	Electrical Biophysics	Pathology
Anatomy	Electrical Engineering	Pharmacology
Animal and Dairy Science	Forestry	Physics
Animal Pathology	Geology	Physiology and Biophysics
Biochemistry	Home Economics	Plant and Soil Science
Biomedical Engineering	Mechanical Engineering	Poultry Science
Botany	Medical Microbiology	Speech Pathology
Chemistry	Medical Technology	Zoology

Master of Arts

Programs are offered in the following fields:

Economics	Greek	Music
English	History	Philosophy
French	Latin	Political Science
Geography	Mathematics	Psychology
German		Spanish

Master of Business Administration

Study leading to the degree of Master of Business Administration is designed to provide opportunity for the individual to develop knowledge and understanding in a wide range of business activities that will provide foundation for growth and success in a business career. Programs are planned on an individual basis.

Doctor of Philosophy

Doctoral programs are offered for qualified students in the fields of:

Biochemistry	Microbiology	Psychology
Botany	Pharmacology	Zoology
Chemistry	Physics	
Electrical Engineering	Physiology and Biophysics	

Admission

To be eligible for admission a student should hold a baccalaureate degree, prior to the date of first enrollment, or have completed work equivalent to that required for a baccalaureate. His undergraduate records should indicate that he is capable of successful study at the graduate level. Graduates of unaccredited institutions must support their applications with satisfactory aptitude and advanced scores on the Graduate Record Examinations. Foreign students, see special instruction on page 110.

Admission is limited to students who intend to become candidates for advanced degrees, other than Doctor of Medicine, and students whose enrollment will consist of courses to be taken for graduate credit. Students who hold bachelors' degrees but whose entire enrollment will be in undergraduate courses should seek admission as non-matriculated students in the appropriate undergraduate college.

Only applicants who desire to work along lines in which the University offers graduate programs will be admitted to the Graduate College. Students in the Graduate College therefore fall into three categories: (1) duly admitted students accepted to candidacy, (2) degree candidates at other institutions who study at

the University of Vermont for transfer of credit, (3) duly admitted students not yet accepted to candidacy.

Students seeking admission to the Graduate College must make application on an official form which can be obtained from the Office of the Graduate College. All applications must be supported by official transcripts from each college or university attended and by three letters of recommendation from persons qualified to assess the applicant's capacity for graduate work. For submission of necessary test scores, see Aptitude and Achievement Tests.

The deadline for applications for admission in the fall semester is May 15. It is not always possible to admit additional students at midyear in all departments. Such applications should be initiated well in advance of the date study is to begin. Students who wish to be considered for fellowships as well as admission should complete the appropriate section on the application form. Such applications, with supporting materials, must be filed by March 1 of the academic year preceding that for which the application is made.

Admission to the Graduate College does not mean that a student is automatically accepted as a candidate for an advanced degree.

FOREIGN STUDENTS Applications from students who are citizens of the United Kingdom, Australia, New Zealand and Canada will be accepted directly. Foreign students currently studying in the United States may apply directly but must submit evidence of proficiency in English.

Foreign students should apply through the following international agencies:

Africa	The African-American Institute 866 United Nations Plaza New York, New York 10017
Middle East	American Friends of the Middle East, Inc. Middle East House 1607 New Hampshire Avenue, N.W. Washington, D. C. 20009
Korea	The American-Korean Foundation, Inc. 345 East 46 Street New York, New York 10017
Europe, South America, and South East Asia	Institute of International Education 809 United Nations Plaza New York, New York 10017

Foreign applicants must be highly qualified, and present evidence of independent financial support for their first year (approximately \$3,500 U.S.). Applicants should submit Graduate Record Examination scores. In the case of non-English speaking countries, applicants should submit scores of the Graduate Record Examination or Test of English as a Foreign Language. Information on these examinations may be obtained from the Educational Testing Service, Box 592, Princeton, New Jersey 08540.

APTITUDE AND ACHIEVEMENT TESTS Applicants for admission to graduate programs in some departments must submit scores on the Graduate Record Examination and the Miller Analogies Test.

All applicants requesting fellowship support must submit scores on the Graduate Record Examination.

Credentials submitted by the student, such as transcripts and letters of recommendation, become the property of the Graduate College and may not be returned.

GENERAL REQUIREMENTS

Each student is expected to be familiar with the general requirements and procedures of the Graduate College and with the specific degree requirements in his chosen field of study. He should refer to the Graduate College Bulletin.

ACCEPTANCE TO CANDIDACY Applicants for the master's degree may be accepted to candidacy concurrent with admission, or candidacy may be deferred pending a period of satisfactory graduate study at the University of Vermont. Acceptance to candidacy for the master's degree is granted only to those students who have fully met all undergraduate prerequisites for the courses that are required in his graduate degree program. The approval of the department and the Dean is required.

Candidacy for the doctoral degree requires a full year of graduate study in residence at the University of Vermont. A doctoral student is accepted to candidacy upon the approval of the student's Studies Committee, the department or departments concerned, and the Dean.

MINIMUM RESIDENCE REQUIREMENTS The residency requirement is fulfilled with courses that (1) are taken for graduate credit on the University of Vermont campus, either in the academic year or in summers, and (2) are taken after the student has been admitted to the Graduate College. Each candidate for the master's degree must satisfactorily complete twenty-one hours in residence. Each candidate for the doctoral degree must satisfactorily complete a minimum of fifty hours in residence.

Each doctoral candidate must spend one full year on the University of Vermont campus and be available for and participate in departmental functions such as seminars and research within the department. A year of residency is interpreted as at least 6 credit hours in each of two consecutive semesters and a minimum total of 15 credit hours for the twelve-month period.

Departments may require more hours in residence than the minimum.

TEACHING REQUIREMENT Each degree candidate must acquire appropriate teaching experience in his chosen field prior to the award of his degree. The nature and the amount of this teaching, for which no academic credit is allowed by the Graduate College, will be determined by the department concerned.

GRADUATE CREDIT Courses numbered 400 or above are limited to candidates for the degree of Doctor of Philosophy; courses numbered 300 to 399 are limited to graduate students; courses numbered 200 to 299 are graduate courses open to advanced undergraduates. Courses numbered 100 to 199 may not be taken for graduate credit except upon recommendation of a student's Studies Committee and with the authorization of the Dean. Under no circumstances will graduate credit be allowed for a course numbered below 100.

GRADE REQUIREMENTS Courses taken for graduate credit are given the letter grades of A (excellent), B (good), C (fair), and F (failure). Graduate credit is given for letter grades A, B, and C. This grading

system differs somewhat from that for undergraduate level courses in that there is no letter grade of D.

A candidate for a graduate degree must complete his program with a minimum overall quality point average of 3.0 (B).

Designations of S, satisfactory and U, unsatisfactory, are used to indicate levels of performance for credits received in Thesis Research and may be used to indicate levels of performance in Seminar.

MAXIMUM TIME LIMITS A program leading to the master's degree must be completed within a span of: three years for students pursuing graduate study on a full-time basis during the academic year. This limit applies to students with fellowship or traineeship support or salaried by the University of Vermont as Class C or C-G employees; five years for students pursuing graduate study in evenings only; seven years for students pursuing graduate study in summers only. A doctoral program must be completed within a span of nine years. These time limits apply both to study at the University of Vermont and to courses presented for transfer of credit. Individual departments may set deadlines within these time limits.

TRANSFER OF CREDIT Upon request of the department, transfer of credit for appropriate courses completed at other institutions may be accepted by the Graduate College. A maximum of nine hours' credit in the case of master's candidates and twenty-four hours in the case of doctoral candidates may be accepted in transfer for appropriate courses completed in residence in other institutions. Such courses must have been taken in a fully accredited college or university which offers graduate study and must be acceptable at that institution in partial fulfillment of its requirements for an advanced degree. Credit cannot be transferred for (1) courses which would not, if taken at the University of Vermont, receive graduate credit, (2) courses in which a grade lower than 80 (B-) was received, (3) correspondence courses, (4) courses which are inappropriate for inclusion in any degree program offered by the Graduate College, (5) courses which were taken more than seven years prior to the completion of a degree program, (6) thesis credits received at another university. Courses taken for graduate credit at the off-campus locations will be considered as transfer credit.

Requirements for Master's Degree

All master's programs require a minimum of thirty semester hours of graduate credit. In programs that require a thesis, the number of credit hours to be earned in thesis research may vary between six (minimum) and fifteen (maximum); these credits are included in the minimum of thirty required for the degree.

Master of Education

Before acceptance to candidacy for the degree of Master of Education, the student must present a satisfactory score in the Miller Analogies Test, and must demonstrate satisfactory proficiency in written composition. Before the degree is awarded, the candidate must have completed one year of successful teaching experience or other educational service.

The graduate program of each student admitted to candidacy for the degree of Master of Education is planned and supervised by an individual committee,

which includes *ex-officio* the Deans of the Graduate College and the College of Education. Program planning takes into consideration the student's undergraduate curriculum, his professional experience, and his aims and purposes in pursuing the master's degree. Each program must include either thirty semester hours of approved course work or twenty-four hours earned in courses and six hours in thesis research. If a student's preparation is inadequate for him to begin study at the graduate level in certain aspects of his program, additional undergraduate courses will be required.

In order to insure effective planning of a graduate program for the degree of Master of Education, not more than nine hours credit will be accepted in partial fulfillment of degree requirements for courses taken prior to acceptance to candidacy. A prospective candidate should therefore make application for acceptance to candidacy before his first semester of residence, or, if he has been a student in Summer Session, prior to his second summer in residence. Candidates must expect to earn on the University of Vermont campus a part of the credit to be applied to a graduate degree. In most cases candidates who are in residence during the regular academic year must also attend one or two summer sessions in order to have a suitable selection of available courses.

Master of Arts in Teaching

The program leading to the degree of Master of Arts in Teaching is designed primarily for teachers with the purpose of enhancing their teaching ability and strengthening their background in their subject matter field.

A minimum of thirty semester hours is required in courses numbered above 200, of which not less than six semester hours shall be in Education taken at the University of Vermont. No thesis is allowable in this degree program; a student must complete at least twenty hours, and usually twenty-four, in a single department offering courses for graduate credit or in any acceptable combination of such departments. In order to be accepted to candidacy for this degree, a student must have completed an undergraduate major within the area of his specialization, have submitted a satisfactory score on the Miller Analogies Test, and be acceptable to the department or departments concerned.

In his undergraduate program, a candidate is expected to have completed the necessary courses in education to meet minimum requirements for a teaching certificate. If candidates have not qualified for teaching certification, they cannot expect to complete the degree in one academic year. To qualify for the degree of Master of Arts in Teaching, the candidate must present at least eighteen semester hours in education in his combined undergraduate and graduate program. This requirement is specified to ensure that the degree recipient can meet minimum state certification requirements.

Master of Extension Education

A minimum of thirty hours is required in courses numbered above 200. Nine semester hours are required as follows: Political Science 241, Philosophy 214, Economics 204 (courses equivalent to Political Science 241 and Economics 204 may be substituted); a minimum of twelve semester hours of course credit in Agriculture and/or Home Economics or related basic courses; and a minimum of six semester hours of course credit in Agricultural Education, Extension Education, and/or Home Economics Education.

The candidate must have completed one year of successful professional experience before the degree is granted.

The candidate is at liberty to select the manner in which he or she will complete the requirements for the degree from the alternatives of: (1) a combination of three-week and six-week summer sessions, (2) a combination of summer session and off-campus offerings in the State, (3) full-time residence on the campus, and (4) a combination of one term of residence and summer sessions.

Master of Arts and Master of Science

FIELD OF SPECIALIZATION At least twenty hours of graduate credit, including credit for the thesis and research leading to the thesis, must be earned in the field of specialization.

RELATED STUDY A graduate program may include advanced courses outside the field of specialization. In order to be included as part of the master's program, these courses must be approved in advance by the department in which the student is specializing.

LANGUAGE REQUIREMENT Certain departments require a reading knowledge of an appropriate language. If required, it may be completed by satisfactory performance on the Educational Testing Service's Foreign Language Examinations.

RESEARCH AND THESIS Each candidate will undertake a problem of original research under the direction of a member of the department in which he is specializing. At the conclusion of the investigation the student must present a thesis which embodies the results of his work and which demonstrates his capability for independent research.

Master of Business Administration

A minimum of thirty semester hours is required in courses numbered above 200. Specific course requirements include Economics 207, 228, 252, and 289, a total of twelve hours. An additional twelve hours (4 courses) of approved electives plus six hours of thesis credit comprise the minimum of thirty credits. The twelve hours of elective credit provide the candidate with the opportunity of concentrating his study in an appropriate field.

Each candidate will pursue a thesis research topic consistent with his area of concentration and overall educational objective. At the conclusion of the research the student must present a thesis which embodies the results of his work and demonstrates his capability.

Information on the M.B.A. evening program may be found in the Evening Division Catalogue.

After April 1, 1968, not more than six credit hours of graduate work completed prior to the date of becoming a candidate for the M.B.A. will be applied toward the degree requirements.

Final Examinations

Both written and oral comprehensive examinations are required for the culmination of the program of graduate study leading to the master's degree.

Requirements for the Degree of Doctor of Philosophy

The degree of Doctor of Philosophy requires of candidates a minimum of seventy-five credit hours to be earned in courses and in thesis research.

At least forty hours must be earned in courses and seminars. The first year of each doctoral program consists almost entirely of required courses; in the following years appropriate courses are selected by the Studies Committee in consultation with the candidate.

LANGUAGE REQUIREMENTS The determination of language requirements is established by each individual department. If knowledge of a foreign language is required, it may be completed by satisfactory performance on the Educational Testing Service's Foreign Language Examinations.

RESEARCH AND THESIS Each candidate, while in residence at the University of Vermont, must complete an acceptable original research project which contributes new knowledge or techniques in his academic field. A minimum of twenty credits will be allowed for thesis research.

EXAMINATIONS The examinations culminating the program of graduate study for the doctoral degree include both a comprehensive written examination in the field of study and an oral examination in which the candidate defends his thesis.

V Continuing Education

The University through its extension services aims to broaden the horizon of those who have not attended college, to afford an opportunity for those who have attended college and subsequently wish to keep in touch with academic thought in their favorite fields or to gain information about subjects which were not studied in college, and to provide undergraduate opportunities in addition to the regular classroom experience.

The Summer Session

Summer Session offers courses on both the graduate and undergraduate level in many subjects, including agriculture, art, astronomy, botany, chemistry, classics, dramatic art, economics, education, English, French, geography, German, history, home economics, journalism, library science, mathematics, music (instrumental and vocal), philosophy, physical education, physics, political science, psychology, reading, sociology, Spanish, speech and zoology.

The offerings are diversified to meet the needs of the following various groups of students: those with adequate preparation who desire courses leading to a bachelor's degree; those with adequate preparation who wish to do graduate work for the master's degree; principals and superintendents of schools who desire fundamental or specialized courses in the fields of educational administration and supervision; teachers in elementary or secondary schools who seek credit toward state teachers' certificates or who desire to broaden their knowledge of special subjects; persons who desire college level courses for self-improvement. Students must have sufficient maturity and background to profit from the courses in which they enroll.

It is recommended that any regularly matriculated student at the University of Vermont obtain prior approval from his academic dean for any courses to be taken in the Summer Session. The purpose of this recommendation is to insure such courses are appropriate for the degree for which the student is working.

The master's degree in several, but not all, areas may be earned through work in the Summer Session. All students desiring graduate credit for courses taken in the Summer Session must secure the approval of the Dean of the Graduate College at the time of registration. Enrollment in courses for graduate credit does not imply admission to the Graduate College. Fuller details on available courses and programs will be sent on request by the Director of the Summer Session.

Evening Division

Continuing education for adults in the State of Vermont is provided under the Evening Division Program offered by the University. Members of the faculty at the University and others, working under temporary appointment, offer

evening or extension courses in arts and sciences and education. A variety of courses is presented in evening sessions on campus throughout the college year. Some of these may be taken for credit while others are non-credit and are designed for the adult who is interested in continuing his education for the pleasure of self-improvement.

Courses are given in towns and cities throughout the state wherever a group of ten or more individuals register for a course.

Arrangements for Evening Division courses are made through the Evening Division, Waterman Building. Length of courses varies from ten to fifteen weeks.

It is recommended that any regularly matriculated student at the University of Vermont obtain prior approval from his academic dean for any courses to be taken in the Evening Division. The purpose of this recommendation is to insure such courses are appropriate for the degree for which the student is working. All persons desiring graduate credit must secure the approval of the Dean of the Graduate College at the time of registration.

Conferences and Institutes

Conference activity is a rapidly increasing part of University life. Both throughout the regular college year and during the summer, many conference groups make use not only of university classroom and auditorium facilities but also of university dormitories and dining service. Groups interested in arranging for meetings or conferences at the University should contact the Conferences and Institutes Office, Waterman Building. This office also arranges the University Lecture Series which brings outstanding speakers to the campus, and coordinates the Speakers Bureau through which University personnel are made available to organizations outside the campus.

V Courses of Instruction

The University reserves the right to change these course offerings at any time.

The departments and areas of instruction are arranged alphabetically, and the college in which each is located is indicated.

A student who lacks the stated prerequisites for a course, but is otherwise qualified to take it, may be permitted to enroll by the department.

Courses numbered from 1 through 99 are elementary and intermediate courses.

Those numbered from 100 through 199 are advanced undergraduate courses. They usually have at least one year or prior work in that discipline as a prerequisite. They may be taken as minor courses, but in some departments only a limited number may be taken as major courses. They are not ordinarily available for graduate credit.

Courses numbered from 200 through 299 are relatively more advanced courses for undergraduates which may also be taken for graduate credit by graduate students. They usually require at least two years of prior work in that and related disciplines. To obtain graduate credit the graduate student generally is expected to meet higher qualitative or quantitative expectations than the undergraduate student.

Courses numbered from 300 through 399 are graduate courses and, with rare exceptions, are taken only by persons holding a bachelor's degree.

Courses numbered above 400 are limited to candidates for the degree of Doctor of Philosophy.

A separate number is used for each semester course and for each semester of a year course.

Two numbers with a comma between (17, 18) indicate that the separate semester courses may be taken independently for credit.

Two hyphenated numbers (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.

The letter "S" preceding the course number indicates the course is offered normally in the Summer Session.

The letter "A" preceding the course number indicates the course is offered normally in the Evening Division program.

The letter "I" preceding the course number indicates the offering is made up of more than one component and is presented as an Institute.

The number of credit hours *per semester* is stated in each course description.

Odd-numbered courses are offered the first semester; even-numbered courses the second semester, unless otherwise indicated by the Roman numeral I for the first semester or II for the second semester.

The form (2-3) immediately following the course title indicates the number of class hours respectively of lecture and of laboratory.

Agricultural Biochemistry

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professor Johnstone (Chairman) and Racusen; Associate Professor Foote, Assistant Professors Sjogren and Weller

55 INTRODUCTORY MICROBIOLOGY (2-4) Study of microorganisms, especially bacteria, their structure, development and activities. Emphasis is placed on the basic principles and laboratory techniques. The role of microorganisms in nature and their various interrelationships with man are discussed. *Prerequisite:* eight hours of chemistry. Four hours. Mr. Sjogren.

151 INTRODUCTORY BIOCHEMISTRY (3-3) An introduction to biochemistry with emphasis on the structure, metabolism, and analysis of biologically important compounds. *Prerequisite:* chemistry 16 or 131. Four hours. Mr. Foote.

197, 198 SENIOR RESEARCH Work on a research problem under the direction of a qualified staff member. Findings submitted in written form as prescribed by the department. *Prerequisite:* senior standing. Three hours. Staff.

201 GENERAL BIOCHEMISTRY (2-4) Basic principles of analytical procedures used in biochemistry are emphasized. Topics covered include: chemistry of proteins and nucleic acids; DNA, RNA, and protein biosynthesis; enzymes, coenzymes, and enzyme kinetics; and metabolism of carbohydrates, lipids, and proteins. *Prerequisite:* 151 or Chemistry 132. Four hours. Mr. Weller.

220 ENVIRONMENTAL MICROBIOLOGY (2-3) An advanced course dealing with the activities and role of microorganisms, primarily bacteria, in the specialized habitats of air, soil, and water. The influence of the cells upon their environment and the effect of the environmental conditions on metabolism will be emphasized. *Prerequisite:* a previous course in microbiology or bacteriology and senior standing. Three hours. Offered alternate years, 1970-71. Mr. Johnstone.

250 ADVANCED BIOCHEMISTRY (4-2) An advanced study of biochemical systems with emphasis on research methods and plant biochemistry. Laboratory sessions include the use of radioisotopes and chromatographic techniques. This course augments agricultural biochemistry 201 (general biochemistry), the combined sequence providing a base for graduate research in biochemistry and related fields. *Prerequisite:* 201 or medical biochemistry 301. Five hours. Mr. Racusen.

254 MICROBIAL BIOCHEMISTRY (2-4) The chemical composition, energy utilization and metabolism of microbial cells. *Prerequisite*: 201 or medical biochemistry 301, botany 55; and departmental permission. Four hours. Mr. Sjogren. Alternate years, 1970-71.

301 SPECIAL PROBLEMS IN BIOCHEMISTRY Reading, discussion, and laboratory research on a special problem. *Prerequisite*: 201 and departmental permission. Credit as arranged. Staff.

381, 382 GRADUATE SEMINAR Topical seminar with discussion of assigned and collateral reading. Required of departmental graduate students. One hour. Staff.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member culminating in an acceptable thesis. Credit as arranged.

491 through 493 DOCTOR'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

Agricultural Economics

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professors Samenfink, Sargent, (Chairman), Sinclair and Webster; Associate Professor Tremblay; Assistant Professor Fife

2 WORLD FOOD AND AGRICULTURE Historical development and pattern of agriculture to the present. Emphasis on the adjustment of agriculture to natural and economic phenomena. Present pattern of crop and livestock production, trade, and consumption in Vermont, the United States, and the world. Three hours. Mr. Tremblay.

51 AGRICULTURAL FINANCE Capital requirements of American agriculture; analysis of the financial problems of farmers; types and sources of credit and the lending problems and practices of farm credit institutions. *Prerequisite*: sophomore standing. Three hours. Mr. Sinclair. Alternate years 1970-71.

61 ECONOMICS OF AMERICAN AGRICULTURE The role of agriculture in the American economy; an introductory analysis to microeconomics and social problems of the agricultural and rural sector. *Prerequisite*: sophomore standing. Three hours. Mr. Sinclair.

103 RURAL SOCIOLOGY Analysis of selected research data concerning all populations in rural areas—rural farm, nonfarm, and suburban—and their social interaction as it relates to the concept of urbanized social organization. *Prerequisite*: junior standing. Three hours. Mr. Samenfink.

166 **SMALL BUSINESS MANAGEMENT (3-2)** Management problems of small business firms. Theoretical and practical considerations in the organization and operation of small businesses with emphasis on financial and legal organization, accounting and budgeting procedures, and tax policies. *Prerequisite:* sophomore standing. Four hours. Mr. Fife.

197, 198 **SENIOR RESEARCH** Work on a research problem under the direction of a qualified staff member. Findings submitted in written form as prescribed by the department. *Prerequisite:* senior standing. Three hours. Staff.

201 **FARM MANAGEMENT (3-2)** Organization and operation of a successful farm business. *Prerequisite:* economics 11-12 or concurrent enrollment, or agricultural economics 62; junior standing. Four hours. Mr. Tremblay.

203 **RESOURCE ECONOMICS** The field of resource economics, benefit-cost analysis, economic appraisal of public resource development investments, water problems, the legal framework of resource development, economic aspects of rural development, land classification, land use planning. *Prerequisite:* economics 11-12, or agricultural economics 62. Three hours. Mr. Sargent.

206 **REGIONAL PLANNING** A definition of regional planning, the legal basis of planning, the political process of planning, social attitudes concerned with planning. The determination and function of public goals. Types of zoning. Quality environment planning. Special planning programs. *Prerequisite:* Principles of Economics or equivalent. Three hours. Mr. Sargent.

207 **AGRICULTURAL MARKETING AND PRICES** Market structure, prices, and economic forces involved in the movement of farm products from producers to consumers. Emphasis on the New England situation. *Prerequisite:* economics 11-12, or agricultural economics 62. Three hours. Mr. Webster.

208 **AGRICULTURAL POLICY** The role of government, farm organizations, and other institutions in the development of agricultural policy. An economic analysis of the price and income problems of American agriculture and alternatives to their solution. *Prerequisite:* economics 11-12, or agricultural economics 62. Three hours. Mr. Sinclair.

220 **ECONOMICS OF OUTDOOR RECREATION** An analysis of demand and supply of natural resources for outdoor recreation in the northeast. A study of methods of economic analysis applicable to outdoor recreation. Emphasis will be placed on discussion of current policy issues and management of recreational business firms. *Prerequisite:* economics 11, 12 or departmental permission. Three hours. Mr. Sargent.

253 **THEORY OF AGRICULTURAL PRODUCTION ECONOMICS** Application of the theory of the firm to agricultural production units. Emphasis on resource allocation and production efficiency. Principles of marginal analysis applied to production problems in a static and dynamic economy. *Prerequisite:* twelve hours in agricultural economics and economics, senior standing, and departmental permission. Three hours. I or II. Mr. Sinclair.

255, 256 **SPECIAL TOPICS IN AGRICULTURAL ECONOMICS** Readings and discussion of specific topics in agricultural economics at advanced level. *Prerequisite:* departmental permission. Credit as arranged. Staff.

303 **ECONOMICS OF RESOURCE PLANNING** A discussion of concepts of resource planning with special emphasis on economic base analysis, benefit-cost analysis, resource base analysis, and economic impact studies. Current literature and current problems will be discussed and each student will make a special study of the economic aspects of the resource development proposal and present it to the class. Three hours. Mr. Sargent.

351 **RESEARCH METHODS** The scientific method, statistical methods, sampling methods, use of electronic computers, linear programming, reporting research results. *Prerequisite:* three hours of statistics. Three hours. I or II. Mr. Fife.

381, 382 **AGRICULTURAL ECONOMICS SEMINAR** Discussion of problems and research in agricultural economics and other social sciences. One hour. Staff.

391 through 393 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

V Agricultural Education

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Associate Professor Fuller; Mr. Davison

102 **EXTENSION METHODS (1-2)** Methods and techniques of extension teaching. *Prerequisite:* junior standing. Two hours. Mr. Davison. Alternate years, 1970-71.

104 **LEADERSHIP TRAINING AND ORGANIZATION METHODS (2-2)** Methods and techniques by which officers, group members and administrators may increase the effectiveness of organizations. Practice in applying the methods treated. *Prerequisite:* junior standing or departmental permission. Three hours. Mr. Fuller.

152 **INTRODUCTION TO VOCATIONAL AND TECHNICAL EDUCATION (1-2)** Introduction to the vocational education acts and major program objectives; the determination of instructional needs, and development of experience programs for high school students. Development of the philosophy of problem solving in agricultural education, and a general orientation to the work of the teacher of agriculture. *Prerequisite:* junior standing. Two hours. Mr. Fuller.

155 **DIRECTED PRACTICE TEACHING IN VOCATIONAL AND TECHNICAL EDUCATION** Ten weeks of practice teaching in high school departments of agricultural education under the guidance of experienced teachers and a teacher educator. One week of observation of students' experience programs during the summer, and the first week of high school. *Prerequisite:* 251 and 253, and acceptance into teacher education program. Eight hours. Mr. Fuller.

156 **METHODS AND MATERIALS OF VOCATIONAL AND TECHNICAL EDUCATION** Consideration is given to an analysis of selected teaching techniques and to the

selection, preparation, and use of instructional materials in vocational education. Emphasis will be given to auto-instructional devices, audio-visual aids, educational television, and other appropriate techniques and materials. *Prerequisite:* 152 or home economics 171 or 173, or departmental permission. Three hours. Mr. Fuller.

173 COMMUNICATION METHODS (see Home Economics 173). Credit to be arranged.

197, 198 SENIOR RESEARCH Work on a research problem under the direction of a staff member. Findings submitted in written form as prescribed by the department. *Prerequisite:* senior standing. Three hours. Staff.

251. METHODS OF TEACHING VOCATIONAL AGRICULTURE (2-2) Making farm surveys, analyzing farm businesses, developing a course of study and farming programs. Developing teaching plans; techniques and visual aids; advising the FFA chapter; evaluating student progress; providing counseling; guidance and maintaining discipline. *Prerequisite:* senior standing. 104 and 152. Three hours.

253 METHODS OF TEACHING YOUNG AND ADULT FARMER CLASSES IN VOCATIONAL AGRICULTURE (2-2) Determining needs, problems and objectives for education of young and adult farmers; selecting positions, planning courses, and developing teaching plans; use of on-farm instructions; demonstrations and other suitable methods, techniques and instructional materials; use of advisory groups; progress evaluation; role of young farmer associations. *Prerequisite:* 104 and 152. Three hours.

282 SEMINAR Evaluation of student teaching experiences; in-school and out-of-school public relations; placement and follow-up of students; department management; planning and maintaining facilities; overall program; summer program and professional responsibilities. Required of agricultural education majors. *Prerequisite:* senior standing; 155. One hour.

301 through 304 RESEARCH IN AGRICULTURAL EDUCATION Investigation of a research topic under the direction of an assigned staff member. Credit as arranged.

Agricultural Engineering

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professor Schneider (Chairman); Associate Professor Arnold; Assistant Professor Bornstein

5 INTRODUCTORY AGRICULTURAL ENGINEERING (2-2) Introduction to principles and practices in farm machinery, internal combustion engines, light building structures, electric wiring and devices, water supply, sewage disposal, and soil and water engineering in residential, recreational and farm use. Not for credit for B.S.A.E. degree candidates. Three hours. Mr. Schneider.

102 FARM SHOP (0-6) Wood and metal working by hand and machine methods, sheet metal work, welding, rope work and tool fitting, demonstrations and methods of teaching. Problems in safety, shop care, layout, and selection of equipment. *Prerequisite:* sophomore standing. Three hours. Mr. Schneider.

115 DAIRY PRODUCTION ENGINEERING (2-2) Theory, principles, and practices in the operation and selection of milk production and handling equipment. *Prerequisite:* permission of either department. Three hours. Given jointly with the Animal and Dairy Science Department. Mr. Arnold and Department of Animal and Dairy Science staff. Alternate years. Not offered 1969-70.

116 DAIRY PLANT ENGINEERING (2-2) Theory and practical problems in the operation and selection of dairy processing equipment. *Prerequisite:* 115. Three hours. Given jointly with Animal and Dairy Science Department. Messrs. Arnold and Nilson. Alternate years. Not offered 1969-70.

121 SOIL AND WATER MANAGEMENT (2-2) Practices and structures used in the conservation of the development of soil and water resources in agriculture, recreation and rural area development. *Prerequisite:* plant and soil science 61 and civil engineering 53. Three hours. Alternate years, 1970-71.

131 AGRICULTURAL, RESIDENTIAL AND RECREATIONAL BUILDINGS (2-2) Site planning, building planning, material selection. Insulation, heating, and ventilation of farm service buildings, residences and recreational buildings. *Prerequisite:* physics 6 and engineering graphics 1, or departmental permission. Three hours. Alternate years, 1969-70.

140 POWER AND MACHINERY FOR AGRICULTURE (2-2) The principles of operation and maintenance of engines, tractors and agricultural field and farmstead machinery. *Prerequisite:* physics 6. Three hours. Alternate years, 1969-70.

160 ELECTRICITY IN AGRICULTURAL, RESIDENTIAL, AND RECREATIONAL USE (2-2) Wiring systems, lighting, motors, heating, and overload protection in the use of electricity in agriculture, residences, recreation and rural area development. *Prerequisite:* physics 6. Three hours. Alternate years, 1970-71.

164 WATER SUPPLY, SEWAGE DISPOSAL AND REFRIGERATION (2-2) Water sources and systems, sewage disposal and refrigeration in agriculture, residences, recreation and rural area development. *Prerequisite:* physics 6. Three hours. Alternate years, 1970-71.

191, 192 SPECIAL TOPICS Advanced study in areas of agricultural engineering as indicated by the interest of the student. *Prerequisite:* departmental permission. Three hours. Staff.

V Animal Sciences

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professors Atherton and Smith (Chairman); Associate Professors Balch, Carew, Duthie, Simmons, and Welch; Assistant Professors Foss and Nilson; Lecturers Gibson, Mercia, and Woelfel.

2 INTRODUCTORY ANIMAL SCIENCE (3-2) Fundamental principles of anatomy, physiology, nutrition, breeding and management of animal species important in our agricultural economy. Technical problems associated with the selection and management of livestock and product utilization will be emphasized. Four hours. Mr. Smith and staff.

33 INTRODUCTORY DAIRY TECHNOLOGY (2-2) History and development of the dairy industry, general and basic composition of milk and milk products, milk quality and the significance of flavor, dairy arithmetic, and fundamental processes used in the manufacture of milk and milk products. Three hours. Mr. Duthie.

44 DAIRY CATTLE JUDGING (0-6) Judging, fitting, and showing of dairy cattle. Practical application of dairy cattle selection will be emphasized. Two hours. Mr. Gibson. Alternate years, 1970-71.

55 FUNDAMENTALS OF LIVESTOCK FEEDING (3-2) Principles of livestock feeding and the evaluation of livestock rations. Emphasis will be placed on economic and nutritive value of various feed ingredients and the application of these facts to proper feed formulation. Four hours. Mr. Smith.

58 INTRODUCTORY AVIAN BIOLOGY (2-2) The evolution and biology of birds. Emphasis will be placed upon physiological and morphological development, physiological and endocrinological aspects of reproduction, social behavioral patterns, and the mechanics of flight. This course has been especially designed for the student who has an interest in broadening his appreciation of biology. Three hours. Mr. Foss.

104 DAIRY TESTING AND QUALITY CONTROL (2-2) The composition and properties of milk. Standard methods of bacteriological and chemical analysis. General laboratory testing procedures for milk and milk products and their importance in quality control. Three hours. Mr. Atherton.

109 FOOD MICROBIOLOGY (2-3) A study of the microorganisms important in milk and other food products, including common methods of laboratory examination and quality control. Desirable as well as undesirable activities of food microorganisms are discussed with emphasis on the elimination of contamination, spoilage, and spread of disease in various food products. Three hours. Mr. Atherton.

114 MANUFACTURED DAIRY PRODUCTS (2-3) Methods and technical problems in manufacturing milk products such as cheese, butter, evaporated and dry milks. *Prerequisite:* 33, junior standing. Three hours. Mr. Nilson. Alternate years, 1969-70.

121 **SENSORY EVALUATION OF MILK AND MILK PRODUCTS (1-4)** Employment of the senses in evaluation of milk and milk products, classification, physiology, and threshold values for taste and odor; comparison of sensory tests used in evaluation; testing consumer acceptance; practical experience in examining off-flavors in milk and milk products; and methods used in flavor identification research. Three hours. Mr. Duthie. Alternate years, 1970-71.

153 **MILK PROCESSING (2-2)** Technical aspects of processing fluid milk and fluid milk products. *Prerequisite:* departmental permission. Three hours. Mr. Nilson. Alternate years, 1970-71.

177 **ADVANCED LIVESTOCK PRODUCTION (2-3)** The organization and operation of livestock enterprises. Emphasis will be on theory and application of feeding, breeding and management programs and principles. *Prerequisite:* 55; junior standing. Three hours. Mr. Welch. Alternate years, 1969-70.

187, 188 **LIGHT HORSE PRODUCTION AND MANAGEMENT (2-3)** The problem of light horse production. Application of the principles of selection, management and horsemanship. *Prerequisite:* 187 for 188; junior standing. Three hours. Mr. Balch. Alternate years, 1970-71.

190 **POULTRY TECHNOLOGY** The organization and operation of poultry enterprises. Emphasis will be placed on theory and application of feeding, breeding, and management programs and principles. *Prerequisite:* 55; 58; Junior standing. Three hours. Staff. Alternate years, 1969-70.

197, 198 **SENIOR RESEARCH** Work on a research problem under the direction of a qualified staff member. Findings submitted in written form as prescribed by the department. *Prerequisite:* senior standing and department permission. Three hours. Staff.

206 **ANIMAL NUTRITION** Nutrients, their function and utilization and requirements for growth, reproduction and lactation. *Prerequisite:* 55; and a course in organic chemistry. Three hours. Mr. Welch.

211 **ICE CREAM AND FROZEN DAIRY PRODUCTS (2-3)** Fundamentals of ice cream manufacturing, the physico-chemical and biological factors involved; calculation of formulas; sherbets and specialties; merchandising, soda fountain management and sanitary control. *Prerequisite:* 104; credit or concurrent enrollment in 109; junior standing. Three hours. Mr. Nilson. Alternate years, 1969-70.

251 **ADVANCED DAIRY CATTLE MANAGEMENT (2-3)** The organization and operation of dairy cattle enterprises. Theories and methods of application of feeding, breeding, and management programs and principles will be emphasized. *Prerequisite:* 55. Three hours. Mr. Woelfel. Alternate years 1969-70.

256 **DAIRY PLANT MANAGEMENT (2-3)** Organization and operation of milk processing and manufactured milk products plants. *Prerequisite:* 153, Ag.Ec. 62; junior standing. Three hours. Mr. Nilson. Alternate years, 1970-71.

257 **DAIRY CHEMISTRY (1-6)** An advanced study of the chemical and physical properties of milk constituents with emphasis on training and experience in dairy research methodology. Students will select, design and perform several research experiments. *Prerequisite:* 33, 104, and a course in organic chemistry. Three hours. Mr. Duthie. Alternate years, 1969-70.

260 ANIMAL BREEDING (2-3) Theory and application of genetic principles to breeding of livestock. *Prerequisite*: 2, zoology 115. Three hours. Mr. Balch. Alternate years, 1969-70.

271 ENDOCRINOLOGY (2-2) Anatomy, physiology, glandular interrelationships, and assay methods of the endocrine glands and their hormones. *Prerequisite*: zoology 1 and departmental permission. Three hours. Mr. Simmons.

275 PHYSIOLOGY OF REPRODUCTION AND LACTATION (2-2) Fundamental principles of the physiology of reproduction and lactation with the primary emphasis on farm animals. Three hours. Mr. Simmons. Alternate years, 1970-71.

281, 282 ANIMAL AND DAIRY SCIENCE SEMINAR Reports and discussions of problems and special investigations in selected fields. One-three hours. Maximum credit two hours senior, three hours graduate. Staff.

291, 292 SPECIAL PROBLEMS IN ANIMAL AND DAIRY SCIENCE Reading, discussion, and special laboratory investigation in the field of animal and dairy science. *Prerequisite*: Departmental permission. Three hours. Staff.

294 HISTORY OF NUTRITION (See home economics 294). One hour. Staff.

307 ADVANCED CONCEPTS IN NUTRITION Study of chemistry and physiology of digestion, absorption and metabolism of nutrients. Methods of estimating and meeting dietary requirements for maintenance, growth, and reproduction of several species. Genetic and nutritional interrelationships. Basic study of growth per se. *Prerequisite*: one of the following: animal and dairy science 206, home economics 243, or a 200 level course in biochemistry. Three hours. Staff. Alternate years, 1969-70.

308 EXPERIMENTAL TECHNIQUES IN NUTRITION (0-4) Methods of conducting research in nutrition with the various animal species including humans. Physical, physiological and biochemical aspects considered. Experimental design and analyses. *Prerequisite*: a 200 level course in nutrition and in biochemistry. Two hours. Staff.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

Animal Pathology

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professor Bolton (Chairman); Associate Professor Durrell

105 ANATOMY AND PHYSIOLOGY Structure and function of the various parts of the animal body with emphasis on cattle. *Prerequisite*: junior standing. Three hours. Dr. Durrell.

106 ANIMAL DISEASES Fundamentals of disease control and prevention. Special disease problems in cattle, sheep, horses, and swine with emphasis on control measures. *Prerequisite:* 105 strongly recommended; junior standing. Three hours. Dr. Durrell.

107-108 LABORATORY ANIMAL TECHNIQUES (2-2) Basic laboratory procedures used in the examination of blood, fecal, urine, milk, and tissue specimens. Preparation of tissue sections. *Prerequisite:* agricultural biochemistry 55 and a course in organic chemistry. Three hours. Staff. Offered in fall of 1969.

110 WILDLIFE PATHOLOGY (3-0) A survey of the more common disease and parasitic problems of large game animals, small fur-bearing animals, waterfowl and game birds and their relationship to domestic animals and man. Autopsy techniques and proper use of diagnostic laboratory facilities will be demonstrated. *Prerequisite:* junior standing, 2 courses in Zoology. Three hours. Dr. Bolton.

116 POULTRY DISEASES (2-2) Anatomy and physiology of the fowl. General principles of sanitation. Major diseases of chickens and turkeys. *Prerequisite:* agricultural biochemistry 55. Three hours. Dr. Durrell.

197, 198 SENIOR RESEARCH Work on a research problem under the direction of a qualified staff member. Findings submitted in written form as prescribed by the department. *Prerequisite:* senior standing. Three hours. Staff.

217-218¹ LABORATORY ANIMALS (2-2) Life cycles, feeding, housing, breeding requirements, nutrition, disease prevention, maintenance of germ-free colonies, preoperative and postoperative care, and human methods of handling. *Prerequisite:* agricultural biochemistry 55 or medical microbiology 201, chemistry 131, 132. Three hours. Staff. Offered in fall of 1970.

220¹ LABORATORY ASSIGNMENTS (1-6) Rotating assignments in the Animal Pathology Laboratory, Division of Animal Services in the College of Medicine, and the Bureau of Laboratories in the State Department of Health. Students are assigned responsibility for groups of experimental animals under the guidance of the professional staff. *Prerequisite:* 107, 217. Three hours. Staff. Offered in spring of 1971.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

1. Approval for graduate credit pending.



COLLEGE OF ARTS AND SCIENCES

Professor Janson (Chairman); Associate Professors J. Davison and Mills; Assistant Professors Roland, Aschenbach and Davies; Instructors Scatchard, W. Davison; Mrs. Wedell, Mrs. Walker.

1, 2 **BASIC DESIGN** The nature and interaction of color, line, light, and space in visual design, stressing invention and discovery as a means toward creative insight and evaluation. Lectures, discussion, projects. Three hours. Mr. Davies.

5, 6 **ART HISTORY** A survey of painting, sculpture, and architecture in the western world. First semester: Egyptian period through the Gothic; second semester: Renaissance to the present. *Prerequisite* 5 for 6. Three hours. Staff.

11 **INTRODUCTION TO FINE METAL CRAFTS** Basic creative experiences in enamels and silver jewelry to develop individual ability in design, appreciation and technical skill. *Prerequisite*: sophomore standing. Three hours. I and II Mrs. Mills.

13 **INTRODUCTION TO CERAMICS** Basic design and practice in ceramics stressing technical competence and critical judgment. Hand coiled and thrown forms, firing and glazing. *Prerequisite*: sophomore standing. Three hours. I and II. Mr. Scatchard.

21 **DRAWING** An investigation of various aspects of drawing through class assignments, individual projects, and group criticisms. Three hours. I, II. Mr. Davies.

41 **INTRODUCTION TO SCULPTURE** A basic course in sculpture, dealing with both formal and technical problems. *Prerequisite*: sophomore standing. Three hours. I and II. Mr. Aschenbach.

51 **GREEK ART** History of art in Greek lands in ancient times, with principal emphasis on sculpture, architecture, and vase painting. *Prerequisite*: sophomore standing. Three hours. Miss. J. Davison.

52 **ROMAN ART** Development of Roman art styles out of Greek forms. Special emphasis on wall painting, Augustan official sculpture, later imperial architecture, mosaic. *Prerequisite*: sophomore standing. Three hours. Staff.

54 **MODERN ART** Painting and sculpture from the period of French Impressionism to the present time; emphasis on European influences. *Prerequisite*: sophomore standing. Three hours. Mrs. Roland.

102 **MEDIEVAL ART** Architecture, sculpture, and painting in western Europe from the early Christian era to the early 15th century, with emphasis on the Romanesque and Gothic. *Prerequisite*: 6 or 51 and 52. Three hours. Mrs. Roland. Alternate years, 1969-70.

103 **RENAISSANCE ART** Painting, sculpture and architecture in Italy and Northern Europe 1400-1600. *Prerequisite:* 6 or 51 and 52. Three hours. Mrs. Roland.

104 **BAROQUE ART** European art and architecture, 1600-1750. Studies of original works in the Museum collection. *Prerequisite:* 6 or 51 and 52. Three hours. Mrs. Roland.

105 **ROCOCO AND ROMANTIC ART** European architecture, sculpture, and painting, circa 1750-1850, and the origins of the modern movement. Studies of original material in the Museum collection. *Prerequisite:* 6 or 51 and 52. Three hours. Mrs. Roland.

106 **MODERN ARCHITECTURE** Monuments, masters and movements since 1850. Visits with architects and to modern buildings in the area. *Prerequisite:* 2 or 6. II. Three hours. Mr. Janson. Alternate years, 1968-69.

107 **AMERICAN PAINTING** Painting in America from Colonial times to the twentieth century. Use of the Fleming and Shelburne Museum collections. *Prerequisite:* 6. Three hours. Mr. Janson.

108 **AMERICAN ARCHITECTURE** The Colonial period to Frank Lloyd Wright. Research projects particularly on buildings of historical interest in the area. *Prerequisite:* 6. Three hours. Mr. Janson. Alternate years, 1969-70.

112 **FINE METAL CRAFTS** Advanced techniques in enamels and silver jewelry. Independent work emphasizing design and skill. Related aspects of historical and contemporary metal crafts. *Prerequisite:* 11 and one of the following which may be taken concurrently: 1, 2, 21. Three hours. Mrs. Mills.

113, 114 **CERAMICS** Advanced techniques in throwing and hand building. Clay and glaze technology, kiln theory and construction. Independent work in ceramic design and execution. Related aspects of historical and contemporary ceramics. *Prerequisite:* 13 and one of the following which may be taken concurrently: 1, 2, 21. Four hours. Mr. Scatchard.

121, 122 **DRAWING AND PAINTING** Exploration of individual problems in drawing and painting. The course includes a seminar on the development of thematic material. *Prerequisite:* 1 or 2 and 21. Three hours. Mr. Davies.

131, 132 **PRINTMAKING: INTAGLIO** Methods and materials in intaglio printing, such as etching and woodcut, stressing design and technical control. *Prerequisite:* 1 or 21 and instructor's permission; 131 for 132. Four hours. Mr. W. Davison.

133, 134 **PRINTMAKING: PLANOGRAPHIC** Methods and materials in planographic printing, such as lithography and silk screen, stressing design and technical control. *Prerequisite:* 1 or 21 and instructor's permission; 133 for 134. Four hours. Mr. W. Davison.

141, 142 **SCULPTURE** Problems of form and design in relation to material and technique. Emphasis on individual exploration and invention. Related aspects of historical and contemporary sculpture. *Prerequisite:* 41 and one of the following which may be taken concurrently: 1, 2, 21. Three hours. Mr. Aschenbach.

185, 186 ART HISTORY SEMINAR A museum oriented course dealing with selected topics or areas in art history. First semester: problems of research and criticism; second semester: organization, presentation and documentation of an exhibition undertaken by the class. *Prerequisite*: six hours of advanced art history and permission. Three hours. Staff.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

197, 198 READINGS AND RESEARCH Independent projects in either art history or studio under the guidance of a staff member. *Prerequisite*: Departmental permission. Three hours. Staff.

207 STUDIES IN AMERICAN ART Advanced studies in selected areas of American art and design, particularly as represented in the collections of the Fleming and Shelburne Museums. Lectures, reports and discussions. *Prerequisite*: Six hours of advanced art history; or by permission to advanced students of American history or literature. Three hours. Mr. Janson.

210 STUDIES IN MODERN ART Advanced studies in selected areas of 19th and 20th century art, stressing individual research and reports. *Prerequisite*: 105 or 5 and 54, and departmental permission. Three hours. Mrs. Roland.

281, 282 STUDIO SEMINAR Advanced studies, combining independent projects and group critiques with staff and visiting critics, in a particular studio area. *Prerequisite*: Six hours of advanced studio and departmental permission. Three or six hours. Staff.

Botany

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professors Dodge¹, Gershoy, Hyde (Chairman), Klein, Marvin, Sproston, and Taylor; Associate Professors Cook, Etherton, Vogelmann.

Biology

1, 2 PRINCIPLES OF BIOLOGY (3-3) Introduction to the structure, functions, and evolution of animals and plants; illustration through lectures, discussions, and laboratory experience of the similarities and differences among organisms. Emphasis on ideas and concepts important both for advanced study in a Life Science and for understanding the biological world of which man is a part. Offered jointly by the Departments of Botany and Zoology. *Prerequisite*: 1 for 2. Four hours. Mr. Bromley, Mr. Klein, Botany and Zoology Staff and guest lecturers.

1. Visiting professor.

Botany

4 INTRODUCTION TO PLANT BIOLOGY (3-3) An introduction to plant science in which structure, function, and reproduction of vascular plants are examined in terms of the dynamics of plant life. Emphasis placed on a general understanding of plants as a basis for advanced study in a plant science. Practical implications of basic botanical information in the applied plant sciences. Four hours. Staff.

103 PHYSIOLOGY OF THE PLANT BODY (3-3) Lecture and laboratory study of the plant as a whole, including the growth and development of the plant and its parts, the relation of plants to water and minerals, the effects of environmental factors on the plant, and regulatory processes. *Prerequisite:* Principles of Biology or Botany 4. Four hours. Staff.

105 DEVELOPMENTAL PLANT STRUCTURE (2-4) The structural changes associated with plants during their developmental cycle and the use of plant material in experimental morphogenesis. Comparison of developmental patterns of major plant groups, with consideration of the evolutionary and physiological implications. *Prerequisite:* Principles of Biology or Botany 4. Four hours. Staff.

110 SYSTEMATICS AND PHYLOGENY (1-4) Principles of classification; evolution of flowering plants; characterization and recognition of major plant families; species and generic concepts; biosystematics; use of taxonomic keys and preparation of herbarium specimens. *Prerequisite:* Principles of Biology or Botany 4, junior standing or departmental permission. Three hours. Mr. Vogelmann. Alternate years, 1969-70.

113 PLANT COMMUNITIES (2-2) Principles of plant sociology; structure and organization of the plant community; sampling methods and analysis of data; climatic and edaphic factors; field work. *Prerequisite:* botany 110 or departmental permission. Three hours. Mr. Vogelmann. Alternate years, 1969-70.

115 HEREDITY (This course is identical with Zoology 115, which see.)

117 PLANT PATHOLOGY (2-4) Diagnosis, life history, and control of plant diseases caused by fungi, viruses, bacteria and nematodes. *Prerequisite:* Principles of Biology or Botany 4. Four hours. Mr. Sproston.

151 PLANTS AND MAN The place of plants in man's affairs. The influence of plants on exploration, migration and the development of civilizations. The role of plants in the world today, with special emphasis on food, drug, fiber and other useful plants and on the botanical features which contribute to their usefulness. *Prerequisite:* Principles of Biology or Botany 4. Three hours. Mr. Taylor.

160 PLANT ECOLOGY Principles of plant ecology; analysis of the environment and effects on plants; interrelationships between plants; ecologic adaptations. *Prerequisite:* Principles of Biology or Botany 4. Three hours. Mr. Vogelmann. Alternate years, 1970-71.

197, 198 SENIOR RESEARCH An introduction to original research under the direction of a member of the faculty of the Department of Botany and/or a faculty member in a related Life Science Department. *Prerequisite:* senior standing. A maximum of five hours in the year. Staff.

205 MINERAL NUTRITION OF PLANTS (See plant and soil science 205.) Three hours. Mr. Bartlett and botany, forestry, and plant and soil science staff. Alternate years, 1970-71.

252 PLANT ANATOMY AND HISTOLOGY (2-4) Development of the organism and accompanying integration of cellular tissues. Ontogeny of vegetative tissues; modifications of the cell wall. *Prerequisite:* Principles of Biology or Botany 4; junior standing. Four hours. Mr. Taylor. Alternate years, 1970-71.

253 FUNGI (2-4) The reproductive processes of the common molds, yeasts, and actinomycetes and their classification. Physiological studies; antibiosis. *Prerequisite:* Chemistry 131, 132 or departmental permission. Four hours. Mr. Sproston. Alternate years, 1969-70.

255 GENETICS AND CYTOGENETICS (2-2) Fundamental principles of genetics. Analysis of mendelian inheritance, recombination in higher plants and animals as well as microorganisms, chromosome aberrations, polyploidy. Gene action and introduction to molecular genetics. *Prerequisites:* 4 or zoology 1; zoology 115 and at least eight additional hours of botany or zoology. Three hours. Mr. Hyde. Alternate years, 1970-71.

256 CYTOLOGY (3-2) The dynamics of the protoplast; nuclear division, gamete formation and syngamy. Ultrastructure of cell organelles; nucleocytoplasmic interaction. *Prerequisite:* 255 or zoology 115; chemistry 131, 132. Four hours. Mr. Hyde. Alternate years, 1970-71.

258 PLANT GROWTH (2-4) The nutrition of plant cells, growth hormones, cyclic variation of environmental factors, morphogenesis. *Prerequisite:* 103; chemistry 131, 132. Four hours. Mr. Marvin. Alternate years, 1969-70.

260 PHYCOLOGY (2-4) The morphology, classification, and general biology of the algae, with special consideration of the freshwater forms. Emphasis on the use of algae as experimental material for the investigation of general biological problems. *Prerequisite:* 105, or two courses in zoology or botany above 100. Four hours. Mr. Cook. Alternate years, 1970-71.

281, 282 BOTANY SEMINAR A topical seminar consisting largely of presentations of personal research by faculty and graduate students from within and outside the University. May be jointly sponsored with Zoology, Agricultural Biochemistry, Forestry, Plant and Soil Science, etc. Required attendance of botany graduate students and seniors in botanical research programs. Without credit. Staff.

381, 386 SELECTED PROBLEMS IN MODERN BOTANY Subject matter varies but will stress recent botanical inquiries, particularly where they border on mathematics, physics, and chemistry. *Prerequisite:* departmental permission. Credit as arranged. Staff.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

491 through 493 DOCTORAL THESIS RESEARCH Original research under the direction of an assigned staff member, culminating in an acceptable doctoral dissertation. Credit as arranged.

V Chemistry

COLLEGE OF TECHNOLOGY

Professors White (Chairman), Cook, Gregg, Flanagan, Krapcho, and Kuehne; Associate Professors Crooks, and Whitcher; Assistant Professors Allen, Strauss, Waters, Weltin, and Wulff

Note: Credit cannot be granted for: 1-2 and also 11-12; 3-4 and also 1-2; 140 and also 141-142.

1-2 INTRODUCTORY CHEMISTRY (3-3) General inorganic chemistry. Lectures, recitations and laboratory, including elementary qualitative analysis. Acceptable prerequisite to advanced courses. *Prerequisite:* at least one year of high school mathematics. Four hours. Messrs. Gregg, Crooks, Whitcher and Allen and staff.

3-4 OUTLINE OF CHEMISTRY (3-3) Backgrounds of inorganic, organic, and biochemistry, primarily for students in nursing or for dental hygienists. Elective for others with the approval of the dean of their college and the chemistry department. *Prerequisite:* at least one year of high school mathematics. One year of high school chemistry or physics recommended. Four hours. Mr. Crooks and staff.

11-12 GENERAL CHEMISTRY (3-6) Lectures, recitations and laboratory, including general experiments in elementary qualitative and quantitative analysis. Recommended for those concentrating in physical science. *Prerequisite:* one year of high school chemistry and concurrent enrollment in mathematics 11 or 13 for chemistry 11. Five hours. Staff.

13, 14 THE CHEMICAL BOND Nature of interatomic and intermolecular forces. Stereochemistry, bond energies, and crystal structures are considered. *Prerequisite:* 1-2 or 11-12. One hour. Mr. Gregg.

16 INTRODUCTORY ORGANIC CHEMISTRY (3-3) A one-semester introduction to organic chemistry. This course is not a prerequisite for any other course in chemistry. Credit cannot be granted for 16 and also for 4 or 131. *Prerequisite:* 2 or 3 or 12. Four hours. Messrs. Krapcho, White, and Strauss.

123 QUANTITATIVE ANALYSIS (3-3) Theory and practice of gravimetric and volumetric methods of analysis. Theoretical discussion of indicators, buffers, pH, etc. *Prerequisite:* 1-2. Not open to students with credit for 11-12. Four hours. Mr. Whitcher.

131, 132 ORGANIC CHEMISTRY (3-3) Organic chemistry for chemistry majors, premedical students, and those concentrating in the biological and physical sciences. *Prerequisite:* 1-2 or 11-12; 131 for 132. Four hours (may be taken without laboratory for three hours credit by chemistry majors who intend to enroll in 134 and 135). Mr. White and staff.

134 ORGANIC CHEMISTRY LABORATORY (0-6) Laboratory practice in organic synthesis with an emphasis on separation and purification procedures. Introduction to spectral methods of structure identification. *Prerequisite:* 131. Two hours. Mr. White.

135 ADVANCED ORGANIC CHEMISTRY LABORATORY (1-6) Chemical and physical methods of identifying organic compounds. Advanced synthetic and separation procedures. *Prerequisite*: 132, 134. Three hours. Staff.

140 PHYSICAL CHEMISTRY FOR BIOLOGICAL SCIENCE STUDENTS Aspects of physical chemistry most pertinent to work in the biological sciences: acid-base equilibrium, theory of solutions, thermodynamics and kinetics. *Prerequisite*: 1-2, physics 5-6 or the equivalent. Three hours. Mr. Flanagan.

141, 142 PHYSICAL CHEMISTRY Elementary quantum chemistry, introduction to statistical mechanics, thermodynamics, properties of solutions and chemical kinetics. *Prerequisite*: 1-2 or 11-12; physics 16; mathematics 21; *Prerequisite for 142 is 141*. Three hours. Messrs. Weltin, Flanagan and Wulff.

144 PHYSICAL CHEMISTRY LABORATORY Basic physical chemistry experiments. *Prerequisite*: 11-12 or 123; 141; concurrent enrollment in 142. Two hours. Messrs. Flanagan, Weltin and Wulff.

Advanced Inorganic Chemistry

108 INORGANIC PREPARATIONS Laboratory preparations of inorganic compounds. *Prerequisite*: 1-2. Two hours. Mr. Crooks.

212 ADVANCED INORGANIC CHEMISTRY Electronic structure of atoms and molecules; valence bond and molecular orbital treatments of chemical bonding; inorganic stereochemistry; ionic crystals; inorganic thermochemistry; inorganic equilibria in solution; theories of acids and bases. *Prerequisite*: 141 or the equivalent. Three hours. Mr. Allen.

213 ADVANCED INORGANIC CHEMISTRY Descriptive chemistry of the elements and of various important classes of inorganic compounds; electron-deficient compounds; organometallic chemistry; inorganic reaction mechanisms. 213 may not be offered every year. *Prerequisite*: 212. Three hours. Mr. Waters.

214 INORGANIC CHEMISTRY LABORATORY Synthesis and characterization of inorganic compounds making use of a controlled atmosphere box, vacuum line, autoclave, photochemical reactor, X-ray diffraction equipment, infrared and ultraviolet-visible spectrophotometers, etc. *Prerequisite*: 212. Two hours. Staff.

311 PHYSICAL INORGANIC CHEMISTRY Ligand field theory, magnetic properties, magnetic resonance techniques (NMR, ESR and NQR), Mossbauer spectroscopy, and optical activity. *Prerequisites*: 213 or equivalent, 246 or permission of the instructor. Three hours. Staff.

