



THE
UNIVERSITY OF
VERMONT

Bulletin

| *April* **1968**

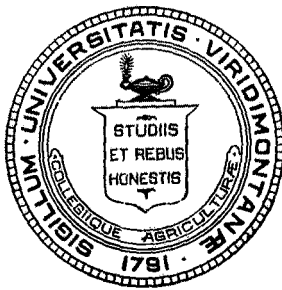
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BURLINGTON, VERMONT

Bulletin of

THE UNIVERSITY OF
V E R M O N T



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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 nine divisions of the University, instruction is offered in more than fifty programs leading to twenty-five 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

The Philosophy and Objectives of The University of Vermont¹

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

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V University of Vermont Personnel

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President }
Governor } *Ex-Officio*

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March, 1963—March, 1969

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Arlington, Vt.

BARTHOLOMEW FRANCIS GARRITY, B.S.

Burlington, Vt.

SANBORN PARTRIDGE, LL.B., M.S.

Proctor, Vt.

ELLERY REDFIELD PROCTOR, B.S., M.Ed.

Mendon, Vt.

March, 1964—March, 1970

LAWRENCE JAMES DOOLIN, B.S.

Philadelphia, Pa.

FLOYD MERLE JAMES, B.S.

Burlington, Vt.

ROBERT FLEMING PATRICK, B.S., M.B.A.¹

Burlington, Vt.

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

Leominster, Mass.

March, 1965—March, 1971

WILLIAM THOMAS BURNS, B.S.

Dorset, Vt.

EDWARD RICHARDSON EURICH

Waitsfield, Vt.

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

South Burlington, Vt.

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Woodstock, Vt.

March, 1966—March, 1972

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Montclair, N.J.

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Detroit, Mich.

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Burlington, Vt.

March, 1967—March, 1973

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Putney, Vt.

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Winooski, Vt.

GEORGE HOWARD SLOAN, M.A.

Rutland, Vt.

March, 1968—March, 1974

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

Mt. Carmel, Conn.

GEORGE EDWARD LITTLE, JR., A.B.

Burlington, Vt.

CHARLES THEODORE SCHECHTMAN, M.D.

New Britain, Conn.

1. Deceased November 30, 1967.

V Officers of Administration

LYMAN SMITH ROWELL, M.S.
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Officers of Instruction

EMERITI

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FLORENCE EMILY BAILEY, M.S.	<i>Professor of Home Economics</i>
HOWARD GORDON BENNETT, A.M.	<i>Professor of Music</i>
DAVID MARSH BOSWORTH, M.D.	<i>Consultant Orthopedic Surgery</i>
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CHARLES E. BRAUN, Ph.D.	<i>Pomeroy Professor of Chemistry and Dean of the Graduate College</i>
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ELIZABETH KUNDERT, M.D.	<i>Assistant Professor of Clinical Psychiatry</i>
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JULIAN IRA LINDSAY, A.M., L.H.D. ³	<i>Professor of English</i>
CARL LUCARINI, A.M.	<i>Assistant Professor of Chemistry</i>
EDD RUTHVEN MCKEE, M.S.E.E.	<i>Professor of Electrical Engineering and Dean of College of Technology</i>
EDWARD DOUGLAS McSWEENEY, M.D.	<i>Assistant Professor of Gynecology</i>
MIRIAM NATILEE MARSTON, A.M.	<i>Assistant Professor of Music</i>
SALLY BERRY MAYBURY, Ed.D.	<i>Associate Professor of Commerce and Economics</i>
JOHN TRUMBULL METCALF, Ph.D.	<i>Professor of Psychology</i>
ALVIN REES MIDGLEY, Ph.D.	<i>Professor of Agronomy</i>
PAUL ROBERT MILLER, M.S.	<i>Dean of College of Agriculture and Home Economics</i>
HENRY LEE MILLS, D.V.M.	<i>Instructor in Public Health</i>
CHESTER ALBERT NEWHALL, M.D.	<i>Thayer Professor of Anatomy</i>

1. Deceased January 4, 1968.

2. Deceased July 28, 1967.

3. Deceased February 23, 1967.

JOHN ALVIN NEWLANDER, Ph.D.	<i>Professor of Animal and Dairy Science</i>
GEORGE HUBERT NICHOLSON, M.A.	<i>Associate Professor of Mathematics</i>
LENA RAUB OAKLEY, M.A.	<i>Associate Professor of Nursing</i>
HERBERT DEAN PEARL, A.M. ¹	<i>Professor of Education</i>
HAROLD BARNARD PIERCE, Ph.D.	<i>Professor of Biochemistry</i>
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WILHELM RAAB, M.D.	<i>Professor of Experimental Medicine</i>
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BERTHA MAY TERRILL, A.M., Sc.D.	<i>Professor of Home Economics</i>
BENJAMIN BOOTH WAINWRIGHT, A.M.	<i>Associate Professor of English</i>
NELSON LEE WALBRIDGE, Ph.D.	<i>Professor of Physics</i>
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RICHARD S. WOODRUFF, M.D.	<i>Assistant Professor of Pathology</i>
LLOYD ABRAM WOODWARD, M.S.	<i>Associate Professor of Physics</i>

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)	<i>Professor of Anesthesiology</i>
RUTH C. ADAMS, M.P.H. (1967)	<i>Associate Professor of Nursing</i>
*WILLIAM RITCHIE ADAMS, Ph.D. (1926)	<i>Professor of Forestry</i>
WENDELL HUGH AFFSPRUNG, M.A. (1967)	<i>Instructor in English</i>
PAUL COMSTOCK AGNEW, M.D. (Dec. 1964)	<i>Assistant Professor of Psychology</i>
WILLIAM STEWART AGRAS, M.B.B.S. (1961)	<i>Associate Professor of Psychiatry</i>
ROBERT BASCOM AIKEN, M.D. M.P.H. (1941)	<i>Associate Professor of Community Medicine</i>
CHARLES PETER ALBRIGHT, M.D. (Jan. 1965)	<i>Instructor in Clinical Medicine</i>
PETER D. ALDEN, M.D. (1964)	<i>Instructor in Clinical Medicine</i>
CHRISTOPHER WHITNEY ALLEN, Ph.D. (1967)	<i>Assistant Professor of Chemistry</i>
MARIE FRANCES ALLEN, B.A. (1967)	<i>Instructor in Romance Languages</i>
SINCLAIR TOUSEY ALLEN, JR., M.D. (1948)	<i>Associate Professor of Medicine</i>
*ABBAS ALNASRAWI, Ph.D. (1963) ²	<i>Associate Professor of Economics and Business Administration</i>
*NORMAN ROLAND ALPERT, Ph.D. (1966)	<i>Professor of Physiology</i>
JANE P. AMBROSE (MRS. Z. P.), M.A. (1967)	<i>Instructor in Music</i>
*ZUELL PHILIP AMBROSE, Ph.D. (1962)	<i>Associate Professor of Classics</i>
ELLSWORTH LYMAN AMIDON, M.D. (1933)	<i>Professor of Medicine</i>
RICHARD WALKER AMIDON, M.D. (1949)	<i>Assistant Professor of Clinical Medicine</i>
ALISON LANE ANAND, M.A. (1967)	<i>Instructor in Music</i>
RICHARD ARNOLD ANDERSON, M.D. (1967)	<i>Instructor in Medicine</i>
ALFRED JOHN ANDREA, A.B. (1967)	<i>Instructor in History</i>
*EDWARD CLINTON ANDREWS, JR., M.D. (1958)	<i>Professor of Pathology</i>
*HEINZ LUDWIG ANSBACHER, Ph.D. (1946) ²	<i>Professor of Psychology</i>
GABOR JANOS ANTONY, M.D. (1967)	<i>Assistant Professor of Pediatrics</i>
EARL LEE ARNOLD, Ph.D. (1953)	<i>Associate Professor of Agricultural Engineering</i>
WALTER PAUL ASCHENBACH (1959)	<i>Assistant Professor of Art</i>
*HENRY VERNON AHERTON, Ph.D. (1949-51; 1953)	<i>Professor of Animal and Dairy Science</i>
ELIZABETH FISK ATWOOD, M.S. (1966)	<i>Assistant Professor of Home Economics</i>
DAVID BABBOTT, M.D. (1967)	<i>Assistant Professor of Medicine</i>
FRANK LUSK BABBOTT, JR., M.D. (1963)	<i>Associate Professor of Community Medicine</i>
*JOHN EMERSON BAKER, Ph.D. (1963)	<i>Professor of Education</i>
DONALD JAMES BALCH, Ph.D. (1952-56; 1957)	<i>Associate Professor of Animal and Dairy Science</i>
*BETTY BANDEL, Ph.D. (1947)	<i>Professor of English</i>
RALPH JOHN BANNISTER (1950)	<i>Instructor in X-Ray Technique</i>

1. Deceased January 8, 1968.

2. On leave 1967-68.

- BERNARD BENJAMIN BARNEY, M.D. (1955-63; 1964)
Assistant Professor of Clinical Surgery
- *HORACE GARDINER BARNUM, Ph.D. (1965)
Assistant Professor of Geography
- THOMAS ALAN BARTHOLOMEW, M.S.C.E. (1967)
Instructor in Civil Engineering
- *RICHMOND JAY BARTLETT, Ph.D. (1958)¹
Professor of Plant and Soil Science
- LOUISE A. BASA, B.A. (1967)
Instructor in Sociology and Anthropology
- THOMAS CLINTON BATES, M.D. (1967)
Instructor in Pediatrics
- ARTHUR ASCHER BAYER, M.A. (1967)
Assistant Professor of Economics and Business Administration
- LOIS RAE BEADLE, M.S. (1967)
Instructor in Home Economics
- PEDRO BEADE, M.A. (1966)
Instructor in Romance Languages
- WILLIAM JOHN BECKETT, Ph.D. (1960)
Assistant Professor of Philosophy and Religion
- WARREN LAZELL BEEKEN, M.D. (1965)
Assistant Professor of Medicine
- JOHN FRYE BELL, M.D. (1947)
Associate Professor of Orthopedic Surgery
- JOYCE ROCKENBACH BELL (MRS. R. T.), M.S. (1958)
Instructor in Nursing
- *ROSS TAYLOR BELL, Ph.D. (1955)¹
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
- HENRY WEINBERG BERGER, Ph.D. (1965)
Assistant Professor of History
- RENEE KIRSCH BERGNER, M.D. (1965)
Instructor (Clinical) in Pediatrics
- GARY ROBERT BICE, M.S. (Jan. 1966)
Assistant Professor of Agricultural Education
- 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
- DONALD ALAN BLOCH, M.D. (Jan. 1965)
Associate Professor of Clinical Psychiatry
- JOHN DOUGLAS BOARDMAN, M.D. (1955)
Assistant Professor of Clinical Obstetrics and Gynecology
- *SAMUEL NATHANIEL BOGORAD, Ph.D. (1946)
Professor of English
- *BETTY MACHTEL BOLLER, D.ED. (1960)
Associate Professor of Education
- *WESSON DUDLEY BOLTON, D.V.M. (1950)
Professor of Animal Pathology
- JOSEPH BORNSTEIN, M.S.
Assistant Professor of Agricultural Engineering
- ARTHUR JOSEPH BOTTING, M.D. (1967)
Assistant Professor of Pathology
- RICHARD EMILE BOUCHARD, M.D. (1955)
Assistant Professor of Clinical Medicine
- DAVID JOHN BOULLIN, Ph.D. (1967)
Associate Professor of Pharmacology
- BERTIE REYNOLD BOYCE, Ph.D. (1966)
Assistant Professor of Plant and Soil Science
- WILLIAM GEORGE BRADLEY, M.S.E.E. (1966)
Instructor in Electrical Engineering
- MARY EVELYN BREEN, B.S. (1957)
Instructor in Medical Technology (Pathology)
- HORACE WILKINSON BRIGGS, II, M.A.L.D. (1964)
Instructor in Political Science
- 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
- CONSTANCE LORRAINE BROWN, M.S. (1928)
Associate Professor of Chemistry
- DEWEES HAROLD BROWN, M.D. (1963)
Instructor in Community Medicine
- 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
- LEO DANIEL BURNS, M.A. (1965)
Instructor in Mathematics
- STANLEY LIVINGSTON BURNS, JR., M.D. (1960)
Associate Professor of Medicine
- 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

1. Sabbatical leave second semester 1967-68.

- MAURICE RAYMOND CARON, M.D. (1953) *Instructor in Clinical Psychiatry*
 HOWARD JULIAN CARPENTER, M.S. (1947) *Associate Professor of Mechanical Engineering*
 *ROBERT WAYNE CASWELL, Ph.D. (1960) *Associate Professor of English*
 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) *Professor of Psychology*
 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*
 *ROBERT KENNETH CHIPMAN, Ph.D. (1962) *Associate Professor of Zoology*
 RUPERT ADDISON CHITTICK, M.D. (1944) *Professor of Psychiatry*
 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*
 MARGARET ISABELLE CLARK, M.S. (1965) *Instructor in Home Economics*
 PAUL DENNISON CLARK, M.D. (1930) *Associate Professor of Clinical Pediatrics*
 VIRGINIA PRESCOTT CLARK (MRS. H. L.), M.A. (1963; 1965) *Instructor in English*
 *JACKSON JOSHUA WALTER CLEMMONS, M.D. (1962) *Associate Professor of Pathology*
 *ROBERT WILLARD COCHRAN, Ph.D. (1954) *Associate Professor of English*
 JULIUS GEORGE COHEN, M.D. (1950) *Associate Professor of Clinical Psychiatry*
 FRANCIS PEABODY COLBURN, Ph.B. (1942) *Professor of Art*
 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) *Assistant Professor of Botany*
 *ROBERT WILLIAM COON, M.D. (1955) *Professor of Pathology*
 *REX DEE COUCH, M.D. (1962) *Associate Professor of Pathology*
 WILTON WARNER COVEY, M.D. (1966) *Clinical Instructor in Psychiatry*
 ALBERT JAMES CRANDALL, M.D. (1939) *Instructor in Clinical Surgery*
 EDWARD BYINGTON CRANE, M.D. (Jan., 1961) *Instructor in Community Medicine (General Practice)*
 DEANNA EARLENE CRISPIN, M.A. (1966) *Instructor in Romance Languages*
 GEORGE CHAPMAN CROOKS, Ph.D. (1930) *Associate Professor of Chemistry*
 *ALBERT DARY CROWELL, Ph.D. (1955)¹ *Professor of Physics*
 JAMES OWEN CULVER, M.D. (1959) *Assistant Professor of Community Medicine*
 JOHN CHARLES CUNNINGHAM, M.D. (1949) *Shipman Professor of Ophthalmology*
 FLORENCE MARY CZERNIAWSKI, B.A. (1967) *Instructor in Medical Technology (Pathology)*
 *MALCOLM DANIEL DAGGETT, Ph.D. (1945) *Professor of Romance Languages*
 JOHN FIDLAR DALY, M.D. (1949) *Professor of Dermatology*
 *ROBERT VINCENT DANIELS, Ph.D. (1956-57; 1958) *Professor of History*
 HANLYN WILKINS DAVIES, M.F.A. (1966) *Instructor in Art*
 PHILIP HOVEY DAVIS, M.D. (1958) *Assistant Professor of Clinical Orthopedic Surgery*
 *JEAN MARGARET DAVISON, Ph.D. (1955)² *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) *Instructor in Surgery*
 WILLIAM NELSON DEANE, Ph.D. (1960) *Assistant Professor of Social Psychiatry*
 JANET MARIE DEARCOPP, M.Ed. (1967) *Instructor in Physical Education for Women*
 *LUBOMIR ATANASOV DELINESCEFF DELLIN, J.S.D. (1957)² *Professor of Economics and Business Administration*
 JEAN PIERRE DE LOESCHNIGG, M.A. (1965) *Instructor in Romance Languages*
 NANCY DEMAND, Ph.D. (1967) *Assistant Professor of Philosophy and Religion*

1. Sabbatical leave second semester 1967-68.

2. Sabbatical leave 1967-68.

- ALINE LOUISE DEMERS, M.S. (1960) *Assistant Professor of Nursing*
 GINO ALDO DENTE, M.D. (1950) *Associate Professor of Clinical Anesthesiology*
 MARY CAROLYN DE PALMA (MRS. B.), M.A. (1966) *Instructor in Nursing*
 DAVID ALLEN DEPATIE, Ph.D. (1967) *Assistant Professor of Physics*
 ROBERT WARREN DETENBECK, Ph.D. (1967) *Associate Professor of Physics*
 NANCY ELEANOR DeVORE, M.S.N. (1966) *Instructor in Nursing*
 WILLIAM MONTGOMERY DIAMOND, Ph.D. (1966) *Associate Professor of Economics and Business Administration*
 ALBERT INSKIP DICKERSON, JR., B.A. (1966) *Instructor in English*
 MARY JANE PHILLIPS DICKERSON (MRS. A. L.), M.A. (1966) *Instructor in English*
 ROBERT BRUCE DICKSON, M.S. (1963-64; 1966) *Instructor in Mathematics*
 RAYMOND GEORGE DILLEY, M.A. (1965) *Instructor in Speech*
 CARROLL WILLIAM DODGE, Ph.D. (1963) *Visiting Professor of Botany*
 RAYMOND MADIFORD FEARDON DONAGHY, M.D. (1946) *Professor of Neurosurgery*
 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*
 DAVID CLIFTON DREW, M.A. (1967) *Lecturer in Mathematics*
 *HOWARD DUCHACEK, M.S.A.E. (1949) *Associate Professor of Mechanical Engineering*
 DAVID RICHARD DUFFELL, M.D. (Jan., 1968) *Assistant Professor of Pathology*
 CHARLES ROGER DUNHAM, M.S. (1967) *Instructor in Civil Engineering*
 *FRED WILLIAM DUNIhue, Ph.D. (1936) *Professor of Anatomy*
 THOMAS CALVIN DUNKLEY, M.Ed. (1966) *Assistant Professor of Physical Education for Men*
 HERBERT ASHLEY DURFEE, JR., M.D. (1957) *Associate Professor of Clinical Obstetrics and Gynecology*
 WINFIELD BOOTH DURRELL, D.V.M. (1949) *Associate Professor of Animal Pathology*
 *ALEXANDER HARRY DUTHIE, Ph.D. (Feb., 1964) *Assistant Professor of Animal and Dairy Science*
 *JULIUS SOLOMON DWORK, Ph.D. (1954) *Associate Professor of Mathematics*
 *GEORGE DYKHUIZEN, Ph.D. (1926) *Marsb Professor of Intellectual and Moral Philosophy*
 OLIVER ROLFE EASTMAN, M.D. (1948) *Associate Professor of Clinical 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. (1963-64; 1967) *Assistant Professor of Speech*
 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*
 FAITH GRISCOM EMERSON, M.A. (1959) *Assistant 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*
 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*
 WILLIAM THOMAS FAGAN, JR., M.D. (1954) *Assistant Professor of Clinical Urology*
 DAVID SPERBER FAIGEL, D.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*
 JOHN EDWARD FARNHAM, D.D.S. (1963) *Clinical Instructor in Dental Hygiene*
 HELEN ELIZABETH FARRINGTON, M.P.H. (1962) *Assistant Professor of Nursing*

- DOUGLAS PATTEN FAY, M.S. (1953) *Associate Professor of Civil Engineering*
 MARY PAULA FEIDNER (MRS. E. J.), B.S. (1965) *Instructor in Speech*
 *JEREMY POLLARD FELT, Ph.D. (1957) *Associate Professor of History*
 PETER MICHAEL FICHTE, Ph.D. (1967) *Instructor in Chemistry*
 CHARLES LYNN FIFE, Ph.D. (Dec., 1966) *Assistant Professor of Agricultural Economics*
 JOHN RICHARD FITZGERALD, M.D. (1961) *Instructor in Clinical Medicine*
 ROBERT FITZSIMMONS, Ph.D. (1949)¹ *Associate Professor of Animal and Dairy Science*
 MARTIN EDWARD FLANAGAN, M.D. (1962) *Assistant Professor of Clinical Neurosurgery*
 *TED BENJAMIN FLANAGAN, Ph.D. (1961)² *Associate 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*
 JOHN LOUIS PHILIPPE FOREST, M.D. (1942) *Assistant Professor of Clinical Psychiatry*
 *DONALD GABRIEL FORGAYS, Ph.D. (1964) *Professor of Psychology*
 ROSE JULIET FORGIONE, M.A. (1964) *Assistant Professor of Nursing*
 BEN RALPH FORSYTH, M.D. (1966) *Associate Professor of Medicine*
 ELIZABETH HELD FORSYTH (MRS. B. R.), M.D. (1967) *Instructor in Psychiatry*
 HOWARD D. FRASER, B.S., Major, United States Army (1965) *Instructor in Military Science*
 STEVEN LESLIE FREEDMAN, Ph.D. (1965) *Assistant Professor of Anatomy*
 EDWARD ESAU FRIEDMAN, M.D. (1963) *Clinical Instructor in Community Medicine*
 ROBERT WEEKS FULLER, M.S. (Jan., 1966) *Assistant Professor of Forestry*
 DANIEL WAYNE GADE, Ph.D. (1966) *Assistant Professor of Geography*
 MARY KILGORE GADE, M.A. (1967) *Instructor in Geography*
 *FRED WILLIAM GALLAGHER, Ph.D. (1944) *Professor of Medical Microbiology*
 JOSEPH HERBERT GANS, Ph.D. (1967) *Associate Professor of Pharmacology*
 EDWARD CHARLES GANZ, A.M. (1967) *Instructor in German*
 WILLIAM GILBERT GARD, Ph.D. (1966) *Assistant Professor of History*
 BRUCE ARTHUR GAYLORD, Ed.D. (Feb., 1960) *Associate Professor of Agricultural Education*
 ALEXANDER SALIM GEHA, M.D. (1967) *Assistant Professor of Thoracic Surgery*
 MARIE GONTIER GENO (MRS. T. H.), M.A. (1966) *Instructor in Romance Languages*
 THOMAS HOWARD GENO, M.A. (1965) *Instructor in Romance Languages*
 STOKES GENTRY, M.D. (1962) *Assistant Professor of Clinical Pediatrics*
 ANTONIO ISAIAS GERMAN, M.D. (1965) *Instructor in Pathology*
 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) *Professor of Classical Languages*
 HARRIET ELLEN GILLETTE, M.D. (1966) *Associate Professor of Physical Medicine and Rehabilitation*
 *ERLAND CHENEY GJESSING, Ph.D. (1954) *Associate Professor of Biochemistry*
 *RICHARD WILLIAM GLADE, Ph.D. (1958) *Professor of Zoology*
 ARTHUR GLADSTONE, M.D. (1933-36; 1941) *Professor of Clinical Surgery*
 CHARLES MORTON GLUCK, M.D. (1965) *Instructor in Clinical Medicine*
 ROBERT JOHN GOBIN, Ph.D. (1965) *Assistant Professor of Physical Education for Men*
 RICHARD HERRON GOLDSBOROUGH, M.D. (1961) *Instructor in Clinical Otolaryngology*
 *LYMAN JAY GOULD, Ph.D. (1953) *Professor of Political Science*
 CORNELIUS O. GRANAL, JR., M.D. (1967) *Instructor in Obstetrics and Gynecology*
 RAYMOND WALLACE GRANT, Ph.D. (1965) *Assistant Professor of Geology*
 DUANE EDGAR GRAVELINE, M.D. (1966) *Clinical Instructor in Medicine*
 DAVID HENRY GRAY, M.D. (1962) *Clinical Instructor in Community Medicine*
 MARY JANE GRAY, M.D. (1960) *Associate Professor of Obstetrics and Gynecology*
 *DONALD CROWTHER GREGG, Ph.D. (1946) *Pomeroy Professor of Chemistry*
 *EDWIN CHARLES GREIF, M.S. (1950) *Professor of Economics and Business Administration*
 HAROLD ALFRED GREIG, M.P.E. (1962) *Assistant Professor of Physical Education for Men*
 HOWARD THEODORE GUARE, M.D. (1952) *Assistant Professor of Clinical Radiology*

1. Deceased March 31, 1967.

2. Sabbatical leave 1967-68.

- ROBERT CESARE GUIDULI, M.D. (1966) *Instructor in Ophthalmology*
 DIETER WALTER GUMP, M.D. (1966) *Assistant Professor of Medicine*
 CHARLES RICHARD HADDEN, D.D.S. (1966) *Instructor in Dental Hygiene*
 CARLETON RAYMOND HAINES, M.D. (1950-52; 1954) *Assistant Professor of Clinical Surgery (Oncology)*
- PUZANT SETRAK HALEBIAN, D.D.S. (1965) *Instructor in Dental Hygiene*
 MARY STARRITT HALL (MRS. R. W.), Ph.D. (1961-62; 1965) *Instructor in English*
 *ROBERT WILLIAM HALL, Ph.D. (1957-63; 1964) *Professor of Philosophy and Religion*
 *SAMUEL B. HAND, Ph.D. (Feb., 1961) *Associate Professor of History*
 PETER ROBERT HANNAH, Ph.D. (Jan., 1967) *Assistant Professor of Forestry*
 JOHN SHERWOOD HANSON, M.D. (1958) *Associate Professor of Medicine*
 JOHN FARWELL HARWOOD, B.S. (1964) *Instructor in Radiology*
 *ROLF NORDAHL BRUN HAUGEN, Ph.D. (1947) *Professor of Political Science*
 WILLIAM A. HAVILAND, Ph.D. (1965) *Assistant Professor of Sociology and Anthropology*
 MARGARET ELLEN HAYES, M.S. (1966) *Instructor in Physical Education for Women*
 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*
- PETER ROBERT HEITKAMP, M.A. (1965) *Instructor in Romance Languages*
 DONALD CEDRIC HENDERSON, M.S. (1944) *Associate Professor of Poultry Science*
 GILLES PIERRE HENNEQUIN, Cert. (1967) *Visiting Assistant Professor of History*
 *EARL BENNETTE HENSON, Ph.D. (1965) *Associate Professor of Zoology*
 ROBERT HEUSSLER, Ph.D. (1966) *Associate Professor of History*
 *RAUL HILBERG, Ph.D. (1956)¹ *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)² *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*
 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*
 *GEORGE RICHARD HOWE, Ph.D. (1962) *Assistant Professor of Physiology*
 JAMES ROBINSON HOWE, M.A. (1964) *Instructor in English*
 DAVID CHARLES HOWELL, Ph.D. (1967) *Assistant Professor of Psychology*
 ROBERT BRUCE HUBER, Ph.D. (1946) *Lawrence Professor of Forensics*
 HANS ROSENSTOCK HUESSY, M.D. (1960) *Associate Professor of Psychiatry*
 *MURIEL JOY HUGHES, Ph.D. (1942-44; 1945) *Professor of English*
 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*
 *BEAL BAKER HYDE, Ph.D. (1965) *Professor of Botany*
 ROBERT WELLS HYDE, M.D. (1967) *Associate Professor of Psychiatry*
 EDWARD SUTER IRWIN, M.D. (Jan., 1963) *Instructor in Ophthalmology*
 *JOSEPH ANTHONY IZZO, Ph.D. (1956) *Associate Professor of Mathematics*
 *JULIAN JOSEPH JAFFE, Ph.D. (1961)³ *Professor of Pharmacology*
 CLINTON DALES JANNEY, Ph.D. (1959) *Associate Professor of Radiologic Physics*
 RICHARD HARRY JANSON, Ph.D. (1958) *Associate 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*
 GERALDINE M. JENNINGS (MRS. C. D.), B.S. (Jan., 1967) *Instructor in Nursing*
 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*

1. Sabbatical leave second semester 1967-68.
2. On military leave 1966-68.
3. Sabbatical leave 1967-68.

- *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
- EVAN PAUL JORDAN, Ph.D. (1966)
Associate Professor of Speech
- *DAVID WILLIAM JUENKER, 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)
Assistant Professor of Medicine
- JAY EDGAR KELLER, M.D. (1950)
Assistant Professor of Clinical Surgery
- ROBERT COLLAMER KELLY, M.S. (1963)
Instructor in Economics and Business Administration
- MARK CLARK KENNEDY, M.A. (1965)
Assistant Professor of Sociology and Anthropology
- *RAMAKANT GOVIND KHAZANIE, Ph.D. (1965)
Assistant Professor of Mathematics
- THOMAS CLAIR KING, Ed.D. (1951)
Professor of Education
- *DAVID LESLIE KINSEY, Ph.D. (1950)
Associate Professor of Music
- FREDERIC KIRK, JR., B.A. (1966)
Assistant Professor of Political Science
- THOMAS ROBERT KLEH, M.D. (1965)
Instructor in Ophthalmology
- RICHARD M. KLEIN, Ph.D. (1967)
Professor of Botany
- MARTHA FITZGERALD KNIGHT, B.S. (1965)
Instructor in Dental Hygiene
- STEPHEN CECIL KNIGHT, JR., M.S. (1952)
Associate Professor of Civil Engineering
- ESTHER LUCILE KNOWLES, M.S. (1945)
Associate Professor of Home Economics
- MAURICE EMILE KOHLER, M.A. (1965)
Assistant Professor of Romance Languages
- MOLLY MOORE KOHLER (MRS. M. E.), M.A. (1967)
Instructor in English
- LORRAINE BAGDON KORSON, M.S. (Feb., 1964)
Instructor in Zoology
- *ROY KORSON, M.D. (1950-52; 1954)
Professor of Pathology
- *ANDREW PAUL KRAPCHO, Ph.D. (1960)
Associate Professor of Chemistry
- BETTY LINN KRIKORIAN, M.A. (1967)
Instructor in Romance Languages
- *JOHN ERNEST KRIZAN, Ph.D. (1962)
Associate Professor of Physics
- *MARTIN ERIC KUEHNE, Ph.D. (1961)
Associate Professor of Chemistry
- RAYMOND FRANK KUHLMANN, M.D. (1951)
Associate Professor of Clinical Orthopedic Surgery
- ARTHUR SAUL KUNIN, M.D. (1957)
Assistant Professor of Medicine and Clinical Biochemistry
- EDWARD ANTHONY KUPIC, M.D. (Nov., 1966)
Assistant Professor of Radiology
- *BERT KARL KUSSEROW, M.D. (1959)
Professor of Pathology
- MARY ELIZABETH LAFERRIERE (MRS. L. L.), M.S. (1966)
Instructor in Nursing
- *DAVID CHIN LAI, Eng.D. (1965)
Associate Professor of Electrical Engineering
- DENIS EMERY LAMBERT, M.A. (1964)
Instructor in 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)
- RALPH ROBERT LAPOINTE, M.Ed. (1951)¹
Assistant Professor of Physical Education for Men
- JEAN-PIERRE LASCOUMES, LIC. (1964)
Instructor in Romance Languages
- ROBERT JOHN LAVALLEE, Ph.D. (1967)
Assistant Professor of Psychology
- *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

1. Deceased September 13, 1967.

- *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) *Assistant Professor of Medicine*
 GORDON FIELDING LEWIS, Ph.D. (1961) *Associate Professor of Sociology and Anthropology*
 WILLIAM J. LEWIS, Ph.D. (1954)¹ *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*
 ROSALIE MAY LOMBARD, M.A. (1959) *Associate Professor of Nursing*
 *NORMAN THEODORE LONDON, Ed.D. (1960) *Associate Professor of Speech*
 LITTLETON LONG, Ph.D. (1949)² *Associate Professor of English*
 DAVID ROGER LONGACRE, M.A., Colonel, United States Army (1966) *Professor of Military Science*
 JEROLD FRANCIS LUCEY, M.D. (1956) *Professor of Pediatrics*
 *WILLIAM HOSSFELD LUGINBUHL, M.D. (1960) *Associate Professor of Pathology*
 *ELEANOR MERRIFIELD LUSE, Ph.D. (1947) *Professor of Speech*
 JOHN HAMILTON MABRY, Ph.D. (1963) *Associate 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*
 JAMES ROBERTSON MACKENZIE, M.D.C.M. (1966) *Assistant Professor of Surgery*
 *WILLIAM HOOPER MACMILLAN, Ph.D. (1954) *Professor of Pharmacology*
 JAMES FREDERICK MADISON, M.D. (Nov., 1964) *Assistant Professor of Clinical Dermatology*
 JOHN VAN SICKLEN MAECK, M.D. (1950) *Professor of Obstetrics and Gynecology*
 FRANK MANCHEL, Ed.D. (1967) *Associate Professor of English*
 JAMES EDWARD MARCEAU, D.D.S. (1949-52; 1954) *Instructor in Dental Hygiene*
 DONALD FRANKLIN MARN, M.A. (1964) *Instructor in Mathematics*
 CARLTON DEAN MARSHALL, M.D. (1966) *Clinical Instructor in Psychiatry*
 GILBERT ADAMS MARSHALL, M.S. (1947) *Associate Professor of Mechanical Engineering*
 KATHLEEN AUDREY MARSLAND, M.S. (1964) *Instructor in Nursing*
 THOMAS WILLIAMS MARTENIS, M.D. (1967) *Instructor in Medicine*
 HERBERT LLOYD MARTIN, M.D. (1954) *Associate Professor of Clinical Neurology*
 LUTHER HOWARD MARTIN, S.T.M. (1967) *Instructor in Philosophy and Religion*
 FRANK MARTINEK, Ph.D. (1967) *Associate Professor of Mechanical Engineering*
 *JAMES WALLACE MARVIN, Ph.D. (1939) *Professor of Botany*
 GUISTINO NICHOLAS MASTRO, B.S.M.E. (1966) *Instructor in Mechanical Engineering*
 ROBERT ARTHUR MAXWELL, Ph.D. (1962-65; 1967) *Visiting Professor of Pharmacology*
 ANTHONY JOHN MAYHEW, Ph.D. (1965) *Assistant Professor of Psychology*
 JOHN EDMUND MAZUZAN, JR., M.D. (1959) *Associate Professor of Anesthesiology*
 CHRISTOPHER PATRICK McAREE, M.B. (1962) *Assistant Professor of Psychiatry*
 *HERBERT CHRISTIAN McARTHUR, Ph.D. (1950) *Professor of English*
 THOMAS GORDON McCARTY, M.A. (1967) *Instructor in Classics*
 JOHN JOSEPH McCORMACK, JR., Ph.D. (1966) *Assistant Professor of Pharmacology*
 MAXWELL L. McCORMACK, D.F. (1964) *Assistant Professor of Forestry*
 *H. LAWRENCE McCORREY, Ph.D. (1966) *Assistant Professor of Physiology*
 JAMES BISHOP McGILL, M.D. (1952) *Assistant Professor of Clinical Surgery*
 GERALD FRANCIS McGINNISS, M.D. (1962) *Assistant Professor of Psychiatry*
 *JERRY LEON McINTOSH, Ph.D. (1964) *Assistant Professor of Plant and Soil Science*

