THE UNIVERSITY OF Vermont

BULLETIN APRIL, 1962

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Bulletin of
THE UNIVERSITY OF VERMONT

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DEDICATION

During the 1961-62 academic year, 70 members of the American Association of Land Grant Colleges and State Universities are commemorating the centennial of the Morrill Act. Signed by President Lincoln on July 2, 1862, this Federal Law established a nationwide system of colleges and universities dedicated to providing opportunities for liberal and practical higher education for all qualified residents of the United States.

Founded more than 70 years before the passage of the Land Grant Act, the University of Vermont became the Land Grant institution of Vermont in 1865 when the Vermont Legislature established the Vermont Agricultural College and joined it with the parent University at Burlington.

It is to Senator Justin Smith Morrill, a native of Strafford, Vermont, himself denied an opportunity for college education, whose visionary image of a system of colleges to provide education opportunities for all who qualified, virtually revolutionized higher education, that this catalogue is dedicated.

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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 35,000, 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

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The American Medical Association

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[1] On leave September, 1961-August, 1962.
[2] Deceased, March 21, 1962.

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*BETTY BANDEL, Ph.D. (1947)	*Professor of English*
RALPH JOHN BANNISTER (1950)	*Instructor in X-Ray Technique*

[1] Deceased December 4, 1961.
[2] Deceased February 21, 1961.
[3] Deceased July 6, 1961.
[4] Sabbatical leave 1961-62.

JAMES HENRY BANNON, M.D. (1955) *Assistant Professor of Clinical Medicine*
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[1] Deceased April 26, 1961.
[2] Sabbatical leave second semester.
[3] On leave 1961-62.

FRANCIS PEABODY COLBURN, Ph.B. (1942) *Professor of Art*
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ROBERT WEBSTER EASTMAN, LL.B. (1953) *Instructor in Political Science*
WINSTON MILO EDDY, M.D. (1960) *Instructor in Clinical Medicine*
DONALD MERRITT ELDRED, M.A. (1949) *Instructor in Clinical Psychology*
PHILIP NORCROSS ELDRED, B.S. (1958)[2] *Instructor in Civil Engineering*
RODNEY WALTER ELDRIDGE, B.A. (1957-59; 1961) *Instructor in Economics*
PAUL DAVID ELLNER, Ph.D. (1960) *Assistant Professor of Medical Microbiology*
FAITH GRISCOM EMERSON, M.A. (1959) *Assistant Professor of Public Health Nursing*
ROBERT RICHARD ENGISCH, M.D. (1961) *Instructor in Clinical Neurology*
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*
RODNEY WARREN EVERHART, Ph.D. (1961) *Associate Professor of Speech*

[1] On leave first semester.
[2] On military leave 1961-62.

WILLIAM THOMAS FAGAN, JR., M.D. (1953) *Assistant Professor of Clinical Urology*
DAVID S. FAIGEL, D.D.S. (1954) *Instructor in Dental Hygiene*
FRANK JAMES FALCK, Ph.D. (1957)
Assistant Professor of Speech Therapy (Preventive Medicine)
VILMA T. FALCK (MRS. F. J.), Ph.D. (1960) *Instructor in Audiology*
DOUGLAS PATTEN FAY, M.S. (1953) *Associate Professor of Civil Engineering*
EDWARD JOSEPH FEIDNER, M.F.A. (1958) *Assistant Professor of Speech*
JEREMY POLLARD FELT, Ph.D. (1957) *Assistant Professor of History*
JOHN RICHARD FITZGERALD, M.D. (1961) *Instructor in Clinical Medicine*
ROBERT FITZSIMMONS, M.S. (1949) *Assistant Professor of Animal and Dairy Science*
TED BENJAMIN FLANAGAN, Ph.D. (1961) *Assistant Professor of Chemistry*
THEODORE ROSS FLANAGAN, Ph.D. (1953) *Assistant Professor of Agronomy*
ARTHUR HOWARD FLOWER, JR., M.D. (1950) *Associate Professor of Clinical Dermatology*
JOSEPH CLAYTON FOLEY, M.D. (1954) *Assistant Professor of Clinical Radiology*
*MURRAY WILBUR FOOTE, Ph.D. (1947-51; 1953)
Associate Professor of Biochemistry (Agriculture)
JOHN LOUIS PHILIPPE FOREST, M.D. (1942) *Instructor in Clinical Psychiatry*
DOYLE RICHARD FOSSO, A.M. (1960) *Instructor in English*
PAUL KENDRICK FRENCH, M.D. (1924) *Professor of Clinical Medicine*
MINORU FUKUDA, M.D. (1956) *Instructor in Clinical Anesthesia*
JANE MARIE FULLER, M.A. (1961) *Instructor in Education*
*FRED WILLIAM GALLAGHER, Ph.D. (1944) *Professor of Medical Microbiology*
BRUCE ARTHUR GAYLORD, Ed.D. (Feb., 1960)
Associate Professor of Agricultural Education
*ALEXANDER GERSHOY, Ph.D. (1923) *Professor of Botany*
*BRADY BLACKFORD GILLELAND, Ph.D. (1957)
Associate Professor of Classical Languages
*ERLAND CHENEY GJESSING, Ph.D. (1954) *Associate Professor of Biochemistry*
RICHARD WILLIAM GLADE, Ph.D. (1958) *Assistant Professor of Zoology*
ARTHUR GLADSTONE, M.D. (1936) *Associate Professor of Clinical Surgery*
PAULINE THERESA GOSSELIN, B.S. (1961) *Instructor in Physical Education for Women*
*LYMAN JAY GOULD, Ph.D. (1953) *Associate Professor of Political Science*
RODERICK WILLIAM GRANT, M.D., C.M. (1960)[1] *Instructor in Clinical Psychiatry*
MARY JANE GRAY, M.D. (Jan., 1960) *Associate Professor of Obstetrics and Gynecology*
*DONALD CROWTHER GREGG, Ph.D. (1946) *Professor of Chemistry*
*EDWIN CHARLES GREIF, M.S. (1950) *Professor of Economics*
HOWARD THEODORE GUARE, M.D. (1952) *Assistant Professor of Clinical Radiology*
CARLETON RAYMOND HAINES, M.D. (1950-52; 1954)
Assistant Professor of Clinical Surgery (Oncology)
MARY STARRITT HALL (MRS. R. W.), M.A. (1960) *Instructor in English*
ROBERT WILLIAM HALL, Ph.D. (1957) *Assistant Professor of Philosophy and Religion*
SAMUEL B. HAND, Ph.D. (Feb., 1961) *Instructor in History*
MARJORIE HANLINE, M.A. (1959) *Instructor in Home Management*
*CALVIN HANNA, Ph.D. (1955)[2] *Associate Professor of Pharmacology*
JOHN SHERWOOD HANSON, M.D. (1958) *Assistant Professor of Medicine*
JOHN BACON HARRINGTON, LL.B. (1961) *Instructor in Speech*
PHILIP HASSMAN, LL.B., Lieutenant Colonel U. S. Army (1959)
Assistant Professor of Military Science
*ROLF NORDAHL BRUN HAUGEN, Ph.D. (1947) *Professor of Political Science*
MOSES ALFRED HAYNES, M.D. (1959)
Assistant Professor of Preventive Medicine and Director of the Family Care Unit
MARGARET HECKMAN, M.D. (1961) *Assistant Professor of Pathology*
MARY CATHERINE HEININGER (MRS. P. L.), R.N. (1951) *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 PAUL HELLER, B.F.A. (1961) *Instructor in Romance Languages*
DONALD CEDRIC HENDERSON, M.S. (1944) *Associate Professor of Poultry Science*

[1] Resigned December, 1961.
[2] Resigned November 1, 1961.