350, 351 SPECIAL TOPICS IN INORGANIC CHEMISTRY Advanced theoretical treatment of bonding and physical properties of transition metal complexes; detailed consideration of the chemistry of various classes of inorganic compounds; detailed treatment of inorganic reaction mechanisms. Credit as arranged. Staff.

Advanced Analytical Chemistry

224 INSTRUMENTAL ANALYSIS (2-6) Theory and practice of optical, electrochemical, chromatographic, and radiochemical methods of analysis. *Prerequisite*: 11-12 or 123; 141 and credit for or concurrent enrollment in 142. Four hours. Mr. Whitcher.

229 SPECIAL TOPICS IN ANALYTICAL CHEMISTRY Discussion of selected topics in analytical chemistry. *Prerequisite:* departmental permission. Credit as arranged. Staff. Offered as occasion warrants.

Advanced Organic Chemistry

231 PHYSICAL ORGANIC CHEMISTRY—PRINCIPLES Structure-reactivity relationships, quantum organic chemistry, molecular properties and their interpretation, kinetics and catalysis. *Prerequisite:* 132 and 142 or 247. Three hours. Mr. Strauss. Alternate years, 1968-69.

233 PHYSICAL ORGANIC CHEMISTRY—MECHANISMS Methods and results of investigations of mechanisms of common organic reactions. *Prerequisite:* 132 and 142 or 247. Three hours. Mr. Krapcho. Alternate years, 1968-69.

251, 252 ADVANCED ORGANIC CHEMISTRY A detailed discussion of systematic organic chemistry with emphasis on important synthetic methods and stereochemistry. Kinetic and Stereochemical approaches to reaction mechanisms will be introduced. *Prerequisite:* 131, 132, credit or concurrent enrollment in 141-142, 251 for 252. Three hours. Messrs. Kuehne, Krapcho, and Strauss.

332 NATURAL PRODUCTS—THE ALKALOIDS The major classes of alkaloids will be surveyed from a biogenetic point of view. Classical and modern degradation methods, total syntheses and biosynthetic incorporation of labeled compounds will be discussed. *Prerequisite:* 252 or concurrent enrollment, or the equivalent with departmental permission. Three hours. Mr. Kuehne. Alternate years, 1968-69.

334 NATURAL PRODUCTS—THE TERPENES Chemistry of mono-sequi-di and triterpenes, including degradations, structure proofs, total syntheses, rearrangements reactions and biogenesis. *Prerequisite:* as for chemistry 332. Three hours. Mr. Kuehne. Alternate years, 1969-70.

336, 338 SPECIAL TOPICS IN ORGANIC CHEMISTRY Advanced level discussion of specific topics in organic chemistry of current interest such as photo-chemistry, carbenes, bio-organic chemistry, magnetic resonance, etc. *Prerequisite:* departmental permission. Credit as arranged. Staff. 336, 1969-70; 338, 1968-69.

Advanced Physical Chemistry

246 FUNDAMENTALS OF SPECTROSCOPY A general discussion of molecular spectroscopy, rotational and vibrational states of molecules, symmetry of vibrations; introduction to electronic spectra. *Prerequisite:* 141-142, mathematics 24 or permission of the instructor. Three hours. Staff.

247 INTRODUCTION TO QUANTUM MECHANICS General considerations of quantum mechanics. Development of techniques pertinent to the application of quantum mechanics to chemical problems. *Prerequisite:* 141-142 or equivalent. Three hours. Mr. Weltin.

248 CHEMICAL THERMODYNAMICS Systematic study of the application of thermodynamics to chemical problems. Concepts of statistical thermodynamics to be introduced. *Prerequisite:* 141-142 or equivalent. Three hours. Mr. Wulff.

249 **STATISTICAL MECHANICS** Development of statistical mechanics and its application to problems of chemical interest. *Prerequisite:* 141-142 or equivalent; 247 recommended. Three hours. Mr. Flanagan.

342 **CHEMICAL KINETICS** Fundamentals of chemical kinetics; collision theory, absolute rate theory, applications to organic and physical chemistry. *Prerequisite:* 247 and 248 or 249. Three hours. Staff. Alternate years, 1968-69.

344 **QUANTUM CHEMISTRY** Applications of quantum mechanical techniques to problems of chemical interest. *Prerequisite:* 247. Three hours. Mr. Weltin. Alternate years, 1968-69.

345, 346, 347 **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. Staff. Offered as occasion warrants.

Seminars and Research

Seminars are required of graduate students and seniors concentrating in chemistry.

184 **SENIOR SEMINAR** Oral and written presentation of a subject of current chemical interest. *Prerequisite:* audit of 381. One hour. Staff.

197, 198, 199 **UNDERGRADUATE RESEARCH** The student elects a field of special study in inorganic, analytical, physical, or organic chemistry and collaborates with an assigned staff member. Findings submitted in written form. *Prerequisite:* 1-2 or 11-12 and departmental permission. Credit as arranged with a maximum of four hours per semester and twelve hours for the undergraduate program. 197 is offered in the fall, 198 in the spring, and 199 in the summer.

371, 372 **METHODS OF CHEMICAL INVESTIGATION** Introduction to advanced modern chemical methods. Primarily for chemistry doctoral students. *Prerequisite:* departmental permission. Two hours. Staff.

380 **RESEARCH PROBLEM CONCEPTION AND SOLUTION** Independent origination of research problems and the methods of their solution. Required of all doctoral candidates. *Prerequisite:* two years of graduate work and departmental permission. Three hours. Staff.

381 through 384 **GRADUATE SEMINAR** One hour. Staff.

391 through 399 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

491 through 499 **DOCTORAL THESIS RESEARCH** Original research under the direction of an assigned staff member, culminating in an acceptable doctoral dissertation. Credit as arranged.

V Classics

COLLEGE OF ARTS AND SCIENCES

Professor Gilleland (Chairman); Associate Professors Ambrose, Bliss, and Davison; Assistant Professor Schlunk; Instructor McCarty

Greek

1-2 **ELEMENTARY GREEK** Essentials of Attic Greek. Prose compositions and selected readings from Greek authors. Four hours. Miss Davison.

11-12 **INTERMEDIATE GREEK** Review of syntax. Selections from Plato's dialogues, the speeches of Lysias, and Xenophon's *Hellenica*; Euripides' *Alcestis*. *Prerequisite*: 1-2 or its equivalent. Three hours. Mr. McCarty.

111-112 **PROSE COMPOSITION** Required of students who concentrate in Greek. *Prerequisite*: 11-12. One hour. Mr. Gilleland.

151 **GREEK DRAMA IN TRANSLATION** Plays of Aeschylus, Sophocles, Euripides, Aristophanes, and Menander. The historical development of dramatic techniques. *Prerequisite*: English 27, 28; six additional hours in literature and philosophy. Three hours. Mr. Gilleland. Alternate years, 1969-70.

153 **GREEK HISTORIANS IN TRANSLATION** Works of Herodotus, Thucydides, Xenophon, Polybius, Arrian, and others. Introduction to Greek historiography. *Prerequisite*: English 27, 28; six additional hours in literature and philosophy. Three hours. Mr. Schlunk. Alternate years, 1968-69.

193, 194 **COLLEGE HONORS**

195, 196 **SPECIAL TOPICS**

197, 198 **READINGS AND RESEARCH**

201 **GREEK ORATORS** Selected speeches of Lysias and Demosthenes. *Prerequisite*: 11-12. Three hours. Mr. Gilleland. Alternate years, 1969-70.

202 **GREEK COMEDY** Two plays of Aristophanes. *Prerequisite*: 11-12. Three hours. Mr. Ambrose. Alternate years, 1968-69.

203 **GREEK HISTORIANS** Thucydides, Books I and II; selections from Herodotus and Xenophon's *Hellenica*. *Prerequisite*: 11-12. Three hours. Mr. Bliss. Alternate years, 1968-69.

204 **GREEK TRAGEDY** Sophocles' *Antigone* and Euripides' *Medea*, or two equivalent plays. *Prerequisite*: 11-12. Three hours. Mr. Ambrose. Alternate years, 1969-70.

205 **GREEK PHILOSOPHERS** Plato, Republic, Books I and II; selections from the pre-Socratics and from Aristotle. *Prerequisite*: 11-12. Three hours. Mr. Schlunk. Alternate years, 1968-69.

206 GREEK EPIC Readings in the *Iliad* and *Odyssey*. Problems of epic composition and language together with mythological and historical background. *Prerequisite*: 11-12. Three hours. Miss Davison. Alternate years, 1969-70.

381, 382 SEMINAR Graduate level study of Greek authors not read in the candidate's undergraduate program. Credit as arranged. Staff.

391, 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

For Greek Philosophy, see philosophy 107; for Greek Art, see art 51.

Latin

1-2 ELEMENTARY LATIN Essentials of Ciceronian Latin. For students who present less than two years of high school Latin.¹ *Credit is allowed only if Latin 11-12 is also completed*. Four hours. Staff.

11-12 INTERMEDIATE LATIN Extensive review of Latin syntax. Selected speeches of Cicero; selections from Vergil and Ovid. *Prerequisite*: 1-2, or two years of high school Latin. Three hours. Staff.

32 ETYMOLOGY Derivation of English words from Greek and Latin bases. Training in analysis of unfamiliar words; special attention to scientific vocabulary. No previous knowledge of Greek or Latin required. Three hours. Staff.

101, 102 SURVEY OF LATIN LITERATURE Selections from the principal Roman authors, with particular attention to Livy and Horace. The development and decline of various prose styles and poetic forms, *Prerequisite*: 11-12 or three years of high school Latin. Three hours. Staff.

111-112 LATIN PROSE COMPOSITION May be taken concurrently with Latin 101, 102. Required of students who major in Latin and of those who wish to be recommended to teach Latin. *Prerequisite*: 11-12 or three years of high school Latin. One hour. Mr. Bliss.

152 ROMAN EPIC IN TRANSLATION Latin epic poetry, from Ennius to Ausonius; its development, fruition, and decline. *Prerequisite*: English 27, 28; six additional hours in literature and philosophy. Three hours. Mr. Ambrose. Alternate years, 1969-70.

154 ROMAN SATIRE IN TRANSLATION Roman satire, in both prose and poetry, from Lucilius to Lucian, and its influence on medieval and modern literary forms. *Prerequisite*: English 27, 28; six additional hours in literature and philosophy. Three hours. Mr. Bliss. Alternate years, 1968-69.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

1. Students who have completed two years of high school Latin more than two years prior to their entrance into the University must obtain departmental permission to enroll in Latin 1-2 for credit.

197, 198 READINGS AND RESEARCH

203 REPUBLICAN PROSE Reading in Caesar and Sallust, and in the speeches of Cicero. *Prerequisite:* 101, 102. Three hours. Mr. Ambrose.

204 EPIC POETS Reading in Lucretius, Vergil, Ovid, and others. *Prerequisite:* 101, 102. Three hours. Mr. Bliss.

227 ROMAN LYRIC POETS Selections from the works of Catullus, Horace, Propertius, Tibullus. *Prerequisite:* Latin 203 or concurrent enrollment therein. Three hours. Mr. Schlunk. Alternate years, 1968-69.

251 ROMAN LETTERS Selected letters of Cicero, Pliny, and Fronto. *Prerequisite:* 203, 204 or concurrent enrollment. Three hours. Mr. Bliss. Alternate years, 1969-70.

252 COMEDY Two plays of Plautus and Terence. Development of this literary form. *Prerequisite:* 203, 204 or concurrent enrollment. Three hours. Mr. Bliss. Alternate years, 1969-70.

253 ROMAN ORATORY Selections from Cicero's *De Oratore*, *Orator*, and *Brutus*, and from his speeches. Historical development of forensic and other rhetorical canons. *Prerequisite:* Latin 203, 204 or concurrent enrollment. Three hours. Mr. Gilleland. Alternate years, 1969-70.

255 HISTORIANS OF THE EMPIRE Augustus, *Res Gestae*; Tacitus, *Annals*, I-IV; selections from Suetonius and Ammianus Marcellinus. *Prerequisite:* 203, 204 or concurrent enrollment. Three hours. Miss Davison. Alternate years, 1968-69.

256 SATIRE Selections from Horace, Persius, and Juvenal. *Prerequisite:* 203, 204 or concurrent enrollment. Three hours. Mr. Gilleland. Alternate years, 1969-70.

271 SILVER LATIN Extensive reading of post-Augustan authors not included in other advanced courses. *Prerequisite:* 203, 204, and 6 additional hours in courses numbered above 200. Three hours. Mr. Bliss. Alternate years, 1968-69.

381 through 384 SEMINAR Graduate level study of Latin authors not read in the candidate's undergraduate program. Credit as arranged. Staff.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

For The Teaching of Latin, see secondary education 179.

For Roman Art, see art 52.

Dental Hygiene

DIVISION OF HEALTH SCIENCES

Assistant Professor Sawabini (Chairman); Instructors Bannister, Faigel, Farnham, Halebian, M. C. Heininger, P. L. Heininger, Lampert, Montgomery, Slack, Sloanaker, Slobodjnak and Wark

1 DENTAL HYGIENE (2) The dental hygiene movement; history, growth, status of dental hygienist, scope of operations, standards and ethics, personal qualifications and personality traits. Two hours. Staff.

2 DENTAL HYGIENE (0-6) Principles and technics of instrumentation for scaling and polishing teeth with use of manikins. Examination and charting of mouth and general clinical procedures. Three hours. Staff.

11 ORAL ANATOMY (2-4) Anatomy of head and neck; form and structure of teeth, nomenclature and relationship; calcification and eruption of teeth; drawing, carving, and identification of individual teeth. Four hours. Dr. Heininger.

22 GENERAL AND ORAL HISTOLOGY AND EMBRYOLOGY (2-2) Microscopic structure and development of the basic tissues of the body with emphasis on dental and oral material. Use of microscope, colored slide projections and drawings. Three hours. Dr. Wark.

31 MEDICAL EMERGENCIES (1-0) Basic principles of emergency aid taught to prevent and cope with emergencies that arise in the dental office. One hour. Mrs. Heininger.

51-52 PHARMACOLOGY AND ANESTHESIOLOGY (1-0) (1-0) The reactions and uses of drugs. Anesthesia, general and local, as used in dental practice. One hour. Dr. Farnham.

53-54 ORAL PATHOLOGY (2-2) General pathology of the more common diseases affecting the human body. Pathology of the teeth and their supporting structures. Two hours. Dr. Faigel.

55 PERIODONTICS (1-0) Classification of periodontal disease, clinical picture, etiological factors, and types of treatment. Particular emphasis is placed on the role of the hygienist in patient education for the prevention of periodontal disease. One hour. Dr. Faigel.

61-62 RADIOLOGY (1-1) Study, demonstration, and practice of the fundamentals of intra-oral radiographic technic including electrophysics; angulation of machine; placing of films and complete processing of films. One hour. Mr. Bannister and Dr. Slack.

72 DENTAL HEALTH EDUCATION (2-0) Demonstrations and practical applications of modern methods of dental health education. Teaching methods; visual aids; surveys and statistics; materials; campaigns; school dental programs. Two hours. Staff.

74 PUBLIC HEALTH (2-0) Public health as it applies to community sanitation; communicable disease control; organization, powers and function of health departments and voluntary health agencies; relation of dentistry to public health. Two hours. Dr. Montgomery.

81-82 CLINICAL DENTAL HYGIENE (0-15) Clinical practice on patients from simple to more difficult cases with children and adults. Field practice at local dental clinics, hospitals and in Children's Homes. Five hours. Staff.

91-92 DENTAL ASSISTING, DENTAL MATERIALS, ETHICS AND OFFICE MANAGEMENT (1-0) Principles of professional ethics and economics; office management and essentials of practice building; dental assistant and materials used in dental practice. One hour. Dr. Lampert.

V Economics and Business Administration

COLLEGE OF ARTS AND SCIENCES

Professors Dellin, Greif, Nadworny (Chairman), and Nyquist; Associate Professors Alnasrawi, Diamond, and Severance¹; Assistant Professors Bayer, Campagna, Chase, Laber, Michael, Nargund, and H. Squire; Instructors Erdmann, Schweyer, and Singleton

11, 12 PRINCIPLES OF ECONOMICS Fundamental economic principles as an aid to the understanding of modern economic society. *Prerequisite:* sophomore standing. Three hours. Staff.

13-14 PRINCIPLES OF ACCOUNTING (2-4) Problems of financial control of business, with laboratory practice. *Prerequisite:* sophomore standing. Four hours. Messrs. Michael and Singleton.

15, 16 ECONOMIC HISTORY OF THE UNITED STATES Analysis of capitalism as first developed in Western Europe and later in the United States as a basis for understanding our modern economic systems. Primarily for freshmen and sophomores. Three hours. Messrs. Dellin and Squire.

11 and 12 are prerequisites for all courses number 100 and above with the exception of accounting courses.

109, 110 BUSINESS LAW I First semester: fundamental legal concepts of the American system of law as related to business, as the law of contracts, sales, bailments, and negotiable instruments. Second semester: the legal aspects of business with reference to the law of agency, partnerships, and corporations. *Prerequisite:* 12, or concurrent enrollment. Three hours. Messrs. Erdmann and Schweyer.

121 PRINCIPLES OF MARKETING The place of marketing in our economy. Analysis of the marketing structure by functions, institutions, and commodities. *Prerequisite:* 12. Three hours. Messrs. Greif and Diamond.

1. On leave 1968-69.

122 **PROBLEMS IN MARKETING** Application of the case method to discover solutions to problems which challenge producers and middlemen in marketing goods and services. *Prerequisite:* 121. Three hours. Messrs. Greif and Diamond.

123 **PERSONAL SELLING IN THE ECONOMY** The personal selling function as a communication activity. Behavioral science areas are explored for insight into the selling process. Individual projects. *Prerequisite:* 122. Three hours. Mr. Greif.

127 **RESEARCH METHODS IN MARKETING** Introduction to the problems of methodology and design in marketing research. Topics include the basic design of proof, selection of economic designs, scaling, techniques, Bayesian applications, factor analysis, and forecasting methods. Individual research. *Prerequisite:* 122. Three hours. Mr. Diamond.

130 **SALES MANAGEMENT AND PROMOTION** Methods of selection, testing, training, compensation, and control. Principles and practices of creative selling. Sales organization analysis and the coordination of related department functions. *Prerequisite:* 122. Three hours. Mr. Greif.

132 **FUNDAMENTALS OF ADVERTISING** Advertising as an economic and social influence. Principles and techniques of copy preparation, selection of media and agency activities. Practice in preparation of advertising copy and layout. *Prerequisite:* 121. Three hours. Mr. Greif.

For Motion and Time Study, and Plant Organization, recommended for students in this option, see Engineering, Mechanical (ME. 175, 176).

141 **LABOR ECONOMICS** LABOR as an economic factor: the labor force, wages, productivity, and income. Wage and hour legislation, social security, and unemployment insurance. History of the American labor movement. *Prerequisite:* 12. Three hours. Messrs. Nadworny and Chase.

143 **INDUSTRIAL MANAGEMENT** Principles and practices employed in the direction and operation of industrial organizations. Techniques of organization and control of operations. Personnel function in an industrial structure. *Prerequisite:* 12. Three hours. Mr. Squire.

160 **INTRODUCTION TO INTEGRATED DATA PROCESSING AND COMPUTERS** A study of the nature of business data processing and a general introduction to the components and characteristics of electronic digital computers available for such processing. Included is a study of programming systems, systems analysis, system design, elementary flow charting, and processing procedures. Demonstration problems are prepared for processing at the University Computation Center. *Prerequisite:* 14. Three hours. Mr. Nyquist.

161-162 **INTERMEDIATE ACCOUNTING** An intensive examination of accounting theory, valuation methods, and classification procedures as they pertain to balance sheet accounts. Second semester: consideration of balance sheet accounts continued; problems of single entry systems and incomplete records; financial statement analysis covering comparative analysis, ratios and measurements; funds-flow and cash-flow reporting and effects of price changes. *Prerequisite:* 14. Three hours. Messrs. Michael and Singleton.

164 **BASIC FEDERAL TAXES** The federal income tax law; regulations cov-

ering taxable income, exclusions and inclusions, allowable deductions, exemptions, gains and losses, accounting methods, and computation of tax for all classes of taxpayers; Federal payroll taxes. Assigned research problems and a preparation of tax returns. *Prerequisite:* 14. Three hours. Messrs. Michael and Nyquist.

181 **TRANSPORTATION AND PUBLIC UTILITIES** Social and economic aspects of transportation problems as revealed by analysis of the nature, history, and problems of transportation public utilities agencies of the United States. *Prerequisite:* 12; political science 21, 22. Three hours. Mr. Squire.

183 **GOVERNMENT AND BUSINESS** Economic causes and consequences of government activities and their impact upon the private sector of the economy. *Prerequisite:* 12; political science 21, 22. Three hours. Messrs. Bayer and Squire.

188 **ELEMENTARY STATISTICS (2-2)** Analyses of variance index number theory and construction, time series analysis, analysis of correlation and regression, and non-parametric tests. *Prerequisite:* mathematics 110. Three hours. Mr. Nargund.

190 **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:* 11-12. Three hours. Mr. Campagna.

193, 194 **COLLEGE HONORS**

195, 196 **SPECIAL TOPICS**

197, 198 **READINGS AND RESEARCH**

201 **MONEY AND BANKING** Commercial and central banking with special attention given to the Federal Reserve System. Monetary theory and policy. *Prerequisite:* 12. Three hours. Mr. Alnasrawi.

203 **ECONOMICS OF TAXATION** Revenues and expenditures of federal, state, and local governments and their effects upon individuals, business institutions, and the national economy. *Prerequisite:* 12. Three hours. Mr. Campagna.

204 **STATE AND LOCAL FINANCE** Revenues, expenditures, and debt management problems of state and local governments; analysis of state and local fiscal relationships. Problems, policies and practices in Vermont and neighboring states. *Prerequisite:* 12. Three hours. Mr. Bayer.

205 **INTERNATIONAL TRADE AND FINANCE** Theory of international values, mechanism of adjustment of international balances, foreign exchange theory, international aspects of monetary and banking theory, and tariff theory. *Prerequisite:* 12, and a year of history. Three hours. Mr. Alnasrawi.

206 **PRINCIPLES OF INVESTMENTS** An analysis of the investment process, including an examination of types of financial assets, the markets in which such assets are traded, and factors affecting their values. *Prerequisite:* 12 and 14. Three hours. Staff.

207 **CORPORATE FINANCE** A study of the sources of financing and the efficient utilization of funds by corporations. Topics include capital budgeting, capital structure, dividend policy, and problems of financing new business ventures, large and small. *Prerequisite:* 12 and 14. Three hours. Mr. Michael.

216 **ECONOMIC DEVELOPMENT** Theories of economic growth applied to underdeveloped areas of the contemporary world, including the political and social determinants of economic progress. *Prerequisite:* 11-12, 193 recommended. Three hours. Messrs. Alnasrawi and Nargund.

228 **CURRENT MARKETING DEVELOPMENTS** Modern marketing theory and practice. Topics include: the nature of consumer changes; urban and suburban trading centers; the distribution cycle; marketing legislation; functional and institutional changes. *Prerequisite:* 122. Three hours. Messrs. Greif and Diamond.

229 **MARKETING MANAGEMENT** Formulation of overall policies and planning strategies for marketing programs. Product planning and development; channel selection; market and sales forecasts; advertising and sales campaigns. *Prerequisite:* 122. Three hours. Mr. Diamond.

238 **ECONOMIC HISTORY OF MODERN EUROPE** A comparative historical study of the process of economic growth as experienced in Britain, France, Germany, and Russia since 1760. For the economic history of pre-industrial Europe see history 237. *Prerequisite:* 12 and history 12. Three hours. Staff.

241 **MANPOWER IN AN ADVANCED ECONOMY** Fundamental changes in the structure of the American labor force; income, education, occupational distribution, and unemployment factors. Implications and impacts of Manpower Development and Training Act, Economic Opportunity Act, and other programs on manpower training and allocation. Income maintenance and manpower. *Prerequisite:* 141. Three hours. Messrs. Chase and Nadworny.

242 **COLLECTIVE BARGAINING** Subject matter, problems, and issues of union-management relationships. Structure and functions of collective bargaining in the economy. The grievance process and arbitration. Laws of collective bargaining. *Prerequisite:* 141. Three hours. Messrs. Nadworny and Chase.

251 **PERSONNEL ADMINISTRATION** The field and organization of the personnel function; selecting and training employees; job analysis and evaluation; evaluating employees; wages and wage administration; problems of morale; human relations in the supervision of personnel. *Prerequisite:* 141. Three hours. Mr. Nadworny.

252 **EXECUTIVE DECISION-MAKING** Synthesis of the management and operation of a firm in terms of production, marketing, personnel, and finance. The process of decision-making, planning and execution of policies. *Prerequisite:* 121, 143, and a course in finance. Three hours. Messrs. Nadworny and Squire.

254 **SCIENTIFIC MANAGEMENT AND LABOR** Development of scientific management; reactions and relationship of organized labor to it. Long-range effects of scientific management on the structure and policies of industry and organized labor. *Prerequisite:* 143. Three hours. Mr. Nadworny.

256 **AMERICAN BUSINESS HISTORY** Evolution of firms and industries from relatively small and undifferentiated establishments to large, highly complex institutions of the present day. Selected studies in textiles, machinery, transportation, steel, coal, electric machinery, insurance, communication, retail, and others. The roles of federal and state governments and of legislation. Developments in American management. *Prerequisite:* 143. Three hours. Mr. Nadworny.

258 **PROBLEMS OF COMMUNISM** (same as political science 258) A comparative study of economic and political problems of applied communism with particular emphasis on current developments in selected Communist countries. *Prerequisite:* Twelve hours in history and/or social sciences. Three hours. Mr. Dellin.

266 **ADVANCED ACCOUNTING** Accounting for partnerships, ventures, consignments, installment sales, insurance, statement of affairs, receivers, realization and liquidation, estates, trusts, home offices and branches, and parent and subsidiary accounting. *Prerequisite:* 162. Three hours. Mr. Nyquist.

271 **AUDITING** Theory and practice of auditing applicable to the work of the internal and external auditor; auditor's responsibility, types of audits, and audit programs. Illustrative audit working papers, financial statements, and audit reports prepared and discussed. *Prerequisite:* 266. Three hours. Mr. Michael.

272, 273 **COST ACCOUNTING** The nature of manufacturing costs and conventional methods of accumulating, summarizing, and interpreting them. Special problems in job order, process and standard costs. Second semester, joint and by-product costs; problems of waste and spoilage; inventory planning, capital budgeting; accounting systems including EDP; statistical methods and operations research. *Prerequisite:* 14, 272 for 273. Three hours, Mr. Nyquist.

276 **C.P.A. PROBLEMS** Review of questions and problems from past C.P.A. examinations. Including: partnerships, corporations, financial statements, auditing, cost accounting, insolvencies, receiverships, liquidations, consolidations, estates, trusts, governmental and institutional accounting methods. *Prerequisite:* 266. Three hours. Mr. Nyquist.

277 **INTRODUCTION TO OPERATIONS RESEARCH** Application of quantitative techniques to the formulation and solution of economic and business problems. Topics include demand and cost analysis, forecasting methods, linear programming, inventory and queuing theory. *Prerequisite:* 188. Three hours. Mr. Diamond.

285 **COMPARATIVE ECONOMIC SYSTEMS** Major economic systems, their theoretical models, basic institutions and practical varieties, from a comparative point of view. *Prerequisite:* 11-12 and six hours in another social science. Three hours. Mr. Dellin.

286 **MICROECONOMIC THEORY** Analysis of consumer demand, supply, market price under competitive conditions and monopolistic influences, and the theory of income distribution. *Prerequisite:* 12 and one other semester course. Three hours. Mr. Laber.

289 **QUANTITATIVE METHODS IN BUSINESS (2-2)** Application of statistical tools to industrial problems. Control charts, sampling plans, index numbers, and measurement of trends. *Prerequisite:* 188. Three hours. Mr. Nargund.

290 **THE SOVIET ECONOMY** Analysis of the economic development of the USSR, its structure, performance and direction. Seminar. *Prerequisite:* 12 and six hours in another social science. Three hours. Mr. Dellin.

291 **ECONOMIC PATTERNS AND POLICIES OF EASTERN EUROPE** An area approach to the resources, organization, and domestic and foreign economic policies of the Communist countries of Eastern Europe, with special emphasis on recent changes. *Prerequisite:* 12 and six hours in another social science. Three hours. Mr. Dellin.

292 **INTERNATIONAL ECONOMIC PROBLEMS AND POLICIES** Important aspects of international cooperation and conflict in the economic sphere; quest for foreign markets, raw materials, investment opportunities, and population outlets. *Prerequisite:* 12. Three hours. Mr. Alnasrawi.

295 **DEVELOPMENT OF ECONOMIC THOUGHT** Development of economic ideas. The Pre-classical, Classical, Socialist, Neo-Classical, Keynesian Schools and individual theoreticians. *Prerequisite:* 286 or concurrent enrollment. 193 recommended. Three hours. Mr. Dellin.

297, 298 **SEMINAR** For students concentrating in the department. Review of recent books and periodic literature; discussions of topics of contemporary interest; student reports based upon personal investigation. *Prerequisite:* senior standing; departmental permission. Three hours. Staff.

300, 301 **INDEPENDENT READING AND RESEARCH** Designed to meet the special research problems of graduate students. Departmental consent required. Hours to be arranged. Staff.

341 **MANAGERIAL ECONOMICS** Techniques used in management decision-making and forward planning. Operations research techniques and advanced quantitative methods applied to operating problems in business. *Prerequisite:* 289, 193, and 286. Three hours. Messrs. Diamond and Campagna.

353 **BUDGET PROCEDURE AND CONTROL** Principles and procedures of preparing budgets and analyzing performance under a budgetary program. Development of sales, production, materials, purchases, labor, capital additions, and cash budgets is demonstrated by coordinated problems assignment. *Prerequisite:* 161 or equivalent and 272. Three hours. Mr. Nyquist.

367 **ADVANCED ECONOMIC STATISTICS** Theories and techniques of statistical analysis; probability, sampling, design of experiments, tests of statistical hypotheses, statistical estimation, regression, correlation, statistical demand and cost functions, econometric methods and models as tools of structural analysis, economic projections. *Prerequisite:* mathematics 110 and economics 188 or its equivalent and mathematics 7, 8 or 11, 12. Three hours. Messrs. Campagna and Nargund.

377 **ADVANCED ECONOMIC THEORY** Macro- and micro-economic models presented and analyzed. Advanced market structure theories; theory of games, general equilibrium, and dynamic models. *Prerequisite:* 286. Three hours. Staff.

391 through 393 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

V Education

COLLEGE OF EDUCATION

Professors Baker (Chairman), Hunt, Lidral, Pappoutsakis, Rippa, and Steeves; Associate Professors Boller, Gobin, Melendy, Petrusich, Redmond, Sekerak, and Zimmerli; Assistant Professors Christensen, Dunkley, Lang, Larson, Leggett, McKenzie, Peterson, Riley, Schultz, and Weinrich; Instructors Chase, Corologos, Lambert, Lange, Walker

For students who are not in teacher education, courses in education are open only by permission of the Chairman of the Department of Education. In pre-service programs, 200-level courses in education are recommended only for graduate students.

2 FOUNDATIONS OF EDUCATION Social foundations of education; development of American education; education as a profession. Two hours. I or II. Staff.

7 EDUCATIONAL PSYCHOLOGY Principles of educational psychology as drawn from research, theory, and educational practice. A study of the learning process, its determining conditions, and its results. *Prerequisite:* junior standing, not open to students who take education 145-146. Three hours. Staff.

145-146 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:* junior standing. Three hours. Staff.

190 HISTORY OF EDUCATIONAL THOUGHT Educational ideas from the seventeenth century to the present with emphasis upon the historical development of the American school. *Prerequisite:* senior standing. Three hours. Miss Boller and Mr. Rippa.

202 PHILOSOPHY OF EDUCATION Educational theory and philosophy past and present; contributions of leading educational philosophers; the interrelationships of education, society, and philosophy. *Prerequisite:* twelve semester hours in education and psychology. Three hours. Miss Boller and Mr. Rippa.

205 HISTORY OF AMERICAN EDUCATION History of principles and practices in American education as they relate to social, economic, political, and cultural developments. *Prerequisite:* twelve hours in education and psychology, or a major in history. Three hours. Mr. Rippa.

211 EDUCATIONAL MEASUREMENTS Essential principles of measurement in education; test construction, application, and analysis. *Prerequisite:* twelve semester hours in education and psychology. Three hours. Mr. Steeves.

220 PERSONALITY DEVELOPMENT AND MENTAL HYGIENE Study of personality and behavior theory as related to problems of individual adjustment and growth. The personality and problems of the teacher, problems of the pupil, and experiences in the family, school, and community are considered in plan-

ning ways of dealing with individual adjustment and in formulating programs of mental hygiene. Three hours. Mr. Riley.

222 IMPROVEMENT OF READING INSTRUCTION IN THE ELEMENTARY SCHOOL A comparative analysis of current and emerging philosophers, progress and practices for teaching reading in the elementary school. Examination and evaluation of basal textbook, individual and specialized reading programs. *Prerequisite*: twelve hours in education and/or psychology including an introductory course in reading. Three hours. Mrs. Lang.

223 READING PROGRAMS IN SECONDARY SCHOOLS AND COLLEGES Relationship of reading to learning; study of organization, procedures, and materials for developing reading improvement programs for secondary schools and college students, reading in content areas. *Prerequisite*: twelve hours in education and/or psychology, including an introductory course in reading or departmental permission. Three hours. Mrs. Lang.

248 EDUCATIONAL MEDIA Modern instructional aids, theory and practice; educational media related to psychology of teaching and learning. *Prerequisite*: twelve hours in education and psychology. Three hours. Mr. Sekerak.

250 GUIDANCE IN EDUCATION Introduction to guidance as an organized function of education; bases of modern guidance practices; the school testing program; relationship of guidance to the curriculum; counseling techniques for classroom teachers. *Prerequisite*: twelve semester hours in education and psychology. Three hours. Mr. Peterson.

275 ANALYSIS OF READING AND RELATED LANGUAGE DIFFICULTIES An interdisciplinary approach to the analysis and evaluation of learning difficulties with an emphasis on reading and writing. Examination of the nature of difficulties; procedures and materials used for the assessment of reading performance. Practice with children is required. *Prerequisite*: twelve hours in education and psychology, including an introductory course in reading or departmental permission. Three hours. Mr. Hunt.

282 ADMINISTRATION AND ORGANIZATION OF GUIDANCE PROGRAMS Consideration is given to policies and procedures for organizing guidance services at all school levels and to guidance functions and relationships of school staff, including administrators, teachers, and guidance specialists. Procedures for instituting and carrying out programs of in-service training and evaluation of guidance activities are examined. *Prerequisites*: an introductory course in guidance and 12 hours in education and psychology. Three hours. Mr. Riley.

284 COUNSELING The process and technique of counseling with emphasis on the sociological and psychological bases. Counseling will be presented as a specialized form of teaching with consideration of its various techniques; interviews, group work, test interpretation, and analysis of case material. *Prerequisite*: graduate standing and twelve hours in education and psychology or candidacy in a program for higher education. Three hours. Mr. Peterson.

297, 298 PROBLEMS IN EDUCATION Individual research problem to be selected prior to enrollment by the student in consultation with a staff member. *Prerequisite*: twelve hours in education and psychology. Endorsement by a sponsoring faculty member. Credit to be arranged. Staff.

351 **UNDERSTANDING THE INDIVIDUAL** A course designed to develop understanding and skills in collecting and interpreting data to help the individual acquire self-understanding. Considerable attention will be devoted to the interpretation of group and individual tests and inventories commonly used by guidance counselors and other pupil personnel workers. *Prerequisite:* 12 hours in education and psychology. Three hours. Mr. Riley.

378 **ADVANCED STUDY IN RESEARCH IN READING AND RELATED LANGUAGE ARTS** Survey of past and current research, comparison and evaluation of emerging programs, design and development of projects in reading through group and individual study. *Prerequisite:* fifteen hours in education including nine hours in the field of reading and language education or departmental permission. Three hours. Mr. Hunt.

379 **SEMINAR IN READING INSTRUCTION** Study of reading relative to total curriculum. Examination and analysis of significant trends and concepts related to specific problems and programs in reading and language arts instruction. Study of the role of the supervisor and the reading consultant. *Prerequisite:* fifteen hours of education including nine hours in the field of reading and language education, or departmental permission. Three hours. Mr. Hunt.

384 **PRACTICUM IN COUNSELING** Supervised experiences in individual and small-group counseling situations. Provides opportunity to relate counseling theory to actual situations and to develop counseling relationships. *Prerequisite:* Counseling 284 and departmental permission. For those nearing completion of a program in guidance. Three hours. Mr. Peterson.

391 through 399 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

Elementary Education

3, 4 **CHILD AND COMMUNITY** Supervised experiences with children's groups in the community. One hour. Miss Boller.

121 **READING AND LANGUAGE ARTS** Principles underlying teaching reading; materials of instruction; reading readiness; vocabulary development; development of correct study skills; reading in the Language Arts program; observation in elementary school. Three hours. Mrs. Lang.

134 **CHILDREN'S LITERATURE AND LANGUAGE ARTS** Traditional and modern children's literature in prose and poetry; appreciation and evaluation of literature for children of all age levels; techniques of story telling; literature in the Language Arts program. Three hours. Mrs. Lang.

140 **ART FOR THE ELEMENTARY SCHOOL** Purposes and methods of contemporary art education in the development of the child. Lectures, discussions, and direct experience in creative art for classroom teachers. Three hours. Mrs. Walker.

144 **TEACHING SCIENCE AND SOCIAL STUDIES** Curriculum, teaching methods, materials in the social studies and science in the elementary school. Observation and participation in elementary schools. Three hours. Miss Petrusich and Mr. Redmond.

160 **TEACHING MATHEMATICS AND CRITICAL THINKING** Curriculum, teaching methods, materials in mathematics in the elementary school, development of critical thinking. Three hours. Miss Boller and staff.

161 **STUDENT TEACHING** Eight full weeks of teaching in the elementary schools of Burlington and vicinity under the guidance of cooperating teachers and college supervisors. *Prerequisite:* senior standing; approval of the supervisors of student teaching. Eight hours. Miss Boller, Mrs. Lang, Miss Petrusich, and Mr. Redmond.

Secondary Education

15 **PARTICIPATION** A minimum of thirty clock hours of observation and participation in classroom work in junior and senior high schools. Weekly seminars on campus. *Prerequisite:* departmental permission. Two hours. Mr. Redmond, Mr. Steeves and staff.

178 **SECONDARY METHODS AND PROCEDURES** General methods of secondary school instruction; classroom problems common to all teachers. *Prerequisite:* satisfactory completion of six hours in education; senior standing; acceptance in teacher education. Three hours. Taken coordinately with student teaching. Mr. Ratcliffe, Mr. Steeves, and staff.

179 **CONTENT, CURRICULUM, METHODS AND MATERIALS IN SPECIAL SUBJECT AREAS** (Latin, mathematics, romance languages and social studies) *Prerequisite:* education 178 and acceptance in teacher education. Two hours. Staff.

181 **STUDENT TEACHING IN SECONDARY SCHOOLS** Eight full weeks of teaching in the public schools of Vermont under the guidance of cooperating teachers, principals, and college supervisors. *Prerequisite:* 15, 178 and 145-146; high achievement in professional courses and in appropriate teaching fields; acceptance in teacher education. Candidates must make written application at least one full semester in advance of the teaching assignment. Eight hours. Mr. Ratcliffe, Mr. Steeves and staff.

182 **SEMINAR FOR PROSPECTIVE TEACHERS OF ENGLISH** (See English 182).

217 **SECONDARY SCHOOL CURRICULUM** Principles and problems in curriculum development for secondary schools. *Prerequisite:* twelve hours of education and psychology. Three hours. Staff.

303-304 **PROBLEMS AND RESEARCH IN TEACHING SECONDARY SCHOOL ENGLISH** (See English 303-304).

381-382 **TEACHING INTERNSHIP** Supervised teaching experience in cooperating schools with related seminar in the special subject field. *Prerequisite:* undergraduate courses leading to certification; acceptable preliminary field experience; acceptance in graduate program. Three to six hours. Staff.

Music Education

For applied music class study see 71, 72 under Music Department.

131 **MUSIC METHODS** Methods and materials in the teaching of vocal and instrumental music in elementary and secondary schools. *Prerequisite:* 145-146 and senior standing in music education. Five hours. Mr. Schultz.

151 **STUDENT TEACHING IN MUSIC** Seven weeks of teaching in the public schools of Vermont under the guidance of cooperating teachers, principals, and college supervisors. *Prerequisite*: concurrent enrollment in 131 and departmental permission. Seven hours. Mr. Schultz.

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. *Prerequisite*: senior standing as a music education major. Three hours. Staff.

291 **PSYCHOLOGY OF MUSIC** Psychological dimensions of tone and rhythm; the learning process in music; emotional and aesthetic response; musical ability; musical behavior and its measurement; American and European viewpoints and contributions. *Prerequisite*: 145-146 or psychology 1 and 205. Three hours. Mr. Lidral.

390 **ORGANIZATION AND ADMINISTRATION OF MUSIC EDUCATION** A study of the organization and administration of vocal and instrumental music in the public schools. *Prerequisite*: graduate standing in music education and teaching experience. Three hours. Mr. Schultz.

Physical Education

100 **PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL** Knowledge of basic skills and techniques for teaching, organizing, and administering the elementary school physical education activities program. Three hours. Mr. Dunkley and Miss Zimmerli. (Two hours, elementary education students only).

116 **HEALTH EDUCATION** Concepts of health of special significance for the teacher; includes mental health, sex education, nutrition and weight control, fatigue and relaxation, common and communicable disease, drugs, and basic first aid. Three hours. Mr. Gobin and Mr. Lambert. (Two hours, elementary education students only).

123 **COACHING BASEBALL AND FOOTBALL (2-2)** Theory and technique of coaching interscholastic baseball and football. Includes practice, game and schedule organizations. *Prerequisite*: skill competency in baseball and football, and junior standing. Three hours. Mr. Holmquist and Mr. Clifford.

124 **COACHING TRACK AND WRESTLING (2-2)** Analysis and practice of the skills, technique and knowledges involved in coaching interscholastic track and wrestling. *Prerequisite*: skill competency in track and wrestling, and junior standing. Three hours. Mr. Nedde. Alternate years 1969-70; 1971-72.

125 **COACHING SOCCER AND BASKETBALL (2-2)** Theory and technique of coaching interscholastic soccer and basketball. Includes practice game, and schedule organization. *Prerequisite*: skill competency in soccer and basketball, and junior standing. Three hours. Mr. Greig and Mr. Loche.

126 **COACHING GYMANSTICS AND AQUATICS (2-2)** Analysis and practice of skills, techniques and knowledges involved in teaching and coaching gymnastics and aquatics. *Prerequisite*: skill competency in gymnastics and aquatics, and junior standing. Three hours. Mr. Dunkley and staff. Alternate years 1970-71; 1972-73.

127 **COACHING WOMEN'S TEAM SPORTS (2-2)** Classroom and laboratory experiences designed to acquaint students with skill progressions, teaching techniques, selection and care of equipment, source materials, and coaching techniques of the following activities: soccer, speedball, field hockey, volleyball, softball, lacrosse, and basketball. *Prerequisite:* skill competency and junior standing. Three hours. Miss Lange and staff.

128 **COACHING WOMEN'S INDIVIDUAL AND DUAL SPORTS (2-2)** Classroom and laboratory experiences designed to acquaint students with skill progressions, teaching techniques, selection and care of equipment, source materials, and coaching techniques in a variety of individual and dual sports including golf, tennis, skiing, skating, and others. *Prerequisite:* skill competency and junior standing. Three hours. Miss Lange and staff.

154 **INTRODUCTION TO RECREATION** Recreation and recreation education; theory and practice of recreational activities for youth and adults. Two hours. Mr. Lambert. (Accelerated).

155 **PHYSICAL EDUCATION IN SECONDARY SCHOOLS** Practice in activity and activity teaching methods in team, individual, dual, recreational sports and other media of physical education suitable for secondary grades. Three hours. Miss Zimmerli and Mr. Gobin.

Number	Title	Credit Hours
S271	Laboratory Experiences in Kindergarten Education	3
S276	Laboratory Experiences in Reading and Related Language Instruction	3
S277	Seminar in Educational Psychology	3
S280	Professional Problems in Education	3
S281	Occupational Information	3
S283	Group Testing in Guidance	3
S285	Individual Testing	3
S286	Interpretation for School Counselors	3
S299	Research Methods in Education	3
S385	Student Personnel Services in Higher Education	3

156 **CURRICULUM IN PHYSICAL EDUCATION** A study of student developmental needs and interests, objectives, and contemporary curricular designs for implementing the physical education program. *Prerequisite:* 168. Three hours. Mr. Gobin. Alternate years 1970-71; 1972-73.

157 **PREVENTION AND CARE OF ATHLETIC INJURIES (1-2)** Prevention, recognition and care of injuries related to school physical education and athletic programs. *Prerequisite:* 22, 116, or a valid first aid certificate. Two hours. Mr. Bryant.

158 **ORGANIZATION AND ADMINISTRATION OF HEALTH AND 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. Mr. Christensen and Miss Zimmerli.

166 KINESIOLOGY (2-2) Study of articulation, muscular action, and basic principles of body mechanics as a foundation for the analysis of motor performance in physical education activities, athletics, and physical therapy. *Prerequisite:* 167. Three hours. Mr. Leggett.

167 PHYSIOLOGY OF MUSCULAR ACTIVITY (2-2) Study of the effects of physical exercise upon the circulatory, respiratory, digestive, and nervous systems. Relationship of endurance, fatigue, training and nutrition to the efficiency of physical performance. *Prerequisite:* 166. Three hours. Mr. Leggett.

168 TESTS AND MEASUREMENTS IN PHYSICAL EDUCATION (2-2) Principles and techniques in evaluation of instruction in health and physical education. Emphasis is given to test selection, administration, construction, application of statistical procedures, and development and interpretation of research data. Three hours. Mr. Greig. (Accelerated).

169 HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION The development of physical education; functions of physical education in society; underlying principles and concepts. Three hours. Mr. Gobin. Alternate years 1969-70, 1971-72.

170 PHYSICAL EDUCATION FOR THE ATYPICAL (2-2) Recognition, prevention, and correction of functional and structural deviations from normal body mechanics. Special emphasis given to the organization of programs adapted to the needs of physically, emotionally, and mentally handicapped children. *Prerequisite:* sophomore standing. Three hours. Staff.

216 HEALTH EDUCATION Methods and materials of teaching. History, principles, aims, and objectives, problem areas, construction, organization and administration of school health curricula. *Prerequisite:* P.E. 116 or 12 hours in education and psychology. Three hours. Mr. Gobin.

For information on the curriculum for prospective teachers of physical education and athletic coaches see page 88.

Other Courses in Education

In addition to the courses offered during the academic year, the following courses may be offered in summer sessions and in the evening division program.

Number	Title	Credit Hours
S75	Driver Education Workshop, Basic	2
S109	Science Methods	3
S110	Teaching Social Studies (elementary)	3
S118	Guiding Elementary School Pupils in Music Experiences	3
S122	Developmental Reading	3
S132	Teaching Arithmetic	3
S142	Audio-Visual Materials and Methods	3
S150	Intensive Teacher Preparation	4
S172	The Creative Process Through Art	3
S175	Driver Education, Advanced	2
S201	Administration of the Athletic Program	3
S203	Principles of Physical Education	3

<i>Number</i>	<i>Title</i>	<i>Credit Hours</i>
S204	History of European Education	3
S206	Comparative Education	3
S209	Education of Teachers of the Mentally Retarded—I Early Years	3-6
S210	Education of Teachers of the Mentally Retarded II— Later Years	3-6
S212	Child and Adolescent Development	3
S213	Statistical Methods in Education	3
S214	The Slow Learner (Education of the Exceptional Child) ...	3-6
S215	The Gifted Child	3
S218	Workshop in Curriculum	4
S219	Workshop in Economic Education	4
S220	Personality Development and Mental Hygiene	3
S225	Teaching Social Studies in the Secondary School	3
S227	Teaching Science in the Secondary School	3
S228	Literature in the Junior-Senior High School Curriculum (Literary Criticism for Teachers)	3
S229	Communicative Arts in Secondary Schools (Teaching English in Secondary Schools)	3
S230	The Elementary School Principalship	3
S231	The Secondary School Principalship	3
S232	School Administration	3
S235	Seminar in Educational Supervision	3
S237	Public Relations in Education	3
S241	Science Methods (Science for Elementary Schools)	3
S242	Modern Trends in Elementary Education	3
S244	Social Studies in the Elementary School	3
S255	The School as a Social Institution	3
S256	Methods and Materials in Elementary School Mathematics ..	3
S257	Teaching Mathematics in the Secondary Schools	3
S259	Teaching Foreign Language	3
S260	Improvement in Teaching Bookkeeping and Basic Business Subjects	3
S261	Seminar in Business Education	3
S262	Principles, Problems, and Trends in Business Education	3
S263	Improvement in Teaching Secretarial Subjects	3
S264	Business Education Curriculum	3
S270	Kindergarten Methods and Organization	3

Engineering, Agricultural

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professor Schneider (Chairman); Associate Professor Arnold; Assistant Professor Bornstein

154 AGRICULTURAL MACHINERY AND EQUIPMENT (2-2) Theory, design, operation and maintenance of agricultural machinery and equipment. *Prerequisite:* civil engineering 130 and 131. Three hours. Mr. Arnold. Alternate years, 1969-70.

155 SOIL AND WATER ENGINEERING (2-2) Study of hydrologic, hydraulic, and agronomic principles as related to design and installation of drainage and irrigation systems, erosion control facilities, farm and small watershed flood control reservoirs, and stream channel improvements. Philosophy of soil and water conservation. *Prerequisite:* plant and soil science 61, civil engineering 53. Three hours. Mr. Bornstein. Alternate years, 1969-70.

158 FARM POWER MACHINERY (2-2) Theory, design, operation, and maintenance of tractors and their engines. *Prerequisite:* mechanical engineering 113, civil engineering 131 or concurrent enrollment. Three hours. Mr. Arnold. Alternate years, 1969-70.

Engineering, Civil

COLLEGE OF TECHNOLOGY

Professors Oppenlander (Chairman), Milbank; Associate Professors Dawson, Knight, and Fay, Assistant Professors Downer, and Condren; Instructor Dunham; Visiting Assistant Professors Dorwart, Kunkle, Stearns

24 STATICS (3-0) Fundamentals of statics; composition and resolution of forces; the analysis of force systems in two and three dimensions, centroids and moments of inertia. *Prerequisite:* mathematics 14. Three hours. Staff.

51 SURVEYING (3-4) Fundamental surveying methods; propagation of errors as applied to surveying measurements; triangulation; control surveys and traverse adjustments. *Prerequisite:* mathematics 13. Four hours. Mr. Dunham.

52 GEOMETRONICS (2-4) Selected items in analytical photogrammetry; elements of photo-interpretation; theory of curves and earthworks. *Prerequisite:* mathematics 14 and 51 or 53. Three hours. Mr. Dunham.

53 PLANE SURVEYING (3-4) Fundamental surveying methods; elements of topographic surveying; special problems as presented in fields affected. For those not enrolled in civil engineering. *Prerequisite:* mathematics 9 and 2. Four hours. Staff.

114 MECHANICS OF MATERIALS LABORATORY (0-3) Experimental stress analysis methods; fundamental properties of metals, plastics, and wood; the effects of size, shape, method and speed of loading, and strain history on these properties. *Prerequisite:* 131. One hour. Staff.

130 DYNAMICS (3-0) Fundamentals of kinematics covering rectilinear and curvilinear motion, relative motion, Coriolis acceleration, translation, rotation, and plane motion. Fundamentals of kinetics covering translation, rotation, and plane motion of particles and rigid bodies; work, energy, power; impulse and momentum; simple harmonic motion. *Prerequisite:* 24, also mathematics 14. Three hours. Staff.

131 MECHANICS OF MATERIALS I (3-0) The elastic and plastic behavior of materials; normal and shearing stresses from axial, torsional, and flexural loading combinations; deflections due to torsion and bending; applications to statically indeterminate members; analysis of plane stress and strain; failure theories, and design criteria. *Prerequisite:* 24; also mathematics 14. Three hours. Staff.

140 STRUCTURAL ANALYSIS I (3-3) Analysis and design of statically determinate structures; prefaced by consideration of function, expected loads, reactions, material choice, and layout of members. Influence lines; criteria for positioning moving loads; design of steel and timber members under combined bending and axial load; base plates; eccentric connections. Laboratory practice in the graphic statics and design computations, including use of electronic computation methods. *Prerequisite:* 131. Four hours. Mr. Knight.

151 ENGINEERING CONTRACTS (2-0) Contract law and engineering specifications, ethics and professional conduct. *Prerequisite:* junior standing. Two hours. Mr. Milbank.

155 REINFORCED CONCRETE (3-0) Analysis of stresses in plain and reinforced concrete members. Design of reinforced concrete structures. Theory of prestressed concrete. *Prerequisite:* concurrent enrollment in 175. Three hours. Mr. Milbank.

158 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:* 155 and 173. Four hours. Mr. Milbank.

162 HYDRAULICS (3-3) Mechanics of fluids with emphasis on incompressible fluids; flow meters; flow in closed conduits and open channels; elements of hydraulic machinery. Laboratory studies of flow in closed conduits and open channels; experiments with hydraulic machinery. *Prerequisite:* 130. Four hours. Staff.

165 SANITARY ENGINEERING I (3-0) Quantities of water and waste water; the role of the earth sciences in the development and control of surface and ground water supplies, transmission of water and waste water. *Prerequisite:* 162. Three hours. Mr. Downer.

166 SANITARY ENGINEERING II (2-3) Characteristics of water and waste water; study of basic mechanisms involved in treatment, role of microbiology in waste stabilization, natural purification of streams. Laboratory pilot plant studies, chemical and biological analyses. *Prerequisite:* 162, 165, chemistry 1-2. Three hours. Staff.

173 SOIL MECHANICS I (2-6) Identification, description, and physical properties of soils and other particulate systems; subsurface exploration; and engineering characteristics of natural deposits. Consideration of stress distribution, permeability, consolidation, shear strength, and stability. Laboratory practice in testing for: index properties, permeability, consolidation, shear, and the effects of additives and cementing agents on particulate systems, as illustrated by Portland cement and bituminous concretes. *Prerequisite:* 131 and senior standing. Four hours. Mr. Knight.

174 TRANSPORTATION ENGINEERING (3-0) Analysis of transportation systems; planning studies for highways, airports, rail and mass transport, pipelines, and belt systems. Traffic flow phenomena and geometric design. Economic analysis during planning, design, and construction phases; critical path scheduling techniques. *Prerequisite:* 51 and junior standing. Three hours. Mr. Knight.

175 STRUCTURAL ANALYSIS II (3-0) Analysis of statically indeterminate structures by consistent deformation, least work, slope deflection, and moment distribution; prefaced by determinations of deflections by virtual work, moment area, conjugate beam, and Williot-Mohr diagram. Continuous structures and an introduction to structural dynamics. *Prerequisite:* 140. Three hours. Staff.

176 ADVANCED STRUCTURAL DESIGN (3-3) Advanced theory and design of structures with emphasis on continuous frames and trusses. Consideration of wind stress analysis, space frames, moment connections, and camber diagrams. Comparative studies of specifications for design in steel; aluminum design. Laboratory problems in design of steel building frames and continuous highway girder and truss bridges. *Prerequisite:* 175. Four hours. Mr. Knight.

180 ENGINEERING INVESTIGATION Independent investigation of a special topic under the guidance of a staff member. The course work may consist of library investigations, unique design problems, laboratory and field studies. Preparation of a formal report on the problem is required. *Prerequisite:* senior standing and departmental permission. Three hours. Staff.

231 MECHANICS OF MATERIALS II (3-0) Study of stresses and strains at a point under plane and three-dimensional loading using Mohr's circle; failure theories; energy methods; plastic design; buckling of plates and shells. *Prerequisite:* 176 or concurrent enrollment. Three hours. Staff.

232 ADVANCED DYNAMICS (3-0) Study of Coriolis acceleration; gyroscopic forces; dynamic measurements; vibrations, earthquakes, and blast shocks on structures. *Prerequisite:* 130, 131, mathematics 201. Three hours. Mr. Fay.

234 ADVANCED MECHANICS OF MATERIALS (3-0) The theory of elasticity with applications to curved beams, combined stresses, torsion of non-circular sections; relaxation procedures. *Prerequisite:* 131, mathematics 201. Three hours. Staff.

235 PHOTOELASTICITY (2-3) Development of the theories of photoelastic stresses analyses; model similitude; correlation with other stress analysis techniques. Laboratory work on two-dimensional applications such as stress concentrations around holes, notches, and fillets. *Prerequisite:* 131, mathematics 201. Three hours. Staff.

249 ENGINEERING ECONOMY Mathematical comparison of alternatives to maximize the financial return on engineering designs and processes. Project feasibility studies and design decision making are presented. The effect of taxes on engineering decisions and analysis of risk and uncertainty are included. *Prerequisite:* Senior or graduate standing in engineering. Three hours. Messrs. Milbank and Knight.

250 CIVIL ENGINEERING SYSTEMS ANALYSIS (3-0) Application of systems engineering techniques to civil engineering problems. Study of a comprehensive problem to illustrate the interplay of social, economic, and civil engineering disciplines. Presentation of current developments. *Prerequisite:* senior or graduate standing. Three hours. Staff.

261 HYDROLOGY (3-0) Basic theory of precipitation, run-off infiltration and ground water; precipitation and run-off data; application of the data for use in development of natural water resources. *Prerequisite:* 162 or mechanical engineering 142. Three hours. Mr. Downer.

262 WATER POWER ENGINEERING (3-0) Hydrologic, hydraulic, and geologic studies of water power sites; selection of turbines and equipment; economic considerations. *Prerequisite:* 162 or mechanical engineering 142. Three hours. Staff.

263 ADVANCED HYDROLOGY (3-0) Application of recent developments to problems in engineering hydrology; the concept and use of the instantaneous unit hydrograph; study of models using a numerical solution of the Saint Venant equations; flow through porous media. *Prerequisite:* 261, mathematics 201. Three hours. Mr. Downer.

264 OPEN CHANNEL FLOW (3-0) Application of the basic laws of fluid mechanics to flow in open channels; boundary layer theory; design of channels and transition structures; non-uniform flow; use of characteristics in the solution of unsteady, non-uniform, spatially varied flow problems. *Prerequisite:* 162, mathematics 201. Three hours. Mr. Downer.

265 WATER TREATMENT PROCESS (3-0) A rigorous study of the theoretical concepts involved in the operation of water and waste-water treatment processes. *Prerequisite:* 166, mathematics 201. Three hours. Staff.

273 SOIL MECHANICS II (3-0) Index and engineering properties of soils with emphasis on current research problems. Critical evaluation of the theories of ground water movement, frost action, consolidation, shearing strength, and stress distribution. Case histories and comparison of failure conditions with predictions based on laboratory tests. *Prerequisite:* 173. Three hours. Mr. Knight.

274 SOIL ENGINEERING (3-0) Applications of soil mechanics to special problems of earth structures and foundations. Topics considered include bearing

capacity evaluation, earth pressures, stabilization, effects of vibratory loading, earth dam and roadway construction. *Prerequisite:* 273. Three hours. Mr. Knight.

275 **INDETERMINATE STRUCTURES II (3-0)** Analysis of trusses with redundant members, elastic weights and column analogy methods for indeterminate frames, plastic methods for gable frames. *Prerequisite:* 175. Three hours. Staff.