1. Sabbatical leave 1967-68.

2. Sabbatical leave first semester 1967-68.

- ROBERT JAMES McKAY, JR., M.D. (1949) *Professor of Pediatrics*
 MARION CLAIRE McKEE, M.D. (1958) *Assistant Professor of Clinical Pediatrics*
 HUGH STRATTON McKENZIE, Ph.D. (1967) *Assistant Professor of Education*
 BRUCE ALLAN McNALLIE, M.A. (1964) *Instructor in English*
 E. DOUGLAS McSWEENEY, JR., M.D. (1964) *Instructor in Surgery*
 HAROLD EDWARD MEDIVETSKY, M.D. (1937) *Assistant Professor of Clinical Medicine*
 CORNELIUS IRVING MEEKER, M.D. (1962) *Assistant Professor of Obstetrics and Gynecology*
 HAROLD AUSTIN MEEKS, Ph.D. (1964) *Assistant Professor of Geography*
 RICHARD WALLACE PAUL MELLISH, M.B. (1963) *Associate Professor of Surgery*
 *DONALD BURTON MELVILLE, Ph.D. (1960) *Professor of Biochemistry*
 *BRUCE ELWYN MESERVE, Ph.D. (1964) *Professor of Mathematics*
 WILLIAM CRAIG METCALFE, Ph.D. (1963) *Assistant Professor of History*
 *WILLIAM LAROS MEYER, Ph.D. (1962) *Assistant Professor of Biochemistry*
 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) *Professor of Civil Engineering*
 *EDWARD JERVIS MILES, Ph.D. (1962) *Professor of Geography*
 DONALD BARKER MILLER, M.D. (1951) *Associate Professor of Clinical Surgery (Thoracic)*
 GARY EARLE MILLER, M.A. (1966) *Instructor in English*
 JEAN BEATTIE MILLIGAN, M.A. (1953)¹ *Associate Professor of Nursing*
 ERNEST LEE MILLS, M.D. (1952-53; 1955) *Associate Professor of Clinical Anesthesiology*
 ISABEL CLARK MILLS (MRS. C. H.), M.A. (1932) *Associate Professor of Art*
 MALCOLM CLARK MILLS, M.B.A. (1967) *Assistant Professor of Economics and Business Administration*
 JOHN HOLLISTER MILNE, M.D. (1964) *Instructor in Clinical Medicine*
 HOWARD JAY MINDELL, M.D. (1967) *Instructor in Clinical Radiology*
 WILLIAM EDWARD MITCHELL, M.A. (1967) *Assistant Professor of Psychiatry*
 THOMAS JOHN MOHRING, Ph.D. (Jan., 1968) *Assistant Professor of Microbiology*
 MAURICE EDWARD MONGEON, M.D. (1966) *Instructor in Medicine*
 DALE BISHOP MONTGOMERY, D.M.D. (Feb., 1965) *Instructor in Dental Hygiene*
 *PAUL AMOS MOODY, Ph.D. (1927) *Howard Professor of Natural History and Zoology*
 DOROTHY JACKSON MORROW (MRS. R. C.), M.D. (1952) *Assistant Professor of Clinical Pediatrics*
 RUFUS CLEGG MORROW, M.D. (1951) *Professor of Otolaryngology*
 *ELLEN HASTINGS MORSE, Ph.D. (1960) *Associate Professor of Home Economics*
 *DONALD EUGENE MOSER, Ph.D. (1960) *Associate Professor of Mathematics*
 MICHAEL JEROME MOYNIHAN, M.D. (1966) *Instructor in Medicine*
 HENRY NICHOLAS MULLER, III, B.A. (1966) *Instructor in History*
 RICHARD E. MUSTY, M.A. (Jan., 1968) *Assistant Professor of Psychology*
 HARRY EUGENE MYERS, M.A. (1966) *Instructor in Speech*
 *MILTON JOSEPH NADWORNYY, Ph.D. (1952)² *Professor of Economics and Business Administration*
 *AMIR NEZAMEDDIN NAHAVANDI, Ph.D. (Jan., 1967) *Professor of Mechanical Engineering*
 NARAYAN KRISHNACHARYA NARGUND, M.A. (1966) *Assistant Professor of Economics and Business Administration*
 RICHARD MITTON NARKEWICZ, M.D. (1966) *Clinical Instructor in Pediatrics*
 AUDREY JEANNE NAYLOR, M.D. (1967) *Assistant Professor of Community Medicine*
 WILLIAM HOWARD NEDDE, JR., M.S. (1967) *Instructor in Physical Education for Men*
 DONALD EDWARD NEVIN, M.A. (1966) *Instructor in Mathematics*
 DAVID S. NEWCOMBE, M.D. (1967) *Associate Professor of Medicine*
 CHESTER ALBERT NEWHALL, M.D. (1929) *Tbayer Professor of Anatomy*
 GEORGE HUBERT NICHOLSON, A.M. (1923) *Associate Professor of 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*
 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) *Professor of Physics*

1. On leave 1966-68.

2. On leave 1967-68.

- *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)
Assistant Professor of Military Science
- HERLUF V. OLSEN, JR., M.H.A. (1967) *Professor of Hospital Administration*
- *RALPH HARRY ORTH, Ph.D. (1959)¹ *Associate Professor of English*
- CLARE MARSHALL O'SHEA, M.D. (1967) *Instructor in Psychiatry*
- *JOHN OGDEN OUTWATER, Sc.D. (1956) *Professor of Mechanical Engineering*
- JAMES STEVEN PACY, M.A. (1967) *Assistant Professor of Political Science*
- WILLIAM EDWARD PADEN, Ph.D. (1965) *Instructor in Philosophy and Religion*
- PAUL PAGANUZZI, Ph.D. (1961) *Associate Professor of Russian*
- HAROLD GORDON PAGE, M.D. (1954) *Professor of Clinical Surgery*
- MARY ELLEN PALMER (MRS. E. M.), (1953-56; 1958) *Associate Professor of Nursing*
- *IPPOCRATES PAPPOUTSAKIS, Mus.M. (1944) *Professor of Music*
- MALCOLM SKEELS PARKER, D.M.L. (1953) *Associate Professor of Romance Languages*
- RODNEY LAWRENCE PARSONS, Ph.D. (1967)
Assistant Professor of Physiology and Biophysics
- *WAYNE CURTIS PATTERSON, Ph.D. (Jan., 1965) *Assistant Professor of Psychology*
- EDWIN MATTSON PAXSON, M.D. (1957) *Assistant Professor of Clinical Pediatrics*
- 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*
- JAMES ALLAN PETERSON, M.Ed. (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) *Assistant Professor of Education*
- ERDWIN H. PFUHL, Ph.D. (1966) *Associate Professor of Sociology and Anthropology*
- CHARLES ALAN PHILLIPS, M.D. (1966) *Assistant Professor of Medicine*
- LORRAINE WATERS PHILLIPS, M.N. (1962)² *Assistant Professor of Nursing*
- RAYMOND VIRGIL PHILLIPS, Ph.D. (1961) *Professor of Education*
- GHITA MARINGER PICOFF (MRS. R. C.), M.A. (1967) *Instructor in English*
- 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)
Frederick Corse Professor of English Language and Literature
- 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*
- ANN WENDY PRESTON, M.A. (1966) *Assistant Professor of Romance Languages*
- FAITH KENYON PRIOR, B.S. (1967) *Assistant Professor of Home Economics*
- RALPH SMITH PROVOST, D.D.S. (1963) *Instructor in Dental Hygiene*
- SYLVIA JANE QUACKENBUSH, M.S. (1966) *Assistant Professor of Home Economics*
- 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) *Associate Professor of Agricultural Biochemistry*
- LESLIE SUE RADCLIFFE, M.A. (1967) *Instructor in Romance Languages*
- RUSSELL SPENCE RATCLIFFE, Ed.D. (1967) *Associate Professor of Education*
- CHARLES LEWIS RAVARIS, M.D. (1965) *Assistant Professor of Psychiatry*
- LOUISE ADELE RAYNOR, Ph.D. (1946) *Associate Professor of Botany*
- THOMAS LAWRENCE READ, D.M.A. (1967) *Assistant Professor of Music*
- JOHN ANDREW REDMOND, Ed.D. (1965) *Associate Professor of Education*

1. Sabbatical leave 1967-68.

2. On leave 1967-68.

- ELMER McCREADY REED, M.D. (1948) *Assistant Professor of Otolaryngology*
 ERNEST MARVIN I. REIT, Ph.D. (Jan., 1966) *Assistant Professor of Pharmacology*
 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*
 JACK DAVID RIVES, B.S., Captain, United States Army (1965) *Assistant Professor of Military Science*
 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*
 THOMAS K. RONEY, M.A. (1967) *Instructor in Mathematics*
 BARBARA JEAN ROSE, B.S. (1967) *Instructor in Physical Education for Women*
 *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)*
 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)¹ *Professor of Philosophy and Religion*
 *JACOB ANTHONY SAMENFINK, Ed.D. (1961) *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*
 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*
 STEPHEN PHILIP SCHEIBLE, M.A. (1965) *Instructor in Romance Languages*
 *ARNOLD HAROLD SCHEIN, Ph.D. (1947) *Associate Professor of Biochemistry*
 WILLIAM MURRELL SCHENK, M.A. (1965) *Instructor in Speech*
 FREDERICK FRANCIS SCHILLER, B.S. (1965) *Assistant Professor of Economics and Business Administration*
 ROBIN RUDOLF SCHLUNK, Ph.D. (1967) *Assistant Professor of Classics*
 *WOLFE WILHELM SCHMOKEL, Ph.D. (1962-64; 1965) *Associate Professor of History*
 EDWIN CALVIN SCHNEIDER, M.S. (1946) *Professor of Agricultural Engineering*
 *NORMAN JAMES SCHOONMAKER, Ph.D. (1956)² *Professor of Mathematics*
 *HAROLD SEESSEL SCHULTZ, Ph.D. (1946)² *Professor of History*
 HERBERT LOUIS SCHULTZ, M.A. (1957) *Assistant Professor of Music*
 GEORGE ADAM SCHUMACHER, M.D. (1950)³ *Professor of Neurology*
 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*
 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) *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. (1967) *Instructor in English*

1. Sabbatical leave first semester 1967-68.
2. Sabbatical leave 1967-68.
3. Leave of absence 1967-68.

- CHARLES DANIEL SHIELDS, M.D. (Feb., 1966)
Professor of Physical Medicine and Rehabilitation
- TAMOTSU SHINOZAKI, M.D. (1967)
Assistant Professor of Surgery
- LAURENCE FORREST SHOREY, M.S. (1926) *Associate Professor of Electrical Engineering*
- *FERDINAND JACOB MORRIS SICHEL, Ph.D. (1937)
Professor of Physiology and Biophysics
- *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
- 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 SINCLAIR, 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
- 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
- DAVID LEE SOBERS, Ph.D. (1965)
Assistant Professor of Philosophy and Religion
- FELIX SOMER, M.D. (Jan., 1965)
Instructor in Clinical Psychiatry
- MARY BETH SORRELL, B.S.N. (1967)
Instructor in Nursing
- ARTHUR BRADLEY SOULE, JR., M.D. (1929)
Professor of Radiology
- ALTON RICHARD SPARKS, B.A., Captain, United States Army (1965)
Assistant Professor of Military Science
- *THOMAS JOHN SPINNER, JR., Ph.D. (1957-59; 1962) *Assistant 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
- *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)
Assistant Professor of Political Science
- BURDETT KINNEY STEARNS, Ph.D. (Nov., 1965) *Assistant Professor of Civil Engineering*
- *FRANK LESLIE STEEVES, Ed.D. (1958)¹
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)
Instructor in Physical Education for Men
- WILLIAM HAYDN STOUCH, M.D. (1967)
Instructor in Medicine
- *NEIL RALPH STOUT, Ph.D. (1964)
Assistant Professor of History
- NORMAN KENNETH STRASSBURG, M.Ed. (1946)
Assistant Professor of Physical Education for Men
- DARBY JOHN McGANNON STRONG, M.A. (1965)
Assistant Professor of Romance Languages
- WILLIAM CRAIGIE STREET, M.D. (1963)
Assistant Professor of Anesthesiology
- 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

1. Sabbatical leave 1967-68.

- *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*
- *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*
- 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) *Instructor in Surgery*
- THOMAS DERMOTT TRAINER, M.D. (1960) *Associate Professor of Pathology*
- *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*
- 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, B.A. (1967) *Instructor in English*
- TONY C. TY, M.D. (1967) *Instructor in Surgery*
- LOUIS MALDONADO UGALDE, Ph.D. (1962) *Assistant Professor of Romance Languages*
- HENRY CARMER VAN BUREN, M.D. (1962) *Instructor in Clinical Medicine*
- FREDERICK WILLIAM VAN BUSKIRK, M.D. (1946)
Associate Professor of Clinical Radiology
- KENNETH EVERSON VARNEY, M.S. (1946) *Assistant Professor of Plant and Soil Science*
- *HUBERT WALTER VOGELMANN, Ph.D. (1955) *Associate Professor of Botany*
- JAMES ANTHONY VOLLKOMMER, M.S. (1967) *Instructor in Geology*
- WILLIAM PHILIP WAGNER, Ph.D. (1966) *Assistant Professor of Geology*
- *NELSON LEE WALBRIDGE, Ph.D. (1924) *Professor of Physics*
- HAROLD JAMES WALLACE, JR., M.D. (1964)
Assistant Professor of Clinical Medicine and Pharmacology
- LESTER JULIAN WALLMAN, M.D. (1948) *Professor of Neurosurgery*
- JOSEPH FRANKLIN WARK, D.M.D. (Nov., 1964) *Instructor in Dental Hygiene*
- RICHARD RALPH WARNER, M.A. (1967) *Assistant Professor of Political Science*
- HERBERT FRANKLIN WASS, M.A. (1964)
Assistant Professor of Economics and Business Administration
- JAMES HARVEY WATERS, Ph.D. (1965) *Assistant Professor of Chemistry*
- LELON ASHLEY WEAVER, JR., Ph.D. (1962) *Assistant Professor of Psychiatry*
- GEORGE DAYTON WEBB, Ph.D. (1966) *Assistant Professor of Physiology*
- *FRED CLARENCE WEBSTER, Ph.D. (1951-53; 1956) *Professor of Agricultural Economics*
- SELINA WILLIAMS WEBSTER (MRS. T. M.), M.S. (1960)
Assistant Professor of Home Economics
- TRUMAN MARION WEBSTER, Ph.D. (1945) *Associate Professor of German*
- MAIDA EWING WEDELL, M.A. (1967) *Instructor in Art*
- *JOHN GEORGE WEIGER, Ph.D. (1958-62; 1964) *Associate Professor of Romance Languages*
- GLENWOOD S. WEINERT, B.S. (1967) *Lecturer in Mathematics*
- FRANCIS ALEXANDER WEINRICH, M.A. (1950) *Assistant Professor of Music*
- JAMES GRAHAM WELCH, Ph.D. (Jan., 1968)
Associate Professor of Animal and Dairy Science

DAVID LLOYD WELER, Ph.D. (1967)	<i>Assistant Professor of Agricultural Biochemistry</i>
GEORGE WILLIAM WELSH, 3rd, M.D. (1956)	<i>Associate Professor of Medicine</i>
EUGEN EMMANUEL WELTIN, Dr.sc.nat. (1966)	<i>Assistant Professor of Chemistry</i>
EMMA FRANCA WENNING (MRS. J. E.), M.D. (1967)	<i>Assistant Professor of Anatomy</i>
JOHN EGMONT WENNING, M.D. (1967)	<i>Assistant Professor of Community Medicine</i>
*BRUCE RICHARD WENNER, Ph.D. (1964)	<i>Assistant Professor of Mathematics</i>
PIETER WESSELING, M.A. (1967)	<i>Assistant Professor of Romance Languages</i>
A. ARNOLD WETTSTEIN, B.A., B.D. (1967)	<i>Instructor in Philosophy and Religion</i>
WENDELL JENNISON WHITCHER, Ph.D. (1952)	<i>Associate Professor of Chemistry</i>
*JAMES FELLOWS WHITE, Ph.D. (1955)	<i>Professor of German</i>
*WILLIAM NORTH WHITE, Ph.D. (1963)	<i>Professor of Chemistry</i>
*ROY ALVIN WHITMORE, JR., M.F. (1958)	<i>Associate Professor of Forestry</i>
MARGARET BEACH WHITTLESEY, M.S.W. (1964)	<i>Assistant Professor of Home Economics</i>
ELBERT BENJAMIN WHORTON, JR., M.S. (Jan., 1968)	<i>Assistant Professor of Community Medicine</i>
*SAMUEL CLAUDE WIGGANS, Ph.D. (Feb., 1963)	<i>Professor of Plant and Soil Science</i>
JOHN GREGOR WILCOX, B.S., Captain, United States Army (1967)	<i>Assistant Professor of Military Science</i>
RAYMOND SCOTT WILKES, M.A. (1967)	<i>Instructor in Speech</i>
BLAIR WILLIAMS, M.S. (1946-48; 1949)	<i>Associate Professor of Home Economics</i>
SARAH ALLENE WISE, B.S. (1967)	<i>Instructor in Medical Technology</i>
GLEN MEREDITH WOOD, Ph.D. (1950)	<i>Associate Professor of Plant and Soil Science</i>
NORMA LOWYN WOODRUFF, M.A. (1952)	<i>Associate Professor of Nursing</i>
RICHARD S. WOODRUFF, M.D. (1950)	<i>Assistant Professor of Pathology</i>
*STUART COWAN WOODRUFF, Ph.D. (1961)	<i>Associate Professor of English</i>
WILLIAM ALOYSIUS ALFRED WOODRUFF, M.B. (1962)	<i>Assistant Professor of Psychiatry</i>
*ROBERT CUMMINGS WOODWORTH, Ph.D. (1961)	<i>Assistant Professor of Biochemistry</i>
ROBERT KINGMAN WRIGHT, Ph.D. (1966)	<i>Assistant Professor of Mathematics</i>
*CLAUS ADOLF WULFF, Ph.D. (1965)	<i>Assistant Professor of Chemistry</i>
ALBERT WILHELM WURTHMANN, M.A. (1947)	<i>Assistant Professor of German</i>
WILLIAM GREENHILL YOUNG, M.D. (1949)	<i>Associate Professor of Clinical Psychiatry</i>
WEI LIANG YU, M.D. (1966)	<i>Assistant Professor of Pediatrics</i>
LUTHER EUGEN ZAI, D.Sc.Tech. (Feb., 1963)	<i>Associate Professor of Forestry</i>
ELIZABETH K. ZIMMERLI, Ed.D. (1967)	<i>Associate Professor of Physical Education for Women</i>

Associates in Instruction and Research

ROSEMARY C. BREWSTER, M.D.	<i>Clinical Associate in Psychiatry</i>
HARRY LIVINGSTON COLOMBO, M.D.	<i>Clinical Associate in Medicine</i>
JOHN PATRICK CORLEY, M.D.	<i>Clinical Associate in Medicine</i>
WILLIAM HENRY HEININGER	<i>Clinical Associate in Medicine</i>
HERMAN CONRAD HERRLICH, Ph.D.	<i>Research Associate in Experimental Medicine</i>
J. LORIMER HOLM, M.D.	<i>Clinical Associate in Radiology</i>
YOSHINORI ISHIKAWA, D.Ag.Sci. (1966)	<i>Research Associate in Biochemistry</i>
FREDERICK MITCHELL LAING, M.S.	<i>Research Associate in Botany</i>
ELIZABETH K. LINCOLN, M.S.W.	<i>Research Associate in Psychiatry</i>
GEORGE E. LUCIA, JR., M.D.	<i>Clinical Associate in Surgery</i>
CHARLES E. MOISAN, JR., M.D.	<i>Clinical Associate in Medicine</i>
MAUREEN KATHERINE MOLLOY, M.D.	<i>Clinical Associate in Orthopedic Surgery</i>
JOHN LOUIS SAIA, M.D.	<i>Clinical Associate in Medicine</i>
NAMIK K. UZSAY, M.D.	<i>Clinical Associate in Medicine</i>
LOUIS JOSEPH WAINER, M.D.	<i>Clinical Associate in Medicine</i>
MAURICE JAMES WALSH, M.D.	<i>Clinical Associate in Medicine</i>

Other Officers of Administration

DAVID RICHARD ABBOTT, M.A.	<i>Assistant Registrar</i>
EDWIN BARTLETT ABBOTT	<i>Auditor</i>
JANE PERLIS AMBROSE, M.A.	<i>Foreign Student Adviser</i>
RICHARD WALKER AMIDON, M.D.	<i>Director of Student Health Services</i>

KARL ALBAN ANDREN, B.S.	<i>Publications Specialist</i>
HAROLD C. AVERY, JR., B.S.	<i>Associate Accountant</i>
DAVID BABBOTT, M.D.	<i>Assistant Dean, College of Medicine</i>
DAVID ALEXANDER BAIN, M.A.	<i>Director of Billings Center and Student Activities</i>
NIKOLAUS STEPHEN BARTH, B.A.	<i>Associate Accountant</i>
THOMAS D. SEYMOUR BASSETT, Ph.D.	<i>Curator, Wilbur Collection, Bailey Library and University Archivist</i>
JAMES HENRY BATES, M.Ed.	<i>Executive Assistant to Dean, College of Medicine</i>
ROBERT F. BIRNEY, B.S.	<i>Staff Associate, Institutional Research</i>
NORMAN ASHLEY BISHOP, B.S.C.E.	<i>Construction Engineer</i>
NORMAN A. BLAIR, B.S.	<i>Assistant Auditor</i>
ARTHUR M. BRINK, JR., B.S. in Ed.	<i>Alumni Secretary</i>
FLORENCE KROGMAN BRODIE	<i>Assistant Director, Purchasing</i>
WALTER G. BRUSKA, B.S.	<i>Director of Development</i>
JOHN LEWIS BUECHLER, M.A.	<i>Head of Special Collections, Bailey Library</i>
STANLEY LIVINGSTON BURNS, JR., M.D.	<i>Assistant Dean, College of Medicine</i>
JOHN ROBERT BUSHEY, B.S.	<i>Director, Evening Division, Conferences and Institutes</i>
MITCHELL NELSON CALL, A.B.	<i>Assistant to the Director of Institutional Research</i>
ROBERT WILLIAM CHAMBERS, B.A.	<i>Writer-Editor for Social Sciences and the Arts, Public Relations</i>
NORBERT FABIAN CHARBONNEAU, M.A.	<i>Operations Manager, Computation Center</i>
ROBERT KENNETH CHIPMAN, Ph.D.	<i>Assistant Dean of Graduate College</i>
THOMAS PAUL CLAIRMONT, M.Ed.	<i>Assistant Director of Admissions</i>
HAROLD SMITH CLARKE, M.Ed.	<i>Registrar</i>
GEORGE NAY CLERKIN	<i>Treasurer</i>
ROBERT EDWARD CLIFFORD, B.S.	<i>Head Football Coach</i>
ELLEN S. COLE, M.Ed.	<i>Counselor, Testing Center</i>
HAROLD CAMPBELL COLLINS, B.S.	<i>Director of Admissions</i>
JOHN HAMILTON COONS, M.S.	<i>Associate in Development</i>
JAMES MICHAEL CROSS, B.S.	<i>Head Hockey Coach</i>
RICHARD CZINA, B.E.E.	<i>Educational Television Assistant Chief Engineer</i>
ROBERT POWERS DAVISON, M.Ed.	<i>Director, Agricultural Extension Service</i>
MALIA WARDEN DEAN, B.A.	<i>Assistant Director of Financial Aid</i>
DAVID DANIEL DEMSKY	<i>Superintendent of Buildings and Grounds</i>
RAYMOND GEORGE DILLEY, M.A.	<i>Educational Television Director of In-School Services</i>
JOHN EDWARD DONNELLY, M.A.	<i>Director of Intercollegiate Athletics</i>
GERALD ALTON DONOVAN, Ph.D.	<i>Associate Director, Experiment Station</i>
HENRY MEADE DOREMUS, II, D.V.M.	<i>Director of Animal Services, Medical College</i>
WALLACE KILBY EDWARDS	<i>Educational Television Chief Engineer</i>
EDWARD JOSEPH FIEDNER, M.F.A.	<i>Director of Drama</i>
RUDOLPH J. FISCHER	<i>Assistant Superintendent of Special Construction</i>
ROBERT AUSTIN FORDHAM, M.A.	<i>Coordinator of Federal Programs</i>
JANET W. FORGAYS (MRS. D. G.), M.Ed.	<i>Counselor, Testing Center</i>
CHARLES J. FOX, B.A.	<i>Assistant Football and Hockey Coach</i>
JACKIE M. GRIBBONS, M.A.	<i>Dean of Women</i>
ROGER GRIFFITH, A.B.	<i>Science-Writer-Editor, Public Relations</i>
DOUGLAS OLIVER HANAU, M.A.	<i>Director of Placement</i>
ROLF NORDAHL BRUN HAUGEN, Ph.D.	<i>Director of Government Research Center</i>
GEORGE HEDENBURG	<i>Director of Housing</i>
FREDERICK OWEN HENEY	<i>Manager of University Store</i>
BRUCE LOGAN HEWITT, M.A.	<i>Assistant Dean of Men</i>
DAVID BYRNE HILL, Ph.D.	<i>Director, Computation Center</i>
GEORGE HARMON HUNTER, B.L.S.	<i>Medical Librarian</i>
JOSEPH ANTHONY IZZO, Ph.D.	<i>Assistant Dean, College of Technology</i>
RICHARD HARRY JANSON, Ph.D.	<i>Director of the Fleming Museum</i>
LYNVILLE WALTER JARVIS, B.A.	<i>Educational Television Producer-Director</i>
PAUL BLAKESLEE KEBABIAN, B.A., B.S.L.S.	<i>Director of Libraries</i>
A. GRANT KENNEDY	<i>Director, Data Processing Center</i>
GEORGE VINCENT KIDDER, Ph.D.	<i>Assistant to the President</i>
HARRY LIGHTHALL, Ph.D.	<i>Assistant Dean, College of Arts and Sciences</i>

GEORGE THOMAS LITTLE, Ph.D.	<i>Director of World Affairs Center</i>
JACK ERNEST LITTLE, Ph.D.	<i>Assistant Dean, Summer Session</i>
ARTHUR KENNETH LOCHE, B.S.	<i>Head Basketball Coach</i>
DAVID ROGER LONGACRE, M.A., Colonel, United States Army	<i>Professor of Military Science</i>
PROCTOR MAYO LOVELL, M.B.A.	<i>Business Manager</i>
WILLIAM HOSSFELD LUGINBUHL, M.D.	<i>Associate Dean, College of Medicine</i>
GEORGE LUHR	<i>Director, University Model Shop</i>
ARTHUR JOHN MAHONEY, B.A. ¹	<i>Assistant Director of Financial Aids</i>
DAVID BANGHART MATTHEWS, B.A.	
	<i>Director of Sports Information and Writer-Editor Student Activities, Public Relations</i>
HERBERT CHRISTIAN McARTHUR, Ph.D.	<i>Associate Dean, College of Arts and Sciences</i>
GERALD FRANCIS McGINNISS, M.D.	<i>Psychiatric Consultant, Wasson Infirmary</i>
CHARLES WILLARD NEWELL, B.S., C.P.A.	<i>Chief Accountant</i>
WILBUR E. NEWTON	<i>Assistant Superintendent of Maintenance</i>
HELEN OUSTINOFF, B.A.	<i>Assistant Director and Technical Services Librarian</i>
DONALD LeROY OWENS, B.S.	<i>Assistant Athletic Trainer</i>
GORDON PATERSON, B.S.	<i>Bursar</i>
LOUIS MICHAEL PHILLIPS, B.F.A.	<i>Educational Television Film Producer</i>
DAVID CURTIS PINKHAM, B.C.E.	<i>Director, Technical Information Center</i>
RICHARD WAYLAND POWERS, A.B.	<i>Dean of Men</i>
FRANK H. PREBLE	<i>Coordinator of Civil Defense</i>
PHYLLIS MELVILLE QUINBY, B.S.	<i>Assistant Director of School of Dental Hygiene</i>
DAVID JAMES ROBERTSON, B.F.A.	<i>Educational Television Production Manager</i>
ALBERT WILLIAM SADLER, Ph.D.	<i>Consultant on Religious Programs</i>
GEORGE SAUNDERS, B.S.	<i>Associate Accountant</i>
WADI I. SAWABINI, D.D.S.	<i>Director, School of Dental Hygiene</i>
HERBERT LOUIS SCHULTZ, M.A.	<i>Director of University Band</i>
ROBERT MICHAEL SEKERAK, Ed.D.	<i>Director of Audio-Visual Center</i>
GARRY C. SIMPSON, B.A.	<i>Educational Television Program Director</i>
HOWARD ODELL SKINNER, B.S.	<i>Educational Television Station Manager</i>
HOWARD MARSHALL SMITH, JR., M.S.	<i>Assistant to the President and Patent Officer</i>
JOHN FRANKLIN SMITH, A.B.	<i>Director of Photographic Center</i>
GLORIA ANN THOMPSON, M.A.	<i>Assistant to the Dean of Women</i>
HENRY J. TYMECKI, B.S.	<i>Director of Personnel</i>
LAWRENCE E. VAN BENTHUYSEN, B.A.	<i>Director of Public Relations</i>
JAMES NICHOLAS VLAMIS, M.A.	
	<i>Associate Director for Management Systems, Computation Center</i>
ALLEN LEE WALKER, A.M.	<i>Director of Financial Aids</i>
GEORGE DONALD WEAVER	<i>Director of Purchasing</i>
STEPHEN TOWNSEND WELCH, M.B.A.	<i>Comptroller</i>
ANNE ELIZABETH WILSON, R.N.	<i>Director of Infirmary, Health Service</i>
MARGARET MARY WING, M.A. ²	<i>Assistant Dean of Women</i>
CHARLES LEWIS WOLF, M.A.	<i>Budget Officer</i>
CONSTANCE ZOLOTAS (MRS.), B.S. ³	<i>Director of Alumni Activities</i>

Retired Officers of Administration

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

1. Resigned as of January 1, 1968.
2. Deceased May 9, 1967.
3. Resigned as of December 31, 1967.

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 DOW, Ph.D.
GERALD ALTON DONOVAN, Ph.D.

Dean and Director
Associate Director and Poultry Scientist

WILLIAM RITCHIE ADAMS, JR., Ph.D.
EARL LEE ARNOLD, Ph.D.
HENRY VERNON ATHERTON, Ph.D.
DONALD JAMES BALCH, Ph.D.
RICHMOND JAY BARTLETT, Ph.D.
MALCOLM IRVING BEVINS, M.S.
WESSON DUDLEY BOLTON, D.V.M., M.S.
BERTIE REYNOLD BOYCE, Ph.D.
WALLACE WAYNE CHRISTENSEN, Ph.D.
ROBERT PATRICK CLARK, M.S.
WINFIELD BOOTH DURRELL, D.V.M., M.S.
ALEXANDER HARRY DUTHIE, Ph.D.
MARY JANE ELLIS, M.S.
CHARLES LYNN FIFE, Ph.D.
ROBERT FITZSIMMONS, Ph.D.¹
THEODORE ROSS FLANAGAN, Ph.D.
MURRAY WILBUR FOOTE, Ph.D.
DONALD CUSHING FOSS, Ph.D.
ROBERT WEEKS FULLER, M.S.
PETER ROBERT HANNAH, Ph.D.
DONALD CEDRIC HENDERSON, M.S.
RICHARD JOHN HOPP, M.S.
BEAL BAKER HYDE, Ph.D.
DONALD BOYES JOHNSTONE, Ph.D.
DONALD EUGENE KEYSER, Ph.D.
RICHARD M. KLEIN, Ph.B.
KARIN KRISTIANSSON (MRS. G.), M.A.
FREDERICK MITCHELL LAING, M.S.
GEORGE BUTTERICK MacCOLLOM, Ph.D.
JAMES WALLACE MARVIN, Ph.D.
MAXWELL LELAND McCORMACK, D.F.
THOMAS JAMES McCORMICK, B.A.²
JERRY LEON McINTOSH, Ph.D.
SUSAN BREWSTER MERROW, M.Ed.
ELLEN HASTINGS MORSE, Ph.D.
ROGER WALTER MURRAY, D.V.M., M.S.
KAY MILLIGAN NILSON, Ph.D.
BRUCE LAWRENCE PARKER, Ph.D.
NORMAN EUGENE PELLETT, Ph.D.
BOYD WALLACE POST, D.F.
MILTON POTASH, Ph.D.
DAVID WILLIAM RACUSEN, Ph.D.
FREDERIC OBERLIN SARGENT, Ph.D.
EDWIN CALVIN SCHNEIDER, M.S.