*RAUL HILBERG, Ph.D. (Feb., 1956) *Associate Professor of Political Science*
*CHARLES WILLIAM HOILMAN, M.S. (1949)
Associate Professor of Electrical Engineering
ALAN HOLDER, A.M. (1958-60; 1961) *Instructor in English*
ROBERTO REYES HOPKINS, B.A. (1961) *Instructor in Romance Languages*
*RICHARD JOHN HOPP, M.S. (1947) *Associate Professor of Horticulture*
NEWTON E. HOWE, D.D.S., M.P.H. (Feb., 1959) *Instructor in Public Health*
JOHN LORENZO HUBBELL, M.A. (1957) *Assistant Professor of Romance Languages*
ROBERT BRUCE HUBER, Ph.D. (1946) *Professor of Speech*
THOMAS HUBER, M.A. (1961) *Instructor in German*
*JOHN CHARLES HUDEN, Ph.D. (1950) *Professor of Education*
HANS ROSENSTOCK HUESSY, M.D. (1960) *Instructor in Clinical Psychiatry*
*MURIEL JOY HUGHES, Ph.D. (1942-44; 1945) *Professor of English*
ALLEN STANDISH HUNT, M.S. (Feb., 1961) *Assistant Professor of Geology*
*A. M. Md. MOAZZAMUL HUQ, Ph.D. (1956) *Associate Professor of Economics*
JOHN WILLIAM HUSSEY, B.S., Captain U. S. Army (1961)
Assistant Professor of Military Science
*JOSEPH ANTHONY IZZO, JR., Ph.D. (1956) *Associate Professor of Mathematics*
JULIUS H. JACOBSON, II, M.D. (1959) *Associate Professor of Surgery*
JULIAN JOSEPH JAFFE, Ph.D. (1961) *Associate Professor of Pharmacology*
CLINTON DALES JANNEY, Ph.D. (1959) *Associate Professor of Radiologic Physics*
RICHARD HARRY JANSON, Ph.D. (1958) *Assistant Professor of Art*
ELBRIDGE EUGENE JOHNSTON, M.D. (1951) *Assistant Professor of Clinical Medicine*
*STUART LYNDE JOHNSTON, Ph.D. (1940-44; 1946) *Professor of Romance Languages*
WILLIAM HERBERT JOHNSTON, M.D. (1952) *Instructor in Clinical Radiology*
*DONALD BOYES JOHNSTONE, Ph.D. (1948) *Professor of Microbiology*
*LEONIDAS MONROE JONES, Ph.D. (1951) *Associate Professor of English*
WESLEY GALE JONES, B.S., Captain U. S. Army (1959)
Assistant Professor of Military Science
ROY GEORGE JULOW, Ph.D. (1957) *Associate Professor of Romance Languages*
*HARRY HELMUTH KAHN, M.A. (1950-53; 1954) *Assistant Professor of German*
GEORGE KARATZAS, M.A. (1959) *Instructor in Commerce and Economics*
EVERETT THOMPSON KEACH, JR., M.Ed. (1955-57; 1959)
Assistant Professor of Education
JAY EDGAR KELLER, M.D. (1950) *Assistant Professor of Clinical Surgery*
*JOHN HARVEY KENT, Ph.D. (1950)
Roberts Professor of Classical Languages and Literature
ANN MARIE KEPPEL, Ph.D. (1958) *Assistant Professor of Education*
GEORGE VINCENT KIDDER, Ph.D. (1922) *Professor of Classical Languages and Literature*
THOMAS CLAIR KING, Ed.D. (1951) *Professor of Education*
*DAVID LESLIE KINSEY, Ph.D. (1950) *Associate Professor of Music*
FRIEDRICH WILHELM KLEMPERER, M.D. (1955) *Assistant Professor of Clinical Medicine*
STEPHEN CECIL KNIGHT, JR., M.S. (1952) *Associate Professor of Civil Engineering*
ESTHER LUCILE KNOWLES, M.S. (1945) *Associate Professor of Home Economics*
*ROY KORSON, M.D. (1951-52; 1954) *Associate Professor of Pathology*
DORIS KRAELING, Ph.D. (1958) *Assistant Professor of Psychology*
ANDREW PAUL KRAPCHO, Ph.D. (1960) *Assistant Professor of Chemistry*
HANS KRAUS, M.D. (1961) *Consultant in Experimental Medicine*
MARTIN ERIC KUEHNE, Ph.D. (1961) *Assistant Professor of Chemistry*
RAYMOND FRANK KUHLMANN, M.D. (1951)
Assistant Professor of Clinical Orthopedic Surgery
ARTHUR SAUL KUNIN, M.D. (1957) *Instructor in Medicine and Clinical Biochemistry*
BERT KARL KUSSEROW, M.D. (1959) *Assistant Professor of Pathology*
BETTY MAY LAGRANGE, M.S. (1958) *Instructor in Clinical Biochemistry*
ANTHONY JOSEPH LAMB, A.B. (1961) *Instructor in Romance Languages*
MORRIS WILLIAMS LAMBIE, M.D. (1955) *Assistant Professor of Clinical Medicine*
*MERTON PHILIP LAMDEN, Ph.D. (1947)[1] *Associate Professor of Biochemistry*
JOHN CLIFFORD LANTMAN, M.D. (1957)
Instructor in Preventive Medicine (General Practice)

[1] Sabbatical leave 1961-62.

RALPH ROBERT LAPOINTE, M.Ed. (1951)
Assistant Professor of Physical Education for Men
MARION RUTH LARSEN, M.A. (1961)[1]
Instructor in Mental Health and Psychiatric Nursing
EUGENE LEPESCHKIN, M.D. (1947) *Professor of Experimental Medicine*
*DAVID ALLEN LESOURD, Ph.D. (1952) *Associate Professor of Economics*
HYMAN BERNARD LEVINE, M.D. (1961) *Instructor in Clinical Medicine*
GORDON FIELDING LEWIS, Ph.D. (1961) *Assistant Professor of Sociology*
WILLIAM J. LEWIS, Ph.D. (1954) *Associate Professor of Speech*
FRANK WAYNE LIDRAL, Ph.D. (1960) *Professor of Music*
HARRY LIGHTHALL, JR., Ph.D. (1955) *Assistant Professor of Mathematics*
*GEORGE THOMAS LITTLE, Ph.D. (1950) *Professor of Political Science*
*JACK ERNEST LITTLE, Ph.D. (1945) *Professor of Biochemistry (Agriculture)*
VIRGINIA LYLE COLE LITTLE (MRS. G. T.), Ph.D. (Feb., 1961)
Assistant Professor of Sociology
JOYCE KENYON LIVAK (MRS. F. H.), M.S. (1961) *Instructor in Home Economics*
*JOHN HUTCHISON LOCHHEAD, Ph.D. (1942) *Professor of Zoology*
MARGIT LOCHHEAD (MRS. J. H.), Ph.D. (1954) *Instructor in Nursing*
MARY PATRICIA LODGE, M.S. (1960) *Professor of Nursing Education*
*PHILIPP HANS LOHMAN, Ph.D. (1945)[2] *Converse Professor of Commerce and Economics*
ROSALIE MAY LOMBARD, M.A. (1959) *Assistant Professor of Medical-Surgical Nursing*
MARSHALL GENE LONDON, M.D. (1961) *Instructor in Clinical Medicine*
NORMAN THEODORE LONDON, M.A. (1960) *Instructor in Speech*
*LITTLETON LONG, Ph.D. (1949) *Associate Professor of English*
CARL LUCARINI, A.M. (1928) *Assistant Professor of Chemistry*
JEROLD FRANCIS LUCEY, M.D. (1956) *Associate Professor of Pediatrics*
WILLIAM HOSSFELD, LUGINBUHL, M.D. (1960) *Assistant Professor of Pathology*
ELEANOR MERRIFIELD LUSE, Ph.D. (1947)[3] *Professor of Speech*
*HERBERT CHRISTIAN McARTHUR, Ph.D. (1950) *Associate Professor of English*
PATRICIA ANN McCARTHY, M.Ed. (1960) *Assistant Professor of Home Economics*
MURDO GLENN MacDONALD, M.D. (1950) *Assistant Professor of Clinical Pharmacology*
VERNE LIONEL McDONALD, JR., M.Ed. (1956) *Instructor in Education*
JAMES BISHOP McGILL, M.D. (1952) *Instructor in Clinical Surgery*
ALBERT GEORGE MACKAY, M.D. (1933) *Professor of Surgery*
ROBERT JAMES McKAY, JR., M.D. (1950) *Professor of Pediatrics*
EDD RUTHVEN McKEE, M.S., E.E. (1934) *Professor of Electrical Engineering*
MARION CLAIRE McKEE, M.D. (1958) *Instructor in Clinical Pediatrics*
*WILLIAM HOOPER MACMILLAN, Ph.D. (1954) *Associate Professor of Pharmacology*
EDWARD DOUGLAS McSWEENEY, M.D. (1923) *Assistant Professor of Gynecology*
JOHN VAN SICKLEN MAECK, M.D. (1948) *Professor of Obstetrics and Gynecology*
FREDERICK JOSEPH MAHER, JR., B.A. (1958) *Instructor in Sociology*
VINCENT HERSCHEL MALMSTROM, Ph.D. (1959)
Visiting Assistant Professor of Geography
J. EDWARD MARCEAU, D.D.S. (1950-52; 1954) *Instructor in Dental Hygiene*
CLAIRE KENT MARSHALL (MRS. E. R.), M.D. (1955)
Instructor in Clinical Psychiatry and in Clinical Neurology
GILBERT ADAMS MARSHALL, M.S. (1947) *Associate Professor of Mechanical Engineering*
*FREDERIC CARVER MARSTON, JR., Ph.D. (1948) *Professor of English*
HERBERT LLOYD MARTIN, M.D. (1954) *Assistant Professor of Clinical Neurology*
RICHARD MONTGOMERY MARTIN, M.S. (1960) *Instructor in Psychology*
*JAMES WALLACE MARVIN, Ph.D. (1939) *Professor of Botany*
SALLY BERRY MAYBURY (MRS. T. J.), Ed.D. (1944)[3] *Associate Professor of Economics*
JOHN EDMUND MAZUZAN, JR., M.D. (1959) *Instructor in Anesthesiology*
HAROLD EDWARD MEDIVETSKY, M.D. (1937) *Assistant Professor of Clinical Medicine*
JAMES TWYFORD MEHORTER, M.S. (1958) *Assistant Professor of Education*
*DONALD BURTON MELVILLE, Ph.D. (1960) *Professor of Biochemistry*
MURIEL EDNA MENZIES, M.S. (1960) *Instructor in Public Health Nursing*
JOYCE EVELYN MERRIAM, M.A. (1961) *Instructor in Mathematics*