276 **ULTIMATE STRENGTH DESIGN (3-3)** Development of ultimate load theory; virtual work and statical methods of analysis. Design of structural steel and reinforced concrete structures by ultimate load methods; consideration of shear, axial force, buckling, and rotation capacity. *Prerequisite:* 155-175. Four hours. Staff.

277 **PRESTRESSED CONCRETE STRUCTURES** Comparison of service and ultimate strength theories. Prestressed concrete beam analysis. Load balancing method. Curved girders. Compression members, columns and piles. Bent analysis. Yield line theory and flat-slab design. Circular prestressing in domes and tanks. Critical discussion of current design specifications. *Prerequisite:* C. E. 155. Three hours. Mr. Stearns.

280 **HIGHWAY AND AIRPORT PAVEMENT DESIGN (3-3)** Structural design of flexible and rigid pavements; types of steel and axle configurations; tire pressures; soil classification; compaction of soils; frost action; subsurface drainage; design of bases and subbases; soil stabilization; theory of stresses in flexible pavements; plate bearing, triaxial and CBR methods of design; mix design methods; Westergaard analysis for rigid pavements; design of joints and reinforcing steel; rigid pavement pumping; pavement evaluation; pavement selection criteria; and test roads. *Prerequisite:* 173. Four hours. Staff.

391 through 393 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged. Staff.

Engineering, Electrical

COLLEGE OF TECHNOLOGY

Professors Roth (Chairman), Essler and Rush; Associate Professors Hoilman (Emeritus), Lai, Lambert, and Taylor; Assistant Professors Absher, Ellis, Evering and Mirchandani

2 **ENGINEERING ANALYSIS I (2-0)** Concepts of linearity. System elements and their models. Interconnection of system elements. Vectors and matrices. Solution of linear simultaneous equations. Kirchoff's laws and equilibrium equations. Resistive networks and their analogies. *Prerequisite:* mathematics 11 or 13. Two hours.

3 ENGINEERING ANALYSIS II (3-0) Input-output relations of systems. Ordinary linear differential equations with specific application to linear systems. Response of systems to exponential excitation and concept of complex frequencies. Impulse response. Steady-state response of linear systems. System functions. Resonance. Network theorems. Energy and power. *Prerequisite:* 2. Three hours.

4 ENGINEERING ANALYSIS III (3-0) Signal flow graphs. Simulation of systems by analog computers. Transient response of linear systems. State-space approach. Response of mechanical systems, electromechanical systems, acoustic systems, magnetic networks, etc. *Prerequisite:* 3. Three hours.

32 ENGINEERING COMPUTATION (2-0) Analog and hybrid computing devices for solving engineering problems. Stimulation of linear algebraic and dynamic systems using modern electronic techniques. Operations of addition, subtraction, differentiation and integration. Multiplication, division and arbitrary function generation developed for solving non-linear problems. Conversion between the analog and digital domains. The scaling of simulated systems. *Prerequisite:* mathematics 23. Two hours.

101, 102 ELECTRICAL ENGINEERING PRINCIPLES (3-3) Principles of electric and magnetic circuits; application of these principles to the theory and performance of selected power, control and communication equipment. *Prerequisite:* mathematics 23 and physics 27, 101 for 102. Four hours.

111 CONTROL SYSTEMS (3-0) Theoretical background for analysis and synthesis of feedback control systems. Concepts of stability, transfer functions, signal flow, performance criteria, compensation and the classical root-locus and frequency response methods. State variable approaches. Analog simulation as a design tool. *Prerequisite:* 4. Three hours.

113 ENERGY CONVERSION I (3-0) Principles basic to electromechanical energy conversion devices and systems. Concepts associated with the interchange of energy among electrical, magnetic and mechanical circuit elements. Continuous energy conversion in the ideal and practical rotating machine. Machine dynamics. *Prerequisite:* 4. Three hours.

114 ENERGY CONVERSION II (3-0) Six basic methods of Direct Energy Conversion (DEC): thermoelectric devices, thermionic devices, magnetohydrodynamic (MHD) converters, solar cells and fuel cells, electrohydrodynamic (EHD) converters. Modern solid state theories of DEC. The past, present, and future of DEC. *Prerequisite:* 113, 163. Three hours.

121 ELECTRONICS I (3-0) Properties of semiconductors. PN junctions. Application of diodes. Circuit models for transistors, vacuum tubes, and other active devices. Biasing techniques and regions of operation. *Prerequisite:* 4. Three hours.

122 ELECTRONICS II (3-0) Properties of amplifiers. Amplifier design. Feedback and oscillation in electronic circuits. High-frequency circuit models and limitations. *Prerequisite:* 121. Three hours.

123 ELECTRONICS III (3-0) Analysis of pulse and digital circuits. Design of transistor logic gates, multivibrators, and blocking oscillators. *Prerequisite:* 122. Three hours.

143, 144 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. *Prerequisite:* 4. Three hours.

146 WAVE AND DIFFUSION ANALOGIES (3-0) Electromagnetic waves on lines and in space. Vibration of strings and membranes. Mechanical waves in fluids and solids. Electromechanical transducers. Thermal waves. Diffusion process. *Prerequisite:* 144. Three hours.

162 ELECTROMAGNETIC PROPERTIES OF MATERIALS (3-0) Theories of conductivity, dielectric constant, magnetic permeability, optical properties, piezoelectricity, ferroelectricity, pyroelectricity, magnetostriction. *Prerequisite:* physics 28. Three hours.

163 SOLID STATE PHYSICAL ELECTRONICS (3-0) Introduction to the physics of atoms and crystals through quantum and statistical mechanics. Application of these principles to semiconductor devices. *Prerequisite:* 162, physics 28. Three hours.

171 SIGNALS AND SYSTEMS (3-0) Fourier series and Fourier integral. Pulse, periodic, and random signals and their spectra. Correlation functions and power spectra of signals. Transmission of signals through linear systems. *Prerequisite:* 4, mathematics 191. Three hours.

174 INFORMATION-TRANSMISSION SYSTEMS (3-0) Introduction to information transmission. Modulation and demodulation. Noise and noise figures. Comparison of information transmission systems. Transmission lines and propagation. *Prerequisite:* 171. Three hours.

Laboratories

Each student will keep a laboratory notebook which will be collected and checked periodically by the instructor. He will prepare one experiment in a form suitable for publication and will present his paper to the class and other interested persons. The student will be graded on the notebook as well as the final written and oral presentation.

81 SOPHOMORE LABORATORY (0-3) Direct-current measurements, non-linear resistive elements, electron ballistics, 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. One hour.

82 SOPHOMORE LABORATORY (1-3) Alternating current bridges, resonant harmonic analyzer, acoustic resonance, measurement of charge, current, voltage, power, resistance, capacitance, inductance, and time. *Prerequisite:* 81. Two hours.

183 JUNIOR LABORATORY (1-3) Two dimensional field mapping; electrostatic field plots, duals, and analogs; magnetic fields and circuits; magnetic forces; and the magnetic field as an energy source. Input-output characterizations of linear time invariant systems. Introduction to active circuits; amplification and oscillation. *Prerequisite:* 82. Two hours.

184 JUNIOR LABORATORY (1-3) Active device characteristics. Power supplies, a.m. and f.m. modulation and detection. Transformers, magnetic amplifiers, a-c and d-c machines. *Prerequisite:* 183. Two hours.

185 SENIOR LABORATORY (1-3) Electrical conductivity in solids, the Hall effect, properties of gaseous conductors and dielectric materials. Control systems. Electromechanical transducers. *Prerequisite:* 184. Two hours.

186 SENIOR LABORATORY (0-3) Design and construction of pulse and digital circuits including logic gates, astable multivibrators, bistable multivibrators, monostable multivibrators, and locking oscillators. *Prerequisite:* 185. One hour.

188 SENIOR PROJECT (0-3) Experimental or theoretical project selected by the student and conducted under staff supervision. *Prerequisite:* 185. One hour.

202 NETWORK ANALYSIS (3-0) Time-domain and frequency-domain analysis of passive and active networks. Topological analysis. State-variable methods. Analysis by computers. *Prerequisite:* 122 and 171. Three hours. Mr. Mirchandani.

205, 206 NETWORK SYNTHESIS (3-0), (3-0) Realizability. General principles for synthesis of one-port and two-port networks. The approximation problem. Synthesis of networks with active elements. Computer-aided design. *Prerequisite:* 202. Three hours. Mr. Mirchandani.

211 ELECTRIC UTILITIES (3-0) Organization of the electrical utility; elementary corporate finance; economics of location, conductor size, station and line costs; rate structures; regulatory bodies. *Prerequisite:* senior standing in electrical engineering and departmental permission. Three hours.

212, 213 POWER TRANSMISSION SYSTEMS (3-0), (3-0) Line parameters for single phase, three phase, and multiple circuit lines. Current and voltage relations. Generalized circuit constants. Representation of power systems. Network equations and solutions using Matrix Algebra for digital computation. Loadflow studies. Economic operation of power systems. Symmetrical faults. Symmetrical components and unsymmetrical faults. Power system stability. *Prerequisite:* senior standing; 212 for 213. Three hours. Mr. Hoilman.

214 INDUSTRIAL POWER APPLICATION (3-0) Design and application of d-c and a-c motor drives for industrial plants; magnetic and electronic controls; duty cycles; acceleration, retardation and braking; power supplies and distribution systems. *Prerequisite:* 102 or 113, and departmental permission. Three hours.

221 TRANSISTORS (3-0) Fundamental principles of semi-conductor operation. P and N type conductivity; the PN junction; construction of the junction transistor. Circuit analysis of transistor operation in terms of hybrid parameters. Equivalent circuits for high frequency operation; oscillators and pulse switching circuits. *Prerequisite:* 123. Three hours.

230 DIGITAL COMPUTER LOGIC, CIRCUITS AND SYSTEMS (3-0) The logical design digital computers. Boolean algebra as an aid to circuit design. Circuits and components for the transmission, storage and modification of information and their combination into arithmetic units, memory devices, program controls and other major mechanisms. *Prerequisite:* 123 or physics 117. Three hours. Staff.

232, 233 HYBRID COMPUTERS (3-0), (3-0) Systems design concepts and use of interconnected analog and digital computers as an engineering tool are stressed. Selected problems from mathematics, biological and physical sciences are solved on a hybrid computer. The use of logic and decision as well as analog/digital and digital/analog conversion are stressed. *Prerequisite:* 123 or departmental permission. Three hours.

235 ELECTRONIC INSTRUMENTATION FOR SCIENTISTS (3-1) Introduction to electrical components and circuit theory, electrical measurements, oscilloscopes, power supplies, amplification by vacuum tubes and transistors, oscillators, comparison measurements, servo systems, operational amplifiers for measurement and control, electronic switching circuits, timing and digital counting systems. This course may not be taken for credit by students in Electrical Engineering. *Prerequisite:* College physics and calculus or permission of the instructor. Four hours. Mr. Evering.

238 RADIATION ELECTRONICS (2-3) Electronic techniques for the detection and measurement of radioactivity; ionization chambers, geiger counters, proportional counters, scintillation counters, neutron counters, coincidence circuits, ratemeters, and scalars. *Prerequisite:* physics 28 or departmental permission. Three hours.

239 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. Mr. Rush.

240 BOUNDARY VALUE PROBLEMS IN ELECTROMAGNETISM (3-0) Solution of classical problems of electromagnetism using images, conformal mapping and separation of variables methods. *Prerequisite:* 144. Three hours. Mr. 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. Three hours. Mr. Evering.

251 APPLICATIONS OF LINEAR ALGEBRA (3-0) Introduction of basic definitions and concepts of linear algebra; formulation and solution of engineering problems. Definitions of linear vector and function spaces, subspaces and manifolds, linear operators, change of basis, spectral representation of operators, the eigenvalue problem, matrices and functions of matrices. Application to problems of state variable analysis, field theory, mechanics, quantum mechanics and signal theory. *Prerequisite:* Graduate standing in E.E. or Physics, or departmental permission. Three hours. Mr. Rush.

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:* mathematics 191. Three hours.

281 through 284 SEMINAR (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 and applications to typical problems of commercial importance in fields of process control, biomedical engineering, communications, circuit design. *Prerequisite:* graduate standing in E.E. or departmental permission. Three hours. Mr. Roth.

287, 288 SPECIAL TOPICS (2-3) Formulation and solution of theoretical and practical problems dealing with electrical circuits, apparatus, machines or systems. *Prerequisite:* 4. Three hours.

311, 312 ADVANCED CONTROL SYSTEMS (3-0) Multiple input-output control system analysis. State space techniques, sampled-data and nonlinear control systems. Design using optimal control theory. *Prerequisite:* 111, 311 for 312. Three hours. Mr. Absher.

314, 315 NONLINEAR SYSTEM ANALYSIS (3-0) Principal methods of solving nonlinear problems. Topological, analytical, graphical, and numerical methods; the general theory of nonlinear oscillation and stability; application of theory to numerous oscillatory problems. *Prerequisite:* 4 or mathematics 211 and degree in physical sciences or engineering. Three hours.

316 POWER SYSTEMS (3-0) Machine and line transients; steady state and transient stability of power systems; relay systems; circuit breakers; lightning; fault studies; coordination of power and telephone systems. *Prerequisite:* senior standing in electrical engineering and departmental permission. Three hours.

340, 341 SPECIAL TOPICS IN ELECTROMAGNETIC FIELD THEORY (3-0) For advanced students in the field of electromagnetism. Topics selected from special interests of staff with lectures and readings from current literature. Three hours. Staff.

342, 343 MILLIMETER WAVE OPTICS (3-0) Optical and microwave theory applicable to the millimeter and submillimeter region. Generation and detection of radiation; dispersion, scattering, and refraction; interference and interferometers; antennas, diffraction and diffraction gratings. Applications to lasers, diffraction anomalies, atmospheric transmission and millimeter wave astronomy. *Prerequisite:* 242 or departmental permission. Three hours. Mr. Evering.

360 SOLID STATE THERMODYNAMICS (3-0) Introduction to Maxwell-Boltzmann, Fermi-Dirac, and Bose-Einstein distribution functions. Application of these functions to problems in solids. Development of the Planck radiation law and the Debye theory of lattice vibrational energies. Introduction to density matrix and negative temperatures. *Prerequisite:* graduate standing in electrical engineering or physics. Three hours. Mr. Lambert.

361 TRANSISTOR ENGINEERING (3-0) Introduction to energy band theory and the effective mass concept. Analysis of the transport properties of holes and electrons. Characteristics of PN junctions. Theory of transistors as developed from drift and diffusion properties of carriers. Charge control model of transistor switch. *Prerequisite:* graduate standing in electrical engineering or physics. Three hours. Mr. Lambert.

363, 364 INTRODUCTION TO SOLID STATE THEORY (3-0) Crystal structures in terms of the Bravais lattice and the Miller indices description. Band theory and the concept of Brillouin zone, Quantum theory of solids. Vibrational, trans-

port, and other fundamental problems associated with ordered solids. *Prerequisite:* Atomic or Modern Physics; 363 for 364. Three hours. Equivalent to and alternates with physics 341, 342. Mr. Lambert.

365 LASERS AND MASERS (3-0) Conditions for operation and photon flux amplification. Modes of operation and measurement of power and beam characteristics. CW and pulsed lasers. Light modulation and detection. *Prerequisite:* bachelor's degree in engineering or physics and departmental permission. Three hours. Mr. Lambert.

366, 367 SOLID STATE THEORY (3-0), (3-0) Quantum mechanical free electron theory of metals. Quasi-free electron theory for periodic structures. Calculation of energy bands for the most common crystal structures employing the tight binding approximation. Development of thermal and magnetic properties of crystals. Calculation and cohesive energy of crystals. Presentation of generation and recombination mechanisms in semiconductors including photon absorption and emission. Introduction to the Boltzmann transport equation and its application to semiconductor problems. *Prerequisite:* 364, 366 for 367. Three hours. Mr. Lambert.

370, 371 SIGNAL THEORY (3-0) Analysis and representation of nonrandom and random signals. Discrete signals. Signal-space concepts. Random processes. Correlation function and power density spectrum. Measurement techniques. Applications. *Prerequisite:* graduate standing in electrical engineering or concurrent enrollment in 174, 370 for 371. Three hours. Mr. Lai.

372 ADVANCED COMMUNICATION ENGINEERING (3-0) Principles of optimum receiver: design and implementation. Implementation of coded communication systems. Models of communication channels: Bandpass channels and fading channels. Modulation systems: AM, FM, PAM, PPM, PWM, and PCM. *Prerequisite:* graduate standing in electrical engineering. Three hours. Mr. Lai.

374 THEORY OF SIGNAL DETECTION (3-0) Testing of hypothesis. Detection of known and unknown signals. Detection by multiple observations. The estimation of signal parameters. Detection of signals of unknown arrival time. Signal resolution. *Prerequisite:* graduate standing in electrical engineering. Three hours. Mr. Lai.

376 CODING AND SIGNALING (3-0) The coding problem. Linear codes and nonlinear codes. Error-correction capabilities of linear codes. Important linear codes. Cyclic codes. Bose-Chaudhuri codes. Burst-error-correcting codes. Recurrent codes. Parity-check codes. Decoding methods. Efficient signaling for message sequences. *Prerequisite:* graduate standing in electrical engineering. Three hours. Staff.

378 SPECIAL TOPICS IN STATISTICAL COMMUNICATION AND RELATED FIELDS Coding for communication or computer systems, pattern recognition and learning machines, artificial intelligence, etc., selected from special interests of staff with lectures and readings from current literature. *Prerequisite:* graduate standing in electrical engineering. Three hours. Mr. Lai.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member culminating in an acceptable thesis. Credit as arranged.

491 through 493 DOCTORAL THESIS RESEARCH* Investigation of research topic under the direction of an assigned staff member culminating in an acceptable doctoral dissertation. Credit as arranged.

* Areas of research include control systems, instrumentation, electromagnetic fields, biomedical engineering, solid state materials and devices and statistical communications

Engineering, Mechanical

COLLEGE OF TECHNOLOGY

Professors Nahavandi (Chairman), Outwater, and Tuthill; Associate Professors Carpenter, Duchacek, Hundal, Marshall, Martinek, and McLay; Instructor Mastro

1 ENGINEERING GRAPHICS I (0-6) Basic geometrical constructions, freehand sketching and lettering, charts and graphs, orthographic projection and applications of orthographic principles to typical engineering problems. Introduction to descriptive geometry. Two hours.

2 ENGINEERING GRAPHICS II (0-6) A continuation of the application of orthographic principles to technical problems covering intersections and development. Axonometric projection. *Prerequisite:* 1. Two hours.

53 MANUFACTURING PROCESSES (2-3) Theory and principles of casting and molding, metal forming, welding, machining and finishing processes with emphasis on economics and design. *Prerequisite:* 2. Three hours.

73 CREATIVE DESIGN (3-0) Application of fundamental engineering principles to the solution of real engineering problems through formulation, selection, synthesis, analysis, optimization, oral and written presentation. *Prerequisite:* sophomore standing in M.E. Three hours.

84 MECHANICAL INSTRUMENTATION (1-0) Engineering measurements; experimental error; test sequence; data analysis. *Prerequisite:* mathematics 14. One hour.

92 THERMODYNAMICS I (2-0) Engineering thermodynamics with particular emphasis on energy forms, the development of thermodynamics laws, equilibrium, fixed and variable mass systems, reversibility, and entropy. *Prerequisite:* mathematics 14, physics 18. Two hours.

111 THERMODYNAMICS II (3-3) 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. Laboratory on problems and analysis. *Prerequisite:* 92. Four hours.

113 THERMODYNAMICS AND HEAT TRANSFER (3-0) Fundamental principles of engineering thermodynamics; application of these principles to thermodynamic cycles; heat transfer. *Prerequisite:* physics 18; mathematics 14. Three hours.

115 THERMODYNAMICS (3-0) The first and the second law of the classical thermodynamics; introduction to statistical mechanics, Boltzmann, Bose-Einstein and Fermi-Dirac statistics, partition function; microcanonical, canonical and grand canonical ensembles; kinetic theory of gases; introduction to statistical thermodynamics; derivation of thermodynamic properties of perfect gases and solids; Maxwell relations; chemical equilibrium; the behavior of real gases and liquid; phase equilibrium and multicomponent systems. *Prerequisite:* physics 28, mathematics 14. Three hours.

117 MECHANICAL ENGINEERING LABORATORY (0-3) Experiments using the project method to investigate thermodynamic principles, instrument capability, and the theory of experimentation. *Prerequisite:* 84 and concurrent enrollment in 111. One hour.

133 KINEMATICS AND DYNAMICS (3-0) Fundamentals of kinematics; analysis and synthesis of displacement, velocity and acceleration with respect to fixed and moving frames of reference; principles of particle and rigid body motion; conservation principles of dynamics and their application in the solution of dynamics problems; dynamic analogies between mechanical, fluid and electrical systems. *Prerequisite:* C.E. 24. Three hours.

135 ENGINEERING DESIGN I (3-3) Application of the principles of kinematics, dynamics, strength of materials and design to the design of machine elements including consideration of function; production and economic factors; with special emphasis on engineering mechanics. *Prerequisite:* M.E. 133, C.E. 131. Four hours.

137 SYSTEMS CONTROL (2-0) Concepts of control, stability and interaction of systems with particular reference to design of mechanical, pneumatic, hydraulic and other control circuits. *Prerequisite:* mathematics 201. Two hours.

142 FLUID MECHANICS (3-0) Dynamics of an ideal fluid; energy and momentum relations; similitude; flow in conduits; boundary layer mechanics; compressibility phenomena; wing theory; hydrodynamic lubrication; fluid machines and controls. *Prerequisite:* 111 or 113, 133. Three hours.

164 ENVIRONMENTAL ENGINEERING (3-0) The principles of psychrometrics, heat transfer and fluid mechanics applied to thermal environments and their control for man, animal or process. *Prerequisite:* 111 or 113, 142. Three hours.

174 INDUSTRIAL ENGINEERING (3-0) Principles of industrial organization, plant facilities and layout, production and quality control, motion and time study, wage incentives and job evaluation. *Prerequisite:* inspection trip. Three hours.

175 METHODS ENGINEERING (2-3) Work methods analysis and design, introduction to human engineering. Work measurement including stop watch study, work sampling and predetermined data. *Prerequisite:* junior standing. Three hours.

176 PLANT ORGANIZATION (3-3) Analysis of industrial plant requirements as to layout and materials handling; plant services and maintenance. *Prerequisite*: junior standing. Four hours.

191, 192 THESIS (0-9) Investigation of a research or design project under the supervision of an assigned staff member culminating in an acceptable thesis. *Prerequisite*: senior standing and departmental permission. Three hours.

202 ADVANCED MECHANICS (3-0) Development of the foundations of mechanics leading to Hamilton's principle and LaGrange's equations; vibration and stability of systems with many degrees of freedom; gyroscopic effects in mechanical systems; systems with variable co-efficients and non-linear systems. *Prerequisite*: 133. Three hours.

203 ADVANCED MECHANICAL VIBRATION (3-0) Vibration phenomena in single and multi-degree of freedom systems; response of systems to periodic and transient excitation; random vibration theory; general normal mode theory; impedance, matrix and numerical methods for vibration problems; isolation of shock, vibration and noise; vibration of continuous systems; methods of non-linear analysis. *Prerequisite*: senior standing. Three hours.

204 ADVANCED SYSTEMS ANALYSIS (3-0) Lumped-parameter and distributed-parameter systems analysis of mechanical thermal, hydraulic, pneumatic and electromechanical systems; system response to periodic, transient and random excitation. *Prerequisite*: senior standing. Three hours.

206 APPLICATION OF COMPUTERS IN ENGINEERING (4-0) Utilization of analog, digital and hybrid computers as engineering tools for the solution of complex engineering problems. *Prerequisite*: senior standing. Four hours.

211 ADVANCED MECHANICAL STRUCTURES I (3-0) Statically indeterminate problems in bending; general expression of strain energy; theorem of Castigliano and its application to statically indeterminate problems; the reciprocal theorem and influence lines; theory of curved bars; beams on elastic foundation; combined direct compression and lateral loaded beams; continuous beams; theory of thin plates and shells with their applications. *Prerequisite*: senior standing. Three hours.

222 ADVANCED MECHANICAL STRUCTURES II (3-0) Lateral buckling of beams, struts, circular rings, circular arches and tubes under external pressure; thick wall cylinder; torsion of shafts of non-circular cross-section and rolled profile section; membrane analogy; torsional buckling of thin-walled compression members; combined bending and torsion; various strength theories; theory of plates and shells with their applications. *Prerequisite*: senior standing. Three hours.

243 ADVANCED FLUID MECHANICS (3-3) Foundations of fluid dynamics; thermodynamics and concepts of compressible flow; isentropic flow; normal shock waves; flow in ducts with friction and with heating or cooling; generalized solution of combined effects. *Prerequisite*: 142 and mathematics 201. Four hours.

244 COMPRESSIBLE FLOW (3-0) Introduction to flow in two and three dimensions; steady irrotational flow; small perturbations; the hodograph method; the Karman-Tsien, Prandtl-Glauert, and Gothert's methods; supersonic airfoils; the method of characteristics; oblique shocks; shock waves and boundary layer interaction. *Prerequisite*: 243. Three hours.

246 AERODYNAMICS (3-0) Application of the principles of fluid mechanics to the design and performance of aircraft; fluid dynamics; experimental facilities; airfoil characteristics; aspect ratio and plan-form influences; viscosity phenomena as applied to boundary layer; transition and separation on various shapes; compressibility phenomena; the optimum airfoil; performance. *Prerequisite*: 142. Three hours.

252 ENGINEERING DESIGN II (3-3) Application of the principles of kinematics, dynamics, strength of material, fluid mechanics and thermodynamics to the design of mechanical systems and their components; application of computers to design; design optimization; group projects in design; construction and evaluation. *Prerequisite*: 135. Four hours.

262 THERMAL SYSTEMS (3-3) Application of engineering thermodynamics to the analysis of thermodynamic machines and processes; problems on gas turbine, jet propulsion, nuclear power plants, energy conversion devices and other areas of current interest. *Prerequisite*: senior students, Four hours.

266 HEAT TRANSFER (3-0) Fundamental principles of heat transfer; conduction, convection, radiation; steady and unsteady state; the electric analogy; applications to heat transfer equipment. *Prerequisite*: 111 or 113 and mathematics 201. Three hours.

267 ADVANCED THERMODYNAMICS (3-0) A rigorous, detailed study of the laws of thermodynamics and of ideal and actual thermodynamic processes. *Prerequisite*: 111 or 113 and mathematics 201. Three hours.

271 INDUSTRIAL MATERIALS I (3-0) Fundamentals of ferrous and nonferrous physical metallurgy, and non-metallic materials. The correlation of the microscopic structure and physical properties of metals, ceramics and plastics with their heat treatments and uses. *Prerequisite*: chemistry 2; physics 18. Some laboratory work required. Three hours.

272 MECHANICAL BEHAVIOR OF MATERIALS (3-0) Elastic and plastic behavior of single crystals and polycrystals; dislocations; approximate plastic analysis; anisotropic materials; hardness; residual stress, brittle, transitional and ductile fractures; fatigue; damping; creep and surface phenomena. *Prerequisite*: senior standing. Three hours.

274 INDUSTRIAL MATERIALS II (3-0) Geometrical crystallography; packings in crystals; formation and transformations in crystals; structure of metals, semiconductors, and insulators. *Prerequisite*: 271. Three hours.

281, 282 SEMINAR (1-0) Presentation and discussion of advanced mechanical engineering problems and current developments. *Prerequisite*: senior or graduate engineering enrollment. One hour.

284 ADVANCED HEAT ENGINES (3-0) Application of engineering science to specific types of heat engines according to the interest of the students. *Prerequisite*: 111, 142, 266. Three hours.

294 ENGINEERING DESIGN ANALYSIS AND SYNTHESIS (4-0) The application of the fundamental concepts and principles of mathematics, physics, mechanics, electricity, thermodynamics, fluid dynamics and heat transfer combined with

economic considerations and decision-making processes to the rigorous training in the design, analysis and synthesis of engineering systems and their components. *Prerequisite:* senior standing. Four hours.

295, 296 SPECIAL TOPICS (3-0) Advanced study and discussion in areas dependent on the interest of the students. *Prerequisite:* senior or graduate standing and departmental permission. Three hours.

297 NUCLEAR ENGINEERING (3-0) Neutron chain reactions and the criticality condition; the slowing down of neutrons in an infinite medium; one-speed diffusion of neutrons in a multiplying and non-multiplying system combined slowing down and diffusion; bare and reflected homogeneous reactors; time-dependent behavior of reactors; reactor control theory; reactor accident and transient analysis. *Prerequisite:* senior standing. Three hours.

301 ADVANCED ENGINEERING DESIGN ANALYSIS AND SYNTHESIS (4-0) Application of the fundamental concepts and principles of advanced mathematics, physics, mechanics, electricity, thermodynamics, fluid dynamics and heat transfer combined with economic considerations and decision-making processes to the rigorous training in the design, analysis and synthesis of complex engineering systems and their components. *Prerequisite:* graduate standing in M.E. Four hours.

302 ENGINEERING ELASTICITY (4-0) General analysis of stress and strain; stress-strain relationships; equations of equilibrium and compatibility using Cartesian tensors; two-dimensional stress problems. Airy's stress function solutions using Fourier series, Fourier integral, and approximate methods; simple three-dimensional problems; axisymmetric stress distribution; thermoelastic problems; energy principles of elasticity and their application; torsion of beams; theory of unsymmetrical beams; stress waves in elastic media. *Prerequisite:* graduate standing in M.E. Four hours.

303 STRESS ANALYSIS (THEORY AND EXPERIMENT) (3-0) Theory and experimental method for measuring static and dynamic stress and strain including the use of piezoelectric materials; wire resistance strain gages; mechanical, optical, inductance and capacitance displacement gauges; photoelasticity; brittle coating; x-rays and associated instrumentation and recording systems; theory of plasticity; methods of elastic-plastic analysis, plastic design of structures, plates and shells. *Prerequisite:* graduate standing in M.E. Three hours.

306 CONTINUUM MECHANICS (3-0) A unified treatment of those topics which are common to solid and fluid continua; general discussion of tensors; deformation, strain, rates of deformation and strain; conservation laws; mass, momentum and energy; laws of motion; constitutive equations of mechanics for fluids, elastic and hyperelastic solids including materials with memory. *Prerequisite:* graduate standing in M.E. Three hours.

307 ADVANCED FLUID DYNAMICS (4-0) Integrated development of equations of continuity, momentum and energy for fluid particles and control volumes; viscous flow theory; stress and rate of deformation tensors; Navier-Stokes equations and its applications; boundary layer theory; turbulence; flow about immersed bodies and in closed conduits; theory of fluid amplifiers and computers. *Prerequisite:* graduate standing in M.E. Four hours.

308 ADVANCED DYNAMICS (3-0) Fundamental principles of kinematics and dynamics; motion of systems with several degrees of freedom; rotating and accelerating frames of reference; energy methods; variational principles; LaGrange's and Hamilton's equations; gyroscopes and their application; vibration and stability of systems; non-linear vibration and dynamics of structures; Liapunov's method. *Prerequisite:* graduate standing in M.E. Three hours.

309 ADVANCED ENGINEERING THERMODYNAMICS (3-0) A rigorous and general treatment of the first law of thermodynamics for a system and control volume with applications to steady and transient problems involving fluid flow and heat transfer; application of the first law to chemical reactions; the second law of thermodynamics for a system and control volume and its application; entropy production and the concept of availability; irreversible thermodynamics and its application; phase equilibrium; equation of state; transfer phenomena; relation between statistical mechanics and thermodynamics; canonical equations; Liouville's Theorem, ensembles; partition function, statistical thermodynamics, the third law of thermodynamics; equilibrium in a gas with charged particles; equilibrium of multicomponent systems; metastability. *Prerequisite:* graduate standing in M.E. Three hours.

310 ADVANCED HEAT TRANSFER (3-0) Generalized equation of heat conduction including heat generation, moving boundaries; solution of the heat conduction equation for various geometries and boundary conditions; numerical methods; thermal boundary layer phenomena in forced and natural convection; dimensional analysis; application of convective heat transfer to engineering problems; aerodynamic heating; heat transfer in rarefied gases; condensation; boiling; transpiration and ablative cooling; heat exchange by radiation; interchange factors in radiation. *Prerequisite:* graduate standing in M.E. Three hours.

311 ADVANCED GAS DYNAMICS (3-0) Analysis of compressible flow in ducts with area change, friction and heat transfer; shock waves; oblique shock; two- and three-dimensional compressible flow; small perturbation theory; similarity in high speed flow; transonic and supersonic flow; method of characteristics. *Prerequisite:* graduate standing in M.E. Three hours.

320 SPECIAL PROBLEMS IN ELASTICITY (3-0) Advanced topics in the theory of elasticity in which there is a particular student and staff interest. *Prerequisite:* graduate standing in M.E. Three hours.

321 SPECIAL PROBLEMS IN FLUID MECHANICS (3-0) Advanced topics in fluid mechanics in which there is a particular student and staff interest. *Prerequisite:* graduate standing in M.E. Three hours.

322 SPECIAL PROBLEMS IN DYNAMICS (3-0) Advanced topics in dynamics in which there is a particular student and staff interest. *Prerequisite:* graduate standing in M.E. Three hours.

323 SPECIAL PROBLEMS IN THERMODYNAMICS (3-0) Advanced topics in thermodynamics in which there is a particular student and staff interest. *Prerequisite:* graduate standing in M.E. Three hours.

324 SPECIAL PROBLEMS IN HEAT TRANSFER (3-0) Advanced topics in heat transfer in which there is a particular student and staff interest. *Prerequisite:* graduate standing in M.E. Three hours.

325 **SPECIAL PROBLEMS IN MATERIALS (3-0)** Advanced topics in behavior of materials in which there is a particular student and staff interest. *Prerequisite:* graduate standing in M.E. Three hours.

391-393 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

English

COLLEGE OF ARTS AND SCIENCES

Professors Bandel, Bogorad (Chairman), Jones, Long, Pope, and Trevithick; Associate Professors Cochran,¹ Manchel, Orth, and Woodruff¹; Assistant Professors Broughton, Clark, A. I. Dickerson, Hall,² Howe, Leonard, Poger, Shepherd, and Stephany; Instructors Affsprung, Bryan,³ M. J. Dickerson, Holladay, C. Jarrett, D. Jarrett, Johnson, Kohler, M. E. Leonard,³ Miller, Mosher, Sheridan, Simone, Smith, Tillinghast, True, Twitchell, and Zeuch.

1-2 **FRESHMAN ENGLISH** Study and discussion of selected literary works and writing compositions related to them, to encourage reading with understanding and enjoyment and to develop clear and effective expression. Required of all freshmen. Three hours. Staff.

16 **EXPOSITORY WRITING** Writing and analysis of expository essays. *Prerequisite:* 1-2. Three hours. I, II. Mr. Howe and Mr. Manchel.

17 **CREATIVE WRITING** An introductory course in the techniques of writing poetry and short prose fiction. Classes are organized around the discussion of student work and the problems arising from weekly writing assignments. *Prerequisite:* 1-2. Three hours. Mr. Broughton.

18 **CREATIVE WRITING** An intermediate writing course open to students who have completed English 17 and wish to continue their work during the second semester. *Prerequisite:* 17. Three hours. Mr. Broughton.

27, 28 **SOPHOMORE LITERATURE** Selected masterpieces of English, American, and World Literature. Lectures, discussions, and frequent assignment of critical and analytical papers. *Prerequisite:* 1-2. Three hours. Staff.

101 **CHAUCER** The principal works of Chaucer, with emphasis on Chaucer's literary scope, talents, and position in medieval literature. *Prerequisite:* 27, 28. Three hours. Mr. Stephany.

133, 134 **THE DEVELOPMENT OF AMERICAN LITERATURE** The emergence and growth of a national literature, including both major and minor figures. First

1. Sabbatical leave first semester 1968-69.

2. On leave 1968-69.

3. First semester only, 1968-69.

semester: Colonial times to the Civil War; second semester: from the Civil War to the present. *Prerequisite*: 27, 28. Three hours. Mr. Poger and Mr. Shepherd.

135, 136 CANADIAN LITERATURE The development of a national literature. Required of students in the Canadian Area Studies Program. *Prerequisite*: 27, 28. Three hours. Mr. Miller. Alternate years, 1970-71.

182 SEMINAR FOR PROSPECTIVE TEACHERS OF ENGLISH Grammar and language; literary interpretation and criticism; allied problems useful to teachers of English. *Prerequisite*: 27, 28; and 261. Three hours. Mr. Manchel.

192 MAJOR DEVELOPMENTS IN ENGLISH LITERATURE Twelve to fifteen broad studies of literary periods, movements, and ideas. For seniors concentrating in English. Designed to assist, but not limited to, candidates for departmental honors. *Prerequisite*: 27, 28. Three hours. Mr. Jones.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

197, 198 READINGS AND RESEARCH

200 OLD ENGLISH The sounds, words, and structure of Old English; simple prose texts and selections from *Beowulf*. *Prerequisite*: 27, 28. Three hours. Mr. Dickerson. Alternate years, 1969-70.

202 MEDIEVAL LITERATURE The forms (in translation) of medieval literature, with emphasis on Arthurian materials. *Prerequisite*: 27, 28. Three hours. Mr. Stephany.

204 MIDDLE ENGLISH Literary, historical, and linguistic considerations of Middle English texts, excluding Chaucer. *Prerequisite*: 27, 28. Three hours. Mr. Dickerson. Alternate years, 1970-71.

206 ELIZABETHAN DRAMA Drama in England from its beginning to 1642, exclusive of Shakespeare. *Prerequisite*: 27, 28. Three hours. Mr. Leonard. Alternate years, 1970-71.

207-208 SHAKESPEARE Literary study and textual interpretation of most of Shakespeare's works. *Prerequisite*: 27, 28. Three hours. Miss Bandel.

209, 210 ELIZABETHAN PROSE AND POETRY The major writers of the Tudor and Stuart periods: English prose from the early humanists to the Restoration; English poetry from Wyatt and Surrey to Donne and his followers, including the development of Elizabethan lyric poetry. *Prerequisite*: 27, 28. Three hours. Mr. Long. Alternate years, 1969-70.

212 MILTON The works of Milton including *Paradise Lost*, *Paradise Regained*, *Samson Agonistes*, some of the minor poems, and selections from the prose works. Lectures, discussions, and reports. *Prerequisite*: 27, 28. Three hours. Mr. Bogorad.

217 RESTORATION AND EIGHTEENTH-CENTURY DRAMA Development of English drama from Dryden to Sheridan. The lectures, discussions, and reports consider the literary and theatrical qualities of representative plays. *Prerequisite*: 27, 28. Three hours. Mr. Howe. Alternate years, 1970-71.

218 RESTORATION AND EIGHTEENTH-CENTURY PROSE AND POETRY The works, including selected novels, of significant writers from Dryden to Johnson. Particular emphasis on the development of the essay, the satires of Pope and Swift, and the works of the Johnson-Boswell circle. *Prerequisite:* 27, 28. Three hours. Mr. Jones. Alternate years, 1970-71.

221, 222 THE ROMANTIC PERIOD First semester: development of the Romantic Movement through Wordsworth and Coleridge; second semester: Byron, Shelley, Keats, and other Romantic poets and prose-writers. *Prerequisite:* 27, 28. Three hours. Mr. Jones.

227, 228 ENGLISH NOVEL English fiction from its origin through the nineteenth century. Masterpieces are stressed and read critically. *Prerequisite:* 27, 28. Three hours. Mr. Jarrett and Mr. Woodruff.

231, 232 VICTORIAN LITERATURE A study of the lives and the works, except the novels, of the significant writers from 1832 to 1900. *Prerequisite:* 27, 28. Three hours. Mr. Long. Alternate years, 1970-71.

233 MODERN AMERICAN NOVEL Representative American novelists since 1915. *Prerequisite:* 27, 28. Three hours. Mr. Shepherd and Mr. Poger.

234 MODERN BRITISH NOVEL Representative British and continental novelists. *Prerequisite:* 27, 28. Three hours. Mr. Woodruff.

235 MODERN BRITISH DRAMA British and continental plays representing the principal trends in the dramatic renaissance of the late 19th and 20th centuries. *Prerequisite:* 27, 28. Three hours. Mr. Leonard.

236 MODERN AMERICAN DRAMA American plays representing the principal trends culminating in contemporary drama. *Prerequisite:* 27, 28. Three hours. Mr. Orth.

239 MODERN BRITISH POETRY A study of selected British poets since World War I. *Prerequisite:* 27, 28. Three hours. Mr. Poger.

240 MODERN SHORT FICTION Critical study of short stories and novellas of outstanding modern writers; recent techniques and trends. *Prerequisite:* 27, 28. Three hours. Mr. Cochran.

244 MODERN IRISH LITERATURE A study of Irish literature from 1890 to the present with emphasis on Yeats and Joyce. *Prerequisite:* 27, 28. Three hours. Alternate years, 1969-70.

251, 252 AMERICAN NOVEL OF THE NINETEENTH CENTURY Masterpieces of nineteenth-century American fiction selected on the basis of literary merit. Lectures, class discussions, oral and written reports. First semester: Hawthorne, Melville, and others; second semester: Mark Twain, Howells, James and others. *Prerequisite:* 27, 28. Three hours. Mr. Trevithick and Mr. Shepherd.

254 EMERSON, THOREAU AND THEIR CIRCLE The essays, journals, and poetry of Emerson, and Thoreau's *Walden*. Minor writers in the group will receive briefer treatment. Lectures, discussions, oral and written reports. *Prerequisite:* 27, 28. Three hours. Alternate years, 1969-70.

256 REGIONAL WRITING IN AMERICA Selected works by Cooper, Harte, Garland, Twain, Faulkner, and others, including units on local color and South-west humor. Lectures, discussion and reports. *Prerequisite:* 27, 28. Three hours. Mr. Cochran. Alternate years, 1969-70.

257 AMERICAN POETRY TO WORLD WAR I Major American poets from the eighteenth century to the First World War, including Poe, Whitman, Emily Dickinson, and others. *Prerequisite:* 27, 28. Three hours. Mr. Orth.

258 MODERN AMERICAN POETRY Major American poets since World War I. *Prerequisite:* 27, 28. Three hours. Mr. Poger.

261 STRUCTURE OF THE ENGLISH LANGUAGE Descriptive study of the structure of Modern American English. *Prerequisite:* 27, 28. Three hours. Mrs. Clark.

262 HISTORY OF THE ENGLISH LANGUAGE The principles of historical linguistics and their application to English. *Prerequisite:* 27, 28. Three hours. Mrs. Clark. Alternate years, 1970-71.

273 TECHNIQUE AND CRITICISM OF POETRY Poetic theory with close analysis of selected poems, past and present, designed to show their organic structure, the relation between poetic effect and sense, mood, tone, imagery, stanzaic form, figurative language, and meter. Lectures, discussions, reports. *Prerequisite:* 27, 28. Three hours. Mr. Bogorad.

275 HISTORY OF CRITICISM Principles and theories of criticism from Aristotle to the twentieth century. *Prerequisite:* 27, 28. Three hours. Mrs. Hall. Alternate years, 1969-70.

276 CONTEMPORARY CRITICISM A seminar in selected contemporary critical methods and interests; discussion and criticism of selected major works, both contemporary and traditional, with emphasis on criticism of a major modern work. *Prerequisite:* 27, 28. Three hours. Mr. Poger.

277-278 ADVANCED CREATIVE WRITING A writing workshop in which students are encouraged to follow their own interest in poetry, prose, fiction and drama. Permission of instructor required. *Prerequisite:* 27, 28; 17. Three hours. Mr. Broughton.

301 CHAUCER Principal works. Three hours. Mr. Dickerson.

302 GRADUATE SEMINAR Discussion topics vary from year to year. Recommended for all first-year graduate students in English. Three hours.

303-304 PROBLEMS AND RESEARCH IN TEACHING SECONDARY SCHOOL ENGLISH Consideration of problems, curricular materials, teaching procedures and research methods in secondary school language, literature, and composition. *Prerequisite:* 12 hours of education; acceptance as qualified to earn graduate credit in English. Three hours. Mr. Manchel.

371 BIBLIOGRAPHY Methods of literary study, research, and scholarship. Recommended for all first-year graduate students in English. Three hours. Mr. Pope.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.



Extra-Departmental Courses

COLLEGE OF ARTS AND SCIENCES

General Literature

62 **GERMAN LITERATURE IN TRANSLATION** Lectures on the development of German literature; reading and discussion of representative works in English translations. No knowledge of German required. *Prerequisite:* junior standing and one year course in any literature. Three hours. Mr. Kahn.

72 **ROMANCE LITERATURE IN TRANSLATION** Comparative study of contemporary literature in French, Spanish, and Italian in English translations. The novel and theatre are studied in alternate years. *Prerequisite:* junior standing and one year course in any literature. Three hours. Mr. Parker.

81, 82 **RUSSIAN LITERATURE IN TRANSLATION** First semester: Russian masters of the nineteenth century. Second semester: twentieth century writers from the symbolists to the present. *Prerequisite:* junior standing and one year course in any literature. Three hours. Mr. Gard.

Meteorology

61 **INTRODUCTORY METEOROLOGY** An introductory study of weather elements and the dynamic processes under which they combine and act. Special consideration of the interaction of earth and atmosphere. *Prerequisite:* mathematics 11; a year of college chemistry (1-2), geology, or physics. Three hours. Mr. Vollkommer.

World Problems

101, 102 **WORLD PROBLEMS** A different major issue of particular importance to men and women in the modern world will be presented each semester by various instructors from the humanities, the sciences, and the applied arts. Language and communication, evolutionary thinking, and problems of education are examples of topics recently studied. Lectures, discussion, readings and reports. Not counted toward concentration requirements. *Prerequisite:* senior standing or permission of the director. Three hours.

Forestry

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professor Christensen (Chairman); Associate Professors Post and Whitmore; Assistant Professors Armstrong, Fuller, Hannah, and McCormack

1 INTRODUCTION TO FORESTRY (2-3) Introduction to forestry and conservation sciences. Three hours. Mr. McCormack.

5 DENDROLOGY (3-3) Classification and silvical characteristics of native and exotic forest trees. Twig identification. *Prerequisite:* biology 1 or botany 4. Four hours. Mr. Hannah.

31 FOREST FIRE CONTROL Forest fire behavior as influenced by fuels, weather, topography; causes and effects of fire; fire danger measurement; methods of prevention and controlling fires; use of fire in forest management. *Prerequisite:* sophomore standing. Two hours. Mr. Whitmore.

100 FORESTRY PROBLEMS Forest plants and animals and their relationship to the environment. Related forestry studies. Field trips. *Prerequisite:* 5. Three weeks in summer camp. Three hours. Mr. Fuller and Mr. McCormack.

103 WOODLAND MANAGEMENT (3-3) Silviculture practice and multiple use concepts in the management of small woodland areas. *Prerequisite:* junior standing. Four hours. Mr. Hannah. Alternate years, 1970-71.

122 SILVICS (2-3) Environmental factors and their influence upon the development, distribution, and succession of forest trees. Basic for the practice of silviculture. *Prerequisite:* 5. Three hours. Mr. Post.

123 SILVICULTURE (2-3) The principles and practices for governing growth and reproduction of forest stands. *Prerequisite:* 122 or permission. Three hours. Mr. McCormack.

130 FOREST MANAGEMENT PLANNING Application of surveying methods to forestry practice; topographic mapping; planning and construction of forest roads. *Prerequisite:* civil engineering 53. Two weeks in summer camp. Two hours. Mr. Armstrong.

133 FOREST RECREATION MANAGEMENT The philosophies, values, economics, land use planning, design, and development of forest and woodland areas in public and private ownership for outdoor recreation. The impact upon the natural resources and the community. Coordination of timber, wildlife and water resources with forest recreation management. Two hours. Staff.

136 FOREST MANAGEMENT (2-2) Organization of forests for continued production, regulation of cut, rotation and cutting cycles for sustained yields. *Prerequisite:* 123 and 141. Three hours. Mr. Armstrong.

140 FOREST MENSURATION I Tree measurement techniques, volume determination of standing timber and wood products; growth and yield determina-

tions. *Prerequisite:* 5 and mathematics 110. Three weeks in summer camp. Three hours. Staff.

141 FOREST MENSURATION II (2-3) Methods of mathematical and graphical analysis of the measurement of forest trees, stands, and products. *Prerequisite:* 140. Three hours. Staff.

142 FOREST PHOTOGRAMMETRY (2-3) Preparation of planimetric and topographic maps from aerial photographs; vegetation and forest type mapping. Forest inventory through the use of aerial photographs. *Prerequisite:* 141. Three hours. Staff.

151 FOREST ECONOMICS Economics of forest production and distribution; demand for forest products and services; taxation of forest lands; use of analytical methods in forestry problems; marketing of forest products. *Prerequisite:* economics 12 and senior standing in forestry. Three hours. Mr. Armstrong.

152 FOREST POLICY AND ADMINISTRATION The development and present status of forest policies, public and private, including philosophies of natural resource management as applied to public and private enterprises. *Prerequisite:* junior standing in forestry. Three hours. Mr. Christensen.

161 WOOD TECHNOLOGY (2-3) Identification of commercial woods of the United States; basic properties and variations in relation to their uses. *Prerequisite:* botany I. Three hours. Mr. Whitmore.

163 TIMBER HARVESTING (2-3) Methods and costs of harvesting timber under different forest conditions and silvicultural treatments; organization and costs of logging operations. *Prerequisite:* 5 or 103. Three hours. Staff.

164 FOREST PRODUCTS (2-3) Wood products manufacture including lumber, veneer and plywood, pulp and paper. Wood preservation; naval stores; maple products. Forest products marketing practices. *Prerequisite:* 161. Three hours. Mr. Whitmore.

171 PRINCIPLES OF WILDLIFE MANAGEMENT Properties of game populations and their habitat in relation to the mechanisms and practices of game management. *Prerequisite:* senior standing and departmental permission. Three hours. Mr. Fuller.

172 PRACTICE OF WILDLIFE MANAGEMENT (2-3) Life history, ecology, and management of important game birds and mammals in relation to other land management objectives; techniques for research and management. *Prerequisite:* 171. Three hours. Mr. Fuller.

197, 198 SENIOR RESEARCH Work on a research problem under the direction of a staff member. Findings submitted in written form as prescribed by the department. *Prerequisite:* senior standing. Three hours. Staff.

205 MINERAL NUTRITION OF PLANTS (See plant and soil science 205) Three hours. Mr. Bartlett and botany and forestry staff. Alternate years, 1969-70.

207 WATER RELATIONS OF PLANTS Absorption, translocation, and transpiration of water. Soil-water relations. Effects of excesses and deficits of water. Mineral absorption. *Prerequisite:* Botany 103 or permission. Three hours. Mr. Post and botany and plant and soil science staff. Alternate years, 1970-71.

208 **BIOLOGICAL STATISTICS** Application of statistics to the analysis of biological data; interpretation of statistical analysis. *Prerequisite:* mathematics 9; senior standing. Three hours. Mr. Post.

221 **SITE RELATIONS AND PRODUCTION DYNAMICS IN FORESTS** Theory of site relations, methods of study, discussion of current research and its application; total site concepts; and dynamics of dry matter production. *Prerequisite:* Permission. Three hours. Mr. Hannah.

222 **ADVANCED SILVICULTURE** Scientific bases for silvicultural practices for specific forest types. *Prerequisite:* Permission of instructor. Three hours. Mr. McCormack.

242 **ADVANCED FOREST MENSURATION** Advanced mensuration principles in forest land management. Current developments in the science of forest mensuration. *Prerequisite:* 141. Three hours. Staff.

252 **FOREST VALUATION** Principles of valuation of forest growing stock, land and other forest resources. *Prerequisite:* 151 and 136 or concurrent enrollment. Two hours. Mr. Armstrong.

282, 284 **FORESTRY SEMINAR** Review and discussion of current forestry problems. Required of forestry seniors and graduate students. One hour. Mr. Christensen.

381, 382 **SPECIAL TOPICS** Advanced readings and discussion of forestry research literature. Three hours. Staff.

391 through 393 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credits as arranged.

V Geography

COLLEGE OF ARTS AND SCIENCES

Professor Miles (Chairman); Assistant Professors Barnum, Gade, Ingold, and Meeks.

Note: The normal introductory sequence is 11, 12 although 11, 14 is a recommended alternative, especially for students in economics and business administration.

11, 12 **INTRODUCTION TO GEOGRAPHY** First semester: physical elements. Second semester: human elements. Not open to students who have taken Geography 33. Three hours. I, II. Staff.

14 **INTRODUCTION TO ECONOMIC GEOGRAPHY** The types and distribution of economic activity with focus on agricultural and industrial resources and regions. Three hours. Mr. Ingold.

33 **WORLD GEOGRAPHY** Survey of the major regions and nations of the world. Required of elementary education students. Not open to students who have taken Geography 11, 12. Three hours. I, II. Staff.

51 **CLIMATE** Temperature, precipitation, wind and pressure as elements of weather and climate, and the interaction of these elements with one another to produce world climate patterns. Weather instrument use and daily weather analysis to facilitate understanding of various climatic systems. *Prerequisite:* sophomore standing. Three hours. I, II. Mr. Meeks.

71 **CARTOGRAPHY** Introduction to maps and map preparation, principles of map construction, kinds of information suitable for map presentation, techniques of map drawing, methods of map reproduction, graphs and frequency distributions. *Prerequisite:* sophomore standing. Three hours. I, II. Mr. Barnum.

101-109 **REGIONAL COURSES** The character, origin and development of the contemporary cultural, economic, and political patterns of the area against the background of its physical and resource base. *Prerequisite:* twelve hours in the social sciences. Three hours.

101 **GEOGRAPHY OF AFRICA** Mr. Miles.

102 **GEOGRAPHY OF CANADA** Mr. Miles.

103 **GEOGRAPHY OF USSR** Mr. Meeks.

105 **GEOGRAPHY OF EUROPE** Mr. Barnum.

106 **GEOGRAPHY OF LATIN AMERICA** Mr. Gade.

107 **GEOGRAPHY OF THE UNITED STATES** Mr. Meeks.

108 **GEOGRAPHY OF EAST ASIA** Mr. Ingold.

109 **GEOGRAPHY OF SOUTH ASIA** Mr. Ingold.

193, 194 **COLLEGE HONORS**

195, 196 **SPECIAL TOPICS**

197, 198 **READINGS AND RESEARCH**

201 **HISTORICAL GEOGRAPHY OF THE UNITED STATES** (Same as history 201) The physical setting of the American historical development, emphasizing the sequence of peoples and cultures which have occupied the land and their varied appreciation of its resource base. *Prerequisite:* history 23 or 28, plus nine additional hours in geography, history, or other social sciences. Three hours. Mr. Miles.

202 **HISTORICAL GEOGRAPHY OF EUROPE** (Same as history 202) European geography within a framework of past times; the historical development and distribution of settlement, economic and political patterns. *Prerequisite:* history 12 or 13, plus six additional hours in geography, history, or other social sciences. Three hours. Mr. Barnum.

211 **GEOGRAPHIC ANALYSIS OF VERMONT** A course emphasizing field studies, using the state and local area as an outdoor laboratory to indicated lines of

geographic inquiry and to demonstrate methods and techniques of investigation into the human use of the earth. *Prerequisite:* junior standing and six hours in geography. Three hours. Mr. Gade and staff.

221 through 224 **SPECIAL TOPICS IN REGIONAL GEOGRAPHY** Specialized study of a particular region or parts thereof. *Prerequisite:* twelve hours in the social sciences including three in geography, senior standing and departmental permission. Three hours. Staff.

231 **PHYSICAL AND RESOURCE GEOGRAPHY OF THE UNITED STATES** The physical environmental patterns of the United States. Identification and analysis of natural regions as they reflect the elements of the physical environment. Emphasis on distributional patterns and resource significance. *Prerequisite:* six hours in geography including Geography 11. Three hours. Mr. Meeks.

244 **ADVANCED ECONOMIC GEOGRAPHY** The geographical aspects of the localization of economic activity, patterns of circulation, regional specialization and development. *Prerequisite:* Geography 14 and nine additional hours in geography, economics or other social sciences. Three hours. Mr. Ingold.

246 **URBAN GEOGRAPHY** An analysis of the morphology and function of cities. Consideration of urban growth and development, methods of classification, distribution, and theories of location. *Prerequisite:* Geography 12 and nine additional hours in the social sciences. Three hours. Mr. Barnum.

257 **POLITICAL GEOGRAPHY** (Same as political science 257) Characteristics of the political unit as a geographic area. Consideration of location, resources, and the distributional relationships of the variety of cultural and human factors as they have a bearing on the structure and functioning of the modern political unit. Relationship between geopolitics and political geography. *Prerequisite:* twelve hours in geography and political science. Three hours. Mr. Miles.

258 **SELECTED TOPICS IN POLITICAL GEOGRAPHY** Advanced studies in political geography focusing primarily on contemporary world politics from a geographical and geopolitical viewpoint. *Prerequisite:* Geography/Political Science 257 and permission. Three hours. II. Mr. Miles.

262 **CULTURAL GEOGRAPHY** The elements of the cultural landscape, their evolution and distribution, including settlement, technology, domesticated plants and animals; as well as the spatial implications of language, religion, and cultural attitudes. *Prerequisites:* Geography 12 and nine additional hours in geography, anthropology, or other social sciences. Three hours. I. Mr. Gade.

263 **MAN IN NATURE** An inquiry into the changing conceptions of the earth as the home of man, and the conservative and destructive use of the physical environment that have resulted from these attitudes. *Prerequisite:* Three hours of geography and senior standing. Three hours. II. Mr. Gade.

271 **ADVANCED CARTOGRAPHY** The history and importance of cartography; contemporary developments; special laboratory projects. *Prerequisite:* Geography 71 and permission. Three hours. I, II. Mr. Barnum.

281 **DEVELOPMENT OF GEOGRAPHIC THOUGHT** Nature and development of geography as a discipline and a profession. *Prerequisite:* twelve hours in geography. Three hours. I. Staff.

285 SEMINAR IN HISTORICAL GEOGRAPHY Advanced studies and research in historical geography. *Prerequisite:* Geography/History 201 or 202 and permission. Messrs. Barnum and Miles.

381, 382 ADVANCED READINGS AND RESEARCH Readings on research topics, with conferences and reports, to provide graduate students with background and specialized knowledge in an area not appropriately covered by an existing course. Credit as arranged. Staff.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member culminating in an acceptable thesis. Staff.

V Geology

COLLEGE OF ARTS AND SCIENCES

Associate Professors Doten, Hunt, and Stanley (Chairman); Assistant Professors Grant and Wagner; Instructor Vollkommer

1-2 INTRODUCTORY GEOLOGY (3-2) The earth's composition and present state. The role of the sun, atmosphere, oceans, and internal forces in modifying our planet. The origin and evolution of the earth, continents, oceans, atmosphere, and life, with emphasis on methods of interpretation. Introduction to geophysics, geochemistry, geobiology, oceanography, and space geology. Two lectures, a recitation, and laboratory each week. Field trips. Four hours. Staff.

11-12 MINERALOGY (3-3, 2-3) Crystallographic, chemical and physical properties of minerals with emphasis on their geologic environment. Laboratory sessions will stress identification of minerals in hand specimen and by means of x-ray methods and the polarizing microscope. *Prerequisite:* 1-2. Introductory chemistry is advisable and may be taken concurrently. Four, three hours. Mr. Grant.

21 GEOLOGY FOR ENGINEERS (2-3) Recognition of common minerals and rocks; rock structures and their effects on engineering problems. Required of students in civil engineering, elective by permission to students in agricultural engineering, open to others by departmental permission. Three hours. Mr. Doten.