Forester
Associate Agricultural Engineer
Dairy Bacteriologist
Associate Animal Scientist
Agronomist
Associate Agricultural Economist
Animal Pathologist
Assistant Horticulturist
Forester
Research Assistant
Associate Animal Pathologist
Assistant Dairy Chemist
Home Economist Assistant
Assistant Agricultural Economist
Assistant Dairy Scientist
Assistant Agronomist
Associate Biochemist
Post-Doctoral Fellow
Assistant Wildlife Management Specialist
Assistant Forester
Poultry Scientist
Horticulturist
Cell Biologist
Microbiologist
Assistant Biochemist
Cell Biologist
Assistant Editor
Research Associate
Associate Entomologist
Plant Physiologist
Assistant Forester
Assistant Editor
Assistant Soil Scientist
Associate Nutritionist
Associate Nutritionist
Associate Animal Pathologist
Assistant Dairy Products Specialist
Assistant Entomologist
Assistant Ornamental Horticulturist
Associate Forester
Associate Limnologist
Associate Biochemist
Resource Economist
Agricultural Engineer

1. Deceased March 31, 1967.

2. On leave September 1, 1967 to March 1, 1968.

GERARD C. SHREWSBURY, M.S.	<i>Research Associate</i>
KENNETH ROGERS SIMMONS, Ph.D.	<i>Associate Animal Pathologist</i>
ROBERT ORVILLE SINCLAIR, Ph.D.	<i>Agricultural Economist</i>
ROBERT ERIK SJOGREN, Ph.D.	<i>Assistant Microbiologist</i>
ALBERT MATTHEWS SMITH, Ph.D.	<i>Animal Scientist</i>
JOHN WALLACE SPAVEN, B.S.	<i>Editor</i>
THOMAS SPROSTON, JR., Ph.D.	<i>Plant Pathologist and Mycologist</i>
ENOCH HAROLD TOMPKINS, M.S.	<i>Associate Agricultural Economist</i>
RAYMOND HERMAN TREMBLAY, Ph.D.	<i>Agricultural Economist, Farm Management</i>
TERRY LAWRENCE TURNER, M.S.	<i>Assistant Forester</i>
KENNETH EVERSON VARNEY, M.S.	<i>Associate Agronomist</i>
KATHLEEN BEAVINGTON WEBB, B.S.	<i>Associate Editor</i>
FRED CLARENCE WEBSTER, Ph.D.	<i>Agricultural Economist, Marketing</i>
JAMES GRAHAM WELCH, Ph.D.	<i>Associate Animal Nutritionist</i>
DAVID LLOYD WELLER, Ph.D.	<i>Assistant Biochemist</i>
SAMUEL CLAUDE WIGGANS, Ph.D.	<i>Horticulturist</i>
BLAIR WILLIAMS, M.S.	<i>Home Economist</i>
ROY ALVIN WHITMORE, JR., M.F.	<i>Associate Forester</i>
GLEN MEREDITH WOOD, Ph.D.	<i>Associate Agronomist</i>
LUTHER EUGEN ZAI, Ph.D., D.Tech.Sci.	<i>Associate Forester</i>

ENGINEERING

WARREN ORVEL ESSLER, Ph.D.	<i>Director and Electrical Engineer</i>
REGINALD VENN MILBANK, M.S.	<i>Civil Engineer</i>
JOHN OGDEN OUTWATER, M.A., Sc.D.	<i>Mechanical Engineer</i>

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.	<i>Dean and Director</i>
WESSON DUDLEY BOLTON, D.V.M., M.S.	<i>Animal Pathologist</i>
HOLLIS EARL BUCKLAND, B.S.	<i>Seed Analyst</i>
WINFIELD BOOTH DURRELL, D.V.M., M.S.	<i>Associate Animal Pathologist</i>
ROGER WALTER MURRAY, D.V.M., M.S.	<i>Associate Animal Pathologist</i>
KAY MILLIGAN NILSON, Ph.D.	<i>Assistant in Dairy Manufacturing</i>
HARRY LEONARD SAWYER, JR., B.S.	<i>Associate Chemist</i>
THOMAS SPROSTON, JR., Ph.D.	<i>Plant Pathologist and Mycologist</i>
JAMES ROGER WADSWORTH, V.M.D., M.S.	<i>Animal Pathologist</i>
ROBERT THOMAS WETHERBEE, M.S.	<i>Chemist</i>

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.	<i>Dairy Bacteriologist</i>
DONALD JAMES BALCH, Ph.D.	<i>Animal Scientist</i>
MALCOLM IRVING BEVINS, M.S.	<i>Agricultural Economist</i>
CHARLES WHITNEY BIGALOW, M.S.	<i>Extension Economist, Food Marketing</i>
WESSON DUDLEY BOLTON, D.V.M., M.S.	<i>Animal Pathologist</i>
CHARLES LYMAN CALAHAN, M.S.	<i>Horticulturist</i>
MRS. ELIZABETH PERLEY DAVIS, B.S.	<i>Urban Youth Specialist</i>
WARREN ALBERT DODGE, B.S.	<i>Dairyman</i>
DWIGHT KIMBALL EDDY, B.S. ¹	<i>Agricultural Economist</i>
NORRIS ARTHUR ELLIOTT, B.S.	<i>Area Resource Development Specialist</i>
JAMES ALBERT EDGERTON, M.Ext.Ed.	<i>Area Resource Development Specialist</i>
ROBERT FITZSIMMONS, Ph.D. ²	<i>Dairy Scientist, Breeding</i>
THEODORE ROSS FLANAGAN, Ph.D.	<i>Assistant Agronomist</i>
RAYMOND THOMAS FOULDS, JR., M.F.	<i>Forester</i>
BYRON THOMAS FRENCH, M.A.T.	<i>Housing and Utilities Engineering Specialist</i>
KENNETH STEWART GIBSON, M.S.	<i>Dairyman</i>
VERLE RANDALL HOUGHABOOM, Ph.D.	<i>Agricultural Economist, Farm Management</i>
KARIN KRISTIANSSON (MRS. G.), M.A.	<i>Assistant Editor</i>
MRS. WINIFRED WOODBURY LANGTRY, B.Ed.	<i>Urban Specialist</i>
WILLIAM PATRICK LEAMY, M.S.	<i>Dairyman, DHIA</i>
JOHN JOSEPH LINDSAY, M.S.	<i>Recreation Development Specialist</i>
GEORGE BUTTERICK MacCOLLOM, Ph.D.	<i>Entomologist</i>
THOMAS JAMES McCORMICK, B.S. ¹	<i>Assistant Editor</i>
JERRY LEON McINTOSH, Ph.D.	<i>Agronomist</i>
JOHN DOTY MERCHANT, B.S.	<i>Supervisor and Program Leader (Youth Work)</i>
LEONARD SMITH MERCIA, M.S.	<i>Poultryman</i>
GORDON ROY NIELSEN, Ph.D.	<i>Entomologist</i>
NORMAN EUGENE PELLETT, Ph.D.	<i>Ornamental Horticulturist</i>
MRS. JEANIE McDONOUGH PILLSBURY, B.S.	<i>Health Education Specialist</i>
FAITH KENYON PRIOR (MRS.), M.S.	<i>Family Economist</i>
MARY PAULINE ROWE, M.E.	<i>Supervisor and Program Leader (Youth Work)</i>
FREDERIC OBERLIN SARGENT, Ph.D.	<i>Resource Economist</i>
EMERSON WARREN SHEDD, JR., M.S.	<i>Area Resource Development Specialist</i>
M. PHYLLIS McGOVERN SOULE (MRS.), B.S.	<i>State Home Economist in Rural Civil Defense</i>
JOHN WALLACE SPAVEN, B.S.	<i>Editor</i>

¹ On leave September 1, 1967 to March 1, 1968.

² Deceased March 31, 1967.

DORIS HOSMER STEELE (MRS. B.), M.A.	<i>Supervisor and Program Leader (Home Economics Work)</i>
WILLIAM WILLARD STONE, M.A.	<i>Supervisor and Rural Development Specialist</i>
KATHLEEN LEBARON STRASSBURG, B.S.	<i>Clothing Specialist</i>
ANDREW TESSMANN, B.S.	<i>Agricultural Engineer</i>
NOAH THOMPSON, B.S.	<i>Area Resource Development Specialist</i>
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2. Associate Member.

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 go 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, 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 techniques 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 Division of Health Sciences was authorized by the Board of Trustees to be in effect on July 1, 1968, bringing together several existing related programs. It includes the School of Allied Health Sciences, the School of Nursing, and the College of Medicine.

The School of Allied Health Sciences offers programs in Dental Hygiene and in Medical Technology. Additional programs, as in Radiologic Technology, are contemplated or planned. A School of Dental Hygiene was established in 1949 and became a department of the School of Allied Health Sciences in 1968; it offers a two-year program leading to a certificate in Dental Hygiene. The Department of Medical Technology offers a two-year basic program leading to a certificate, and a four-year curriculum leading to a degree.

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 Education 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. With the establishment of the

School of Nursing, a two-year curriculum leading to an associate degree will be offered, 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.

Regional Cooperation

The University of Vermont is an active participant with the other state universities of New England in a program of regional cooperation aimed at increasing educational opportunities for the qualified young men and women of the six 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 avail-

able 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 major renovation of the chemistry department facilities in Williams Science Hall was completed recently at a cost of 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 and the department of mathematics. 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 well-equipped language laboratory is maintained in the Waterman Building with 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 the Waterman Building are the Computation Center and Data Processing facilities. The I.B.M. 360, 1620, and 1130 model electronic computers are used for teaching and research and to some extent for University business operations.

In 1949, a group of modern buildings, financed by state appropriation, was erected on the East campus. These are the Hills Agricultural Science Building, 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. A Life Science Building providing teaching and research space for the departments of botany and zoology and including a lecture auditorium seating 350 was completed in 1968.

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, appropriately, 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 was 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; the late 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. This unit for men was 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 were 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 house unit, is to be constructed 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 Shelburne 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 College of Medicine

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 now underway on 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 Uni-

versity 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. The entire facility is scheduled for completion in 1968.

Development of the College of Medicine, together with the fine hospital with which the medical college is affiliated, 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.

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 microform. 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 in the Creative Arts.

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 which supplement the permanent collections by representing various aspects of painting, sculpture, graphic arts, architecture, photography and related material.

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 painting and the dance 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, Danny Kaye, 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*, *L'il 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 two extension series—one in St. Johnsbury and one in Brattleboro.

Conferences and Institutes

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

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, 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. The first semester classes are open primarily to freshmen who are selected as a result of diagnostic tests given at the beginning of the academic year. Other students may enroll in the reading program as places become available. Students who enroll must attend regularly throughout the semester.

SPEECH CLINIC Services of the speech clinic, located in Pomeroy Hall, are free to students in the University who have problems of articulation, foreign dialect, stuttering, inadequate vocal control, cerebral palsy, or hearing loss.

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 one of the modern general hospitals 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 free 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 \$8.00 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 active 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 the school year.

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 are responsible for providing opportunities for the residents to profit from the educational programs afforded by the University, intellectual, social, and cultural, and to 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. Athletic 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 land-grant colleges and 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 weekly 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.

V The Admission of Students

To be fully qualified for admission an applicant must have his 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 course work for a purpose other than the earning of a degree.

Students in either of these two categories may be full-time or part-time students.

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 1968 on November 2 and December 7, and in 1969 on January 11, March 1, May 3 and July 12. Complete information may be obtained from the College Entrance Examination Board, P. O. Box 592, Princeton, New Jersey.

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 Special Examination

A student who wishes to do so may under certain conditions receive credit for a course by taking a special examination. His request must be made in writing at least two months before the date of the examination and must have been approved by the department chairman, the academic dean, and the Committee on Student Excellence. A fee will be charged.

Normally, a student whose grade average is below 3.0 may not take such a special examination. He must not have audited or previously received a grade in the course nor have attempted a prior special examination.

Upon passing a special examination with a minimum grade of B, the student receives credit, but not a grade, for the course.

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 \$15.00 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)\$1800.00 per year

Part-time students (fewer than twelve hours) 75.00 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 charges.

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 68) 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 resident 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. Nominal 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	1800.00
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	\$2912.50

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 Bursar's Office 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-CA, 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 \$135.00, 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 \$40.00 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 \$228.00, 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 basic course. A student enrolled in the advanced course receives a uniform allowance credit of \$100.00 which is ample to defray the cost of his uniform. 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, is 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 \$25.00. 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.

	<i>Grade</i>	<i>Quality points</i>
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.
- 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; it investigates problems; it disseminates information; it renders related services. These four areas of work are performed respectively by the resident instruction division; the research division, or Vermont Agricultural Experiment Station; the extension division, or Vermont Agricultural Extension Service; and the Related Services Division.

The curricula of the resident instruction division are oriented to prepare students for professional careers. Upon receiving the bachelor's degree students are offered employment opportunities 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 has necessitated 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, in addition, 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.) Normally fifteen to eighteen credit hours of courses exclusive of courses in physical education constitute a semester program.

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.

It is desirable that students obtain work experience 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 course requirements established for the curriculum, option or program 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 is intended to provide an environment for such students which will insure that they are constantly challenged by the most advanced work their talents will allow.

Such 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 options:

Agribusiness
Agricultural economics
Agricultural education
Agricultural engineering management
Animal and dairy science
Botany

Dairy industry
Foreign agricultural economics
General agriculture
Laboratory animal technology
Plant and soil science
Poultry 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 one of the above options 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 plus one course in 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

AGRICULTURAL ECONOMICS *Agribusiness* is an option designed to meet the growing need for persons trained to handle the complex and challenging problems of administration and management of small businesses and agricultural firms. Students selecting this option prepare themselves for work in business management as well as for graduate study, extension work, and sales.

Each student in this option must complete eighteen hours of course work in agricultural economics and twelve hours of course work in economics and business administration selected with the approval of his adviser.

Agricultural Economics is the study of economic theories and principles and their application to agriculture and the rural economy. Students selecting this option may concentrate in one of three areas:

1. *Agricultural Marketing*: Relates to the broad areas of marketing agricultural products and the regulatory or statistical agencies of government concerned with marketing.
2. *Farm Management*: The management of farm businesses for profit.
3. *Resource Economics*: Changing resource use to meet regional economic developments requires an increasing number of students who understand principles of regional development and resource economics.

Through the proper selection of courses, students in any of these areas will be prepared for employment in agriculture or agriculturally-related industries, in general business and finance, in government, or for advanced study.

Each student majoring in agricultural economics must satisfactorily complete thirty hours of credit in agricultural economics or general economics, eighteen hours of which must be in agricultural economics. All courses must be selected in consultation with and have the approval of the student's departmental adviser.

Foreign Agricultural Economics prepares students for work in foreign countries with one of the many foreign aid development programs or with businesses in foreign countries. It also provides a basis for advanced work in foreign agricultural economics or with the federal government.

Students selecting this option will be required to take twelve credit hours in agricultural economics; twelve hours in economics and business administration; twelve hours in political science; twelve hours in sociology anthropology, or psychology; and six hours of a foreign language above the elementary level. All courses are selected in consultation with, and have the approval of, the student's adviser.

AGRICULTURAL EDUCATION This option prepares students to teach vocational agriculture to high school pupils, young farmers and adult farmers in the community. The program prepares individuals to serve as advisers to local FFA chapters and Young Farmer Associations in their role of developing leadership and citizenship abilities in these organizations.

Students completing this option may pursue many of the professional agricultural careers in commercial concerns, government agencies and foreign services in agricultural education.

Students are prepared to enter graduate programs in agricultural education leading to employment by technical agricultural schools, colleges or departments of education.

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

AGRICULTURAL ENGINEERING MANAGEMENT This option leads to the Bachelor of Science Degree in Agriculture. It provides the student with technical and practical instruction in agricultural engineering application and management. 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 which would be open are: Agricultural Extension; Farm Equipment Manufacture—Sales Liaison and Management; Farm Equipment Sales and Service; Agricultural Cooperative—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, and 12 semester hours in agricultural economics or commerce and economics. Also required are: engineering graphics 1, botany 1, chemistry 1-2, physics 5-6, plant & 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 AND DAIRY SCIENCE *Animal and Dairy Production*, provides technical and practical instruction in the field of animal science with emphasis on the selection, breeding, nutrition, and management of farm animals. It prepares the graduate for the operation of dairy farms and other livestock enterprises; for field work with federal and state extension services, breed associations, farm organizations and various commercial companies concerned with the animal sciences; for positions in industries related to the processing and sales of dairy products and meats, feed and grain companies, dairy equipment and supply agencies; and for advanced study.

Dairy Industry, provides technical and practical instruction to prepare the graduate for positions in either dairy technology or dairy plant management.

It prepares the individual for supervisory and management positions in the dairy industry; for quality control work in the dairy industry and allied fields; and for advanced study.

Required courses: Satisfactory completion of eight semester courses in animal and dairy science, including at least five of advanced standing. Additional courses to be selected by the student in consultation with the department in order to place the desired emphasis 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 in 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:

Botany 1
Botany 103
Chemistry 131, 132
Physics 5-6
Zoology 1

Introductory Botany
Plant Physiology
Organic Chemistry
General Physics
Introduction to Zoology

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.

POULTRY SCIENCE This option provides formal training in the theory and practice of poultry science and technology. The phases that may be emphasized are nutrition, physiology, production, marketing technology, incubation and hatchery management. This prepares the student, depending

upon curriculum emphasis, for graduate work or positions in poultry or related fields in the areas of resident teaching, extension, research, or industry.

Required courses: Four semester courses plus two semesters of seminar in poultry science. Other courses from supporting disciplines to be selected in consultation with the student's adviser and approved by the department chairman. Such a program is designed to be flexible and allow the student to meet his needs and desires.

The Agricultural Engineering Program

A. *Agricultural Engineering Management* (see the Curriculum in Agriculture, page 63).

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 that 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. Nonresident students enrolled in this program complete their last two years as transfer students to the University of Maine or to any other agricultural engineering school 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. 23	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
			Introductory Botany or Introductory Zoology, Bot. 1 or Zool. 1	.....	4

Note: The Junior and Senior years will be taken at the University of Maine under Regional Cooperation Program. (See page 30.)

The Preveterinary Program

This program offers preparation for entrance to colleges of veterinary medicine. Adjustments of individual programs may be made to meet the require-

ments 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
Introductory Zoology, Zool. 1	4	.....	Organic Chemistry, Chem. 131, 132	4	4
Introductory Botany, Bot. 1	.....	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 technical education in forest management, or in 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 the multiple-use of forest land in coordinating the management of natural resources for forest products, wildlife, water, and for recreational facilities. Elective courses offered by the department and throughout the University afford the opportunity for either concentrating or broadening the student's education. Selection of the concentration in Forest Management or in Wildlife Management will be made by the second semester of the sophomore year.

A minimum of 138 semester credit hours of prescribed and elective courses are required for graduation. Eight credit hours are earned for the summer program for eight weeks immediately following 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 undergraduate program may be designed to prepare for graduate study in the forest or in the wildlife sciences.

Forest Management and Wildlife Management

	1st SEMESTER	2nd SEMESTER		1st SEMESTER	2nd SEMESTER
The Freshman Year			The Sophomore Year		
College Algebra, Math. 9	3	.....	American Government, Pol. Sci. 21	3	.....
Dendrology, For. 3, 4	1	4	Elementary Statistics, Math. 110	.....	3
Engineering Graphics, M.E. 1	.....	2	English	3	3
Freshman English, Eng. 1, 2	3	3	Forest Fire Control, 31	2	.....
Introductory Botany, Bot. 1	.....	4	Foundations of Silviculture, 24	.....	3
Introduction to Forestry, 1	3	.....	Introductory Chemistry, Chem. 1, 2	4	4
Public Speaking, Speech 11	3	.....	Introduction to Zoology, Zool. 1 ²	.....	4
Trigonometry, Math. 2	.....	3	Plane Surveying, C.E. 53	4	.....
Elective ¹	3-4	.....	Elective ¹	0-2	0-5

Summer Field Program³

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

A. Forest Management Concentration

	1st SEMESTER	2nd SEMESTER		1st SEMESTER	2nd SEMESTER
The Junior Year			The Senior Year		
Principles of Economics, Ec. 11-12	3	3	Forest Economics, 151	2	.....
Elementary Physics, Physics 5-6 or additional Chemistry	4	4-5	Forest Management, 136	.....	3
Forest Mensuration II, 141	3	.....	Forest Recreation Management, 133	2	.....
Silvics, 122	.....	3	Timber Harvesting and Milling, 163	4	.....
Wood Technology, 161	3	.....	Seminar, 282	.....	1
Elective	3-5	7-8	Silviculture, 123	3	.....
			Watershed Management, 232	.....	3
			Elective	5-6	9-10

B. Wildlife Management Concentration

	1st SEMESTER	2nd SEMESTER		1st SEMESTER	2nd SEMESTER
The Junior Year			The Senior Year		
Comparative Vertebrate Anatomy, Zool. 41, 42 or Physiology, Zool. 52	4	3-4	Animal Ecology, Zool. 104	.....	4
Elementary Physics, Physics 5-6 or Additional Chemistry	4	4-5	Plant Communities, Bot. 113 ⁴	3	.....
Principles of Economics, Ec. 11-12	3	3	Field Zoology, Zool. 109	4	.....
Plant Communities, Bot. 113 ⁴	3	.....	Forestry Seminar, For. 282	.....	1
Silvics, For. 122	.....	3	Taxonomy, Bot. 110 ⁴	.....	3
Taxonomy, Botany 110 ⁴	.....	3	Wildlife Management, For. 171, 172	3	3
Elective	2-7	0-5	Wildlife Pathology	.....	3
			Elective	6-10	2-6

1. Electives may be in the Arts, Humanities, Languages, Social Sciences, or Mathematics.
2. Required for Wildlife Management. Optional for Forest Management. May be taken in either semester.
3. Courses in the eight-week program immediately following the second semester of the sophomore year. See page 51 for expenses.
4. Alternate year courses.

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—Teaching 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.

Courses Required of All Students

A. Four semesters of English	12
One semester of speech	3
B. Two semesters of a laboratory science ¹ (chemistry, physics, zoology)	8 (6)
C. Two semesters of economics	6
Two semesters of history or political science ¹	6
One semester of sociology	3
One semester of psychology	3
	<u>39-41</u>
D. Home Economics:	
Orientation required of all Freshmen. No credit.	
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
	<u>18</u>
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.

1. Certain fields of specialization have specific requirements within these areas.
2. Most fields of specialization require H.E. 35, Basic Concepts of Food and Nutrition—4 credits.

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

EDUCATION—TEACHING AND EXTENSION 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: 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.

FAMILY LIVING—HUMAN DEVELOPMENT— This option prepares men and women in two areas of concentration: **PREPROFESSIONAL SOCIAL WORK** and **Preschool 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.

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 201, Home Economics 244, 239
- (b) 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 201

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, is designed to assure adequate training in language, particularly in English, and in certain other subjects essential to an understanding of the various fields of human knowledge; and to provide for further study and mastery 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.

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.

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 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 a related subject (the "minor").¹
3. It must contain at least four semester courses (twelve hours) of advanced level in one subject and two related 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.

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.

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 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 21 or 23; 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, 193, 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, but an intermediate course in a second foreign language is not required.

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

GEOLOGY Mathematics 11, 12 (or 11 and Biology 1, 2); Physics 5, 6 or 17, 18, 27; Chemistry 1-2 or 11-12; Geology 1-2, 11-12, 105, 106, 115 (or accredited summer field camp), 116, and 281-282. 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 which must include 12 or 13, at least six hours in American history and at least six hours in courses numbered above 200.

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 21, 24, 102, 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 21; 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 Students may choose one of five options, as follows: General speech: 1, 11, 12 or 14, 31, 294; any two among 61, 74, and 39; nine additional hours at the advanced level. Emphasis in speech pathology: 1, 11, 74, 201, 271, 272, 273, 281, and three additional hours; twelve hours of psychology including 5. Emphasis in theatre: 1, 11, 39, 41, 142, 145, 151, and three additional hours. Emphasis in broadcasting: 1, 11, 61, 161, 162, 163, 264, and six additional hours. Emphasis in rhetoric and public address: 1, 11, 12, 111, 116, 214, 217, 221; and three 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; Biology 1, 2; twenty-six hours in zoology, of which at least eighteen must be in courses numbered above 100, and including 41 and 150. The seminar (281, 282) is required of all students doing research. The advanced related course may be in one of the other sciences or in psychology. A student concentrating in zoology must attain an over-all average of 1.7 or above in the courses in mathematics and science required for concentration in the department.

Special Provisions Concerning Credit

Courses Offered in Other Colleges Acceptable for Full 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 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, 193, 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:

	1st	2nd		1st	2nd
	SEMESTER			SEMESTER	
The Freshman Year			The Sophomore Year		
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. 193 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 193 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
Motion and Time Study, 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.

Special 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 special 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 special 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 grade point average of 3.0 (B) or better in French and a 2.5 (B-) overall average.
2. An adequate 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.

The College of Education

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

The objectives of the several curricula include growth in appreciation and understanding of the cultural heritage, development of social and civic competence, improvement of personality, stimulation of intellectual curiosity, strengthening of personal integrity, and development of competence and enthusiasm for the profession of teaching. To attain these objectives each curriculum provides for a balance of general education courses, professional courses, and laboratory experiences.

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 public schools under the supervision of the College of Education.

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. 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 information about majors may be obtained from advisers, the department chairman, or the dean's office.

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 seven full weeks of student teaching in the elementary schools of Burlington, South Burlington, Winooski, and Essex Junction.

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.

The Freshman Year	1st SEMESTER	2nd SEMESTER	The Sophomore Year	1st SEMESTER	2nd SEMESTER
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

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

The Junior Year		1st SEMESTER	2nd SEMESTER	The Senior Year		1st SEMESTER	2nd SEMESTER
Art for Elementary School Music		3	.....	Methods and Materials School Music		3	.....
Children's Literature and Language Arts		3	.....	Physical Education for Elementary Schools		2 or 2	
Learning and Human Development		3	3	Health Education		2 or 2	
Courses in Field of Concentration		6	6	Student Teaching		7	.....
Reading and Language Arts		.....	3	History of Educational Thought		.....	3
Methods and Materials		.....	3	Art (History or Appreciation)		.....	3
				Political Science ¹		.....	3
				Approved Electives (Field of Concentration)		.....	6

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 chosen teaching fields and are given opportunity to participate in teaching experiences in local secondary schools. The junior and senior years combine courses in the elected teaching fields, professional courses in education, and laboratory experience in teaching.

PROFESSIONAL REQUIREMENTS Candidates for the degree in secondary education are required to complete with a high standard of scholarship 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, speech, 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

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

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.

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.

The Freshman Year		1st SEMESTER	2nd SEMESTER	The Sophomore Year		1st SEMESTER	2nd SEMESTER
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				
The Junior Year		1st SEMESTER	2nd SEMESTER	The Senior Year		1st SEMESTER	2nd SEMESTER
Learning and Human Development		3	3	Secondary Education Methods		3	or 3-4
Approved Electives in Teaching Fields		12-15	12-15	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.

The Freshman Year		1st SEMESTER	2nd SEMESTER	The Sophomore Year		1st SEMESTER	2nd SEMESTER
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	.....

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 Applied Music, page 211).

	1st SEMESTER	2nd SEMESTER		1st SEMESTER	2nd SEMESTER
The Junior Year			The Senior Year		
Orchestration	3	.....	Practice Teaching in Music	7	.....
Counterpoint	3	.....	Elementary and Secondary		
Conducting	.....	3	Music Methods	5	.....
History of Music	3	3	History of Educational		
Laboratory Science	.....	4	Thought	.....	3
Learning and Human			Form and Analysis	.....	3
Development	3	3	Applied Music: Major, recital,		
Applied Music: Major, brass			percussion and repair class	.....	4
class	3	3	Ensembles: Major, secondary,		
Ensembles: Major, secondary,			or chamber music ¹	.....	2
or chamber music ¹	2	2	Electives	.....	6
			Applied Music	1	.....

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

Physical Education

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

The curriculum includes a general education base, a planned sequence of professional courses, laboratory experiences, and a second teaching major of at least twenty-four credits.

Candidates will include thirty to thirty-six credits in physical education courses and will be required to demonstrate competency in a minimum of sixteen sports activities. 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 knowledge and skills in scheduled tests.

Physical education majors will be required at the beginning of the junior year to purchase a special instructor's uniform.

A minor of eighteen to twenty credits in physical education may be elected by students who are enrolled in the secondary education curriculum. Courses for the minor must be approved by enrollment advisers in accord with outlines available from the physical education departments or the dean's office.

Physical education courses are open only to majors and minors in physical education or by permission of the chairmen of the physical education departments. All regulations governing academic achievement, admission to teacher education, and retention in teacher education apply to the program in physical education.

	1st SEMESTER	2nd SEMESTER		1st SEMESTER	2nd SEMESTER
The Freshman Year			The Sophomore Year		
Foundations of Education	2 or 2		Development of Motor Skills	.....	2
Anatomy and Physiology	3	3	Literature	3	3
English 1, 2	3	3	Psychology	3 or 3	
Foreign Language	3-4	3-4	Participation	2 or 2	
Social Science ²	3	3	Foreign Language ³	3	3
Speech	.....	3	Electives and courses in		
Foundations of P.E.	3	.....	second teaching field ⁴	3-9	3-9

1. A second applied field may be substituted for one ensemble.
2. If history is chosen, European Civilization is recommended.
3. An approved elective if intermediate language has been completed.
4. Courses in Health Education, Administration and Organization of Physical Education, and Care and Prevention of Athletic Injuries are recommended electives.

The Junior Year		1st SEMESTER	2nd SEMESTER	The Senior Year		1st SEMESTER	2nd SEMESTER
Learning and Human Development		3	3	P.E. for the Atypical Child		3	.....
Kinesiology		3	.....	Electives and courses in second teaching field		9-12	.....
P.E. in the Elementary School		3	.....	Tests and Measurements in P.E.		.....	3
Physiology of Muscular Activity		.....	3	History of Educational Thought		.....	3
P.E. in the Secondary School		.....	3	Student Teaching		.....	6
Courses in second teaching field		6-9	6-9	Elective		.....	3

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

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.

The Freshman Year		1st SEMESTER	2nd SEMESTER	The Sophomore Year		1st SEMESTER	2nd SEMESTER
General Chemistry 11-12		5	5	Organic Chemistry 131, 132		3	3
Freshman English 1-2		3	3	Organic Laboratory 134		.....	2
Mathematics ¹		4-5	4-5	Physical Chemistry 141		.....	3
Physics 17-18		3	3	Literature, Eng. 25, 26 or 27, 28		3	3
		—	—	Mathematics ¹		3-4	3-4
		15-16	15-16	Physics 27		4	.....
				German ² or Elective		4	4
						—	—
						17-18	18-19

The Junior Year		1st SEMESTER	2nd SEMESTER	The Senior Year		1st SEMESTER	2nd SEMESTER
Physical Chemistry 142		3	.....	Advanced Inorganic Chem. 212		3	.....
Molecular Structure 143		.....	3	Advanced Chemistry Elective ⁵		3	3
Phys. Chem. Lab. 144, 145		2	2	Senior Seminar 184		.....	1
Organic Laboratory 135		3	.....	Research 197, 198 ⁶ or Elective		2	4
Instrumental Analysis 224		.....	4	Electives ^{3,4}		9	6
German ² or Elective		3	3			—	—
Electives ^{3,4}		6	6			17	14
		—	—				
		17	18				

A minimum of 134 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.

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.

1. A minimum of mathematics through mathematics 21 or 23 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 18 hours of courses in the humanities and social studies in addition to the English and foreign language requirements.
4. Advanced courses in physics and mathematics are highly recommended.
5. Courses in biochemistry are acceptable as advanced chemistry electives.
6. May be taken only with permission of the department.

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 the 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) ²
	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	2nd
	SEMESTER	
Mathematics, 13, 14 ¹	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 curricula and courses as outlined in this catalogue are applicable to all students entering for the first time in September, 1966, and thereafter.

Students already enrolled in the Engineering Programs should consult the catalogues for the years 1965-66 and 1966-67 for curriculum and degree requirements and consult their adviser concerning any substitutions or alterations in enrollment.

The Sophomore Year

	1st	2nd
	SEMESTER	
Engineering Mathematics, 23	4	.....
Differential Equations, Math. 211	.....	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	2nd		The Senior Year	1st	2nd
	SEMESTER				SEMESTER	
Mech. of Materials, C.E. 131	3	.....		Reinforced Concrete, C.E. 155	3	.....
Engineering Geology, Geol. 21	3	.....		Sanitary Engineering I,		
Electrical Engineering,				C.E. 165	3	.....
Principles, 101	4	.....		Soil Mechanics, C.E. 173	4	.....
Transportation Engineering,				Structural Analysis II,		
C.E. 174	3	.....		C.E. 175	3	.....
Thermodynamics and Heat				Humanistic-Social Studies ⁴	3	3
Transfer, M.E. 113	.....	3		Substructure Design, C.E. 158	.....	4
Humanistic-Social Studies ⁴	3	3		Sanitary Engineering II,		
Mech. of Materials Lab., C.E.				C.E. 166	.....	3
114	.....	1		Adv. Structural Design,		
Engineering Contracts, C.E.				C.E. 176	.....	4
151	.....	2		Professional Elective ⁵	.....	3
Hydraulics, C.E. 162	.....	4			—	—
Structural Analysis I, C.E. 140	.....	4			16	17
	—	—				
	16	17				

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.

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

Electrical Engineering

The curricula and courses as outlined in this catalogue are applicable to all students entering for the first time in September, 1966, and thereafter.

Students already enrolled in the Engineering Programs should consult the catalogues for the years 1965-66 and 1966-67 for curriculum and degree requirements and consult their adviser concerning any substitutions or alterations in enrollment.

		1st	2nd			1st	2nd
		SEMESTER				SEMESTER	
The Sophomore Year							
	Humanistic-Social Studies					3	3
	Mathematics, 23					4	.....
	Probability Theory, Math. 291					.....	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
The Junior Year							
	Humanistic-Social Studies	3	3	The Senior Year		1st	2nd
	Electromagnetic Field Theory, E.E. 143, 144	3	3			SEMESTER	
	Thermodynamics, M.E. 113	.....	3	Humanistic-Social Studies		3	3
	Electronics I, E.E. 121	3	.....	Approved Mathematics Elective		3	.....
	Laboratory, 183, 184	2	2	Solid State Physical Electronics, E.E. 163		3	.....
	Signals and Systems, E.E. 171	3	.....	Laboratory, 185		2	.....
	Electromagnetic Properties of Materials, E.E. 162	.....	3	Energy Conversion I, E.E. 113		3	.....
	Control Systems, E.E. 111	3	.....	Electronics III, E.E. 123		3	.....
	Electronics II, E.E. 122	.....	3	Information Transmission Systems, E.E. 174		.....	3
		—	—	Laboratory, E.E. 186		.....	1
		17	17	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

The curricula and courses as outlined in this catalogue are applicable to all students entering for the first time in September, 1966, and thereafter.

Students already enrolled in the Engineering Program should consult the catalogues for the years 1965-66 and 1966-67 for curriculum and degree requirements and consult their adviser concerning any substitutions or alterations in enrollment.

		1st	2nd			1st	2nd
		SEMESTER				SEMESTER	
The Sophomore Year							
	Engineering Math. III, Math. 23		4	.....		
	General Physics III, Physics 27		4	.....		
	Manufacturing Processes, M.E. 53		3	or 3			
	Sophomore Literature, English 27 ¹		3	.....		
	Statics, C.E. 24		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			
	Public Speaking, Speech 11		3	or 3			
			—	—			
			17	15			
The Junior Year							
	Mech. of Materials, C.E. 131	3	.....			
	Thermodynamics II, M.E. 111	4	.....			
	Differential Equations, Math. 211	3	.....			
	Mech. Engineering Laboratory, M.E. 117	1	.....			
	Electrical Engineering Principles, E.E. 101, 102	4	4				
	Heat Transfer, M.E. 266	.....	3				
	Fluid Mechanics, M.E. 142	.....	3				
	Machine Design, M.E. 135	.....	4				
	Humanistic-Social Studies ¹	3	3				
		—	—				
		18	17				
The Senior Year							
	Industrial Materials I, M.E. 271	3	.....			
	Advanced Fluid Mechanics, M.E. 243		4	.....		
	Systems Control, M.E. 137		2	.....		
	M.E. Elective ²		3	4			
	M.E. Elective ²		3	.....		
	Thesis, M.E. 192, or M.E. Elective ²		.....	3			
	Engineering Design Analysis and Synthesis, M.E. 294		.....	4			
	Humanistic-Social Studies ¹		3	6			
		—	—				
			18	17			

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

Management Engineering

The curricula and courses as outlined in this catalogue are applicable to all students entering for the first time in September, 1966, and thereafter.