[1] Resigned January, 1962.
[2] Sabbatical leave 1961-62.
[3] Sabbatical leave second semester.

EVERETT PERKINS MERRILL, Ph.D. (1961) *Assistant Professor of Animal and Dairy Science*
*ALVIN REES MIDGLEY, Ph.D. (1951)[1] *Professor of Agronomy*
*REGINALD VENN MILBANK, M.S. (1946-48; 1949) *Professor of Civil Engineering*
DONALD BARKER MILLER, M.D. (1951) *Associate Professor of Clinical Surgery (Thoracic)*
PAUL ROBERT MILLER, M.S. (1931) *Professor of Agronomy*
JEAN BEATTIE MILLIGAN, M.A. (1953) *Associate Professor of Nursing*
ERNEST LEE MILLS, M.D. (1955) *Assistant Professor of Clinical Anesthesia*
ISABEL CLARK MILLS (MRS. C. H.), M.A. (1932) *Associate Professor of Art*
*PAUL AMOS MOODY, Ph.D. (1927) *Howard Professor of Natural History and Zoology*
DOROTHY JACKSON MORROW (MRS. R. C.), M.D. (1952)
Instructor in Clinical Pediatrics
RUFUS CLEGG MORROW, JR., M.D. (1951) *Associate Professor of Otolaryngology*
ELLEN HASTINGS MORSE, Ph.D. (1960) *Associate Professor of Home Economics*
DONALD EUGENE MOSER, Ph.D. (1960) *Associate Professor of Mathematics*
HANS JOACHIM MURBE, M.A. (1960) *Instructor in English*
*BENNET BRONSON MURDOCK, JR., Ph.D. (1951) *Professor of Psychology*
*MILTON JOSEPH NADWORNY, Ph.D. (1952) *Professor of Economics*
RICHARD L. NAEYE, M.D. (1960) *Assistant Professor of Pathology*
CHESTER ALBERT NEWHALL, M.D. (1929) *Thayer Professor of Anatomy*
DAVID SOULE NEWHALL, M.A. (1959) *Instructor in History*
AUDREY EVELYN NEWTON, M.S. (1955) *Assistant Professor of Home Economics*
GEORGE HUBERT NICHOLSON, A.M. (1923) *Associate Professor of Mathematics*
*ANDREW EDGERTON NUQUIST, Ph.D. (1938) *McCullough Professor of Political Science*
*WESLEY LEMARS NYBORG, Ph.D. (1960) *Professor of Physics*
*ELBERT AUSTIN NYQUIST, M.S., C.P.A. (1953) *Associate Professor of Economics*
ROBERT EMMETT O'BRIEN, M.D. (1955) *Assistant Professor of Clinical Medicine*
JAMES DONALD O'HARA, M.A. (1959) *Instructor in English*
PAUL OREN, JR., Ph.D. (1958) *Associate Professor of Sociology*
RALPH HARRY ORTH, Ph.D. (1959) *Assistant Professor of English*
*JOHN OGDEN OUTWATER, JR., Sc.D. (1956) *Professor of Mechanical Engineering*
HENRI LOUIS PACHE, M.D. (1951) *Instructor in Clinical Surgery*
PAUL PAGANUZZI, M.A. (1961) *Assistant Professor of Russian*
HAROLD GORDON PAGE, M.D. (1954) *Assistant Professor of Surgery*
MARY ELLEN PALMER (MRS. E. M.), M.S. (1953-55; 1958) *Assistant Professor of Nursing*
*IPPOCRATES PAPPOUTSAKIS, Mus.M. (1940) *Professor of Music*
VICTOR H. PAQUET, B.S. (1949) *Associate Professor of Graphics*
MALCOLM SKEELS PARKER, D.M.L. (1953) *Assistant Professor of Romance Languages*
EDWIN MATTSON PAXSON, M.D. (1957) *Instructor in Clinical Pediatrics*
MERVYN WILLIAM PERRINE, Ph.D. (1961) *Assistant Professor of Psychology*
OSCAR SYLVANDER PETERSON, JR., M.D. (1944)
Associate Professor of Clinical Radiology and Associate in Biophysics
THOMAS LESLIE PHILBRICK, Ph.D. (1958) *Assistant Professor of English*
RAYMOND VIRGIL PHILLIPS, Ph.D. (1961) *Professor of Education*
JAMES EUGENE POOLEY, A.M. (1928)
Associate Professor of Classical Languages and History
*WILLARD BISSELL POPE, Ph.D. (1934)[2]
Frederick Corse Professor of English Language and Literature
ARCHIBALD THOMPSON POST, Ed.M. (1929)
Associate Professor of Physical Education for Men
*MILTON POTASH, Ph.D. (1951) *Associate Professor of Zoology*
PLATT RUGAR POWELL, M.D. (1949) *Associate Professor of Clinical Urology*
JOSEPH ARTHUR POWERS, M.A. (1960) *Lecturer in Sociology, Preventive Medicine*
HENRY LEWIS PRATT, M.D. (1952) *Instructor in Clinical Obstetrics and Gynecology*
MARY LOUISE PRATT, M.Ed. (1955) *Assistant Professor of Economics*
WILLIAM ARTHUR PRATT, M.D. (1950) *Instructor in Clinical Medicine*
*HERBERT EVERETT PUTNAM, Ph.D. (1931) *Associate Professor of History*
PHYLLIS MELVILLE QUINBY, B.S. (1949) *Assistant Professor of Dental Hygiene*
DAVID WILLIAM RACUSEN, Ph.D. (1958) *Assistant Professor of Agricultural Biochemistry*
ROBERT MALCOLM RAGAN, M.S. (1959) *Assistant Professor of Civil Engineering*

[1] Sabbatical leave second semester.
[2] Sabbatical leave 1961-62.