61 INTRODUCTORY METEOROLOGY (see p. 177)

103 GEOMORPHOLOGY (2-3) The description and interpretation of earth land forms with emphasis on processes by which land forms evolve. A survey of the physiographic provinces of North America. Aerial photographic interpretations of land forms. *Prerequisite:* 1 and 2. Three hours. Mr. Wagner.

105, 106 PETROLOGY (3-3) The igneous, sedimentary, and metamorphic rocks with emphasis on geologic processes instrumental in their formation.

Laboratories present various methods utilized in rock analysis. *Prerequisite:* 12 for 105, open to others by departmental permission; 105 for 106. Four hours. Staff.

116 **STRUCTURAL GEOLOGY (2-3)** Behavior of rocks in different tectonic environments of the earth's crust. Laboratory studies of rock deformation, description and geometry of structural types, and the kinematic and dynamic interpretation of structural features of all sizes. *Prerequisite:* 12. Three hours. Mr. Stanley.

121 **PALEONTOLOGY (2-3)** Principles of classification, methods of interpretation, and a survey of ancient life. Consideration is given to the species concept, the fossil sample, principles of evolution, uses of fossils, and other basic topics. *Prerequisite:* 2 or zoology 1, or the equivalent. Three hours. Mr. Hunt.

125 **FIELD GEOLOGY (1-6)** Geologic mapping of a nearby area or field study of selected structural features within a 100-mile radius of the University. Methods of analysis of field data, structural features in sedimentary, metamorphic, and igneous rocks, and stratigraphic principles. *Prerequisite:* 116 or departmental permission. Three hours. Mr. Stanley.

130 **GEOLOGY OF MINERAL RESOURCES (2-3)** The origins, forms, and classifications of mineral deposits. The world location, occurrence and production of major mineral products. *Prerequisite:* 2 or 21. Three hours. Mr. Doten.

193, 194 **COLLEGE HONORS**

195, 196 **SPECIAL TOPICS**

197, 198 **RESEARCH IN GEOLOGY (0-2)** Individual research supervised by a member of the staff. Discussions and readings are designed to deepen a student's knowledge in a selected field of geology. Students from the allied sciences, mathematics, and engineering who have taken several of the required courses of the geology major may elect a research problem that combines their major field of study and geology. Written and oral research reports required. *Prerequisite:* consultation with the staff. Three hours.

211 **X-RAY CRYSTALLOGRAPHY** The theory and practice of x-ray powder diffraction techniques for the identification of crystalline materials; single crystal methods and x-ray spectrography. *Prerequisite:* junior or senior standing with a concentration in a physical science, engineering or mathematics. Three hours. Mr. Grant.

216 **GLACIAL GEOLOGY (2-3)** The Quaternary history of North America with emphasis on the origin, mechanics, and effects of past and present glaciations. *Prerequisite:* 103 or 105. Three hours. Mr. Wagner. Alternate years, 1968-69.

218 **HYDROGEOLOGY (3-0)** The origin, occurrence, movement, and character of ground water in various geologic environments, principles and practices of development, utilization, and management of ground water supplies. *Prerequisite:* Geology 103 or 216. Mr. Wagner. Alternate year, 1969-70. Three hours.

224 **STRATIGRAPHY (2-2)** Sequential development and distribution of the sedimentary rocks. *Prerequisite:* 223. Three hours. Staff. Alternate years, 1969-70.

242 REGIONAL GEOLOGY (3-0) Comprehensive study of the geology and sequential development of selected regions of the earth's crust. *Prerequisite:* 106 (or concurrent enrollment), 116, 125. Mr. Stanley. Three hours.

251 GEOLOGY OF ORE DEPOSITS Special emphasis is placed upon the study of the origins and geologic associations of ore deposits. Other aspects include consideration of the application of physical and chemical methods for their discovery. Laboratory work will include thin and polished section techniques as well as chemical investigations. *Prerequisite:* 106. Mr. Doten. Alternate years, 1968-69.

271-272, 273-274 TOPICS IN GEOLOGY (1-0) Selected topics of current interest. *Prerequisite:* 106, 116. One hour. Staff.

312 ADVANCED MINERALOGY (2-3) Selected topics in mineralogy including crystal chemistry, experimental mineralogy, and current problems in mineralogy. *Prerequisite:* 211. Three hours. Mr. Grant. Alternate years, 1968-69.

321 IGNEOUS GEOLOGY (2-3) Paragenesis of igneous rocks; laboratory work on selected suites of specimens. *Prerequisite:* Three hours. Mr. Doten. Alternate years, 1968-69.

324 METAMORPHIC GEOLOGY (2-3) The origin of metamorphic rocks with emphasis on the concepts of metamorphic facies, analysis and interpretation of mineral assemblages and the spacial relationship of metamorphism to tectogenesis. *Prerequisite:* 106, 211. Three hours. Messrs. Grant and Stanley. Alternate years, 1968-69.

326 SEDIMENTARY PETROLOGY (2-3) Origin and interpretation of sedimentary rocks. Topics include mechanics of transportation and deposition, recent depositional environments, interpretation of surface textures, methods of statistical analysis, theoretical aspects of rock classification, and sedimentary tectonics. Thin section study and individual projects. *Prerequisite:* 106. Three hours. Mr. Hunt.

330 ADVANCED GEOMORPHOLOGY (2-3) Examination of stream, wind, glacier, and wave mechanics and the resultant land forms. Emphasis is given to recent field and laboratory studies. Three hours. Mr. Wagner.

335 ADVANCED STRUCTURAL GEOLOGY (2-3) The geometric relationship and origin of various structural features in the different tectonic environments of the earth's crust. Emphasis is placed on field investigations, laboratory results, and theoretical models that provide insight into the deformation behavior of rocks in different parts of the earth's crust and the relationship between geologic structure and the dynamic configuration in which they have formed. *Prerequisite:* 116. Three hours. Mr. Stanley.

337 STRUCTURAL PETROLOGY (3-0) Origin of strain features in common rock forming minerals with emphasis on their dynamic and kinematic interpretation as based on laboratory and field studies since World War II. Laboratory will be problem oriented with emphasis on techniques of analyses including orientation and universal stage procedures, use of computers in the rotation of data, and methods of interpretation. *Prerequisite:* Geology 116 and Optical Mineralogy. Will alternate with Advanced Structural Geology 335. Mr. Stanley.

342 ADVANCED PALEONTOLOGY (2-3) Problems in biogeology, paleoecology, and stratigraphic paleontology. The use of fossils in determining the origin, depositional environment, and age of rocks. Consideration is given to biogenic sedimentation, to taxonomic, adaptive, and biogeographic methods of paleoecological interpretation, and to geochronologic measures. *Prerequisite:* 121. Three hours. Mr. Hunt.

371, 372 ADVANCED READINGS IN GEOLOGY Readings and research problems intended to contribute to the program of graduate students in phases of geology for which formal courses are not available. *Prerequisite:* graduate standing in geology. One to three hours. Staff.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

V German

COLLEGE OF ARTS AND SCIENCES

Professors Webster (Chairman) and White; Assistant Professors Kahn and Wurthmann; Instructors Ganz, Noble and Thresher

1-2 ELEMENTARY GERMAN Emphasis on the spoken language of everyday use. Oral and written practice in speaking, reading, and comprehension, based on memorization of texts in the form of dialogues. Tape recordings are used in the language laboratory as aids to speaking and comprehension. *Credit is allowed only if German 11-12 is also completed.* Four hours. Staff.

11-12 INTERMEDIATE GERMAN Reading and discussion, as far as possible in German, of selected prose with review of grammar and practice in translating technical expository prose. Emphasis on development of facility in reading; knowledge of idioms; auditory comprehension. *Prerequisite:* 1-2 or equivalent. Three hours. Staff.

81-82 SCIENTIFIC GERMAN Development of ability to read accurately and efficiently original German in the field of each student's scientific interest. *Prerequisite:* 11-12 or equivalent. Three hours. Mr. Wurthmann.

101-102 INTRODUCTION TO GERMAN LITERATURE Selected works of Lessing, Goethe, and Schiller. Survey of the development of German literature from the beginnings to the twentieth century, with practice in hearing, writing, and speaking German. *Prerequisite:* 11-12. Three hours. Mr. Webster.

121-122 COMPOSITION AND CONVERSATION Guided conversation, discussion, and oral and written drill in German with emphasis on increasing oral and written command of the language. Free composition, oral reports, and translation

into German are required. *Prerequisite:* 11-12 or equivalent and departmental permission. Three hours. Mr. Wurthmann.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS Advanced study in accordance with students' needs and interests. *Prerequisite:* 101-102 or the equivalent and departmental permission. Three hours. Staff.

197, 198 READINGS AND RESEARCH

205, 206 GOETHE Life and works of the poet through the Italian journey (205). Goethe in the years of his maturity: 1790-1832 (206). *Prerequisite:* 101-102 or the equivalent. Three hours. Messrs. Webster and White. Alternate years, 1970-71.

207 NINETEENTH-CENTURY PROSE Masterpieces of narrative prose by representative authors such as Mörike, Keller, O. Ludwig, C. F. Meyer, Stifter, Raabe, and the early Thomas Mann. *Prerequisite:* 101-102 or the equivalent. Three hours. Mr. White.

208 NINETEENTH-CENTURY DRAMA Works by Kleist, Büchner, Grillparzer, Hebbel, O. Ludwig, Wagner, and the early Hauptmann. *Prerequisite:* 101-102 or the equivalent. Three hours. Mr. White.

209, 210 THE TWENTIETH CENTURY Selected works in poetry, prose and drama by Brecht, George, Hauptmann, Hofmannsthal, Kafka, Thomas Mann, Rilke, and others. *Prerequisite:* 101-102 or the equivalent. Three hours. Mr. White. Alternate years, 1969-70.

221-222 ADVANCED COMPOSITION AND CONVERSATION Guided conversation, discussion and advanced oral and written drill in German. Study of modes of expression and stylistic devices of modern German based on analysis of selected texts. Problems in translating literary and technical English prose into German. *Prerequisite:* 121-122 or equivalent. Three hours. Mr. Kahn.

232 HISTORY OF THE GERMAN LANGUAGE Introduction to Germanic linguistics, the comparative method, and linguistic reconstruction. The development of German from Indo-European to the present. No knowledge of the older stages of the language is presupposed or required. *Prerequisite:* 121-122 or the equivalent. Three hours. Mr. White.

235 THE STRUCTURE OF GERMAN Linguistic analysis of the phonological, morphological, and syntactic structure of modern German with special attention to problems useful for teachers. *Prerequisite:* 121-122 or the equivalent. Three hours. Mr. White.

281-282 SENIOR SEMINAR Readings and research. Required of all senior concentrators. One hour.

381, 382 GRADUATE SEMINAR Readings, conferences, and reports in connection with the work of candidates for the M.A. degree. Three hours.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

V Hebrew

COLLEGE OF ARTS AND SCIENCES

Assistant Professor Kahn

1-2 ELEMENTARY HEBREW The spoken language of everyday use with oral, aural and written practice in speaking, reading, and comprehension based on memorization of texts in the form of dialogues. Four hours. Mr. Kahn. Alternate years, 1969-70.

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. Mr. Kahn. Alternate years, 1970-71.

V History

COLLEGE OF ARTS AND SCIENCES

Professors Daniels (Chairman), Evans, and Schultz; Associate Professors Ambrose, Davison, Felt,¹ Hand,² Schmokel, Spinner, and Stout; Assistant Professors Berger, Gard, Metcalfe, Muller, Overfield, and True; Instructors Andrea, Fachler, Hutton, and McCarty; Lecturers Goldberg, Morrissey, and Moseley³

All advanced courses numbered 100 or above have the prerequisite of a specific survey course. CEEB and Advanced Placement tests may in some cases be accepted instead, with the permission of the instructor concerned. Courses numbered 200 or above have the further prerequisite of six additional hours of history or other social science, together with junior standing or permission of the instructor. The first semester of any two-semester course is prerequisite for the second semester, except by permission of the instructor.

Note: All students required to take a year of history for distribution in the Liberal Arts Curriculum must complete either 11 and 12, or 13, unless they offered for admission a year of European or World History. Students planning to concentrate in a classical language may substitute Ancient or Medieval History.

1 INTRODUCTION TO EUROPEAN HISTORY Survey of the principal developments, from ancient times to the present. Open only to freshmen who lack the preparation necessary for 11. This course cannot be counted toward concentration or distribution requirements in the Liberal Arts Curriculum. Three hours. Mr. Hand.

1. On leave, spring semester, 1969.

2. On leave, fall semester 1968.

3. Spring semester, 1969.

11, 12 EUROPEAN CIVILIZATION History of Europe, 1500 to the present. 11 and 12, or 13 is required of all who concentrate in history. Waived as concentration requirement and prerequisite for advanced courses for students who are offered advanced placement by the Department at the time of freshman orientation. Three hours. Messrs. Andrea, Gard, Hutton, Metcalfe, Overfield, Schmokel, and Spinner.

13 EUROPEAN THOUGHT AND INSTITUTIONS Survey of European history, 1500 to the present, with emphasis on social and intellectual history. An accelerated course open only to freshmen with departmental permission. Freshmen who complete history 13 in the fall semester are advised to take 28 in the spring semester, if qualified to do so. The sequence of 13 and 28 satisfies the distribution requirement in history in the Liberal Arts Curriculum. Three hours. Staff.

23, 24 HISTORY OF THE UNITED STATES American history since 1783. *Prerequisite:* sophomore standing. Three hours. Messrs. Berger, Felt, Muller, Schultz, and Stout.

28 AMERICAN THOUGHT AND INSTITUTIONS Survey of American history, 1783 to the present, with emphasis on social and intellectual history. An accelerated course open only to freshmen and sophomores with departmental permission. Three hours. Mr. Hand.

31, 32 ANCIENT HISTORY The ancient Near East, Greece, and Rome. *Prerequisite:* sophomore standing or concurrent enrollment in Latin or Greek. Three hours. Miss Davison, Messrs. Ambrose and McCarty.

33, 34 MEDIEVAL EUROPE Europe from the late Roman Empire to the Renaissance, with emphasis on political and cultural developments. *Prerequisite:* sophomore standing or concurrent enrollment in Latin. Three hours. Mr. Andrea.

40 BIOGRAPHY The biographical approach to history. *Prerequisite:* senior standing. Three hours. Mr. Schultz.

51, 52 CONTEMPORARY HISTORY Survey of recent world events: first semester, 1918-1945; second semester, 1945 to the present. *Prerequisite:* sophomore standing. Three hours. Messrs. Spinner and Goldberg.

61, 62 HISTORY OF SCIENCE Survey of the principal developments in the history of science, both physical and biological, from antiquity to the present. *Prerequisite:* junior standing and one year laboratory science. Three hours. Staff.

71, 72 ASIAN CIVILIZATION Survey of the history of the principal civilizations of Asia, from ancient times to the twentieth century. First semester: the Moslem world and India; second semester: the Far East and Southeast Asia. *Prerequisite:* sophomore standing. Three hours. Messrs. Gard and Moseley.

91 HISTORIOGRAPHY An introduction to the mechanics of historical research and to the writings of great historians. Strongly recommended for students concentrating in history. *Prerequisite:* six hours of history. Three hours. I, II. Staff.

115, 116 AFRICAN HISTORY Survey of the history of Africa south of the Sahara, from earliest times to independence. First semester: to 1880; second semester: 1880 to the present. *Prerequisite:* 11 and 12, or 13; geography 101 recommended. Three hours. Mr. Schmokel.

123 AMERICAN HISTORY SINCE 1945 Survey of recent developments in the United States not covered in detail in 24 or 28. *Prerequisite:* 23 and 24, or 28. Three hours. Mr. Hand.

125 HISTORY OF THE NEGRO IN THE UNITED STATES The Negro in American 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. *Prerequisite:* 23 and 24, or 28, or appropriate work in social science. Three hours. Mr. Felt.

130 CHINESE HISTORY Survey of Chinese civilization from the seventeenth century to the present. *Prerequisite:* 11 and 12, or 13, or political science 175. Three hours.

191 READINGS FOR DEPARTMENTAL HONORS For seniors concentrating in history only. (Candidates should consult the chairman of the Department at the time of spring enrollment. Students accepted will do their readings between November and March; official enrollment will be in the spring semester.) *Prerequisite:* an 80 average through the junior year and an 85 average in at least eighteen hours of history; completion of at least six hours of history numbered above 200. Three hours. Staff.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

197, 198 READINGS AND RESEARCH

201 HISTORICAL GEOGRAPHY OF THE U. S. Three hours. See geography 201.

202 HISTORICAL GEOGRAPHY OF EUROPE Three hours. See geography 202.

203, 204 LATIN-AMERICAN HISTORY Political, social, and economic development. First semester, colonial period; second semester, national period. *Prerequisite:* 11 and 12, or 13. Three hours. Mr. True.

207 THE DARK AGES Western Europe from the late Roman Empire to the death of Otto III (A.D. 1002). Emphasis on political, social, and ecclesiastical developments. *Prerequisite:* 12 hours of history including 91 or 301 or concurrent enrollment in 301. Three hours. Mr. Andrea.

208 THE HIGH MIDDLE AGES Western Europe, 1000-1300. Emphasis on religious, intellectual, and artistic developments. *Prerequisite:* 207. Three hours. Mr. Andrea.

211 THE RENAISSANCE Political, economic, and cultural developments in Europe, c. 1250 to c. 1517, with emphasis on Italian humanism. *Prerequisite:* 11 and 12, 13, or 34. Three hours. Mr. Evans.

212 THE REFORMATION Political, economic, and cultural developments in Europe in the sixteenth century, with particular attention to the religious movements, and to the evolution of Northern European humanism. *Prerequisite:* 11 and 12, or 13. Three hours. Mr. Overfield.

213, 214 CANADIAN HISTORY Canadian development from the French exploration and settlement to the present; evolution of self-government and rela-

tions with the United States; historical foundations of the problems of biculturalism. *Prerequisite:* 11 and 12, or 13. Three hours. Messrs. Muller and Metcalfe.

221 THE AMERICAN COLONIES The colonial period of American history from the earliest explorations to 1763. *Prerequisite:* 11 and 12, or 13, or 23 and 24, or 28. Three hours. Mr. Stout.

222 THE AMERICAN REVOLUTION History of the War for Independence, the confederation, and the making of the U. S. Constitution, 1763-1789. *Prerequisite:* 221. Three hours. Mr. Stout.

231, 232 FRENCH HISTORY History of France in modern times: first semester, seventeenth century to 1848; second semester, 1848 to the present. *Prerequisite:* 11 and 12, or 13. Three hours. Mr. Hutton.

233, 234 GERMAN HISTORY History of Germany in modern times; first semester, seventeenth century to 1850; second semester, 1850 to the present. *Prerequisite:* 11 and 12, or 13. Three hours. Messrs. Overfield and Schmokel.

237 ECONOMIC HISTORY OF PRE-INDUSTRIAL EUROPE Development of economic institutions and technology from the late Roman Empire to the eighteenth century. For the economic history of Modern Europe see economics 238. *Prerequisite:* 11 and 12, or 13, and economics 12 (one of the prerequisites may be taken concurrently). Three hours. Mr. Stout. (For ECONOMIC HISTORY OF EUROPE SINCE THE INDUSTRIAL REVOLUTION, see economics 238.)

241, 242 ERA OF THE FRENCH REVOLUTION AND NAPOLEON French history from 1789 to 1815 with special attention to the impact of French ideas and power upon Europe. *Prerequisite:* 11 and 12, or 13, and reading knowledge of French. Three hours. Mr. Evans.

243 SOVIET RUSSIA The USSR from the Revolution of 1917 to the present. A general introduction to the study of Russia and Communism, including historical and ideological background, Soviet political and economic institutions, Soviet foreign policy, and international Communism. *Prerequisite:* 11 and 12, or 13, or 52. Three hours. Mr. Daniels.

244 TSARIST RUSSIA History of Russia from the Middle Ages to the Revolution of 1917, with emphasis on the period since Peter the Great. *Prerequisite:* 11 and 12, or 13. Three hours. Mr. Gard.

253, 254 ENGLISH HISTORY Political and social history of England and its role in world history. First semester, Middle Ages to 1715; second semester, 1715 to the present. *Prerequisite:* 11 and 12, or 13. Three hours. Messrs. Metcalfe and Spinner.

257, 258 AMERICAN STATESMEN Thought and practical politics of American statesmen. *Prerequisite:* 23 and 24, or 28. Three hours. Mr. Schultz.

259 THE LINCOLN ERA A history of the United States, 1830-1865, with emphasis on the sectional conflict of the 1850's, the Civil War, and the life of Lincoln. *Prerequisite:* twelve hours of history, including 23 or its equivalent. Three hours. Mr. Schultz.

261 VERMONT HISTORY A survey of Vermont History from early times to the present, with special emphasis on local history as a means to examine national trends and as a vehicle for research. *Prerequisite:* 23 and 24, or 28. Three hours. Mr. Muller.

265, 266 INTELLECTUAL HISTORY OF THE UNITED STATES Selected topics in the intellectual history of the United States since 1783. *Prerequisite:* 23 and 24, or 28, or appropriate work in another discipline. Three hours. Mr. Felt.

267, 268 HISTORY OF U. S. FOREIGN RELATIONS International relations from the eighteenth century to the present, with major emphasis on the foreign policies of the United States. First semester: 1763-1893; second semester: 1893-present. *Prerequisite:* 11 and 12, or 13, or 23 and 24, or 28. Three hours. Mr. Berger.

277 GOVERNMENT OF THE USSR (Same as political science 277.) Theoretical background, structure and development of the Soviet state and the Communist Party; economic, social, and cultural policies; comparative survey of other Communist governments; current changes. *Prerequisite:* 243, or six hours of political science including 72, and one other year course in social science. Three hours. Mr. Daniels.

278 FOREIGN POLICY OF THE USSR (Same as political science 278). Theoretical background; history of Soviet foreign relations; development of the international Communist movement and the Communist bloc; factors and instruments of policy; current problems of relations between Russia and the West among the Communist countries. *Prerequisite:* 243 or six hours of political science including 51, and one other year course in social science. Three hours. Mr. Daniels.

301 HISTORIOGRAPHY Techniques of historical research and the development of the various philosophies of history. (Designed to provide a professional orientation for graduate students.) Required for all beginning graduate students. Three hours. Mr. Felt.

Seminar Courses: Ordinarily each seminar will be given for one semester in alternate years. All seminars will count for three credit hours per semester. The prerequisites for each seminar are appropriate work in the given field, foreign language where necessary, and permission of the instructor. Exceptionally qualified senior undergraduates will be admitted to seminars when space permits.

303, 304 LATIN AMERICAN HISTORY Mr. True. (1969-70)

305, 306 ANCIENT HISTORY Miss Davison. (1968-69)

307, 308 MEDIEVAL HISTORY Mr. Andrea. (1968-69)

311, 312 THE HISTORY OF EARLY MODERN EUROPE Mr. Evans, Mr. Overfield. (1968-69)

313, 314 THE HISTORY OF CANADA Mr. Metcalfe, Mr. Muller. (1968-69)

321, 322 AMERICAN COLONIAL HISTORY Mr. Stout. (1969-70)

331, 332 THE HISTORY OF FRANCE Mr. Evans, Mr. Hutton. (1969-70)

- 333, 334 THE HISTORY OF GERMANY Mr. Schmokel. (1969-70)
 343, 344 THE HISTORY OF RUSSIA Mr. Daniels,, Mr. Gard. (1968-69)
 353, 354 THE HISTORY OF ENGLAND Mr. Metcalfe, Mr. Spinner. (1969-70)
 355, 356 RECENT EUROPEAN HISTORY Mr. Schmokel and staff. (1968-69)
 357, 358 U.S. POLITICAL HISTORY Mr. Hand, Mr. Schultz. (1968-69)
 361, 362 STATE AND LOCAL HISTORY Mr. Bassett, Mr. Morrissey, Mr. Muller. (1968-69)
 365, 366 U.S. SOCIAL AND INTELLECTUAL HISTORY Mr. Felt. (1969-70).
 367, 368 THE HISTORY OF U. S. FOREIGN RELATIONS Mr. Berger. (1969-70)
 377, 378 SPECIAL TOPICS Mr. Daniels and staff. (1969-70)

391 through 393 MASTER'S THESIS RESEARCH Investigation of an individual research topic. Required of all candidates for the M.A. Normally arranged for two semesters at three hours each. Staff.

397, 398 SPECIAL READINGS AND RESEARCH Readings or research topics, with conferences and reports, to provide graduate students with background and specialized knowledge in an area not appropriately covered by an existing course. Three hours. Staff.

V Home Economics

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professor Samenfink; Associate Professors Brown, Caldwell, Knowles, Morse, and Williams (Chairman); Assistant Professors Atwood, Emanuel, Jameson, Lepeschkin, Livak, Powell, Prior, Webster, and Whittlesey; Instructors Osborn and Soule; Mr. Emanuel; Mr. Spaven

1 ORIENTATION Home Economics in the Land-Grant College—teaching, research, and extension. The historical development of the field, its common core of family and individual, and the professional opportunities which are available. Required of all freshmen. 1 hour. Staff.

Related Art

15 DESIGN (1-4) Color and design in theory and practice. Work with various media as a means of creative expression and understanding of art principles. Three hours. I, II. Miss Caldwell.

17 COSTUME DESIGN (1-4) Application of design fundamentals and principles to fashion planning. Techniques of fashion illustration. *Prerequisite:* 15. Three hours. Miss Caldwell.

115 TEXTILE DESIGN (1-4) Application of design elements and principles to processes of textile design. The Shelburne Museum collection will provide resources for research. *Prerequisite:* 15, 20; or art 10 and departmental permission. Three hours. Miss Atwood.

116 WEAVING (1-4) Practical application of design fundamentals in the creation of woven textiles. Opportunity will be provided to use the Shelburne Museum textile collection. *Prerequisite:* 15, 20; or art 10 and departmental permission. Three hours. Miss Atwood.

117 HISTORY OF COSTUME (2-2) History of costume stressing the background, philosophy and events of each period as reflected in dress. Adaptation of historic design to modern fashion. *Prerequisite:* history 12. Three hours. Miss Caldwell.

119 HOME FURNISHING I (1-4) Application of design fundamentals to the problems involved in furnishing the home. *Prerequisite:* 15. Three hours. Miss Caldwell.

S217 AMERICAN TEXTILES AND FASHION: TWO CENTURIES—18th Century to 1910. The collections of textiles and needle art in the Shelburne Museum will provide source material for lectures, demonstrations and laboratory experience in the study of home production, design and use of early fabrics. The Museum's extensive collection of Couturier gowns will be used for the study of late Victorian and Edwardian fashion. *Prerequisite:* six hours in design and/or textiles, or permission of instructors. Three hours. Misses Atwood and Caldwell. (Graduate Credit Pending)

219 HOME FURNISHING II (1-4) Interior design; period furnishing, its present use and influence upon modern furnishing. *Prerequisite:* 119. Three hours. Miss Caldwell.

Clothing and Textiles

20 INTRODUCTION TO TEXTILES AND CLOTHING (3-1) Fibers, their properties and manufacturing processes. Selection of clothing to meet consumer needs in relation to material, design and appropriateness. Three hours. I, II. Mrs. Emanuel.

22 CLOTHING SELECTION AND CONSTRUCTION (1-4) Selection of clothing to meet individual needs in relation to design and appropriateness of dress. Development of clothing construction techniques. Three hours. Staff.

120 ADVANCED TEXTILES (1-4) Historical and sociological background to textiles and textile design; testing techniques and recent developments in the field. *Prerequisite:* 20. Three hours. Mrs. Emanuel.

122 PATTERN DESIGN AND ADVANCED CONSTRUCTION (2-4) Techniques of designing and altering flat patterns. Advanced construction techniques and original design. *Prerequisite:* 22. Three hours. I, II. Mrs. Webster.

123 TAILORING (2-4) Construction techniques with emphasis on tailoring problems. *Prerequisite:* 122. Three hours. Mrs. Webster.

221 **COSTUME DESIGN AND DRAPING (1-4)** Draping techniques used in creative fashion design. Handling of fabrics in relation to line in dress. Original projects developed according to individual interests. *Prerequisite:* 15, 122. Three hours. Mrs. Webster.

229 **CLOTHING, TEXTILES AND RELATED ART SEMINAR** Theory and research in the field of Clothing, Textiles and Related Art, analysis of current problems; review and discussion of recent research, books and publications; individual studies. *Prerequisite:* 117, 219, 221, or equivalent. Three hours. Staff.

Food and Nutrition

35 **BASIC CONCEPTS OF FOOD AND NUTRITION (3-2)** Principles of nutrition for the individual related to growth and health in family setting. Basic principles of food purchasing and preparation presented through demonstration-lectures. Four hours. I, II. Mrs. Livak, Miss Williams.

41 **FUNDAMENTALS OF NUTRITION** Basic principles of nutrition. Nutrient content of foods. Practice in recording and evaluating dietary intake of individuals. *Prerequisite:* chemistry 4, zoology 6. Three hours. Miss Powell.

135 **ADVANCED FOOD PREPARATION (2-4)** Scientific principles and fundamental processes underlying food preparation and preservation with practical application. *Prerequisite:* 35, chemistry 16 or 131. Four hours. I, II. Mrs. Livak.

137 **MEAL MANAGEMENT (1-5)** Principles and practice in planning, preparing and serving family meals at different cost levels. *Prerequisite:* 35. Three hours. I, II. Mrs. Soule.

144 **APPLIED NORMAL NUTRITION (2-2)** Emphasizing nutritional needs of individuals in all stages of the life cycle. Attention is given to the social, economic and cultural factors which affect nutrient intake. Selected field experience. *Prerequisite:* 35, sociology 21, junior standing. Three hours. I, II. Miss Powell.

S235 **RECENT ADVANCES IN FOOD AND NUTRITION** Interpretation, application and communication of the recent trends in Foods and Nutrition as evidenced through current literature and research. *Prerequisite:* 35, 135, 137, or equivalent; chemistry 1 and 2, or 3 and 4. Three hours. Staff. (Summer Session or Evening Division only).

236 **INTRODUCTION TO FOOD RESEARCH (1-4)** Methods and techniques in experimental work in foods. Independent laboratory study of problems in food preparation. *Prerequisite:* 135. Three hours. Mrs. Livak.

237 **READINGS IN FOODS** Critical survey of the literature on the recent developments in food research. *Prerequisite:* senior standing; 135. Two or three hours. Staff.

238 **WORLD DIETARY PROBLEMS (3-0)** The complex interrelationships which are responsible for the nutritional status of persons living in selected countries. A background for the understanding of the causes of malnutrition in various areas of the world and the study of the techniques used, and agencies working to alleviate the problems. *Prerequisite:* 135, 144; sociology 21, or departmental permission. 3 hours. Miss Williams.

243 **ADVANCED NUTRITION (3-0)** Human nutrition; the nutritive value of foods with application in calculating food requirements; diets for children, adults and family groups. *Prerequisite:* 135; agricultural biochemistry 151; zoology 6 or 52. Three hours. Miss Morse.

244 **DIET THERAPY (2-2)** Adaptations of the normal diet in conditions affected by or affecting the utilization of food. *Prerequisite:* 243. Three hours. Miss Powell.

248 **READINGS IN NUTRITION** Critical survey of the literature on recent developments in nutrition. *Prerequisite:* 243, or departmental permission. Two or three hours. Staff.

249 **NUTRITION SEMINAR** A review of the recent developments in human nutrition in reference to the individual and to the nutritional problems on a world-wide basis. *Prerequisite:* a college course in principles of nutrition. Two or three hours. Staff.

294 **HISTORY OF NUTRITION** Foremost investigators and methods involved in the development of present day nutritional knowledge. *Prerequisite:* three hours of nutrition. One hour. Staff.

Institutional Food Service

138 **QUANTITY FOOD PRODUCTION AND SERVICE (3-4)** Equipment; sanitation; time and motion; practical applications of principles, methods, and techniques used in quantity food production and service in different types of food service establishments. *Prerequisite:* 135. Five hours. Mr. Emanuel.

139 **INSTITUTIONAL PURCHASING AND FOOD COST CONTROL (3-0)** Principles of institutional purchasing, accounting, food cost control, and menu planning. *Prerequisite:* 135. Three hours. Mrs. Emanuel.

239 **INSTITUTIONAL ORGANIZATION AND MANAGEMENT (3-0)** Institutional organization and management; personnel policies; laws and regulations; promotion and advertising. *Prerequisite:* 138, 139 or equivalent. Three hours. Mr. Emanuel.

Housing

51 **HOUSING** Survey of family shelter, needs and supply. Discussion of problems of site location, financing, utilization of space and materials. Three hours. Miss Knowles.

54 **HOUSEHOLD EQUIPMENT (2-2)** Application of scientific principles to the selection, operation and care of household equipment. Three hours. Miss Knowles.

151 **HOUSE PLANNING (1-4)** An advanced study of housing design to meet family requirements, application of home management principles. *Prerequisite:* 51, 56. Three hours. Miss Knowles.

155 **EXPERIMENTAL EQUIPMENT (1-4)** Performance measurement and rating of household equipment. *Prerequisite:* 54. Three hours. Miss Knowles.

251 **ADVANCED HOUSING** Investigation of housing data and current problems including studies of environmental factors, technological developments and governmental programs. *Prerequisite:* 51; economics 12 and sociology 21. Three hours. Miss Knowles.

Home Management

56 **PRINCIPLES OF HOME MANAGEMENT** Family and individual management techniques. Application to use of time, energy and money. Introduction to consumer economics. Three hours. Mrs. Soule.

156 **HOME MANAGEMENT RESIDENCE** Practical application of home management and group living in the Home Management Residence. Students are charged for room rent and board proportional to that paid by students in University residence halls. *Prerequisite:* 56, 137. Three hours. I, II. Mrs. Soule.

158 **CONSUMER PROBLEMS** Role of the consumer in the economy, problems in modern buyer/seller relationships; institutions and agencies providing information and protection to the consumer. Lecture, readings, demonstration problems. *Prerequisite:* junior or senior standing. Three hours. Mrs. Prior.

256 **HOME MANAGEMENT PROBLEMS** Application of economic and sociological principles to some problems of the home and family. *Prerequisite:* 56; economics 12; psychology 1. Three hours. Staff.

258 **FAMILY ECONOMICS** The consumer and the market. Use of credit, savings and investments, insurance and estate planning for the family. *Prerequisite:* 56; economics 12. Three hours. Miss Ellis.

301 **READINGS IN FAMILY ECONOMICS** Critical survey of the literature and of recent research in Family Economics. *Prerequisite:* 258. Statistical Methods and one other advanced economics course (may be taken concurrently). Three or four hours. Staff.

Family Living-Human Development

61 **THE FAMILY, COMMUNITY AND PRESCHOOL** The family as a basic social unit and its interrelationships with the community and school. Three hours. Mrs. Jameson.

63 **HUMAN DEVELOPMENT AND PERSONALITY (I)** The biological, psychological, and social growth and development of the child and his relationships with his family, peers and institutions. Observation in the preschool laboratory. *Prerequisite:* sophomore standing. Three hours. I, II. Mrs. Jameson.

163 **DYNAMICS OF FAMILY DEVELOPMENT** Development growth of parents and children in the various stages of the family life cycle. *Prerequisite:* junior standing. Three hours. I, II. Mr. Samenfink, Mrs. Jameson.

164 **INTRODUCTION TO PARENT EDUCATION AND FAMILY CONSULTING** Principles of parent education and family consulting; formulation and presentation of programs for preschool parents. Two hours. Alternate years, 1969-70. Mrs. Jameson.

165 **AGING IN THE FAMILY AND COMMUNITY** Orientation to the place of the older person in contemporary American life and in modern western European cultures. *Prerequisite:* junior standing or departmental permission. Three hours. Staff.

263 **SEMINAR IN FAMILY RELATIONS AND HUMAN DEVELOPMENT** Theory and research on the family. *Prerequisite:* 163 and/or sociology 151 or equivalent. Three hours. Mr. Samenfink. Alternate years, 1969-70.

264 **THE AMERICAN WOMAN** Recent literature regarding the role of women and the unique tasks they face in maintaining stability in a dynamic twentieth century world. *Prerequisite:* 163 and/or sociology 151 or equivalent. Three hours. Mr. Samenfink. Alternate years, 1969-70.

265 **FAMILY LIFE EDUCATION IN SCHOOL AND COMMUNITY** Practical and theoretical approach to the family as an interacting unit and as an institution. Teachers, social workers, nurses, guidance and extension specialists and others, are offered an opportunity to develop a philosophy basic to family life education. *Prerequisite:* 63, 163, or equivalent. Three hours. Mr. Samenfink.

266 **PERSONALITY AND DEVELOPMENT IN EARLY CHILDHOOD** An intensive study and application of the principles of child development in relationship to preschool education, nursing and other areas. *Prerequisite:* 63 and 163, or equivalent. Three hours. Mr. Samenfink.

Early Childhood Education

65 **EXPERIENCE WITH PRESCHOOL FAMILIES (2-2)** Work in the laboratory preschool program to understand better the role of the teacher consultant in relationship to young children and their families. *Prerequisite:* 63. Four hours. I, II. Mrs. Lepeschkin.

82 **CREATIVE CURRICULUM ACTIVITIES FOR PRESCHOOL AND KINDERGARTEN I (2-2)** The theory and practice of developing a creative curriculum for preschool and kindergarten children: experimenting with art, science, and language materials and experience with preschoolers. *Prerequisite:* 63. Three hours. Mrs. Lepeschkin.

164 **INTRODUCTION TO PARENT EDUCATION AND FAMILY CONSULTING** Principles of parent education and family consulting; formulation and presentation of programs for preschool parents. Two hours. Alternate years, 1969-70. Mrs. Jameson.

183 **CREATIVE CURRICULUM ACTIVITIES FOR PRESCHOOL AND KINDERGARTEN II (2-3)** Investigation of cognitive learning in the early childhood years and practices in introducing numbers, science and social studies. *Prerequisite:* 82. Three hours. Mrs. Lepeschkin.

184 **EARLY CHILDHOOD EDUCATION** An examination of educational theories from early civilizations to modern times with emphasis on the early childhood years. The present approach to the total structuring of facilities and curriculum for the preschool child. Three hours. Mrs. Lepeschkin.

189 **PRESCHOOL PRACTICUM (1-5)** Supervised planning and conducting the preschool laboratory program. *Prerequisite:* 63, 65, 82 and 164. Six hours. Staff.

Preprofessional Social Work

166 SOCIAL WELFARE AS A SOCIAL INSTITUTION History, philosophy, purpose of social welfare; review of fields and processes of social work. *Prerequisite:* sociology 21, psychology 1. Three hours. I, II. Miss Whittlesey.

167 SOCIAL WELFARE AS A PROFESSION Major components of professional social work services; structure and functions of social agencies in the U.S.: basic methods of social work practice. *Prerequisite:* 166; sociology 22. Three hours. I, II. Miss Whittlesey.

168 SOCIAL WORK IN THE COMMUNITY Study and discussion of social work services in the community: field experience in community social agencies. *Prerequisite:* 167. Four hours. I, II. Miss Whittlesey.

Education

15 PARTICIPATION (See education 15) Credit to be arranged. Staff.

71 INTRODUCTION TO HOME ECONOMICS EDUCATION Homemaking education in relation to philosophy, professional contacts, and growth toward teacher competencies. Observation of secondary school problems, place of homemaking in general education. *Prerequisite:* sophomore standing. Two hours. Staff.

102 EXTENSION METHODS (See agricultural education 102) Credit to be arranged. Staff.

104 LEADERSHIP TRAINING AND ORGANIZATION METHODS (See agricultural education 104) Credit to be arranged. Staff.

171 METHODS OF TEACHING Methods of teaching home economics in junior and senior high schools, and of general administration of home economics departments in secondary schools. *Prerequisite:* 71; psychology 1. Three hours. Miss Brown.

172 STUDENT TEACHING Supervised observation and teaching in approved secondary schools in Vermont. *Prerequisite:* 171. Seven hours. Miss Brown.

173 COMMUNICATION METHODS (2-2) Presentation of information through the media of press, radio and television, and lecture-demonstration. *Prerequisite:* junior standing. Three hours. I. Miss Williams and Mr. Spaven.

175, 176 SPECIAL PROBLEMS IN HOME ECONOMICS EDUCATION Individual investigation of a problem selected to meet special needs of students. *Prerequisite:* 171. Two or three hours. Miss Brown.

272 TEACHING ADULTS (1-2) Problems of organization and of teaching classes in home economics to meet the needs of adults; supervised experience in techniques of teaching adults. *Prerequisite:* 171 or education 145-146; agricultural education 104, or equivalent. Two hours. Staff.

273 OCCUPATIONAL EDUCATION (2-3) Role of the home economics teacher in organizing and implementing wage earning educational units at the secondary school level. *Prerequisite:* 171, or experience in secondary home economics education. Three hours. Staff.

297, 298 PROBLEMS IN EDUCATION (See education 297, 298) Credit to be arranged. Staff.

Seminars and Research

290 INTRODUCTION TO RESEARCH Research procedures with lectures and discussions of problem selection, objectives, bibliographical techniques, and analysis of data. Each student will prepare a project outline for a simple experiment or study in a chosen field. A suggested prerequisite for special problems or theses. One hour. Misses Morse and Ellis. (Graduate credit pending).

291, 292 SPECIAL PROBLEMS Supervised study in a field of home economics. Findings submitted in a form prescribed by the department. One to three hours. Not for graduate credit. Staff.

307 ADVANCED CONCEPTS IN NUTRITION See animal science 307. 3 hours. Staff.

308 EXPERIMENTAL TECHNIQUES IN NUTRITION See animal science 308. 2 hours. Staff.

370 ADVANCED HOME ECONOMICS EDUCATION

386, 387 GRADUATE SEMINAR Advanced study in a special field; opportunities for independent work are provided. Three hours. Staff.

391 through 399 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged. Staff.

V Mathematics

COLLEGE OF TECHNOLOGY

Professors Schoonmaker (Chairman), Izzo, Meserve, and Riggs; Associate Professors Chamberlain, Dwork, Lighthall, Moser, and Nicholson; Assistant Professors Cooke, Hill, Khazanie, Sylwester, and Wright; Instructors Brown, Burns, Dimmock, Roney, Stein, Stewart and Vogl.

1 ELEMENTARY COLLEGE ALGEBRA Review of fundamental operations and a more extensive study of fractions, exponents, radicals, linear and quadratic equations. Additional topics to be discussed include ratio, proportion, variation, progressions and the binomial theorem. This course covers the 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 Summer Session. Three hours. Staff.

2 PLANE TRIGONOMETRY A study of trigonometric functions, their graphs and other properties, logarithms, solution of triangles, trigonometric equations and identities, and inverse trigonometric functions. *Prerequisite:* 1 or 9. Three hours. Staff.

4 **MATHEMATICS OF FINANCE** Mathematical theory of finance applied to interest and investments, annuities, and life insurance. *Prerequisite:* 1 or 9. Three hours. Staff.

7, 8 **FUNDAMENTALS OF MATHEMATICS** To provide an understanding of basic logical and mathematical ideas (both ancient and modern) and some of their applications to other fields of knowledge. Emphasis is on fundamental concepts and logical methods of reasoning rather than on the development of techniques. Many topics of algebra, trigonometry and analytic geometry are considered in their relation to certain basic concepts pervading all mathematics. A course for students in the arts, social sciences and others whose programs do not require further study of mathematics. Credit will not be given for both mathematics 7 and 9. *Prerequisite:* one year each of secondary school algebra and geometry, 7 for 8. Three hours.

9 **COLLEGE ALGEBRA** A study of sets, relations, and functions with particular attention to properties of algebraic, exponential, and logarithmic functions, their graphs and applications. Students who have earned credit for any higher numbered course in mathematics may not enroll in this course for credit. Credit will not be given for both mathematics 7 and 9. *Prerequisite:* two years of secondary school algebra and one year of secondary school geometry. Three hours. Staff.

11¹ **PLANE ANALYTIC GEOMETRY AND CALCULUS** A few topics from College Algebra and an introduction to plane analytic geometry and calculus. This course prepares students for mathematics 12. *Prerequisite:* 9 and 2 or sufficiently strong background in secondary school algebra and trigonometry. Five hours. Staff.

12 **ANALYTIC GEOMETRY AND CALCULUS** A continuation of the study of plane analytic geometry, differential and integral calculus and their applications, vectors, and solid analytic geometry. *Prerequisite:* 11. Five hours. Staff.

13¹ **ENGINEERING MATHEMATICS I** Some plane analytic geometry and calculus of algebraic functions with applications. This course is intended primarily for engineering students. *Prerequisite:* 9 and 2 or sufficiently strong background in secondary school algebra and trigonometry. Four hours. Staff.

14 **ENGINEERING MATHEMATICS II** A continuation of mathematics 13 including transcendental functions, techniques of integration, applications of the calculus and solid analytic geometry. *Prerequisite:* 13. Four hours. Staff.

31 **PROGRAMMING AND ELEMENTARY NUMERICAL METHODS** Programming in machine language and fortran language with assigned problems on the IBM 1620 and 1130. Topics to be studied in numerical methods include finding roots of equations, numerical integration, solution of systems of linear equations, theory of least squares and polynomial approximations with applications to scientific problems. *Prerequisite:* credit or concurrent enrollment in 121 or 123. Two hours. Staff.

102 **FUNDAMENTAL CONCEPTS OF MATHEMATICAL ANALYSIS** Sets, relations, functions, the Schroeder-Bernstein theorem, cardinal numbers, ordinal numbers, well-ordering, the Axiom of Choice, Zorn's lemma, rational numbers, fundamen-

1. 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.

tal sequences, real numbers, complex numbers, elementary topology of the reals and complexes. *Prerequisite:* credit or concurrent enrollment in mathematics 121. Three hours. Staff.

110 **ELEMENTARY STATISTICS** Frequency distributions, measures of central tendency, measures of variation, probability, expectation, binomial and normal distributions, sampling, estimation, tests of hypotheses, regression and correlation. Not open to mathematics majors. *Prerequisite:* 9 or the equivalent. Three hours. Staff.

121 **SOPHOMORE MATHEMATICS** Partial differentiation, multiple integrals, infinite series, and elementary differential equations. *Prerequisite:* 12. Three hours. Staff.

123 **ENGINEERING MATHEMATICS III** A continuation of mathematics 14 including vectors, partial derivatives, multiple integrals, infinite series, complex numbers and elementary differential equations. *Prerequisite:* 14. Four hours. Staff.

124 **LINEAR ALGEBRA** A study of matrices, linear dependence, vector spaces, linear transformations and characteristic equations. *Prerequisite:* 12. Three hours. Staff.

125, 126 **FUNDAMENTAL CONCEPTS OF ELEMENTARY SCHOOL MATHEMATICS** Discussion of natural numbers, integers, fractions, decimals, and real numbers together with the fundamental operations and fundamental principles involving them. Number bases, sets, measurement and approximation, ratio, proportion, percentage, and selected topics from algebra which are a natural extension of arithmetic. Open only to students in elementary education. *Prerequisite:* sophomore standing; 125 for 126. Three hours. Staff.

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 the 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. *Prerequisite:* six semester hours beyond mathematics 12. Two or three hours. Mr. Meserve.

181, 182 **SENIOR PROBLEM** Investigation of some area or problem, under the direction of an assigned staff member, culminating in a report. This course is available only to candidates for the Bachelor of Science degree in Mathematics. *Prerequisite:* departmental permission. Three hours. Staff.

191 **ELEMENTS OF PROBABILITY** Basic concepts, techniques and applications of probability, random variables, moment generating functions, laws of large numbers and central limit theorems. Techniques and applications include permutations and combinations, binomial and normal distributions, the Poisson process, reliability theory and quality control. *Prerequisite:* 12. Three hours. Staff.

192 **STATISTICAL METHODOLOGY** Fundamental ideas and techniques of statistics, including randomization, confidence intervals and hypothesis testing, and estimation. Emphasis on applications to current problems of interest to the stu-

dent requires acquaintance with another discipline to serve as source of data for problems (e.g., education, biology, economics, psychology, agricultural engineering). Computer programming recommended. Credit for one but not both 192 and 292 for mathematics majors. *Prerequisite*: 12. Three hours. Staff.

201 APPLIED MATH FOR ENGINEERS AND SCIENTISTS I Matrix theory, vector analysis, linear ordinary differential equations. Emphasis on methods of solution, including numerical methods. *Prerequisites*: 123 and knowledge of Fortran Programming. Three hours.

202 APPLIED MATH FOR ENGINEERS AND SCIENTISTS II Partial Differential Equations of Mathematical Physics, Calculus of Variations, Functions of a Complex Variable, Cauchy's Theorem, integral formula, conformal mapping. *Prerequisite*: 201. Three hours.

207, 208 ADVANCED CALCULUS The calculus beginning with limits, continuity, differentiation, and Riemann integrals; treatment of those topics not included in the earlier course as a foundation for more advanced courses in analysis and applied mathematics. *Prerequisite*: 102 recommended; 207 for 208. Three hours. Staff.

209 PROJECTIVE GEOMETRY Principle of duality, perspectivity, projectivity, harmonic sets, cross ratio, the theorems of Pascal and Brianchon, and poles and polars. *Prerequisite*: 12. Three hours. Staff. Alternate years, 1970-71.

210 FOUNDATIONS OF GEOMETRY Geometry as an axiomatic science, various non-Euclidean geometries, and relationships existing between Euclidean plane geometry and other geometries. The development of geometry as a science based upon invariant properties. *Prerequisite*: 12. Three hours. Staff.

211 DIFFERENTIAL EQUATIONS Solutions of linear ordinary differential equations, the Laplace transformation, and series solutions of differential equations. *Prerequisite*: 121. Three hours. Staff.

212 APPLIED MATHEMATICS Boundary-value problems, orthogonal functions and vector analysis. *Prerequisite*: 124 and 211. Three hours. Mr. Dwork.

213, 214 APPLIED MATHEMATICS First semester: partial differential equations, solutions of partial differential equations of mathematical physics, and functions of a complex variable. Second semester: calculus of variations, difference equations, and integral equations. *Prerequisite*: 212; 213 for 214. Three hours. Staff.

220 VECTOR ANALYSIS Introduction to vector methods including the elements of vector algebra and vector calculus with applications to physics and mechanics. *Prerequisite*: 121. Three hours. Staff.

222 GEOMETRY FOR ELEMENTARY SCHOOL TEACHERS Informal Euclidean geometry, classical constructions, coordinate geometry, inductive and deductive reasoning, convexity, and an introduction to topology. Not open to mathematics majors. *Prerequisite*: 126. Three hours. Mr. Izzo.

225, 226 TOPOLOGY The elements of point set topology; closed sets and open sets in metric spaces, continuous mappings, connection, Peano curves, separation theorems and homotopy. *Prerequisite*: 102 or 208, 225 for 226. Three hours. Staff. Alternate years, 1970-71.

227 DIFFERENTIAL GEOMETRY Analytic metric differential geometry of curves and surfaces in ordinary three dimensional space; curvature, torsion, Frenet formulas, involutes, developable and ruled surfaces, and geodesic curves. *Prerequisite:* 121. Three hours. Staff. Alternate years, 1969-70.

228 NUMBER THEORY Divisibility, prime numbers, Diophantine equations, congruence of numbers, and methods of solving congruences. *Prerequisite:* 121. Three hours. Staff.

231, 232 FUNCTION OF A COMPLEX VARIABLE Differentiation and integration of a function of a complex variable, mapping of elementary functions, infinite series, properties of analytic functions, analytical continuation, calculus of residues, contour integration, integral functions, meromorphic functions, Riemann surfaces, and conformal representation. *Prerequisite:* 208; 231 for 232. Three hours. Staff.

233, 234 THEORY OF FUNCTIONS OF REAL VARIABLES Functions of real variables, including: point sets and measure, transfinite numbers, Riemann and Lebesgue integrals, and sequences of functions. Considerable outside reading is assigned. *Prerequisite:* 208; 233 for 234. Three hours. Staff.

235, 236, 237 SPECIAL TOPICS IN ANALYSIS For advanced students in the field of analysis. Lectures, reports and directed readings on advanced topics in analysis. *Prerequisite:* 232 or 234 and departmental permission. Credit as arranged. Offered as occasion warrants. Staff.

241, 242 MODERN HIGHER ALGEBRA Fundamental concepts of Abstract Algebra. Sets, mappings, groups, rings, integral domains, fields, homomorphisms, isomorphisms, linear transformations and vector spaces. *Prerequisite:* 12; 102 highly desirable; 241 for 242. Three hours. Staff.

243 THEORY OF GROUPS The study of the various kinds and structures of groups. *Prerequisite:* 241. Three hours. Staff. Alternate years, 1969-70.

244 GALOIS THEORY The study of Galois theory leading to the insolubility of general quintic equations by radicals and theorems on constructions with ruler and compasses. *Prerequisite:* 243. Three hours. Staff. Alternate years, 1969-70.

245, 246, 247 SPECIAL TOPICS IN ALGEBRA For advanced students in the field of algebra. Lectures, reports and directed readings on advanced topics in algebra. *Prerequisite:* 241 and departmental permission. Credit as arranged. Offered as occasion warrants. Staff.

249 NUMERICAL ANALYSIS Error analysis, evaluation of functions by power series, Chebyshev series, continued fractions. Numerical evaluation of integrals by various methods. Other topics. Assigned problems on IBM 1620 or 1130. *Prerequisite:* 21 or 23, 31 or knowledge of Fortran programming, 121 or 123, 124 desirable. Three hours. Mr. Riggs.

251 THE THEORY OF DIGITAL COMPUTING MACHINES AND NUMERICAL ANALYSIS Mathematical theory underlying digital computing machines including assigned problems on the IBM 1620, or 1130, including programming in machine language and Fortran language. About half of the course is devoted to

elementary numerical analysis. *Prerequisite:* 121, 124 highly desirable. Three hours. Mr. Riggs.

252 **ADVANCED NUMERICAL ANALYSIS** Finite difference methods, numerical solution of differential equations, numerical solutions of systems of linear equations, linear programming and approximations of various types. Problems solved on the IBM 1620 or 1130. *Prerequisite:* 249 and credit or concurrent enrollment in 124. Three hours. Mr. Riggs.

253 **ADVANCED PROGRAMMING** Assembly language programming, subroutines, structure of operating systems and compilers. *Prerequisite:* 31 or knowledge of Fortran programming. Three hours. Staff.

255, 256, 257 **SPECIAL TOPICS IN GEOMETRY** For advanced students in the field of geometry. Lectures, reports and directed readings on advanced topics in geometry. *Prerequisite:* 209 or 227 and departmental permission. Credit as arranged. Offered as occasion warrants. Staff.

259, 260 **MATHEMATICAL LOGIC** Truth tables, axiomatic propositional calculus, independence, first order quantification theory, completeness theorems, prenex normal forms, decidability. Formal number theory, recursive functions, Gödel numbers, recursive undecidability, axiomatic set theory, ordinal numbers, the axiom of choice, effective computability, undecidable problems. *Prerequisite:* 102 or departmental permission, 259 for 260. Three hours. Staff.

261, 262, 263 **SPECIAL TOPICS IN COMPUTER SCIENCE** For advanced students in the field of computer science. Directed reading and research on topics in the area of computers. *Prerequisite:* 252 and 253. Credit as arranged. Staff.

265, 266, 267 **SPECIAL TOPICS IN TOPOLOGY** For advanced students in the field of topology. Lectures, reports and directed readings on advanced topics in topology. *Prerequisite:* 226 and departmental permission. Credit as arranged. Offered as occasion warrants. Staff.

270, 271 **ORDINARY DIFFERENTIAL EQUATIONS** Linear and non-linear systems, approximate solutions, existence, uniqueness, stability, asymptotic behavior of solutions. *Prerequisite:* 208; 270 for 271. Three hours. Mr. Chamberlain.

275, 276 **FUNCTIONAL ANALYSIS** L^2 spaces and L^p spaces, Hilbert and Banach spaces, linear functionals and linear operators, completely continuous operators, Fredholm alternative, completely continuous symmetric operators, Hilbert-Schmidt theory, unitary operators, Bochner's Theorem, Fourier-Plancherel and Watson transforms. *Prerequisite:* 234; 275 for 276. Three hours. Staff.

281, 282, 283, 284, 285, 286 **SEMINAR** Members of the staff and approved students meet weekly to study contemporary advances in mathematics and for reports on current research. One hour. Staff.

291 **PROBABILITY THEORY** Basic non-measure-theoretic course in probability theory with some applications. Axioms of probability, random variables, moment generating functions, laws of large numbers and central limit theorems, introduction to stochastic processes. Students will need a strong working knowledge of calculus including infinite series, partial differentiation and multiple integration. *Prerequisite:* 102, 124. Three hours. Staff.

292 **MATHEMATICAL STATISTICS I** Theory and application of classical statistical methods. Sampling distributions and order statistics, estimation procedures, tests of hypothesis and confidence intervals. Credit for one but not both 292 and 192 for mathematics majors. *Prerequisite:* 291. Three hours. Staff.

293 **MATHEMATICAL STATISTICS II** Theory and application of modern statistical procedures. Non-parametric methods, multi-variate techniques, decision theory, sequential procedures. *Prerequisite:* 292. Three hours. Staff.

294 **EXPERIMENTAL DESIGN AND ANALYSIS, METHODOLOGY** Techniques of regression, analysis of variance and covariance, multiple comparisons. Heavy emphasis on applications requires knowledge of another discipline to serve as source of current problems and data. Computer used for calculations. *Prerequisite:* 192 or 292, elementary computer programming ability. Three hours. Staff.

295 **MEASURE THEORY** Sets and classes, inner and outer measure, Lebesgue-Stieltjes measure, measurable functions, absolute continuity, Radon-Nikodym theorem, convergences, and applications in theoretical probability. *Prerequisite:* 208. Three hours. Mr. Khazanie.

298 **APPLIED STOCHASTIC PROCESSES** Random walk models, Markov chains, Poisson process, Brownian motion, probability generating functions, discrete branching processes, homogeneous birth and death processes, diffusion processes, and first passage times. *Prerequisite:* 291, credit or concurrent enrollment in 192 or 292, and departmental permission. Three hours. Mr. Sylwester.

341, 342 **ABSTRACT ALGEBRA** Groups, rings, integral domains, extensions of rings and fields, factorization theory, groups with operators (Jordan-Hölder theorem, Krull-Schmidt theorem), modules, chain conditions, Hilbert basis theorem, Noetherian rings, linear spaces, tensor products of modules. *Prerequisite:* 242; 341 for 342. Three hours. Staff.

391 through 393 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged. Staff.

Other Courses in Mathematics

In addition to the courses offered during the academic year, the following courses may be offered in summer sessions and in the evening division program.

<i>Number</i>	<i>Title</i>	<i>Credit Hours</i>
A15	Plane Analytic Geometry	3
A16	Differential Calculus	3
A17	Integral Calculus	3
A18	Intermediate Calculus	3
A19	Differential Equations	3
S45	Coordinate Geometry and Vectors	3
S46	Elementary Functions	3
S47	Calculus I	3
S48	Calculus II	3
S142	Fundamental Concepts of Algebra	3
S144	Statistics and Probability	3
S205	The Development of Mathematics	3

Medical Technology

DIVISION OF HEALTH SCIENCES

Note: All Courses limited to students of Medical Technology except by permission of the Departmental Chairman.

1-2 **ORIENTATION TO THE HEALTH SCIENCES** Introduction to the whole pattern of comprehensive health care. Fall semester. One hour. Dr. Coon, Miss Breen.