Students already enrolled in the Engineering Program should consult the catalogues for the years 1965-66 and 1966-67 for curriculum and degree requirements and consult their adviser concerning any substitutions or alterations in enrollment.

		1st	2nd
		SEMESTER	
The Sophomore Year			
	Engineering Math. III, Math. 23	4	.....
	General Physics III, Physics 27	4	.....
	Manufacturing Processes, M.E. 53	3	.....
	Statics, C.E. 24	3	.....
	Principles of Economics, Economics 11, 12 ¹	3	3
	Programming and Numerical Methods, Math. 31	.....	2
	Introduction to Modern Physics, Physics 28	.....	4
	Public Speaking, Speech 11	.....	3
	Kinematics and Dynamics, M.E. 133	.....	3
	Sophomore Literature, English 28 ¹	.....	3
		—	—
		17	18

1. See distribution of Humanistic-Social Studies on page 92. Econ. 11, 12 is required.
 2. Any 200 level course with approval of the Mechanical Engineering Department.

The Junior Year		1st SEMESTER	2nd SEMESTER	The Senior Year		1st SEMESTER	2nd SEMESTER
Principles of Accounting, Economics 13, 14		4	4	Mech. of Mat'l, C.E. 131		3	.....
Electrical Engineering Principles, E.E. 101, 102		4	4	Methods Engineering, M.E. 175		3	.....
Differential Equations, Math. 211		3	.....	Industrial Materials I, M.E. 271		3	.....
Thermodynamics and Heat Transfer, M.E. 113		.....	3	Personnel Administration, Economics 251		3	.....
Elementary Statistics, Math. 110 or Math. 191		3	.....	Plant Organization, M.E. 176		.....	4
Statistics, Economics 188 or Math. 192		.....	3	Elective		.....	3
Fluid Mechanics, M.E. 142		.....	3	Business Law, Economics 109, 110		3	3
General Psychology, Psychology 1 ¹		3	.....	Humanistic-Social Studies ¹		3	3
		<u>3</u>	<u>.....</u>	Machine Design, M.E. 135		.....	3
		17	17			18	16

A minimum of 135 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, 21, 24		3	3
Laboratory Science ³		4	4	Mathematics, 102		.....	3
Approved Elective		3	3	German, French or Russian		4	4
		<u>15</u>	<u>15</u>	General Physics, 17, 18		3	3
				Approved Electives		3	.....
						16	16
The Junior Year		1st SEMESTER	2nd SEMESTER	The Senior Year		1st SEMESTER	2nd SEMESTER
German, French or Russian ⁴		3	3	Mathematics Electives ⁵		9	9
Mathematics Electives ⁵		6	6	Advanced Science ⁶		3	3
Physics 27		4	.....	Approved Electives		3	3
Approved Electives		4	7			<u>15</u>	<u>15</u>
		<u>17</u>	<u>16</u>				

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

1. See distribution of Humanistic-Social Studies on page 92.
2. See footnote under course offerings of the Department of Mathematics.
3. Students desiring to take a foreign language during the freshman year may defer the approved electives until after the language requirement has been met.
4. If an intermediate language is taken initially, an elective may be substituted.
5. Beyond mathematics 102.
6. Physical science or engineering courses beyond the sophomore level, to constitute a minor specialization.

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	Sophomore Literature 27, 28	3	3
Mathematics ^{1,3} 11, 12 or 13, 14	4-5	4-5	Mathematics 21, 24 or 23, 24	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
The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	1st SEMESTER	2nd SEMESTER
German, French or Russian ⁴	3	3	Physics 271, 272	3	3
Physics 117, 118	3	3	Physics 191, 192 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 211, 212	3	3	Elective ⁵	3-4	3-4
Elective ⁵	3	3		—	—
	—	—		14	15
	18	18		to 17	to 18

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.

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.

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 to become effective on July 1, 1968, brings together several related programs in this important field. It includes the School of Allied Health Sciences, which offers programs in Dental Hygiene and in Medical Technology; the School of Nursing, with two-year and four-year programs; and the College of Medicine.

The School of Allied Health Sciences

In addition to the present curricula in Dental Hygiene and in Medical Technology, a new program in Radiologic Technology is being planned and will be offered in the near future.

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 ever-increasing need for dental health service. It offers a two-year curriculum leading to a Certificate in Dental Hygiene. A new four-year curriculum, leading to a baccalaureate degree, is under consideration for the future.

The curriculum conforms to the requirements for accrediting of schools of dental hygiene as adopted by The Council on Dental Education of the American Dental Association on June 20, 1951. On successful completion of this curriculum, the student is eligible to take various examinations given by the State Board of Dental Examiners for licensing by that body.

Graduates of this program will be qualified to give oral prophylactic treatment; to chart the mouth, and to carry dental health education into the private dental practice, public institutions, hospitals and industrial clinics. The hygienist may be called upon to perform the following subsidiary functions as the supervising dentist may direct or approve: to X-ray teeth and develop X-ray films; to assist with laboratory work; to make appointments and keep office records; to give demonstrations of the proper method of using a toothbrush and massaging the gums; to lecture on oral hygiene, and to teach oral hygiene and the relation of diet to oral health. The role of the dental hygienist in the achievement of oral health is an extremely important one, and opportunities for well-rewarded service are practically unlimited.

The course of study is designed to give the student a background of knowledge sufficient to enable her to perform intelligently the tasks of her profession.

Students applying for this program should be interested in and have aptitude for scientific studies. A general scientific background is acquired by courses in chemistry, bacteriology, anatomy, and physiology. Courses specifically relating to dental problems give the student an insight into the field of dentistry and dental health. English composition and public speaking teach the individual to express herself clearly on paper and by word of mouth. The proper approach to the patient is taught by courses in psychology and sociology. Skill and self-confidence are acquired by extensive work during the second year in the dental clinic.

The Department of Dental Hygiene operates a fourteen-chair clinic and offers its services for examination and charting of teeth, prophylactic treatments, and the teaching of dental health to students, employees, and faculty members of the University, in addition to the school children in surrounding areas.

Enrollment is limited to women who are high school graduates and otherwise eligible to enter the freshman class of the University. Prospective applicants are invited to write the Director of Admissions for detailed information concerning such matters as requirements for admission and expenses. High school subjects which are helpful prerequisites include algebra, chemistry, physics or biology. Attributes necessary for success in this curriculum are good health, emotional stability, interest in the work, and the ability to get along well with people. Since the laboratory equipment in the School of Dental Hygiene is limited, prospective students are advised to submit their application before February 1 of their senior year in high school. Applicants in this curriculum are required to take the Dental Aptitude test. Application for the test should be made to the American Dental Hygienists' Association, 304 East 45th St., New York, N.Y. 10017.

	1st	2nd		1st	2nd
	SEMESTER			SEMESTER	
The Freshman Year			The Sophomore Year		
Freshman English, Eng. 1-2	3	3	Introductory Microbiology, Bot. 55	4	.....
Oral Anatomy, 11	4	.....	The Cultures of Man, Soc. and Anthropol. 21	3	.....
Oral Histology and Embryology, 22	.....	3	Oral Pathology, 53-54	2	2
Outline of Chemistry, Chem. 3-4	4	4	Radiology, 61-62	1	1
Dental Hygiene 1	2	.....	Public Health, 74	.....	2
Dental Hygiene 2	.....	3	Clinical Dental Hygiene, 81-82	5	5
Medical Emergencies, 31	1	.....	Dental Health Education, 72	.....	2
General Psychology, Psych. 1	.....	3	Pharmacology and Anesthesiology, 51-52	1	1
Mammalian Anatomy and Physiology, Zool. 5-6	3	3	Assisting, Materials, Ethics and Office Management, 91-92	1	1
Physical Education	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. Minimum standards set by the Council on Medical Education of the American Medical Association require that a minimum of sixteen semester hours of chem-

istry, sixteen semester hours in biological sciences, and one semester of college mathematics be taken during the first three years of college. 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.

The Freshman Year	1st SEMESTER	2nd SEMESTER	The Sophomore Year	1st SEMESTER	2nd SEMESTER	
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 5, 6	4	4	
Introduction to Medical Technology, M.T. 1	1	.....	Approved Electives	5-6	5-6
Approved Electives	.....	3		—	—
	—	—		16	16	
	15	17		or	or	
				17	17	
The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	8 wk. SUM. SES.	1st SEMESTER	2nd SEMESTER
Introductory Microbiology, Agricultural Biochemistry 55	4	Basic Techniques in Medical Technology 101-102	10	6
Physiology, Zool. 52	4	Medical Technology, 103	2
Biochemistry for Medical Technologists, 111-112	4	4	Medical Technology Seminar, 110	1
Approved Electives	8-9	8-9	Hospital Assignments	5	8
	—	—	Approved Electives	(3-4)	(3-4)
	16	16		—	—	—
	or	or		10	11	11
	17	17				

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 Certified Laboratory Assistants of the American Society of Clinical Pathologists and the American Society of Medical Technologists.

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.

	1st SEMESTER	2nd SEMESTER		1st SEMESTER	2nd SEMESTER
The Freshman Year			The Sophomore Year		
English 1-2	3	3	Botany 55	4	.....
Chemistry 3, 4	4	4	Math. 7	3	.....
Psychology	3	.....	Elective	3	.....
Sociology	.....	3	Clinical Laboratory Assignments	3	8
Introduction to Health Sciences	2	2	Medical Orientation	1	.....
Zoology 5, 6	3	3		—	—
	—	—		14	8
	15	15			

SUMMER SESSION

Basic Techniques—8 credits

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

The School of Nursing

The faculty of the School of Nursing believes that nursing is a profession which has increasing responsibilities and contributions to make in meeting the health needs of a changing society. In accordance with this belief, the educational program is designed to stimulate the optimum growth of each student as an individual, a professional person, and a contributing member of society. It is believed that this can best be realized in an environment which recognizes the individuality of each student and which provides guidance towards achievement of independent thought, critical judgment, and effective behavior.

The purposes of the program are to provide the opportunity for qualified individuals to prepare for professional practice in beginning positions, 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 receive the degree of Bachelor of Science in Nursing, are qualified for state licensure examination, and may advance without further 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 meet 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 typical program of studies follows:

The Freshman Year		1st SEMESTER	2nd SEMESTER	The Sophomore Year		1st SEMESTER	2nd SEMESTER
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. and Anthropol. 21		.....	3	Nursing 21-22		4	6
Nursing 1		1	.....	Nursing 26		.....	3
Elective		3	3	Elective		3	.....
The Junior Year ¹		1st SEMESTER	2nd SEMESTER	The Senior Year ¹		1st SEMESTER	2nd SEMESTER
Nursing 121, 122		9	9	Nursing 156		6	.....
Human Development and Personality, Home Ec. 63		3	.....	Nursing 176		6	.....
Elective		3	6	Nursing 165		.....	3
				Nursing 167		.....	3
				Nursing 186		.....	3
				Electives		3	6

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.

To be eligible for the Bachelor of Science in Nursing degree a candidate must have completed a minimum of 124 approved semester hours plus required courses in physical education. Grades in nursing courses are based on achievement in theory and in laboratory practice. The Department of Nursing reserves the right to require the withdrawal from the nursing curriculum of any student whose health, academic record or performance and behavior in nursing is judged unsatisfactory.

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

EXPENSES The cost of the program in nursing is approximately the same as for other students in the University (see also pages 50-52) with the following exceptions:

1. Effective by October 1 of the second year all students in nursing are required to carry Blue-Cross and Blue-Shield insurance, or its equivalent, at not less than the maximum daily rate issued by Blue-Cross.
2. At the beginning of the second year all students in nursing are required to purchase uniforms and other items of special equipment.

Financial aid is available in the form of scholarships, loans, prizes and employment (see page 53). Of special interest to students in nursing is the Nursing Student Loan Program. Anyone interested should make application for financial aid by Feb. 1.

In addition to funds handled through the University, students 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.

ASSOCIATE DEGREE PROGRAM A two-year program leading to an associate degree in nursing and eligibility for the state examination for licensure as a registered nurse will be offered beginning in September, 1969. The purpose of this program is to assist qualified applicants to acquire the competencies commonly associated with rendering nursing care to patients where nursing supervision is available.

PROFESSIONAL PERSONNEL IN COOPERATING AGENCIES

Robert B. Aiken, M.D., Commissioner of Health, Vermont State Department of Health
 Grace Buttolph, R.N., Director, School of Nursing, Medical Center Hospital of Vermont, Mary Fletcher Unit
 Mary Cassell, R.N., Director of Nursing Service, Medical Center Hospital of Vermont, DeGoesbriand Unit
 Rupert Chittick, M.D., Superintendent, Vermont State Hospital
 Sister Duchesneau, R.H.S.J., R.N., Director, Jeanne Mance School of Nursing, Medical Center Hospital of Vermont, DeGoesbriand Unit
 Vera Hanks, R.N., Director, Nursing Service, Vermont State Hospital
 Frances Magee, R.N., Director of Nursing Education, Vermont State Hospital
 Sally Sample, R.N., Director, Nursing Service, Medical Center Hospital of Vermont, Mary Fletcher Unit
 Mrs. Lisbeth Stouch, R.N., Executive Director, Burlington Visiting Nurse Association, Inc.
 Alfred Vigneau, R.N., Chief, Rehabilitation Nursing, Vermont Rehabilitation Center

The College of Medicine

Requirements for Admission

The College of Medicine requires that an applicant hold a Bachelor's degree, and that his four years of college work be taken 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 including laboratory work or equivalent; 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 Admission Test. Such scores are taken into consideration but are not used as the final determinant in accepting students. If a majority (all but one or two) of the required courses have been or will be completed by the end of the third year in college, applicants are urged to take the Medical College Admission Test in May of that year.
4. All applicants 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.

Applications for admission to the class entering in September of any year will close January 1 preceding the September admission. Application blanks should be in by October 15 for early consideration.

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 January 15, 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 basic science core program includes the entire freshman year and the fall of the sophomore year. During this period students will be instructed in the medical sciences which form the basis for medical practice. The objective of the basic science core is to present that body of knowledge common to all types of medical practice and to avoid minute details which are relevant only to individual medical specialties. From the very outset students will be exposed to patients in the comprehensive clinics, the aim of which is to present the broader perspectives of medical practice.

Clinical Science Core

The clinical core will extend from January of the sophomore year until December of the junior year. During this twelve-month period each student will receive 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 instruction 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 274 and 275, 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

Programs are designed to prepare qualified candidates for school positions in guidance, supervision, administration and reading, or to give classroom teachers a more complete understanding of professional education as applied to teaching and to membership in the profession. Programs are planned on an individual basis and may include courses in areas outside professional 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	Geology	Latin
Botany	German	Mathematics
Chemistry	Greek	Music
English	History	Physics
French	Home Economics	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	Music	Greek
English	Philosophy	History
French	Political Science	Latin
German	Psychology	Mathematics
	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 instructions 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 (see under department).

Information on the Miller Analogies Test may be obtained from the Testing Office, University of Vermont, or from any college testing office. Information on the Graduate Record Examination may be obtained from the Testing Office or directly from the Educational Testing Service, Box 592, Princeton, New Jersey 08540.

Arrangements for taking the Writing Proficiency Test, required of applicants for the Master of Education degree program, should be made with the Dean's Office, College of Education.

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

DEPOSIT A deposit of \$35 is required of each applicant upon notification of admission into the Graduate College. The deposit will cover the advanced degree fee of \$35 (see page 52). Any residue from this deposit will be returned to the student upon withdrawal from the college.

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

DISMISSAL

A graduate student whose work or deportment is deemed unsatisfactory at any time may be requested by the Dean or the department concerned to withdraw from the Graduate College.

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.

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 Each candidate for the master's degree must satisfactorily complete at least twenty-two hours of graduate credit while in residence on The University of Vermont campus, either in the regular academic year or in summer sessions, or at the off-campus centers established at Lyndon and Castleton. Each candidate for the doctoral degree must satisfactorily complete a minimum of fifty hours in residence at The University of Vermont. 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.

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 if it is pursued on a full-time basis during the regular academic year; if the program is pursued on a part-time basis or in summer sessions, it must be completed within a span of seven years. A doctoral program must be completed within a span of nine years. This time limit applies 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 A maximum of eight hours credit in the case of master's candidates and twenty-five 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 B—(80) was received, (3) extension courses, (4) correspondence courses, (5) courses which are inappropriate for inclusion in any degree program offered by the Graduate College, (6) courses which were taken more than seven years prior to the completion of a degree program, (7) thesis credits received at another university. No transfer of credit is possible prior to a student's acceptance to candidacy.

EXTENSION COURSES Not more than eight semester hours of credit toward the master's degree may be earned by taking extension courses offered by The University of Vermont. A maximum of three hours of graduate credit per semester is permissible for master's candidates who are full-time teachers in public schools. No credit for extension courses is allowable in a doctoral program.

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 twelve hours credit (fourteen if the maximum eight hours of transfer credit is offered) 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. 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 extension course 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. All course credits included in these twenty hours must have been earned in courses which are numbered above 200.

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.

STUDIES COMMITTEE A Studies Committee will be appointed by the Department Chairman for each candidate for the master's degree. It shall be the responsibility of this committee to supervise the student's program and review his progress at regular intervals.

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. For information regarding submission of the thesis, refer to the Graduate College Bulletin.

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 provides 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

The examinations culminating the program of graduate study for the master's degree are as follows:

I. *For the Degree of Master of Education:*

- a. A written comprehensive examination (three-hour minimum) in the field of Education.
- b. A comprehensive oral examination (one-hour minimum) in the field of Education.

II. *For the Degree of Master of Arts in Teaching:*

- a. A written comprehensive examination (two-hour minimum) in the field of Education.
- b. A written comprehensive examination (two-hour minimum) or a comprehensive oral examination (one-hour minimum) in the field of specialization. The choice between written and oral examination is to be determined by the department after consultation with the candidate.

III. *For the Degree of Master of Extension Education:*

- a. A written comprehensive examination (two-hour minimum) in the technical and social science areas.
- b. A comprehensive oral examination (one-hour minimum) in the field of specialization.

IV. *For the Degrees of Master of Arts and Master of Science:*

- a. A written comprehensive examination (two-hour minimum) in the field of specialization.
- b. An oral examination (one-hour minimum) in defense of the thesis.

V. *For the Degree of Master of Business Administration:*

- a. A written comprehensive examination (two-hour minimum) with emphasis in the field of specialization.
- b. An oral examination in defense of the thesis.

Normally the comprehensive examination is written upon completion of all course work for the degree.

Success in the written examination is prerequisite to taking the oral examination. One re-examination only is permitted for any final comprehensive examination.

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.

STUDIES COMMITTEE Upon admission to the Graduate College, the prospective candidate for the Ph.D. degree will be assigned an inter-departmental Studies Committee by the Dean. This committee will meet at least once a semester with the candidate to advise him and to help plan his program of study. All courses taken in the program must be approved by this committee, the department chairman concerned, and the Dean of the Graduate College. The committee will also be responsible for administering and evaluating language examinations.

COURSES 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. Details of each program can be obtained from the appropriate department chairman or from the Dean.

LANGUAGE REQUIREMENTS In order to satisfy the language requirements, each candidate must be able to comprehend the literature of his field in at least two foreign languages appropriate to his field in addition to English, or demonstrate fluent command (ability to read, write and converse) of one foreign language appropriate to his field in addition to English. The choice of the language is to be determined by the candidate's department. The language requirements must be completed before the comprehensive examination is taken.

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. For in-

formation regarding submission of the thesis, refer to the Graduate College Bulletin.

THESIS EXAMINING COMMITTEE Upon submission of the completed thesis, the Dean of the Graduate College will appoint a Thesis Committee for the oral examination of the candidate. The Committee shall consist of the Dean, the members of the Studies Committee, and at least two other faculty members nominated by the chairman of the department concerned. The acceptability of the thesis will be determined by the Thesis Examining Committee.

EXAMINATIONS

- (a) A comprehensive written examination in the field of study must be passed by the candidate at least six months before the thesis is submitted. This examination will be prepared by the department concerned, in consultation with the candidate's Studies Committee. One re-examination only will be permitted.
- (b) An oral examination, in which the candidate will be expected to defend his thesis, will be scheduled no sooner than one month after the thesis has been submitted to the Department. One re-examination only will be permitted.

Financial Aids

Students who wish to be considered for fellowships as well as admission must submit applications, with supporting material, by March 1 of the academic year preceding that for which application is made. All applicants requesting fellowship and traineeship support must submit scores received on the Graduate Record Examination. Application for fellowships should be made by completion of the appropriate section on the application form, except as otherwise indicated.

GRADUATE FELLOWSHIPS The Graduate College offers Graduate Fellowships of \$1,000 each plus a full tuition scholarship. These fellowships are open to applicants in any field in which the University offers a graduate degree program. Holders of Graduate Fellowships are expected to carry a full-time graduate program towards an advanced degree.

GRADUATE TEACHING FELLOWSHIPS AND GRADUATE RESEARCH FELLOWSHIPS Graduate Teaching and Research Fellowships are awarded in departments offering graduate work.

Graduate Teaching Fellows are usually appointed for nine months with an initial stipend of \$2,200; Graduate Research Fellows for eleven months with an initial stipend of \$2,640. Teaching and Research Fellows may enroll for a maximum of twelve hours per semester; they are eligible for reappointment. Fellowship award includes tuition scholarship.

A maximum of half-time assistance in the department is expected of Graduate Teaching Fellows and Graduate Research Fellows, and they must expect that more than one academic year will be necessary to complete the requirements for the master's degree. If a Teaching Fellow or Research Fellow is a candidate for the doctoral degree, he must expect to spend at least four calendar years before his academic program can be completed. While it is customary, it is not obliga-

tory that Fellows select their fields of concentration in the departments in which they are appointed; for example, foreign-born students appointed Graduate Teaching Fellows in the Department of Romance Languages may be accepted as degree candidates by the Department of English.

Appointments will be announced on or before April 1.

STUDENT PERSONNEL FELLOWSHIPS—RESIDENCE HALLS Graduate students, men and women, are eligible to apply for Student Personnel Fellowships. The candidates selected to fill these positions will normally be assigned administrative and advisory positions in the residence halls. Student Personnel Fellows have the opportunity to gain valuable experience in the areas of group advising, administration, personal advising and educational programming. Such positions are open to either married or single students who have been accepted for graduate work in any of the academic programs of the University of Vermont. Selection is based upon academic record, character, recommendations, and quality of related experiences. A personal interview is required. First year Student Personnel Fellows receive a stipend of \$2,200 plus a tuition scholarship for a nine-month period. Room and board is deducted from this stipend. Requests for applications and additional information should be addressed to the Dean of Men or Dean of Women, respectively. Applications received after March 20 will be considered only for unanticipated openings.

GEORGE H. WALKER DAIRY FELLOWSHIP The George H. Walker Dairy Fellowship which is awarded periodically, provides a stipend plus a full tuition scholarship. It is available to graduate students who, during their undergraduate courses, have studied "agriculture, chemistry, and bacteriology" and who desire to study the problems relating to the production of a sanitary milk supply on comparatively small plants and farms. Applications should be addressed to the Chairman of the Department of Animal and Dairy Science.

NATIONAL DEFENSE EDUCATION ACT FELLOWSHIPS The U. S. Department of Education supports fellows in several departments under provisions of Title IV of the National Defense Education Act. Fellowships are available in the Departments of Biochemistry, Botany, Chemistry, Electrical Engineering, Physiology and Biophysics, Psychology, and Zoology. These awards are made to predoctoral students who are U. S. citizens or nationals. They carry stipends plus a dependency allowance and include payment of tuition and nonrefundable fees. Requests for NDEA Fellowships should be indicated on the application for admission.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION TRAINEESHIPS The National Aeronautics and Space Administration supports postdoctoral graduate traineeships in the Departments of Botany, Chemistry, Electrical Engineering, Physics, Psychology and Zoology. These awards, which are available to U. S. citizens and nationals, carry stipends plus a dependency allowance and cover payment of tuition and nonrefundable fees. Requests for these traineeships should be indicated on the application for admission.

NATIONAL SCIENCE FOUNDATION TRAINEESHIPS The University of Vermont participates in the graduate traineeship program of the National Science Foundation. These traineeships are open to graduate students in the natural sciences, engineering and the quantitative social sciences who are U. S. citizens or nationals. They carry a stipend plus a dependency allowance, and include payment of tuition and nonrefundable fees. Requests for these traineeships should be indicated on the application for admission.

GRADUATE TRAINEESHIPS Graduate traineeships have been made available to certain departments through grants from various divisions of the U. S. Public Health Service. Traineeships are available to graduate students enrolled in the following departments: biochemistry, medical technology, pharmacology, physiology and biophysics, and speech. These traineeships generally carry stipends of \$2,400 upwards plus payment of tuition. The chairman of the department concerned should be contacted for information on the availability of these awards.

PROSPECTIVE TEACHER FELLOWSHIPS Under Title V of the Higher Education Act of 1965, the U. S. Office of Education supports graduate study for prospective teachers of English at the secondary level who are pursuing full-time study leading to the M.A. or M.A.T. degrees. Requests for such support should be indicated on the application for admission.

OTHER SOURCES Students undertaking graduate work at The University of Vermont may apply for other awards such as the National Science Foundation Graduate Fellowships and National Institutes of Health Predoctoral Fellowships. Further information concerning these programs may be obtained from the respective granting agencies.

LOANS Graduate students may apply for National Defense Student Loans. Applications should be made through the Director of Financial Aid, Waterman Building, prior to April 1 for September enrollment.

Graduate students, after they have successfully completed one semester, are also eligible for university loans on the same basis as undergraduates. Details may be obtained from the Financial Aid Office.

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 undergraduates 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 to 99 are elementary and intermediate courses. Those numbered from 100 to 199 are advanced undergraduate courses. Those numbered from 200 to 299 are advanced courses for undergraduates which also may be taken for graduate credit by qualified graduate students. Courses numbered from 300 to 399 are limited to graduate students. 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); Associate Professors Foote and Racusen, Assistant Professors Sjogren and Weller

55 INTRODUCTION 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 INTRODUCTION 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 (3-4) Broad coverage of fundamentals of biochemistry for science students, including the chemistry of carbohydrates, proteins, lipids, vitamins, enzymes, and hormones and their relation to processes of biological significance. Basic principles of analytical procedures involved in biochemical methods. *Prerequisite*: chemistry 131. Five hours. Mr. Weller.

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 (2-3) The chemical composition, energy utilization and metabolism of microbial cells. *Prerequisite*: 201 or medical biochemistry 301, botany 55; and departmental permission. Three hours. Mr. Sjogren. Alternate years, 1968-69.

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 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 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.

V 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 1968-69.

62 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 business firms including agricultural cooperatives. 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, economics of recreational land use, economic aspects of rural development, land classification, rural zoning, land use planning. *Prerequisite:* economics 11-12, or agricultural economics 62. 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.

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. Webster.

381, 382 **AGRICULTURAL ECONOMICS SEMINAR** Discussion of problems and research in agricultural economics and other social sciences. 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.

Agricultural Education

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Assistant Professor Bice; Mr. Davison

102 EXTENSION METHODS (1-2) Methods and techniques of extension teaching. *Prerequisite:* junior standing. Two hours. Mr. Davison. Alternate years, 1968-69.

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. Three hours. Mr. Bice.

152 INTRODUCTION TO TEACHING VOCATIONAL AGRICULTURE (1-2) Introduction to the vocational education acts and major program objectives; the determination of instructional needs, and development of farming 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 vocational agriculture. *Prerequisite:* junior standing. Two hours. Mr. Bice.

155 DIRECTED PRACTICE TEACHING IN VOCATIONAL AGRICULTURE Ten weeks of practice teaching in high school departments of vocational agriculture under guidance of experienced teachers and the teacher trainer. One week of home visits to supervised farming programs during the summer, and the first week of high school. *Prerequisite:* 251 and 253, and acceptance into teacher education program. Eight hours. Mr. Bice.

156 METHODS AND MATERIALS OF VOCATIONAL 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. Bice.

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. Mr. Bice.

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. Mr. Bice.

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. Mr. Bice.

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

1 FARM POWER, MACHINERY AND ELECTRICITY (2-2) Operation and maintenance of internal combustion engines and farm tractors; operation and the maintenance of farm machinery; electricity and the utilization of electricity and electrical equipment on the farm. Not for credit for B.S.A.E. degree candidates. Three hours. Mr. Schneider.

2 FARM STRUCTURES AND UTILITIES AND SOIL AND WATER ENGINEERING (2-2) Construction on the farm; planning and selection of materials. Operation, selection and maintenance of farm water systems and sewage disposal systems. Operation of refrigeration units used on the farm. Soil conservation practices and surveying. 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, 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, 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. Not offered 1968-69.

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. Not offered 1968-69.

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. Not offered 1968-69.

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. Not offered 1968-69.

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. Not offered 1968-69.

Animal and Dairy Science

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professors Atherton and Smith (Chairman); Associate Professors Balch, Simmons, and Welch; Assistant Professors Duthie and Nilson; Lecturers Elliott and Gibson.

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. Elliott. Alternate years, 1968-69.

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.

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, 1968-69.

153 **MILK PROCESSING (2-2)** Technical aspects of processing fluid milk and fluid milk products. *Prerequisite:* departmental permission. Three hours. Mr. Nilson. Alternate years, 1968-69.

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. Three hours. Mr. Welch. Alternate years, 1969-70.

187, 188 **LIGHT HORSE PRODUCTION AND MANAGEMENT (2-3)** The problems of light horse production. Application of the principles of selection, management and horsemanship. *Prerequisite:* 187 for 188. Three hours. Mr. Balch. Alternate years, 1968-69.

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.

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. Smith.

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 DAIRY CATTLE AND MILK PRODUCTION (2-2) Advanced principles of dairy cattle feeding and management. *Prerequisite:* 55. Three hours. Mr. Gibson. Alternate years, 1969-70.

256 DAIRY PLANT MANAGEMENT (2-3) Organization and operation of milk processing and manufactured milk products plants. *Prerequisite:* 153, economics 12; junior standing. Three hours. Mr. Nilson. Alternate years, 1968-69.

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, 1968-69.

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. Three hours. Staff.

294 HISTORY OF NUTRITION (See home economics 294). One hour. Messrs. Donovan and Smith and Miss Morse.

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. Messrs. Donovan and Smith and Miss Morse.

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.

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.

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 humane methods of handling. *Prerequisite:* agricultural biochemistry 55 or medical microbiology 201, chemistry 131, 132. Three hours. Staff. Offered in fall of 1969.

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

1. Approval for graduate credit pending.

guidance of the professional staff. *Prerequisite:* 107, 217. Three hours. Staff. Offered in spring of 1970.

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.



COLLEGE OF ARTS AND SCIENCES

Associate Professors Bliss, J. Davison, Janson (Chairman) and Mills; Assistant Professors Roland and Aschenbach; Instructors Davies, Scatchard, W. Davison; Mrs. Wedell

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. First semester: two-dimensional design; second semester: three-dimensional design. 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. Mr. Bliss.

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. 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. Three 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 21. Three hours. Mr. Davies.

131, 132 **PRINTMAKING** Methods and materials in traditional printmaking media, planographic and intaglio, stressing design and technical control. *Prerequisite:* 1 or 21 and departmental permission; 131 for 132. 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:* 2 or 21 or 41. Three hours. Mr. Aschenbach.

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 hours. Staff.

Botany

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professors Dodge¹, Gersboj, Hyde (Chairman), Klein, Marvin, Sproston, and Taylor; Associate Professor Vogelmann; Assistant Professor Cook

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, and guest lecturers.

Botany

1 **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. Prac-

1. Visiting professor.

tical 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 1. 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 1. Four hours. Staff.

110 **TAXONOMY (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 1; 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 1. 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 1. 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 1. Three hours. Mr. Vogelmann. Alternate years, 1968-69.

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, 1969-70.

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*: 2; senior standing. Four hours. Mr. Taylor. Alternate years, 1968-69.

253 FUNGI (2-4) The reproductive processes of the common molds, yeasts, and actinomycetes and their classification. Physiological studies; antibiotics. *Prerequisite*: 103. 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*: 1 or zoology 1; zoology 115 and at least eight additional hours of botany or zoology. Three hours. Mr. Hyde.

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, 1968-69.

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*: 2, or two courses in zoology or botany above 100. Four hours. Mr. Cook. Alternate years, 1969-70.

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 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.

Chemistry

COLLEGE OF TECHNOLOGY

Professors Cook, Gregg and White (Chairman); Associate Professors Brown, Crooks, Flanagan,¹ Krapcho,² Kuehne, and Whitcher; Assistant Professors Allen, 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 INTRODUCTION 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 Miss Brown 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. Mr. Waters and 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 INTRODUCTION 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 staff.

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

1. Sabbatical leave September 1967-September 1968.

2. Sabbatical leave September 1968-September 1969.

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. Three hours. Messrs. Weltin, Flanagan and Wulff.

143 MOLECULAR STRUCTURE Molecular spectroscopy, scattering and resonance phenomena, symmetry properties of molecules, etc. *Prerequisite:* 142. Three hours. Messrs. Flanagan, Weltin 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.

145 ADVANCED PHYSICAL CHEMISTRY LABORATORY Experiments dealing with molecular structure; spectroscopy, x-ray diffraction, dipole moment determination, magnetic susceptibility. For chemistry majors. *Prerequisite:* 142; 144; concurrent enrollment in 143. 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.

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, electrometric, 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. White. 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 and Krapcho.

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 photochemistry, carbenes, bio-organic chemistry, magnetic resonance, etc. *Prerequisite*: departmental permission. Credit as arranged. Staff. 336, 1969-70; 338, 1968-69.

Advanced Physical Chemistry

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 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.

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. Messrs. Ambrose and Gilleland.

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. Miss Davison. Alternate years, 1968-69.

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. Bliss. Alternate years, 1968-69.

203 GREEK HISTORIANS Thucydides, Books I and II; selections from Herodotus and Xenophon's *Hellenica*. *Prerequisite*: 11-12. Three hours. Miss Davison. 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. Ambrose. 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. Mr. Schlunk. 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.