LOUISE ADELE RAYNOR, Ph.D. (1946) *Associate Professor of Botany*
ELMER McCREADY REED, M.D. (1948) *Assistant Professor of Otolaryngology*
EDWARD K. REIMAN, D.D.S. (1951) *Instructor in Dental Hygiene*
*HEATH KENYON RIGGS, Ph.D. (1953) *Associate Professor of Mathematics*
BENJAMIN ALBERT RING, M.D. (1959)
Assistant Professor of Neuroradiology and Radiologic Anatomy
S. ALEXANDER RIPPA, Ed.D. (1960) *Associate Professor of Education*
NORMA EMERICK ROBB (MRS. J. M.), B.S. (1960)[1] *Instructor in Dental Hygiene*
ALBAN BENNETT ROONEY, M.S. (1922) *Associate Professor of Physics*
JAMES ALBERT ROOT, M.C.E. (1948) *Associate Professor of Civil Engineering*
LYMAN SMITH ROWELL, M.S. (1925) *Associate Professor of Zoology*
CHARLES BRUSH RUST, M.D. (1948) *Assistant Professor of Clinical Orthopedic Surgery*
THOMAS DUDLEY SACHS, Ph.D. (Feb., 1962) *Assistant Professor of Physics*
ALBERT WILLIAM SADLER, Ph.D. (1956) *Associate Professor of Philosophy and Religion*
J. ANTHONY SAMENFINK, Ed.D. (1961) *Professor of Home Economics*
WADI I. SAWABINI, D.D.S. (1950) *Assistant Professor of Dental Hygiene and Assistant Professor of Oral Hygiene and Dental Medicine*
ROBERT NEWTON SAXBY, M.D. (1950) *Instructor in Clinical Radiology*
DANIEL JOSEPH SCHEANS, B.A. (1959) *Instructor in Sociology*
*ARNOLD HAROLD SCHEIN, Ph.D. (1947) *Associate Professor of Biochemistry*
CAROL ANN SCHELPER, B.A. (1960)[2] *Instructor in Physical Education for Women*
EDWIN CALVIN SCHNEIDER, M.S. (1946) *Associate Professor of Agricultural Engineering*
*NORMAN JAMES SCHOONMAKER, Ph.D. (1956) *Professor of Mathematics*
*HAROLD SEESSEL SCHULTZ, Ph.D. (1946) *Professor of History*
HERBERT LOUIS SCHULTZ, M.A. (1957) *Assistant Professor of Music*
GEORGE ADAM SCHUMACHER, M.D. (1950) *Professor of Neurology*
ROBERTA B. SCHWALB, M.A. (1958) *Assistant Professor of Nursing*
JOHN SERAFIN, B.A., Captain U. S. Army (1960) *Assistant Professor of Military Science*
HAROLD MANNING SERVEN, JR., A.B., Captain U. S. Army (1960)
Assistant Professor of Military Science
*MALCOLM FLOYD SEVERANCE, Ph.D. (1951-52; 1953) *Associate Professor of Economics*
WILLIAM IRELAND SHEA, M.D. (1952) *Instructor in Clinical Surgery*
NAI-CHENG SHEN, M.A. (1959) *Visiting Professor of Political Science*
LAURENCE FOREST SHOREY, M.S. (1926) *Associate Professor of Electrical Engineering*
AUDREY JOHN WASHINGTON SHORT, B.S., Captain U. S. Army (1961)
Assistant Professor of Military Science
*FERDINAND JACOB MORRIS SICHEL, Ph.D. (1937)
Professor of Physiology and Biophysics
MORRIS LEON SIMON, M.A. (1954) *Assistant Professor of Political Science*
JAMES EDWIN SIMPSON, M.D. (1953) *Instructor in Clinical Orthopedic Surgery*
ETHAN ALLEN HITCHCOCK SIMS, M.D. (1950)
Associate Professor of Clinical Biochemistry and Medicine
*ROBERT ORVILLE SINCLAIR, Ph.D. (1953-55; 1956)
Associate Professor of Agricultural Economics
ADAM STANISLAW SKAPSKI, Ph.D. (1953)[3] *Professor of Physics*
HOWARD DARELL SLACK, D.D.S. (1950) *Instructor in Dental Hygiene*
NORMAN JOSEPH SLAMECKA, Ph.D. (1957) *Assistant Professor of Psychology*
WILLIAM JOSEPH SLAVIN, JR., M.D. (1942)
Associate Professor of Obstetrics and Gynecology
ALBERT MATTHEWS SMITH, Ph.D. (1957)
Associate Professor of Animal and Dairy Science
*DURWOOD JAMES SMITH, M.D. (Jan., 1953) *Professor of Pharmacology*
*HOWARD MARSHALL SMITH, JR., M.S. (1947) *Professor of Electrical Engineering*
ROBERT PEASE SMITH, M.D. (1951-54; 1956)
Instructor in Medicine and Preventive Medicine (Rehabilitation)
ARTHUR BRADLEY SOULE, JR., M.D. (1928) *Professor of Radiology*
ELEANOR SOUVILLE, M.A. (1959) *Instructor in Romance Languages*
*THOMAS SPROSTON, JR., Ph.D. (1946) *Professor of Botany*

[1] Resigned February, 1962.
[2] Resigned January, 1962.
[3] On leave 1961-62.