3 **MEDICAL ORIENTATION** Terminology related to medical science and hospital services. Includes the reporting, recording, charting and filing of laboratory results. Limited to students in the Medical Laboratory Technician program except by permission of departmental chairman. Fall semester. One hour. Dr. Rice.

20 **INTRODUCTION TO MEDICAL TECHNOLOGY (5-20)** Techniques of basic laboratory procedures in hematology, serology, blood banking, chemistry and urinalysis. Limited to students in the Medical Laboratory Technician program except by permission of departmental chairman. Summer session. Eight hours. Dr. Rice, Miss Breen, and staff.

101 **MEDICAL TECHNOLOGY (5-20)** Principles, procedures, and special techniques in medical technology. Includes hematology, immunohematology, serology, and urinalysis. Summer Session. Eight hours. Dr. Coon, Dr. Rice, Miss Breen, and staff.

102 **MEDICAL TECHNOLOGY (2-6)** Continuation of 101; includes histologic technique, introduction to cytopathology, parasitology. *Prerequisite:* 101. Fall semester. Four hours. Dr. Coon, Dr. Rice, Miss Breen, and staff.

103 **MEDICAL TECHNOLOGY** Lectures on special problems in medical technology and individual research. Spring semester. Two hours. Dr. Coon, Miss Breen, and staff.

110 **SEMINAR IN MEDICAL TECHNOLOGY** Group discussions of techniques and principles in medical technology, especially clinical chemistry. Spring semester. Two hours. Dr. Coon, Dr. Rice, Miss Breen, and staff.

111-112 **BIOCHEMISTRY FOR MEDICAL TECHNOLOGISTS** Human physiological chemistry; structure, metabolism and regulatory mechanisms. Laboratory: biological reactions, preparation of reagents, instrumentation. Application of sound quantitative principles to analysis of body constituents. Lectures, conferences and laboratory. Limited to students of medical technology except by permission of departmental chairman. Four hours. Dr. Melville and staff. *Prerequisite:* Organic Chemistry.

120 CLINICAL MICROBIOLOGY (3-6) Lectures and laboratory experiments in clinical aspects of microbiology. Fall semester. *Prerequisite:* Biochemistry 55. Six hours. Dr. Smith and staff.

140 CLINICAL PRACTICUM Rotating assignments in the laboratories of the Medical Center and other approved facilities. Fall and Spring semesters. Total of twelve hours. Dr. Coon, Dr. Rice, Miss Breen, and staff.

201 MEDICAL TECHNOLOGY, ADVANCED Individual research in the field of medical technology. *Prerequisite:* departmental permission. Credit as arranged. Fall and Spring semesters. Dr. Coon.

V Military Science

Lieutenant Colonel Oehler (Chairman); Majors Carter and Murtha; Captain Benson; MSG Gerber and SFC Ovitt

1-2 U. S. DEFENSE ESTABLISHMENT (2-1) Orientation on the ROTC program; causes of war; history and mission of the U. S. Army; factors of National Power; national objectives, policy and strategy; organization of the defense establishment for national security; marksmanship training; leadership laboratory.

11-12 INTRODUCTION TO TACTICS: AMERICAN MILITARY HISTORY (2-1) Military topographic and aerial photographic map study; small unit operations, communications and logistics; a survey of military history from the Revolutionary War to the present; leadership laboratory.

101-102 LEADERSHIP AND MANAGEMENT I: FUNDAMENTALS AND DYNAMICS OF THE MILITARY TEAM I (3-1) Methods of oral presentation; leadership seminar in study and discussion of psychological, physiological and sociological factors which affect human behavior; branches of the Army; principles and fundamentals of small unit tactics; leadership laboratory.

111-112 LEADERSHIP AND MANAGEMENT II: FUNDAMENTALS AND DYNAMICS OF MILITARY TEAM II (3-1) Leadership and management skills; Army administration; military law; maintenance management; orientation on service life; customs and courtesies of the service; obligations and responsibilities of an officer; military intelligence; logistics; world change and military implications; tactics; leadership laboratory.

V Music

COLLEGE OF ARTS AND SCIENCES

Professors Lidral (Chairman), Bennett and Pappoutsakis; Associate Professors D. Kinsey, and Schultz; Assistant Professors Chapman, Read, and Weinrich; Part-time Instructors Ambrose, Anand, Auchter, Dahl, F. Kinsey, and Metcalfe.

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.

Theory and Composition

5-6 **THEORY I (2-3)** Melodic and rhythmic dictation, sight singing, and elementary harmony. Three hours. Mr. Lidral.

9 **INTRODUCTORY MUSIC** Required of students in elementary education, elective to others. Ear training, music reading and writing, and elementary theory. Three hours.¹ Messrs. Pappoutsakis and Read.

13 **CONTEMPORARY MUSIC** Development and stylistic characteristics of twentieth century music from the late Romanticists to the experimentalists. Both European and American composers will be presented. *Prerequisite:* 1, 2, or 10. Three hours. Mr. Schultz.

105-106 **THEORY II (2-3)** Contrapuntal and harmonic dictation, advanced harmony, and elementary counterpoint. *Prerequisite:* 5-6, Three hours. Mr. Read.

201, 202 **ADVANCED HARMONY AND HARMONIC ANALYSIS** Contemporary harmonic practice and sonority organizations; traditional and contemporary analysis. *Prerequisite:* 105-106; 201 for 202. Three hours. Mr. Kinsey. Alternate years, 1970-71.

203, 204 **ORCHESTRATION** First semester: characteristics of instruments, arranging for orchestra; second semester: advanced exercises in orchestral scoring. *Prerequisite:* 105-106; 203 for 204. Three hours. Mr. Pappoutsakis. 204 in alternate years, 1970-71.

205, 206 **COUNTERPOINT** First semester: tonal counterpoint; second semester: canon and fugue. *Prerequisite:* 105-106; 205 for 206. Three hours. Mr. Kinsey. 206 in alternate years, 1969-70.

207 **PEDAGOGY OF THEORY** Objectives, viewpoints, content and specific approach to the organization and teaching of theory courses. *Prerequisite:* eighteen hours in theory. Three hours. Mr. Lidral.

208 **FORM AND ANALYSIS** Creative approach to aural and sight analysis of musical construction. *Prerequisite:* 105-106 or the equivalent; 205 recommended. Three hours. Mr. Kinsey.

1. Enrollment in 5 will cancel credit for 9.

209, 210 **ARRANGING, VOCAL AND INSTRUMENTAL** First semester: arranging for vocal ensembles of various sizes and functions including mixed groups, men's and women's glee clubs, and chamber groups. Second semester: arranging for instrumental ensembles of various sizes including marching, concert, and school bands, and chamber groups. *Prerequisite:* 203. Three hours. Messrs. Lidral and Schultz. Alternate years, 1970-71.

215, 216 **COMPOSITION** Creative work in free composition with instruction according to the needs and capabilities of the individual student. *Prerequisite:* 205 and 208 or consent of instructor. Three hours. Mr. Read.

History and Literature

1, 2 **SURVEY OF MUSICAL LITERATURE** First semester: the Classical and Romantic eras in songs and piano pieces, program music, and the symphony and the concerto. Second semester: Gregorian chant to Handel and Bach, opera, postromanticism, modern music, and American music. Three hours. Messrs. Kinsey and Chapman, Mrs. Anand.

10 **INTRODUCTORY MUSIC** Required of students in elementary education, elective to others. History and appreciation. Three hours.¹ Messrs. Pappoutsakis and Weinrich.

13 **CONTEMPORARY MUSIC** Development and stylistic characteristics of twentieth century music from the late Romanticists to the experimentalists. Both European and American composers will be presented. *Prerequisite:* 1, 2, or 10. Three hours. Mr. Schultz.

129 **CHORAL LITERATURE** A study of selected masterpieces of choral literature through analysis and performance. *Prerequisite:* twelve hours or the equivalent in voice. Two hours. Mr. Weinrich. Alternate years, 1969-70.

130 **VOCAL LITERATURE** A study of selected masterpieces of the vocal literature through analysis and performance. *Prerequisite:* twelve hours or the equivalent in voice. Two hours. Mr. Weinrich. Alternate years, 1970-71.

193, 194 **COLLEGE HONORS**

195, 196 **SPECIAL TOPICS**

197, 198 **READING AND RESEARCH**

221, 222 **HISTORY OF MUSIC** Changes in musical structure and style in relation to contemporaneous artistic, literary, religious, and social movements. First semester: Gregorian chant to the Baroque era. Second semester: Baroque to Modern. *Prerequisite:* 1, 2 and 5-6. Three hours. Mr. Chapman.

223 through 228 **MUSIC LITERATURE** Advanced studies in the literature of music. *Prerequisite:* 105-106 and 221, 222. Three hours. Mr. Bennett.

245, 246 **CHAMBER MUSIC LITERATURE** A study through analysis and performance of masterworks for small groups leading to public performance. *Prerequisite:* twelve hours or the equivalent in applied field and departmental permission. One hour. Staff.

1. Enrollment in 1 or 2 will cancel credit for 10.

281 through 284 **INDEPENDENT STUDY** Studies in theory, composition, history, or literature under the direction of an assigned staff member for advanced students and candidates for honors. Credit as arranged.

381 through 384 **SEMINAR** Study of special topics appropriate to student needs. One hour. Mr. Kinsey.

391 through 393 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

For Music Education, see page 151.

Performance

For the fees for instruction, see page 51-52.

A senior recital in the performance major field is required of all music majors. Regular appearances in informal recitals are required of all performance students. Appearance in one formal departmental recital a semester is required of all music majors. At the end of each semester jury examinations are given in applied music.

All music majors on any curriculum are required to pass a **FUNCTIONAL PIANO FACILITY** examination before certification for graduation. 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 the use of 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.

41, 42 **MAJOR ENSEMBLES (0-3)** University Band, Choir, Choral Union, and Orchestra. *Prerequisite:* departmental permission. One hour.¹ Messrs. Chapman, Lidral, Schultz, and Weinrich.

45, 46 **CHAMBER MUSIC (0-2)** Study and performance of masterworks for small groups. Outside practice required. *Prerequisite:* departmental permission. One hour.¹ Mr. Weinrich and staff.

51, 52 **PERFORMANCE STUDY** Private study in piano, organ, harpsichord, voice, strings, woodwinds, brass, percussion, and harp. One or two hours.¹ Staff.

71, 72 **CLASS STUDY (0-2)** Required of music education students, elective to others to limit of facilities and equipment. Class study in performance fields of voice, strings, woodwinds, brass, and percussion. One hour.¹ Staff.

1. Indicated courses in performance may be taken for several years, but no B.A. candidate may receive credit toward graduation totalling more than six semester hours in ensembles and six semester hours for individual study. One hour of credit per semester will be given for one private lesson (one-half hour) per week under a member of the department, and six hours practice per week, on condition that the instruction be accompanied or preceded by music 1, 2 or 5-6 or 9, 10 and participation in ensemble (keyboard students excepted); two hours credit will be given for two private lessons per week (one hour) and twelve hours practice per week, on the same condition.

74 INSTRUMENT REPAIR CLASS (0-2) A laboratory for music education students in minor repair and adjustment of string, woodwind, brass, and percussion instruments. *Prerequisite:* string, woodwind, brass, and percussion classes of concurrent enrollment and departmental permission. One hour. Mr. Schultz.

211, 212 CONDUCTING (2-2) First semester: technique of the baton, score reading, laboratory practice. Second semester: preparation and performance of selected scores, including score reading at the piano and rehearsal procedures. Selected students will conduct University major ensembles. *Prerequisite:* 5-6; 211 for 212. Three hours. Mr. Pappoutsakis. 212 in alternate years, 1969-70.

251, 252 ADVANCED PERFORMANCE STUDY Individual instruction in keyboard instruments, voice, strings, woodwinds, brass, percussion, and harp leading to public recital performance. *Prerequisite:* graduate standing in performance field. One or two hours.¹ Staff.

271, 272 PERFORMANCE PEDAGOGY Methods of teaching voice, strings, woodwinds, brass or keyboard instruments and advanced class instruction in them. Research paper required. *Prerequisite:* performing ability, teaching experience, and consent of instructor. Two hours.¹ Staff.

1. See footnote 1 on page 211.

Nursing

DIVISION OF HEALTH SCIENCES

Professor Woodruff (Director); Associate Professors Adams, Demers, Emerson, Milligan, Palmer, and Sawyer; Assistant Professors Allen, Barrett, Farrington, Forgiione, Magee, Marsland, Powell, Rodgers, Schwalb, Thompson, and Ure; Instructors Burroughs, Celano, Elmendorf, Murray, Quinn, and Scranton.

7 HOME NURSING (0-2) Care of the family. *Prerequisite:* junior standing in home economics curriculum. One hour. Miss Milligan.

Professional Nursing

21-22 INTRODUCTORY NURSING (2-16) First semester: Development of understandings, attitudes, and skills necessary to performance of basic activities involved in the nursing care of adults. Laboratory experience in classroom, hospital, and rehabilitation center. Second Semester: Development of understandings, attitudes, and skills necessary in giving nursing care to adults who face illnesses which have a favorable or controllable outcome. Laboratory experiences in classroom, hospital, and rehabilitation center with emphasis on the ability to assume increased responsibility for patient care. Six hours. Mrs. Celano, Elmendorf, Murray, Rodgers, Palmer, and Quinn; Misses Sawyer and Scranton.

121 INTERMEDIATE NURSING: MATERNAL-CHILD NURSING (4-20) Development of knowledge and skills in maternal-child nursing and the nurse-family relationships. Laboratory experiences include observation and participation in the hos-

pital and out-patient environment. Nine hours. Misses Forgione and Schwalb; Mrs. Marsland and Burroughs.

122 **INTERMEDIATE NURSING (4-20)** Development of understandings, attitudes, and skills necessary in giving nursing care to adults who face illnesses which require considerable adjustments in behavioral and living patterns. Laboratory experience in classroom, hospital, rehabilitation center, clinics, and selected community settings. Nine hours. Mrs. Celano, Elmendorf, Murray, Rodgers, Palmer, and Quinn; Misses Sawyer and Scranton.

156 **PSYCHIATRIC NURSING (4-8)** Principles of nursing care of patients with psychiatric problems in hospitals and other settings. The emphasis will be on the development of therapeutic relationships with selected patients and upon the nurse's role with patients in various treatment situations. Six hours. Miss Magee and Mrs. Ure.

165 **ADVANCED NURSING (1-8)** The development of understandings, concepts, and skills necessary to provide nursing care to the critically ill patient. An emphasis will be placed on the patho-physiological basis of nursing care. Three hours. Sister Barrett, r.h.s.j.

167 **NURSING LEADERSHIP (1-8)** Study and discussion of nursing service and nursing team from the perspective of the staff nurse. Laboratory experience provided with emphasis on indirect nursing care and participation in a leadership capacity in assessing the nursing needs of patients and the planning and co-ordination necessary to meet them. Three hours. Miss Thompson.

176 **NURSING IN THE COMMUNITY (4-8)** Study and discussion of the development functions and trends in official and voluntary health organizations with emphasis on the role of the nurse at the local, state, national and international level. Laboratory study provided in the community. Six hours. Misses Emerson and Farrington.

186 **SURVEY OF CONTEMPORARY NURSING** Influence of contemporary social, educational, political and economic developments on nursing; problems and issues in the profession today; professional organizations in nursing and responsibilities of the professional nurse. Three hours. Misses Milligan and Woodruff.

Technical Nursing (Tentative)

11-12 **FUNDAMENTALS OF NURSING (2-6)** A basic course in the principles of nursing care. Emphasis is placed on nursing interventions to meet the common health needs of individuals of all age groups. Concurrent experiences are planned in hospitals and community agencies. Four hours.

14 **NURSING (Six weeks summer session)** *Prerequisite:* 11-12. Four hours.

27-28 **NURSING (4-15), (4-18)** These courses focus on applications and adaptations of nursing principles in the care of children and adults with common major health problems. Content and related clinical experiences include maternity and infant care and the care of patients with physical and mental illnesses. *Prerequisite:* 14. 27, nine hours; 28, Ten hours.

30 **NURSING TRENDS** This course is designed to increase the student's understanding of the role of the technical nurse within the profession. Past and current trends in nursing are reviewed in relation to future goals. *Prerequisite:* 27. Two hours.

Philosophy and Religion

COLLEGE OF ARTS AND SCIENCES

Professors Dykhuizen, Hall (Chairman), and Sadler; Assistant Professors Beckett, Kahn, Paden, and Sobers; Instructors Martin and Paskow.

Philosophy

1, 2 INTRODUCTION TO PHILOSOPHY A systematic analysis of the thought of such leading philosophers as Plato, Aristotle, Descartes, Spinoza, Hume, and Kant on such topics as Theory of Knowledge, Ethics, Political Philosophy, and Theory of Art. Three hours. Staff.

3 LOGIC Principles and conditions of correct thinking with emphasis on the detection of fallacies of thought. Three hours. Mr. Beckett.

4 ETHICS Examinations of the ideas underlying man's moral behavior to develop an acceptable and coherent theory of conduct. Three hours. Staff.

51 PHILOSOPHY IN LITERATURE Selected philosophical works and the literary works which they have influenced. *Prerequisite:* one course in philosophy. Three hours. Mr. Hall. Alternate years, 1969-70.

82 PHILOSOPHY OF SCIENCE Some philosophical problems closely associated with the scientific enterprise: scientific explanation, interpretations of the concept of probability, the justification of induction, causality, space and time, and the relation of science to ethics. Emphasis on current attempts at their solution. *Prerequisite:* a course in philosophy or a science; sophomore standing. Three hours. Mr. Beckett.

101 CONTEMPORARY PHILOSOPHIC THOUGHT The philosophic ideas of such men as Russell, Dewey and Whitehead, and of such movements as pragmatism, logical empiricism and existentialism. *Prerequisite:* 1; junior standing. Three hours. Mr. Beckett.

102 PHILOSOPHY OF RELIGION A critical analysis of the basic concepts and values which have emerged from man's religious experience. *Prerequisite:* 1, or religion 1, 2. Three hours. Mr. Hall.

107, 108 HISTORY OF PHILOSOPHY First semester: ancient and medieval philosophy; second semester: modern philosophy through Kant. *Prerequisite:* 1; junior standing. Three hours. Mr. Dykhuizen.

113 PHILOSOPHY OF THE ARTS An analysis of some principal theories of art and the beautiful as exemplified in music, literature and painting. *Prerequisite:* 1; junior standing. Three hours. Mr. Hall.

181 SYMBOLIC LOGIC Newer techniques of logical analysis; discussion of logistic systems; general inquiry into the nature of deductive logic. *Prerequisite:* one course in philosophy. Three hours. Mr. Beckett. Alternate years, 1968-69.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

197, 198 READINGS AND RESEARCH

202 ANALYTIC PHILOSOPHY The significant problems of philosophy from the standpoint of the predominant contemporary philosophic movement in England and the United States. *Prerequisite*: two advanced courses in philosophy. Three hours. Mr. Beckett. Alternate years, 1968-69.

203 CONTEMPORARY ETHICAL THEORY An intensive study of the contributions of leading ethical philosophers since G. E. Moore in ethical theory and metaethics. *Prerequisite*: two advanced courses in philosophy. Three hours. Mr. Beckett. Alternate years, 1968-69.

204 THEORY OF KNOWLEDGE An examination of the principal sources of knowledge and our awareness of the external world. *Prerequisite*: two advanced courses in philosophy. Three hours. Mr. Sobers. Alternate years, 1969-70.

206 SOCIAL PHILOSOPHY The meaning and values inherent in social life. *Prerequisite*: two advanced courses in philosophy. Three hours. Mr. Hall. Alternate years, 1968-69.

207 METAPHYSICS Current and traditional metaphysical problems such as the concept of change, the existence of God, the self, and the world. *Prerequisite*: two advanced courses in philosophy. Three hours. Mr. Sobers. Alternate years, 1969-70.

208 THEORY OF VALUE An analysis of the nature of value and the nature of experience of the various realms of value. *Prerequisite*: two advanced courses in philosophy. Three hours. Mr. Sobers. Alternate years, 1968-69.

209 AMERICAN PHILOSOPHY The thought of such leading American philosophers as Royce, Peirce, James, Santayana, and Dewey. *Prerequisite*: two advanced courses in philosophy. Three hours. Mr. Dykhuizen. Alternate years, 1969-70.

211 NINETEENTH-CENTURY PHILOSOPHY A systematic analysis of the contributions to philosophical thought since Kant of such thinkers as Fichte, Schelling, Hegel, Schopenhauer, Nietzsche, Mill, Kierkegaard, and Dilthey. *Prerequisite*: two advanced courses in philosophy. Three hours. Mr. Hall. Alternate years, 1968-69.

212 EXISTENTIALISM Existentialism, its sources and its relation to literature and to the arts; Heidegger, Sartre, Marcel, Jaspers and others. *Prerequisite*: two advanced courses in philosophy. Three hours. Mr. Hall.

214 INTELLECTUAL BACKGROUNDS OF MODERN LIFE Intellectual movements which have influenced the thought and life of today. *Prerequisite*: two advanced courses in philosophy. Three hours. Mr. Dykhuizen.

281, 282 SEMINAR Selected topics in philosophy, determined according to the interest of students and instructor. *Prerequisite*: two advanced courses in philosophy. Three hours. Staff.

For economic philosophy, see economics 295; and for political philosophy, see political science 211, 212.

Religion

1, 2 RELIGIONS OF THE WORLD First semester: Confucianism, Taoism, Hinduism, Buddhism. Second semester: Judaism, Christianity, Islam. Three hours. Messrs. Martin, Paden, and Sadler.

101 RELIGION AND SOCIETY A comparative study of the basic types of religious community and religious institution, within various cultural settings. *Prerequisite:* 1, 2, or sociology 101; sophomore standing. Three hours. Staff.

112 RELIGIOUS EXPERIENCE A comparative study of the ways in which the inward dimension of the religious life finds expression. *Prerequisite:* 1, 2 or sociology 21; sophomore standing. Three hours. Mr. Sadler.

122 MYTH, SYMBOL, AND RITUAL A comparative study of the symbolic process in religious expression. *Prerequisite:* 1, 2 or sociology 21; sophomore standing. Three hours. Mr. Paden.

151 THE OLD TESTAMENT WRITINGS Study of the history and writings of the Hebraic-Judaic religion to the first century B.C. *Prerequisite:* religion 1, 2. Staff.

152 POST-BIBLICAL JUDAISM A study of the formation of post-biblical Judaism with special attention to the Rabbinic period, 70-500 A.D. *Prerequisite:* 151 or permission of the instructor. Three hours. Mr. Kahn. Alternate years.

160 THE NEW TESTAMENT WRITINGS Study of the New Testament writings and their environment. *Prerequisite:* religion 1, 2. Mr. Martin.

201 METHODS OF UNDERSTANDING RELIGION Investigation of some of the major methods and approaches used in studying and interpreting religion. *Prerequisite:* 1, 2; junior standing. Three hours. Mr. Paden.

205, 206 AREA STUDIES IN RELIGION A study in depth of religion in a particular area of the modern world, for example, the Indian sub-continent, Japan, the Middle East, Latin America. *Prerequisite:* six hours in religion. Three hours. Mr. Sadler.

211 CONTEMPORARY TRENDS Significant modern developments in the world religions. *Prerequisite:* 1, 2; junior standing. Three hours. Staff.

281, 282 PROBLEMS IN THE HISTORY AND PHENOMENOLOGY OF RELIGION Topics of current concern to historians of religions. *Prerequisite:* 201 and senior standing. Three hours. Staff.

V Physical Education

COLLEGE OF EDUCATION

Associate Professors Evans, Gobin, Zimmerli (Chairman for Women); Assistant Professors Bryant, Christensen (Chairman for Men), Dunkley, Greig, Leggett, and Strassburg; Instructors Chase, Condon, Dearcopp, Farrell, Hayes, Lambert, Lange, Loche, Neddle, and Stone.

1-2 FRESHMAN PHYSICAL EDUCATION Two hours weekly. One credit. Staff.

11-12 SOPHOMORE PHYSICAL EDUCATION Two hours weekly. One credit. Staff.

Two years of physical education are required of undergraduate students (see page 58). The program is centered around the physical activity needs, abilities, and interests of young adults. The aims are to help all to improve physical fitness; to provide opportunity to establish skills in basic movement; 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.

Activities				
<i>Men</i>	<i>Men and Women</i>			<i>Women</i>
Basic Physical Education*				
Handball	Badminton	†Judo	Squash	Archery
Paddleball	Golf	Skiing	Tennis	Bowling
Wrestling	Ice Skating		Track	Fencing
				Riding
				Rifle
	†Swimming	Basketball		Field Hockey
	Synchronized	Soccer—Speedball		Lacrosse
Touch Football	†Life Saving	Volleyball		Softball
	†Skin and Scuba			
	†Folk—Social—Square Dance			
	†Modern Dance			
Body Building	†Gymnastics—Tumbling—Apparatus			Posture and
Remedial Exercise	†Children's Play Activities			Conditioning

* Required P.E. 1 for men.

† Coed classes.

Students who elect skiing, riding, or bowling will have additional fees for transportation and instruction. Those in skiing, skating, and judo usually provide their own equipment and gear.

The required physical education uniforms must be regulation in style and color and *must* be obtained at the University Bookstore:

Men: T-shirts, shorts and sweat clothes (supporter, white socks, white tennis shoes).

Women: Shorts and shirt (white ankle socks, white tennis shoes), black leotard and black dance tights.

Every man enrolled in physical education must pay a four dollar locker-towel fee.

21 FOUNDATIONS OF PHYSICAL EDUCATION (2-2) An introduction to the scope and role of school physical education; and to the opportunities and obligations associated with physical education as a profession. Three hours. Mr. Christensen and Miss Zimmerli.

22 FIRST AID AND SAFETY EDUCATION (1-2) Study of safety needs at various maturity levels and in the school environment. A consideration of first aid practices for common injury situations including wounds, burns, shock, broken bones, artificial respiration, and poisoning, including techniques of bandaging and transportation. Red Cross certificate for successful completion. Two hours. Mr. Bryant.

26 TEACHING AQUATICS (W.S.I.) (1-2) Knowledge, skills, and methods required to demonstrate competency in the performance and teaching of aquatic skills. Satisfactory completion of the course will be recognized by the issuance of a Red Cross Safety Instructor's certificate. Two hours. Staff.

50 INTRODUCTION TO DANCE (2-2) An introduction to the field of dance. Background in the historical and educational basis of dance. Opportunities to develop skill in the types of dances commonly taught in public schools. *Prerequisite:* Skill competency and junior standing. Miss Hayes.

52 DEVELOPMENT OF MOTOR SKILLS (1-2) Orientation to an understanding of the basic motor skills which form the foundation for all activity planning in the physical education program. Two hours. Mr. Dunkley.

V Physics

COLLEGE OF ARTS AND SCIENCES

Professors Crowell (Chairman), Juenker, and Nyborg¹; Associate Professors Detenbeck, Krizan, and Scarfone; Assistant Professors Brown, Depatie, Huang, Sachs, and Thurnauer

5, 6 ELEMENTARY PHYSICS (3-2) An introduction to the principles of physics for students not concentrating in physical science or engineering. Mechanics, heat, waves, optics, electricity, magnetism, atomic and nuclear physics. Demonstration lectures coordinated with laboratory work. *Prerequisite:* 5 for 6; secondary school algebra and trigonometry. Four hours. Staff.

17, 18, 27 GENERAL PHYSICS (3, 3, 3-2) For students concentrating in engineering or a physical science. Mechanics, thermal physics, electricity and magnetism, wave motion, and optics. *Prerequisite:* for 17, concurrent enrollment or credit in mathematics 11, or 13; for 18, 17 and concurrent enrollment or credit in mathematics 12 or 14; for 27, 18 or departmental permission, and credit or concurrent enrollment in mathematics 121 or 123. Three, three, and four hours. Staff.

1. Sabbatical leave September 1, 1968 to July 1, 1969.

28 INTRODUCTORY MODERN PHYSICS (3-2) An introduction to the theory of relativity and to modern descriptions of radiation, the electron, the atom and combinations of atoms, the atomic nucleus, and elementary particles. *Prerequisite*: 27² and credit or concurrent enrollment in mathematics 121 or 123. Four hours. Staff.

101, 102 INTERMEDIATE PHYSICS LABORATORY (1-3) Selected experiments from the fields of mechanics, heat, electricity and magnetism, and optics. Students required to formulate details of objectives and procedure and to evaluate results. Intended to be taken concurrently with physics 116 and 117 in the first semester and 118 and 173 in the second, but may be taken independently with departmental permission. *Prerequisite*: 27,² mathematics 121; 101 for 102. Three hours. Mr. Sachs and Mr. Depatie.

116 MECHANICS (3-0) 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. Extensive use is made of descriptive, analytical, and approximations techniques, including energy diagrams, vector differential operations, moving and non-cartesian coordinate systems. *Prerequisites*: 27, mathematics 121 or 123. Three hours.

117 ELECTRICITY AND MAGNETISM (3-0) Fundamental principles of electricity and magnetism; charge, currents, circuits, theory of electrostatic fields, and magnetic fields of steady currents. Electrical and magnetic properties of matter and electromagnetic energy relationships. Vector analysis developed as necessary. *Prerequisite*: 27,² mathematics 121. Three hours. Mr. Crowell.

118 ELECTRICITY AND OPTICS (3-0) Introduction to time dependent electromagnetic fields. Maxwell's equations. Electromagnetic waves including visible light and wave optics. *Prerequisite*: 117. Three hours. Mr. Depatie.

122 BIOLOGICAL PHYSICS (3-2) Physical laws, concepts and methods discussed with respect to their reference to biology. Mechanics of solids, liquids and non-ideal media. Electric and magnetic fields, transport of dissolved gases and ions. Properties of macromolecules, radiation biophysics. *Prerequisite*: 6, chemistry 2, mathematics 12. Four hours. Mr. Nyborg.

173 THERMAL PHYSICS (3-0) Basic concepts of thermodynamics including the characteristic functions, and their application to determination of equilibrium conditions in homogeneous and heterogeneous systems. Introduction to kinetic theory and statistical mechanics. *Prerequisite*: 27¹ and mathematics 121. Three hours. Mr. Sachs. Alternate years, 1969-70.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

197, 198 SENIOR RESEARCH (0-4, 0-8) The student works on a theoretical or experimental project under direction. Written and oral reports are submitted. 191, two hours; 192, four hours. Staff.

1. May be replaced by physics 5-6 with departmental permission.
2. Physics 6 with departmental permission.

203, 204 ADVANCED PHYSICS LABORATORY (1-3) Selected experiments from the fields of modern physics: atomic nuclear and solid state physics, physics of radiation and plasmas. Students required to formulate details of objectives and procedure and to evaluate results. Intended to be taken concurrently with physics 271, 272 but may be taken independently with departmental permission. *Prerequisite:* 281, mathematics 121; 203 for 204. Three hours. Mr. Nyborg and Mr. Detenbeck.

212 MECHANICS AND WAVE MOTION (3-0) Continuation and developments of the principles and methods of mechanics; integration of fundamental physical principles with mathematics and with the extension of these principles to wave motion. *Prerequisite:* 116. Three hours. Mr. Depatie.

222 ADVANCED BIOLOGICAL PHYSICS (3-2) Sound and electromagnetic waves, the latter including light, micro-waves and x-rays; ionizing particles and radiation. Interaction of these physical agents with biological systems. Physical properties of macromolecules and their aggregates. *Prerequisite:* chemistry 2; mathematics 121; and experience in applying differential equations. Departmental permission required. Four hours. Mr. Nyborg.

225, 226, 227 SPECIAL TOPICS IN BIOLOGICAL PHYSICS For research students in the field of biological physics. Lectures, reports and directed readings related to the research of the department. *Prerequisite:* 122 or 222, mathematics 121 and departmental permission. Credit as arranged. Mr. Nyborg. Offered as occasion warrants.

231, 232, 233 SPECIAL TOPICS IN ACOUSTICS For research students in the field of acoustics. Lectures, reports and directed readings on problems of particular interest to the current research of the department. *Prerequisite:* 212 and departmental permission. Credit as arranged. Messrs. Nyborg and Sachs. Offered as occasion warrants.

251, 252, 253 SPECIAL TOPICS IN THE PHYSICS OF SURFACES For research students in the field of surface chemistry and physics. Background of particular interest to the current research of the department is presented and discussed. *Prerequisite:* 173, or chemistry 142, mathematics 212 and departmental permission. Credit as arranged. Mr. Crowell. Offered as occasion warrants.

271, 272 MODERN PHYSICS Background and concepts of relativity, quantum theory, and nuclear physics. Topics selected from relativity, electron physics, atomic structure and spectra, wave mechanics, molecular and solid state physics, x-rays, nuclear physics. *Prerequisite:* 116 or chemistry 142, 271 for 272. Three hours. Mr. Huang.

281, 282 COLLOQUIUM Members of the staff and graduate students meet weekly to study contemporary advances in physics and for reports on research being done in the department. No credit. Staff.

301, 302 MATHEMATICAL PHYSICS Required of all graduate students in physics. Introduction to basic mathematical methods of theoretical physics; vector and tensor analysis, partial differential equations, orthogonal functions, complex variables and variational techniques presented with appropriate physical illustrations. *Prerequisite:* 116 and 118, or mathematics 212, 301 for 302. Three hours. Mr. Krizan.

311, 312 **ADVANCED DYNAMICS** Classical mechanics presented as the basis of the concepts and methods of modern physics. Variational, Lagrangian and Hamiltonian formulations, canonical transformations, continuous systems. Selected topics such as small oscillations, perturbation theory and special relativity. *Prerequisite:* 116, mathematics 211; 311 for 312. Three hours. Mr. Brown.

313 **ELECTROMAGNETIC THEORY** Development of Maxwell's theory of electromagnetism with emphasis on the unity of electric and magnetic phenomena, both in their physical basis and in the mode of mathematical description. Boundary value problems in electrostatics, multipoles, electrostatics of macroscopic media, dielectrics, magnetostatics, time varying fields, Maxwell's equations, conservation laws, gauge transformations, wave equations, Green's functions are employed throughout. *Prerequisite:* 118, mathematics 211. Three hours. Mr. Scarfone.

314 **CLASSICAL ELECTRODYNAMICS** A continuation of electromagnetic theory. Plane electromagnetic waves, wave guides and resonant cavities, simple radiating systems and diffraction, magnetohydrodynamics and plasma physics, special theory of relativity, relativistic particle kinematics and dynamics, multipole fields. *Prerequisite:* 313. Three hours. Mr. Krizan.

321, 322, 323 **SPECIAL TOPICS IN THEORETICAL PHYSICS** For research students interested in pursuing topics of general and departmental research interest in theoretical physics such as classical and quantum field theory, relativity, group theory, plasma physics, many-body problem and scattering theory; material involved would not be presently covered in other courses. *Prerequisite:* departmental permission. Credit as arranged. Theoretical Physics staff. Offered as occasion warrants.

341, 342 **SOLID STATE PHYSICS** Introduction to crystal structure and classification of solids and to x-ray and neutron diffraction in crystals. Ionic crystals. Introduction to elastic properties of crystals, lattice vibrations, infrared absorption and thermal properties of solids. Dielectric and magnetic properties of solids. Introduction to the free electron and band theories of solids. Phenomenological treatment of superconductivity and introduction to cooperative phenomena. Diffusion. Semiconductor physics. *Prerequisite:* 118, 173 and 272. Three hours. Mr. Brown. Offered in alternate years, 1969-70.

343, 344 **ADVANCED SOLID STATE PHYSICS** Introduction to methods of calculating energy bands in solids. The second quantization formalism and the quasiparticle concept with applications to phonons in metals and dielectrics, magnons, and various other collective systems. Systematic discussion of the Fermi surface in metals and the experiments which yield information about its properties. Many-electron screening effects in metals. Elements of the BCS theory of superconductivity. deHaas van Alphen effect and cyclotron resonance. Magnetoacoustic attenuation and ultrasonic attenuation. Neutron scattering studies in crystals. Introduction to the two-particle Green's function. *Prerequisite:* 342, 362, 314. Three hours. Mr. Brown. Offered as occasion warrants.

361, 362 **QUANTUM MECHANICS** Mathematical and physical foundations of non-relativistic quantum mechanics are presented from the unifying point of view of Dirac which includes the matrix and wave formulations. Applications in-

clude the theory of angular momentum, perturbation theory, the theory of radiative transitions and scattering theory. The role of symmetry operations and the essential algebraic structure of quantum mechanics are emphasized. *Prerequisite:* 272, 361 for 362. Three hours. Mr. Thurnauer.

363 ADVANCED QUANTUM MECHANICS Introduction to the mathematical and physical concepts of relativistic quantum mechanics. Topics include the Klein-Gordon equation, Dirac's theory of the electron, the relativistic hydrogen atom, Feynman's propagator theory and its applications. *Prerequisite:* 362. Three hours. Mr. Scarfone.

364 ADVANCED QUANTUM THEORY Quantization of free and interacting fields. Symmetry properties of fields and particles. The S-matrix and Feynman graphs. Soluble models and renormalization. The elements of Dispersion Theory. Applications in relativistic particle scattering. *Prerequisite:* 363. Three hours. Mr. Scarfone.

372 NUCLEAR AND PARTICLE PHYSICS Discussion of the conservation principles following from space-time symmetries and their consequences for nuclear and particle physics. The nucleon-nucleon interaction, iso-spin, light nuclei, nuclear models, analysis of scattering experiments at low and high energies. Selected additional topics such as the interaction between nucleons and radiation, weak interactions, dynamical theories of fundamental particle interactions. *Prerequisite:* 311, 314, 362. Three hours. Mr. Thurnauer.

375 KINETIC THEORY AND STATISTICAL MECHANICS Review of thermodynamics. Elements of kinetic theory including the Boltzmann equation, H theorem and transport phenomena. Introduction to equilibrium statistical mechanics, both quantum and classical. *Prerequisite:* 173, 272. Three hours. Mr. Krizan.

376 STATISTICAL MECHANICS Applications of fundamentals of statistical mechanics to quantum and classical ideal and imperfect gases. Investigations of special topics such as the Ising model, relativistic statistical mechanics, physical adsorption and phase transitions. *Prerequisite:* 375 and 361. Three hours. Mr. Krizan.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

491 through 493 DOCTORAL THESIS RESEARCH Original research under the direction of an assigned staff member, culminating in an acceptable doctoral dissertation. Credit as arranged.

V Plant and Soil Science

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professors Wiggins (Chairman), Bartlett, and Hopp; Associate Professors MacCollom and Wood; Assistant Professors Boyce, Flanagan, McIntosh, and Pellett; Lecturers Calahan, Benoit, Parker, and Way

10 HOME AND GARDEN HORTICULTURE Enrichment of everyday home living through horticulture. Planning of the home grounds for maximum enjoyment. Selection and maintenance of plants for the home grounds, including shrub, tree and flower plantings, the home lawn, home fruit and vegetable gardens, and house plants. Designed primarily for non-agricultural students. Three hours. Mr. Wiggins and staff.

11 INTRODUCTORY PLANT SCIENCE (3-2) Principles and practices involved in the culture, management, and utilization of plants and plant products with emphasis on economically important horticultural and agronomic crops. Four hours. Mr. Boyce.

61 INTRODUCTION TO SOIL SCIENCE (2-3) An introductory study of the nature and properties of soils and how they serve as media for plant growth. *Prerequisite:* sophomore standing. Three hours. Mr. McIntosh.

102 NATURAL RESOURCE CONSERVATION A systematic appraisal of the extent and character of the nation's resources; including soil, water, atmosphere, forest, wildlife, mineral, and other utilitarian and recreational aspects; their past use and misuse, present conservation status, and adequacy for the future. *Prerequisite:* junior standing. Three hours. Mr. Flanagan.

104 PRINCIPLES OF PEST CONTROL (2-3) Practices and principles involved in modern pest control including biological, cultural, and chemical methods for weeds, insects, and plant diseases. *Prerequisite:* eight hours of biological sciences or chemistry. Three hours. Staff. Alternate years, 1969-70.

106 ECONOMIC ENTOMOLOGY (3-2) Survey of the major insect orders, and the relationship of structure, physiology and life history to control; material and methods for control of injurious species. *Prerequisite:* zoology 1 or botany 1. Four hours. Mr. MacCollom. Alternate years, 1970-71.

108 FOREST ENTOMOLOGY (2-2) The ecology and population dynamics of insects affecting trees, forests and forest products, the types of injury and their recognition, and methods of insect control by silvicultural, biotic and chemical means. *Prerequisite:* junior standing in forestry or departmental permission. Three hours. Mr. Parker.

110 FOREST PATHOLOGY (2-2) The etiology of the principal types of diseases in forest trees and forest products, with emphasis on prevention and control in relation to forest management and utilization. *Prerequisite:* junior standing in forestry or departmental permission. Three hours. Staff.

122 **SMALL FRUIT CROPS (2-3)** Principles of small fruit production, including propagation, culture, management, and harvesting. *Prerequisite:* 11. Three hours. Mr. Boyce. Alternate years, 1969-70.

123 **VEGETABLE CROPS (2-3)** Origin and improvement of vegetable crops, including cultural practices and principles involved in modern vegetable production. Review of recent experimental work. *Prerequisite:* 11. Three hours. Mr. Hopp. Alternate years, 1969-70.

125 **ORNAMENTAL HORTICULTURE (2-3)** The identification, climatic requirements, cultural management, and use of ornamental plant materials in landscape plantings. *Prerequisite:* 11. Three hours. Mr. Pellett. Alternate years, 1969-70.

138 **PLANT PROPAGATION (2-3)** The principles and practices involved in the propagation of herbaceous and woody plants by seeds, division, layering, cutting, budding, and grafting. *Prerequisite:* 11 or equivalent. Three hours. Staff. Alternate years, 1970-71.

141 **FORAGE CROPS (2-3)** Producing, improving, and managing forage and pasture crops, including a study of silage and hay making. *Prerequisite:* 11. Three hours. Mr. Wood. Alternate years, 1970-71.

144 **FIELD CROPS (2-3)** Theory and practice of producing, improving and managing field crops other than those for forage. *Prerequisite:* 11. Three hours. Mr. Wood. Alternate years, 1969-70.

145 **TURFGRASSES (2-3)** Principles of establishment, maintenance and utilization of turf for lawns, parks, athletic fields, airports, cemeteries, roadsides, golf courses, ski slopes and other special uses. *Prerequisite:* 11. Three hours. Mr. Wood. Alternate years, 1969-70.

162 **SOIL FERTILITY AND MANAGEMENT** The essential principles of soil management as they relate to soil fertility. A study of soil testing methods and interpretations, fertilizer manufacture and usage, and management practices which will maintain or improve soils. *Prerequisite:* 61. Three hours. Mr. McIntosh. Alternate years, 1968-69.

197, 198 **SENIOR RESEARCH** Work on a research problem under the supervision of a senior staff member. Findings submitted in written form as prescribed by the department. *Prerequisite:* senior standing. One to three hours. Staff.

201 **MICROMETEOROLOGY** A theoretical and practical consideration of the micrometeorological factors that affect plant growth and response. The relationship of these factors to crop selection and agricultural practices. *Prerequisite:* 11 or equivalent. Three hours. Mr. Benoit. Alternate years, 1969-70.

204 **PLANT RESEARCH TECHNIQUES (2-3)** Methods of conducting research with plants. Organizing and planning of experiments. The use of field and laboratory equipment. *Prerequisite:* 11, 61, and botany 103 or equivalent. Three hours. Mr. Wiggans. Alternate years, 1969-70.

205 **MINERAL NUTRITION OF PLANTS** Roles of essential elements and deficiency effects. Classical and modern approach to study of ion availability and mechanisms of entry and transport. Colloid chemistry of roots and the rhizo-

sphere. *Prerequisite*: botany 103 or equivalent. Three hours. Messrs. Bartlett and Klein and botany, forestry, and plant and soil science staff. Alternate years, 1969-70.

207 WATER RELATIONS OF PLANTS (See forestry 207) Three hours. Mr. Post and botany and plant and soil science staff. Alternate years, 1970-71.

222 ADVANCED TREE FRUIT CULTURE (2-3) Theory and practice of modern commercial fruit science. Basic principles involved in nutrition and responses to cultural and management practices. *Prerequisite*: 11. Three hours. Mr. Calahan. Alternate years, 1970-71.

S223 ADVANCED ORNAMENTAL HORTICULTURE (2-3) Developmental landscape drafting, design and composition. Taxonomy, ecology, and physiological considerations in adaptation of plants in the landscape environment. Physiological principles related to modern methods of greenhouse and landscape environmental control. *Prerequisite*: 125 or departmental permission. Three hours. Mr. Pellett.

261 SOIL FORMATION AND CLASSIFICATION A discussion of the development of soils throughout the world as influenced by soil forming factors. Detailed study of soils occurring in Vermont. Classification of soils, including the Unified System, 7th Approximation. *Prerequisite*: 61 or a total of six hours in ecology, geology, or geography. Two hours. Mr. Bartlett. Alternate years, 1970-71.

264 SOIL CHEMISTRY (2-3) The chemistry and biology of soils as they affect plant growth. Colloidal properties of clays and organic matter in relation to soil acidity and availability of essential elements. Modern laboratory analysis of soils, fertilizer and plant tissue. *Prerequisite*: 61, chemistry 1-2 or 11-12. Three hours. Mr. Bartlett. Alternate years, 1969-70.

266 SOIL PHYSICS (2-3) The physical properties of soils. The mathematical and physical principles necessary to understand the soil-water-plant interaction and its relationship to production and management. *Prerequisite*: 61, physics 5-6. Three hours. Mr. Benoit. Alternate years, 1970-71.

281 through 284 SEMINAR Presentation and discussion of papers on selected topics of current interest by students and staff. *Prerequisite*: senior standing. One hour. Staff.

381, 382 SPECIAL TOPICS Advanced readings and discussion of horticulture, agronomy, or soils research literature. Three hours. Staff.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged. Staff.

Political Science

COLLEGE OF ARTS AND SCIENCES

Professors Dellin, Gould (Chairman), Haugen, Hilberg, Little and Nuquist; Associate Professor Staron¹; Assistant Professors Knoller, Pacy, Simon, Warner, and Wertheimer; Instructors Brubaker, Eastman, and Nelson

11, 12 **INTRODUCTION TO POLITICAL SCIENCE** First semester: elements of political science. Second semester: comparative governmental institutions. Three hours. Staff.

21, 22 **AMERICAN GOVERNMENT** The American governmental system. First semester: theory, principles, institutions, and political processes. Second semester: functions and problems. *Prerequisite:* sophomore standing; 21 for 22. Three hours. Staff.

51, 52 **INTERNATIONAL RELATIONS** First semester: contemporary international problems in historical perspective. Second semester: national settings of foreign policy; the international system in cooperation and conflict. *Prerequisite:* sophomore standing. Three hours. Messrs. Hilberg and Pacy.

161, 162 **LOCAL GOVERNMENT** First semester: government of counties, towns, and other rural units. Second semester: municipal government. *Prerequisite:* 11, 12 or 21, 22 or junior standing. Three hours. Mr. Nuquist.

171, 172 **GOVERNMENTS OF EUROPE** Political and legal ideas, institutions, and processes in the context of national life. First semester: emphasis on the United Kingdom and France. Second semester: emphasis on the U.S.S.R. and Germany. *Prerequisite:* 11, 12 or junior standing. Three hours. Mr. Staron.

173 **GOVERNMENTS OF CANADA AND THE COMMONWEALTH** Governmental systems in the British Commonwealth and overseas territories, with particular emphasis on Canada and Commonwealth cooperation. *Prerequisite:* 11, 12 or junior standing. Three hours. Mr. Haugen. Alternate years, 1969-70.

174 **GOVERNMENT OF LATIN AMERICA** Analysis of the formal and informal political structure of the Latin American states with emphasis upon contemporary developments. *Prerequisite:* 11, 12 or junior standing. Three hours. Mr. Gould. Alternate years, 1968-69.

175, 176 **GOVERNMENTS OF ASIA** The 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:* 11, 12 or junior standing. Three hours. Mr. Little. Alternate years, 1969-70.

193, 194 **COLLEGE HONORS**

195, 196 **SPECIAL TOPICS**

197, 198 **READINGS AND RESEARCH**

1. Sabbatical leave, 1968-69.

211, 212 **POLITICAL THOUGHT** First semester: development of political thought from Plato to Burke. Second semester: recent political ideologies. *Prerequisite:* 11, 12 or 21, 22, or 51, 52; junior standing. Three hours. Mr. Staron.

216 **AMERICAN POLITICAL THOUGHT** American political thought from the colonial period to recent times. *Prerequisite:* 11, 12 or 21, 22, or history 24 or 28; junior standing. Three hours. Mr. Simon.

221, 222 **CONSTITUTIONAL LAW** First semester: judicial review, federalism, citizenship and suffrage, taxing power, commerce power. Second semester: Bill of Rights, Due Process, Equal Protection. *Prerequisite:* 11, 12 or 21, 22; junior standing. Three hours. Mr. Gould.

225 **COMPARATIVE ADMINISTRATIVE LAW** A comparative analysis of the administrative law systems of Great Britain, France, Germany, and Russia. *Prerequisite:* 221 or 241 or three hours in comparative government. Three hours. Mr. Haugen.

226 **ADMINISTRATIVE LAW** A study of judicial decisions affecting the actions of public officials as they relate to the functions and policies of government. *Prerequisite:* 221 or 241 or 263. Three hours. Mr. Nuquist.

227, 228 **INTERNATIONAL LAW** Principles and applications of public international law. *Prerequisite:* 51, 52; 227 for 228; junior standing. Three hours. Mr. Little.

231 **THE LEGISLATIVE PROCESS** Congressional and parliamentary organization and procedure. *Prerequisite:* 11, 12 or 21, 22; junior standing. Three hours. Mr. Haugen. Alternate years, 1969-70.

232 **LAWMAKING AND PUBLIC POLICY** Influence of the executive and problems of congressional and parliamentary control. *Prerequisite:* 11, 12 or 21, 22; junior standing. Three hours. Mr. Haugen. Alternate years, 1969-70.

235 **DEFENSE POLICY** Constitutional and historical framework; intelligence, R and D, procurement, manpower and deployment: U. S.-Soviet discrepancies, developments, and dilemmas. *Prerequisite:* twelve hours of political science below the 100 level. Three hours. Mr. Pacy.

241 **PUBLIC ADMINISTRATION** Introduction to the role of administration in government, theories of administrative organization and their application, the basic functions of administrative management, and problems of democratic control. *Prerequisite:* 11, 12 or 21, 22; one other course or one sophomore course in social science; junior standing. Three hours. Mr. Nuquist.

242 **ADMINISTRATIVE PROCEDURES** *Prerequisite:* 241 or 263. Three hours. Mr. Warner.

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:* twelve hours of political science below the 100 level. Three hours. Mr. Hilberg.

253, 254 **WORLD POLITICS** Comparative analysis of the foreign policies of countries other than the United States; selected problems in Europe, Africa, Asia, and Latin America. *Prerequisite:* 51, 52; junior standing. Three hours. Mr. Little. Alternate years, 1968-69.

256 INTERNATIONAL ADMINISTRATION Theory and practice in international agencies. *Prerequisite:* 51, 52; junior standing. Three hours. Mr. Little. Alternate years, 1968-69.

257 POLITICAL GEOGRAPHY See geography 257. Three hours. Mr. Miles.

258 PROBLEMS OF COMMUNISM See economics 258. Three hours. Mr. Dellin.

263 STATE GOVERNMENT Processes of basic formulation and popular control, the nation-wide effort to improve governmental systems, the theoretical basis of reform movements, and trends in the treatment of governmental problems. *Prerequisite:* 11, 12 or 21, 22; junior standing. Three hours. Mr. Brubaker.

264 STATE ADMINISTRATION The effect of expansion in state activity problems in policy determination, the responsibility and accountability of officers and agencies, the organization and maintenance of central services and controls, and the impact of study and investigation by legislative committees, interim commissions, councils, and citizens groups. *Prerequisite:* 263 or 241. Mr. Haugen.

265, 266 INTERGOVERNMENTAL RELATIONS First semester: problems of the federal system. Second semester: national-state-local cooperative administration of selected public functions. *Prerequisite:* 11, 12 or 21, 22; junior standing. Three hours. Mr. Haugen. Alternate years, 1968-69.

271, 272 POLITICAL PARTIES AND PRESSURE GROUPS First semester: political parties. Second semester: citizen participation and interest groups. *Prerequisite:* 11, 12 or 21, 22; junior standing. Three hours. Mr. Nelson.

277 GOVERNMENT OF THE U.S.S.R. Three hours. Mr. Daniels. See history 277.

278 FOREIGN POLICY OF THE U.S.S.R. Three hours. Mr. Daniels. See history 278.

279 COMPARATIVE PUBLIC ADMINISTRATION Universal applicability of basic administrative concepts evident in the administrative systems and environments in selected countries in Europe, the Commonwealth, and elsewhere; problems and developments in established and in emergent countries. *Prerequisite:* 241, or three hours in comparative government; junior standing. Mr. Haugen.

281, 282 SEMINAR Research in special topics. *Prerequisite:* departmental permission. Three hours. Mr. Warner and Mr. Wertheimer.

283 SCOPE AND METHODS OF POLITICAL SCIENCE Approaches, sources of information, research methods, and systematization in the study of political phenomena. Open to senior majors and graduate students only. Three hours. Mr. Wertheimer.

291 through 293 READING AND RESEARCH For advanced undergraduates and graduate students. Three hours. Staff.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

V Psychology

COLLEGE OF ARTS AND SCIENCES

Professors Ansbacher, Chaplin, and Forgays (Chairman); Associate Professors Forsyth and Perrine; Assistant Professors Howell, Lawson, Leitenberg, Mayhew, Musty, and Patterson

1 **GENERAL PSYCHOLOGY** Introduction to the entire field, emphasizing the normal adult human being. Three hours. Messrs. Forgays, Musty and Patterson.

2 **LABORATORY IN GENERAL PSYCHOLOGY** Exercises in individual differences, sensation, perception, learning, motivation, emotion, and personality. To be taken concurrently with 1; recommended to students who plan to major in psychology. Enrollment limited. One hour. I, II. Mr. Mayhew.

5 **PSYCHOLOGICAL STATISTICS** Statistical technique and research design pertinent to the behavioral scientist. Topics covered include certain descriptive statistics and certain parametric and non-parametric hypothesis-testing statistics. A calculation laboratory is provided. *Prerequisite:* 1. Three hours. Mr. Howell.

100 **BEHAVIOR MODIFICATION** A survey of techniques for the manipulation and control of human behavior, and evaluation of their effectiveness. Such topics as conditioning, brainwashing, and hypnosis will be discussed. *Prerequisite:* 1. Three hours. Mr. Leitenberg.

105 **CHILD PSYCHOLOGY** Development of the individual from birth to adolescence. *Prerequisite:* 1. Three hours. Staff.

106 **PERSONALITY** Individual and life problems from the field-theoretical and phenomenological approach with emphasis on Alfred Adler's viewpoint. *Prerequisite:* 1. Three hours. Mr. Ansbacher.

108 **ABNORMAL PSYCHOLOGY** The more unusual mental processes; methods of observing them and interpreting them; their bearing on our understanding of the normal mind. *Prerequisite:* 1. Three hours. Staff.

109 **EXPERIMENTAL PSYCHOLOGY I** Problems of experimental design and methodology, including such areas as threshold measurement, scaling, classical conditioning, perception, motivation, and verbal learning; laboratory exercises involving data collection and analysis; development and completion of an original experiment. *Prerequisite:* 5. Four hours. Mr. Lawson.

110 **EXPERIMENTAL PSYCHOLOGY II** Research using animals as subjects; experiments in such areas as operant conditioning, discrimination learning, secondary reinforcement, chaining, schedules of positive reinforcement, and negative reinforcement. *Prerequisite:* 109. Four hours. Mr. Musty.

121 **SOCIAL PSYCHOLOGY** A psychological approach to social phenomena with emphasis on the concepts and methods used in the study of the behavior of

individuals in various social situations. Topics include: the nature, formation, and change of attitudes and norms; group dynamics; leadership; conformity; group conflict and social change; social movements; and language, symbols, and communication. *Prerequisite* : 1. Three hours. Mr. Perrine.

123 **SYSTEMATIC PSYCHOLOGY** A comparative study of the leading contemporary schools of psychological thought. *Prerequisite*: 1; sophomore standing. Three hours. Mr. Chaplin.

193, 194 **COLLEGE HONORS**

195, 196 **SPECIAL TOPICS**

197, 198 **RESEARCH** Individual research under staff direction. *Prerequisite*: departmental permission. Three or six hours. Staff.

210 **COMPARATIVE PSYCHOLOGY** Behavior of animals under controlled experimental conditions and in their natural environments. Consideration of behavior similarities and differences at various levels of the phyletic scale from lower forms to man. *Prerequisite*: 110, 123. Three hours. Mr. Leitenberg.

221 **PHYSIOLOGICAL PSYCHOLOGY** The structure and function of the mammalian nervous system, with emphasis upon neurological correlates of behavior and receptor mechanisms. Individual laboratory experience in electro-physiological techniques and the recording of receptor potentials. *Prerequisite*: 110, 123. Mr. Patterson.

222 **PHYSIOLOGICAL PSYCHOLOGY II** The study of the role of central nervous system mechanisms in the determination of innate behavior, arousal, internal inhibition and learning. Individual laboratory experiences in assessing the effects of brain stimulation, hormones, and psychoactive drugs upon behavior. *Prerequisite*: 110, 123, 221. Mr. Musty.

225-226 **PSYCHOLOGICAL TESTS (2-2)** Survey of important clinical tests of ability and personality; training in the administration of individual intelligence tests. *Prerequisite*: 110, 123, and permission of the instructor, who may waive the prerequisites in special cases. Three hours. Mr. Ansbacher.

230 **LEARNING** Basic laws of the learning process as revealed by controlled experiments; with emphasis upon specific phenomena and the variables which govern them. Laboratory experiences are provided and students may undertake original experiments. *Prerequisite*: 110, 123. Three hours. Mr. Mayhew.

232 **EXPERIMENTAL SOCIAL PSYCHOLOGY (2-2)** A laboratory course in the experimental methods and techniques typically used in social psychological research. Topics include attitude formation and change, conformity, motivation, prejudice, rumor, social perception, and suggestion. Techniques used in attitude measurement and public opinion surveys will also be examined and applied. Laboratory experiences are provided and students may undertake original experiments. *Prerequisite*: 110, 123. Three hours. Mr. Perrine.

234 **MOTIVATION AND EMOTION** Nature and development of motives, emotions and their relation to other psychological processes. *Prerequisite*: 110, 123. Three hours. Mr. Chaplin.

236 **THINKING** A critical review of the experimental investigation of thought processes. Such topics as concept formation, rule learning, plans and strategies, language and thought, and creative thinking will be discussed. *Prerequisite:* 110 and 123. Three hours. Mr. Mayhew.

237 **SENSORY PERCEPTION** An introduction to the sensory basis of perception. Emphasis is on methodology and research literature; development of an original experiment. *Prerequisite:* 110, 123. Three hours. Mr. Lawson.

238 **SOCIAL PERCEPTION** Experimental and theoretical study of the phenomena of the human perceptual process; with emphasis on the role of social, motivational, and learning factors. The major perceptual theories are examined critically in the light of recent research. Students may undertake original experiments. *Prerequisite:* 110, 123. Three hours. Mr. Perrine.

281-282 **SEMINAR** Review and discussion of current psychological research. *Prerequisite:* 110, 123. One hour. Staff.

303-304¹ **ADVANCED GENERAL PSYCHOLOGY** This course serves as an overview of the field. It will emphasize empirical findings from the frontiers of the field and relate them to the body of psychology as it is developing today. Experiments will be undertaken by each student. Three hours. Mr. Chaplin.