392, 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. Ambrose.

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.

203 REPUBLICAN PROSE Reading in Caesar and Sallust, and in the speeches of Cicero. *Prerequisite*: 101, 102. Three hours. Mr. Gilleland.

204 EPIC POETS Reading in Lucretius, Vergil, Ovid, and others. *Prerequisite*: 101, 102. Three hours. Mr. Ambrose.

227 ROMAN LYRIC POETS Selections from the works of Catullus, Horace, Propertius, Tibullus. *Prerequisite*: Latin 203 or concurrent enrollment therein. Three hours. Mr. Bliss. Alternate years, 1968-69.

251 ROMAN LETTERS Selected letters of Cicero, Pliny, and Fronto. *Prerequisite*: 203, 204 or concurrent enrollment. Three hours. Mr. Gilleland. 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. Gilleland. 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.

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.

Dental Hygiene

DIVISION OF HEALTH SCIENCES

Associate Professor Quinby and Assistant Professor Sawabini (Chairman); Instructors Bannister, Faigel, Farnham, Halebian, M. C. Heininger, P. L. Heininger, Knight, Lampert, Montgomery, Slack, 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. Miss Quinby.

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. Miss Quinby and Mrs. Knight.

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. Mrs. Knight.

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. Miss Quinby and Mrs. Knight.

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,¹ Greif, Nadworny (Chairman), and Nyquist; Associate Professors Almasrawi,² Diamond, and Severance (Interim Chairman); Assistant Professors Bayer, Campagna, Chase, Michael, Mills, Nargund, Schiller, H. Squire, and Wass; 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. Three hours. Messrs. Dellin and Schiller.

11 and 12 are prerequisites for all courses numbered 100 and above with the exception of accounting courses.

Banking and Finance

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

1. Sabbatical leave 1967-68.

2. On leave 1967-68.

business with reference to the law of agency, partnerships, and corporations. *Prerequisite:* 12, or concurrent enrollment. Three hours. Messrs. Erdmann and Schweyer.

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. Messrs. Mills and Wass.

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. Mills.

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. Messrs. Alnasrawi and Wass.

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. Messrs. Mills and Wass.

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.

Marketing and Merchandising

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.

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.

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:* 228. Three hours. Mr. Diamond.

Industrial and Personnel Management

For Motion and Time Study, and Plant Organization, recommended for students in this option, see Engineering, Mechanical (M.E. 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.

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.

Accounting

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 covering 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 preparation of tax returns. *Prerequisite:* 14. Three hours. Messrs. Michael and Nyquist.

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.

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.

Economics

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.

193 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.

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.

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. Mr. Schiller.

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:* 12 and six hours of political science or six hours of European history. Three hours. Mr. Dellin.

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. Wass.

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:* 187. 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. Messrs. Alnasrawi and Wass.

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. Messrs. Dellin and Schiller.

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.

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, King, Lidral, Pappoutsakis, Rippa, and Steeves; Associate Professors Boller, Mills, Ratcliffe, Redmond, Sekerak, and Zimmerli; Assistant Professors Christensen, Dunkley, Gobin, Lang, Leggett, McKenzie, Peterson, Petrusich, Riley, Schultz, and Weinrich; Instructors Chase, Lambert, and Lange

For students who are not in teacher education, courses in education are open only by permission 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.

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 and Mr. Riley.

222 **IMPROVEMENT OF READING INSTRUCTION IN THE ELEMENTARY SCHOOL** A comparative analysis of current and emerging philosophies, 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 and Mr. Riley.

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.

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.

285 **INDIVIDUAL TESTING** Specific training in the techniques of the administration, scoring, and interpretation of individual intelligence tests suitable for application from the pre-school age through adult levels. Special emphasis

will be placed on the Stanford-Binet Scale, L-M, and the Wechsler Adult Intelligence Scale. *Prerequisite*: graduate standing and twelve hours in education and psychology including an introductory course in testing. Three hours. Staff.

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.

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 a 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 CHILD AND COMMUNITY Supervised experiences with children's groups in the community. One hour. Miss Boller.

113 SCHOOL MUSIC Basic principles in elementary school music teaching. *Prerequisite*: 9-10 or 1, 2 and 5-6. Three hours. Staff.

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. Mills.

144 **METHODS AND MATERIALS I** Curriculum, teaching methods, materials in the social studies and science in the elementary school. Observations and participation in elementary schools. Three hours. Miss Petrusich and Mr. Redmond.

160 **METHODS AND MATERIALS II** Curriculum, teaching methods, materials in mathematics in the elementary school, development of critical thinking. Three hours. Miss Boller and Staff.

161 **STUDENT TEACHING** Seven 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. Seven hours. Miss Boller, Mrs. Lang, Miss Petrusich, and Mr. Redmond.

Secondary Education

15 **PARTICIPATION** Thirty clock hours of observation and participation in classroom work in junior and senior high schools. Discussion meetings on campus. *Prerequisite:* departmental permission. Two hours. Mr. Ratcliffe, 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. Two or 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** Seven 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. Six hours. Mr. Ratcliffe, Mr. Steeves and staff.

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 **TEACHING INTERNSHIP** Supervised teaching experience in cooperating schools with related seminar in the special subject field. *Prerequisite:* undergraduate courses leading to certification; 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

1 **FOUNDATIONS OF PHYSICAL EDUCATION** 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 Mr. Leggett.

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.

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. Three hours. 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.

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. Two hours or three hours. Mr. Dunkley and Miss Zimmerli.

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. Two or three hours. Mr. Gobin and Mr. Lambert.

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. Cross and Mr. Coons.

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. Post and Mr. Nedde.

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 GYMNASTICS 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 Mr. Leggett.

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.

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. Mr. Gobin.

156 **CURRICULUM IN PHYSICAL EDUCATION** A study of student developmental needs and interests, objectives, and contemporary curricular designs for implementing the physical education program. Three hours. Mr. Gobin.

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:* zoology 5 and 6. 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.

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.

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.

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
S114	Music for the Junior High School	3
S115	Guidance of Music Activities—Grades III-VI	3
S118	Guiding Elementary School Pupils in Music Experiences	3
S119	Elementary School Music (Music for grades I-III)	3

S122	Developmental Reading	3
S132	Teaching Arithmetic	3
S142	Audio-Visual Materials and Methods	3
S150	Intensive Teacher Training	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
S204	History of European Education	3
S206	Comparative Education	3
S209	Education of Teachers of the Mentally Retarded— Early Years	3-6
S210	Education of Teachers of the Mentally Retarded II— Later Years	3-6
S212	Child Development (Adolescent Development)	3
S213	Statistical Methods in Education and Guidance	3
S214	The Slow Learner (Education of the Exceptional Child)	3
S215	The Gifted Child	3
S216	Health Education	6
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
S233	Elementary School Supervision	3
S234	Secondary School Supervision	3
S235	Seminar in Educational Administration (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 in the Elementary (Secondary) School)	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

S271	Laboratory Experiences in Kindergarten Education	4
S276	Laboratory Experiences in Reading and Related Language Instruction	3-6
S277	Seminar in Educational Psychology	3
S280	Professional Problems in Education	3
S281	Occupational Information	3
S282	Administration and Organization of the Guidance Program	3
S283	Group Testing in Guidance	3
S286	Test Interpretation for School Counselors	3
S299	Research Methods in Education	3

Engineering, Agricultural

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professor Schneider (Chairman); Associate Professor Arnold; Assistant Professor Bornstein

151 FARM STRUCTURES (2-2) Design of farm structures, materials, structural requirements, functional requirements, insulating, heating, and ventilating. *Prerequisite:* civil engineering 131 or concurrent enrollment. Three hours. Mr. Arnold. Alternate years, 1968-69.

152 FARM UTILITIES (2-2) Water systems; plumbing; sewage disposal; refrigeration. *Prerequisite:* mechanical engineering 142 or civil engineering 162 or concurrent enrollment; physics 18. Three hours. Mr. Arnold. Alternate years, 1968-69.

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.

156 ELECTRICITY IN AGRICULTURE (2-2) Theory and engineering practices in the application of electricity to agriculture. *Prerequisite:* electrical engineering 101. Three hours. Mr. Arnold. Alternate years, 1968-69.

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.

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 Engineering, Civil

COLLEGE OF TECHNOLOGY

Professor Milbank (Chairman); Associate Professors Knight, and Fay, Assistant Professors Downer and Stearns; Instructors Bartholomew and Dunham; Visiting Assistant Professor Dorwart

The curricula and courses as outlined in this catalogue are applicable to all students entering for the first time in September, 1966, and thereafter.

Students already enrolled in the Department of Civil Engineering should consult the catalogues for the years 1965-66 and 1966-67 for curriculum and degree requirements and consult their adviser concerning any substitutions or alterations in enrollment.

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. Mr. Bartholomew.

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-Morh diagram. Continuous structures and an introduction to structural dynamics. *Prerequisite:* 140. Three hours. Mr. Stearns.

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 211. 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 211. Three hours. Mr. Stearns.

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 211. Three hours. Staff.

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 DeSaint Venant equations; flow through porous media. *Prerequisite*: 261, mathematics 211. 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 211. Three hours. Mr. Downer.

265 WATER TREATMENT PROCESSES (3-0) A rigorous study of the theoretical concepts involved in the operation of water and waste-water treatment processes. *Prerequisite*: 166, mathematics 211. 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. 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 meth-

ods; 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. Mr. Knight.

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 Engineering, Electrical

COLLEGE OF TECHNOLOGY

Professors Essler, Roth (Chairman), and Rush; Associate Professors Hoilman, Lai, Lambert, Shorey, and Taylor; Assistant Professor Evering; Instructor Bradley

The curricula and courses as outlined in this catalogue are applicable to all students entering for the first time in September, 1966, and thereafter.

Students already enrolled in the Department of Electrical Engineering should consult the catalogues for the years 1965-66 and 1966-67 for curriculum and degree requirements and consult their adviser concerning any substitutions or alterations in enrollment.

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. Applica-

tion 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 291. 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 blocking 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. Lai.

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. Staff.

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 of 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.

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 scalers. *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, boundary conditions for time varying systems, skin effect and internal impedance of a conductor. Propagation and reflection of electromagnetic waves, guided electromagnetic waves, resonant cavities, and microwave networks. *Prerequisite:* 240. Three hours. Mr. Evering.

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 291. 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 EE 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. Taylor.

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, transport, and other fundamental problems associated with ordered solids. *Prerequisite:* introductory statistical thermodynamics; 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 of 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 SIGNAL THEORY (3-0) Analysis and representation of non random signals, signal space concepts. The Fourier representation. Orthogonal functions. Analysis and representation of random signals. Random processes, correlation and power spectral density. Gaussian random process. *Prerequisite:* graduate standing in electrical engineering. Three hours. Mr. Lai.

372 ADVANCED COMMUNICATION ENGINEERING (3-0) Principles of optimum receiver: design and implementation. Implementation of coded communi-

cation 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.

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.

Engineering, Mechanical

COLLEGE OF TECHNOLOGY

Professors Nabavandi (Chairman), Outwater, and Tutbill; Associate Professors Carpenter, Duchacek, Hundal, Marshall, and Martinek; Instructor Mastro

The curricula and courses as outlined in this catalogue are applicable to all students entering for the first time in September, 1966, and thereafter.

Students already enrolled in the Department of Mechanical Engineering should consult the catalogues for the years 1965-66 and 1966-67 for curriculum and degree requirements and consult their adviser concerning any substitutions or alterations in enrollment.

1. ENGINEERING GRAPHICS I (0-6) Basic geometrical constructions, free-hand 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.

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.

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, math 12. Three hours.

135 MACHINE DESIGN I (3-3) Application of the principles of kinematics, dynamics and strength of materials to the proportioning and design of machine elements including consideration of function; production and economic factors; design of linkages, cams, gears, belts, ropes, chains and other mechanisms; balancing of rotors and reciprocating machines; vibration analysis; critical speed in shafts. *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 211. 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; civil engineering 130. 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 or senior 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 or senior 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 an engineering tool 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 211. 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 MACHINE 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 211. 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 211. 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, alloys and plastics with their heat treatments and uses. *Prerequisite:* chemistry 2; physics 16 or 28. Some laboratory work required. Three hours.

272 MECHANICAL BEHAVIOR OF MATERIALS (4-0) 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. Four 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 systems; 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.

385, 386 SPECIAL TOPICS IN MATERIALS (3-0) Lectures, reports and directed readings on advanced topics on materials. *Prerequisite*: graduate enrollment. Three hours. Staff.

387, 388 SPECIAL TOPICS IN ENERGY CONVERSION (3-0) Lectures, reports, and directed readings on advanced topics on energy conversion. *Prerequisite*: graduate enrollment. 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.

English

COLLEGE OF ARTS AND SCIENCES

Professors Bandel, Bogorad (Chairman), Hughes, Jones, Pope, and Trevithick; Associate Professors Caswell, Cochran, Long,¹ Manchel, Orth,² and Woodruff; Assistant Professors Broughton, Poger, Leonard, and Shepberd; Instructors Affsprung, Clark, A. I. Dickerson, M. J. Dickerson, Hall, Howe, C. Jarrett, D. Jarrett, Johnson, Kohler, McNallie, Miller, Picoff, Sberidan, Tillinghast, True, and Twitchell.

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, 18 CREATIVE WRITING Writing short stories, novels, poetry, plays, and imaginative essays. Instruction is guided by the particular needs and talents of the students. *Prerequisite*: 1-2; 17 for 18. Three hours. I, II. 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. Dickerson.

133, 134 THE DEVELOPMENT OF AMERICAN LITERATURE The emergence and growth of a national literature, including both major and minor figures. First semester: Colonial times to the Civil War; second semester: from the Civil War to the present. *Prerequisite*: 27, 28. Three hours. Mr. Orth.

1. Sabbatical leave first semester 1967-68.

2. Sabbatical leave 1967-68.

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, 1968-69.

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.

202 **MEDIEVAL LITERATURE** The forms (in translation) of medieval literature and middle English texts, excluding Chaucer. Lectures, discussion, and reports. *Prerequisite:* 27, 28. Three hours. Miss Hughes.

206 **ELIZABETHAN DRAMA** Drama in England from its beginning to 1642, exclusive of Shakespeare. *Prerequisite:* 27, 28. Three hours. Mr. Long. Alternate years, 1968-69.

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. Bogorad. Alternate years, 1968-69.

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. Bogorad. Alternate years, 1968-69.

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. 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, 1968-69.

233 MODERN AMERICAN NOVEL Representative American novelists since 1915. Limited to seniors, except with departmental permission. *Prerequisite:* 27, 28. Three hours. Mr. Cochran and Mr. Shepherd.

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. Caswell.

236 MODERN AMERICAN DRAMA American plays representing the principal trends culminating in contemporary drama. *Prerequisite:* 27, 28. Three hours. Mr. Caswell.

239 MODERN BRITISH POETRY A study of selected British poets since World War I. *Prerequisite:* 27, 28. Three hours. Mr. Caswell.

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. Mr. Caswell. 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.

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. Mr. Trevithick. 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 Southwest 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. Cochran.

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. Mr. Dickerson. Alternate years, 1968-69.

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, 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. Mr. Orth. 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 Development of extended projects in creative writing such as a novel, a group of short stories or plays, or a sequence of poems. *Prerequisite:* 27, 28; 17. Three hours. Mr. Broughton.

301 CHAUCER Principal works. Three hours. Miss Hughes.

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, Whitmore, and Zai; Assistant Professors Fuller, Hannah, and McCormack

1 INTRODUCTION TO FORESTRY (2-3) Introduction to forestry and conservation sciences. Three hours. Mr. McCormack.

5 DENDROLOGY (3-2) Classification and silvical characteristics of native and exotic forest trees. Twig identification. *Prerequisite:* botany 1. Four hours. Mr. Hannah.

24 FOUNDATIONS OF SILVICULTURE (2-2) Influence of site factors upon forest characteristics, growth, and development and the influence of forest vegetation on the site. *Prerequisite:* sophomore standing. Three hours. Mr. Post.

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 and botany 1. Three weeks in summer camp. Three hours. Mr. Fuller and Mr. McCormack.

103 WOODLAND MANAGEMENT (3-3) The theory and practice of silviculture in the management of farm woodlands and small forest areas. Practices in forest management and product utilization. *Prerequisite:* junior standing. Four hours. Mr. Hannah.

122 SILVICS Environmental factors and their influence upon the development, distribution, and succession of forest trees. Basic for the practice of silviculture. *Prerequisite:* 24. Three hours. Mr. McCormack.

123 SILVICULTURE (2-3) The principles and practices for governing growth and reproduction of forest stands. *Prerequisite:* 122. 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. Staff.

133 FOREST RECREATION MANAGEMENT The philosophies, values, economics, land use planning, design, and development of forest and wildland 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. Staff.

140 FOREST MENSURATION I Tree measurement techniques, volume determination of standing timber and wood products; growth and yield determinations. *Prerequisite:* 5 and mathematics 110. Three weeks in summer camp. Three hours. Mr. Zai.

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. Mr. Zai.

142 FOREST PHOTOGRAMMETRY (2-3) Preparation of planimetric and topographic maps from aerial photographs; vegetation and timber type mapping. Timber cruising through the use of aerial photographs. *Prerequisite:* 141. Three hours. Mr. Zai.

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. Staff.

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 1. Three hours. Mr. Whitmore.

163 TIMBER HARVESTING AND MILLING (3-3) Methods and costs of harvesting timber under different forest conditions and silvicultural treatments; organization and costs of logging operations; equipment, methods, and costs of lumber manufacture; air seasoning and kiln drying. *Prerequisite:* 5 or 103. Four hours. Staff.

164 FOREST PRODUCTS (2-3) Forest products other than lumber. Wood products manufacture including 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.

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.

222 ADVANCED SILVICULTURE Scientific bases for silvicultural practices for specific forest types. *Prerequisite*: 123. 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. Mr. Zai.

252 FOREST VALUATION Principles of valuation of forest growing stock, land and other forest resources. *Prerequisite*: 151 and 136 or concurrent enrollment. Two hours. Staff.

282, 284 FORESTRY SEMINAR Review and discussion of current research literature. Required of forestry seniors and graduate students. One hour. Staff.

381, 382 SPECIAL TOPICS Advanced readings and discussion of forestry research literature. Three hours. Staff.

391 through 394 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.

Geography

COLLEGE OF ARTS AND SCIENCES

Professor Miles (Chairman); Assistant Professors Barnum, D. W. Gade, and Meeks; Instructor M. K. Gade

1, 2 **INTRODUCTION TO GEOGRAPHY** An introduction to geography as a discipline. The earth as the home of man, emphasizing the interrelationships of the physical and cultural environments. Special emphasis on the areal distribution of the various elements of the environment and on the correlation and significance of the resulting global patterns. Not open to students who have taken 3. Three hours. I, II. Staff.

3 **WORLD GEOGRAPHY** Survey of the major regions and nations of the world, their peoples, problems, and potentialities. The physical and cultural factors which have been influential in shaping present-day economic, social and political patterns. Required of elementary education students. Not open to students who have taken geography 1 or 2. 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 **GEOGRAPHY OF AFRICA** The significance of geographic factors in the rapid political and economic development of tropical Africa. Attention is focused on the character of the human patterns and cultural development in the various regions against the background of the physical and resource base of the continent. *Prerequisite:* twelve hours in the social sciences. Three hours. Mr. Miles.

102 **GEOGRAPHY OF CANADA** The character, origin, and development of cultural, industrial and commercial patterns of present-day Canada against the background of the physical and resource base of the country. The analysis of Canadian regions. *Prerequisite:* twelve hours in the social sciences. Three hours. Mr. Miles.

103 **GEOGRAPHY OF THE SOVIET UNION** The geographic basis of Soviet strength. The geographical development of the Soviet Union with reference to the physical patterns and their relationship to settlement, agriculture, industrial resources, economic structure and urbanization. *Prerequisite:* twelve hours in the social sciences. Three hours. Mr. Meeks.

104 **GEOGRAPHY OF ASIA** Lands and peoples of east, southeast, southwest and south Asia, with special attention to India, China, and Japan. Geographic foundations of economic activities and population problems. *Prerequisite:* twelve hours in the social sciences. Three hours. Mr. Meeks.

105 **GEOGRAPHY OF EUROPE** Regional analysis of the physical and cultural basis of European life. Similarities and differences among European nations in terms of ethnographic, linguistic, and population patterns; urban and rural settlements; economic activities and overseas possessions. The geographic basis of the Common Market and other regional economic and military groupings. *Prerequisite:* twelve hours in the social sciences. Three hours. Mr. Barnum.

106 **GEOGRAPHY OF LATIN AMERICA** Similarities and differences among Latin American geographic regions resulting from the interplay of physical, economic, historical, cultural and political forces. *Prerequisite:* twelve hours in the social sciences. Three hours. Mr. Gade.

107 **GEOGRAPHY OF THE UNITED STATES** Geographic regions of the United States in their physical, economic, and cultural aspects. *Prerequisite:* twelve hours in the social sciences. Three hours. Mr. Meeks.

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 science. 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 science. 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.

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. *Prerequisite:* 2 and nine additional hours in geography, anthropology, or other social sciences. Three hours. Mr. Gade.

281 **DEVELOPMENT OF GEOGRAPHIC THOUGHT** Nature and development of geography as a discipline and a profession. *Prerequisite:* twelve hours in geography. Three hours. Staff.

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.

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.

115 **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:* 12. Three hours. Mr. Stanley.

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 (2-2) 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. Laboratory includes methods of collecting, preparing, and identifying fossils. *Prerequisite*: 2 or zoology 1, or the equivalent. Three hours. Mr. Hunt.

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. Field trips to typical mining operations. *Prerequisite*: 2 or 21. Three hours. Mr. Doten.

197, 198 RESEARCH IN GEOLOGY (0-12) 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.

224 STRATIGRAPHY (2-2) Sequential development and distribution of the sedimentary rocks. *Prerequisite*: 223. Three hours. Mr. Hunt. Alternate years, 1969-70.

242 FOREIGN REGIONAL GEOLOGY An examination and comparison of the geology of selected portions of the world. *Prerequisite*: 106, 116. Messrs. Stanley and Doten. Alternate years, 1968-69.

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) A synthesis of geologic processes and evolution of North America and selected portions of the world. Topics cover a wide range of subjects, with emphasis on current problems. *Prerequisite*: 106, 115, 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.

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.

German

COLLEGE OF ARTS AND SCIENCES

Professor White (Chairman); Associate Professor Webster; Assistant Professors Kahn and Wurthmann; Instructors Ganz and Noble

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.

195, 196 **SPECIAL TOPICS** Advanced study, readings, and reports in accordance with students' needs and interests. *Prerequisite:* 101-102 or the equivalent and departmental permission. Three hours. Staff.

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, 1968-69.

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 will be read. *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 will be read. *Prerequisite:* 101-102 or the equivalent. Three hours. Mr. White. Alternate years, 1968-69.

209, 210 THE TWENTIETH CENTURY Selected works in poetry, prose and drama by Brecht, George, Hauptmann, Hofmannsthal, Kafka, Thomas Mann, Rilke, and others will be read. *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.

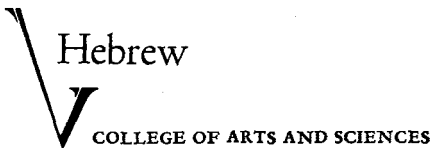
232 HISTORY OF THE GERMAN LANGUAGE Introduction to Germanic linguistics, the comparative method, and linguistic reconstruction. The linguistic development of German from Indo-European to the present. No knowledge of the older stages of the language is presupposed or required. *Prerequisite:* 121-122 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.



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, 1968-69.

V History

COLLEGE OF ARTS AND SCIENCES

Professors Daniels (Chairman), Evans,¹ and Schultz;¹ Associate Professors Davison, Felt, Hand, Heussler, and Schmokel; Assistant Professors Ambrose, Berger, Gard, Spinner, Stout, and True; Visiting Assistant Professor Hennequin; Instructors Andrea, Briggs, McCarty, Metcalfe, and Muller

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. The first semester of any two-semester course is prerequisite for the second semester, except by departmental permission.

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.

11, 12 EUROPEAN CIVILIZATION History of Europe, 1500 to the present. For students who satisfy the department that they have adequate preparation. 11 and 12, or 13 is required of all who concentrate in history. Three hours. Messrs. Andrea, Gard, Heussler, Metcalfe, Schmokel, Spinner, and Stout.

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. Mr. True.

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.

1. On leave 1967-68.

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. Messrs. Schultz and Hand.

51, 52 **CONTEMPORARY HISTORY** Survey of recent world events: first semester, 1918-1945; second semester, 1945 to the present. *Prerequisite:* sophomore standing. Three hours. Mr. Heussler.

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. Briggs and Gard.

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. Messrs. Gard and True.

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.

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. Mr. Briggs.

191, 192 **SENIOR HONORS RESEARCH** For seniors concentrating in history only; required of candidates for Special Honors in history. *Prerequisite:* six hours of advanced history courses and departmental permission. Three hours. Staff.

195 **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.

- 197, 198 SPECIAL SEMINARS AND PROJECTS Three hours. Staff.
- 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.
- 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. Andrea.
- 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. Staff.
- 213, 214 CANADIAN HISTORY Canadian development from the French exploration and settlement to the present; evolution of self-government and relations 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:* same as 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. Hennequin.
- 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. Mr. 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 his-

torical 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 **AMERICAN SOCIAL AND INTELLECTUAL HISTORY** Selected topics in the social and intellectual history of the United States since 1783. *Prerequisite:* 23 and 24, or 28. 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.

275¹ **THE EXPANSION OF EUROPE** Survey of the spread of European political and other influence in Latin America, Asia and Africa from the 16th century through the 19th century. *Prerequisite:* 12 or 13. Three hours. Mr. Heussler.

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 sci-

1. Approval for graduate credit pending.

ence including 51, and one other year course in social science. Three hours. Mr. Daniels.

281 through 284 SEMINAR Research in selected topics in American, European, Canadian, or Ancient History. By permission. Three hours. Staff.

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. Staff.

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 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. 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, Ellis, Lepeschkin, Livak, Powell, Prior, Quackenbush, Webster, and Whittlesey; Instructors Beadle and Clark; 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. No credit. 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.

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. Miss Quackenbush.

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. Miss Quackenbush.

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 (3-4) 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, Mrs. Hamilton.

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. Hamilton.

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. 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 (3-2)** Human nutrition; the nutritive value of foods with application in calculating food requirements; diets for children, adults and family groups. *Prerequisite:* 135; agricultural biochemistry 201; 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. Miss Morse and Messrs. Donovan and Smith.

Institutional Food Service

138 QUANTITY FOOD PRODUCTION (1-4) Practical applications of principles, methods, and techniques used in quantity food production. *Prerequisite:* 135. Three hours. Mr. Emanuel.

139 INSTITUTIONAL ADMINISTRATION Survey of the field; organization, management and personnel problems; time and motion studies; sanitation; food cost control. *Prerequisite:* 138, may be taken concurrently. Three hours. Staff. Alternate years, 1968-69.

239 INSTITUTIONAL MARKETING AND ACCOUNTING (3-2) Advanced institutional management, marketing, accounting, equipment, floor plans, layouts and related material on design and furnishing in the different types of food services. *Prerequisite:* 138, 139. Four hours. II. Staff. Alternate years, 1968-69.

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. Miss Knowles.

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. Miss Beadle.

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. Mr. Samenfink.

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. Clark.

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.

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 51. 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 51. 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. Staff.

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. Mr. Samenfink. Alternate years, 1969-70.

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 41. 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

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.

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.

15 **PARTICIPATION** (See education 15) Credit to be arranged. 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.

297, 298 **PROBLEMS IN EDUCATION** (See education 297, 298) Credit to be arranged. Staff.

Seminars and Research

192 **INTRODUCTION TO RESEARCH** Research procedure with lectures and discussions of outlines, selection of problem, bibliographical techniques, and simple analysis of data. Open to anyone in the College of Agriculture and Home Economics as a suggested prerequisite to senior research or special problems. Each student will prepare a project outline for a simple experiment or study in a chosen field. *Prerequisite:* junior standing. One hour. I, II. Misses Morse and Ellis.

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**

308 EXPERIMENTAL TECHNIQUES IN NUTRITION

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.

Mathematics

COLLEGE OF TECHNOLOGY

Professors Meserve, Riggs, and Schoonmaker (Chairman); Associate Professors Chamberlain, Dwork, Izzo, Lighthall, Moser, and Nicholson; Assistant Professors Hill, Khazanie, Sylwester, Wenner, and Wright; Instructors Burns, Dickson, Marn, Nevin, Roney, Stein and Stewart

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.

9¹ 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.

12¹, 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.

13. 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.

21 SOPHOMORE MATHEMATICS Partial differentiation, multiple integrals, infinite series, and elementary differential equations. *Prerequisite:* 12. Three hours. Staff.

23 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.

24 LINEAR ALGEBRA A study of matrices, linear dependence, vector spaces, linear transformations and characteristic equations. *Prerequisite:* 12. Three 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 sci-

1. The enrollment of students who desire eventually to take mathematics 12 will depend on their previous record and their score on a mathematics achievement test. Students not qualified to enroll in mathematics 11 will be enrolled in mathematics 9. A student who takes mathematics 9 in the fall of his freshman year and who, because of his chosen curriculum, needs to have completed mathematics 12 prior to the beginning of his sophomore year, will need to take mathematics 12 during the summer between his freshman and sophomore years. Those who are deficient in high school mathematics are urged to attend summer school prior to their first semester in college.

entific problems. *Prerequisite:* credit or concurrent enrollment in 21 or 23. 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, fundamental sequences, real numbers, complex numbers, elementary topology of the reals and complexes. *Prerequisite:* credit or concurrent enrollment in mathematics 21. 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. Mr. Izzo.

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:* junior 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. Not acceptable for fulfilling a mathematics requirement for mathematics majors. *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 student 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.

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; 207 for 208. Three hours. Staff.

209 **PROJECTIVE GEOMETRY** Principle of duality, perspectivity, projectivity, harmonic sets, cross ratio, the theorems, the Pascal and Brianchon, and poles and polars. *Prerequisite:* 12. Three hours. Staff. Alternate years, 1968-69.

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:* 21. Three hours. Staff.

212 **APPLIED MATHEMATICS** Boundary-value problems, orthogonal functions and vector analysis. *Prerequisite:* 24 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:* 21. 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, 1968-69.

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:* 21. Three hours. Staff. Alternate years, 1969-70.

228 **NUMBER THEORY** Divisibility, prime numbers, Diophantine equations, congruence of numbers, and methods of solving congruences. *Prerequisite:* 21. 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, Rie-

mann surfaces, and conformal representation. *Prerequisite:* 208; 231 for 232. Three hours. Staff. Alternate years, 1968-69.

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. Alternate years, 1969-70.

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, 24 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:* 21, 24 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 24. Three hours. Mr. Riggs. Alternate years, 1968-69.

253 **ADVANCED PROGRAMMING** Assembly language programming, sub-routines, 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:* 24, 102. 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.

Medical Technology

DIVISION OF HEALTH SCIENCES

Note: All courses limited to students of Medical Technology except by permission of the Departmental Chairman.

1 **INTRODUCTION TO MEDICAL TECHNOLOGY** Orientation and explanatory lectures in each of the disciplines in Medical Technology. Fall semester. One hour. Dr. Coon, Misses Breen and Wise, and staff.

101 **MEDICAL TECHNOLOGY (5-20)** Principles, procedures, and special techniques in medical technology. Includes hematology, immunohematology, serology, and urinalysis. Fall semester. Six hours. Dr. Coon, Miss Wise, and staff.

102 **MEDICAL TECHNOLOGY (3-6)** Continuation of 101; includes histologic technique, introduction to cytopathology, parasitology, clinical biochemistry, and clinical microbiology. Fall semester. Six hours. Dr. Coon, Miss Wise, and staff.

103 **MEDICAL TECHNOLOGY** Lectures on special problems in medical technology and individual research. Spring semester. Two hours. Dr. Coon, Miss Wise, and staff.

110 SEMINAR IN MEDICAL TECHNOLOGY Group discussions of techniques and principles in medical technology. Spring semester. Two hours. Dr. Coon, Miss Wise, 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. Mr. Melville and staff.

HOSPITAL ASSIGNMENTS Rotating assignments in various departments of hospital, medical college, and public health diagnostic laboratories to give experience in medical laboratory procedures. Fall and spring semesters. Total of thirteen hours. Dr. Coon, Miss Breen, and staff.

Military Science

Colonel Longacre (Chairman); Lieutenant Colonel Oehler; Majors Peck and Sparks; Captains Fraser and Wilcox

1-2 U. S. ARMY AND NATIONAL SECURITY (2-1) Organization for national defense; national security program and objectives; organization of Army units; role of the U. S. Army in total, limited, and cold war; military technology and weapons systems; modernization of the Army; principles of marksmanship; principles of military leadership; leadership laboratory.

11-12 MILITARY MAP READING; U. S. MILITARY HISTORY (2-1) Military topographic and aerial photographic maps; grid reference systems; cartographic symbology; small unit tactics; counterinsurgency; Revolutionary War; Civil War; World War I; World War II; the Korean War; Vietnam conflict; leadership laboratory.

101-102 ARMY TEACHING METHODS; FUNDAMENTALS OF LEADERSHIP (3-1) Methods of instruction; military leadership; military communications; small unit tactics; branches of the Army; leadership laboratory.

111-112 MILITARY COMMAND AND MANAGEMENT (3-1) Military administration; staff functions and organization; training management; military law; military intelligence; military transportation; logistics; role of the U. S. in world affairs; leadership laboratory.

Music

COLLEGE OF ARTS AND SCIENCES

Professors Lidral (Chairman), Bennett and Pappoutsakis; Associate Professor D. Kinsey; Assistant Professors Read, Schultz, and Weinrich; Part-time Instructors Ambrose, Anand, Auchter, Dabl, 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. Read.

9 INTRODUCTORY MUSIC Required of students in elementary education, elective to others. Ear training, music reading and writing, and elementary theory. Three hours.¹ Mr. Pappoutsakis and staff.

105-106 THEORY II (2-3) Contrapuntal and harmonic dictation, advanced harmony, and elementary counterpoint. *Prerequisite:* 5-6. Three hours. Mr. Pappoutsakis.

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, 1968-69.

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. Messrs. Pappoutsakis and Lidral. 204 in alternate years, 1968-69.

205, 206 COUNTERPOINT First semester: tonal counterpoint; second semester: canon and fugue. *Prerequisite:* 105-106; 205 for 206. Three hours. Messrs. Kinsey and Lidral. 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. Alternate years, 1969-70.