ERNEST STARK, M.D. (1945) *Associate Professor of Pathology*
JAMES CARL STARKE, M.D. (1961) *Instructor in Clinical Dermatology*
STANISLAW JAN STARON, M.A. (1961) *Instructor in Political Science*
SADAH SHUCHARI START (MRS.), B.A. (1946-48; 1949) *Assistant Professor of Music*
EDWARD WILLIAM STEELE, JR., Ph.D. (1951-53; 1955)
Assistant Professor of Political Science
FRANK LESLIE STEEVES, Ed.D. (1958) *Associate Professor of Education*
CHARLES WATTLES STEPHENSON, M.D. (1948) *Associate Professor of Clinical Neurolgoy*
NORMAN KENNETH STRASSBURG, M.Ed. (1946)
Assistant Professor of Physical Education for Men
WALTER ALVA STULTZ, Ph.D. (1937) *Professor of Anatomy*
BORYS SURAWICZ, M.D. (1955)
Assistant Professor of Experimental Medicine and of Clinical Medicine
FRIDA GERARDA SURAWICZ (MRS. B.), M.D. (1961) *Instructor in Clinical Psychiatry*
JOSEPH ROBERT SURIANO, Ph.D. (1959) *Assistant Professor of Medical Microbiology*
RALPH DANIEL SUSSMAN, M.D. (1946) *Associate Professor of Clinical Pediatrics*
BURTON SAMUEL TABAKIN, M.D. (1954) *Associate Professor of Medicine*
DAVID LATHAM TABER, M.D. (1953) *Instructor in Clinical Obstetrics and Gynecology*
*FRED HERBERT TAYLOR, Ph.D. (1943) *Professor of Botany*
CHRISTOPHER MARLOWE TERRIEN, M.D. (1939) *Associate Professor of Clinical Medicine*
LOUIS GEORGE THABAULT, M.D. (1939) *Instructor in Clinical Surgery*
WILFRID THABAULT, M.D. (Jan., 1958) *Instructor in Clinical Obstetrics and Gynecology*
ARTHUR BARNARD THOMPSON, JR., M.A. (1958)[1] *Instructor in Political Science*
JACK EVERAD THOMPSON, M.F. (1959) *Assistant Professor of Forestry*
MARY ELIZABETH THOMPSON, M.A. (1958) *Assistant Professor of Nursing*
THOMAS BARTHOLOMEW TOMASI, JR., M.D. (1960)
Assistant Professor of Experimental Medicine
*REUBEN TORCH, Ph.D. (1953) *Associate Professor of Zoology*
RANDOLPH SHEPARDSON TOWNE, A.M. (1928)
Assistant Professor of Romance Languages
THOMAS DERMOTT TRAINER, M.D. (1960) *Instructor in Pathology*
JOHN COPLEY TRAVIS, A.B. (1959) *Instructor in Speech*
*RAYMOND HERMAN TREMBLAY, Ph.D. (1953)
Associate Professor of Agricultural Economics
*JACK TREVITHICK, Ph.D. (1946) *Professor of English*
*VIRGINIA YAPP TROTTER (MRS. R. T.), Ph.D. (1955) *Professor of Home Economics*
KEITH FRANK TRUAX, M.D. (1932) *Associate Professor of Clinical Surgery*
ARTHUR FREDERICK TUTHILL, M.S. (1946)
Associate Professor of Mechanical Engineering
JOHN CUSHMAN TWITCHELL, M.D. (1961) *Instructor in Clinical Medicine*
MARSHALL COLEMAN TWITCHELL, JR., M.D. (1942)
Assistant Professor of Ophthalmology
HIRAM EUGENE UPTON, M.D. (1930) *Associate Professor of Clinical Medicine*
FREDERICK WILLIAM VAN BUSKIRK, M.D. (1946)
Associate Professor of Clinical Radiology
KENNETH EVERSON VARNEY, M.S. (1946) *Assistant Professor of Agronomy*
*HUBERT WALTER VOGELMANN, Ph.D. (1955) *Assistant Professor of Botany*
LAWRENCE EVERETT WAGNER, M.S. (1960) *Instructor in Mathematics*
BENJAMIN BOOTH WAINWRIGHT, A.M. (1925) *Associate Professor of English*
LUCILLE WAKEFIELD, M.S. (1957) *Assistant Professor of Home Economics*
*NELSON LEE WALBRIDGE, Ph.D. (1924) *Professor of Physics*
LESTER JULIAN WALLMAN, M.D. (1948) *Associate Professor of Neurosurgery*
HELEN JANE WAMBOLDT (MRS.), Ph.D. (1953-54; 1959) *Assistant Professor of Speech*
EARL JAMES WEAVER, Ph.B. (1959) *Instructor in English*
*FRED CLARENCE WEBSTER, Ph.D. (1951-53; 1956)
Associate 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*
JOHN GEORGE WEIGER, M.A. (1958) *Instructor in Romance Languages*

[1] On leave first semester.

FRANCIS ALEXANDER WEINRICH, M.A. (1950) *Assistant Professor of Music*
GEORGE WILLIAM WELSH, 3rd, M.D. (1956) *Assistant Professor of Medicine*
WENDELL JENNISON WHITCHER, Ph.D. (1952) *Associate Professor of Chemistry*
*JAMES FELLOWS WHITE, Ph.D. (1955) *Professor of German*
ROY ALVIN WHITMORE, JR., M.F. (1958) *Associate Professor of Forestry*
HILTON ADDISON WICK, LL.B. (1949) *Assistant Professor of Economics*
BLAIR WILLIAMS, M.S. (1949-50; 1951) *Associate Professor of Home Economics*
MARTIN WESLEY WILLIAMS, Ph.D. (1953-56; 1958)[1] *Associate Professor of Pharmacology*
BETTY JANE WILLS, M.S. (1960) *Assistant Professor of Physical Education for Women*
JANET BROWNELL WILSON, M.A. (1957) *Assistant Professor of Home Economics*
*WALTER LEROY WILSON, Ph.D. (1949) *Associate Professor of Physiology and Biophysics*
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*GLEN MEREDITH WOOD, Ph.D. (1950) *Associate Professor of Agronomy*
FLORENCE MAY WOODARD, Ph.D. (1923) *Professor of Economics*
NORMA LOWYN WOODRUFF, M.A. (1952) *Associate Professor of Nursing*
RICHARD S. WOODRUFF, M.D. (1950) *Assistant Professor of Pathology*
STUART COWAN WOODRUFF, M.A. (1961) *Instructor in English*
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ALBERT W. WURTHMANN, M.A. (1947) *Assistant Professor of German*
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JAMES ARTHUR DANIGELIS, M.D. *Research Associate in Radiology*
HOWARD RANDALL DEMING, M.D. *Research Associate in Radiology*
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HERMAN C. HERRLICH, Ph.D. *Research Associate in Experimental Medicine*
GEORGE RICHARD HOWE, Ph.D. *Research Associate in Physiology and Biophysics*
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FREDERICK M. LAING, M.S. *Research Associate in Botany*
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EDWARD R. ATWOOD, M/Sgt. *Assistant in Military Science*
JOSEPH ROGER BEAUREGARD, M.S. *Research Assistant in Pharmacology*

[1] Resigned, December 1961.

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JOHN FREDERICK COLLIER, A.B. — *Research Assistant in Neurosurgery and Anatomy*
PHYLLIS G. COLLINS (MRS.) — *Research Assistant in Botany*
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THOMAS F. DONOVAN — *Technical Assistant in Surgery*
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ROBERT HALVERSON, B.S. — *Research Assistant in Medicine*
DAVID HANLON, M.A. — *Research Assistant in Biochemistry*
JOHN CONRAD HARTNETT, M.S. — *Research Assistant in Biochemistry*
JEAN RYAN HEWITT (MRS.), B.S. — *Research Assistant in Experimental Medicine*
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MAUREEN O'CONNELL, B.S. — *Research Assistant in Medicine*
DAVID OSBORNE — *Technical Assistant in Biochemistry*
OGUZCAN OZALTIN, B.S. — *Research Assistant in Mechanical Engineering*
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ROBERT PRINDLE — *Research Assistant in Anesthesia*
HELEN REICHEL (MRS.), B.S. — *Research Assistant in Preventive Medicine*
CRISTINA E. SCHWEIKER, M.S. — *Research Assistant in Pathology*
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JOHN F. SHERIDAN, SFC — *Assistant in Military Science*
YVONNE K. STARCHESKA — *Research Assistant in Experimental Medicine*
SHIRLEY JANE STRONG, B.A. — *Research Assistant in Pharmacology (Documentation)*
MIRIAM GLASS VEDDER (MRS.), B.A. — *Assistant Computing Consultant*
MICHAEL JOSEPH VENDETTI, B.S. — *Special Assistant Football Line Coach*
VERA M. C. VERVLOET — *Research Assistant in Medicine*
LAWRENCE PAUL VOYER, SR., SFC — *Assistant in Military Science*
LEOPOLD WIERZBICKI, M.S. — *Research Assistant in Biochemistry*
WING M. WOON — *Research Assistant in Pathology (Photography)*

Graduate Fellows

CARL E. ARONSON, A.B.
Pharmacology
STEPHAN F. AUSTIN, A.B.
Chemistry
JOSEPH R. BEAUREGARD, B.A.
Pharmacology
FRANK P. BOLLES, B.S.
Pathology
PHILLIP S. BRITTON, B.A.
Chemistry
MRS. VIRGINIA P. CLARK, B.A.
English
NICHOLAS J. DESANCTIS, B.A.
Pharmacology
DONALD E. HEALD, B.S.
Physiology and Biophysics
ROBERT W. HEATON, B.A.
Pharmacology
MRS. JANET L. HILL, B.M., B.S.
Music
PAUL S. HUYFFER, B.A.
Chemistry
ALLAN KUPFERMAN, M.S.
Pharmacology

[1] Deceased, January 21, 1962.