305-306¹ **ADVANCED STATISTICAL METHODS** Study of statistical methods as aids for understanding and evaluating psychological data. Critical study of such topics as sampling theory, statistical estimation, simple and complex analysis of variance, non-parametric methods, simple and complex correlative techniques. Three hours. Mr. Howell.

307¹ **ADVANCED SOCIAL PSYCHOLOGY** A critical evaluation of such major concepts and methods as attitude formation, change and measurement; prejudice; social perception; group dynamics. Three hours. Mr. Perrine.

309¹ **RESEARCH APPARATUS AND DESIGN** A study of the methods and techniques used in executing behavioral science research, with special emphasis given to the basic principles of electricity and behavioral apparatus design. Individual laboratory experience and demonstrations give the student exposure to the contemporary methodology used by the experimental psychologist. Three hours. Mr. Patterson and Staff.

311¹ **SEMINAR IN LEARNING THEORY** An examination of selected contemporary theoretical approaches to learning and a study of recent research contributions to such problem areas as social learning, emotional learning, the physiology of learning, etc. Three hours. Mr. Mayhew.

312¹ **SEMINAR IN VERBAL LEARNING** Selected problems in verbal learning and memory will be studied by means of a detailed critical examination of the relevant literature. Current topics such as short and long term memory, organizational structure of free recall, and pre-experimental associations will be examined. Three hours. Mr. Howell.

1. The prerequisite for this course is acceptance to the graduate psychology program which involves the satisfactory completion of undergraduate courses in experimental psychology, systematic psychology, and statistics. In special cases, these prerequisites may be waived by permission of the instructor. In addition, acceptance to Master's degree candidacy is a prerequisite.

314¹ **COMPARATIVE PSYCHOLOGY OF BEHAVIORAL DEVELOPMENT** An examination of the general principles underlying the development of behavior from prenatal to adult responding. Focus will be on the pertinent research literature, particularly as it concerns the influence of various kinds of experience in early life upon later functioning. Three hours. Mr. Forgays.

321¹ **SENSORY PROCESSES** A study of the structure and function of the sense organs. Emphasis will be on research technique and methodology. Three hours. Mr. Patterson.

322¹ **CENTRAL PROCESSES** Basic neurophysiological psychology with emphasis on the control of behavior by the brain. Neuronal and synaptic transmission, chemical modulators of brain activity, basic organization of the nervous system. Three hours. Mr. Musty.

324¹ **SEMINAR IN PERCEPTION** A review of the history and contemporary problems of perceptual processes. Emphasis will be on perceptual mechanisms responsible for organization of sensory information. Three hours. Mr. Lawson.

326¹ **INTRODUCTION TO CLINICAL PSYCHOLOGY** Initially this course will be a study of the basic principles of interviewing, testing, assessment from life situations, and report writing. Later there will be an examination of the most common approaches to psychotherapy, such as the client-centered, habit change, cognitive change, emotional change, interpersonal relations, and group therapy approaches. Three hours. Mr. Ansbacher.

328¹ **SEMINAR IN SOCIAL PERCEPTION** Examination of the process through which impressions and judgments of man and other social objects are reached. Three hours. Mr. Perrine.

330¹ **SEMINAR IN OPERANT CONDITIONING** A review of current developments in this area of research. Negative and positive reinforcement; discrimination training and generalization. Three hours. Mr. Leitenberg.

331¹ **SEMINAR IN BEHAVIOR THERAPY** A review of the literature relating to theory, practice, and research. Emphasis will be placed on the applications of conditioning theory and the experimental analysis of behavior to psychotherapy. Three hours. Messrs. Leitenberg and Agras.

371,¹ 372,¹ 373¹ **CONTEMPORARY TOPICS** Designed to cover selected topics in depth. The major emphasis will be on intensive and critical analysis of original literature in a given area. Suitable topics include: Visual Perception, Accident Research, Memory, Fear and Frustration, Adlerian Theory, Behavior Therapy, Behavioral Pharmacology, Information Theory, Instinct, Propaganda and Attitude Formation, Psycholinguistics. Three hours. Staff.

381 through 383 **ADVANCED READINGS AND RESEARCH¹** Readings, with conferences, to provide graduate students with background and specialized knowledge relating to an area in which an appropriate course is not offered. One to three hours. Staff.

391 through 393 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of a staff member. Credit as arranged. Staff.

491 through 493 **DOCTORAL THESIS RESEARCH** Acceptance as doctoral candidate is a prerequisite. Credit as arranged. Staff.

1. See footnote 1 on page 231.

V Romance Languages

COLLEGE OF ARTS AND SCIENCES

Professors Daggett and Johnston; Associate Professors Julow (Chairman), Parker, Ugalde, and Weiger; Assistant Professors Chinchón, Kohler, Strong, and Wesseling; Instructors Allen, Branden, Crichfield, de Loeschnigg, Geno, Lascoumes, Lehovich, Meadows, Puleston, Radcliffe, Serra, Simard, and Zumbo

French

1-2 ELEMENTARY FRENCH The fundamentals of French, with emphasis on the spoken form through pattern drills, use of tapes, and study of the basic grammatical structure of the language. For those who present less than two years of high school French. *Credit is given only if Intermediate French is also completed.* Four hours. Miss Lehovich and staff.

11-12 INTERMEDIATE FRENCH Re-enforcement and advancement of the four basic language skills, speaking, comprehension, reading and writing, through pattern drills in electronic laboratory, structured discussion in class of cultural and literary texts, and composition on assigned topics. Conducted chiefly in French. *Prerequisite:* 2 or two years of high school French. Three hours. Mr. Lascoumes and staff.

13-14 ADVANCED INTERMEDIATE FRENCH An intermediate course similar to 11-12 but designed for students with better than average preparation in French. Conducted entirely in French. Assignment by department only. Three hours. Mr. Lascoumes and staff.

101, 102 FRENCH LITERATURE: 19TH CENTURY Outstanding authors of the romantic, realistic, and naturalistic schools. This course is prerequisite for all other courses in French literature. *Prerequisite:* 12. Three hours. Messrs. Daggett and Julow.

103, 104 MASTERWORKS A thematic study of outstanding works of French literature of various periods. *Prerequisite:* 12. Three hours. Messrs. Parker, de Loeschnigg, and Crichfield.

121, 122 COMPOSITION AND CONVERSATION Development of skills in conversation and comprehension through systematic review of phonology and grammatical structure. Literary texts will be the basis of analysis and discussion. Explications of textes littéraires and exposés. Written compositions required regularly. Required of those who wish to be recommended to teach French. *Prerequisite:* 12 or equivalent, 121 for 122. Three hours. Mr. Kohler and staff.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

197, 198 READINGS AND RESEARCH

203, 204 FRENCH LITERATURE: 20TH CENTURY Principal movements from 1900 to the present, with emphasis on outstanding works in the novel, drama, and poetry. *Prerequisite:* Any French literature course numbered 100 or above. Three hours. Mr. Johnston.

211 FRENCH LITERATURE: 18TH CENTURY Main currents of the literature of the century with emphasis on Montesquieu, Diderot, Voltaire, and Rousseau. Lesage, Marivaux, and Beaumarchais will be studied in the drama. *Prerequisite:* Any French literature course numbered 100 or above. Three hours. Mr. Johnston. Alternate years, 1969-70.

213 FRENCH LITERATURE OF THE BAROQUE AGE Selected works of the period from Montaigne to Pascal with emphasis on d'Aubigné, Jean de Sponde, Malherbe, Hardy, Mairet, Rotrou, Corneille, Tristan, Saint-Amant, d'Urfé, Scudéry and Scarron. *Prerequisite:* Any French literature course numbered 100 or above. Three hours. Mr. Parker. Alternate years, 1970-71.

214 FRENCH LITERATURE: 17TH CENTURY Selected works of the century with emphasis on Corneille, Racine, and Molière. *Prerequisite:* Any French literature course numbered 100 or above. Three hours. Mr. Julow. Alternate years, 1970-71.

215 FRENCH MEDIEVAL LITERATURE A study of important works of the medieval period: Chansons de geste, romans courtois, Roman de Renart, Roman de la Rose, religious and comic theatre. Works studied in original text and in modern French versions. *Prerequisite:* Any French literature course numbered 100 or above. Three hours. Mr. Daggett. Alternate years, 1970-71.

216 FRENCH LITERATURE: 16TH CENTURY Selected works of the period with emphasis on Rabelais, Montaigne and the Pléiade. *Prerequisite:* Any French literature course numbered 100 or above. Three hours. Mr. Daggett. Alternate years, 1970-71.

217 SPECIAL STUDIES ON FRENCH LITERATURE Selected authors and themes, representative of French thought and literary merit. Three hours. Mr. Johnston. Alternate years, 1969-70.

220 THE NOVEL FROM 1850 TO 1900 Study of theory and practice in the realistic-naturalistic novel in France from midnineteenth century to approximately 1900, with emphasis on Flaubert, the Frères Goncourt, Zola, Maupassant, Daudet. *Prerequisite:* Any French literature course numbered 100 or above. Three hours. Mr. Julow. Alternate years, 1969-70.

223, 224 ADVANCED COMPOSITION AND CONVERSATION Translation into French of difficult English prose, free composition, and discussion of questions of style. Advanced conversation. Required of those who wish to be recommended to teach French. *Prerequisite:* 122 or equivalent. Three hours. Messrs. Daggett and Kohler.

227, 228 LINGUISTIC STRUCTURE OF FRENCH An analysis of present-day French, with emphasis on phonetics, phonemics, morphology, and syntax of the language. Required of those who wish to be recommended to teach French. *Prerequisites:* 122; 227 for 228. Three hours. Miss Radcliffe.

233 **EXPLICATION DE TEXTES** Written and oral analyses in French by the instructor and by the student of a variety of literary passages. Constructive criticism of students' *explications*. *Prerequisite*: 224. Three hours. Mr. Lascoumes.

234 **STYLISTICS** Study and comparison of various literary styles. Imitative compositions based on passages studied, development of individual styles. *Prerequisite*: 233. Three hours. Mr. Lascoumes.

281, 282 **SENIOR SEMINAR** Special readings and research. Required of all senior concentrators. One hour. Staff.

301 **MARCEL PROUST, *A La Recherche du Temps Perdu*** A study in depth of Proust's novel and of the various waves of criticism devoted to Proust and his work. Lectures, discussions, reports. Three hours. Mr. Parker. Alternate years, 1969-70.

302 **EMILE ZOLA, *Rougon-Macquart*** A thorough study of Emile Zola's *Rougon-Macquart* series, his theories of naturalism and critical estimate of his work. Lectures, discussions, reports. Three hours. Mr. Julow. Alternate years, 1970-71.

381, 382 **GRADUATE SEMINAR** Offered for resident candidates for the Master of Arts degree; opportunities for independent work are provided. Three hours. Staff.

391 through 393 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

Italian

1-2 **ELEMENTARY ITALIAN** Study of basic grammar through learning of dialogues, pattern drills in class and in electronic laboratory; reading. Four hours. Mr. Serra.

11-12 **INTERMEDIATE ITALIAN** Conversation grammar reviews, and readings in modern Italian. The spoken language is stressed. *Prerequisite*: 2 or its equivalent. Three hours. Mr. Serra.

Spanish

1-2 **ELEMENTARY SPANISH** The fundamentals of Spanish, with emphasis on the spoken form through pattern drills, use of tapes, and study of the basic grammatical structure of the language. For those who present less than two years of high school Spanish. *Credit is given only if Intermediate Spanish is also completed*. Four hours. Mr. Ugalde and staff.

11-12 **INTERMEDIATE SPANISH** Review of the fundamentals of grammar. Readings from selected authors. Conducted chiefly in Spanish. *Prerequisite*: 2 or two years of high school Spanish. Three hours. Mr. Wesseling and staff.

13-14 **ADVANCED INTERMEDIATE SPANISH** An intermediate course similar to 11-12 but designed for students with better than average preparation in Spanish. Review of grammar, special emphasis on reading, oral practice, and composition. Conducted entirely in Spanish. Assignment by department only. Three hours. Mr. Ugalde.

101 **SPANISH LITERATURE: 19TH CENTURY** Principal literary currents of the 19th Century, from Romanticism to the "Generation of 1898." Representative readings from the poetry, drama, and novel of the period. *Prerequisite:* 12 or departmental permission. Three hours. Mr. Ugalde.

102 **SPANISH LITERATURE: 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. *Prerequisite:* 12 or departmental permission. Three hours. Mr. Wesseling.

105 **READINGS IN SPANISH AMERICAN LITERATURE: NINETEENTH CENTURY** Outstanding works from the Colonial Period to modernismo. *Prerequisite:* 12. Three hours. Mr. Chinchón.

106 **READINGS IN SPANISH AMERICAN LITERATURE: CONTEMPORARY PERIOD** Outstanding works of the 20th Century with emphasis on the novel. *Prerequisite:* 12. Three hours. Mr. Chinchón.

121-122 **CONVERSATION AND COMPOSITION** Phonology of the Spanish language. Drills on rhythm and intonation. Comparison of the phonemic structures of English and Spanish. Written compositions and practice in conversation. Development of vocabulary. Required of those who wish to be recommended to teach Spanish. *Prerequisite:* 12 or equivalent, 121 for 122. Three hours. Mr. Wesseling.

193, 194 **COLLEGE HONORS**

195, 196 **SPECIAL TOPICS**

197, 198 **READINGS AND RESEARCH**

205, 206 **SPANISH-AMERICAN LITERATURE OF SOCIAL PROTEST** The literature of the Spanish-American peoples as a reflection of and contribution to the social problems of the area. The second half of the course will stress the contemporary scene. *Prerequisite:* Spanish 106 or political science 174 or history 203 or 204. (For those who do not present Spanish 106, a knowledge of Spanish is assumed.) Three hours. Mr. Chinchón. Alternate years, 1970-71.

213, 214 **SPANISH LITERATURE: GOLDEN AGE** The picaresque novel, the drama and poetry of the 16th and 17th centuries, with emphasis on Lope de Vega, Calderón, Quevedo, Tirso de Molina. *Prerequisite:* any Spanish literature course numbered 100 or above. Three hours. Mr. Weiger. Alternate years, 1970-71.

215-216 **SPANISH LITERATURE: CERVANTES** *Don Quijote*, the *Novelas Ejemplares*, and the theater of Cervantes. *Prerequisite:* any Spanish literature course numbered 100 or above. Three hours. Mr. Weiger. Alternate years, 1969-70.

223, 224 **ADVANCED COMPOSITION AND CONVERSATION** Composition, conversation, stylistics, panel discussions, translation into Spanish of difficult English prose. Required of those who wish to be recommended to teach Spanish. *Prerequisite:* 122. Three hours. Mr. Ugalde.

281, 282 **SENIOR SEMINAR** Special readings and research. Required of all senior concentrators. One hour. Staff.

301, 302 **GENERATION OF 1898** The essays, novels, poetry and drama of Unamuno, Azorín, Valle-Inclán, Baroja, Benavente, *et al.* Study of such thinkers as Ortega y Gasset, Américo Castro and Julián Marías and critics such as Menéndez y Pelayo and Menéndez Pidal. Three hours. Mr. Ugalde.

305 **THE REGIONAL NOVEL OF SPANISH AMERICA** The *criollista* and *indigenista* trends in the fictional literature of Spanish America. Study of works by Alegria, Gallegos, Güiraldes, Latorre, López y Fuentes, Rivera and others. *Prerequisite:* 206. Three hours. Mr. Chinchón.

306 **THE PSYCHOLOGICAL NOVEL OF SPANISH AMERICA** The more sophisticated trends of the novel dealing with the development of urban and suburban society in Spanish America. Study of works by Barrios, Borges, Carlos Fuentes, Godoy, Mallea, Yáñez and others. *Prerequisite:* 206. Three hours. Mr. Chinchón.

313 **THE SPANISH COMEDIA** Extensive readings in the baroque theater. Investigation of the genre in the light of research published in the twentieth century. *Prerequisite:* 213. Three hours. Mr. Weiger.

314 **THE SPANISH THEATER** Evolution of the Spanish drama from the twelfth-century *Auto de los Reyes Magos* to the contemporary theater of García Lorca, Casona and Buero Vallejo. Three hours. Mr. Weiger.

381, 382 **GRADUATE SEMINAR** Offered for resident candidates for the Master of Arts degree; opportunities for independent work are provided. Three hours. Staff.

391 through 393 **MASTER'S THESIS RESEARCH** Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.



Russian

COLLEGE OF ARTS AND SCIENCES

Associate Professor Paganuzzi; Instructor Scheglow

1-2 **ELEMENTARY RUSSIAN** Spoken and written Russian. Training in modern Russian, designed to help the student gain assurance in self-expression in the language. Practice in pronunciation and aural comprehension in class and through tape recordings. *Credit is given only if Intermediate Russian is also completed.* Four hours.

11-12 **INTERMEDIATE RUSSIAN** Rapid and systematic review of basic Russian. Increased stress on pronunciation, conversation, and reading. Readings in works by Pushkin, Lermontov, Tolstoi, Chekov, and others. *Prerequisite:* 1-2. Three hours.

101-102 **INTRODUCTION TO RUSSIAN LITERATURE** Outstanding authors of the nineteenth and twentieth centuries, from Pushkin to Pasternak and Solzenitzin. Oral discussion of readings; written practice. *Prerequisite:* 11-12. Three hours.

103-104 **ADVANCED RUSSIAN** Advanced oral and written drill. Grammar review, lexical problems, roots of Russian language. Lectures and discussions of Russian language, literature and culture. *Prerequisite:* 101-102. Three hours.

V Sociology and Anthropology

COLLEGE OF ARTS AND SCIENCES

Professor Lewis (Chairman), Associate Professor Mabry; Assistant Professors Dumont, Haviland, Johnson, Kennedy, and Steffenhagen; Instructors Cousins and Lux

Anthropology

21 **THE CULTURES OF MAN** The culture concept; its use in perceiving and understanding behavioral regularity and the diversity of social systems. The life-ways of non-Western societies of varying social complexity. Three hours. I, II. Staff.

24 **WORLD PRE-HISTORY** The origins and antiquity of culture; the development of increasing cultural complexity and diversity; the beginnings of civilizations. The nature of archaeological data and interpretation. Significance of similar development in the Old and New Worlds. Three hours. Mr Haviland.

26 **PHYSICAL ANTHROPOLOGY** An introduction to the study of the evolution and racial differentiation of man. Three hours. Mr. Haviland.

161 **PEOPLES OF THE AMERICAS** An ethnographic survey of representative Amerindian cultures. Attention will be paid to the standard culture areas and culture history, modern fusions of Amerindian and European peoples, and to the theoretical implications of American research data. *Prerequisite:* 21. Three hours. Messrs. Haviland and Johnson.

162 **PEOPLES OF AFRICA** A survey of representative African cultures. Emphasis is placed on the trends and schools of African anthropological research, and on socio-cultural understanding of emerging African societies. *Prerequisite:* 21. Three hours. Mr. Johnson.

163 **PEOPLES OF SOUTHEAST ASIA AND OCEANIA** A general ethnographic survey of contemporary culture types in Southeast Asia, Polynesia, Micronesia, Melanesia and Australia. Consideration is given to the traditional cultures of these areas and their place in the modern world. *Prerequisite:* 21. Three hours. Mr. Lux.

165 **PEOPLES OF JAPAN, CHINA AND INDIA** A survey of these three major civilizations of east and south Asia. Consideration of their culture history, social

structure, and cultural contributions to the world. Contrasts with the experience of the North Atlantic world emphasized. *Prerequisite*: 21. Three hours. Mr. Johnson.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

197, 198 READINGS AND RESEARCH

221 CULTURE AND PERSONALITY (See sociology 221)

225 CURRENT ANTHROPOLOGICAL THEORY The data and theories of socio-cultural dynamics: innovation, diffusion, acculturation, revitalization; theories of cultural evolution, culture circles, and the American historical school. *Prerequisite*: 21, and 161, 162, 163, or 165. Three hours. Mr. Johnson.

228 SOCIAL ORGANIZATION Evaluation of the comparative method in anthropology; its use in the formation of generalizations concerning the nature of society. *Prerequisite*: 21, and 161, 162, 163, or 165. Three hours. Mr. Haviland.

262 CULTURAL GEOGRAPHY (Same as geography 262)

283 APPLIED ANTHROPOLOGY A descriptive and analytical presentation of the place of anthropology in the modern world. Study of the human problems resulting from attempts to direct cultural change in subindustrial societies. *Prerequisite*: 21, and 161, 162, 163, or 165. Three hours. Mr. Johnson.

290 SEMINAR *Prerequisite*: twelve hours of anthropology and senior standing. Three hours.

Sociology

21 CULTURES OF MAN (See anthropology 21)

22 PRINCIPLES OF SOCIOLOGY The structure and dynamics of human groups. Socialization, social norms and processes, groups, stratification, institutions, and social change, with examples drawn mainly from American society. Three hours. Staff.

141 SOCIAL PROBLEMS A study of social problems peculiar to "pre-industrial" and developing societies as a basis for understanding their counterparts in societies, such as the United States, which have already made the industrial transformation. Select problems causally associated with urban-industrialization. *Prerequisite*: 22. Three hours. I, II. Mr. Kennedy.

151 THE FAMILY A cross-cultural approach to the study of the family as a social institution: the American family institution; nature of the changes it is undergoing, problems generated by these changes. *Prerequisite*: 22. Three hours. Mr. Lewis.

154 MINORITY GROUPS Case histories of selected New World minority groups, treated comparatively, and with attention to their origins as minorities here, their patterns of relations with the dominant American society, changes now going on, and their distinctive contributions to the common culture. Some inclusion of African and Eurasian cases will be made too, for further comparative insight. *Prerequisite*: 22. Three hours. Staff.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

197, 198 READINGS AND RESEARCH

205 SMALL GROUP DYNAMICS An analysis of the problems and the functioning of small groups and their relationship to large organizations. Attention will be given to the effect of the group on the individual, the consequences of democratic and non-democratic arrangements, factors making for group efficiency and morale, and the effects of groups on the larger organization in which they are located. Case studies include factory groups, gangs, military groups and various experimental situations. *Prerequisite:* six hours of sociology. Three hours. Mr. Steffenhagen.

210 POPULATION ANALYSIS Analysis of factors affecting population growth and distribution; migration patterns, and the relationship between economic activity and population trends. Particular attention will be given to the population problems of underdeveloped areas. *Prerequisite:* six hours of sociology. Three hours. Mr. Dumont.

212 THE COMMUNITY Analysis of the structure and function of communities as social systems with emphasis on American communities. Ecology, social class and power structure, and social change within the community context; procedures for sociological study of communities. *Prerequisite:* six hours of sociology. Three hours. Mr. Lewis.

213 URBAN SOCIOLOGY The place of the city in social organization. The emergence, nature and problems of modern urbanism. *Prerequisite:* six hours in sociology. Three hours. Staff.

214 PUBLIC OPINION Analysis of opinion and attitude formation with the primary emphasis on the political sphere. Attention will be given to the relationship between opinions and religious, racial, class and partisan affiliations. The sources of democratic and non-democratic political tendencies will be examined. *Prerequisite:* six hours of sociology. Three hours.

221 CULTURE AND PERSONALITY Relationship of socialization to the socio-cultural milieu; the cross-cultural comparison of personality development; the problem of delineating modal personality types; variations in child-rearing situations according to "social class" in contemporary Western Civilization. *Prerequisite:* 21, 22 and one 100 level course in sociology or anthropology. Three hours. Mr. Steffenhagen.

242 SOCIAL MOVEMENTS: A study of social movements with special emphasis given to revolutions. Selected cases, to clarify the relation of social movements to social problems, social institutions, and social class structure. *Prerequisite:* 22 and 141. Three hours. Mr. Kennedy.

243 SOCIAL STRATIFICATION A comprehensive study or analysis of the various ways in which societies become stratified into social class and caste, or open and closed social systems; the relationship of stratification systems to other aspects of social structure and to societal change. *Prerequisite:* six hours in sociology. Three hours. Dr. Dumont.

250 **METHODOLOGY OF SOCIAL RESEARCH** Methodological foundations of the social sciences; the nature of social facts and phenomena; formation of concepts and the application of logic in the social sciences. *Prerequisite:* six hours in sociology. Three hours. Dr. Dumont.

251 **SOCIAL RESEARCH METHODS** The logic and techniques of sociological inquiry. *Prerequisite:* 250, psychology 5. Three hours. Mr. Dumont.

255 **THE DEVELOPMENT OF SOCIOLOGICAL THEORY** A critical analysis of the development of sociological thought with special attention to the works of such 19th and 20th century writers as Durkheim, Marx, Weber Simmel, Park, Sorokin, and C. Wright Mills. *Prerequisite:* 22 and history 11 or 13. Three hours. Mr. Kennedy.

257 **CONTEMPORARY SOCIOLOGICAL THEORY** A survey and analysis of modern schools of sociological theory with particular reference to present day issues or fundamental problems around which sociological theory is developing. *Prerequisite:* 255. Three hours. Staff.

258 **CRIME AND DELINQUENCY** Definitions of crime and delinquency; the sociological bases of criminal and delinquent behavior; analyses of delinquent subcultures such as the gang, the underworld, and white-collar crimes. *Prerequisite:* 22 plus six additional hours in sociology. Three hours. Staff.

259 **PENOLOGY** A sociological approach to the history, current conditions and trends regarding the apprehension, adjudication and disposition of juvenile and adult offenders. *Prerequisite:* 258. Three hours. Staff.

270 **HEALTH AND MEDICINE** The social and cultural environment of illness and its influence on definition and treatment. Role definitions and behavior of patients, physicians, and others. The use of community resources. The methods and status of research in medical sociology. *Prerequisite:* nine hours of sociology. Three hours. Mr. Steffenhagen and Mr. Mabry.

271 **SOCIOLOGY OF MENTAL HEALTH** The influence of a socio-cultural environment upon the perception and definition of mental health and illness. Social responses to inappropriate behavior, including the roles of the patient, physician and family. Relationships between socialization processes and mental health. Etiology and epidemiology of mental illness. *Prerequisite:* Nine hours in sociology or departmental permission. Three hours. Mr. Steffenhagen.

281, 282 **SEMINAR** Readings in current sociological literature to acquaint advanced students with contemporary issues in sociology. *Prerequisite:* twelve hours of sociology, senior standing, and departmental permission. Three hours. Staff.

300 **ADVANCED SEMINAR IN MEDICAL SOCIOLOGY** Analysis of current problems relating to sociological aspects of medicine and the medical profession with emphasis on an interdisciplinary approach. Course will be taught jointly by the departments of Community Medicine, Psychiatry, and Sociology. *Prerequisite:* permission of staff. Three hours. Staff.

305, 306 **INDIVIDUAL STUDY IN MEDICAL SOCIOLOGY** Independent work in the study of socio-cultural factors influencing medicine and the medical profession. Topics for study and research are to be chosen by the student with the approval

of the professor concerned from one of the following: epidemiology, community medicine, and social psychiatry. Offered as a result of the joint efforts of the departments of Community Medicine, Psychiatry, and Sociology. *Prerequisite:* permission of staff. Credit as arranged: 1-3 hours. Staff.

The following courses in Social Work are available in the Department of Home Economics:

H.E.166 SOCIAL WELFARE AS A SOCIAL INSTITUTION

H.E.167 SOCIAL WORK AS A PROFESSION

H.E.168 SOCIAL WORK IN THE COMMUNITY



COLLEGE OF ARTS AND SCIENCES

Professors Huber, Lewis, and Luse; Associate Professors V. Falck, Feidner, London (Chairman), and Woolf; Assistant Professors Ellenwood and Thomsen; Instructors Bensman, Dilley, MacDonald, Myers, Pearson, Schenk, Schmider, and Wilkes; Lecturer Smith

General

1 FOUNDATIONS OF ORAL COMMUNICATION A non-performance course which provides the philosophical and theoretical bases for studying the entire process of communication with emphasis on its oral aspects. Three hours. I, II. Mr. Lewis and staff.

11 PUBLIC SPEAKING Preliminary analysis, gathering material, organization and delivery of speeches; use of visual aids and speech to inform. Two-thirds of the time devoted to student performance. Three hours. I, II. Staff.

31 ORAL INTERPRETATION OF LITERATURE Principles and techniques of oral interpretation of literature; analysis and appreciation of poetry, prose and drama through the development of ability in communicating the logical, emotional and aesthetic values of literature to an audience. Three hours. I, II. Mr. London and staff.

81 VOICE AND ARTICULATION Elements of speech and phonetics for the improvement of voice and articulation in communication. Class exercises and performance. *Prerequisite:* sophomore standing. Three hours. I, II. Miss Luse and staff.

101 PHONETICS Analysis of English speech sounds used in the International Phonetic Alphabet. Application to standards of English pronunciation in the United States and to foreign dialects. *Prerequisite:* junior standing and nine hours of speech; or English 27, 28; or a foreign language through the intermediate level. Three hours. Miss Luse.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

197, 198 READINGS AND RESEARCH

221 GENERAL SEMANTICS The theory of communication, both verbal and non-verbal, with emphasis upon the factors of interpersonal and intrapersonal communication breakdowns. *Prerequisite*: six hours of speech. Three hours. Mr. Lewis.

294 SEMINAR FOR PROSPECTIVE TEACHERS OF SPEECH The resources, procedures and methods utilized in teaching the different areas of speech at the various instructional levels. *Prerequisite*: twelve hours, including I and II. Three hours. Mr. London.

300 RESEARCH METHOD AND DESIGN Research method and design, bibliographical resources, and professional writing in the field of speech and drama. A required, professional orientation for all beginning graduate students. Three hours. Mr. London.

381, 382 ADVANCED READINGS Readings, with conferences, intended to contribute to the programs of graduate students in phases of speech for which formal courses are not available. *Prerequisite*: 271, 272. Credit to be arranged up to three hours each semester. Miss Luse and Mr. Woolf.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

Mass Communication

63 SURVEY OF MASS COMMUNICATION The origins, evolution, and impact of Press-Radio-Television-Film; development of their respective industries; social and cultural influences as commercial and educational enterprises. Three hours. I, II. Mr. Bensman.

161 AUDIO PRODUCTION An analysis of the theories of producing sound for radio, television, motion pictures, recordings, etc. A study of the problems of planning, directing and editing various kinds of audio productions. Laboratory at WRUV-FM. *Prerequisite*: 63. Three hours. Mr. Bensman.

162 WRITING FOR MASS COMMUNICATION A comparative study of the principles of writing for the mass communications media. Writing projects will be adapted to the interests and talents of the students. *Prerequisite*: 63. Three hours. Mr. Lewis. Alternate years. 1970-71.

165, 166 DEVELOPMENT OF THE MOTION PICTURE Development of the motion picture medium from its beginnings to the present. American and foreign films representative of major advances in the medium will be shown and discussed. *Prerequisite*: junior standing, 165 for 166. Three hours. Mr. MacDonald.

263 ISSUES IN CONTEMPORARY MASS COMMUNICATION An analysis of current issues related to the mass media such as: the effects of mass media on society, governmental regulation of the mass media, censorship of the mass media, special legal problems, etc. *Prerequisite*: 12 hours, including 63. Three hours. Mr. Lewis.

264 **TELEVISION PRODUCTION** An analysis of the principles involved in the production of programs for television broadcast. Emphasis on the following types of programs: educational, news, documentary, dramatic and variety. Laboratory use of the ETV studio. *Prerequisite* : 161. Three hours. Mr. Dilley.

Rhetoric and Public Address

3 **PARLIAMENTARY PROCEDURE** Study and practice in the fundamentals of conducting a meeting. The class meets twice a week with one hour of outside preparation. *Prerequisite*: sophomore standing. One hour. Mr. Huber.

12 **ARGUMENTATION** Inductive, deductive, causal, and analogical reasoning as applied to the speaking situation; designed to develop through performance skill in logical expression of thought. *Prerequisite* : 11. Three hours. I, II. Mr. Huber and Mr. Wilkes.

14 **GROUP DISCUSSION** Methods of procedure in committees, round table discussions, lecture forums, symposiums, panels, and other types of discussion; designed to develop through performance skill in the thought process involved in discussion leadership. *Prerequisite*: 11. Three hours. Mr. Myers and Mr. Wilkes.

111 **PERSUASION** Human motivation, attitudes and how to change them; emotion, stereotypes, attention, and audience psychology; training in their use through student performance. *Prerequisite*: six hours, including 11. Three hours. Mr. Huber.

116 **SPEECH COMPOSITION** Study of speech style and rhetorical criticism by analysis of great speeches and by writing longer speeches. *Prerequisite*: six hours, including 11. Three hours. Mr. Huber. Alternate years, 1970-71.

214 **HISTORY AND CRITICISM OF AMERICAN PUBLIC ADDRESS** Selected American speakers and speeches studied against the background of their lives and the issues of their times. *Prerequisite*: nine hours of related speech courses, including 11. Three hours. Mr. Wilkes.

217 **CLASSICAL RHETORIC** A study of selected works in order to provide understanding of the points of view of outstanding classical writers who have influenced rhetorical thought, criticism, speaking and writing. *Prerequisite*: nine hours of related speech courses, including 11. Three hours. Staff.

Speech Pathology-Audiology

74 **INTRODUCTION TO DISORDERS OF ORAL COMMUNICATION** Causes, symptoms and treatment of disorders of speech, hearing, and language. Selected observations of diagnostic and remedial sessions. *Prerequisite*: sophomore standing. Three hours. Mr. Ellenwood.

270 **LEARNING AND DEVELOPMENT OF SPEECH AND LANGUAGE** Speech and language acquisition in relation to current learning theory and methods of linguistic analysis. *Prerequisite*: nine hours of speech and psychology, including Speech 74. Three hours. Mr. Woolf.

271 **SPEECH PATHOLOGY I** The etiology, symptoms, and principles of habilitation for voice disorders, cleft palate; historical aspects of stuttering; problems of foreign accent. Observation and practicum required. *Prerequisite*: twelve hours of speech and psychology, including speech 74. Three hours. Miss Luse.

272 **SPEECH PATHOLOGY II** The etiology, symptoms, and treatment of retardation of speech, including congenital aphasia, aphasia in adults, and cerebral palsy. Observation and practicum required. *Prerequisite:* twelve hours of speech and psychology, including speech 74. Three hours. Mr. Woolf.

273 **PRINCIPLES OF AUDIOLOGY** Anatomy and physiology of the ear; history of audiometry; diagnostic hearing tests. *Prerequisite:* twelve hours of speech and psychology, including 74. Mrs. Falck.

275, 276 **CLINICAL STUDY** Observation and practice in diagnosis and therapy of speech disorders. *Prerequisite:* 271 or 272 and departmental permission. One or two hours. May be repeated up to five credit hours. Mr. Ellenwood.

281 **ANATOMY-PHYSIOLOGY OF SPEECH** Anatomy and physiology of speech and language processes. *Prerequisite:* nine hours of speech and psychology. Lectures and laboratory. Four hours. Miss Luse.

282 **ANATOMY-PHYSIOLOGY OF AUDITION** Anatomy and physiology of the normal auditory system. Basic acoustics and subjective correlates of the auditory stimulus. *Prerequisite:* nine hours of speech and psychology. Lectures and laboratory. Four hours. Mrs. Falck.

377 **REHABILITATIVE AUDIOLOGY I: AMPLIFICATION; SELECTION AND USE** Principles and rationale underlying clinical procedures in hearing aid selection. *Prerequisite:* Speech 273. Two hours. Mrs. Falck.

378 **REHABILITATIVE AUDIOLOGY II: SPEECH-READING AUDITORY TRAINING** Theories and methods for the development of speech-reading skills and the effective use of residual hearing. *Prerequisite:* Speech 273. Two hours. Mrs. Falck.

379 **REHABILITATIVE AUDIOLOGY III: PSYCHO-SOCIAL ASPECTS OF HEARING LOSS** Perceptual, personal, and social problems of the hard-of-hearing; theories, research, and management. *Prerequisite:* Speech 273. Two hours. Mrs. Falck.

385 **SEMINAR IN VOICE** Study of the research in voice production and speech. Application to pathological and non-pathological problems. *Prerequisite:* 271, 272. Three hours. Miss Luse.

386 **SEMINAR IN CEREBRAL PALSY** Study of the pathology, etiology, methods in diagnosis, and the rehabilitative procedures used with the various types of cerebral palsy. *Prerequisite:* 271, 272. Three hours. Miss Luse.

387 **SEMINAR IN LANGUAGE DISORDERS** Study of the different types of language disorders, examination procedures, and methods of rehabilitation. *Prerequisite:* 271, 272. Three hours. Mr. Woolf.

388 **SEMINAR IN STUTTERING** Study of the research in stuttering relative to etiology and rehabilitation. *Prerequisite:* 271, 272. Three hours. Mr. Woolf.

Theatre

39 **INTRODUCTION TO THEATRE** A critical appraisal of the theatrical event; its form, functions, materials and essential personnel in various societies and historical periods. Three hours. Messrs. Schenk and Thomsen.

41 **ACTING** Fundamentals of acting, including improvisation, character analysis, and styles of acting. Performance in short classroom acting projects required. *Prerequisite:* 39; sophomore standing. Three hours. I, II. Mr. Feidner.

141 **ADVANCED ACTING** Acting for those who have demonstrated some ability in speech 41. Periods and styles of acting, intensive character analysis, frequent acting projects, including at least one public performance. *Prerequisite:* 41 and departmental permission. Three hours. Mr. Feidner.

142 **PLAY DIRECTING** Lecture-laboratory in the problems and techniques of directing plays: staging, script analysis, production techniques, and rehearsal techniques. *Prerequisite:* six hours, including 39. Three hours. Mr. Feidner.

145, 146 **DEVELOPMENT OF WESTERN THEATRE** History of the theatre and drama in western civilization from the earliest rituals to the contemporary theatre. Plays from all major periods are read and discussed. *Prerequisite:* junior standing; English 27, 28. Three hours. Mr. Thomsen.

151 **STAGECRAFT** Lecture and laboratory in the scenic elements of play production; analysis of theatre forms, study and application of basic elements of scenery construction. *Prerequisite:* 39. Three hours. Mr. Schenk.

252 **LIGHTING** Theory and practice in the illumination of stage productions and the creation of aesthetic effects. *Prerequisite:* 151. Three hours. Mr. Schenk.

254 **SCENE DESIGN** Lecture and laboratory. Analysis of the drama from the standpoint of its visual creation upon the stage; audience-stage relationships, styles of production. *Prerequisite:* 252; art 1. Three hours. Mr. Schenk.



COLLEGE OF ARTS AND SCIENCES

Professors Potash (Chairman), Glade, Lochhead, and Moody; Associate Professors Bell, Henson, Davison, and Rothstein; Assistant Professors Bromley and Stevens; Instructor Korson

Biology

1, 2 **PRINCIPLES OF BIOLOGY (3-3)** Introduction to the structure, functions, and evolution of animals and plants; illustration through lectures, discussions, and laboratory experience of the similarities and differences among organisms. Emphasis on ideas and concepts important for both advanced study in a Life Science and for understanding the biological world of which man is a part. Offered jointly by the Departments of Botany and Zoology. *Prerequisite:* 1 for 2. Four hours. Botany and Zoology staffs.

Zoology

5-6 **MAMMALIAN ANATOMY AND PHYSIOLOGY (2-2)** Structure and function of the mammalian body, with special reference to man. Dissection, primarily of the cat; physiological experiments; microscopic study of tissues. Required of

students in the Nursing and Dental Hygiene curricula, elective to others.¹ Three hours. Mr. Stevens.

101 GENETICS Principles of inheritance and their structural basis; gene mutations; chromosomal aberrations; genes and enzymes; gene action in differentiation; genetics of populations; nonchromosomal inheritance. *Prerequisite:* Biology 1, 2. Three hours. Mr. Moody and staff.

102 ENVIRONMENTAL ZOOLOGY (3-3) Relationship between animals and their environments; dynamics of animal populations; aspects of animal behavior; conservation of environmental and animal resources; principles of systematics. *Prerequisite:* Biology 1, 2. Four hours. Mr. Potash and staff.

103 GENERAL STRUCTURE AND FUNCTION (3-3) A discussion of the structure and physiology of cells and organisms, with emphasis on basic features common to all forms of life. *Prerequisite:* Biology 1, 2. Four hours. Mr. Davison and staff.

104 COMPARATIVE STRUCTURE AND FUNCTION (3-3) A discussion of the ways in which diverse animal types deal with such fundamental processes as reproduction, locomotion, and metabolism. *Prerequisite:* 103. Four hours. Mr. Stevens and staff.

105 GENETICS LABORATORY (0-3) Experiments to illustrate concepts presented in Zoology 101. *Prerequisites:* concurrent enrollment in Zoology 101 and permission of the instructor. One hour. Mr. Glade.

112 COMPARATIVE HISTOLOGY (2-4) Microscopic anatomy of invertebrate and vertebrate tissues. Basic tissue similarities and specializations in relation to function. *Prerequisite:* 104, junior standing. Four hours. Mr. Glade. Alternate years, 1969-70.

150 INVERTEBRATE ZOOLOGY (2-4) Anatomy, physiology, and life histories of representatives of the more important invertebrate phyla. Required of all students concentrating in zoology. *Prerequisite:* 104, junior standing. Four hours. I. Mr. Lochhead.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

197, 198 UNDERGRADUATE RESEARCH Individual laboratory research topics under the guidance of a faculty member. Undergraduates who meet the academic requirements may enroll concurrently in the College Honors or Departmental Honors program. Students must turn in a completed application form for 197, 198 at least two weeks prior to preregistration. *Prerequisite:* junior or senior standing and departmental permission. Three hours or six hours.

201* CONTROL OF GROWTH AND DIFFERENTIATION Factors controlling the processes of growth and differentiation in selected animal forms. Lectures and discussion. Three hours. *Prerequisites:* Zoology 101 and Chemistry 131, 132. Mr. Davison.

1. May be taken for credit in the College of Arts and Sciences but does not satisfy the requirement of a course in laboratory science for students concentrating in nonscience fields, nor the requirement of a course in biology for premedical and pre dental students. Students will not receive credit for both this course and zoology 103 and 104.

* Pending approval of the Graduate College

202* **THE COMPOUND EYE** The evolution, anatomy, fine structure, physiology, and functional roles of various types of compound eyes, and their historical significance in our general understanding of vision. Three hours. *Prerequisite:* Zoology 104. Mr. Lochhead.

203 **POPULATION ECOLOGY** Dynamics, composition, and density regulation of animal populations. *Prerequisite:* 102. Four hours. Mr. Potash. Alternate years, 1970-71.

207 **VERTEBRATES (3-3)** Classification, ecology, behavior, evolution, and distribution of vertebrates other than birds. *Prerequisite:* 104. Four hours. Mr. Bell. Alternate years, 1969-70.

208* **GENERAL ENTOMOLOGY (2-4)** Study of insects; morphology, physiology, and evolution. *Prerequisite:* 102 or 103 or departmental permission. Four hours. Mr. Bell. Alternate years, 1970-71.

209* **FIELD ZOOLOGY (2-4)** Collection and identification of animals; study of local habitats, their nature, and the adaptations of animals to them; factors governing distribution of animals; methods of collecting and preparing study specimens. *Prerequisite:* 102 or 103 or departmental permission. Four hours. Mr. Bell.

211* **EMBRYOLOGY (2-4)** General principles of development exemplified by typical invertebrate and vertebrate embryos. *Prerequisite:* 104, junior standing. Four hours. Mr. Glade.

216 **HUMAN GENETICS** Principles of human inheritance; population genetics; interaction of heredity and environment; application of principles of heredity to human problems. *Prerequisite:* 101 or Botany 255. Three hours. Mr. Moody.

220 **MECHANISMS OF CELL DIVISION** A study of the fine structure and physiology of normal and abnormal cell division with special emphasis upon mechanisms. *Prerequisite:* 103, a course in biochemistry, and the consent of the instructor. Three hours. Mr. Stevens.

222 **EXPERIMENTAL EMBRYOLOGY (2-6)** Theoretical approach to major problems of development based on modern research in embryology, genetics, physiology, bacteriology, and related fields. *Prerequisite:* 211 and departmental permission. Four hours. Mr. Glade. Alternate years, 1970-71.

231 **CELL PHYSIOLOGY (2-4)** Study of cell function, with emphasis upon experimental techniques used to elucidate chemical and physical mechanisms within living cells. *Prerequisite:* 103, chemistry 131, 132, and departmental permission. Four hours. Mr. Rothstein.

236 **FRESH-WATER BIOLOGY (2-4)** Organisms of lakes, ponds and streams; their aquatic environment and their adaptations to varying physical, chemical and biotic conditions. *Prerequisite:* 102 and inorganic chemistry. Four hours. Mr. Henson.

255 COMPARATIVE ANIMAL PHYSIOLOGY (2-6) General principles of function in invertebrates and vertebrates. *Prerequisite*: 231 or departmental permission and Chemistry 131, 132. Four hours. II. Mr. Rothstein.

267 GENETICS OF DEVELOPMENT (2-4) Problems of differentiation and morphogenesis approached from the viewpoint of gene action and biosynthesis; influence of hereditary material during ontogeny. *Prerequisite*: 101, 104, and departmental permission. Four hours. Mr. Bromley. Alternate years, 1970-71.

270 MODERN EVOLUTIONARY THEORY Contributions of modern research in genetics, systematics, distribution, experimental embryology, serology, and related fields to problems of the means and methods of evolutionary change. *Prerequisite*: 101, (102 recommended). Three hours. Mr. Moody.

271 ADVANCED LIMNOLOGY Analyses of current limnological concepts and problems. *Prerequisite*: 236. Four hours. Mr. Henson.

281 through 283 SEMINAR Review and discussion of current zoological research. Required of graduate students and seniors in zoological research programs; open to others by special permission only. Without credit. Staff.

381 through 383 SPECIAL TOPICS IN ZOOLOGY Readings with conferences, small seminar groups, or laboratories intended to contribute to the programs of graduate students in phases of zoology for which formal courses are not available. *Prerequisite*: an undergraduate major in zoology. Credit as arranged.

391 through 393 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of an assigned staff member, culminating in an acceptable thesis. Credit as arranged.

491 through 493 DOCTORAL THESIS RESEARCH Original research under the direction of an assigned staff member, culminating in an acceptable doctoral dissertation. Credit as arranged.

V The Alumni Council

Under an alumni reorganization plan approved at the June 1964 meeting of the Council the purposes were defined as follows: to give organization and aid of the highest efficiency to all efforts of the Alumni of the University of Vermont for the benefit of the University, and more particularly in the following respects: to act as a clearing house for alumni sentiment and the interchange of alumni ideas; to consider, recommend, and approve projects to be put forth in the alumni name; to act as the official spokesman of alumni sentiment to the administration, and as the avenue of approach by which the administration should have access to the Alumni collectively; to recommend on such undertakings, or to provide for their being carried on, as are reasonably within the province of alumni activity, and are of benefit to the University; to plan and activate programs and services for the classes and clubs.

Offices of the Council consist of a president, vice-president, secretary, and treasurer, who shall be the treasurer of the University. The president and vice-president are elected biennially, and neither office may be held by the same individual for more than one term. The secretary shall be a staff member of the University selected in conference between the Executive Committee of the Council and the President of the Council or his delegated representative.

Council membership represents clubs, classes and areas. Members-at-large are nominated by the Nominating Committee as deemed necessary, and are elected for a term of one year. Vacancies may be filled in between elections by appointment of the Council President.

The officers and membership members of the Council follow:

Officers of the Alumni Council:

John S. Burgess, '42, President, 50 Western Avenue, Brattleboro, Vt.
Bingham J. Humphrey, '27, Vice-President, 680 Evergreen Ave., Mt. Carmel, Conn.
Arthur M. Brink, Jr., '66, Secretary, Alumni House, University of Vermont
George N. Clerkin, Treasurer, Treasurer's Office, University of Vermont

Honorary:

Lyman S. Rowell, '25, President of the University of Vermont
Mrs. Isabelle Y. Gallup, Honorary Lifetime Member, 530 North St., Burlington, Vt.

Members-at-Large

Howard A. Allen, Jr., '40, 20 Woodcrest Ln., Burlington, Vt.
Mrs. Consuelo Northrop Bailey, '21, 1317 Spear St., S. Burlington, Vt.
Mrs. Dorothy Collins Cox, '31, 138 So. Willard St., Burlington, Vt.
Luther F. Hackett, '55, 39 Laurel Hill Dr., S. Burlington, Vt.
William M. Lockwood, '27, 283 So. Prospect St., Burlington, Vt.
Mrs. Antoinette Hubbard Loudon, '33, 26 Fairview Ter., White River Jct., Vt.
Mrs. Catherine Durick Lull, '34, Shelburne, Vt.
Alan D. Overton, '59, 22 Prospect St., Essex Jct., Vt.
Thomas M. Reeves, '35, 106 Colchester Ave., Burlington, Vt.

Charles T. Schechtman, M.D., '26, 73 Cedar St., New Britain, Conn.
 A. Bradley Soule, Jr., A.B. '25, M.D. '28, P. O. Box 216, Shelburne, Vt.
 Ralph D. Sussman, B.S. '35, M.D. '38, 21 Loomis St., Burlington, Vt.
 David W. Webster, '33, 31 Cliff St., Burlington, Vt.

Club or Regional:

Reginald H. Arnold, '30, 66 Clarendon Ave., Montpelier, Vt.
 Lawrence H. Averill, '27, Chairman, Fund Committee, Washington Towers, Apt. 801, Gaithersburg, Md.
 Theodore E. Battles, '48, 1011 Mogford St., Midland, Tex.
 Francis E. Beer, '31, 27 Case Pkwy., Burlington, Vt.
 Charles F. Black, Jr., '52, Stowe, Vt.
 Alfred E. Brooks, '26, 100 Hoover Rd., Rochester, N. Y.
 Donald B. Carpenter, '38, Box 87, Mendocino, Calif.
 Clarence F. Castle, '28, 6015 Telegraph Rd., Alexandria, Va.
 Max B. Davison, '24, Morrisville, Vt.
 Roland J. Delfausse, '35, 191 Howard St., Burlington, Vt.
 Clarence J. Douglas, '29, 7 Winter St., Northfield, Vt.
 Mrs. Dorothea Smith Hanna, '41, Mountain Rd., Stowe, Vt.
 Mrs. Esther Stanley Humphrey, '27, 680 Evergreen Ave., Mt. Carmel, Conn.
 Joseph C. Impallaria, '54, 7 Dennis Rd., Wellesley Hills, Mass.
 Fletcher B. Joslin, '34, Box 552, Montpelier, Vt.
 John F. Kenney, '20, Yates Hotel, Syracuse, N. Y.
 Jane E. King, '49, 10739 Clair Dr., Sun City, Ariz.
 Raymond G. Kinsler, '26, 200 Crestview Circle, Longmeadow, Mass.
 Frank R. Leary, Jr., '53, 71 Pershing Dr., Windsor Locks, Conn.
 Douglas L. Liston, '48, 25 Damon Rd., Holden, Mass.
 Elias Lyman, Jr., '88, 125 Ninth St., Wilmette, Ill.
 Roy E. McFee, '20, 14925 Rosemont, Detroit, Mich.
 Gladys E. Neiburg, '49, P. O. Box 1, St. Albans, Vt.
 Mrs. Marjorie Tewksbury Peach, '28, Island Pond, Vt.
 Arthur Q. Penta, M.D., '25, 1301 Union St., Schenectady, N. Y.
 Kenneth W. Pierce, '49, 14 Kingsley Ave., Rutland, Vt.
 Mrs. Gloria Ahrens Ravetch, '52, 20822 Keswick St., Canoga Park, Calif.
 Mr. and Mrs. John J. Spasyk, '42, Box 98, Cabot, Vt.
 Mrs. Janice Hammond Wallace, '53, 58 Page Rd., Newtonville, Mass.
 Roger D. Whitcomb, '38, Derby, Vt.
 Robert L. Williams, '41, 131 E. Beechtree Ln., Wayne, Pa.
 Ruth S. Wimet, '39, 35 East 30th St., Apt. 9E, New York, N. Y.

Class Representatives or Agents:

Ray R. Allen, '11, South Hero, Vt.
 John O. Baxendale, '12, 172 Cliff St., Burlington, Vt.
 James M. Anderson, '12, E. Craftsbury, Vt.
 Mrs. Cora Parkhurst Schoppe, '13, 19 Elsom Pkwy., S. Burlington, Vt. (Omnibus Representative)
 Harold F. Johnson, '14, 29 Crestview Circle, Longmeadow, Mass.
 Harold A. Mayforth, '15, 237 Shelburne St., Burlington, Vt.
 Wesley T. Abell, '16, 31 Robinson Pkwy., Burlington, Vt.
 F. Raymond Churchill, '17, P. O. Box 288, Middlebury, Vt.
 Walter M. Smith, '18, R.D. No. 2, Box 7, Woodbury Rd., Springfield, Vt.
 Marsh M. Byington, '19, Charlotte, Vt.
 Guy D. Hawkins, '20, 255 E. Tulane Rd., Columbus, Ohio
 Gerald H. McGreevy, '21, 124 Red Brook Harbor Rd., Cataumet, Mass.
 Chester M. Way, '22, Court Square, Middlebury, Vt.
 John R. Spalding, '23, 184 Brimfield St., Wethersfield, Conn.
 Jesse E. Sunderland, '24, 16 Upper Weldon St., St. Albans, Vt.
 Leon D. Latham, Jr., '25, 112 Ethan Allen Pkwy., Burlington, Vt.
 Mrs. Doris Dodds Sternbergh, '26, 587 S. Prospect St., Burlington, Vt.
 Ellis J. Moodie, '27, 203 New York Ave., Lake Helen, Fla.
 Col. William N. Cogswell (Ret.), '28, 1 S. Main St., Warner, N. H.
 Mrs. Bertha Hazen Beardsley, '29, 281 Shelburne St., Burlington, Vt.
 Herrick M. Macomber, '30, 9 Grove Ct., Exeter, N. H.
 Hugh R. Mattison, '31, P. O. Box 821, Burlington, Vt.

Dr. Samuel B. Barker, '32, 1812 Woodcrest Dr., Birmingham, Ala.
 Mrs. Mary Ward Maniatty, '33, 130 Robinson Pkwy., Burlington, Vt.
 Charles J. Libby, '34, 820 Pinetree Rd., Winter Park, Fla.
 Donald C. Gregg, '35, 60 University Ter., Burlington, Vt.
 John C. Williams, '36, 38 Sheridan St., Glens Falls, N. Y.
 Feno H. Truax, '37, Dunstu Drive, Hanover, N. H.
 Albert C. Spaulding, '38, 27 Kingsland Ter., Burlington, Vt.
 Francis C. Leonard, '39, 52 S. Main St., Northfield, Vt.
 Charles W. Utter, '40, R.R. No. 1, Happy Valley Rd., Westerly, R. I.
 William S. Preston, Jr., '41, 178 Summit St., Burlington, Vt.
 Robert D. Paterson, '42, 110 Summit St., Burlington, Vt.
 George E. Little, Jr., '43, 255 S. Prospect St., Burlington, Vt.
 Joseph E. Corbett, '43, 28 Overlake Pk., Burlington, Vt.
 Paul R. Walgren, Jr., '44, 650 Sherman Ave., Hamden, Conn.
 Mrs. Harriet Pearl Grant, '45, 59 Alder Ln., Burlington, Vt.
 Mrs. Mary Robinson Adsit, '46, 695 S. Prospect St. Ext., Burlington, Vt.
 Houghton D. Pearl, '47, 50 Norman St., Marblehead, Mass.
 Torrey C. Carpenter, '48, 55 Cliff St., Burlington, Vt.
 Philip E. Robinson, '48, 49 Nearwater Ave., Massapequa, L. I., N. Y.
 Malcolm F. Severance, '49, Colchester, Vt.
 Ellwyn F. Hayslip, '50, R.F.D. No. 1, Littleton, N. H.
 Peter M. Haslam, '51, 24 Liberty St., Montpelier, Vt.
 Frank E. Dion, '52, 23 Woodridge Dr., Burlington, Vt.
 Rodney S. Belden, '53, 3737 N. Dorko Dr., Port Clinton, Ohio
 Joanne D. Atwood, '54, c/o Korea Oil A., P. O. Box 4, Ulsan, Kyungsangnam-Do, Korea
 Clinton H. Thompson, '55, Gold Brook, Stowe, Vt.
 Kenneth T. Savelle, '56, Stowe, Vt.
 John A. Burgess, '57, P. O. Box 766, Montpelier, Vt.
 Martin R. Johnson, '58, 13 Knight St., Falmouth, Me.
 Ray W. Allen, '59, South Hero, Vt.
 Roy J. Greene, '60, 10706 Jordan Rd., Carmel, Ind.
 Frederick L. Lewis, '61, R.F.D. No. 1, Hullcrest Rd., Burlington, Vt.
 H. Scott Johnson, '62, 700 Joyce, Woodburn, Ore.
 David H. Nichols, '63, 145 East 74th St., Apt. 11-B, New York, N. Y.
 Ronald A. Guttman, '64, 14 Horatio St., New York, N. Y.
 Samuel J. Laufer, '65, 141 N. Manassas St., Apt. 10-A, Memphis, Tenn.
 Arthur M. Brink, Jr., '66, 51 Loomis St., Burlington, Vt.
 Gary V. Lawson, '67, Wallingford, Vt.
 Paul T. Malone, '68, 67 Miller St., New Haven, Conn.

Alumni Representatives on the University Athletic Council:

Norman H. Myers, '34, 7 Driftwood Lane, Burlington, Vt.
 Albert C. Spaulding, Jr., '38, 27 Kingsland Ter., Burlington, Vt.
 H. B. Levine, M.D., B.S. '30, M.D. '39, 231 Maple St., Burlington, Vt.
 Roy E. Alberghini, '43, 222 Loomis St., Burlington, Vt.