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.

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

1. Enrollment in 5 will cancel credit for 9.

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, 1968-69.

215, 216 **COMPOSITION** Creative work in free composition with instruction according to the needs and capabilities of the individual student. *Prerequisite*: 205 and 208. Three hours. Mr. Read.

History and Literature

1, 2 **SURVEY OF MUSICAL LITERATURE** First semester: the Romantic era in songs and piano pieces, program music, the symphony and the concerto, and the opera. Second semester: the Classical era, Gregorian chant to Handel and Bach, modern music, and American music. Three hours. Messrs. Kinsey and Read, Mesdames Ambrose and Anand.

10 **INTRODUCTORY MUSIC** Required of students in elementary education, elective to others. History and appreciation. Three hours.¹ Mr. Pappoutsakis and staff.

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, 1968-69.

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. Bennett.

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.

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 155.

For School Music, see Elementary Education 113.

1. Enrollment in 1 or 2 will cancel credit for 10.

Applied Music

For the fees for instruction, see page 50.

A senior recital in the applied major field is required of all music majors. Regular appearances in informal recitals are required of all applied music 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, and Orchestra. *Prerequisite:* departmental permission. One hour.¹ Messrs. 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 INDIVIDUAL 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 applied music fields of voice, strings, woodwinds, brass, and percussion. One hour.¹ Staff.

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 or 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.

1. Indicated courses in applied music 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.

251, 252 **ADVANCED INDIVIDUAL STUDY** Private study in piano, organ, harpsichord, voice, strings, woodwinds, brass, percussion, and harp leading to public recital performance. *Prerequisite:* advanced standing in applied field and departmental permission. One or two hours.¹ Staff.

271, 272 **APPLIED MUSIC PEDAGOGY** Methods of teaching voice, strings, woodwinds, brass or keyboard instruments and advanced class instruction in them. Research paper required. *Prerequisite:* performing ability and teaching experience. Two hours.¹ Staff.

Nursing

DIVISION OF HEALTH SCIENCES

Associate Professors Adams, Lombard, Milligan,² Palmer, and Woodruff (Chairman); Assistant Professors Demers, Emerson, Farrington, Forgione, Phillips,² Powell, Rodgers, Schwalb, and Thompson; Instructors Celano, DePalma, DeVore, Elmendorf, Gardner, Jennings, Marsland, Quinn, and Sorrell

1 **ORIENTATION TO NURSING** Introduction to nursing as a profession with reference to its historical development. One hour. Miss Woodruff.

7 **HOME NURSING (0-2)** Care of the family. *Prerequisite:* junior standing in home economics curriculum. One hour. Mrs. Rodgers.

21-22 **INTRODUCTORY NURSING (2-8), (3-12)** First semester: development of understandings, attitudes, and skills necessary in giving basic nursing care. Laboratory study in classroom and hospital. Second semester: development of understandings, attitudes, and skills necessary in giving nursing care to people who face illnesses which have a favorable prognosis. Laboratory experience in hospital. 21, four hours; 22, six hours. Miss Gardner, Mrs. Rodgers, Mrs. DePalma, and Mrs. Elmendorf.

26 **INTERPERSONAL RELATIONS IN NURSING** Understanding of human relationships in the care of patients; some of the dynamic factors influencing interpersonal relations; development of approaches useful in the solution of common problems in nurse-patient relationships. Three hours. Misses DeVore and Sorrell.

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 hospital and out-patient environment. Nine hours. Misses Forgione and Schwalb; Mrs. Marsland and Mrs. Jennings.

1. See footnote 1 on page 211.

2. On leave 1967-68.

122 INTERMEDIATE NURSING (4-20) Development of understandings, concepts and skills necessary to provide nursing care to the adult and his family when illnesses are encountered which necessitate short and long term adjustments in patterns of living. Nine hours. Mrs. Celano, Mrs. Palmer, and Mrs. Quinn.

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. Misses DeVore and Sorrell.

165 ADVANCED NURSING (3-12) 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. Laboratory experience is provided in the care of the critically ill. A six weeks course. Three hours. Miss Lombard.

167 NURSING LEADERSHIP (3-12) 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 coordination necessary to meet them. A six weeks course. 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. Miss Woodruff.

Philosophy and Religion

COLLEGE OF ARTS AND SCIENCES

Professors Dykhuizen, Hall (Chairman), and Sadler; Assistant Professors Beckett, Kahn, and Sobers; Instructors Paden and Martin

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.

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.

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.

Physical Education

COLLEGE OF EDUCATION

Associate Professors Evans, Post and Zimmerli (Chairman for Women); Assistant Professors Bryant, Christensen (Chairman for Men), Dunkley, Gobin, Greig, Leggett, and Strassburg; Instructors Chase, Condon, Dearcopp, Hayes, Lambert, Lange, Loche, Nedde, Rose, 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 57). 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

Men	Men and Women			Women
Basic Physical Education*				
Handball	Badminton	†Judo	Squash	Archery
Paddleball	Golf	Skiing	Tennis	Bowling
Wrestling	Ice Skating		Track	Fencing
				Riding
				Rifle
Touch Football	†Swimming	Basketball		Field Hockey
	Synchronized	Soccer—Speedball		Lacrosse
	†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.

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. (Also listed as Education 22.)

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.

For information on the curriculum for prospective teachers of physical education and athletic coaches see page 88.

V Physics

COLLEGE OF ARTS AND SCIENCES

Professors Crowell (Chairman)¹, Juenker, and Nyborg; Associate Professors Detenbeck, Krizan, and Scarfone; Assistant Professors Brown, Depatie, 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 9, 11, or 13; for 18, 17 and concurrent enrollment or credit in mathematics 11 or 13; for 27, 18 or departmental permission, and credit or concurrent enrollment in mathematics 21 or 23. Three, three, and four hours. Staff.

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:* 27 and credit or concurrent enrollment in mathematics 21 or 23. 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, mathematics 21; 101 for 102. Three hours. Mr. Sachs, and Mr. Depatie.

116 MECHANICS (3-0) Mechanics of a particle, including central forces, forced and coupled vibrations; introductory rigid body motion. *Prerequisite:* 27; mathematics 21. Three hours. Mr. Scarfone.

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, mathematics 21. 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.

1. Sabbatical leave January 1 to July 1, 1968.

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:* 27 and mathematics 21. Three hours. Mr. Sachs. Alternate years, 1969-70.

191, 192 **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.

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 21; 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. Sachs.

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 21; 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 21 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.

1. May be replaced by physics 5-6 with departmental permission.

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. Juenker and Mr. Krizan.

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. Nyborg.

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. Depatie.

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. Brown.

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 phe-

nomena. 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 include 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 Wiggans (Chairman), Bartlett, and Hopp; Associate Professors MacCollom and Wood; Assistant Professors Boyce, Flanagan, McIntosh, and Pellett; Lecturers Calaban, 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. Wiggans and staff.

11 **PRINCIPLES OF PLANT SCIENCE (2-3)** Principles and practices involved in the culture, management, and utilization of plants and plant products with emphasis on economically important horticultural and agronomic crops. *Prerequisite:* botany 1 or equivalent. Three 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, 1968-69.

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, 1968-69.

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, 1968-69.

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 (1-3) 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. Two 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 Classical work in solution culture; modern theories of ion accumulation. Colloidal chemistry of roots and the rhizosphere. Measurement of ion availability in relation to uptake and growth. *Prerequisite:* 11, 61, and botany 103 or equivalent. Three hours. Mr. Bartlett and botany, forestry and plant and soil science staff. Alternate years, 1969-70.

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. Boyce. Alternate years, 1968-69.

S223¹ 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, 1968-69.

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, 1968-69.

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 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.

1. Approval for graduate credit pending.

Political Science

COLLEGE OF ARTS AND SCIENCES

Professors Dellin¹, Gould (Chairman), Haugen, Hilberg², Little and Nuquist; Associate Professor Heussler; Assistant Professors Kirk, Pacy, Simon, Staron and Warner; Instructors Briggs, Brubaker, and Eastman

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. Briggs, 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. Messrs. Briggs or Little. Alternate years, 1969-70.

191, 192 HONORS OR SPECIAL READINGS Three hours. Staff.

1. Sabbatical leave, 1967-68.

2. Sabbatical leave second semester, 1967-68.

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. Hilberg.

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. Nuquist.

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. Pacy.

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, 1968-1969.

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. Kirk.

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.

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. Staron.

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.

Poultry Science

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professor Donovan (Chairman) and Associate Professor Henderson

1 **GENERAL POULTRY SCIENCE (2-2)** Principles of poultry science and their application to the poultry industry. Three hours. Mr. Henderson.

58 **INTRODUCTORY AVIAN BIOLOGY (2-2)** The evolution and biology of birds. Includes development from physiological and morphological viewpoints, the endocrinology and physiology of reproduction, social behavior and mechanics of flight. Designed for students with a general interest in biology. Three hours. Mr. Henderson.

102 **INCUBATION AND BROODING (2-4)** General biology of embryonic development and hatchability; fundamental principles underlying incubation practices; theory and practice of brooding chicks and other poultry. *Prerequisite:* 1; junior standing and departmental permission. Four hours. Mr. Henderson.

103 **PROCESSING AND PACKAGING POULTRY PRODUCTS (2-2)** Principles of marketing of eggs and poultry meat; candling, grading, and packing eggs; preparation of poultry for market. A one-week inspection trip to the Boston market for which there is a charge of \$30.00. *Prerequisite:* junior standing. Three hours. Mr. Henderson. Alternate years, 1968-69.

190 **POULTRY TECHNOLOGY** Principles of poultry feeding, breeding, and management. 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. Three hours. Staff.

281 through 284 **SEMINAR** Current developments and literature. Required of all poultry seniors. *Prerequisite:* 1. One hour. Staff.

294 **HISTORY OF NUTRITION (See home economics 294)** One hour. Miss Morse and Messrs. Donovan and Smith.

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. Mr. Donovan and Miss Morse. Alternate years, 1969-70.

308 EXPERIMENTAL TECHNIQUES IN NUTRITION (See animal and dairy science 308) Two hours. Miss Morse and Messrs. Donovan and Smith.

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.

Psychology

COLLEGE OF ARTS AND SCIENCES

Professors Ansbacher, Chaplin, and Forgays (Chairman); Associate Professor 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. Mr. Forgays and staff.

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 concentrate 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, verbal learning, and concept formation; 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.

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.

231 **PERCEPTION** Experimental and theoretical study of the perceptual processes. Traditional problems of space, form and movement perception and consideration of the role of social and motivational factors. Laboratory experiences are provided and students may undertake original experiments. *Prerequisite:* 110, 123. Three hours. Mr. Perrine and Mr. Lawson.

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. Lawson.

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.

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.

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 the serial position effect, remote as-

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.

sociations, short-term memory, the stimulus in serial learning, and pre-experimental associations will be examined. Three hours. Mr. Howell and Mr. Mayhew.

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. Patterson.

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.

327¹ **SEMINAR IN JUDGMENTAL PHENOMENA** Survey of the basic methodological and theoretical problems involved in the process of making human judgments. Three hours. Mr. Perrine.

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; applications of operant techniques. 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: Memory, Fear and Frustration, Adlerian Theory, Behavior Therapy, Behavioral Pharmacology, Information Theory, Instinct, Propaganda and Attitude Formation, Psycholinguistics. Three hours. Staff.

1. See footnote 1 on page 231.

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.

V Romance Languages

COLLEGE OF ARTS AND SCIENCES

Professors Daggett and Johnston; Associate Professors Julow (Chairman), Parker and Weiger; Assistant Professors Chinchón, Kobler, Preston, Strong, Ugalde and Wesseling; Instructors Allen, Beade, Crispin, de Loeschnigg, M. Geno, T. Geno, Heitkamp, Krikorian, Radcliffe, Scheible and Serra

French

1-2 **ELEMENTARY FRENCH** The fundamentals of French, with emphasis on the spoke 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 Crispin 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. Heitkamp 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. Geno 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, 103 for 104. Three hours. Messrs. Parker and de Loeschnigg.

121-122 **COMPOSITION AND CONVERSATION** Development of skills in conversation and comprehension through systematic review of phonology and gram-

mathematical structure. Literary texts will be the basis of analysis and discussion. Explications de textes littéraires and exposés. Written compositions required regularly. Required of those who wish to be recommended to teach French. *Prerequisite*: good standing in 11-12. Three hours. Mr. Kohler and staff.

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*: 102, 203 for 204. 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*: 102. 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*: 102. Three hours. Mr. Parker. Alternate years, 1968-69.

214 FRENCH LITERATURE: 17TH CENTURY Selected works of the century with emphasis on Corneille, Racine, and Molière. *Prerequisite*: 102. Three hours. Mr. Julow. Alternate years, 1968-69.

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*: 102. Three hours. Mr. Daggett. Alternate years, 1968-69.

216 FRENCH LITERATURE: 16TH CENTURY Selected works of the period with emphasis on Rabelais, Montaigne and the Pléiade. *Prerequisite*: 102. Three hours. Mr. Daggett. Alternate years, 1968-69.

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*: 102. 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. Three hours. Messrs. Daggett and Kohler.

227 LINGUISTIC PROBLEMS IN FRENCH A study of the structure of the French language with emphasis on phonetics, phonemics, morphology and syntax. The contribution of linguistics to the field of language study is stressed. Considerable language laboratory practice is required. *Prerequisite*: 121-122 and junior standing. Three hours. Miss Radcliffe.

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, 1968-69.

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. Credit for 1-2 granted only if language requirement already satisfied in some other language. 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. Weiger 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*: 101. Three hours. Mr. Ugalde.

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*: good standing in 11-12. Three hours. Messrs. Beade and Chinchón.

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, 1968-69.

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; 213 for 214. Three hours. Mr. Weiger. Alternate years, 1968-69.

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 Marias 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 Alegría, 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 Garcia 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

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. Practice in hearing, writing, and speaking Russian. *Prerequisite:* 11-12. Three hours.

103-104 **ADVANCED RUSSIAN** Guided conversation, discussion, and advanced oral and written drill in Russian. Lectures, readings, and reports on works by classic and modern Russian writers. *Prerequisite:* 101-102. Three hours.

Sociology and Anthropology

COLLEGE OF ARTS AND SCIENCES

Associate Professors Lewis (*Chairman*), Mabry, and Pful; Assistant Professors Haviland, Johnson, Kennedy, and Steffenbagen; Instructor Basa

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. Staff.

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.

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.

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. *Prerequisite:* 21. 3 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 and anthropology 26. Three hours. Mr. Pfuhl.

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:* nine 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:* nine hours of sociology. Three hours.

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:* nine hours of sociology. Three hours. Mr. Lewis.

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:* nine 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 41. Three hours. Mr. Kennedy.

251 **SOCIAL RESEARCH METHODS** The logic and techniques of sociological inquiry. *Prerequisite:* 22, psychology 5 and 3 additional hours in sociology. Three hours. Mr. Pfuhl.

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.

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. Mr. Pfuhl.

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. Mr. Pfuhl.

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*: 22, and 6 additional 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.

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

V Speech

COLLEGE OF ARTS AND SCIENCES

Professors Huber, Lewis, and Luse; Associate Professors V. Falck, Jordan, and London (Chairman); Assistant Professors Ellenwood and Thomsen; Instructors Bensman, Dilley, M. Feidner, MacDonald, Myers, Schenk, and Wilkes

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. Staff.

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.

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.

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.

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.

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, emo-

tional and aesthetic values of literature to an audience. Three hours. I, II. Mr. London and staff.

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. Feidner, 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.

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. Staff.

74 **INTRODUCTION TO SPEECH CORRECTION** The causes, symptoms and treatment of speech disorders. One-third devoted to articulatory problems of children. Observation of children's therapy in the Speech Clinic. *Prerequisite:* sophomore standing. Three hours. I, II. Mr. Ellenwood.

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.

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, 1968-69.

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.

161 **RADIO PRODUCTION** An analysis of the principles involved in the production of programs for radio broadcast. Emphasis on the production of the fol-

lowing types of programs: talks, music, news, dramatic, variety and documentary. Laboratory use of the facilities of WRUV-FM. *Prerequisite*: 63. Three hours. Mr. Bensman.

162 **WRITING FOR RADIO AND TELEVISION** Principles and techniques of writing for radio and television; adaptations, documentaries, and dramatic scripts. *Prerequisite* 63. Three hours. Mr. Lewis. Alternate years, 1968-69.

163 **BROADCAST MATERIALS** A comprehensive survey and analysis of the style and content of all types of broadcast materials including selected critical and research works. Extensive use is made of source materials such as recordings, tapes, films and kinescopes. *Prerequisite*: 161. Three hours. Mr. Lewis. Alternate years, 1968-69.

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 and staff.

197, 198 **HONORS OR SPECIAL READINGS** Three hours. Staff.

201 **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.

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.

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.

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.

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. Dillely.

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. Jordan.

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.

274 **SPEECH READING AND AUDITORY TRAINING** Principles of teaching speech, reading, and auditory training to the hard of hearing. *Prerequisite:* 273. 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 **VOICE SCIENCE** The anatomical, physiological, and physical factors of speech. *Prerequisite:* twelve hours of speech and psychology. Three hours. Miss Luse.

283 **CLINICAL AUDIOLOGY** Advanced audiological testing and clinical procedures. *Prerequisite:* 273. Three hours. Mrs. Falck.

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 1 and 11. 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. Jordan.

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. Jordan.

388 **SEMINAR IN STUTTERING** Study of the research in stuttering relative to etiology and rehabilitation. *Prerequisite:* 271, 272. Three hours. Mr. Jordan.

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.

Zoology

COLLEGE OF ARTS AND SCIENCES

Professors Glade (Chairman), Lochhead, Moody, and Potash; Associate Professors Bell, Chipman, Henson, Davison, and Rothstein; Assistant Professors Bromley and Stevens; Instructor Korson

1 For the introductory course, see Biology 1, 2 under Department of Botany.

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.

21 ORGANIC EVOLUTION A nonlaboratory course on the theory of evolution. Biological principles connected with the development of life on earth; evidences that evolution occurs. A student may not receive credit for both 2 and 21. *Prerequisite:* sophomore standing. Three hours. Mr. Moody.

41, 42 COMPARATIVE VERTEBRATE ANATOMY (2-4) Survey of Phylum Chordata; outline of basic vertebrate body plan; functional anatomy and phylogeny of the organ systems of vertebrates, beginning with an agnathan and concluding with a mammal. *Prerequisite:* 1; 41 for 42. Four hours. Mr. Davison.

52 PHYSIOLOGY Chemical and mechanical fundamentals of animal physiology, with special reference to man. *Prerequisite:* 1, junior standing; some knowledge of chemistry. Three hours. Mr. Lochhead.

104 ANIMAL ECOLOGY (2-4) Relationships between animals and their environments; dynamics of animal populations; aspects of wildlife conservation. *Prerequisite:* 1, and an additional semester of zoology or botany; inorganic chemistry. Four hours. Mr. Potash.

108 GENERAL ENTOMOLOGY (2-4) Study of insects; morphology, physiology, and evolution. *Prerequisite:* 1, and 2 or 41. Four hours. Mr. Potash.

109 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:* 1, and an additional semester of zoology or botany. Four hours. Mr. Bell.

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 42.

111 EMBRYOLOGY (2-4) General principles of development exemplified by typical invertebrate and vertebrate embryos. *Prerequisite:* 41, junior standing. Four hours. Mr. Glade.

112 COMPARATIVE HISTOLOGY (2-4) Microscopic anatomy of invertebrate and vertebrate tissues. Basic tissue similarities and specializations in relation to function. *Prerequisite:* 41, junior standing. Four hours. Mr. Glade. Alternate years, 1968-69.

115 HEREDITY Principles of inheritance and their physical basis. *Prerequisite:* junior standing and two semesters of courses selected from botany, psychology, and zoology. Three hours. Mr. Moody.

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:* 1, and 41 or 108; junior standing. Four hours. I. Mr. Lochhead.

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 Special 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.

203 POPULATION ECOLOGY Dynamics, composition, and density regulation of animal populations. *Prerequisite:* 104. Four hours. Mr. Potash. Alternate years, 1968-69.

207 VERTEBRATES (2-4) Classification, ecology, behavior, evolution, and distribution of vertebrates other than birds. *Prerequisite:* 42, either 2 or 21, and a course in zoology numbered above 100. Four hours. Mr. Bell.

216 HUMAN GENETICS Principles of human inheritance; population genetics; interaction of heredity and environment; application of principles of heredity to human problems. *Prerequisite:* 115 or botany 255. Three hours. Mr. Moody.

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:* 111 and departmental permission. Four hours. Mr. Glade. Alternate years, 1969-70.

225 ENVIRONMENTAL PHYSIOLOGY The physiological processes by which animals cope with moderate, changing, and extreme environments. *Prerequisite:* a course in physiology and a course in ecology. Four hours. Mr. Chipman.

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:* a course in zoology numbered above 100; 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*: a course in zoology numbered above 100, and inorganic chemistry. Four hours. Mr. Henson.

255 **COMPARATIVE ANIMAL PHYSIOLOGY (2-6)** General principles of function in invertebrates and vertebrates. *Prerequisite*: 104 or 150 or 236 and departmental permission; 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*: 111, 115, and departmental permission. Four hours. Mr. Bromley. Alternate years, 1968-69.

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*: a course in evolution and one in heredity or genetics. 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.



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.

Officers 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, the Director of Alumni Relations, and the President of the University 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:

Honorary: The President of the University, Lyman S. Rowell, '25
 President: John S. Burgess, '42, 50 Western Ave., Brattleboro, Vt.
 Vice-President: Bingham J. Humphrey, '27, 680 Evergreen Ave., Mt. Carmel, Conn.
 Council Secretary: Arthur M. Brink, Jr., '66, Alumni House, University of Vermont
 Treasurer: George N. Clerkin, University of Vermont

Members-at-Large:

Howard A. Allen, Jr., '40, 20 Woodcrest Ln., Burlington, Vt.
 Consuela Northrop Bailey, '21, 1317 Spear St., S. Burlington, Vt.
 Luther F. Hackett, '55, 39 Laurel Hill Dr., S. Burlington, Vt.
 William Lockwood, '27, 283 So. Prospect St., Burlington, Vt.
 Mrs. Antoinette Loudon, '33, 36 Fairview Ter., White River Jct., Vt.
 Allen Overton, '59, 22 Prospect St., Essex Jct., Vt.
 Thomas Reeves, '35, 106 Colchester Ave., Burlington, Vt.
 Charles Schechtman, M.D., '26, 73 Cedar St., New Britain, Conn.
 Ralph Sussman, M.D., '38, 21 Loomis St., Burlington, Vt.
 David Webster, '33, 31 Cliff St., Burlington, Vt.
 Mrs. Isabelle Y. Gallup (Honorary), 530 North St., Burlington, Vt.

Club or Regional:

- Reginald H. Arnold, '30, 66 Clarendon Ave., Montpelier, Vt.
 Lawrence 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.
 Alfred E. Brooks, '26, 100 Hoover Rd., Rochester, N. Y.
 Charles F. Black, Jr., '52, Stowe, Vt.
 Donald B. Carpenter, '38, Box 87, Mendocino, Calif.
 Clarence F. Castle, '28, 6015 Telegraph Rd., Alexandria, Va.
 William J. Cimonetti, '59, 37 Elsom Pkwy., S. Burlington, Vt.
 Mrs. Dorothy Collins Cox, '31, 138 S. Willard St., Burlington, Vt.
 Max B. Davison, '24, Morrisville, Vt.
 Roland J. Delfausse, '35, 191 Howard St., Burlington, Vt.
 Clarence J. Douglas, '29, 7 Winter St., Northfield, Vt.
 John Fitzpatrick, '56, Highacres Rd., Randolph, N. H.
 John F. Galascione, '57, 34 Belcher Rd., Wethersfield, Conn.
 Mrs. Dorothea Smith Hanna, '41, Mountain Rd., Stowe, Vt.
 Mrs. Florence Cudworth Holden, '45, 125 School St., Concord, N. H.
 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.
 Mrs. Catherine Durick Lull, '34, Shelburne, Vt.
 Elias Lyman, Jr., '38, 125 Ninth St., Wilmette, Ill.
 Lawrence H. Marvin, '28, 11 Hillcrest Rd., Essex Junction, Vt.
 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.
 A. Bradley Soule, Jr., M.D., '28, P. O. Box 216, Shelburne, Vt.
 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. Wimettt, '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 Smith, '18, R.D. No. 2, Box 7, Woodbury Rd., Springfield, Vt.
 Marsh 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. Spaulding, '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, 64 Woodland St., Claremont, 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.
 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 Dion, '52, 15 Roseade Pkwy., 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.
 Sam Laufer, '65, 141 N. Manassas St., Apt. 10-A, Memphis, Tenn.
 Arthur M. Brink, Jr., '66, 51 Loomis St., Burlington, Vt.
 Gary Lawson, '67, Wallingford, Vt.

Alumni Representatives on the University Athletic Council:

Norman H. Myers, '34, 7 Driftwood Dr., Burlington, Vt.
 Albert C. Spaulding, Jr., '38, 27 Kingsland Ter., Burlington, Vt.
 H. B. Levine, M.D., '39, 231 Maple St., Burlington, Vt.
 Roy E. Alberghini, '43, 222 Loomis St., Burlington, Vt.

V Enrollment Statistics

Summary of Resident Enrollment

Fall Semester, 1967-68

The Undergraduate Colleges:	<i>Men</i>	<i>Women</i>	<i>Total</i>
Arts & Sciences	1644	863	2507
Education & Nursing	129	726	855
Technology	526	108	634
Agriculture & Home Economics	200	222	422
TOTAL	2499	1919	4418
College of Medicine	188	15	203
Graduate College	376	137	513
Non-Matriculated	110	78	188
School of Dental Hygiene	0	33	33
TOTAL	3173	2182	5355
Undergraduate Colleges by Classes	<i>Men</i>	<i>Women</i>	<i>Total</i>
Senior	517	388	905
Junior	583	417	1000
Sophomore	662	556	1218
Freshman	737	558	1295
TOTAL	2499	1919	4418

	<i>In-State</i>			<i>Out-of-State</i>			<i>Total</i>
	<i>M</i>	<i>F</i>	<i>T</i>	<i>M</i>	<i>F</i>	<i>T</i>	
Arts & Sciences	953	625	1578	691	238	929	2507
Technology	339	43	382	187	65	252	634
Education & Nursing	83	494	577	46	232	278	855
Agric & Home Economics	126	131	257	74	91	165	422
Graduate	193	94	287	183	43	226	513
Medicine	49	6	55	139	9	148	203
Non-Matriculated	103	63	166	7	15	22	188
Dental Hygiene	0	24	24	0	9	9	33
	1846	1480	3326	1327	702	2029	5355

GRAND TOTAL—FALL SEMESTER, 1967—5355

Enrollment by Divisions

I. COLLEGE OF ARTS AND SCIENCES

	<i>In-State</i>			<i>Out-of-State</i>			<i>Total</i>
	<i>M</i>	<i>F</i>	<i>T</i>	<i>M</i>	<i>F</i>	<i>T</i>	
Class of 1968	209	101	310	160	53	213	523
Class of 1969	237	153	390	145	44	189	579
Class of 1970	240	165	405	190	81	271	676
Class of 1971	267	206	473	196	60	256	729
TOTAL	953	625	1578	691	238	929	2507

ENROLLMENT STATISTICS

	<i>In-State</i>			<i>Out-of-State</i>			<i>Total</i>
	<i>M</i>	<i>F</i>	<i>T</i>	<i>M</i>	<i>F</i>	<i>T</i>	<i>In & Out</i>
II. COLLEGE OF TECHNOLOGY							
Class of 1968	76	9	85	24	10	34	119
Class of 1969	83	11	94	30	15	45	139
Class of 1970	89	13	102	55	24	79	181
Class of 1971	91	10	101	78	16	94	195
TOTAL	339	43	382	187	65	252	634
III. COLLEGE OF EDUCATION AND NURSING							
	<i>In-State</i>			<i>Out-of-State</i>			<i>Total</i>
	<i>M</i>	<i>F</i>	<i>T</i>	<i>M</i>	<i>F</i>	<i>T</i>	<i>In & Out</i>
Class of 1968	14	95	109	8	67	75	184
Class of 1969	23	114	137	9	37	46	183
Class of 1970	18	118	136	13	80	93	229
Class of 1971	28	167	195	16	48	64	259
TOTAL	83	494	577	46	232	278	855
IV. COLLEGE OF AGRICULTURE AND HOME ECONOMICS							
	<i>In-State</i>			<i>Out-of-State</i>			<i>Total</i>
	<i>M</i>	<i>F</i>	<i>T</i>	<i>M</i>	<i>F</i>	<i>T</i>	<i>In & Out</i>
Class of 1968	21	30	51	5	23	28	79
Class of 1969	43	32	75	13	11	24	99
Class of 1970	34	32	66	23	43	66	132
Class of 1971	28	37	65	33	14	47	112
TOTAL	126	131	257	74	91	165	422
V. GRADUATE COLLEGE							
			<i>Matric.</i>			<i>Non-Matric.</i>	<i>Total</i>
<i>In-State</i>	<i>M</i>		139		54		193
	<i>F</i>		64		30		94
	<i>T</i>		203		84		287
<i>Out-of-State</i>	<i>M</i>		181		2		183
	<i>F</i>		40		3		43
	<i>T</i>		221		5		226
<i>Total</i>	<i>M</i>		320		56		376
	<i>F</i>		104		33		137
	<i>T</i>		424		89		513
VI. COLLEGE OF MEDICINE							
	<i>In-State</i>			<i>Out-of-State</i>			<i>Total</i>
	<i>M</i>	<i>F</i>	<i>T</i>	<i>M</i>	<i>F</i>	<i>T</i>	<i>In & Out</i>
Class of 1968	13	1	14	29	1	30	44
Class of 1969	15	2	17	31	1	32	49
Class of 1970	13	1	14	39	2	41	55
Class of 1971	8	2	10	40	5	45	55
TOTAL	49	6	55	139	9	148	203
VII. NON-MATRICULATED							
	<i>In-State</i>			<i>Out-of-State</i>			<i>Total</i>
	<i>M</i>	<i>F</i>	<i>T</i>	<i>M</i>	<i>F</i>	<i>T</i>	<i>In & Out</i>
Arts & Sciences	48	39	87	4	11	15	102
Education & Nursing	6	11	17	1	0	1	18
Technology	44	10	54	2	4	6	60
Agric. & Home Econ.	5	3	8	0	0	0	8
TOTAL	103	63	166	7	15	22	188

ENROLLMENT STATISTICS

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VIII. SCHOOL OF DENTAL HYGIENE	<i>In-State</i>	<i>Out-of-State</i>	<i>Total In & Out</i>
Second Year	10	5	15
First Year	14	4	18
TOTAL	<u>24</u>	<u>9</u>	<u>33</u>

V Degrees Granted

JUNE, 1967

School of Dental Hygiene

Judith Ann Aja, Essex Junction
 Carol Ann Brown, Danville
 Dianne Louise Copeland, Melrose, Mass.
 Donna Lorene Durett, Stowe
 Susan Jane Gray, Lexington, Mass.
 Ellen Lee Hawley, Bethel
 Sue Ellen Hughes, Burlington
 Deborah Hutchins, Bradford
 Ruth Esther Lambert, Highgate Center
 Carol Jean Lamonda, South Burlington
 Anne Marie Lessard, Barre

Jane Merrill Marcy, Readfield, Me.
 Nancy Joyce Minard, Norwich
 Janet Louise Munson, Milton
 Susan Gayle Neylon, Amherst, Mass.
 Rebecca Ann Simpson, Farmington, Me.
 Nancy Elizabeth Stearns, South Burlington
 Mary Towle Taplin, Stowe
 Judith Allison Thompson, Newton Highlands,
 Mass.
 Patricia Ann Wheeler, St. Johnsbury Center
 Marsha Dale Williams, Hingham, Mass.

College of Education and Nursing

Bachelor of Science in Nursing

Anne Christine Adams, North Bellmore, N.Y.
 Diane Patenaude Anderson, Burlington
 Carol Ann Bosanquet, Canton, Mass.
 Katherine Lurana Brush, Brandon
 Ann Elizabeth Dion, Hartford, Conn.
 Anna Margaret Gardner, Fairhaven, Mass.
 Carol Ann Green, Burlington
 Nancy Jean Grover, Floral Park, N.Y.
 Harriet Diantha Hall, Lyndonville
 Pamela Jeanne Handy, Springfield
 JoAnne Hedges, Northfield
 Michele Carol Hennessey, Bellows Falls
 Georgiana Louise Hodge, Topsham
 Carole Farnham Jacobs, Winoooski

Diane Lois Kirk, Richmond, Mass.
 Carla Mabel Lamberton, Randolph
 †Barbara Cora Mortenson, Proctor
 Joan Elizabeth Newman, Gilman
 Anna Jeannette Paquette, St. Albans
 Carol Jean Peake, Rutland
 Ann Howarth Reardon, Durham, N.H.
 *Lynn Keppelman Resnick, Essex Fells, N.J.
 Joan Meiklem Rousseau, North Haven, Conn.
 Linda Corey Smith, *cum laude*, Brandon
 Sandra Toni Snowling, Keene, N.H.
 Elaine Joyce Swinyer, Poultney
 Donna Jane Wilcox, Burlington
 Trudy Lee Young, Wallingford

Bachelor of Science in Business Education

Carole Lee Munger, Benson

Bachelor of Science in Music Education

George Robert Bedell, Stowe
 Grace Marilyn Gibby, West Topsham

David Kimball Hebert, Rutland
 *Joan Sandra Hutchinson, Plainfield

* As of October 15, 1966.

† As of February 18, 1967.