BRUCE McCONNELL, M.S.
Biochemistry
RICHARD L. MOMPARLER, B.S.
Pharmacology
MRS. BERTHA A. MULIERI, B.S.
Physiology and Biophysics
LOUIS A. MULIERI, B.E.E.
Physiology and Biophysics
FREDERICK T. PERRY, A.B.
Pharmacology
ALFRED F. RAMPONE, JR., M.A.
Physiology and Biophysics
VERNON N. REINHOLD, M.S.
Biochemistry
SYLVIA SCHECHNER, B.S.
Biochemistry
WILLIAM SCHRAMM, B.A.
Political Science

Graduate Research Fellows

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Chemistry
ANNE E. BILLINGS, B.S.
Pathology
HARRY O. BROOKS, B.S.
Electrical Engineering
NICKOLAS J. CALVANICO, M.S.
Agricultural Biochemistry
GARY H. COHEN, B.S.
Agricultural Biochemistry
JOHN W. COLLINS, A.B., M.S.
Agricultural Biochemistry
COLIN C. CONNOLLY, B.Sc.
Physics
DANIEL C. DEWOLFE, B.S.
Economics
BRYCE C. ELLIOTT, B.S.
Animal and Dairy Science
GARY HOLCK, B.S.
Animal and Dairy Science
ROLAND E. JENKINS, A.A.S., B.S.A.
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CYRUS KERMANJ, B.S.
Music
ALAN R. LANGILLE, B.S.
Agronomy
ERNEST H. LEMAY, A.B.
Psychology
LESLIE C. LEWIS, B.S.
Animal and Dairy Science
ROBERT J. McCOUBRIE, JR., B.S.
Anatomy
PETER L. MINOTTI, B.S.
Agronomy
MIKHAIL E. NASRALLAH, B.S.
Horticulture
WILLIAM F. O'CONNOR, B.S.
Agricultural Economics
JOHN F. RUITBERG, JR., B.S.
Agricultural Economics
RICHARD S. SAGENDORPH, JR., B.S.
Animal and Dairy Science
DINESH K. TEWARSON, B.Sc., B.S.
Electrical Engineering
FRED TUNG, B.S.
Biochemistry
INDUMATI M. ULLAL, B.S.
Experimental Medicine
RICHARD F. WOOD, B.S.
Agricultural Economics

Graduate Teaching Fellows

CHARLES E. BAYHA, A.B.
Chemistry
DANIEL J. BEAN, B.S.
Zoology
JACQUES BLANDIN, Dip.
French
JULIA E. BORZONE, Prof.
Spanish
RONALD P. BRAND, B.S.
Physics
JOHN J. BRINK, B.S.
Biochemistry
JOHN P. BULGER, B.A.
Chemistry
LEROY C. BUTLER, B.S.
Chemistry
MALCOLM W. CHASE, JR., B.S.
Chemistry
MRS. SUSAN W. COCHRAN, B.A.
Zoology
GERALD R. CONKLIN, B.S.
Music
DAVID E. CROWLEY, B.A.
Psychology
JAMES R. DIMON, B.A.
Geology
ROGER C. ECKHARDT, S.B.
Chemistry
MRS. NAOMI S. FINEBERG, B.A.
Mathematics
MADELEINE GANTER, Cert. de Lic.
French
BEN C. HARMS, B.S.
Physics
MRS. SUSAN F. HEIN, B.S.
Medical Microbiology
LINDA A. HUFNAGEL, B.A.
Zoology
THOMAS G. IRWIN, B.A.
Botany
JOHN B. LANE, B.A.
Mathematics
DONALD J. LIVENGOOD, B.S.
Mathematics

AI-TSUNG LU, B.S.
Electrical Engineering
CAROLYN A. PAINE, B.S. in Ed.
Education
LUIS R. M. QUIROZ, Prof.
Spanish
THOMAS G. SICCAMA, B.S.
Botany
EUGENE K. VEDDER, A.B.
Mathematics
JANE WARK, B.A.
Botany
C. GRANT WARNER, B.A., M.S.
Chemistry
SANDRA J. WEAVER, B.S.
Chemistry
RUDOLF WEGENER, B.A.
Botany
GERDA WEITZ
German
DAVID L. WILLIAMS, B.S.
Chemistry
SANFORD S. WITHERELL, JR., B.A.
Botany

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PATRICIA CRUSE, R.N. — *Nurse*
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IRENE HALLOCK, R.N. — *Nurse*
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ALLACE C. SCHALK (MRS.)	*Preventive Medicine*
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DALLAS BOUSHEY	*Anatomy*
JOHN H. PORTER, B.A.	*Regulatory Service*
AGNES RICHARDSON	*Animal Pathology*
EARL H. STONE	*Agricultural Engineering*
JOHN R. TOURVILLE, B.S.	*Animal Pathology*

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(1961-1962)

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Delta Delta Delta
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MRS. ELIZABETH GROW
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Claggett House
MRS. CHRISTIE HOLLISTER
Mason Hall
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Allen House
MRS. JESSIE J. PEARL
Assistant Head Resident
MISS MILDRED POWELL
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Slade Hall
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Kappa Alpha Theta
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Simpson Hall
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Robinson Hall
MRS. JULIA WORTHEIM
Redstone Hall

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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.

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DONALD JAMES BALCH, M.S. — *Assistant Animal Husbandman*
RICHMOND JAY BARTLETT, Ph.D. — *Assistant Agronomist*
MALCOLM IRVING BEVINS, M.S. — *Assistant Agricultural Economist*
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REGINALD VENN MILBANK, M.S. — *Civil Engineer*
JOHN OGDEN OUTWATER, JR., M.A., Sc.D. — *Mechanical Engineer*

AGRICULTURAL EXTENSION SERVICE STAFF

The Vermont Agricultural Extension Service is a cooperative undertaking of the State of Vermont, the College of Agriculture, 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 each county. Its purpose is "to aid in diffusing among the people . . . useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of the same." It works primarily with the rural people of the State, including both adults and children.

PAUL ROBERT MILLER, M.S. — *Dean*
ROBERT POWERS DAVISON, M.Ed. — *Director*

HENRY VERNON ATHERTON, Ph.D. — *Dairy Bacteriologist*
DONALD JAMES BALCH, M.S. — *Assistant Animal Husbandman*
WESSON DUDLEY BOLTON, D.V.M., M.S. — *Animal Pathologist*
CHARLES LYMAN CALAHAN, M.S. — *Horticulturist*
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RAYMOND THOMAS FOULDS, JR., M.F. — *Forester*
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WINSTON ARTHUR WAY, M.S. — *Agronomist*
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JOHN FRANKLIN STEPHENSON, B.S. (Associate)	Middlebury
Home Demonstration: MRS. LEONA WARREN THOMPSON, B.S.	Middlebury
Club: BERNARD MAURICE NADEAU, B.S.	Middlebury
Bennington County	
Agricultural: JOHN CALVIN PAGE, M.S.	Bennington
Home Demonstration: MRS. MARION STONE HARRIS, B.S.	Bennington
Club: JAMES ALBERT EDGERTON, B.S.	Bennington
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Home Demonstration: MRS. ALICE JOHNSON BLAIR, B.S.	St. Johnsbury
Club: MRS. MARGARET TOWER BECK, B.S.	St. Johnsbury
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BRUCE LELAND CRAIG, B.S. (Assistant)	Essex Junction
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Agricultural: SILAS HAMILTON JEWETT, B.S.	Morrisville
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Club: MARY GUSTAVA SANDIN, B.S.	Morrisville
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DAVID PAUL NEWTON, B.S. (Associate)	Rutland
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Home Demonstration: MRS. HAZEL C. BROWN, M.S.	Montpelier
Club: RICHARD CHARLES STONE, B.S.	Montpelier

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Home Demonstration: MRS. RUTH DENSMORE HERTZBERG, B.S.	Brattleboro
Club: HOWARD HARRY SMITH, B.S.	Brattleboro

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JOYCE WILLIAM SUMNER, B.S. (Associate)	Woodstock
Home Demonstration: MRS. JENNIE ARMSTRONG HALL, B.S.	Woodstock
Club: EDWARD WALTER GOODHOUSE, B.S.	Woodstock

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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 conduct of short courses and educational conferences.