Enrollment Statistics

Summary of Resident Enrollment

Fall Semester, 1968-69

Undergraduate Colleges & Schools (4 Yr.)	Men	Women	Total
Arts & Sciences	1707	847	2554
Education	154	553	707
Technology	597	30	627
Agriculture & Home Economics	250	229	479
Nursing	0	199	199
Allied Health Sciences	6	88	94

SUBTOTAL 2714 1946 4660

College of Medicine	215	16	231
Graduate-Matriculated	330	139	469
Graduate-Non-Matriculated	98	51	149
Non-Matriculated—Undergraduate	109	133	242
Allied Health Sciences (2 Yr. Programs)	0	38	38

TOTAL 3466 2323 5789

Undergraduate Colleges by Classes	Men	Women	Total
Senior	645	419	1064
Junior	612	499	1111
Sophomore	639	482	1121
Freshman	818	546	1364

TOTAL 2714 1946 4660

	In-State			Out-of-State			Total
	M	F	T	M	F	T	
Arts & Sciences	975	640	1615	732	207	939	2554
Technology	383	11	394	214	19	233	627
Education	99	381	480	55	172	227	707
Agriculture & Home Economics	146	138	284	104	91	195	479
Nursing	0	144	144	0	55	55	199
Allied Health Sciences (4 Yr.)	4	38	42	2	50	52	94
Graduate—Matriculated	127	81	208	203	58	261	469
Graduate—Non-Matriculated	83	46	129	15	5	20	149
Non-Matriculated Undergraduate	94	111	205	15	22	37	242
Medicine	53	7	60	162	9	171	231
Allied Health Sciences (2 Yr.)	0	24	24	0	14	14	38
	1964	1621	3585	1502	702	2204	5789

GRAND TOTAL—FALL SEMESTER, 1968—5789

Enrollment by Divisions

I. COLLEGE OF ARTS AND SCIENCES

	In-State			Out-of-State			Total
	M	F	T	M	F	T	In & Out
Class of 1969	266	147	413	156	38	194	607
Class of 1970	239	146	385	188	77	265	650
Class of 1971	245	171	416	174	47	221	637
Class of 1972	225	176	401	214	45	259	660
	975	640	1615	732	207	939	2554

ENROLLMENT STATISTICS

II. COLLEGE OF TECHNOLOGY

	In-State			Out-of-State			Total In & Out
	M	F	T	M	F	T	
Class of 1969	101	2	103	27	0	27	130
Class of 1970	80	1	81	39	3	42	123
Class of 1971	73	4	77	61	4	65	142
Class of 1972	129	4	133	87	12	99	232
	383	11	394	214	19	233	627

III. COLLEGE OF EDUCATION

	In-State			Out-of-State			Total In & Out
	M	F	T	M	F	T	
Class of 1969	22	84	106	7	26	33	139
Class of 1970	21	92	113	7	49	56	169
Class of 1971	24	116	140	7	29	36	176
Class of 1972	32	89	121	34	68	102	223
	99	381	480	55	172	227	707

IV. COLLEGE OF AGRICULTURE & HOME ECONOMICS

	In-State			Out-of-State			Total In & Out
	M	F	T	M	F	T	
Class of 1969	46	33	79	19	12	31	110
Class of 1970	25	36	61	11	31	42	103
Class of 1971	30	36	66	24	12	36	102
Class of 1972	45	33	78	50	36	86	164
	146	138	284	104	91	195	479

V. SCHOOL OF NURSING

	In-State			Out-of-State			Total In & Out
	M	F	T	M	F	T	
Class of 1969	0	30	30	0	15	15	45
Class of 1970	0	30	30	0	14	14	44
Class of 1971	0	38	38	0	13	13	51
Class of 1972	0	46	46	0	13	13	59
	0	144	144	0	55	55	199

VI. SCHOOL OF ALLIED HEALTH SCIENCES (4 YEAR)

	In-State			Out-of-State			Total In & Out
	M	F	T	M	F	T	
Class of 1969	1	18	19	0	14	14	33
Class of 1970	1	5	6	1	15	16	22
Class of 1971	1	3	4	0	9	9	13
Class of 1972	1	12	13	1	12	13	26
	4	38	42	2	50	52	94

VII. COLLEGE OF MEDICINE

	In-State			Out-of-State			Total In & Out
	M	F	T	M	F	T	
Class of 1969	15	2	17	30	1	31	48
Class of 1970	13	1	14	42	2	44	58
Class of 1971	6	2	8	40	2	42	50
Class of 1972	19	2	21	50	4	54	75
	53	7	60	162	9	171	231

ENROLLMENT STATISTICS

255

VIII. GRADUATE COLLEGE

	<i>In-State</i>			<i>Out-of-State</i>			<i>Total In & Out</i>
	<i>M</i>	<i>F</i>	<i>T</i>	<i>M</i>	<i>F</i>	<i>T</i>	
Regular	127	81	208	203	58	261	469
Non-Matriculated	83	46	129	15	5	20	149
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	210	127	337	218	63	281	618

IX. SCHOOL OF ALLIED HEALTH SCIENCES (2 YEAR)

DENTAL HYGIENE

	<i>In-State</i>			<i>Out-of-State</i>			<i>Total In & Out</i>
	<i>M</i>	<i>F</i>	<i>T</i>	<i>M</i>	<i>F</i>	<i>T</i>	
Second Yr.	0	9	9	0	4	4	13
First Yr.	0	13	13	0	10	10	23
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	0	22	22	0	14	14	36

MEDICAL LAB TECHNICIAN

	<i>In-State</i>			<i>Out-of-State</i>			<i>Total In & Out</i>
	<i>M</i>	<i>F</i>	<i>T</i>	<i>M</i>	<i>F</i>	<i>T</i>	
First Yr.	0	2	2	0	0	0	2

X. NON-MATRICULATED

	<i>In-State</i>			<i>Out-of-State</i>			<i>Total In & Out</i>
	<i>M</i>	<i>F</i>	<i>T</i>	<i>M</i>	<i>F</i>	<i>T</i>	
Arts & Sciences	52	72	124	10	13	23	147
Education	5	20	25	0	2	2	27
Technology	30	4	34	3	4	7	41
Agriculture & Home Econ.	7	15	22	2	3	5	27
Graduate	83	46	129	15	5	20	149
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	177	157	334	30	27	57	391

V Degrees Granted

MAY, 1968

School of Dental Hygiene

Leigh Elizabeth Anthony, Rochester, N.Y.
 Helena Catherine Bishop, Poultney
 Elizabeth Anne Blanchette, Essex Junction
 Deborah Anne Fortier, Castleton
 Elizabeth Mae Griggs, South Burlington
 Charlotte Haywood, Sea Bright, N.J.
 Sherida Beth Herold, Bristol, Conn.
 Kerry Ann Kiniry, Springfield

Rebecca Jo MacDonald, Newport
 Mary Ellen Martin, New London, Conn.
 Susan Jane Money, Cranford, N.J.
 Andrea Helen Rowen, Grand Isle
 Louise Jane Smith, Ludlow
 Janet Helen Stancliffe, Morrisville
 Nan Jane VanHoesen, Springfield

College of Education and Nursing

Bachelor of Science in Nursing

Judith Ann Bloom, Manhasset, N.Y.
 Mary Alice Brisbin, South Burlington
 Helen Ann Burgess, Marshfield, Mass.
 Anita Jane Burke, Swampscott, Mass.
 Nancy Ellen Changaris, Tenafly, N.J.
 Gail Bartlett Congdon, Trumbull, Conn.
 Pauline DiGiovanna, Franklin Square, N.Y.
 Margaret Leeds Dixon, Stockbridge, Mass.
 Patricia Lee Dunham, Schenectady, N.Y.
 Barbara Ann Eisenbud, *magna cum laude*,
 Great Neck, N.Y.
 Colleen Ann Fitzgerald, Barre
 Margaret McMullin Fowler, Wolcott, N.Y.
 Mary Jean Stein Frizzell, Ames, Ia.
 Virginia Burroughs Fuller, Wells River
 Cynthia Eleanor Gales, Wollaston, Mass.
 Ellen Louise Garrison, Garden City, N.Y.
 Amy Rose Hamlin, Buffalo, N.Y.
 Carol Lillian Hull, Verona, N.J.
 Martha Murray Jessup, Frederick, Md.
 Joan Carol Ketler, *cum laude*, Rockville Center,
 N.Y.
 Joan Marie Lazar, White Plains, N.Y.
 Ruth Evelyn Leard, Upper Montclair, N.J.

Jean Cynthia Leslie, Orleans
 Bonnie Rae Lincoln, Burlington
 Margaret Anne MacQueen, Schenectady, N.Y.
 Susan Margaret Mahoney, Loudonville, N.Y.
 Carolyn Mirkin, Newton, Mass.
 Ruth Elizabeth Monteith, Morrisville
 Barbara Jean Montgomery, Newburgh, N.Y.
 Susan Ruth Moses, Medford, Mass.
 †Frances Cheryl Murphy, Winooski
 Joanne Bass O'Connor, Farmington, Me.
 Mary Helena Paquette, Winooski
 Judith Sandra Pike, Arlington
 Magdalene Roberts, HoHoKus, N.J.
 Stephanie Lowell Rochester, Wethersfield, Conn.
 Nancy Anne Rozendal, Little Falls, N.J.
 Kathleen Mary Smith, Salem, N.Y.
 Jean Jordan Stevens, Morgan Center
 Janet Frances Stewart, Hanover, N.H.
 Janet Mary Stroman, Buffalo, N.Y.
 Mary Elizabeth Taylor, Lake Luzerne, N.Y.
 Nora Jean Terrien, Burlington
 Linda E. Uren, Fayetteville, N.Y.
 Susan Heath Williamson, Westport, Conn.

* As of October 1967.

† As of February 1968.

Bachelor of Science in Business Education

Leanne Virginia Dawson, Essex Junction

Bachelor of Science in Music Education

Bernard Arthur Kelley, Burlington

Bachelor of Science in Education

- Dianne Julia Ainsworth, Rochester
 Cynthia Jean Alexander, Vernon
 Mitzie Mae Amidon, Brattleboro
 Judith Ann Anderson, *cum laude*, Barre
 Marsha Carman Anstey, Winooski
 Deborah Sherman Arnold, Rutland
 †Diane Louise Ashland, St. Albans
 Susan Parker Avery, Norwich
 Elizabeth Ann Barrows, Essex Junction
 Kathryn Lita Bechtel, Essex Junction
 Marilee Stuart Bobian, *magna cum laude*,
 Essex Junction
 †Nanci Ringholm Bohne, Burlington
 Jean Martha Bomhower, Wilder
 Janet Barber Bond, Montpelier
 Mary Elizabeth Brunina, Bennington
 Cheryl Ann Burrus, Charleston, S.C.
 Barbara Clerkin Capron, Burlington
 Wendy Lee Carmolli, Barre
 Janet Patricia Carpenter, Richmond
 Stella Maria Carrara, Rutland
 Sharon Kay Chickering, Hinesburg
 Carolyn Jane Clark, *cum laude*, Chester
 Patricia Ann Clark, West Rutland
 Susan Lee Colombo, Barre
 Maxine Schneider Copulsky, Brooklyn, N.Y.
 Debra Jean Craddock, Barre
 Margaret Ann Crane, New Canaan, Conn.
 †George Harrison Crossman, Waterbury
 Patricia Cullins, Burlington
 Susan Irene Cutting, *magna cum laude*,
 Randolph Center
 Diane Elizabeth Davis, Williston
 Jane Elizabeth Dougan, Glens Falls, N.Y.
 Eugene Clayton Dumas, Milton
 Christina Berman Dunphy, Burlington
 Mary Emerson Dunsmore, St. Albans
 Syrette Dym, *cum laude*, Sands Point, N.Y.
 Jane Ursula Edwards, *cum laude*, Saxtons River
 Joyce Eidenberg, Bronx, N.Y.
 Jo-Ann Ellenson, Asbury Park, N.J.
 Elizabeth Ann Farman, Newport
 †Alice Helen Fedick, Essex Center
 Nancy Blamy Garrand, Windsor
 Donna Lee Godfrey, St. Albans
 Brenda Ann Goodsell, Chazy, N.Y.
 Susan Carol Grieger, *cum laude*, North Haven,
 Conn.
 Kathleen Sandra Grodeska, Leonardo, N.J.
 Sallyanne Gubbay, New Rochelle, N.Y.
 †Bruce Gerard Hanna, Union City, N.J.
 †Dorcas Brannum Harna, Northfield
 Jo Marie Elliott Hayes, Potsdam, N.Y.
 Judith Lynn Holmes, Orange, Conn.
 Dean Raymond Howe, Tunbridge
 Frances Stott Howe, *cum laude*, Essex Junction
 Norman Andrew Jodoin, Winooski
 Peter Dix Jones, Basking Ridge, N.J.
 Patricia Hall Joseph, Windsor
 Joanne Marie Koledo, *cum laude*, Springfield
 William Lee Librera, Franklin Lakes, N.J.
 Linda Prentiss Linderman, Rumford Center,
 Me.
 Sally Ann Marcotte, White River Junction
 Rosemary Ann Marotta, Delmar, N.Y.
 Marianne Martin, Richford
 Karen Marie McMurray, *cum laude*,
 Mountainside, N.J.
 Mary Elizabeth McNeil, Burlington
 Alison Elizabeth Menard, Shoreham
 Sally Sims Miniszek, Brattleboro
 Cheryl Dawn Montgomery, Randolph
 Sharon Moran Nardine, Center Rutland
 †Jeanette McKenzie Neal, Wilder
 Robert Guy Neild, Montreal, Que., Canada
 †Betsy Hamilton Neumeister, West Brattleboro
 Jacqueline Newman, Brookline, Mass.
 Helen Florence Nichols, Danby
 Richard Dana O'Connor, Augusta, Me.
 Phyllis Irene Oremland, Verona, N.J.
 †Richard Alan Page, Morrisville
 Robert Douglas Paterson, Burlington
 Leslie Ann Perfect, Bristol
 Ann Elizabeth Persons, South Barre
 †Judith Doyle Peters, *magna cum laude*, Fairlee
 *Grace Ferguson Pigeon, Fairfax
 Kathryn Mary Rock, Burlington
 *Dorothy Arnold Rogers, Burlington
 Susan Harriett Rosenbaum, Far Rockaway, N.Y.
 Judy Lynn Rosenblum, Utica, N.Y.
 Susan Louise Ross, Fairlee
 Lee Jerome Roy, Denmark, Me.
 Mary Jane Cota Rusnak, St. Albans
 Gail Elaine Saxton, Wallingford, Conn.
 Christine Ann Sears, Wells
 †Janet Carter Selby, Milton
 Vicki Marilyn Sherman, Irvington, N.J.
 David Mason Shumate, St. Johnsbury
 Linda Sue Simet, New York, N.Y.
 Deborah Small, Hanover, N.H.
 Amy Tarr Spokes, *magna cum laude*, South
 Burlington
 Jane Parker Stanton, Chelsea
 Irma Angela Staro, Troy, N.Y.
 Rhona Lew Stein, Roslyn, N.Y.
 Martha Gail Stevens, Schenectady, N.Y.
 Richard Elwood Stewart, Wallingford
 Dixie Lee Streeter, Brattleboro
 Mary Anne Sullivan, Salisbury
 Teresa Nora Sullivan, Wakefield, Mass.
 Jeffrey William Taft, Essex Junction
 Marilyn Ruth Tell, *cum laude*, Jamaica, N.Y.
 Kathleen Jo Torrisi, Bennington
 Judith Ann Triplett, Montpelier
 Mona Jean Uckele, Burlington
 Jayne Lena Warner, *cum laude*, North Troy
 Cynthia Mary Whiting, East Barre
 Patricia Nicholson Whitney, Montpelier
 Janice James Willey, Hartland
 Jill Taylor Williamson, Plattsburgh, N.Y.
 Barbara Johnson Winton, Livingston, N.J.
 James Lee Yendrzski, South Burlington

* As of October 1967.

† As of February 1968.

College of Technology

Bachelor of Science in Chemistry

Charles Daniel Brown, Pawtucket, R.I.
 Gary Allen Glynn, Springfield
 Harold Abel Nordstrom, Jr., Brattleboro
 John Joseph Oprendek, Jr., *cum laude*, West
 Rutland

Theodore Arnold Schulz, Saugerties, N.Y.
 James Dustin White, Groton
 Barbara Ellen Williams, Windsor

Bachelor of Science in Civil Engineering

Wilson Merriman Alford, Jr., Windsor, Conn.
 William Robert Arnold, Burlington
 †William Earl Bates, Morrisville
 Jean-Guy Lionel Beliveau, *cum laude*, Shelburne
 Ralph Houghton Clark, III, Charlotte
 David Richard Cobb, Burlington
 Brian Charles Dyer, Winooski
 Henry Harrison Haggerty, Burlington
 Eric James Hamilton, Brattleboro
 John Henry Kirk, Winooski
 Jeffrey Paul Laible, Watchung, N.J.

†George John Latulippe, Danvers, Mass.
 Peter Thomas McGarry, *magna cum laude*,
 Burlington
 †Philip Barnes Mix, Montpelier
 Richard Erwin Powers, Brattleboro
 Barry Orcutt Purinton, Vergennes
 Michael Howell Roberts, Poultney
 Morris James Root, Essex Junction
 †Ozro Scott Swett, Jr., Dixfield, Me.
 †Richard Paul Trowbridge, Schenectady, N.Y.
 Richard Eaton Wardwell, Glens Falls, N.Y.

Bachelor of Science in Electrical Engineering

John Holden Bickford, Northfield
 David Carleton Brown, Rutland
 William Harrison Burling, Jr., Toronto, Ont.,
 Canada
 Edward Nixon Chase, Waterbury Center
 Edwin Thomas Congdon, Clarendon
 Jonathan Peter Fineman, Burlington
 Andre Conrad Forcier, Burlington

Thomas Monroe Fyles, Shoreham
 †Russell James Houghton, Danville
 Kenneth James Ketcham, *cum laude*, Waitsfield
 James Francis Paolucci, South Burlington
 Nandor Gyorgy Thoma, Winooski
 Charles Shefman Thompson, Bradford
 *Donald Lewis Vanden Brock, Vergennes

Bachelor of Science in Management Engineering

David Robert Allen, Burlington

Bachelor of Science in Mathematics

Samuel Eugene Bain, Jr., St. Johnsbury
 Thomas Sylvester Cooper, III, *magna cum laude*,
 Burlington
 Patricia Ann Cusick, Scotch Plains, N.J.
 Clinton Willard Emeritt, Jr., St. Albans
 *Stuart Richmond Eldred, Bennington

Ruth Lucille Maxant, Ayer, Mass.
 Kenneth Rodney Morey, St. Johnsbury
 †William Francis Peabody, Burlington
 Regina Rutberg, Clifton, N.J.
 Eric Raymond Skinner, West Springdale, Conn.
 Robert William Sullivan, St. Albans

Bachelor of Science in Mechanical Engineering

*George De Sille Beardsley, Plainfield, N.J.
 Wayne Thompson Bonhag, Glen Rock, N.J.
 Edward Nixon Chase, Waterbury Center
 John Robert Chevalier, Swanton
 †Peter John Coleman, Charlotte
 Bradley Allyn Cook, Burlington
 Gerard John Desany, Burlington
 Lawrence Ray Folsom, Charlotte
 Robert Karl Haenichen, Burlington

William Chapman King, Langhorne, Pa.
 Jonathan Tift Longley, Wellesley, Mass.
 †Gerald Erwin Miner, Rochester, N.Y.
 †Peter Edward Morgenthaler, Murray Hill, N.J.
 *Michael Clifford Murphy, Moretown
 David Alan Paulus, Burlington
 Walter Pluss, North Clarendon
 Charles Douglas Rossier, Ferrisburg
 George Edward Vandevord, South Burlington

* As of October 1967.

† As of February 1968.

Bachelor of Science in Medical Technology

Alan Ernest Besette, Essex Junction
 Carol Ann Brown, *magna cum laude*, Wharton,
 N.J.
 Melinda Cross, Monson, Mass.
 Sarah Leigh Dopp, South Burlington
 Sharon Anne Foley, *cum laude*, Wayland, Mass.
 Sharon Lorraine Maloney, Paramus, N.J.

Mary Veysey Nelson, Seattle, Wash.
 Janet Fay Roser, Auburndale, Mass.
 Barbara Elizabeth Sadler, Glen Cove, N.Y.
 Carol Ann Sanderson, Chatham, N.J.
 *Karin Ringdahl Snyder, Stowe
 Orien Lee Tulp, Milton
 Joan Ruth Weightman, *cum laude*, Eden Mills

Bachelor of Science in Physics

Gregory Pierce Hughes, Locust Valley, N.Y.

College of Agriculture and Home Economics

Bachelor of Science in Agriculture

†Donald Peter Anderson, St. Albans
 †Peter Webster Bristol, Middlebury, Conn.
 Paul Bruns, Bellows Falls
 Lawrence David Clark, West Pawlet
 Andrew Norman Dufresne, Bakersfield
 †George Murray Dunsmore, Swanton
 †Clayton Allen Gage, Randolph Center
 Herman Richard Hoops, Slate Hill, N.Y.
 Bruce Young Hyde, Bradford

†Ashley William Jewell, *cum laude*, Sheffield
 †Richard Daniel Kleeman, West Caldwell, N.J.
 *Arthur Raymond Menut, St. Johnsbury
 †Harold John Moulton, Vergennes
 William Howard Nelson, Ryegate
 †Charles Sumner Rich, Jr., San Pedro, Cal.
 †William DeMille Telfair, West Caldwell, N.J.
 Barbara Ruth Urey, Port Washington, N.Y.
 †Richard John Walker, Bennington

Bachelor of Science in Agricultural Engineering

Robert Leslie Foster, Middlebury

Bachelor of Science in Home Economics

Barbara Doris Andersen, Los Altos, Cal.
 Betty Travers Andrews, *magna cum laude*,
 Hardwick
 Jennifer Ann Berger, *magna cum laude*,
 Pittstown, N.J.
 Judith Parker Blackburn, *summa cum laude*,
 Washburn, Wis.
 Kathryn Marie Christy, New Carrollton, Md.
 Janice Ellen Dutton, Lyndon Center
 Kathleen Constance Dyer, Lexington, Mass.
 Patricia Jachym Fischer, Ballston Lake, N.Y.
 Diane Ruth Foster, Winthrop, Me.
 Kathy Nannette Graham, Rutland
 Joan Margaret Hagerty, Ann Arbor, Mich.
 Joan Haslett, Great Neck, N.Y.
 Priscilla Gove Heininger, Burlington
 Karen Rose Holub, Hastings-on-Hudson, N.Y.
 Jane Ellen Holz, *magna cum laude*, Yorktown
 Heights, N.Y.
 *Judy Mary Houston, Craftsbury
 Naomi R. Krasner, Syracuse, N.Y.
 Virginia Anne Lawrence, Burlington
 Christina Mary Maniatty, Burlington

Donna Ann Martell, Georgia
 Barbara Ann Maynes, Rutland
 Amy Ona Mitchell, White Plains, N.Y.
 Mary Louise Morris, Milton
 Melinda Heather Parker, Camden, Me.
 Pamela Adele Phelps, Burlington
 Nancy Lane Reynolds, Chappaqua, N.Y.
 Susan Rines, Lakeland, Fla.
 Christine Barbara Rosencrantz, *magna cum
 laude*, South Dorset
 Suzanne Rousseau, Burlington
 Constance Lenore Sheldon, Wells
 Deborah Fraser Smith, Montpelier
 Eileen Ann Smith, Ithaca, N.Y.
 Laurel Beth Stanley, Enosburg Falls
 Carol Jean Thomas, Burlington
 Marilyn Lee Vogel, Darien, Conn.
 Amanda Elizabeth Vogt, Media, Pa.
 Wilma Carolyn Walker, St. Johnsbury
 Frances Ellen Warner, Buffalo, N.Y.
 Jane Elizabeth Weed, Enosburg Falls
 Sharon Louise White, Livingston, N.J.
 Lorraine Cota Wright, St. Albans

* As of October 1967.

† As of February 1968.

College of Arts and Sciences

Bachelor of Science in Commerce and Economics

- Thomas Andrew Abernethy, Flushing, N.Y.
 †Thomas Henry Armbricht, Washington, N.J.
 †Donald Warner Burgess, North Haven, Conn.
 †Dennis Paul Dusko, Limerick, Pa.
 Donald Edward Fitts, Barre
 †John Emanuel Gurrieri, West New York, N.J.
 E. Marvin Guyette, South Burlington
 Howard Herbert Harding, Cabot
 †Kent Byron Haskin, Claverack, N.Y.
 John David Hayes, White River Junction
 †John Robert Loiselle, Leominster, Mass.
 Michael Gibbs Winton, Bronxville, N.Y.

Bachelor of Science in Business Administration

- Thomas Edson Adams, Swanton
 David Joseph Aubin, Vergennes
 Peter Donald Baldwin, Hinesburg
 Erle Gene Blanchard, Gilman
 Bruce Richard Bottamini, Barre
 Stephen Jon Cassidy, Rutland
 Thomas Paul Ciaraldi, Stowe
 Alan Gerald Cooke, Bridport
 Arthur Frank DeLucia, West Haven, Conn.
 Donald Henry Donnelly, Jr., Rutherford, N.J.
 Ronald Benjamin Fitch, II, Winooski
 James Joseph Gallipo, Rutland
 David Mark Goldberg, Pawtucket, R.I.
 Charles Walter Golec, *cum laude*, Bellows Falls
 Charles Marshall Goodwin, IV, Weston
 John Allen Hilton, Rumson, N.J.
 William Lee Hull, Wilder
 David Alan Keenan, Essex Junction
 Dennis Grover King, Springfield
 Peter Fraser Klinkenberg, Burlington
 Andrew Thor Lundgren, Glens Falls, N.Y.
 Daniel Timothy Martin, Ansonia, Conn.
 Kevin James McAvoy, Saratoga, N.Y.
 John Sherwood McClelland, West Hartford, Conn.
 Francis Fernand Michaud, Winooski
 David Charles Moreau, Swanton
 Arthur Edward Morrill, St. Johnsbury
 *Donald Joseph Murphy, Bennington
 Robert Joseph Nadler, Jr., Amsterdam, N.Y.
 Thomas Paul Orzell, *magna cum laude*, West Rutland
 John Bradshaw Packard, Shrewsbury, Mass.
 Frederic Lesure Parkhurst, Jr., Cape Elizabeth, Me.
 Richard Theodore Pelsue, Jr., Burlington
 Joseph Anthony Robertson, Jr., Lawrence, Mass.
 Mark Anthony Roy, Winooski
 Robert Morrow Rudd, Larchmont, N.Y.
 Russell William Schalk, Essex Junction
 Donald Charles Schneider, Jr., Cedar Grove, N.J.
 Richard Norman Shaw, Burlington
 Nelson Arthur Shepard, Windsor
 Richard Joseph Stracensky, Linden, N.J.
 Robert Stephen Terry, Burlington
 Robert Allen Walker, Brandon
 Norbert Allen Wheeler, Winooski
 Peter Winthrop White, Middlebury
 Scott Everett Willard, Westport, Conn.
 Edwin Andrew Young, Jr., Cohasset, Mass.

Bachelor of Arts

- Michael William Abajian, South Burlington
 Arthur Richard Abelson, Waban, Mass.
 William Lewis Acker, La Plume, Pa.
 James Powell Adams, Swanton
 Lucy Carey Shea Albarelli, Burlington
 *Arthur Andrew Allen, North Caldwell, N.J.
 Laurelee Allen, Randolph Center
 †Vivian Jean Kalinen Allen, Chester
 Jeffrey Robert Alpert, *cum laude*, Lakewood, N.J.
 †Joseph Michael Andreas, Beverly, Mass.
 Marion Elizabeth Arbo, East Poultney
 John Talmadge Atwood, Woodstock
 Jolen Norma Bisaccia Aubin, San Antonio, Tex.
 John Sherman Backels, Waterbury
 James Alan Bahrenburg, Burlington
 John Garrett Baker, South Burlington
 Mary Gleda Baldini, Union City, N.J.
 Robert Flanders Balivet, Danville
 Nina Mae Ballard, Quechee
 James Robert Barash, Roslyn Harbor, N.Y.
 Eliza Clark Barnard, Bloomfield Hills, Mich.
 Dean Douglas Bartholomew, Fair Haven
 William Alan Bartlett, St. Albans
 Louise Bayles, Weston, Mass.
 Shirley Elizabeth Beamis, Groton
 Deborah Elaine Bedient, Portland, Conn.
 †James Clement Bellino, Burlington
 Richard Michael Beloin, *cum laude*, Canaan
 Robert Joseph Bender, Rutland
 Stephen Anthony Bernardini, Burlington
 †John Raymond Bing, Schenectady, N.Y.
 Robert Avram Bloomenthal, Burlington
 †Suellen Botsford, Keeseville, N.Y.
 Curtis Lareau Bourdon, Woodstock
 Alan Terry Boutilier, South Burlington
 Lynda Helen Bowker, Rutland
 Susan Elizabeth Bowman, Toms River, N.J.

* As of October 1967.

† As of February 1968.

- James Edward Boylan, Island Pond
 †Edward Bohan Bradstreet, Cheshire, Conn.
 †Hedia Mara Delit Bress, Flushing, N.Y.
 Karen Ann Bringelsen, Bernardsville, N.J.
 †John Michael Brisbois, Hudson, Mass.
 †Francis James Brock, Jr., East Longmeadow, Mass.
 †Barbara Sue Wright Brown, New Preston, Conn.
 †David Allen Bryant, East Grand Rapids, Mich.
 †Rebecca Doane Bryant, Syracuse, N.Y.
 Sarah Eleanor Buermann, Randolph
 Gerald Paul Bugbee, Bellows Falls
 Michael Leopold Burak, *summa cum laude*, Winooski
 George Larry Burritt, Bristol
 †Clark Burtred Burrows, II, Crown Point, N.Y.
 Priscilla Ann Bush, Newfane
 †Laurence Jay Bussin, South Orange, N.J.
 Sally Bonnie Buxton, Plainfield
 Sherry Jo Byron, St. Johnsbury
 Carolyn Eva Calder, South Burlington
 Bruce Tauno Call, Springfield
 Patricia Ann Call, Springfield
 Phillip Roe Canfield, Rockford, Ill.
 *Carol Ann Canter, Flushing, N.Y.
 Joan Clara Capelle, Northfield
 John William Caputo, Jr., Darien, Conn.
 Lionel Donald Carboneau, Newport
 James Kennedy Carlson, Essex Fells, N.J.
 Eugene Carruthers, North Tarrytown, N.Y.
 Nancy Louise Cassone, Stamford, Conn.
 Peter Lynn Caverzasi, St. Albans
 †Sandra Johnstone Cerutti, Barre
 Deborah Frances Chambers, Keene, N.H.
 Robert Daniel Chapin, Essex Junction
 †Donald Arthur Chase, Brattleboro
 Gary Stephen Chicoine, Winooski
 Edward Michael Childs, South Burlington
 †Frederick George Chioffi, Rutland
 Sandra Lee Chioffi, *magna cum laude*, Rutland
 Joan Patricia Clark, South Burlington
 †Peter Meirion Clark, Longmeadow, Mass.
 Frederick Goodhue Cleveland, *cum laude*, Randolph Center
 Steven Lawrence Cohen, New Haven, Conn.
 †Robert Vincent Colagiovanni, Cranston, R.I.
 David Carl Coletti, Troy, N.Y.
 David Carlton Cook, Marshfield
 *George Ladd Cook, Providence, R.I.
 Walter Richard Cooper, Gales Ferry, Conn.
 David Walter Copeland, Barre
 *Christopher Clark Coughlin, Windsor
 Edward David Crane, Charlotte
 James Edward Culhane, Weehawken, N.J.
 *Frederick Walrath Cummings, Jr., Pittsford, N.Y.
 James Michael Cunningham, Burlington
 Peter Arthur Daley, Lemington
 Cheryl Anne Dalton, South Burlington
 Nicholas Louis Danigelis, Burlington
 Edward John Darling, *cum laude*, Brandon
 Terrence Lee Davis, Newport
 Timothy Clark Davis, Burlington
 †Margaret Mary Wilson Dea, Essex Junction
 Patricia Mae DeCesaris, South Burlington
 James Holley Dedman, Orange, Conn.
 Richard Del Giudice, Ogdensburg, N.Y.
 †James Roger Dennehey, Brandon
 Jeffrey Carl Diamond, New Rochelle, N.Y.
 Paul Arthur Dodge, *cum laude*, Gorham, Me.
 †Paul Cecil Dodge, Winooski Park
 *Robert Peter D'Orazio, Burlington
 *Paul Michael Dorsey, Belmont, Mass.
 Sandra Lee Drake, Binghamton, N.Y.
 Nancy Ann Draper, *magna cum laude*, Middlebury
 Janice Elizabeth Duba, Burlington
 Diane Lenore Duley, Barrington, R.I.
 William Joseph Dunn, Barrington, R.I.
 Alice Anne Dupuis, St. Albans
 Jonathan Brown Durand, Bennington
 Lawrence Martin Eagle, *summa cum laude*, Teaneck, N.J.
 Scott Jeffrey Edson, Morrisville
 Eva Lillian Paquin Eschholz, St. Paul, Minn.
 John Francis Farley, West Hartford, Conn.
 Cheryl Lee Farr, *summa cum laude*, Vestal, N.Y.
 †Elaine Louise Farrell, Burlington
 Barbara Elaine Favreau, Burlington
 †David Anthony Fayette, South Burlington
 †William Bernard Ferriter, Jr., Claremont, N.H.
 Joan Louise Fessenden, Huntington, N.Y.
 Nicolas Henri Finck, St. Johnsbury
 Linda Carol Fisk, Burlington
 Arthur Frederick Fournier, Jr., Springfield
 Aloyse Teresa Fraga, South Burlington
 *James Alan Freeman, Great Barrington, Mass.
 †Robin Maria Frost, Haydenville, Mass.
 Martha Frothingham, South Dartmouth, Mass.
 Janice Ellen Fucci, Rutland
 *Susan Cobb Fuller, Bellows Falls
 Andrea Lynn Gaborsky, St. Johnsbury
 Mary Ellen Gallagher, Burlington
 Lynn Janice Noble Gallipo, Rutland
 Barbara Jo Vinette Gannon, *magna cum laude*, White Plains, N.Y.
 Bernice Carol Garnick, Barre
 Nancy Farris Gear, Farmington, Conn.
 †Ellen Conant Germann, Binghamton, N.Y.
 Francis John Giebutowski, West Rutland
 Peter Newcombe Giroux, *magna cum laude*, Northfield
 Harvey Clark Goodchild, Rutland
 *Jonathan Eliot Gould, Brookline, Mass.
 Ann Marie Coyette, Bennington
 Anne Whitman Graham, Poughkeepsie, N.Y.
 Jeffrey Allen Grant, North Attleboro, Mass.
 Richard David Greenblatt, New Britain, Conn.
 Walter Hunnewell Greene, Guilford, Conn.
 Gerard Joseph Grenon, Burlington
 †Edson Bixby Hackett, Underhill
 Richard Berry Hadley, Jr., Rye, N.Y.

* As of October 1967.

† As of February 1968.

- Beverly Isabel Hall, Clinton, N.Y.
 Kathryn Millar Hancock, East Hardwick
 Marie Corbin Harding, *magna cum laude*,
 Endicott, N.Y.
 Robert Gordon Harrigan, Manchester
 *John Russell Harrington, Braintree, Mass.
 James Cathell Harrod, Troy, N.Y.
 Peter Dale Hart, South Burlington
 Peter Dale Hazelton, Northfield Falls
 *Sarah Longacre Hazelton, Londonderry
 Michael William Hebb, Thetford
 Melvin Hebel, Rockaway, N.J.
 †Russel Wayne Henrichs, Irving, Tex.
 Joyce Theresa Herlihy, Jersey City, N.J.
 William Tiernan Heydt, Jr., Upper Montclair,
 N.J.
 William Peer Hickok, Bennington
 Ann Thomas Hoffman, Phillipsburg, N.J.
 Craig Stearns Hoffman, Hampton, N.J.
 †Susan Elizabeth Horr, Westfield, N.J.
 Richard George Houle, Burlington
 Rowan Belknap Howard, Princeton, N.J.
 Laurence Wilson Howe, Orange, Conn.
 †Susan Flanders Hoxie, Montpelier
 Patricia Ann Hughes, Nutley, N.J.
 Jeffrey Alan Hyman, Amsterdam, N.Y.
 Elisabeth Meigs Ingoldsbys, Englewood, N.J.
 Janet Susan Irwin, *summa cum laude*, Briarcliff
 Manor, N.Y.
 Merle Isenberg, Newton, Mass.
 †Marilyn Gail Israel, Berlin, N.H.
 Ronald Ernest Izumi, Winsted, Conn.
 Louis Mario Izzo, Burlington
 Thomas Howard Jacobs, St. Albans
 Janilyn Johnson, Montpelier
 †Bryant Davis Jones, Brattleboro
 Nancy Roy Jones, Waldwick, N. J.
 *Gregory Curtis Ackley Joseph, Lexington,
 Mass.
 Fletcher Brian Joslin, Montpelier
 Jacqueline Kathleen Kaiser, Schenectady, N.Y.
 Cecelia Katherine Kane, Rutland
 Judith Elizabeth Leach Kaplan, Abington, Mass.
 Libby Ruth Kaplan, Burlington
 Mark Alan Kaplan, Burlington
 Donald Brandt Kaveny, Pawlet
 Laurie Ellen Abramson Keilty, Mount Vernon,
 N.Y.
 Keith Allen Kelley, St. Albans
 Vernon Starr Kellogg, *magna cum laude*,
 Stratford, Conn.
 Barry Joshua Kemler, *summa cum laude*, Old
 Westbury, N.Y.
 Bonnie Lee Kennedy, Bristol
 James Robert Kenney, Essex Junction
 Cynthia Anne Quimby Kent, Peacham
 Jeffrey Donald Kent, Chatham, N.J.
 †James Dawson Klode, Jr., Milwaukee, Wis.
 Dana Scott Kolbe, Burlington
 †Richard James Kowen, East Rochester, N.Y.
 Katrina Janet Koziol, Bennington
- Gary Walter Krasofski, Burlington
 James Robert Krause, Granby, Mass.
 Michael Lee Kropsky, *summa cum laude*,
 Burlington
 Jeffrey Allan Kuhman, Toledo, Ohio
 †Richard Michael Laden, Maplewood, N.J.
 *John Paul Lambert, Burlington
 Carol Beth Lamden, Burlington
 †James Hamilton Lang, St. Albans
 Mary Ethelyn Langmaid, St. Johnsbury
 Barbara June Laplant, *magna cum laude*,
 Rutland
 Elaine Evelyn Lashway, Burlington
 Bruce Charles Latelle, Springfield
 Jonathan Paul Lavigne, *summa cum laude*,
 Winooski
 Nancy McIntosh Leake, Chittenden
 Paul Bryan Leake, Bennington
 John Charles Lepage, Burlington
 Paul Wayne Lewis, *cum laude*, Townshend
 Charles Plympton Lillie, Schenectady, N.Y.
 Eileen Frances Lippe, West Orange, N.J.
 †Richard Bruce Loati, Montpelier
 Ann Bellows Alsever Loisel, Syracuse, N.Y.
 Margaret Rose Lombardo, Lake Luzerne, N.Y.
 †Carson Robert Loomis, DeWitt, N.Y.
 Barbara Lou Luders, Philadelphia, Pa.
 Edward Phelps Lyman, Jr., South Burlington
 Caroline Ann Mabry, Burlington
 William Cyrus Machanic, Burlington
 †Anne Stearns Macmillan, Burlington
 Paul Thomas Malone, New Haven, Conn.
 Lane Malsin, Croton-on-Hudson, N.Y.
 Ira Norman Mandell, *cum laude*, New Hyde
 Park, N.Y.
 John Kendall Mansur, Reading, Mass.
 *Joseph Edward Marceau, III, Burlington
 †Rebecca Ann Marshall, Essex Junction
 †Norman Gerard Martin, Colchester
 *Thomas Alwin McCormick, Brattleboro
 †John Michael McKnight, Montclair, N.J.
 Roderick Greeley McLean, DeWitt, N.Y.
 Adrienne William Mercier, Jr., Newburgh, N.Y.
 Theodore Clarence Merriitt, Jr., Flemington,
 N.J.
 Mary Jane Miner, Woodstock
 †Rubi Minkin, Clinton, N.J.
 Michael Green Minsky, Bennington
 †Charles William Wagner Mitchell, Jr., West-
 boro, Mass.
 James Bullard Mitchell, Wallingford, Conn.
 Jane Fisk Kimball Mitchell, Keene, N.H.
 Russell Addison Moll, North Plainfield, N.J.
 Daryl Jean Monroe, Montpelier
 Laurel Marie Monti, New Britain, Conn.
 David Leland Monty, East Berkshire
 Malcolm Stuart Moore, Marlboro
 Stephen John Moreau, Burlington
 *Jeffrey Hall Morgan, Hartland Four Corners
 *Johanne Christine Morrow, Burlington
 Marjorie Morton, *cum laude*, Riverton, N.J.

* As of October 1967.

† As of February 1968.

- *Thomas Lillard Neal, White River Junction
Waldo Warren Nelson, Newbury
Susan Burne Nestler, Summit, N.J.
- †Mary Susan Huber Noble, Burlington
Stephen Thomas Noyes, Bennington
Bonnie Hazelton Oakman, Northfield Falls
Audrey Margaret O'Brien, Burlington
Eugene James O'Donnell, Holyoke, Mass.
George Everett Passage, Jr., Burlington
- †John Fogg Pastore, Waterville, Me.
Susan Elizabeth Paterson, Montpelier
- *Douglas Carl Peterson, Hudson, N.Y.
Priscilla Jean Pettee, Brattleboro
Patricia Ann Peyser, Briarcliff Manor, N.Y.
Michael Alan Pietsch, Honolulu, Hawaii
Margaret Anne Pond, Montpelier
Mary Gail Potwin, Woodstock
Lorraine Edith Pratt, St. Albans
- †Jon Means Pringle, Longmeadow, Mass.
- *Derick Arnold Proctor, Mt. Pocono, Pa.
Douglas Edward Provost, *cum laude*, Burlington
Elizabeth Jane Purda, Brattleboro
- †William Alfred Raleigh, Chester
Martha Ann Robinson Rhodes, St. Johnsbury
Gary Bruce Rice, Swanton
Keenan Dennis Roberts, Morrisville
- †Mark Alan Robin, Jamaica, N.Y.
Frances Fullam Robinson, Sharon
Robert Lee Robinson, III, Plainfield, N.J.
Haydon Rochester, Hardwick
- †Victor Michael Romano, Jr., Fairfield, Conn.
Jacob Joseph Rosenberg, Brooklyn, N.Y.
Peter Stuart Rosenblum, *cum laude*, West Hartford, Conn.
- †Mary Elizabeth Rowe, *cum laude*, Wells River
Jay Arthur Rudolph, Brooklyn, N.Y.
Joel Scott Russell, Rutland
Mary Margaret Ryan, Milton
- *Paul Hatfield Ryan, Winchester, Mass.
Paul Lamont Ryan, Schenectady, N.Y.
- †Richard Charles Sachs, Yardley, Pa.
†Peter James Sargent, Hanover, N.H.
Pamela Jane Saxby, St. Albans
Barbara Harrison Schill, Rutland
William Karl Schmidt, Fort Lee, N.J.
Naomi Claire Schocken, Scarsdale, N.Y.
Robert Howard Schroeder, Wallingford, Conn.
William Howard Schubart, Morrisville
Eva-Lynn Schultz, Scarsdale, N.Y.
Karin Haser Schumacher, Burlington
Donna Lee Sweeney Scott, Winoski
Stephanie Ann Seguin, Montpelier
John Dorsey Semler, Salisbury, Conn.
Joan Kistler Senecal, *cum laude*, Brattleboro
- †Kenneth Edward Senecal, Wallingford
Paul Francis Shambo, Rutland
- †Leonard Joseph Shefiott, Watford, Conn.
- †Susan Dorothy Shelly, Red Bank, N.J.
- *Douglas Atherton Sherwin, Brattleboro
Francis Xavier Short, Chittenden
Franklin Sills, Riverdale, N.Y.
- Barrett Howard Smith, South Burlington
Geoffrey Shaw Smith, Stowe
Roberts Cameron Smith, Greensboro
- †Robert Allyn Snyder, Jr., Northbrook, Ill.
- †Richard Holmes Squire, Westport, Mass.
Jean Barbara Stables, St. Johnsbury
Patricia Jean Stankevich, Springfield
- †Michael Neill Stanton, *summa cum laude*, Burlington
Elizabeth Ellen Stevens, Lyndonville
John Edwin Stevens, Saxtons River
Robert Bradley Stewart, Middlebury, Conn.
Cora Diana Stimpson, Hartland
Martha Szwczak Stratton, Lee, Mass.
- †Kenneth Allen Stufko, Clifton, N.J.
Richard Eric Stutt, Brooklyn, N.Y.
John Henry Sutor, Jr., *cum laude*, Deerfield, Mass.
James Ash Sullivan, Concord, N.H.
James William Sullivan, Vergennes
- †Carol-Lynn Jean Suydam, Burlington
- †Orlin Sven Svenson, Worcester, Mass.
Peter Edward Sweeney, Staatsburg, N.Y.
- *Henry Parker Taggard, Jr., Marblehead, Mass.
Thomas Francis Talbot, White River Junction
- †Francis Kenny Tavares, Lowell, Mass.
Beverly Brooke Taylor, Schenectady, N.Y.
Davis Leonard Tefner, Stowe
Jonathan William Teuscher, Weston, Conn.
William Edward Thetford, Montpelier
Vincent Pierre Thibault, Norton
Lesley Jean Thompson, Montpelier
- †Merrill Thoresen, Jr., East Hartford, Conn.
Richard Robert Tinervin, Brattleboro
Curt Reisinger Tobey, Chicago, Ill.
Mary Caroline Tormey, Randolph
Richard Henry Trevithick, South Burlington
Julie Twombly, Morrisville
- †Henry Holt Uihlein, Jr., Milwaukee, Wis.
Barry Uminsky, West Newton, Mass.
Dennis Michael Usdan, Woodmere, N.Y.
Anne Usdavin, Stratford, Conn.
Jean Pölexene Velentgas, Portland, Me.
John Peter Wagner, Stowe
Thomas Gates Wagner, Claremont, N.H.
- *Nathan Call Wakefield, Bradford
Susan Jane Walker, Orleans
Georgia Walsh, Manhasset, N.Y.
Robert John Warren, Burlington
Nancy Warsawer, Teaneck, N.J.
Peter Norman Dingman Watson, Putney
Barbara Elgie Weeks, East St. Johnsbury
Jay Bennett Weintraub, West Hartford, Conn.
Deborah Farr Wernecke, Bradford
Nathaniel Wolcott Wetherbee, *cum laude*, Topsfield, Mass.
David Clinton Whitney, North Adams, Mass.
James Stephen Whitney, North Adams, Mass.
- *Richard Patterson Whittier, Concord, N.H.
Jeanne Marie Wile, *magna cum laude*, Lynn, Mass.

* As of October 1967.

† As of February 1968.

Richard Charles Williamson, Spreckelsville,
Hawaii
Charles Edward Windus, Bristol, Conn.
Edmund Berkeley Wodehouse, South Burlington
Stephen John Woodruff, Barre
Michael William Wool, Burlington
Richard Clyde Wormwood, Rutland

Joy Marie Wright, *magna cum laude*, Mont-
pelier
Norma Louise Wright, Colchester
†Judith Groves Young, Livingston, N.J.
William Michael Young, White River Junction
†Lee Steven Zheutlin, Maplewood, N.J.

Departmental Honors

English

Janet Susan Irwin, '68
Jonathan Paul Lavigne, '68

Marjorie Morton, '68
†Michael Neill Stanton, '68

Speech

†Ann Marie Goyette, '68

Special Honors

Classics

Robert Flanders Balivet, '68
"Athenian Family Law. (487-322 B.C.)"

Jeanne Marie Wile, '68
"Some Problems Involved in Dating Greek Drama: Aristophanes' Thesmophoriazusae"

Geography

Peter Newcombe Giroux, '68
"The Changing Geography of the Upper Mad River Valley, 1947-1967"

History

Marilee Stuart Bobian, '68
"1774: The Decisive Year: The Revolutionary Movement in Massachusetts, December 16th, 1773 to April 19th, 1775"

Phillip Roe Canfield, '68
"Types of Anti-War and Pacifist Dissent in America with Special Emphasis on World War I and the Vietnam Conflict"

Nancy Ann Draper, '68
"The Soviet-Iranian Dispute, 1945-1946"

Syrette Dym, '68
"The Changing Concept of Suburbia"

Jayne Lena Warner, '68
"M. Vipsanius Agrippa: Missions to the East 23-21 and 17/16-13 B.C."

Nathaniel Wolcott Wetherbee, '68
"The Rise and Fall of Automobile Manufacturing in Southern New England, 1896-1909"

Philosophy

Michael Lee Kropsky, '68
"Plato—The Negative Dialogues"

Religion

Cheryl Lee Farr, '68
"Death of God Theology: The Death-of-God as a Phenomenon of Language"
Caroline Ann Mabry, '68
"The Pardon in Its Social Setting"

* As of October 1967.

† As of February, 1968.

Zoology

Beverly Brooke Taylor, '68

"The Intercellular Localization of Hematoporphyrin in C3HBA Mammary Adenocarcinoma Cell Culture"

College of Education and Nursing

Fifth-Year Certificate in Education

*Elizabeth Martha Branch, St. Albans

Graduate College

Master of Education

- *William Brice Adams, B.S. (Univ. of Vermont) 1962; Burlington, *in absentia*
- Edward Richard Beebe, Jr., B.A. (Carroll College) 1966; Green Bay, Wis.
- Richard Wilson Bennet, Jr., A.B. (Colgate Univ.) 1951; Burlington
- †Bertram Dudley Coolidge, B.S. (Castleton Teachers College) 1960; Brandon
- Joseph F. Fusco, A.B. (St. Michael's College) 1962; Essex Junction
- David B. Harrington, B.A. (Univ. of Rhode Island) 1965; Warwick, R.I.
- *Geraldine Wilcox Hunt, B.S. (Univ. of Vermont) 1941; Newport
- Linda Place Kasvinsky, A.B. (Middlebury College) 1961; Underhill Center, *in absentia*
- *Leslie Richard Klinefelter, B.S. (Lyndon State College) 1965; Enosburg Falls
- *Steven Clarence Leonard, B.A. (Bowdoin College) 1965; Montpelier, *in absentia*
- Robert Allan Lobel, B.S. (Kent State Univ.) 1966; Topeka, Kans.
- *Katharine Ann McGlynn, B.S. (Skidmore College) 1951; East Middlebury, *in absentia*
- *Dexter Paul Morse, A.B. (Bowdoin College) 1962; Saxtons River, *in absentia*
- *Gerard Allen Muller, B.S. (Univ. of Vermont) 1955; Jericho
- *Gordon William Pelkey, B.S. (Castleton Teachers College) 1959; Rutland
- *Doris Mary Singleton, B.S. (Johnson Teachers College) 1951; Burlington
- Barbara Bornemann Stainton, A.B. (Bryn Mawr College) 1955; Williston
- *Alfred Lee Tedford, B.A. (Univ. of Western Ontario) 1948; Montreal, Que., Canada, *in absentia*
- *Louis Cyrus Theobald, Jr., A.B. (Colby College) 1962; Kent, Conn.
- *Anna Bradney Wedwaldt, B.S. (Mary Washington College of the Univ. of Virginia) 1933; Wallingford

Master of Arts in Teaching

- Lucie Grace Pike Anderson, B.S. (Univ. of Vermont) 1962; Pittsford, *in absentia*
- Frank Charles Barto, Jr., A.B. (Rutgers—The State Univ.) 1966; Clark, N.J.
- Dorothy Florence Bent, B.S. (Univ. of Massachusetts) 1942; Braintree
- John Hamlyn Duval, B.S. (Castleton State College) 1965; Shelburne
- Robert Conger Levis, B.S. (Univ. of Vermont) 1966; Morrisville
- *John Holstead Mead, B.S. (Ithaca College) 1962; Mystic, Conn.
- *Helen Williams Newton, B.S. (Univ. of Vermont) 1963; Williamsville
- Alice Atwood Spaulding, A.B. (Middlebury College) 1940; South Burlington
- *Barbara Jean Tracy Staab, B.A. (Univ. of Illinois) 1957; Colchester, *in absentia*
- William Robert Taylor, B.S. (Univ. of Hartford) 1964; Manchester, Conn.
- *James Frank Wolynec, B.A. (Norwich Univ.) 1965; Montpelier, *in absentia*

Master of Extension Education

- Dwight Kimball Eddy, B.S. (Univ. of Vermont) 1947; Hinesburg
- Philip Kair Grime, B.S. (Univ. of Rhode Island) 1951; St. Johnsbury
- Thomas J. McCormick, B.A. (Wesleyan Univ.) 1948; Winooski

* As of October 1967.

† As of February 1968.

Master of Science

AGRICULTURAL ECONOMICS

- *Bruce Leland Craig, B.S. (Univ. of Vermont) 1960; Boston, *in absentia*
Thesis: Vermont's Property Tax and the Impact on Personal Incomes
- Glen Arthur Schricker, B.S. (Iowa State Univ.) 1956; Acton, Mass.
Thesis: Contribution Margin Analysis

ANATOMY

- Franklin Worthley Bowles, B.S. (Univ. of Connecticut) 1957; Barre
Thesis: An Electromyographic Study of Some Accessory Muscles of Respiration in Normal and Emphysematous Subjects

ANIMAL AND DAIRY SCIENCE

- David Earle Cochrane, B.S. (Cornell Univ.) 1966; Fishkill, N.Y.
Thesis: Studies on the Immunofluorescent Localization and Histochemical Characterization of Cells Containing Bovine Luteinizing Hormone

BOTANY

- *Raymond W. Herndon, B.S. (Virginia Polytechnic Institute) 1964; Danville, Va., *in absentia*
*Thesis: The Influence of Ultraviolet and Visible Light on Sporulation of the Fungus *Stemphylium solani* Weber*
- *Jerome Barry Jacobs, B.A. (Univ. of Vermont) 1965; Worcester, Mass.
*Thesis: Essential Nutrients Involved in Sporulation of *Stemphylium solani* Weber*

CHEMISTRY

- *Marie Douglas LaPrade, B.S. (Univ. of Michigan) 1964; Winslow, Ariz., *in absentia*
Thesis: An Investigation of Hydrogen Absorption by Palladium-Iridium Alloys

COMMERCE

- *Thomas Theodore Brodin, B.S. (U.S. Military Academy) 1952; Chicago, Ill., *in absentia*
Thesis: A Comparative Wage Analysis: An Investigation of the Influence of Work Stoppages on the Wage Settlement
- Gerard Joseph Kirchner, B.A. (Dartmouth College) 1947; Stowe
Thesis: The Council of Economic Advisers—A Study of its Influence on National Economic Policy

ELECTRICAL ENGINEERING

- Alexander James Grant, B.S. (Rochester Institute of Technology) 1964; Central Islip, N.Y.
Thesis: A Dynamic Respiratory Measurement System
- Albert John Gregoritsch, Jr., B.S. (Univ. of Vermont) 1965; Huntington Station, N.Y.
Thesis: Theoretical and Model Studies of Current Density and Potential Fields from Defibrillating Electrodes
- *Robert William Koss, B.S. (Univ. of Connecticut) 1964; New London, Conn., *in absentia*
Thesis: Design of an Oxygen Concentration Detector

FORESTRY

- Paul A. Murphy, B.S. (Southern Illinois Univ.) 1964; Burlington
Thesis: Prediction of Total Cubic Foot Volume for Sugar Maple

* As of October 1967.

† As of February 1968.

GEOLOGY

- William Broderick Blakeman, B.A. (Univ. of Vermont) 1957; Bethel
Thesis: A Study of the Mineralogic and Magnetic Characteristics of Metamorphosed Iron Formation from the Julian Deposit, Wabush Lake Area, Labrador
- *Richard F. Clement, Jr., B.S. (Boston College) 1965; Reading, Mass., *in absentia*
Thesis: A Study of the Sediment Size Distribution of Malletts Bay
- *Maurice Lamotte Jenks, III, A.B. (Hamilton College) 1963; Wellesley, Mass., *in absentia*
Thesis: Bedrock Geology and Garnet Analysis of the Northwestern Portion of the Woronoco Quadrangle, Massachusetts
- Edward James Kodl, B.S. (Union College) 1966; Rouses Point, N.Y.
Thesis: Surficial Geology of the Amsterdam Region Lower Mohawk Valley, New York
- *John Arthur Millett, B.A. (Hofstra College) 1965; Huntington, N.Y., *in absentia*
Thesis: The Clay Mineralogy of the Bottom Sediments of Champlain Basin from Thompson's Point, Vermont to the Ausable River, New York

HOME ECONOMICS

- Lois Rae Beadle, B.S. (Univ. of Vermont) 1961; Orleans
Thesis: Medical Care Costs and Health Insurance Coverage for a Sample of Burlington Residents during 1966: A Descriptive Study
- †Shirley Ann Campbell Hamilton, B.S. (Univ. of Vermont) 1957; South Burlington
Thesis: Consumer Preference for Milk Refrigerated at 4.4°, 5.5°, and 10° C

MECHANICAL ENGINEERING

- George Henry Bloom, B.S. (Massachusetts Institute of Technology) 1961; Burlington
Thesis: The Effect of Surface Finish on the Dynamic Fatigue of Glass Rods Subjected to Hertzian Stress
- William Osborn Carnes, B.M.E. (Villanova University) 1966; Hingham, Mass.
Thesis: The Fracture Energy of Composite Materials
- Carl Barry Jones, B.S. (Milwaukee School of Engineering) 1962; Rockford, Ill.
Thesis: A Study Synthesizing the Techniques of Stress Measurement in Vacuum Deposited Thin Films

MEDICAL MICROBIOLOGY

- *Barbara Ann Hulick, B.S. (Univ. of Massachusetts) 1965; Chelmsford, Mass.
Thesis: Occurrence of Neutralizing Antibodies against Eastern and Western Equine Encephalitis among Animals in Vermont

PHYSICS

- James Henry Heininger, B.A. (Univ. of Vermont) 1966; Burlington
Thesis: A Vectorial Analysis of the Electric Field above a Plane Optical Reflector
- Stephen Matthew Smith, Jr., B.S. (Merrimack College) 1965; Thompsonville, Conn.
Thesis: The Motion of a Bubble in a Sound Field

PLANT AND SOIL SCIENCE

- *Joseph Francis Costante, B.S. (Univ. of Maryland) 1957; Milbridge, Me.
Thesis: Low Temperature Injury of Highbush Blueberry Shoots at Various Times of the Year
- †Rolf Jesinger, B.S. (Cornell Univ.) 1965; Drosselweg, W. Germany, *in absentia*
Thesis: The Influence of Various Treatments on the Rooting of Cuttings of Certain Conifers Throughout the Year

SPEECH PATHOLOGY

- Elizabeth Prince Allen, A.B. (Smith College) 1943; Fair Haven
Thesis: A Study of the Identification of Speech Problems, and the Rating of Their Severity, by Public School Teachers in One Vermont Supervisory District
- *Juanita Whitney Cook, B.A. (Univ. of Buffalo) 1959; Clarendon Springs
Thesis: A Study of Voice Quality in an Institutionalized Educable Population

* As of October 1967.

† As of February 1968.

MASTER OF ARTS

ENGLISH

- *Linda Jean Knight, B.S. (Univ. of Vermont) 1964; Springfield
Thesis: A Study of Howard Nemerov's Language as it Reflects the Theme of Time in His Poetry
- †Thomas Edmund LeClair, A.B. (Boston College) 1965; Ludlow
Thesis: The Grail Myth in Five Contemporary Novels: The Winter of Our Discontent, Invisible Man, Morte D'Urban, Other Voices, Other Rooms, The Natural
- †Frederick Hamilton Merrill, Jr., B.A. (Colby College) 1962; Corvallis, Ore., *in absentia*
Thesis: Four Golding Novels and Contemporary Literature
- †Philip Fabian Sheridan, A.B. (St. Michael's College) 1959; Winooski, *in absentia*
Thesis: Wordsworth's Poetry and Annette Vallon: Passion, Guilt, and Sublimation
- Howard Randall Snyder, B.A. (Beloit College) 1967; Leland, Mich., *in absentia*
Thesis: The Diversity of Forms of Fate in Thomas Hardy's Fiction
- Mary Vaughan Twitchell, A.B. (Middlebury College) 1961; Burlington, *in absentia*
Thesis: The Aesthetics of Walter Pater

FRENCH

- †Gaston-Marcel Carrier, B.A. (McMaster Univ.) 1941; M.S. in Ed. (Univ. of Bridgeport) 1959; Burlington
Thesis: La Vie et L'oeuvre de Marie-Joseph Pierre Teilhard de Chardin

HISTORY

- *Philip Garth Bean, B.Ph. (Univ. of Montreal) 1963; Enosburg Falls, *in absentia*
Thesis: American Foreign Policy Toward the Algerian Revolution 1954-1962
- *Richard Kennedy Cole, B.A. (Williams College) 1959; Bradford
Thesis: Napoleon, Forerunner of Totalitarianism
- Vincent Edward Feeney, B.A. (San Jose State College) 1966; San Francisco, Calif.
Thesis: Sinn Fein: 1916-1918
- William Charles Hill, A.B., 1939; LL.B. (New York Univ.) 1941; Monkton
Thesis: Vermont Judiciary and the Tradition
- Charles Lee Noyes, B.A. (Univ. of Vermont) 1965; Pittsfield, Mass., *in absentia*
Thesis: The Development of Lenin's Political Thought, 1887-1902

LATIN

- Margaret Agnes Foley, A.B. (Emmanuel College) 1966; Weymouth, Mass.
Thesis: A Study of Sources: Lucretius, De Rerum Natura Book II, 588-660

MATHEMATICS

- Trina Arlene Barton, B.A. (State Univ. College at Potsdam, N.Y.) 1966; Alexandria Bay, N.Y.
Thesis: Linear Programming Techniques to Solve Menu Planning Problems
- Donald Norman Corey, B.S. (Norwich Univ.) 1966; Wilbraham, Mass.
Thesis: A Study of the Methods of Computing Character Tables of Finite Groups
- Sharon Rae Hept, B.S. (Otterbein College) 1963; Vandalia, Ohio
Thesis: Open Covers and Metrization
- David Wylie Hosmer, B.A. (Univ. of Vermont) 1966; Syracuse, N.Y.
Thesis: The Sequential Probability Ratio Test
- †Walter Edward Lalime, A.B. (St. Michael's College) 1964; Burlington, *in absentia*
Thesis: A Theoretical Study of the Theory of Representations of Abstract Groups and Algebras
- Louise Ann Spry, B.A. (Centenary College) 1966; Memphis, Tenn.
Thesis: Luroth Theory and M-Stable Automorphisms

* As of October 1967.