Bachelor of Science in Education

- Terry Frank Acker, North Woodstock, N.H.
 Elizabeth Ahr, Westerly, R.I.
 Judith Ann Allen, Winooski
 Bonnie Louise Auserehl, Huntington, N.Y.
 *Tyler, Insley Bean, Burlington
 Mikell Ann Beckley, South Ryegate
 †Nancy Lois Beckwith, Manchester Center
 Judy Minerva Beeber, Brooklyn, N.Y.
 Charlotte Stanford Bell, Rutland
 Francis Jerome Bigelow, Bellows Falls
 Diane Elizabeth Birt, Darien, Conn.
 Susan Roberta Blau, Woodmere, N.Y.
 †Marjorie Jane Bohrer, Great Neck, N.Y.
 Barbara Ellen Booth, Bridgewater
 †Susan Jill Boriskin, Burlington
 Susan Jane Bowers, North Troy
 †Ronni Sue Brambier, Westbury, N.Y.
 David Charles Brassard, Northfield
 Ann Raymond Brown, Evanston, Ill.
 Charles Sterling Brown, Newport
 Gaylen Louise Campbell, Staten Island, N.Y.
 Donald Norton Carlson, Essex Junction
 Thomas Robert Carlson, South Ryegate
 Audrey Casella, *cum laude*, Rutland
 †Ronnie Joyce Chapman, North Plainfield, N.J.
 Stephanie Elaine Cole, Mount Holly
 Betsy Berry Coughlin, Norwich
 †Janeen Lee Dilworth, Fishkill, N.Y.
 Bruce Edwin Douglas, Shoreham
 Janice Agnes Duby, Rutland
 Carole Ann Dutton, Lyndon Center
 †Christine Economou, Burlington
 Cheryl Fay Eisert, New York, N.Y.
 Suzanne Joan Ek, Shrewsbury, Mass.
 Anne Harrison Eliot, Milford, Conn.
 Lee Fardelmann, Winooski
 Vicki Norton Fennessey, Bath, Me.
 Cynthia Gail Fisher, *magna cum laude*,
 Burlington
 Altiera Marie Fusco, Fair Haven
 Sue Charlotte Gibbons, Rahway, N.J.
 Judy Gladstone, Burlington
 Nadine Hope Glasban, West Hartford, Conn.
 Sheila Eileen Gorbis, Bayonne, N. J.
 Doris Young Harvey, Colchester
 Glenna Elise Hazelton, Londonderry
 Carolyn Burnett Herndon, *cum laude*,
 Danville, Va.
 Deborah Mitchell Herron, Haworth, N.J.
 Marsha Lee Hitchcock, Springfield
 Sherrill Jean Hodgeman, Lowell
 George Elmer Hood, Barre
 Gail Ann Horst, Bennington
 Kate Dean Hubert, Berlin, Conn.
 Cornelia Ann Hurley, Northfield
 Karen Ann Jensen, Burlington
 Margaret Anne Jones, Old Greenwich, Conn.
 Gail Rhodes Kaiser, Stowe
 Nancy Louise Kirkendall, Naugatuck, Conn.
 Kathleen Jo Kushner, Owego, N.Y.
 *Bruce Douglas Lapine, Windsor
 William Maurice Leete, Jr., Williamstown,
 Mass.
 Jeannette Anita Lesage, Winooski
 Shirley Blanche Levine, South Burlington
 *Carole Joy Lindeman, Burlington
 Linda Anne MacKay, Burlington
 June Marie Manor, Jericho
 Corolin Elizabeth Marcy, Greene, N.Y.
 †Jayne Warren Martinsen, Staten Island, N.Y.
 †Marion Louise Maynard, Perkinsville
 *Louise Wright McArdle, Fairfax
 Mary Christine Moscatello, Rutland
 Nancy Lee Nelson, Ryegate
 Rae Wallace Newcomb, North Haven, Conn.
 Carolyn Jeanne Norvik, Albany, N.Y.
 †Patricia Landenberger Nugent, Winooski
 Barbara Ellen Pack, Troy, N.Y.
 Sandra Fidler Parsons, Winooski
 Kristin Sayward Pattee, *cum laude*, South
 Burlington
 Janet Lee Pearson, North Kingston, R.I.
 Judith Peitscher, Rochester, N.Y.
 John Stephen Pluta, West Rutland
 †Geraldine Joan Renaud, East Hardwick
 †Carol Schick Rothschild, Forest Hills, N.Y.
 Marc Stephen Sacher, West Hartford, Conn.
 Donna Mary St. Pierre, Essex Junction
 Lee Aura Sanguinetti, Barre
 Aida Mae Saxton, Richmond
 Claudia Harriet Serwer, Larchmont, N.Y.
 Gail Ellen Seymour, *magna cum laude*, St.
 Albans
 Jeanne Marie Sherbert, Waterbury
 Carmen Joanna Sinos, Rutland
 Carole Miriam Smith, West Hartford, Conn.
 Marilyn Winifred Smith, La Salle, Que.
 †Susan Strassburg, Garden City South, N.Y.
 Jane Rose Taylor, *summa cum laude*,
 Burlington
 Donna Lee Treadway, Whiting
 *Rita Gertrude Villemaire, Winooski
 Patricia Ann Vladich, Whitehouse Station,
 N.J.
 *Janice Elaine Watson, Lyndonville
 Susan Delle Westerberg, North Troy
 Dorothy Eleanor Zimmer, Bennington

* As of October 15, 1966.

† As of February 18, 1967.

College of Technology

Bachelor of Science in Chemistry

Peter Finamore, New York, N.Y.
Albertine Meymarian, Burlington

Philip Ronald Veysey, South Burlington

Bachelor of Science in Civil Engineering

†Steven Wayne Broderick, Alexandria, Va.
Douglas Warren Chase, South Burlington
†Jacques Gerald Couture, Websterville
Don Geoffrey Fitton, East Williston, N.Y.
Arthur George Hill, Jr., Upper Montclair,
N.J.

Henry Wittwer Kelly, Hamden, Conn.
Lance Allan Llewellyn, Syracuse, N.Y.
Jay Lovatt Rutherford, South Burlington
Charles Irwin Wilson, Greensboro

Bachelor of Science in Electrical Engineering

1967
John George Angelis, Beverly, Mass.
William Forrest Butterfield, Springfield
William James Craig, Stamford
Douglas Cecil Holland, Jr., Essex Junction
Herbert Raymond Jones, Jr., Burlington
Fabian Jerry Lahue, Morrisville

Hugh Chalker Maddocks, *summa cum laude*,
South Burlington
Charles William Moran, Jr., Barre
Melvyn Jorge Norona, Saxtons River
*William Harry Pelkey, Winooski
Wayne Allen Ryen, Burlington

Bachelor of Science in Management Engineering

*David Francis Chioffi, Rutland
John Stuart Demars, Boxford, Mass.

Bruce Edward Durgin, Lynnfield, Mass.
Diane Marie Meyer, Cleveland, Ohio

Bachelor of Science in Mathematics

Harold Frank Fedick, South Burlington
Jeffrey Stewart Galuten, Hartsdale, N.Y.
Douglas William MacDougal, Mountainside,
N.J.
Bernard Elijah Newton, *magna cum laude*,
Burlington

*Clyde Christian Nichols, Elmhurst, N.Y.
Clifton William Price, Jr., *summa cum laude*,
Burlington
*James Edward Rogers, Plattsburgh, N.Y.

Bachelor of Science in Mechanical Engineering

Larry Edward Austin, Vergennes
Keith Forest Brewster, Burlington
John Joseph Carbone, Mechanicville, N.Y.
Stephen Burrows Dates, Livingston, N.J.
Frederick Olsen Gates, *cum laude*, Norwich
Scott Sheldon Hallock, Colchester
Gary Ralph Jackman, Cheshire, Conn.
Francis Walter Kazak, Springfield

†David Drake Macdonald, West Hartford,
Conn.
*Giustino Nicholas Mastro, Schenectady, N.Y.
Ashwin Mafatlal Mehta, Antwerp, Belgium
†John Adams Norton, Jr., Union, N.J.
Gary Castle John Randall, Rutland
Frederick Leslie Sole, Essex Center
Sidney Allen Young, Lyndonville

Bachelor of Science in Medical Technology

Constance Rita Chapman, Williston
Nancy Dryden Ellis, Underhill
Kathleen Anne Fitzpatrick, Barre
Miriam Kay Fogg, Pittsburg, N.H.
Donna Leila Hunt, Vergennes
*Mary Elizabeth Knight, Essex Junction
Vicky Ann Lawson, Enosburg Falls

Judith Roberts McNamara, Lexington, Mass.
Joyce Ellen Mintzer, Mechanicville, N.Y.
Lucene Martha Pike, Stowe
Theo Angela Russell, Glens Falls, N.Y.
Karen Von Fritzingler, Reading, Mass.
Ruthann Yaeger, Barre

* As of October 15, 1966.

† As of February 18, 1967.

College of Agriculture and Home Economics

Bachelor of Science in Agriculture

- Roger Neal Allbee, Newfane
 Ronald Alan Allbee, Newfane
 Dennis James Baker, Brattleboro
 †Wryth Spencer Baker, Washington, D.C.
 *Robert Clark Bayer, Scarsdale, N.Y.
 Keith Allen Bohne, Bennington
 †Donald Merrill Canedy, Burlington
 †James Robert Carpenter, Bellows Falls
 Clifford Chester Clark, West Pawlet
 Natt Lincoln Divoll, Bellows Falls
 †Peter Harden Foulkes, West Peabody, Mass.
 Peter Francois Fredericks, Essex Junction
 Mark Sheldon Gates, Pittsford
 Carolyn Ruth Goodrich, Burlington
 *Edward Amos Haight, Croton Falls, N.Y.
 †Brian Darcy Hawley, Shelburne
 †Edward Henry Holden, Bennington
 †Jane Ann Karpich, Springfield, N.J.
 Anthony Scott Leake, Bennington
 Myles Jay Leeds, Malverne, N.Y.
 Ervin Macy Davis Lemmon, Richmond
 John Marshall Lindley, III, Springfield
 Dwight Carlton Ovitt, Enosburg Falls
 Scott Abbott Renfrew, Bradford
 Irving Arthur Salkovitz, Newton, Mass.
 William Joseph Scott, Vergennes
 Douglas Paul Snyder, Westfield, N.J.
 John Merritt Speirs, Slate Hill, N.Y.
 Larry Elton Walbridge, Cabot
 Gerald Markey Wilcox, Manchester
 Harmon Arthur Willey, South Londonderry

Bachelor of Science in Home Economics

- Jeanne Mary Angus, Flemington, N.J.
 *Ellen Dee Baker, Springfield, Mass.
 Donna Rae Baraw, Stowe
 Cathlyn Ann Beck, Summit, N.J.
 Nancy Poplawski Behan, Winooski
 Bernadette Ann Berthiaume, Swanton
 Diana Sue Bowen, Hydeville
 Sharon Louise Burke, Rutland
 Lucy Jane Burnap, Pelham, N.Y.
 Rita Rae Collett, St. Albans Bay
 †Norma Jeannine Danis, Burlington
 Dianne Dolores Dempsey, St. Albans
 Anne Louise Elliott, Barton
 Susan Elizabeth Fick, Wyckoff, N.J.
 Marjorie Chapman Gilbert, Burlington
 Leslie Barbara Grossmann, Montpelier
 Diantha Woodhull Hall, North Bennington
 Michele Margaret Harper, Barton
 †Harriett Nellie Howard, Shaftsbury
 Patricia Raye Howrigan, Fairfield
 Patricia Anne Jewett, *magna cum laude*,
 Morrisville
 †Barbara Elizabeth Kaldy, Florence
 Priscilla Ann Lindley, Bound Brook, N.J.
 Lois Button Mason, Chelsea
 Janice Ellen Moncsko, Saratoga Springs, N.Y.
 Susan Louise Montrone, Fair Haven
 †Cassandra Hickin Mundell, Brattleboro
 Judy Linda Nystrom, Newfane
 Barbara Ellen Ramsey, Fairfax
 Michaele Garon Roberts, *cum laude*, Newport
 Lois Ethel Senger, West Hartford, Conn.
 Ruth Florence Taylor, Croton Falls, N.Y.
 Donna Patricia Tift, Dorset

College of Arts and Sciences

Bachelor of Science in Commerce and Economics

- Francis Peter Ambrose, Fairfield, Conn.
 Harold Albert Armstrong, Jr., Cortland, N.Y.
 Arthur Ivan Aronson, Brighton, Mass.
 *John Franklin Barrett, Jr., Linden, N.J.
 *Thomas Arthur Benway, Montpelier
 Jack Thomas Frederick Bitter, Jr., West
 Hartford, Conn.
 *John Louis Boisvert, Winooski
 Alan James Bordeau, Winooski
 Bruce Bovenizer, Glen Rock, N.J.
 William Robert Boyd, Bloomfield, N.J.
 John Albert Carlson, Trumbull, Conn.
 William Richard Comstock, Williamstown
 Edward Eugene Curtis, South Burlington
 Roland John Delfausse, Jr., Burlington
 Donald Charles DeVries, Farmingdale, N.Y.
 †Roderick Winfield Durrell, Shelburne
 Marvin Alex Feit, Port Chester, N.Y.
 Alec Charles Felder, Burlington
 James Edward Foley, Burlington
 Dwight Allen Fortier, Orwell
 Sanford Arnold Friedlander, New York, N.Y.
 Clayton Clark Fuller, Burlington
 *John Bryant Gilman, Jr., Wallingford
 Daniel Kessler Goldberg, Burlington
 Richard Philip Goldstein, Little Neck, N.Y.
 Stanton Campbell Griffin, East Longmeadow,
 Mass.
 Lloyd Jay Hier, Pittsford
 Robert Wayne Jensen, Richmond
 Thomas Richard Ernst Landmann,
 Larchmont, N.Y.

* As of October 15, 1966.

† As of February 18, 1967.

Richard Langs, Forest Hills, N.Y.
 Rayburn Vaughan Lavigne, Burlington
 * John I. Leggett, Colchester
 William Alan Levy, Woodmere, N.Y.
 Thomas Edward Lozen, Rutland
 * Albert Ernest Lyon, White River Junction
 Constantine Basil Maglaris, Burlington
 Robert Edward Martel, Rutland
 Thomas Lee Mills, Burlington
 Stanley Minkin, Clifton, N.J.
 John Gilman Morse, IV, Bath, Me.
 Duncan Reid Nash, Old Bennington
 James Richard Nixon, Rochester, N.Y.
 Frank Anthony Patalano, Bellows Falls
 Edward Waite Perry, Bristol, Conn.
 Frank Christopher Pierce, Montpelier
 Richard Kenneth Polish, Cedarhurst, N.Y.
 Michael Paul Ricciardi, Oyster Bay, N.Y.
 Alan Neil Rice, Newtonville, Mass.
 Peter Edward Rising, Glen Head, N.Y.
 David Dexter Rowe, Nashua, N.H.

John Noel Rutledge, Scotia, N.Y.
 Michael Joseph Schneider, Bradford, Mass.
 Daniel John Senecal, Rutland
 Arnold Kuhne Shimelman, West Hartford,
 Conn.
 Philip Henry Steckler, III, Scarsdale, N.Y.
 Christopher Alan Stephens, Marshfield, Mass.
 Michael Sherman Sutliff, Gloversville, N.Y.
 † George Charles Treiber, Manhasset, N.Y.
 William Walter Van Bennekum, Hoboken,
 N.J.
 Martha Lee Van Schaick, Saxtons River
 Lawrence James Veladota, Burlington
 Frederick Richard Ward, Cranford, N.J.
 Allen David Webster, Burlington
 Raymond Sidney Weinstein, West Hartford,
 Conn.
 Richard Andrew Weiss, *magna cum laude*,
 New Rochelle, N.Y.
 Robert Donald Werner, Eastchester, N.Y.

Bachelor of Arts

Beverly Jane Kliner Abbott, North Plainfield,
 N.J.
 George Albert Abbott, White River Junction
 † Janet Ladd Merrill Abrahamson, West
 Newton, Mass.
 † James Francis Aher, Hartford
 * Joseph John Albanese, Palisade Park, N.J.
 Beverly Joyce Alger Alexander, Orleans
 Judith Louise Allard, Rutland
 † Brian Charles Andrews, Farmington, Conn.
 Richard Alan Arbetter, Auburndale, Mass.
 † John Clinton Babcock, Silver Spring, Md.
 Curtiss Stow Bacon, IV, Karlua, Hawaii
 Suzanne Elaine Bacon, Hillsdale, N.J.
 Joseph Harold Badgewick, *cum laude*,
 Rutland
 † Dena Frances Apple Bailey, Rutland
 Neil Leslie Baker, Newton Highlands, Mass.
 Nancy Mae Baldwin, *cum laude*, Charlotte
 † Joel Banilower, Riverdale, N.Y.
 † Sandra Betit Clough Batease, North Adams,
 Mass.
 Jean Marie Battles, East Montpelier
 Michael Dunham Beale, Rutland
 Maurice John Belden, Jr., Danby
 Marvin Joel Bellovin, Brooklyn, N.Y.
 William Donald Belville, Burlington
 Betsey Stewart Benton, Vergennes
 Richard Daniel Berk, Brooklyn, N.Y.
 Marjorie Ann Berkowitz, Forest Hills, N.Y.
 † Priscilla Ann Lee Beuret, Stowe
 † Lynn Alan Bicknell, Middlebury
 John Thomas Birchhead, East Williston, N.Y.
 Steven Jeffrey Blackwell, *cum laude*, New
 York, N.Y.
 Allen Francis Blaine, Burlington
 Louis Berl Blumenfeld, New Britain, Conn.

Earl Russell Boardman, Mattapoisett, Mass.
 * Melvyn Douglas Borofsky, Fitchburg, Mass.
 George Merrill Boshier, North Bellmore, N.Y.
 Richard Morris Bouffard, Essex Junction
 Norman Joshua Boyden, 3rd, Burlington
 Elizabeth Sara Bradspies, Amityville, N.Y.
 Mary Thorp Brady, Barre
 Alison Louise Bristol, *cum laude*, Bristol
 Frederick Boynton Brown, Woonsocket, R.I.
 Matthew Alan Brown, New Bedford, Mass.
 Richard Lawrence Brown, Yonkers, N.Y.
 Mason David Bryant, III, Hallowell, Me.
 Robert Howard Bullard, Barre
 Alan Howard Bullock, Rego Park, N.Y.
 † Kay Mary Burbank, Jericho
 Francis Warner Burke, Rutland
 Mary Virginia Burnham, Northfield
 Mark Steven Burwick, Meriden, Conn.
 Jesse Lewis Byock, Montclair, N.J.
 Ruth Karabin Campagna, *summa cum laude*,
 Winooski
 † Julia Bourne Thurber Candon, Charlotte
 Stephen Thomas Carlson, Cabot
 David Francis Carpenter, Ludlow, Mass.
 Candice Theresa Carter, Delmar, N.Y.
 Curtis Wentworth Carter, Topsfield, Mass.
 † Joan Marjorie Carter, Bellows Falls
 John Joseph Cassidy, Lowell, Mass.
 Renier Frederick Chaintreuil, Pittsford, N.Y.
 Roberta Holt Channer, Whitesboro, N.Y.
 * Judith Ann Mercier Chaput, Websterville
 Louise Elinor Chartrand, New Hyde Park,
 N.Y.
 † Vincent Philip Chesarone, Newton, Mass.
 Donald Joseph Chioffi, Rutland
 Barbara Anne Clark, Tiverton, R.I.
 Robert Allen Clark, Millburn, N.J.

* As of October 15, 1966.

† As of February 18, 1967.

- Alexander Mansfield Clarke, Marion, Conn.
 *Judith Ann Cloud, Williamstown
 Jeffrey Marshall Clyman, New York, N.Y.
 James Owen Collins, Swanton
 *Robert Allen Collins, Pequannock, N.J.
 Harry Roy Colombo, Montpelier
 Raymond Luther Conant, Rochester, N.Y.
 James Richard Concannon, Northfield
 John Michael Conley, Bath, Me.
 Mary-Emelyn Cornish, Chevy Chase, Md.
 *Laureen Edna Coutermarsh, Rutland
 Peter Bruce Covette, *cum laude*, Brooklyn, N.Y.
 Christine Ellen Larue Covey, Albany, N.Y.
 Alison Craig, *magna cum laude*, Brookfield
 Maria Cecilia Cunningham, Fair Haven
 Steven Max Curland, Norwich, Conn.
 Margaret Fayre Curtis, Providence, R.I.
 Vassar Haight Curtis, Saratoga Springs, N.Y.
 Norman David Dahl, Barre
 Richard Fredric Dalton, South Burlington
 Robert Charles Davidson, Manchester, Conn.
 Scott Edward Davis, Meriden, Conn.
 John Lawrence DeBoer, *cum laude*, Burlington
 Clement Louis Deforge, Burlington
 John Arthur Devino, Winooski
 Alan David Diamond, Oceanside, N.Y.
 Robert W. Dillon, Belle Harbor, N.Y.
 Kathy Sue Doherty, Reading, Mass.
 Mark Earl Dolgenas, Plainview, N.Y.
 Richard Michael Dombal, Garfield, N.J.
 *Peardon Donaghy, Burlington
 Robert Emmett Dolan, Milwaukee, Wis.
 William Peter Dorozenski, New Britain, Conn.
 Stephen Hunt Drewes, Pelham, N.Y.
 Maurice Ellwyn Drown, Jr., St. Johnsbury
 William James Duke, Montpelier
 Cynthia Joyce Dunnan, Boston, Mass.
 Helen Margaret Duranleau, Burlington
 Martha Jane Earle, Canaan
 Argie Economou, Burlington
 David Stanley Ely, St. Johnsbury
 Hannah Imogene Evans, Jacksonville, Fla.
 Jerome Marvin Felsenstein, *magna cum laude*, Bellerose, N.Y.
 Syndee Sue Feuer, Bomoseen
 Roger Henry Feuss, Manhasset, N.Y.
 †William Kenneth Fifield, Wells
 Barbara Smith Fineman, Greensboro
 William Harris Finger, Newburgh, N.Y.
 Sara Jane Firth, Milton, Mass.
 †Todd Edward Fischer, North Tonawanda, N.Y.
 Elizabeth Ann Fische, Bellows Falls
 *Allan Baxter Fisher, Clifton, N.J.
 *Walter Scott Fitz, III, Nashua, N.H.
 Paul Sanford Flaxman, *cum laude*, Oceanside, N.Y.
 Victoria Elaine Fleming, Manchester Depot
 †Ronald MacNeish Fletcher, Springfield, Mass.
- Richard Warren Flood, Yonkers, N.Y.
 Robert Joseph Florczak, Fairfield, Conn.
 Paula Carol Flynn, Burlington
 John Warner Foley, III, New London, N.H.
 M. Eileen Fontana, East Dorset
 Alan Robert Forman, Malden, Mass.
 Pamela Lovell Foster, Burlington
 †Linda Dorothy Dick Fox, Bellows Falls
 †Laura Jean Frank, New Rochelle, N.Y.
 †Stuart Ervin Freeman, Jr., Westwood, Mass.
 *Ruth Margaret Frost, West Hempstead, N.Y.
 Gail Irene Fuller, Schenectady, N.Y.
 Cheryl Gaye Fuss, Great Neck, N.Y.
 Kenneth Nicholas Geluso, Oyster Bay Cove, N.Y.
 *Paul Michael Giardi, East Hartford, Conn.
 Donald Joseph Giles, Jr., Short Hills, N.J.
 David Dante Gilrain, Rutland
 Edward Hugh Glass, Bronxville, N.Y.
 Mary Eileen Goedicke, Newport
 James Samuel Goldberg, Scarsdale, N.Y.
 Lawrence Ira Goodman, Yonkers, N.Y.
 Donald William Goodrich, Bennington
 Sarah Wales Goodrich, Newton, Mass.
 Stephen Booth Goodwin, Montpelier
 *Barent William Gordiniere, Nassau, N.Y.
 Linda Susan Graf, *magna cum laude*, Burlington
 Ralph Philip Joseph Grenon, Burlington
 Peter Frederick Gross, Staten Island, N.Y.
 Titus Alden Hale, Barre
 †Douglas Blanchard Hall, Windsor
 Kathleen Elizabeth Halpin, Rutland
 Toby Sawyer Hammer, Oradell, N.J.
 Kingsley Hull Hammett, Summit, N.J.
 David Frederick Hammond, Houlton, Me.
 †Hugh Joseph Harley, III, Stowe
 Karen Norlie Haugen, Burlington
 David Bruce Havanich, Devon, Conn.
 †Sherrill Elizabeth Hawkins, Essex Junction
 Lelia Michele Hay, Bellows Falls
 Timothy Barnaby Hayes, New York, N.Y.
 Susan Anne Haynes, West Woodstock
 Linda Claire Heller, Westfield, N.J.
 Richard Howard Hellman, Great Neck, N.Y.
 Robert John Hill, Springfield
 Linda Rose Hillman, Chatham, N.J.
 Thomas Morse Hinckley, Acton, Mass.
 Richard Craig Hitchins, Hamden, Conn.
 Ralph Richard Hochberg, Syosset, N.Y.
 Diane Susan Hoffman, Chester, N.J.
 Robert Ronald Holland, Essex Junction
 Marsha Louise Hopkins, *cum laude*, Springfield
 Lee Marshall Horowitz, Woodmere, N.Y.
 Martha Jeanne Huff, Flemington, N.J.
 Donald Stewart Hutchinson, Trumbull, Conn.
 †Constance Jean Roessler Ireland, Baltimore, Md.
 †Alan Emery Irwin, *magna cum laude*, Burlington

* As of October 15, 1966.

† As of February 18, 1967.

- Carole Schalk Ives, Stamford, Conn.
 Bonnie Jean Jackson, Somersworth, N.H.
 Robert Barry Jahrmarkt, New York, N.Y.
 *Paul Martin Jedzinak, Woodside, N.Y.
 †Randolph Dieter Jenne, Tarrytown, N.Y.
 Gordon Wohl Josephson, Rockville Centre, N.Y.
 Lynda Gale Joslyn, Waterbury
 Claire Ellen Kahkola, *magna cum laude*, Bellows Falls
 Cordelia Knight Kennedy, Colchester
 Linda Jean Kilby, White River Junction
 Theodore Frederick Kinerson, Danville
 Edward John Kiniry, Springfield
 Philip Bills Kirk, Chappaqua, N.Y.
 Jane Gail Kleinberg, South Orange, N.J.
 Kenneth Edward Klonsky, Rockville Center, N.Y.
 Kirby Orrin Kloter, Rockville, Conn.
 Martha Ann Ross Knight, Barre
 Ira Kotler, Yonkers, N.Y.
 Herbert Ira Kravetz, Fall River, Mass.
 Lorraine Adele Kretchman, North Clarendon
 Donald Jeffrey Kruger, Annandale, Va.
 David Ernest Lambert, Lunenburg, Mass.
 Peter Steven Lamm, Merrick, N.Y.
 Michael Lee Lapointe, *summa cum laude*, Winooski
 Philip Aiston Laporte, Burlington
 Peter Hans Larsen, Rutland
 Patricia Ann Lashway, Burlington
 †Angela Elvira Tirola Lawson, Yonkers, N.Y.
 Gary Veasey Lawson, Wallingford
 Patricia Lee, Dorset
 William Harvey Leinbach, Reading, Pa.
 †Alan Barker Levine, Burlington
 Janet Phyllis Levine, Schenectady, N.Y.
 William Kaufman Levy, Stratford, Conn.
 Richard Barron Lewis, *cum laude*, Newton, Mass.
 Stephen Ray Libbey, Lyndonville
 Peter Randolph Lichtenthal, White Plains, N.Y.—
 William Thomas Lichter, New York, N.Y.
 Carl Hersh Lisman, Burlington
 David Edward Livingston, New York, N.Y.
 Donald Maurice Longley, Burlington
 *Richard Holbrook Lowell, Burlington
 Cabot Lyman, Dover, Mass.
 Robert Gerald Lynde, Kenmore, N.Y.
 *Stephen Byron MacCausland, Ascuntny
 Stephen Roy Maniloff, Rockville Centre, N.Y.
 Virginia Rosemary-Rita Marconi, Chittenden
 Richard Allan Matheson, *cum laude*, Wardsboro
 †Edgar James Matteson, North Bennington
 *David Banghart Matthews, Burlington
 David Lawrence Matthews, *magna cum laude*, Franklin Lakes, N.J.
 Terry James Matthews, Rochester, N.Y.
 Donald Kirton Mayland, Merrick, N.Y.
 Mary Elizabeth McColl, Delmar, N.Y.
 John Cragin McCord, Wayne, Pa.
 †Patricia Folsom McEntee, Burlington
 †James Brady McGuire, Seekonk, Mass.
 Marcia Lee McKenzie, Mendon
 John Francis McLaughlin, Jr., Rutland
 †David McKelvie McLelland, III, North Adams, Mass.
 Arlene Joyce McLeod, Swanton
 Jeffrey McMullen, Schenectady, N.Y.
 William Alan Meezan, Bronx, N.Y.
 Herman Cody Meissner, Winchester, Mass.
 Ann Mary Meunier, Torrington, Conn.
 John Biddle Meyer, Summit, N.J.
 Claire Evelyn Michaud, Winooski
 Lois Leah Millen, *cum laude*, Brookline, Mass.
 Bruce William Miller, Palmer, Mass.
 Robert Ira Mirman, Bethesda, Md.
 David Walter Modzelewski, Chicopee Falls, Mass.
 Diane Constance Monti, *cum laude*, New Britain, Conn.
 Carol Jane Moore, Plymouth Union
 Thomas Joseph Moore, Woodstock
 Cheryl Dexter Morrill, Portsmouth, N.H.
 †Stephen Allen Morse, Brattleboro
 Barry John Mossman, Tappan, N.Y.
 David Charles Mount, Burlington
 Charles Gregg Moxhay, *cum laude*, Port Chester, N.Y.
 Mary Louise Fay Musler, Jericho
 John Anton Nefzger, Hackensack, N.J.
 Harry Andrew Nelson, Pitscain, Pa.
 Jeffrey Bruce Nesse, Great Neck, N.Y.
 Karen Barbara Neuringer, Belle Harbor, N.Y.
 Lanny Stephen Newman, West Hartford, Conn.
 Peter Mark Nolan, Holyoke, Mass.
 Edwin Michael Norse, Manchester Depot
 Frederick Milton Ober, Jr., Saxtons River
 Eino Woodman Ojanen, Chester
 Mark Allan Oliver, Brooklyn, N.Y.
 *Raymond Bernard Olson, Proctor
 Candace Jane Orr, Burlington
 Douglas Gordon Orvis, *cum laude*, Bristol
 Thomas William Osmer, Manchester Depot
 Gregory Bruce Pahl, Montclair, N.J.
 Frederick Howard Palmer, Cumberland Center, Me.
 Craig Norman Parenteau, St. Johnsbury
 Janet Ruth Parsons, Burlington
 Susan Patch, River Vale, N.J.
 John Patterson, Durham, Conn.
 James Arthur Peake, Williamstown
 Gerald Gengler Pearce, Fairfield, Conn.
 Jean Priscilla Pearson, Fitchburg, Mass.
 Richard Alden Pearson, Fitchburg, Mass.
 Sharon Irene Peloquin, Auburn, Mass.
 *James O'Neill Pelton, West Rupert
 James Lewis Perlmutter, West Roxbury, Mass.

* As of October 15, 1966.

† As of February 18, 1967.

- David Allan Peura, Peabody, Mass.
 Leo Thomas Pfeiffer, Port Washington, N.Y.
 *Edward Alexander Phillips, Catskill, N.Y.
 Peter Stewart Pierpont, Mt. Kisco, N.Y.
 Ronald Louis Pinciario, Bridgeport, Conn.
 Bruce Edward Platzek, Fairfield, Conn.
 Marcia Ann Pogar, Wilder
 Edward Mitchell Poulin, Jr., *cum laude*, Essex
 Junction
 Spencer George Pratt, West Hartford, Conn.
 Robert William Price, New Haven, Conn.
 †Albert Richard Purchase, II, Montpelier
 Douglas Mark Rapp, Great Neck, N.Y.
 Michael Joseph Reardon, Wallingford, Conn.
 †Robert Resnick, Manchester, N.H.
 Donald Erwin Richardson, Bradford
 *John Mitchell Richardson, Hyde Park
 *Terry Jane Ricker, Montpelier
 Judith Rose Ripley, Barre
 Louis Rissin, Yonkers, N.Y.
 Richard Michael Robbins, Croton-on-Hudson,
 N.Y.
 Eloise Anna Roberts, *cum laude*, South Hero
 Paul Gerard Roberts, Newton, Mass.
 †Barry Lee Robertson, Danvers, Mass.
 Marion Astella Robinson, Milton
 Jay Arthur Rogers, Danville
 Joseph Clinton Roper, Jr., Laconia, N.H.
 Bruce Ira Rosen, Jericho, N.Y.
 Richard Harvey Ross, Brooklyn, N.Y.
 *Stephen Martin Ross, Orange, Conn.
 Lawrence Mark Roth, New Rochelle, N.Y.
 Theodore Mark Rowen, Oceanside, N.Y.
 Nicholas Frew Rowland, Hanover, N.H.
 Philip Michael Rugo, Barre
 Jane Saacke, Rockville Centre, N.Y.
 Jeffrey Bartlett Sagalyn, Springfield, Mass.
 Joseph Anthony Salamack, Amsterdam, N.Y.
 Barbara Bryant Sargent, Manchester Center
 Arthur Corey Sarkisian, Forest Hills, N.Y.
 Gary Carson Savage, Burlington
 Cary Ross Schaye, Brooklyn, N.Y.
 †Norma June Hines Scherk, Canaan
 Laura Vicki Schildhaus, Washington, D.C.
 John Charles Schweberger, Weehawken, N.J.
 †James Lloyd Sealy, Brooklyn, N.Y.
 Carolyn Seigel, Brooklyn, N.Y.
 †Errol Stanley Selsby, North Adams, Mass.
 Karen Ann Shalvoy, *magna cum laude*, East
 Norwalk, Conn.
 George Lawrence Shapiro, New York, N.Y.
 Stuart Jeffrey Shapiro, Long Island City, N.Y.
 Kathleen Marie Sheehy, Proctor
 Sally Adams Shepard, Montpelier
 Patricia Anne Chouinard Sheridan, Winooski
 Arthur French Shields, Bennington
 Peter Sherman Sidel, West Newton, Mass.
 Howard Gary Silver, Greensboro Bend
 Richard Steven Silverstein, New Haven,
 Conn.
 Paul Edwin Simon, Hewlett, N.Y.
 Burton Alan Sivin, *magna cum laude*,
 Brooklyn, N.Y.
 John Stanley Smiarowski, *summa cum laude*,
 Whately, Mass.
 Chadburn Howard Smith, Bar Harbor, Me.
 Robert Asa Smith, Northfield Falls
 Joseph Dominick Soldano, West New York,
 N.J.
 Howard David Solomon, Burlington
 Ronald Dana Solomson, West Hartford, Conn.
 Toby Starr, Bronx, N.Y.
 Carroll Shepard Stearns, Bloomfield, Conn.
 Burton John Streen, St. Albans
 Ronnie Fay Stein, Brooklyn, N.Y.
 David John Stevenson, Cold Spring, N.Y.
 June Stevenson, Proctor
 *Marshall Lee Stevenson, Jr., Potsdam, N.Y.
 Rodney Andrew Stewart, Bellows Falls
 Mark Andrew Stine, Bayside, N.Y.
 Howard Kemble Stokes, Jr., Allenhurst, N.J.
 David Ross Stover, Colonia, N.J.
 Margaret Jean Strait, *magna cum laude*, St.
 Albans
 Richard Jeremy Strauss, Marblehead, Mass..
 Lynda Mary Brent Stuart, Burlington
 Harvey David Sugar, Brattleboro
 Gloria Jean Sumner, Stowe
 Esther Harriet Sundell, Montgomery Center
 Martin Joseph Sweeney, Harrisburg, Pa.
 †William Joseph Swinburne, Woodside, N.Y.
 †Robert Scott Taintor, Wellesley Hills, Mass.
 Earle William Tarbell, Thompsonville, Conn.
 Susan Elizabeth Tebbets, Norwich
 Eric Bruce Tenenbaum, East Orange, N.J.
 Michael Leonard Tenzer, New Rochelle, N.Y.
 Paul Edward Tesone, Everett, Mass.
 Alice Melvina Thayer, South Burlington
 †Dorothy Sheila Thompson, Center Rutland
 Charles Wallace Tiernan, Jr., Essex Fells, N.J.
 Doris Elaine Tillotson, Waits River
 John David Tobin, Fair Haven
 †Peter James Tomasi, Bristol
 Robert Francis Troendle, Rumford, R.I.
 Philip George True, Melrose, Mass.
 Wanda Turfboer, Woodbridge, Conn.
 Jerrold Cecil Unterman, Rockville Centre,
 N.Y.
 William Teunis Van Atten, III, Burlington
 †Robert Wayne Van Ham, East Falmouth,
 Mass.
 Lloyd Sanborn Van Norden, St. Albans
 Jan Pieter Van Schaik, Cavendish
 Sylvia Davis Vatalaro, Greensboro Bend
 *John Howard Vibber, Rutland
 †Thomas Storer Vickery, Freeport, Me.
 Martha Jane Vincent, *magna cum laude*,
 Rutland
 Florence Emmelene Walder, *cum laude*, Forest
 Hills, N.Y.
 Richard Neal Waldman, Flushing, N.Y.
 Mary Grow Waldo, Randolph Center

* As of October 15, 1966.