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WESSON DUDLEY BOLTON, D.V.M., M.S.	*Animal Pathologist*
ALEC BRADFIELD, M.S.	*Associate, Dairy Industry*
HOLLIS EARL BUCKLAND, B.S.	*Seed Analyst*
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JAMES ROGER WADSWORTH, V.M.D., M.S.	*Animal Pathologist*
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UNIVERSITY COMMITTEES

Effective July 1, 1961

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JAMES R. HAGADONE, B.A.	*Director, Saga Food Service*
GREGORY CONTOS, B.S.	*Manager, Saga Food Service, Simpson*
ROBERT C. MONROE, B.S.	*Manager, Saga Food Service, Waterman*
DONALD SANTA CROCE, B.S.	*Manager, Saga Food Service, Marsh*

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 the first 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 and Nursing, the College of Medicine, the Graduate College, and the two-year School of Dental Hygiene.

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: botany, chemistry, economics, English, French, geology, German, Greek, history, Latin, mathematics, music, philosophy, physics, political science, psychology, sociology, Spanish, speech, and zoology.

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 to such professional schools

and colleges as those of medicine, dentistry, law, theology, optometry, 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 degrees of Bachelor of Science in Agriculture, Bachelor of Science in Agricultural Engineering 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, agronomy, animal and dairy production, dairy plant management, dairy technology, botany, foreign agricultural service, forestry, horticulture, and poultry science.

The curriculum in home economics provides options in general home economics; food and nutrition; related arts, clothing and textiles; and home economics 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 to include the curricula in civil, electrical, mechanical, and management engineering; professional chemistry; commerce and economics; and, later medical technology.

Majors in the Department of Commerce and Economics may specialize in options which include accounting; banking, finance and insurance; business administration; industrial management, marketing and merchandising; and secretarial studies.

The College of Education and Nursing

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 and, in 1946, the College of Education and Nursing, offering four-year curricula leading to the Bachelor of Science degree in the fields of elementary, secondary, business and music education; and a four-calendar-year curriculum leading to the degree of Bachelor of Science in Nursing.

Although techniques have varied, the primary concern of the education curricula has been to prepare qualified teachers who have a broad background in academic subject matter and modern professional training in education methods.

The University's collegiate program of nursing is designed to educate the student for the practice of professional nursing in beginning positions in the hospital, home and community, and to provide a foundation for advanced study in nursing at the graduate level.

The College of Medicine

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 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.

The School of Dental Hygiene

The School of Dental Hygiene was established at the University in 1949. This two-year program leads to a Certificate in Dental Hygiene. Recipients of the certificate are eligible to take all state board examinations for licensing as dental hygienists. Enrollment in the School is limited to women.

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 available through the University of Vermont admission 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 beginning with the year indicated. Students from the New England states may enter the programs earlier than the year indicated but in that event the out-of-state rate of tuition would apply.

Classics, junior year, Massachusetts, New Hampshire, Rhode Island; graduate, Maine.
Business Education, junior year, Maine.
Dairy Manufacturing, junior year, Maine, New Hampshire, Rhode Island.
Foreign Agricultural Service, sophomore year, Massachusetts, Rhode Island.
Medical Electronics, graduate, Maine, Massachusetts, New Hampshire, Rhode Island.
Medical Technology, senior year, Massachusetts.
Microbiology, graduate, Maine, Rhode Island.
Nursing, freshman year, New Hampshire.
Secretarial Science, junior year, Maine.

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 being remodeled to serve 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 Williams Science Hall, the first completely fire-proofed college building in this country, was added in 1896 to house the expanding departments of the several sciences. The gift of Dr. and Mrs. Edward

H. Williams of Philadelphia, 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 has just been completed 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 present engineering building and gymnasium were built in the early 1900's, and are inadequate for present demands. Construction of a new $2,700,000 physical education facility, with three playing floors, swimming pool, field house with indoor track and ice rink, will be completed in the fall of 1962. Alumni and private support and a state guaranteed bond issue to be repaid from student fees have made this possible. Construction of a new $1,895,000 engineering building was made possible by a state appropriation. This is now under construction and when complete will house all of the engineering departments and mathematics.

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 which has become a symbol of the University, 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 Theatre.

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, a dining hall, and the University Store. A well-equipped language laboratory is maintained in the Waterman Building with tape-recording facili-

ties and listening stations as an aid to pronunciation, aural comprehension, and pattern practice in French, German, Hebrew, Russian and Spanish. An I.B.M. 1620 model electronic computer has been installed to be used for teaching and research in the University and for use by other colleges which may have need for its service.

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.

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 Dairy Science Building.

Coolidge Hall and the three men's residence halls, Buckham, Chittenden and Wills Halls, were the first University resident 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. An additional new residence hall for women and a new three unit residence and dining facility for men were completed in the fall of 1961 under the federal housing loan program. The new unit for women is named to honor former Dean of Women Marian Patterson. The men's units, which make it possible for the University to provide on campus housing for many upperclassmen, are 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.

Other buildings of interest include Grassmount, a gracious Georgian mansion which was the home of a former Governor of Vermont and which now houses University women; 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 Alice E. Blundell, a member of the University's home economics faculty, was completed on the Redstone campus in 1961.

The Bailey Library

In November 1961, nearly 3,000 students and faculty worked through the day and into the night to move the books from the Billings Library, the Wilbur Library and the stacks in the Waterman Building to the new University Library. The collection of more than 250,000 volumes was moved under the supervision of the Library staff in a manner which eliminated any long period of time in which the library collection would have been unavailable to faculty and students.

The new library, is named to honor the late Guy W. Bailey, thirteenth president of the University. Early completion was made possible by a bond issue guaranteed by the state, to be repaid through an annual student library fee. The University's library collection also includes the medical library collection housed in the medical building. It is the largest book collection in Vermont and 1400 periodical titles are regularly received.

Support of the library is derived mainly from University operating funds. Some support is received from income from endowments designating the library as beneficiary, and a group of friends, the Library Fellows, interest themselves in the library and its support.

The library is a depository of U. S. Government publications. Newspapers, pamphlets, maps, state agricultural publications, and microfilms are included in the collection. Special collections include the George P.

Marsh Library, of about twelve thousand volumes in the humanities, the Howard-Hawkins Civil War collection, and the Whittingham-Stevens collection of Chiswick imprints.

The James B. Wilbur Library, is rich in manuscript materials, early Vermont imprints, books relating to Vermont, and books by Vermont authors. The Wilbur Library has recently been given the personal collection of Dorothy Canfield Fisher, consisting of books, correspondence, and literary manuscripts.

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 often devoted to temporary exhibitions which supplement the permanent collections by representing various aspects of painting, sculpture, graphic arts, architecture, photography and related material. Group shows such as the Vermont Camera Club Exhibition and the Northern Vermont Artists' Show are held annually.

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 geological collection, a collection of several thousand photographs of painting and sculpture, and study area for courses in art.

The auditorium of the Museum has been reconstructed as an arena theater. A lighting and control room was added and the interior of the auditorium was redesigned to contain about 300 theater seats on the four sides. 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 Royal Ballet of London, Rudolf Serkin, 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, Mantovani, Sir John Gielgud, Roberta Peters, Pete Seeger, the New York City Opera Company, and a number of plays including *Tea and Sympathy, Li'l Abner, Look Homeward, Angel,* and *J. B.* In addition to two major series presented during each academic year, the Lane Series also sponsors a Chamber Arts Series in the spring semester, and the Lane Summer Series.

Conferences and Institutes

An increasing number of groups seek to meet on the campus of the University of Vermont for the purpose of holding educational conferences, institutes and seminars. Wherever it is possible to do so, the University is pleased to cooperate in making its facilities available for this purpose. Nominal charges are made to cover costs to the University.