† As of February 1968.

MUSIC

Victoria Louise Scoones, B.M. (Eastman School of Music) 1966; Clinton, N.Y.

Thesis: Melodic Ornamentation of the Late Baroque Period as Applied to Two Sonatas by Bach and Handel

†Therese Cecile Coderre Trahan, B.Ed. (Univ. of Vermont) 1943; Swanton

Thesis: Adriana Lecouvreur by Francesco Cilea the Two Soprano Highlights

POLITICAL SCIENCE

†George Frederick Robert Hanke, B.A. (Yale Univ.) 1960; Washington, D.C., *in absentia*

Thesis: Communist and Non-Communist Shipping to North Vietnam

PSYCHOLOGY

*Jeanne Ellen Bader, A.B. (Univ. of Delaware) 1965; Bala-Cynwyd, Pa., *in absentia*

Thesis: The Effects of Age + Differential Visual Stimulation During Development on Massed and Distributed Maze Learning Trials

Gregory Joseph Bertsch, A.B. (Boston College) 1966; Winooski

Thesis: An Experimental Comparison of Electric Shock and Non Reward in an FE Paradigm

*Edwin Wells Coppage, B.S. (College of William and Mary) 1964; North Springfield, Va., *in absentia*

Thesis: Effects of Item and Position Information upon Serial Learning Performance

Richard Crosby Coughlin, Jr., B.A. (Williams College) 1966; Binghamton, N.Y.

Thesis: Magnitude of the Frustration Effect as a Function of Percentage of Reinforcement

John Steven Richardson, B.A. (Univ. of Toronto) 1965; Port Credit, Ont., Canada, *in absentia*

Thesis: Self-Injection of Amobarbital Sodium during Extinction of Food Reinforced Bar Pressing

College of Medicine

Doctor of Medicine

Charles Francis Belanger, Jr., B.S., Holden, Mass.

James Paul Caldwell, B.S., E.E., Cranford, N.J.

Stephen Edward Clark, B.A., St. Johnsbury

Laurence Michael Cohan, B.A., Waban, Mass.

Frederick Wade Crowley, B.S., West Boylston, Mass.

Charles Michael D'Angelo, B.A., *cum laude*, Marlboro, Mass.

Bruno DePalma, B.A., Canton, Mass.

James Elmer Emmons, B.S., Burlington

Steven Allen Feldman, A.B., Pawtucket, R.I.

Jeffrie Brent Felter, B.A., Brattleboro

Merrick Scott Fisher, B.A., Marblehead, Mass.

Terence Sean Fitzgerald, B.A., St. Albans

William James French, B.S., Dover, N.H.

James Amasa Frizzell, B.S., Charlestown, N.H.

Todd Mitchell Gladstone, B.A., Burlington

Joseph Edward Godard, A.B., Clinton, Mass.

Ronald Lloyd Green, B.S., Providence, R.I.

Stephen Harris Greenberg, A.B., Worcester, Mass.

Thomas Albert Hallee, A.B., Pittsfield, Me.

Robert Christopher Hannon, B.S., Belmont, Mass.

Parker Fred Harris, B.A., Presque Isle, Me.

David Jay Keller, B.A., Burlington

Robert Howard Lenox, B.S., Newton, Mass.

Robert Scott Madrell, B.A., Ellsworth, Me.

Patrick Joseph Mahoney, B.A., Burlington

Robert Joseph Malvesta, A.B., *cum laude*, Quincy, Mass.

John Thomas O'Brian, B.S., Clifton, N.J.

Ronald Charles Oliver, B.A., Burlington

Paul Richard Olson, B.A., Holden, Mass.

Morris Ostroff, B.A., Milton, Mass.

Barrie Paster, B.A., Malden, Mass.

Jon Perley Pitman, A.B., North Vassalboro, Me.

Sylvia Schechner, B.S., M.S., Burlington

David Ralph Schmottlach, A.B., *cum laude*, Lawrence, Mass.

David Wolfe Scotton, B.S., Needham, Mass.

Robert F. Shapiro, B.S., Brooklyn, N.Y.

Neil Elliott Share, B.A., Beverly, Mass.

Thomas Keith Slack, B.A., South Burlington

Donald Thomas Smith, A.B., Huntington, N.Y.

David Alan Strassburg, B.A., Essex Junction

Nelson Horace Sturgis, III, A.B., Arlington, Mass.

Timothy John Terrien, B.A., *cum laude*, Burlington

Sydney Melvin Wedmore, A.B., Taunton, Mass.

Clarence Cluff Whitcomb, B.A., Springfield

* As of October 1967.

† As of February 1968.

Graduate College

Doctor of Philosophy

BIOCHEMISTRY

William Henry Habig, B.S. (Rutgers - The State Univ.) 1964; Livingston, N.J.

Thesis: A High Molecular Weight Malate Dehydrogenase in Leaves

†Richard Louis Michaud, A.B. (St. Michael's College) 1963; Auburn, Me.

Thesis: A Physico-Chemical Study of the Iron-Binding Sites of Siderophilin and Conalbumin

BOTANY

Thomas Gordon Siccama, B.S., 1961; M.S., 1964 (Univ. of Vermont); Rahway, N.J.

Thesis: Altitudinal Distribution of Forest Vegetation in Relation to Soil and Climate on the Slopes of the Green Mountains

CHEMISTRY

*Paul Gregroy Abajian, B.S. (Worcester Polytechnic Institute) 1963; Framingham, Mass., *in absentia*
Thesis: The Thermodynamics of the System $\text{CuO}-\text{Cu}(\text{OH})_2-\text{H}_2\text{O}$

Thomas Joseph Giacobbe, B.A. (Bowdoin College) 1963; Fair Lawn, N.J., *in absentia*

Thesis: Thallium Triacetate Oxidation of Enamines

*David Edward Horn, A.B. (Franklin and Marshall College) 1962; M.S. (Villanova Univ.) 1964; Palmerton, Pa.

Thesis: Solvolytic Studies of Alkylated Sulfonate Esters

*Joseph Herman Lesser, B.A. (Hunter College) 1963; Woodside, N.Y., *in absentia*

Thesis: The Synthesis and Chemistry of Bicyclo $[\text{X} \cdot 2 \cdot 0]$ Ring Systems

PHYSICS

†Theodore Henry Ansbacher, B.S. (Massachusetts Institute of Technology) 1960; M.S. (Univ. of Vermont) 1965; Burlington

Thesis: Changes in the Resistance of Molybdenum Films Due to the Adsorption of Carbon Monoxide

PHYSIOLOGY AND BIOPHYSICS

†Berthann Scubon Mulieri, B.S. (Pennsylvania State Univ.) 1958; Brooklyn, N.Y.

Thesis: The Resistance of the Intercalated Discs and their Role in Transmission of the Action Potential in Myocardium

Louis A. Mulieri, B.E.E. (Polytechnic Institute of Brooklyn) 1958; Brooklyn, N.Y.

Thesis: Directional Excitability Studies on Isolated Striated Muscle Fibers

PSYCHOLOGY

Patricia Ann Stone, B.A. (Univ. of Vermont) 1964; Burlington

Thesis: The Development and Validation of a Differential Drawing Scale of Personality Based on Adler's Concept of Social Interest

ZOOLOGY

*Kevin Archer Fox, A.B., 1960; M.S. (Univ. of New Hampshire) 1962; Wilton, N.H., *in absentia*

Thesis: The Effects of Prepuberal Habitation Conditions on the Reproductive Physiology of the Male House Mouse

Allan Frederick Wolfe, A.B. (Gettysburg College) 1963; M.A. (Drake Univ.) 1965; Peckville, Pa.

Thesis: A Histological and Histochemical Study of the Male Reproductive System of *Artemia* (Crustacea, Branchiopoda)

* As of October 1967.

† As of February 1968.

Degrees Honoris Causa

Harlow Carpenter, Doctor of Laws, Waitsfield, Vermont.

Presented by Professor Richard H. Janson

Arthur Wentworth Hewitt, Doctor of Humane Letters, Riverton, Vermont.

Presented by Dean Edward C. Andrews, Jr.

Philip Henderson Hoff, Doctor of Laws, State of Vermont.

Presented by Vice President Clinton D. Cook

Marjorie Ellinwood Luce, Doctor of Science, Waterbury, Vermont.

Presented by Professor Blair Williams

Samuel Sandmel, Doctor of Humane Letters, Cincinnati, Ohio.

Presented by Professor Harry H. Kahn

Thomas J. Watson, Jr., Doctor of Laws, Armonk, New York.

Presented by Dean William H. Macmillan

Department of Military Science

COMMISSIONED SECOND LIEUTENANT, UNITED STATES ARMY

*Gary Stephen Chicoine, Adjutant General's Corps

*Walter Richard Cooper, Infantry

*David Alan Keenan, Artillery

*Paul Wayne Lewis, Corps of Engineers

*Daniel Timothy Martin, Infantry

COMMISSIONED SECOND LIEUTENANT, UNITED STATES ARMY RESERVE

William Lewis Acker, Corps of Engineers

*Samuel Eugene Bain, Jr., Adjutant General's Corps

Jean-Guy Lionel Beliveau, Corps of Engineers

William Harrison Burling, Jr., Signal Corps

George Larry Burritt, Armor

*Edward Nixon Chase, Ordnance Corps

Edward Michael Childs, Artillery

*Edwin Thomas Congdon, Signal Corps

Edward David Crane, Medical Service Corps

James Edward Culhane, Military Intelligence

Peter Arthur Daley, Military Intelligence

Robert Leslie Foster, Corps of Engineers

Arthur Frederick Fournier, Jr., Military

Intelligence

Francis John Giebutowski, Military Intelligence

James Cathell Harrod, Transportation Corps

William Tiernan Heydt, Jr., Artillery

Richard George Houle, Medical Service Corps

Dean Raymond Howe, Armor

Jeffrey Alan Hyman, Quartermaster Corps

Ronald Ernest Izumi, Artillery

Mark Alan Kaplan, Artillery

Donald Brandt Kaveny, Medical Service Corps

Keith Allen Kelley, Military Police Corps

Vernon Starr Kellogg, Medical Service Corps

James Robert Krause, Armor

*Paul Frederick Leake, Finance Corps

Roderick Greeley McLean, Armor

Theodore Clarence Merritt, Jr., Quartermaster Corps

*James Bullard Mitchell, Adjutant General's Corps

Eugene James O'Donnell, Artillery

George Everett Passage, Jr., Artillery

Robert Douglas Paterson, Jr., Artillery

Michael Alan Pietsch, Transportation Corps

Richard Erwin Powers, Corps of Engineers

Gary Bruce Rice, Military Intelligence

Haydon Rochester, Jr., Signal Corps

*Morris James Root, Ordnance Corps

Robert Howard Schroeder, Medical Service Corps

*David Mason Shumate, Artillery

Richard Elwood Stewart, Artillery

William Edward Thetford, Armor

Vincent Pierre Yves Thibault, Armor

Charles Sherman Thompson, Signal Corps

*Richard Robert Tinervin, Adjutant General's Corps

*Curt Reisinger Tobey, Artillery

William Michael Young, Artillery

COMMISSIONED SECOND LIEUTENANT, UNITED STATES ARMY RESERVE,

UPON COMPLETION OF ROTC CAMP

Curtis LaReau Bourdon, Military Intelligence

Eugene Carruthers, Medical Service Corps

James Joseph Gallipo, Quartermaster Corps

Thomas Howard Jacobs, Armor

*Richard James Kowen, Infantry

Kevin James McAvoy, Artillery

Robert Lee Robinson, III, Armor

Robert William Sullivan, Artillery

COMMISSIONED SECOND LIEUTENANT, UNITED STATES ARMY RESERVE,

UPON COMPLETION OF SUMMER SCHOOL

Richard Steven Buchheim, Artillery

Robert Raymond Coburn, Artillery

*William Douglas Krebs, IV, Ordnance

Malcolm Stuart Lee, Armor

Robert Fairbanks Merriam, Transportation Corps

Martin Valentine Torok, Artillery

Robert Walter Towle, Artillery

* Distinguished Military Graduates

Sources of Financial Aid Awarded by the University

General Financial Aid

Scholarship Funds

LIZZIE P. ALLEN Founded in 1900 by Lizzie P. Allen, a descendant of Ira Allen, founder of the University.

ALUMNI ANNUAL GIVING FUND Established in 1968 from annual alumni giving and bequest.

REV. LUCIUS E. BARNARD, Class of 1853. Established by bequest in 1903.

ADA S. BLAIRE Established by bequest in 1926.

ELIZABETH CHAPMAN Established by bequest in 1950.

CLASS OF 1861 Endowed and made available in 1891.

CLASS OF 1881 Endowed in 1937 by William H. Rice.

CLASS OF 1940 No restriction.

JOHN H. CONVERSE, Class of 1861 Established in 1882.

ROLLO J. FRANCISCO Established by bequest in 1951.

GENERAL MOTORS SCHOLARSHIP PROGRAM Open to any U. S. citizen entering college as a freshman. No restrictions on course of study. Awards range from \$200 to \$2,000 a year, depending upon demonstrated need.

GENERAL SCHOLARSHIP

ALBERT T. HENDERSON Established in 1945 by a bequest from William J. Henderson in memory of his son.

FRANCIS WHELPLEY HICKOK, Class of 1871 Founded in 1902 by Mrs. Julia F. Hickok, widow of James W. Hickok, Class of 1837, in memory of their son.

HIGHER EDUCATION ACT OPPORTUNITY GRANTS, established by passage of the Higher Education Act of 1965. Provides for scholarships in the amount of \$200 to \$1,000.

DAVIS HOLLIS

CHARLES A. HOYT, Class of 1858 Established by bequest in 1904.

MARTIN LUTHER KING, 8 tuition grants and other aid with respect to need, to minority ethnic groups with primary consideration to members of the Negro race.

MORETOWN AND MIDDLESEX Founded by the Rev. E. C. Bass, Class of 1859.

C. E. AND C. C. PARKER Founded in 1880 by Rev. Charles C. Parker, D.D., Class of 1841, in memory of himself and his son, Charles Edmund Parker, Class of 1867.

MINNIE A. PICKERING Established in 1938 by gift in memory of her daughter.

LILLIAN BRYAN PROCTOR MEMORIAL SCHOLARSHIP, established in 1965 by the Vermont Federation of Women's Clubs. The income from this fund will be awarded each year to a Vermont boy or girl attending the University.

IRA B. SAFFORD SCHOLARSHIP Established in 1966 by bequest of Alice H. Safford.

LUCY B. SCHIEFFELIN SCHOLARSHIP Established in 1966.

MINNIE ADAMS SEGAR Established in 1962 by the friends of Minnie Adams Segar for worthy students, male and female.

SAMUEL SIDNEY SMITH Founded in 1896 by bequest of Mrs. Eliza Smith in memory of her husband.

HATTIE LAURA WETHERBY WESTON Established by bequest in 1936.

JAMES B. WILBUR The University of Vermont Trust Fund, amounting to about two million dollars, was established by James B. Wilbur as an endowment for scholarships for Vermont students who are in need of assistance to undertake college work and who have earned entrance or college records that indicate extraordinary scholastic ability.

NORMAN WILLIAMS

Loan Funds

ELIZABETH CHAPMAN Established by bequest in 1950.

CLASS OF 1929 LOAN FUND.

THE CONSOLIDATED FUND Composed of the following: the Class of 1916 Fund, the Class of 1923 Fund, the Class of 1924 Fund, the Class of 1925 Fund, the Emergency Loan Fund, the Julia I. Bates Fund, the Student Loan Fund, the B. F. Taylor Fund, the New York Alumni Fund of November, 1927, the Edmund Seymour Fund, the Kidder Loan Fund, the Lydia M. Blood Loan Fund, the Charles H. Bayley Fund, the Charles S. and Etta M. Kehoe Fund, the Sealand W. Landon Fund, the Annette Fiske Mereness Fund, the Pearl E. and Iddie F. Stone Loan Fund, the Student Emergency Loan Fund, and the Emily and Thomas Telfer Fund.

DONALD DRESSER MEMORIAL FUND No restrictions.

NATIONAL DEFENSE STUDENT LOAN FUND.

NEW ENGLAND SOCIETY IN THE CITY OF NEW YORK LOAN FUND Temporary loans.

F. H. AND GRACE M. SHEPARDSON For deserving students, subject to such regulations as the Board of Trustees shall prescribe.

HENRY MARTIN STANTON AND HARRIET BABCOCK STANTON MEMORIAL LOAN FUND Established by the Estate of Eleanor Louise Stanton.

General Financial Aid for Women

Scholarship Funds

MARCIA P. BROWNE Established by bequest for women students.

EMORY N. BURRITT Established by bequest for women students.

SARAH L. BURRITT Established by bequest for women students.

CELINDA A. B. LILLEY Founded in 1880 for women students.

PANHELLENIC COUNCIL Proceeds of the Panhellenic picnic or similar function are donated each year to the University to provide a scholarship for an out-of-state girl.

THEODORA AGNES PECK Established by bequest in 1965 income to be used to aid worthy young women to obtain a university education.

Loan Funds

CATHERINE ARMSTRONG LOAN FUND For women only.

MATTHEW HENRY BUCKHAM Any needy girl.

ASA FISKE Established for women students by Annette Fiske Mereness in memory of her father.

MARY GRAVES Established for women students by Annette Fiske Mereness in memory of her mother.

LADIES OF THE FACULTY For women students. Not more than fifty dollars is loaned to any one student.

MARY A. SHAW AND FANNY E. SHAW Established by Mrs. Willard Pope, daughter of Mary A. Shaw, for women students.

THE WOMEN'S STUDENT HEALTH COUNCIL FUND For women designated by the Dean of Women and the Chairman of the Department of Physical Education for Women, under special regulations as to interest and repayment.

ELLEN E. H. WOODRUFF For personal emergencies for any girl with limit of \$50.00 and approved by the Dean of Women.

General Financial Aid for Men

Scholarship Funds

- LOUIS COLLINS DODD Established by bequest in 1962 for worthy and deserving male students who need financial assistance.
- LOUISA H. HOWARD Founded in 1882; available for men.
- CLARK AND EDWARD S. ISHAM SCHOLARSHIP FUND Established by Lois C. Isham to aid needy boys.
- WILLIAM G. SHAW, Class of 1849 Originally founded in 1892 by bequest of one thousand dollars and increased by his daughter, Mrs. Willard Pope; available for men students.
- CHARLES D. SIAS Established by bequest in 1943; available for men.

Loan Funds

- CORNELIUS A. JEDEVINE Established by Allen E. Jeudevine as a memorial to his son to aid Vermont men in obtaining a liberal education.

Financial Aid by Geographical Areas

Scholarship Funds

- ANONYMOUS Craftsbury preference.
- FRANKLIN BALDWIN Established in 1915 by bequest of Mr. Baldwin for students from Putney.
- SEYMOUR ISRAEL BAROWSKY Preference given to a student from Holyoke, Massachusetts.
- REUBEN CLARK BENTON, Class of 1854 Established by bequest for students from Waterford and Lunenburg, Vermont, or from Minneapolis, Minnesota.
- ELIZABETH F. BRIGHAM Established by bequest in 1910; preference to be given to students from Brigham Academy.
- EZRA HOYT BYINGTON Founded in 1905 in memory of Mr. Byington by Mrs. Louise J. Byington for students from Hinesburg, or students bearing the name of Byington, Boynton, or Hoyt, or Wortman, or in some way related to these families.
- CONE FOUNDATION SCHOLARSHIPS to be awarded to boys or girls from Windsor, Vermont and vicinity including sons and daughters of any employees of the Cone Automatic Machine Company.
- CRAFTSBURY Founded in 1900 for relatives of Mr. and Mrs. Nathan S. Hill, or residents of Craftsbury or Isle La Motte.
- PHILIP HENRY CREEER Founded by Ex-Gov. Redfield Proctor for students from Proctor.
- ISLE LA MOTTE Founded in 1884 by Nathan S. Hill; for students from Isle La Motte or from Craftsbury.
- SARAH B. JACOBS Founded in 1882; available for graduates of Brigham Academy only.
- ROBERT J. KIMBALL Founded in 1900 for students from Randolph. The Trustees of Randolph High School may make nominations for this scholarship.
- LYNDON INSTITUTE Endowed by George E. P. Smith, Class of 1897; awarded annually to a graduate of Lyndon Institute nominated by the faculty of that school.
- CHARLES MUNSON MARSH Established by bequest in 1893 for students from Woodstock by Charles P. Marsh in memory of his son.
- CHARLES P. MARSH Established by bequest in 1893; for men and women from Windsor County.
- EDWIN WRIGHT MARSH, 1872 Founded in 1883 by Charles P. Marsh, Class of 1839, in memory of his son; for students from the town of Weathersfield or from Windsor County.

- MARGARET PATTERSON McDANIELS** Established in 1941 by a bequest of George M. McDaniels in memory of his mother; preference to be given to applicants from the towns of Craftsbury and Greensboro.
- JUSTIN S. MORRILL** Founded in 1900 by Senator Justin S. Morrill; for students from Strafford.
- ARTHUR W. AND LOUISE S. PERKINS** Established in their memory in 1947 by their sons and daughters. The income provides aid for students of high character and reasonably good scholarship who are graduates of a secondary school in Rutland. School authorities in Rutland are to be consulted regarding the qualifications of candidates who are not already enrolled in the University.
- H. P. RUSSELL SCHOLARSHIP** For students from Grand Isle County.
- SHATTUCK SCHOLARSHIP** Established in 1962 by George Lysander Shattuck in memory of his wife Carolyn, for boys and girls who are natives of Bakersfield, Vermont, and graduates of Brigham Academy.
- ANNA C. SMITH SCHOLARSHIP FUND** To aid deserving and needy students from the Ludlow, Vermont area.
- MARIA H. AND PERCY B. SWEET SCHOLARSHIP FUND** Preference to be given to students from Newport.
- JOHN AND MARY WATERMAN** Endowed in 1923 by Charles W. Waterman, Class of 1885, in memory of his father and mother; for residents of Waitsfield or Denver, Colorado.
- WESTFORD** Founded in 1882 by Luke P. Poland; available first to students from the town of Westford.
- JOHN A. S. WHITE** Established by bequest; for students from Washington County or from Vermont.
- CLAYTON J. WRIGHT** Established by bequest; available first for students from the town of Williston.
- DAVID PARKER WRIGHT AND ALICE M. WRIGHT** Established in 1958 for students from Westminster, Vermont.

Loan Funds

- JOHN H. AND MARY A. BLODGETT** Established in 1938 by bequest of Mary A. Blodgett of Bellows Falls, preference to be given to graduates of the Kurn Hattin and Warner Memorial Homes and to residents of Rockingham.
- ELLIS EDWIN FOSTER LOAN FUND** Preference to graduates of Peoples Academy of Morrisville, Vermont.
- GREATER NEW YORK CITY ALUMNI LOAN FUND** Preference given to students from the greater New York area.
- LEWIS RALPH JONES AND ANNA CLARK JONES LOAN FUND** Loan Fund to derive from the income of the investment of the above-named estate. To aid worthy and needy students in such manner as the trustees deem proper. Preference—students from Brookfield, Vermont.
- CHARLES D. AND CARRIE D. ORDWAY** Bequeathed by Charles D. Ordway in 1933, for Vermont students.
- RIXFORD MANUFACTURING COMPANY** For students from Highgate.

Financial Aid by Academic Areas

College of Agriculture and Home Economics

Scholarship Funds

- DEAN JOSEPH E. CARRIGAN** Established in 1957 by the people of Vermont to honor Dean Carrigan. The income from this fund is used to provide scholarships for Vermont boys and girls attending the College of Agriculture and Home Economics.

- CHARLES M. COX** Income from this trust fund provides a scholarship of \$300 for a student in Agriculture, preferably to one majoring in Dairy or Poultry Science, on the basis of need, character, and scholarship.
- DAIRYMEN'S LEAGUE COOPERATIVE ASSOCIATION, INC.** \$500 to a student who has completed at least two years in the College of Agriculture and Home economics. Preference is given to a student who is most likely to make a contribution to agricultural or home economics education, dairy marketing or dairy technology, with final selection based on character, scholastic record and financial need.
- EASTERN MILK PRODUCERS ASSOCIATION SCHOLARSHIP FUND** Two \$250 scholarships for students in the College of Agriculture and Home Economics with need, scholastic ability and leadership qualities. Preference given to freshmen and sons and daughters of members of the association.
- ERICK P. HOLZER** \$1500, restricted to agricultural students.
- DR. CHARLES H. HOOD** Given by the Charles H. Hood Dairy Foundation. Five \$500 scholarships awarded preferably to upperclass students studying milk production. One or two selections may be made from among first-year students who plan to major in dairy-related curricula.
- RALSTON PURINA** \$500 awarded at the beginning of the senior year to a student majoring in an area related to animal nutrition on the basis of need, scholarship, leadership and character.
- SEARS-ROEBUCK FOUNDATION** Six scholarships of \$300 each awarded annually on the basis of need, scholarship and farm origin; three to entering students in agriculture, two to entering students in home economics, and one to a sophomore in agriculture.
- VERMONT HOME DEMONSTRATION COUNCIL SCHOLARSHIPS** Two scholarships of \$200 awarded to Vermont girls who are enrolled in and have completed at least one year of Home Economics at the University of Vermont.

Loan Funds

- THURSTON M. ADAMS MEMORIAL FUND** Preference given to students in Agricultural Economics.
- AMERICAN AGRICULTURIST RESEARCH FOUNDATION** For juniors and seniors in Home Economics.
- ROBERT M. CARTER** Agriculture and Home Economics students.
- JOSEPH LAWRENCE HILLS LOAN FUND** Established by Friends of Dean Hills who completed fifty years of service to the University in 1937 and contributions by Alpha Zeta, Agricultural Honorary Society.
- KENNETH J. SHELDON LOAN FUND** Gift from various donors established as a loan fund for Vermont Agricultural students.
- TERRILL-HOLBROOK** For women students, preference being shown to those in Home Economics.

College of Medicine

Scholarship Funds

- DR. ELLICE M. ALGER SCHOLARSHIP FUND** Established 1967 to aid worthy and needy medical students.
- MOSES D. CARBEE**, Class of 1873 Established by a bequest from Mrs. Mary D. Carbee in memory of her husband; available for medical students.
- GROVER C. EMERY** Established by bequest in 1968 for students in College of Medicine who are residents from State of Maine or a premedical student from State of Maine.
- JOHN W. AND JOHN SEELEY ESTABROOK** Established by bequest in 1956; for students in the College of Medicine from Rutland County, preference being given to students from Brandon.
- FEDERAL MEDICAL SCHOLARSHIP GRANTS**, established by the Health Professions Educational Assistance Amendments Act of 1965.

- DR. EDWARD EVERETT HAWES Established by bequest in 1946; available for medical students.
- EDITH BLANCHE KIDDER Established by Joseph W. Kidder for students in the College of Medicine; preference to be given to legal residents of Barre.
- ALDO J. LEANI, M.D., Class of 1934, established in 1961 for students in the College of Medicine.
- NEW YORK LIFE INSURANCE COMPANY SCHOLARSHIP Established in 1966 for students in College of Medicine.
- JOHN ORDRONAUX Founded in 1909; for students in the Academic and Medical Colleges.
- HORTENSE A. QUIMBY Established by bequest in 1968; income to be used to provide scholarships to medical students with preference being given to students from Essex County, Vermont.
- PETER J. SHAMMON SCHOLARSHIP FUND Established in 1967 as a memorial to Mrs. Marian Shammon.
- DR. H. C. TINKHAM Established by bequest in 1956; for students in the College of Medicine.

Loan Funds

- MOSES DYER CARBEE, M.D., Class of 1873 Established by Mrs. May D. Carbee in memory of her husband for students of the College of Medicine.
- DR. THOMAS HARMAN DENNE MEMORIAL LOAN FUND Established in 1963 by relatives and friends of the late Dr. Thomas H. Denne, Class of 1905, the income to be used for deserving students in the College of Medicine.
- G. STEDMAN HUARD MEDICAL STUDENT LOAN FUND Established by G. Stedman Huard, M.D., Class of 1946, for aid to senior medical students who are Vermont residents, preference to be given to Winooski residents.
- KELLOGG FOUNDATION LOAN FUND Medical students.
- DR. JOSEPH E. LUMBARD Established in 1946 by the gift of Mr. J. Edward Lumbard, Jr., for students in the College of Medicine.
- MEDICAL STUDENT LOAN FUND Established in 1933 by Medical College alumni for students in the College of Medicine.
- ELIZABETH D. AND CLIFFORD R. PROCTOR Established in 1953 for students in the College of Medicine.
- QUARTER-OF-A-CENTURY LOAN FUND A loan fund for medical students established by the Class of 1938 and added to by the following 25-year classes.
- JAMES A. SINGISER MEDICAL STUDENT LOAN FUND Established by James A. Singiser, M.D., to aid needy medical students.
- UNIVERSITY OF VERMONT MEDICAL SCHOOL LOAN FUND For medical students from New Hampshire, established in 1963 by Dr. Thomas R. Plowright.
- MRS. HAROLD T. WHITE MEDICAL STUDENT LOAN FUND Preference given to medical students.

College of Arts and Sciences

Scholarship Funds

- LIZZIE S. CONVERSE Founded by bequest of Sarah Elizabeth Converse for students of classics.
- CHARLES W. RICH, Class of 1836 Founded in 1883 for students in the College of Arts and Sciences.
- SOPHIA STOW Endowed in 1937 by bequest of George L. Stow, '73, in memory of his mother; for students of classical languages.
- NORMAN SARETT MEMORIAL FOUNDATION, INC. In memory of Norman Sarett. To be awarded to a sophomore student in the liberal arts curriculum.

Loan Fund

- STEPHEN DWIGHT AND LIDA MASON HODGE For women students in the College of Arts and Sciences.

School of Nursing

Scholarship Funds

ELIDA N. RYALS SCHOLARSHIP FUND To be awarded annually to a student or students in the Nursing curriculum.

NURSING SCHOLARSHIP PROGRAM For nursing students with exceptional financial need. \$200 to \$1500 per year depending on need.

Loan Fund

NURSING STUDENT LOAN PROGRAM To need or \$1500.

Department of Chemistry

Scholarship Funds

NATHAN F. MERRILL SCHOLARSHIP FUND The income from this fund is used for three scholarships annually for students pursuing Chemistry as their primary study.

LELAND MASON WILLEY Preference to students majoring in Chemistry.

THE CHEMICAL CLUB OF NEW ENGLAND \$500 annually to a student of chemistry or chemical engineering.

Department of Education

Loan Fund

MARY MAUD PATRICK Established by Epsilon Sigma as a memorial to Mary Maude Patrick for students in Elementary Education.

Department of Athletics

Scholarship Funds

ALUMNI MEMORIAL Restricted to athletics.

ANONYMOUS ATHLETIC Restricted to students who participate in intercollegiate athletics.

ERNEST A. BRODIE ATHLETIC SCHOLARSHIP To be used to help needy athletes.

GEORGE H. COOK, JR. Athletic scholarship with preference to students from Cushing Academy.

RALPH LAPOINTE Established in 1968 from gifts: income to be used annually to support an undergraduate student athlete's scholarship; preference to baseball program.

EDWARD G. NEMER Established in 1961 from a gift in memory of the late Edward G. Nemer, for athletic scholarships.

SAGA FOOD SERVICE, INC. \$550 yearly to help defray the expense incurred in the purchase of University board contracts by two University students participating in intercollegiate athletics.

Program in Dental Hygiene

Loan Fund

DENTAL MEMORIAL LOAN FUND Established by Vermont Dental Society for financial assistance to second-year Dental Hygiene students.

Department of Engineering

Scholarship Funds

ELECTRICAL MANUFACTURERS' REPRESENTATIVES CLUB OF NEW ENGLAND, INC. Scholarships totalling \$500 will be awarded to two Electrical Engineering students on the basis of need and quality of scholarship.

JOHN M. EVANS Established in 1958 in memory of himself and his wife, Mary Hickey Evans, for worthy students in Civil Engineering.

VERMONT ELECTRICAL ASSOCIATION SCHOLARSHIP FUND Awarded to a junior or senior majoring in Electrical Engineering who is a resident of Vermont.

WESTERN ELECTRIC SCHOLARSHIP FUND Awarded to an undergraduate in the Engineering Department. \$800 or the cost of tuition, books, and fees, whichever is lower. The fixed amount in no event will be less than \$400. In addition, a grant-in-aid amounting to three-quarters of the amount of the scholarship.

Loan Funds

CHESTNUT FUND For students in Mechanical Engineering upon recommendations of the department chairman.

LEONARD PERLEY DICKINSON For students in Engineering, preference to be given to those in Electrical Engineering.

HORACE E. STEVENS, Class of 1870 Established in 1926 by his relatives for students in Engineering.

Professions

Law

Loan Fund

HENRY BIGELOW SHAW, Class of 1896 Established in 1938 by Mrs. Willard Pope, in memory of her brother, for those who plan to study at Harvard University Law School.

Ministry

Scholarship Fund

DR. DANIEL WASHBURN Founded in 1853 for young men; preference to be given to those studying for the ministry.

Financial Aid With Special Restrictions

Scholarship Funds

PARKER J. BUXTON Available to a needy and deserving member of the Senior Class.

DANIEL PITKIN MINER Established by bequest in 1943; for native-born students, not over twenty-five years of age.

DR. WALTER CARPENTER Established by bequest; preference to be given to sons of clergymen and physicians.

SOLDIERS' Founded in 1913 by a group of Civil War Veterans for students who are descendants of soldiers in the Civil War.

Loan Funds

PHI BETA KAPPA Available to members of the Senior Class; preference being shown to members of the society.

REV. STEPHEN G. BARNES To provide loans or gifts for needy students to attend religious conferences.

Military

U. S. ARMY ROTC SCHOLARSHIPS Established by Public Law 88-647 in 1964; for students motivated toward a career as an officer in the United States Army. For details, see page 56.

Prizes and Awards

ALPHA LAMBDA DELTA AWARD presented by the National Council to the senior girl who has the highest average for four years.

ALPHA ZETA PROFICIENCY AWARD for the agricultural student who in his freshman year is deemed most proficient in scholarship, extracurricular activities, and self-support.

AMERICAN INSTITUTE OF CHEMISTS AWARD given to a senior with high potential for advancement of chemistry as a profession, based on leadership, ability and character with high scholastic standing.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS AWARD, President's Award for meritorious service and award for best technical paper.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS AWARD for outstanding effort and accomplishment in behalf of the ASME Student Section.

AMERICAN LEGION AWARD to the cadet commander of the Army ROTC Company adjudged to be the most proficient during the year.

ARMY RESERVE OFFICERS ASSOCIATION AWARD to the Army ROTC cadet in the senior class who has shown the greatest versatility and participation in the ROTC program.

ARMY SUPERIOR CADET AWARDS to the outstanding Army ROTC cadet in military and academic proficiency in each class.

ASSOCIATION OF THE U. S. ARMY AWARD to the Army ROTC CADET in the junior class who has contributed the most through his leadership to advancing the standing of the ROTC unit and the Military Department of the University of Vermont.

ASSOCIATION OF THE U. S. ARMY MILITARY HISTORY PRIZE to a freshman ROTC cadet for excellence in Military History.

ATHLETIC COUNCIL MANAGERIAL AWARD to the senior sports manager who has shown the greatest proficiency.

WARREN R. AND MILDRED L. AUSTIN AWARD to the student who has shown the most interest and endeavor in knowledge of international organization for the principles and purposes of the United Nations.

BENEDICT ESSAY AWARD established by Robert Dewey Benedict of the Class of 1848, to be awarded annually to the member of the senior class who presents the best essay on international arbitration.

BENNETT ESSAY AWARD, endowed by Philo Sherman Bennett, provides an annual award for the best essay discussing the principles of free government.

COLONEL WESTON L. BLANCHARD AWARD to the cadet commander of the ROTC Battalion adjudged to be the most proficient during the year.

B'NAI B'RITH AWARD, given annually by the Joseph Frank Lodge of Burlington to that student who has done the most to encourage interfaith cooperation and activities.

BORDEN AGRICULTURAL AWARD to the senior Agricultural student in the College of Agriculture and Home Economics who enters senior year with the highest average.

ERNEST C. BRAUN PRIZE, awarded annually to a student in chemistry.

WILLIAM EUSTIS BROWN ALUMNI PRIZE to a graduating student on the basis of broad cultural interests and loyalty to the College of Medicine.

BURPEE AWARD IN HORTICULTURE on the basis of scholarship, practical experience, and interest in flower and vegetable growing.

BUTLER DEBATING AWARDS, endowed by Edward Page Butler, 1870, given annually to the three women students who have shown the greatest ability in debate.

- ERNEST HIRAM BUTTLES CENTURY CLUB PRIZE** awarded annually to the second-year student selected by the Department of Pathology for outstanding performance in that subject.
- CARBEE MEDICAL AWARD** established by the late Mrs. May D. Carbee in memory of her husband, Moses Dyer Carbee, M.D., of the Class of 1873, to be given to the senior in the College of Medicine who has shown the greatest proficiency in the field of Obstetrics.
- CARPENTER GERMAN AWARD** in honor of Professor Fred D. Carpenter, given annually to the student who has shown the most progress and improvement in the study of German during the first two years.
- CARPENTER TENNIS AWARD** presented in appreciation of Professor Fred D. Carpenter's service as coach of the tennis team and as a member of the Athletic Council, to the member of the varsity tennis squad who has demonstrated the greatest degree of progress in tennis proficiency during the season.
- UNIVERSITY OF VERMONT CENTURY CLUB AWARD FOR SCHOLARSHIP** to the graduating student in the College of Medicine who has attained the highest scholastic rank in his class during the four years.
- UNIVERSITY OF VERMONT CENTURY CLUB AWARD FOR UNDERGRADUATE RESEARCH** for excellence in conducting an independent research project.
- CHEMICAL RUBBER COMPANY ACHIEVEMENT AWARDS** to each of the highest ranking students in the beginning courses in chemistry, mathematics and physics.
- CONVERSE AWARDS**, established by John Heman Converse, 1861, to outstanding students in the Department of Economics and Business Administration.
- CORSE TRAVELING FELLOWSHIP** established by Frederick M. Corse, Class of 1888, to a Bachelor of Arts graduate having a language major and preparing for a career in college teaching.
- FAYE CRABBE AWARD** established in honor of Faye Crabbe by the alumnae and faculty of the University of Vermont School of Nursing, awarded to the senior majoring in nursing who has excelled in scholarship, nursing ability, and service to the University.
- CRAIG TROPHY** donated by Major M. E. Craig in honor of the 1936-37 Rifle Team, has each year engraved upon it the name of the man making the highest cumulative score through the year in the principal matches in which the rifle team competes.
- DAUGHTERS OF FOUNDERS AND PATRIOTS OF AMERICA AWARD** to the ROTC cadet of the junior class for outstanding ROTC academic achievement.
- EMERSON AWARD IN HISTORY**, in memory of Samuel Franklin Emerson, Professor of History for forty-two years, awarded to an undergraduate for the best essay on any topic chosen from any field of history.
- GOLDBERG AWARD** by Phi Chapter of Phi Sigma Delta Fraternity to a senior man who plans on graduate work and has excelled in scholarship, intramural athletics, and contribution to University life.
- SALLY ANN HALL MEMORIAL AWARD** presented annually to a woman student in her junior year in the Elementary Education curriculum who has financial need and who has demonstrated commitment to teaching.
- HAMILTON WATCH COMPANY AWARD** to the senior engineer who has most successfully combined proficiency in his major field of study with notable achievements in the social studies and humanities.
- HOWARD AWARDS**, established by a bequest from Mrs. Hannah T. Howard, for students in the College of Arts and Sciences who have shown excellence in the work of the freshman year.
- ELWIN LEROY INGALLS AWARD**, established in 1934 to honor Elwin Leroy Ingalls, 1896, who had then completed twenty years of continuous service as State 4-H Club Leader, to be given to a student outstanding in character, 4-H Club work, and scholarship.
- INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS AWARD** to the student member who has shown the greatest professional development, accomplishment, and interest in the activities of the student branch.
- INTERFRATERNITY SCHOLASTIC CUP** for the fraternity having the highest scholastic average during the preceding semester.
- INTERFRATERNITY SCHOLASTIC TROPHY** for the fraternity whose scholastic average shows the greatest improvement during the last two semesters.

- LEWIS RALPH JONES AWARD** established in 1963 to be given to a student displaying outstanding proficiency in plant sciences.
- JOHN F. KENNEY PRIZE** awarded annually to one or more graduate students for excellence in mathematics.
- A. ATWATER KENT AWARD** awarded annually for excellence of judgment and general grasp of the principles of electrical engineering, development in personality and greatest promise of success in this field.
- KIDDER MEDAL** established in memory of Dr. F. T. Kidder, 1880, a Trustee of the University, and supplemented by funds from the Kake Walk Dispositions Committee, to be awarded to the senior man ranking first in character, leadership, and scholarship.
- LAMB FOUNDATION ESSAY AWARDS** to students in the College of Medicine showing greatest comprehension and appreciation of the doctor-patient relationship.
- ALEXANDER LAMPORT AWARD** established in 1962 to be given to an outstanding student in Hebrew.
- ROBERT ASHTON LAWRENCE DEBATING AWARDS** for students who exhibit the greatest proficiency in debate, established by Edwin Winship Lawrence, 1901, in memory of his brother, Robert Ashton Lawrence, 1899.
- ROBERT ASHTON LAWRENCE AND GEORGE EDWIN LAWRENCE DEBATING AWARDS** to the four students of the University of Vermont and/or Middlebury College showing the greatest proficiency in a joint debate between the two institutions; these awards established by Edwin Winship Lawrence, 1901, in memory of his brother, Robert Ashton Lawrence, 1899, and his father, George Edwin Lawrence (Middlebury College, 1867).
- ELIZABETH C. LISMAN MEMORIAL AWARD**, established in 1962 by Louis Lisman and others, in memory of his wife, to be presented annually for outstanding participation in group discussion.
- EDMUND F. LITTLE CUP**, established by Arlington P. Little, 1901, to the outstanding student in mechanical engineering.
- MERCK CO. INDEX AWARDS** for proficiency in chemistry to be given to the outstanding junior and the outstanding senior.
- HELAINE MESCH MEMORIAL AWARD** given annually by the Class of 1961 to the most deserving senior in the College of Medicine, to be selected by his classmates.
- MORTAR BOARD SCHOLARSHIP CUP** to the women's living unit, including all four classes, attaining the highest scholarship average for the spring semester.
- MORTOR BOARD SCHOLARSHIP TROPHY** for the women's living unit, including all four classes, attaining the highest scholarship average for the fall semester.
- OMICRON NU CUP** to the student in home economics who attains the highest scholastic average during her freshman year.
- OUTING CLUB SKI TROPHY** to the member of the varsity ski team showing outstanding leadership, character, and athletic attainment in skiing during the past year.
- PANHELLENIC CUP** awarded to the sorority with the highest scholastic average.
- PANHELLENIC PLAQUE** awarded to the sorority whose scholastic average shows the greatest improvement in the fall semester.
- COMPANY L-12 PERSHING RIFLES TROPHY** to the ROTC platoon adjudged to be the most proficient during the year.
- PHELPS AWARD** established by Edward J. Phelps in memory of his son, Edward Haight Phelps, 1872, to be given annually to an outstanding senior in civil engineering.
- PHI BETA KAPPA AWARD** to the student in the humanities with the highest standing at the end of the first three semesters.
- PROFESSOR OF MILITARY SCIENCE AWARD** for cadets of the senior class who have made outstanding contribution to the ROTC program.
- COLONEL WADSWORTH RAMSEY-SMITH AWARD** to the outstanding senior cadet of the ROTC. This was established by Mrs. Ramsey-Smith in honor of her husband.
- RETIRED OFFICERS' ASSOCIATION (GREEN MOUNTAIN CHAPTER) AWARD** to the sophomore cadet who has contributed the most to the ROTC program.

- FREEMAN M. SALTUS AWARD established in 1956 to be given to a student writing an outstanding essay on labor and/or economics.
- SEMANS TROPHY, presented by the local chapter of Tau Epsilon Phi Fraternity in memory of Henry Semans, 1924, awarded annually to a senior showing outstanding qualities of leadership, loyalty and service to the University, active participation in athletics, and winning the respect and regard of his fellow students.
- SERGEANT'S MEDAL to the outstanding ROTC cadet in the junior class in leadership and drill proficiency.
- SEYMOUR HORTICULTURAL AWARD established by William W. Seymour in memory of his father, Henry E. Seymour, 1835, for the senior who has done the best work in original horticultural research.
- MARY JEAN SIMPSON CUP to the senior woman who best exemplifies the character, service, and constructive influence which Dean Simpson strove to develop in undergraduate women.
- KIRBY FLOWER SMITH LATIN AWARD, established as a memorial to Kirby Flower Smith, 1884, by his wife, for the student having the highest standing in second-year college Latin.
- MASTER SERGEANT JOEL SURRELL RIFLE TEAM TROPHY for the member of the ROTC Rifle Team who has the highest average for the season.
- LA SOCIETE DES 40 HOMMES ET 8 CHEVAUX AWARD to the Army ROTC cadet in the senior class for the highest academic achievement through the advanced course and who intends to accept a Regular Army Commission.
- SONS OF THE AMERICAN REVOLUTION AWARD to the ROTC cadets of the sophomore and freshman classes for their outstanding character, conduct, leadership and practical knowledge of the year's course.
- STROH TROPHY, named for Charles Stroh, 1934, awarded annually to the member of the baseball team who achieves the highest total of runs-batted-in during scheduled games each year.
- SUNDERLAND MEMORIAL TROPHY awarded to the senior man who has best exempted those qualities of character, leadership, and persistence in overcoming obstacles which were outstanding traits in the life of Russell O. Sunderland, 1938.
- TAU BETA PI AWARD for the sophomore in engineering who has achieved the highest scholastic average for the first three semesters.
- SOCIETY OF UVM CHEMISTS AWARDS for excellence in general freshman chemistry.
- UNITED BUSINESS EDUCATION ASSOCIATION AWARD for outstanding achievement in business education.
- UNIVERSITY RESEARCH CLUB AWARD to the undergraduate submitting the best research paper to the Research Club.
- VERMONT CERTIFIED PUBLIC ACCOUNTANTS AWARD for the outstanding student in accounting.
- VETERANS OF FOREIGN WARS AWARD to the most proficient member of the freshman ROTC class.
- DR. FREDERICK ARNOLD VINTON AWARD established in 1952, for a student displaying proficiency in Latin or Greek.
- THE GEORGE H. WALKER DAIRY AWARD established by George H. Walker, one of the founders of the Walker-Gordon Milk Company, to be awarded to an outstanding senior in dairy studies.
- WALL STREET JOURNAL AWARD to the senior who shows the greatest proficiency in the field of finance.
- WASSON ATHLETIC AWARD established by Mrs. Pearl Randall Wasson in memory of her husband, Dr. Watsin I. Wasson, 1901, for the member of the senior class who has maintained the highest standard of academic scholarship and athletic attainment.
- WOODBURY MEDICAL AWARDS established by Mrs. Pauline S. Woodbury in memory of her husband, Dr. Urban A. Woodbury, 1859, for a senior in the College of Medicine showing the greatest proficiency in the clinical subjects in his senior year; and to a sophomore in the College of Medicine who has received the highest standing of the class in all subjects of the freshman and sophomore years.

V General Index

- Academic Calendar, 287
 Academic Discipline, 55
 Accounting, 78, 143, 146
 Accreditation, iii
 Administrative Personnel, 2, 17
 Admission, 48
 Graduate College, 109
 Medical College, 104
 Advanced Placement, 49
 Advanced Standing, 49
 Agricultural Biochemistry, 119
 Agricultural Economics, 62, 120
 Agricultural Education, 63, 122
 Agricultural Engineering, 66, 123, 156
 Agricultural Engineering Technology, 63, 66
 Agricultural Experiment Station Staff, 20
 Agricultural Extension Service Staff, 22
 Agriculture and Home Economics, College of,
 29, 61
 Aid, Financial, 40, 54, 272
 Allied Health Sciences, 98
 Alumni Council, 250
 Animal Sciences, 64, 125
 Animal Pathology, 127
 Anthropology, 76, 238
 Applied Music, 51
 Area Studies, 73, 80
 Art, 74, 129
 Artists Series, 37
 Arts and Sciences, College of, 28, 72
 Associates, List of, 17
 Athletic Fee, 52
 Athletics, 44
 Auditing Courses, 58
 Awards, 280
- Banking, 144
 Banking Facilities, 54
 Billings Center, 43
 Bills, Payment of, 53
 Biochemistry, Agricultural, 119
 Biology, 131
 Board Charges, 52
 Board of Trustees, 1
 Botany, 65, 74, 131
 Buildings, 32
 Business Administration, 77
- Calendar, 287
 Campus and Buildings, 32
- Center for Area Studies, 73, 80
 Chemistry, 74, 89, 134
 Civil Engineering, 92, 156
 Class Organizations, 47
 Classics, 138
 Clothing and Textiles, 70, 194
 College Entrance Examinations, 49
 Colleges and Curricula, 28, 61, 72, 83, 89, 98, 108
 Commissions Awarded, 271
 Committees, University, 25
 Conferences, 37, 117
 Continuing Education, 116
 Correspondence, vii
 Counseling, 39
 County Agents, 23
 Courses of Instruction, 118-249
 See entries by departments
 Credit by Examination, 50
 Curricula, 28, 61, 72, 83, 89, 98
- Dairy Technology, 64
 Dean's List, 59
 Debating, 46
 Deferred Payment, 53
 Degrees Granted, 256
 Degree Requirements, 59
 Dental Hygiene, 30, 98, 141
 Deposits, 51
 Dining Halls, 41
 Discipline, Academic, 55
 Doctoral Programs, 109, 115
 Dormitories, see Residence Halls
 Dramatics, 46, 76, 245
- Economics, 74, 142
 Economics, Agricultural, 62, 120
 Economics and Business Administration, 74, 142
 Education, 83, 148
 See entries under specific headings
 Education, Agricultural, 63, 122
 Education, College of, 30, 83
 Educational Television, 38
 Electrical Engineering, 93, 160
 Elementary Education, 84, 150
 Emeriti, 3, 19
 Employment, 40
 Engineering, see special headings, 90
 Engineering Experiment Station Staff, 21
 English, 74, 173
 English, Use of, 56

- Enrollment, 49, 58
- Enrollment Statistics, 253
- Entrance Examinations, 49
- Entrance Requirements, 48
- Evening Division, 116
- Expenses, 51-54
- Experiment Station Staff, 20
- Extension Courses, 116
- Extension Education, 108, 113, 116
- Extension Service Staff, 22

- Faculty, List of, 4
- Family Living, 70, 197
- Fees, 51-54
- Finance, 78
- Financial Aid, 40, 54, 272
- Fine Arts Festival, 46
- Fifth Year Certificate, 83, 108
- Fleming Museum, 36
- Food and Nutrition, 71, 195
- Foreign Agricultural Economics, 63
- Forest Management, 68, 178
- Forestry, 67, 178
- Forestry Summer Program, 52, 68
- Fraternalities and Sororities, 42
- French, 233

- General Information, 55
- General Literature, 177
- Geography, 74, 180
- Geology, 74, 183
- German, 74, 186
- Government, See Political Science
- Government Research Center, 81
- Grades and Reports, 59
- Graduate College, 31, 108
- Graduate Record Examination, 110
- Graduates, 1968, 256
- Greek, 74, 138

- Health Insurance, 58
- Health Sciences, Division of, 98
 - Allied, School of, 98
- Health Services, 40
- Hebrew, 188
- History, 74, 188
- Home Economics, 69, 193
- Home Economics Education, 70, 199
- Home Economics Seminars and Research, 200
- Home Management, 71, 197
- Honorary Degrees, 271
- Honorary Societies, 44
- Honors, 59, 62, 80
- Horticultural Science, See Plant and Soil Science
- Housing, 41, 196

- Industrial Management, 78
- Infirmity, 40
- Institutes, 117
- Institutional Administration, 196
- Insurance, 58

- Intramural Sports, 44
- Italian, 235

- Journalism, 79
- Junior Year Study Abroad, 81

- Kake Walk, 45

- Lane Artists Series, 37
- Latin, 75, 139
- Law, 79
- Liberal Arts Curriculum, 72
- Libraries, 36
- Library Fee, 52
- Literature, General, 177
- Living Accommodations, see Residence Halls
- Loan Funds, 272

- Management Engineering, 94
- Marketing, 78
- Master's Degree Programs, 108, 112
- Mathematics, 75, 95, 200
- Matriculated Students, 49
- Mechanical Engineering, 93, 167
- Medical Scholarships, 107, 276
- Medical Student Fee, 52
- Medical Technology, 99, 207
- Medicine, College of, 30, 104
- Meteorology, 177
- Military Science, 56, 208
- Museum, 36
- Music, 75, 209
- Musical Activities, 46
- Music Education, 87, 151
- Music, Performance, 211

- Non-matriculated Students, 49
- Numbering of Courses, 118
- Nursing, 30, 101, 212

- Officers
 - of Administration, 2, 17
 - of Instruction, 3
- Optometry, 79
- Orientation Program, 50

- Pass-No Pass Option, 50
- Payment of Bills, 53
- Personnel Management, 147
- Personnel Services, 39
- Pharmacy, 79
- Philosophy, 75, 214
- Philosophy and Objectives, iv
- Physical Education, 58, 88, 152, 217
- Physics, 75, 96, 218
- Placement, 39
- Plant and Soil Science, 66, 223
- Political Science, 75, 223
- Poultry Science, See Animal Science
- Pre dentistry, 79
- Prelaw, 79
- Premedicine, 79

- Preprofessional Preparation, 78
Pretheology, 79
Preveterinary, 67
Prizes, 280
Psychology, 75, 229
Publications, Student, 47
- Radio Station, 47
Reading Center, 40
Refunds, 53
Recognition Societies, 44
Regional Cooperation, 31
Related Art, 70, 193
Related Services Staff, 21
Religion, 75, 214
Religious Life, 42
Reports, Scholastic, 59
Residence Halls, 41
Resident Student, 55
Romance Languages, 75, 233
Room and Board, 41, 52
ROTC, 56, 208
Russian, 237
- Scholarships, 54, 56, 272
Secondary Education, 86, 151
Ski Lodge, 43
Social Work, 70, 199
Sociology and Anthropology, 76, 238
Sororities, 42
Spanish, 235
Special Students, See Non-matriculated
Speech, 76, 242
Speech Clinic, 40
Statistics, Enrollment, 253
Student Activities, 42
Student Activity Fee, 52
Student Association, 43
Student Committee on Discipline, 43
Student Employment, 40
Student Life, 39
- Student Organization, 42
Student Personnel Services, 39
Student Publications, 47
Student Teaching, 86
Study Abroad, 81
Summer Session, 116
- Technical Information Center, 96
Technology, College of, 30, 89
Testing, 39, 110
Television, 38, 46
Theology, 79
Time payment, 53
Transcripts, 60
Transfer Students, 49
Trustees, 1
Tuition, 51
- University Committees, 25
University Extension, See Continuing Education
University Libraries, 36
University Lodge, 43
University Responsibility, 58
Use of English, 56
UVM, Meaning of, iii
- Vermont Educational Television, 38
Vermont Overseas Study Program, 81
Vermont Resident Defined, 55
Veterans Education, 39
Veterinary, 67
- Wilbur Fund, 273
Wildlife Science, 68
Women's Residences, 41
Women's Student Government Association, 43
World Affairs Center, 82
World Problems, 177
WRUV, 47
- Zoology, 76, 246

V Academic Calendar

Spring Semester 1969

January	14	Tuesday	Registration
January	15	Wednesday	Classes begin, 8:00 a.m.
February	14-15	Friday-Saturday	Kake Walk Recess
March	8	Saturday	Grade Reports
March	17, Monday, through March 21, Friday and March 31, Monday, through April 11, Friday		Enrollment for Fall Semester
March	24	Monday	Spring Recess begins, 8:00 a.m.
March	31	Monday	Classes resume, 8:00 a.m.
April	14	Monday	Honors Day, no classes 10:00 a.m. to 1:00 p.m.
May	5	Monday	Examinations begin
May	13	Tuesday	Examinations end
May	18	Sunday	Commencement

Summer Session 1969

June	23	Monday	Eight-week session begins
July	7	Monday	Six-week session begins
August	15	Friday	Six-week and eight-week sessions end

Fall Semester 1969

September	2	Tuesday	Registration
September	3	Wednesday	Classes begin
October	25	Saturday	Grade Reports
October	27, Monday, through November 14, Friday		Enrollment for Spring Semester
November	27-29	Thursday-Saturday	Thanksgiving Recess
December	8	Monday	Examinations begin
December	16	Tuesday	Examinations end

Spring Semester 1970

January	13	Tuesday	Registration
January	14	Wednesday	Classes begin, 8:00 a.m.
February	13-14	Friday-Saturday	Kake Walk Recess
March	7	Saturday	Grade Reports

March 16, Monday, through
 March 20, Friday
 and March 30, Monday,
 through April 10, Friday

March	23	Monday
March	30	Monday
April	13	Monday

May	4	Monday
May	12	Tuesday
May	17	Sunday

Enrollment for Fall Semester
 Spring Recess begins, 8:00 a.m.

Classes resume, 8:00 a.m.

Honors Day, no classes 10:00 a.m. to
 1:00 p.m.

Examinations begin

Examinations end

Commencement

CALENDAR

1969

JANUARY

S	M	T	W	T	F	S
..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	..
..

FEBRUARY

S	M	T	W	T	F	S
..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	..
..

MARCH

S	M	T	W	T	F	S
..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	..

APRIL

..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	..	..	..
..

MAY

..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
..

JUNE

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	..	..	..	..	..
..

JULY

..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	..	..
..

AUGUST

..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

SEPTEMBER

..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	..	..	..	..
..

OCTOBER

..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	..
..

NOVEMBER

..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	..	..	..	..	..	..

DECEMBER

..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	..	..	..
..

1970

JANUARY

S	M	T	W	T	F	S
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

FEBRUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
..

MARCH

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

APRIL

..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	..	..
..

MAY

..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

JUNE

..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	..	..	..	..
..