† As of February 18, 1967.

Nancy Sue Waldron, Pittsfield, Mass.	Gary Wayne Winch, Burlington
Jack Raymond Warner, Lenox, Mass.	Diana Susan Winn, Glens Falls, N.Y.
David Mark Wayne, Clay, N.Y.	David Wixson, North Bellmore, N.Y.
Janet Barbara Webster, Brattleboro	Maureen Claire Reilly Wolf, Burlington
Richard J. Weinstock, Forest Hills, N.Y.	†Patricia Wolf, Weston, Mass.
Carole Elizabeth Welch, Rutland	Wendy Sue Wollish, Bloomfield, N.J.
Henry Quentin Wellman, Brattleboro	Jane Ellen Woods, Wilder
†David Eugene Wells, Plainfield	Edmond John Wright, Burlington
Ellen Jean Werner, Bath, N.Y.	George Dawson Wrightson, III, Etna, N.H.
Carol Sylvia Wertheimer, New York, N.Y.	David Michael Yarnell, Colchester
Whitman James Wheeler, Whitingham	Robert Michael Zagoren, Highland Park, N.J.
Linda Ann White, Barre	David Alan Zarling, West Newton, Mass.
†Paul Edgar White, Glen Head, N.Y.	Jeffrey Arthur Zinn, Peace Dale, R.I.
Alice Maria Whitney, South Burlington	Alfred Ronald Zissler, Rochester, N.Y.
Carolyn Frances Ballard Whittaker, Rutland	Roy Marc Zuckerman, Valley Stream, N.Y.
Gordon Ray Wilkins, Middlebury	

The University was saddened at the deaths of five members of the Class of 1967: Edward James Lockwood, West Haven, Conn., April 20, 1966; William Howard O'Donnell, Mountain Lakes, N.J., November 12, 1966; William James Roy, Barre, Vt., July 21, 1966; Richard Verner Sparks, Colonia, N.J., May 17, 1965; and George Havell Van Tassel, Jr., Glen Ridge, N.J., November 12, 1966.

Departmental Honors

Music

George Robert Bedell, '67

Margaret Jean Strait, '67

Zoology

Carol Jane Moore, '67

David Alan Zarling, '67

Special Honors

Botany

Steven Jeffrey Blackwell, '67

Chemistry

Ronnie Fay Stein, '67

Classics

Claire Kahkola, '67

English

Kenneth Edward Klonsky, '67

Richard Allan Matheson, '67

Michael Lee Lapointe, '67

Martha Jane Vincent, '67

History

Peter Randolph Lichtenthal, '67

Gary Wayne Winch, '67

Political Science

Carl Hersh Lisman, '67

Paul Gerard Roberts, '67

Psychology

Nancy Mae Baldwin, '67

Zoology

Barbara Anne Clark, '67

Lorraine Adele Kretchman, '67

Alan Robert Forman, '67

Terry James Matthews, '67

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† As of February 18, 1967.

College of Education and Nursing

Fifth-Year Certificate in Education

- | | |
|--|---|
| Marcelle Andree Bachand, St. Johnsbury | Agnes Joanne Jarrett, Shelburne |
| †Barbara Elaine Bouvier, Bristol | †Lola Harriman McKean, Bristol |
| *Richard Louis Cassani, Burlington | David Wallis Orr, Burlington |
| John Allard Child, South Burlington | †Page M. Riley, Burlington |
| Janet Van Woert Cole, Charlotte | Frances Thornburg Shoemaker, Bennington |
| †Ruth Ada Damon, Montpelier | †Norma Carder Shortsleeve, Burlington |
| Elizabeth Ruth Gottlieb, Stowe | Irene Aja Stewart, Barre |
| Stoney Grimes Hinkle, Colchester | *Howard Eugene Travis, South Burlington |

Graduate College

Master of Education

- *Robert Edgar Barras, B.A. (Sir George Williams Univ.) 1958; Dorval, Que., Canada
 †Carole Herbert Beaugard, B.S. (Russell Sage College) 1963; Brandon
 Herbert Saul Bloomenthal, B.A. (Univ. of Vermont) 1962; Burlington, *in absentia*
 *Phyllis Anne Boerner, B.S. (Univ. of N.Y.-State College, Oneonta) 1956; Cobleskill, N.Y.
 Blair Elizabeth Borden, B.S. (McGill Univ.) 1956; Montreal, Que., Canada
 †Philip Frechette Buley, A.B. (Middlebury College) 1959; East Middlebury
 *Mary Agnes Casey, B.A. (Tufts Univ.) 1961; Oxnard, Calif.
 Doris Mae Champine, B.Ed. (Castleton Teachers College) 1946; Pittsford
 *Cynthia Anne Lovelace Clinton, B.A. (Sir George Williams Univ.) 1957; La Tuque, Que., Canada
 *William DeWitt Clinton, B.S., 1946, B.D., 1956 (McGill Univ.); La Tuque, Que., Canada
 *Paul Spencer Danyow, B.S. (Univ. of Vermont) 1958; Shelburne
 Janet Ruth Wakefield Forgays, B.A. (Connecticut College) 1949; Burlington
 *Roger William Fromm, B.A. (Ohio Wesleyan Univ.) 1955; Richmond, *in absentia*
 *Albert Edward Gamble, B.A. (McGill Univ.) 1949; St. Laurent, Que., Canada
 *Charles Edward Goudey, B.A. (Univ. of Vermont) 1963; Winooski, *in absentia*
 *Barbara Judith Greenberg, B.S. (Univ. of Vermont) 1961; Lowell, Mass., *in absentia*
 Marilyn Louise Hartlieb, B.S. (State Univ. College of Education, Cortland, N.Y.) 1962; Port Chester, N.Y.
 *Richard Huston McCann, B.S. (Univ. of Maine) 1960; Windham, Maine, *in absentia*
 Harry Barrows Moulton, B.A. (Norwich Univ.) 1965; Montpelier
 David George Smith, B.A. (Univ. of Akron) 1966; Akron, Ohio
 *T. Gordon Stahlbrand, B.S. (McGill Univ.) 1949; Montreal, Que., Canada
 Peter John Vinton, B.S. (Springfield College) 1963; Derby Line
 †Geoffrey Ander Wade, B.A. (Western Reserve Univ.) 1949; East Barre

Master of Arts in Teaching

- *Howard Elwood Buchanan, Jr., B.A. (N.J. State Teachers College at Montclair) 1960; Maplewood, N.J., *in absentia*
 *Verne Arthur Colburn, B.M. (New England Conservatory of Music) 1960; St. Albans Bay
 *Margaret Thomas Culver, B.A. (Trinity College) 1964; Winooski, *in absentia*
 *Kathleen Mary Duranleau, B.A. (Rivier College) 1962; Beecher Falls
 *Mordecai Hecht, B.S. (Univ. of Vermont) 1965; Burlington, *in absentia*
 *Allen Carlton Kent, B.A. (Principia College) 1961; Barre, *in absentia*
 *John Andrew Preston, B.M. (Boston Univ. College of Music) 1956; South Burlington
 *Arthur Reginald Scammell, B.A. (McGill Univ.) 1942; Montreal, Que., Canada

Master of Science

AGRICULTURAL ECONOMICS

- Charles Whitney Bigalow, B.S. (Cornell Univ.) 1964; Winooski
Thesis: A Management-Oriented Electronic Accounting System for Small to Medium Size Dairy Firms

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AGRICULTURAL BIOCHEMISTRY

- Kozhikot Adatthody Kumaran, B.Sc. (Univ. of Kerala) 1959; Perintalmanna, Kerala, India
Thesis: A Study of the Methods of Extraction of Bean Leaf Protein

ANIMAL AND DAIRY SCIENCE

- Franz-walther Ellendorff, Diplom-Vorprüfung (Landw. Hochschule, Stuttgart) 1963; Heilbronn, Germany
Thesis: The Effect of Dietary Iron Levels on Growth, Carcass Quality, and Blood Constituents of Veal Calves
- David Kurt Pomerantz, B.S. (Cornell Univ.) 1965; Buffalo, N.Y.
Thesis: Immunofluorescent Localization of Bovine Luteinizing Hormone

BOTANY

- *John Charles Lylis, Jr., B.A. (Univ. of Vermont) 1964; Cambridge, N.Y., *in absentia*
Thesis: An Ecological Study of the Nematode Fauna of Shelburne Bay
- *Howard Edson Savage, B.A. (Univ. of Vermont) 1964; Hyannis, Mass.
Thesis: *Tylenchus hexalineatus*, Its Life History and Association with *Acer saccharum*

CIVIL ENGINEERING

- George Alan Gunn, B.S. (Univ. of Vermont) 1961; Nanuet, N.Y.
Thesis: Ground Water Flow System Responses to Natural Rainfall in a Forested New England Watershed
- Robert Roy Lamson, B.S. (Univ. of Vermont) 1965; Burlington
Thesis: Response of Soil Moisture and Litter Flow to Natural Rainfalls in a Forested New England Watershed

COMMERCE

- *John Avery Booth, Jr., B.S. (Univ. of Vermont) 1959; New York, N.Y.
Thesis: A Cost Comparison Between the Present System of Central Certificate Handling and the Proposed System of Central Stock Bookkeeping
- *Mary Caroline Regan, B.A. (Regis College) 1960; St. Albans
Thesis: Certificates of Deposit: A Description and Evaluation
- *William Michael Resk, B.S. (Rensselaer Polytechnic Institute) 1964; Scarsdale, N.Y., *in absentia*
Thesis: An Economic Base Model for Vermont
- Michael Cornelius Roach, B.E. (Univ. of Minnesota) 1962; St. Albans, *in absentia*
Thesis: A Simulation Model for the Analysis of an s, S Spare Parts System

ELECTRICAL BIOPHYSICS

- Roger Lawrence Brown, B.S. (Univ. of Vermont) 1964; Brattleboro, *in absentia*
Thesis: Effects of Localized Ultrasound on Electrical Excitation of *Nitella*

ELECTRICAL ENGINEERING

- *Richard Ralph Blanchard, B.S. (Univ. of Vermont) 1964; East Barre, *in absentia*
Thesis: A Preliminary Study of the Current Distribution in the Brain from Surface Electrodes
- *Harry Oldham Brooks, B.S. (Univ. of Vermont) 1961; Burlington
Thesis: Intracellular Double-Barrelled Microelectrodes
- Wayne Lynford Foster, B.S. (Univ. of Vermont) 1961; Montpelier
Thesis: An Investigation of the Modified Ramp Technique in the Design of a Reliable and Inexpensive Analog-To-Digital Converter
- *Arnold Howard Turner, B.S. (Univ. of Vermont) 1963; Middlesex, *in absentia*
Thesis: Integral Equation Approximation Techniques for the Solution of Static Field Problems

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FORESTRY

- Russell Stephen Kinerson, Jr., B.S. (Univ. of Maine) 1965; Danville
Thesis: Relationships of Some Environmental Factors to the Establishment and the Development of Commercial Balsam Fir Christmas Tree Plantations

MECHANICAL ENGINEERING

- Timothy Lee Brosseau, B.S. (Univ. of Vermont) 1965; St. Albans
Thesis: A Numerical Method for Determining Transient Thermal Stresses in Centrally Heated Short Hollow Cylinders
- James David Gallo, B.S. (Univ. of Vermont) 1965; Rutland
Thesis: The Behavior of Conical Indentation Fractures in Glass
- Robert Bruce Lee, B.S. (Univ. of Vermont) 1965; Canaan
Thesis: A Transient Thermal and Residual Stress Analysis Model Considering Elastic-Plastic Strain in a Thin Disk

MEDICAL MICROBIOLOGY

- Robert Anthony Murgita, B.S. (Univ. of Maine) 1965; Rockland, Maine
Thesis: The Specific Suppression of the Early Immune Response in Mice by Passive Administration of Homologous Antiserum

PATHOLOGY

- Bruce Reed MacPherson, A.B. (Colby College) 1962; Abington, Mass.
Thesis: Some Effects of Irradiation by Cobalt-60 on Rabbit Gamma Globulin

PHYSICS

- Anthony Joseph Desany, B.S. (Univ. of Vermont) 1963; Burlington
Thesis: An Application of Pulse Techniques to the Investigation of Capacitance Effects in Thin Films
- Douglas Louis Lessie, B.S. (Queens College) 1964; College Point, N.Y., *in absentia*
Thesis: The Selective Properties of the Surface Photoelectric Effect of the Metal Molybdenum
- Lec Drew Matthews, B.S. (Platteville State College) 1964; Platteville, Wis.
Thesis: The Chemisorption of Carbon Monoxide on Molybdenum Using Radiotracer Technique
- David Harold Parsons, B.A. (Univ. of Vermont) 1965; Burlington
Thesis: Application of Ultrasound to the Iron Anode
- James Arthur Rooney, A.B. (Clark Univ.) 1965; Springfield
Thesis: Radiation Pressure and Acoustic Streaming Near a Small Solid Source
- Joel Peter Ross, B.S. (Wagner College) 1962; Brooklyn, N.Y.
Thesis: A Technique for Measurement of Polarization—Dependent Optical Reflection from Metals

PLANT AND SOIL SCIENCE

- *Daniel Joseph Donnelly, B.S. (Univ. of Rhode Island) 1963; Warwick, R.I., *in absentia*
Thesis: Effect of Lime on the Availability and Fixation of Phosphorus
- *Julius Gyula Szabo, B.S. (Oregon State Univ.) 1962; Reno, Nev.
Thesis: Freezing Injury to Apple Seedling Roots at Selected Temperatures and Times of Year

ZOOLOGY

- Eugene Davis Albrecht, B.A. (Univ. of Vermont) 1965; Burlington
Thesis: Source of the Pheromones Causing Estrous Synchronization in the Laboratory Mouse
- Arthur Stanwood Brooks, B.A. (Washington and Jefferson College) 1965; St. Johnsbury
Thesis: Environmental Factors Influencing the Distribution of Stream Insects in the Sleepers River, Danville, Vermont

* As of October 15, 1966.

† As of February 18, 1967.

- †Evelyn Mekeel Burrill, A.B. (Mount Holyoke College) 1928; Ticonderoga, N.Y.
Thesis: The Experimental Imposition of a New Plane of Bilateral Symmetry upon the Developing Egg of Rana pipiens; Thermal Gradient Effect on First Cleavage Plane
- David Walter Sonneborn, B.A. (Univ. of Vermont) 1965; Burlington
Thesis: Incorporation of Actinomycin D into the Cell Nucleus: Effect on Nucleic Acid Synthesis and Cell Division

Master of Arts

ECONOMICS

- Ralph R. Monticello, Jr., B.S. (Hofstra College) 1962; Garden City, N.Y.
Thesis: An Analysis of Tax Burden in State and Local Finance in Vermont

ENGLISH

- †John Kirk Howard, B.A. (Univ. of Toronto) 1965; Weston, Ont., Canada, *in absentia*
Thesis: Morality and the Economic Marriage
- Madeleine May Kunin, A.B. (Univ. of Massachusetts) 1956; M.S. (Columbia Univ.) 1957; Burlington
Thesis: Fun and Games with Durrenmatt: An Analysis of Comic Characters
- *Eileen Elizabeth Molner, B.A. (Western Reserve Univ.) 1965; Cleveland, Ohio
Thesis: An Approach to Pearl: The Relationship Between Form and Content
- Howard Frank Mosher, A.B. (Syracuse Univ.) 1964; Cato, N.Y., *in absentia*
Thesis: A Study in Villainy
- Ghita Maringer Picoff, A.B. (Brandeis Univ.) 1957; Burlington
Thesis: The Mingling of Contraries—Metaphysical Patterns in the Poetry of John Donne and William Butler Yeats
- *Sylvia Elizabeth Rice, B.A. (Univ. of Massachusetts) 1952; Brattleboro
Thesis: Milton's Christian Women
- *Richard Earl Steele, A.B. (Harvard College) 1961; Lewiston, Maine, *in absentia*
Thesis: A Study of the Fiction of W. E. B. DuBois (The Quest of the Silver Fleece, Dark Princess, and The Ordeal of Mansart) in Relation to Naturalism

HISTORY

- Richard George Carlson, B.A. (Univ. of Vermont) 1965; New Haven, Conn.
Thesis: From the Sun Dance to the Ghost Dance: A Study of the Religious History of the Dakota Indians, 1877-1891
- Reid Martin Knight, B.S. (Univ. of Vermont) 1965; Barre
Thesis: Roger Casement: Humanitarian and Patriot
- *Herbert Zettl, B.A. (Alderson-Broadbudd College) 1963; Rochester, N.Y., *in absentia*
Thesis: The First Soviet Hungarian Republic

LATIN

- William Joseph Downes, B.A. (Univ. of Vermont) 1964; Hartford, Conn.
Thesis: A Collation of the Stoic Paradoxes in the Codex Vermontensis

MATHEMATICS

- James Edmund Couture, A.B. (St. Michael's College) 1965; Burlington
Thesis: Estimation by the Method of Maximum Likelihood
- Francis Joseph O'Brien, Jr., B.A. (Univ. of Vermont) 1965; Fairlee, *in absentia*
Thesis: Optimization and Simulation of an Assembly Production Line
- Thomas Kemper Roney, A.B. (St. Michael's College) 1963; Burlington, *in absentia*
Thesis: The Stone-Cech Compactification as a Structure Space

* As of October 15, 1966.

† As of February 18, 1967.

MUSIC

Alison Field Lane Anand, A.B. (Univ. of Rochester) 1965; Montpelier
Thesis: Sonata Number One for Violin and Piano

*Maurice Louis Villemaire, B.S. (Univ. of Vermont) 1958; Winooski
Thesis: A Study of Schubert's "Schwanengesang"

POLITICAL SCIENCE

James Leo Monahan, Lt. Col., USAF (Ret.), B.S. (Rhode Island State College) 1950; Essex Junction
Thesis: Vermont Court Reform: An Investigation of Selected Data on Vermont Municipal Courts

Charles Peter Spalding, B.A. (Univ. of Vermont) 1953; Middlebury
Thesis: Viet-Nam: A Study of the American Involvement

College of Medicine

Doctor of Medicine

Stuart Aldrich Alexander, A.B., Burlington
 Michael Brant Armstrong, A.B., Arlington, Mass.

John Harrison Arthur, B.S., Andover, Mass.
 James Francis Austin, B.S., Dalton, Mass.
 Virginia Barnes, B.A., West Newton, Mass.
 Michael Peter Barron, A.B., Watertown, Mass.
 Robert William Bernard, B.A., *cum laude*, Burlington

Jeanine Luella Berry, B.A., Unity, Me.
 Jeffrey Lawrence Black, A.B., Brookline, Mass.
 Norman Myron Bress, B.S., Portland, Me.
 Michael Robert Britt, A.B., Shrewsbury, Mass.
 Carroll Dennis Bucko, B.A., W. Springfield, Mass.

William Mead Burrows, Jr., A.B., Winchester, Mass.

Peter Sturgis Colley, B.A., Farmington, Me.
 James Edward Cooke, B.A., Poultney
 Ursel Danielson, B.S., Burlington
 Philip Anthony DeSimone, B.A., Franconia, N.H.

John Frederick Dick, B.S., Brandon
 Paul Henry Dumdey, B.A., Lisbon, N.H.
 Donald Peter Goldsmith, B.S., *cum laude*, Rumford, R.I.

Nancy Jane Gregory, B.A., Brimfield, Mass.
 Edward George Hixson, Jr., A.B., Oneida, N.Y.

Benjamin Arthur Kropsky, B.A., Burlington
 Albert Richard Lorbati, B.S., Dorchester, Mass.

Lawrence Howard Luppi, A.B., Burlington
 Bruce Reed MacPherson, A.B., *cum laude*, Brockton, Mass.

Phillip Charles Mahoney, A.B., Springfield
 D. Eugene Martin, A.B., Falmouth, Me.
 Richard Nels Nelson, A.B., Wrentham, Mass.
 Irving Gerald Peyser, A.B., Brookline, Mass.
 Bruce James Poitras, A.B., Natick, Mass.
 Gregory Bruno Politi, B.A., Barre
 Edward Rabinowitz, B.A., Kew Gardens, N.Y.
 Mildred Ann Reardon, A.B., *cum laude*, Tewksbury, Mass.

Dick Lamson Robbins, B.A., Winchester, Mass.

Charles Rosenbaum, B.A., Newton, Mass.
 Carl Frank Rosenbloom, A.B., Brookline, Mass.

Myer Hyman Rosenthal, B.A., Newton, Mass.
 Francis Roland Sacco, A.B., *cum laude*, Worcester, Mass.

Robert Henry Smart, B.A., St. Albans Bay
 Merle Geoffrey Smith, A.B., Lunenburg, Mass.
 John William Sturzenburger, B.A., Burlington
 Christopher Marlowe Terrien, Jr., B.A., Burlington

Otis Pennell Tibbetts, B.S., Auburn, Me.
 Anthony Frederick Wasilkowski, A.B., Winooski Park

Roger Maitland Wilson, A.B., Jefferson, Me.

The University was saddened at the death of Damian Edward Karney, West Swanton, Vt., on March 22, 1966, a member of the Class of 1967.

* As of October 15, 1966.

† As of February 18, 1967.

Graduate College

Doctor of Philosophy

BIOCHEMISTRY

David George Bailey, B.S., 1963; M.S., 1964 (Univ. of Delaware); Newark, Del.
Thesis: Some Effects of Light on the Biochemistry and Morphology of Proplastids

CHEMISTRY

†Charles Edward Bayha, A.B. (Rutgers - The State Univ.) 1959; Union City, N.J., *in absentia*
Thesis: Part I A Total Synthesis of Aspidospermine and Related Alkaloids

Part II Attempted Synthesis of Benzocyclobutadiene Derivatives Via Benzynes-Enamine Reactions

*David Lawrence Dalrymple, B.A. (The College of Wooster) 1962; Fredericktown, Ohio
Thesis: Molecular Orbital Correlation of Solvolysis Rates of Chloromethylfurans

*John Edmund McCullough, Jr., B.A. (Univ. of Connecticut) 1961; Southington, Conn., *in absentia*
Thesis: Solvolytic Studies of Spiran Esters

Caleb Grant Warner, A.B., 1956; M.S., 1961 (Middlebury College); Middlebury, *in absentia*
Thesis: Precursor Specificity in Alkaloid Biosynthesis

MICROBIOLOGY

†Donald Richard Tourville, B.S., 1959; M.S., 1962 (Univ. of Vermont); Burlington
Thesis: Production, Purification and Properties of a Lactic Streptococcal Phage-Associated Lysin

PHARMACOLOGY

Allan Kupferman, B.A. (Univ. of Bridgeport) 1957; M.A. (Clark Univ.) 1959; Haverstraw, N.Y., *in absentia*

Thesis: Interactions of Selected Local Anesthetics with Adrenergic Amines on the Blood Pressure of the Rat and in Isolated Hearts and Aortic Strips of This Species

PSYCHOLOGY

Robert John Lavalley, B.A., 1963; M.A., 1965 (Univ. of Vermont); Winooski
Thesis: The Effects of Visual Form and Distance Experience before Maturity on Adult Problem-Solving Ability in the Rat

Degrees Honoris Causa

Herschel Clay Baker, Doctor of Letters,
 Cambridge, Massachusetts
Presented by Professor Willard B. Pope
 Marine Leland, Doctor of Humane Letters,
 Northampton, Massachusetts
Presented by Professor Edward J. Miles

James William Malone, Doctor of Divinity,
 Youngstown, Ohio
Presented by Professor Albert W. Sadler
 Harold Thomas Seeley, Doctor of Engineering,
 Lansdowne, Pennsylvania
Presented by Dean Warren O. Essler

Department of Military Science

Commissioned Second Lieutenant, United States Army

*Norman Joshua Boyden, III, Infantry
 *Frederick Boynton Brown, Medical Service
 Corps
 *Robert Wayne Jensen, Artillery

*David Ernest Lambert, Chemical Corps
 *Douglas Gordon Orvis, Infantry
 *Michael Paul Ricciardi, Artillery

Commissioned Second Lieutenant, United States Army Reserve

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|---|---|
| *Roger Neal Allbee, Ordnance Corps | *Stephen Ray Libbey, Artillery |
| William Donald Belville, Medical Service Corps | John Francis McLaughlin, Jr., Artillery |
| Jack Thomas Frederick Bitter, Jr., Corps of Engineers | *Thomas Lee Mills, Adjutant General's Corps |
| Earl Russell Boardman, Artillery | *Charles Gregg Moxhay, Artillery |
| William Robert Boyd, Artillery | John Anton Nefzger, Armor |
| *Richard Lawrence Brown, Medical Service Corps | *Harry Andrew Nelson, Transportation Corps |
| Mason David Bryant, Artillery | Gregory Bruce Pahl, Army Intelligence |
| *Donald Norton Carlson, Army Intelligence | *David Allan Peura, Medical Service Corps |
| Donald Joseph Chioffi, Army Intelligence | Leo Thomas Pfeiffer, Artillery |
| John Michael Conley, Artillery | Spencer George Pratt, Army Intelligence |
| Vassar Haight Curtis, Army Intelligence | *Michael Joseph Reardon, Armor |
| Robert Charles Davidson, Artillery | *Peter Edward Rising, Finance Corps |
| Clement Louis Deforge, Artillery | *John Noel Rutledge, Armor |
| Argie Economou, Artillery | Joseph Anthony Salamack, Transportation Corps |
| Alec Charles Felder, Transportation Corps | *John Charles Schweberger, Army Intelligence |
| William Harris Finger, Quartermaster Corps | *Joseph Dominick Soldano, Armor |
| *Alan Robert Forman, Medical Service Corps | Ronald Dana Solomson, Medical Service Corps |
| Donald Stewart Hutchinson, Transportation Corps | Rodney Andrew Stewart, Corps of Engineers |
| Fabian Jerry Lahue, Ordnance Corps | Harvey David Sugar, Quartermaster Corps |
| Philip Aiston Laporte, Adjutant General's Corps | Michael Leonard Tenzer, Artillery |
| | Philip George True, Transportation Corps |
| | *Richard Andrew Weiss, Artillery |

Commission of Second Lieutenant, United States Army, Upon Completion of ROTC Camp

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| *Robert Joseph Florczak, Adjutant General's Corps | *Frederick Milton Ober, Jr., Military Police Corps |
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Commission of Second Lieutenant, United States Army Reserve, Upon Completion of ROTC Camp

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| *Francis Peter Ambrose, Ordnance Corps | *David Bruce Havanich, Quartermaster Corps |
| Francis Jerome Bigelow, Transportation Corps | *Edwin Michael Norse, Artillery |
| Alan James Bordeau, Artillery | John Patterson, III, Artillery |
| Matthew Alan Brown, Transportation Corps | *Gary Carson Savage, Artillery |
| *Robert Howard Bullard, Army Intelligence | Howard David Solomon, Medical Service Corps |
| Stephen Hunt Drewes, Infantry | Larry Elton Walbridge, Quartermaster Corps |
| Bruce Edward Durgin, Artillery | Whitman James Wheeler, Army Intelligence |
| Richard Philip Goldstein, Artillery | |
| David Frederick Hammond, Corps of Engineers | |

Commission of Second Lieutenant, United States Army Reserve, Upon Completion of Summer School

- Stuart Richmond Eldred, Ordnance Corps

* Distinguished Military Graduates.

V 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.

REV. LUCIUS E. BARNARD, Class of 1853 Established by bequest in 1903.

ADA S. BLAIR 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.

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.

JOSEPH LAWRENCE HILLS Established by friends of Dean Hills, who completed fifty years of service to the University in 1937.

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.

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.
- 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.
- 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.

- 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.
- 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 EDUCATIONAL OPPORTUNITY GRANTS For nursing students with exceptional financial need. \$200 to \$1,000 per year depending on need.

Loan Fund

NURSING STUDENT LOAN PROGRAM

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.

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

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.

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.
- 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.
- 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.
- HELAINÉ 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.
- MORTAR 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 exemplified 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. Watson L. 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.

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V Academic Calendar

Spring Semester 1968

January	16	Tuesday	Registration
January	17	Wednesday	Classes begin, 8:00 a.m.
February	16-17	Friday-Saturday	Kake Walk Recess
March	9	Saturday	Grade Reports
March 18, Monday, through March 22, Friday and April 1, Monday, through April 12, Friday			Enrollment for Fall Semester Spring Recess begins, 8:00 a.m. Classes resume, 8:00 a.m.
March	25	Monday	Honors Day, no classes 10:00 a.m. to 1:00 p.m.
April	3	Monday	Examinations begin
April	15	Monday	Examinations end
May	6	Monday	Commencement
May	14	Tuesday	
May	19	Sunday	

Summer Session 1968

June	24	Monday	Eight-week session begins
July	8	Monday	Six-week session begins
August	16	Wednesday	Six-week and eight-week sessions end

Fall Semester 1968

September	3	Tuesday	Registration
September	4	Wednesday	Classes begin
October	26	Saturday	Grade Reports
October 28, Monday, through November 15, Friday			Enrollment for Spring Semester
November 28-30		Thursday-Saturday	Thanksgiving Recess
December	9	Monday	Examinations begin
December	17	Tuesday	Examinations end

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

March	24	Monday
March	31	Monday
April	14	Monday

May	5	Monday
May	13	Tuesday
May	18	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

☐ - overtime - hours 11:30
 ○ - vacation

CALENDAR

1968

JANUARY							FEBRUARY							MARCH							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
.....	1	2	3	4	5	6	1	2	3	1	2
7	8	9	10	11	12	13	4	5	6	7	8	9	10	3	4	5	6	7	8	9	
14	15	16	17	18	19	20	11	12	13	14	15	16	17	10	11	12	13	14	15	16	
21	22	23	24	25	26	27	18	19	20	21	22	23	24	17	18	19	20	21	22	23	
28	29	30	31	.....	.....	.....	25	26	27	28	29	.....	.....	24	25	26	27	28	29	30
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31	.....	.....	.....	.....	.....	.....

APRIL							MAY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
.....	1	2	3	4	5	6	.....	.....	.....	1	2	3	4	.....	.....	.....	.....	.....	.....	1
7	8	9	10	11	12	13	5	6	7	8	9	10	11	2	3	4	5	6	7	8
14	15	16	17	18	19	20	12	13	14	15	16	17	18	9	10	11	12	13	14	15
21	22	23	24	25	26	27	19	20	21	22	23	24	25	16	17	18	19	20	21	22
28	29	30	.....	.....	.....	.....	26	27	28	29	30	31	.....	23	24	25	26	27	28	29
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30	.....	.....	.....	.....	.....	.....

JULY							AUGUST							SEPTEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
.....	1	2	3	4	5	6	.....	.....	.....	.....	1	2	3	.....	.....	.....	.....	.....	.....	.....
7	8	9	10	11	12	13	4	5	6	7	8	9	10	1	2	3	4	5	6	7
14	15	16	17	18	19	20	11	12	13	14	15	16	17	8	9	10	11	12	13	14
21	22	23	24	25	26	27	18	19	20	21	22	23	24	15	16	17	18	19	20	21
28	29	30	31	.....	.....	.....	25	26	27	28	29	30	31	22	23	24	25	26	27	28
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29	30	31	.....	.....	.....	.....

OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
.....	.....	1	2	3	4	5	.....	.....	.....	.....	1	2	1	2	3	4	5	6	7	
6	7	8	9	10	11	12	3	4	5	6	7	8	9	8	9	10	11	12	13	14
13	14	15	16	17	18	19	10	11	12	13	14	15	16	15	16	17	18	19	20	21
20	21	22	23	24	25	26	17	18	19	20	21	22	23	22	23	24	25	26	27	28
27	28	29	30	31	24	25	26	27	28	29	30	29	30	31

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JANUARY							FEBRUARY							MARCH						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
.....	1	2	3	4	1	1	
5	6	7	8	9	10	11	2	3	4	5	6	7	8	2	3	4	5	6	7	8
12	13	14	15	16	17	18	9	10	11	12	13	14	15	9	10	11	12	13	14	15
19	20	21	22	23	24	25	16	17	18	19	20	21	22	16	17	18	19	20	21	22
26	27	28	29	30	31	.....	23	24	25	26	27	28	.....	23	24	25	26	27	28	29
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30	31	.....	.....	.....	.....	.....

APRIL							MAY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
.....	.....	1	2	3	4	5	.....	.....	.....	.....	1	2	3	1	2	3	4	5	6	7
6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14
13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21
20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28
27	28	29	30	.....	.....	.....	25	26	27	28	29	30	31	29	30	.....	.....	.....	.....	.....