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

Student Life

The general welfare of students is the responsibility of the Offices of the Dean of Women and the Dean of Men.

Housing

All undergraduate women who do not live locally with their families, or in a sorority house are required to live and have their meals in University residence halls. All freshman, sophomore and junior men who do not live locally with their families or in a fraternity house are required to live and have their meals 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 room assignment, and the date and hour of the opening of his or her residence hall. The rooms for freshman women and men may not be occupied until the first day of the Preliminary Days program. Other students may occupy their rooms no earlier than twenty-four hours before the day of enrollment. Each student is expected to leave the residence hall no 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 each residence hall, and space for the storage of trunks, baggage, and skiis. 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, metal waste baskets, bureau covers, desk lamps and reading lamps.

Women

There are twelve residence halls for women and seven sorority houses. The residents of the halls on the Redstone Campus: Coolidge, Hamilton, Mason, Patterson, Redstone, Robinson, Simpson and Slade Halls will have their meals in Simpson Dining Hall on a twenty-meal per week annual contract. The residents of Allen, Claggett, Grassmount and Sanders will have their meals on an eighteen-meal per week annual contract at the Waterman Cafeteria.

Normally, only junior and senior women are permitted to live in sorority houses. All other residences have a prorated number of residents from each of the four undergraduate classes.

A Head Resident on the staff of the Dean of Women is in charge of each living unit. There is also a student house president in each women's residence unit who is selected by the Women's Student Government Association to carry on its policies, and a house committee, elected by the residents of each unit, to assist the house president and head resident in seeing that the standards of W.S.G.A. are observed.

Men

Austin, Buckham, Chittenden, Converse, Marsh, Tupper, and Wills Halls are residence halls for men. All students who live in these residence halls must have board contracts for the year for eighteen meals per week. Sophomore, junior and senior men who are members of fraternities are eligible to live in their fraternity houses. Other sophomore and junior men will live in University residence halls.

Senior men may live either in their fraternity houses, University residence halls or private homes near the campus. Rental rates in the latter accommodations are about the same as those of the University.

Sixteen fraternity houses representing fourteen national fraternities and two local fraternities provide housing, and in most cases, dining facilities for approximately 400 upperclassmen. Freshmen are not permitted to live or take their meals in fraternity houses.

Student Personnel Services

COUNSELING The offices of the Dean of Women and the Dean of Men offer assistance to students who may have social, vocational and personal problems. Psychiatric counseling is available through the University Health Service.

PLACEMENT SERVICE Seniors register for placement assistance with the Placement Director. The Placement Service prepares confidential credentials, arranges campus interviews each February and March, and assists in other ways to enable the graduate to find employment. Alumni may also contact the Placement Service for interviews and for notices of employment opportunities. Occupational information, as well as employment material distributed by various companies, schools and government agencies, is available in the Placement Service.

VETERANS EDUCATION Veterans who are eligible to receive educational benefits under Public Laws 550, 634, or 894 should present a "Certificate for Education and Training" at registration. If the veteran is presently in training at another institution, he should request his school to

complete a "Change of Place of Training Form" so that a new certificate will be presented to him for use at the University of Vermont. Questions regarding veterans' benefits should be directed to the Office of the Dean of Men.

PART-TIME EMPLOYMENT Some opportunities to do part-time work are available on campus and in Burlington. Freshman students are advised to seek employment only in instances of definite financial need and only when they have reason to believe they can carry successfully a normal college program at the same time.

READING CENTER The University Reading Center provides a free service 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 facilities for maintaining the physical well-being of members of the student body. The Health Service, with its headquarters at the Wasson Memorial Infirmary, provides complete physical examinations on all incoming students, the examination of members of athletic squads, care of injuries, and advice on all health and medical problems. It is staffed by an administrative director, a medical director, resident psychiatrists, and associate physicians who hold regular office hours in the infirmary and are on call for emergencies. An orthopedic surgeon holds a regular clinic for consultation at the infirmary. Registered nurses are on duty at all hours. A student may employ a private physician using the facilities of the infirmary if desired. Cases of serious illness are sent to one of the two modern, well-equipped hospitals which are adjacent to the campus. Parents of a student are notified of an illness by letter or telephone, depending on the nature of the illness.

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 nine months' period. 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.

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 four independent agencies; the B'nai B'rith Hillel Foundation at the University of Vermont; The Council for a Cooperative Ministry at the University of Vermont representing the Baptist, Congregational Christian, Methodist, and Presbyterian churches; The Episcopal Church at the University of Vermont, and the Newman Club at the University of Vermont. Directing these agencies are Prof. Harry H. Kahn, the Rev. Richard E. Leidberg, the Rev. Donald E. Boyer, and the Rev. Philip J. Branon, respectively.

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 COURT The judicial authority of the Student Association is vested in the Student Court, which consists of representatives of each of the undergraduate colleges. The Court has exclusive jurisdiction in all cases concerning interpretation of the Constitution and Bylaws of the Student Association and legislation enacted in pursuance thereof. The Court 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. Through the Honor System high ideals of personal integrity and social consciousness are fostered.

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

HONORARY SOCIETIES The Boulder Society, a local senior honorary society for men, is recognized as an organization responsible for student leadership. Election to this society is counted one of the highest honors that a Vermont man may achieve. Other honorary class societies for men are Key and Serpent, a junior society, and Gold Key, a sophomore society.

Mortar Board is a national honorary society for senior women. Though membership in Mortar Board comes as a great honor for a 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. Other honorary class societies for women are Staff and Sandal for juniors and Sophomore Aides.

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.

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; Tau Kappa Alpha, de-

bating; Sigma Delta Psi, men's physical education; Sigma Phi Alpha, dental hygiene; National Collegiate Players, dramatics; Commerce and Economics Honorary Society; and Alpha Lambda Delta, freshman women's scholastic; Ethan Allen Rifles, outstanding students in the Reserve Officers Training Corps.

ATHLETICS An excellent program of intramural sports provides for voluntary participation by men in all classes. Competitions are arranged among fraternities, dormitories, independent groups, and individuals. A program of intercollegiate competition for men is maintained in football, skiing, baseball, basketball, track, cross-country, tennis, golf, and rifle marksmanship. 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 Women's Recreation Association sponsors intramural and extramural 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 for all women students.

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

FRATERNITIES AND SORORITIES Chapters of Greek letter fraternities and sororities have long been recognized as part of the 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 University Council, and policies regarding the establishment of new chapters and the operation of present groups on the campus are subject to its control. 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, and Theta Chi. Chapters of the following national sororities are represented: Alpha Epsilon Phi, Alpha Chi Omega, Alpha Delta Pi, 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 week end in February. This unique celebration is UVM's gala occasion and many returning alumni attend annually. Festivities include a formal fall at which a king and queen are crowned, snow sculpture, and athletic events. For two nights, the fraternities compete with one another in original skits and in *Walkin' fo' de Kake.*

MUSICAL ACTIVITIES Opportunities for participation and appreciation are provided for students with strong musical interests. The University Choir, the University Orchestra, and the University Band appear in public presentations many times during the year. Christmas and Easter concerts and a spring operetta are regular events.

The University Band is under the guidance of a director who is a member of the music department. The band appears at military reviews, Kake Walk, football games and parades. The band also performs as a concert band in which valuable experience for students in musical education is obtained.

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. One issue of the *Centaur,* devoted to student creative writing, is published during the Festival, and exhibitions, lectures and movies are scheduled at the Fleming Museum.

DRAMA, DEBATING AND RADIO The University Players, an organization of students interested in theatre arts, offers opportunities for student participation. These include two or more full length plays, an annual opera or musical comedy, a faculty-student variety show, Readers Theatre productions, and a Drama Workshop for qualified student directors. Outstanding juniors and seniors are eligible for membership in National Collegiate Players, a national theatre honorary.

The Lawrence Debate 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 Tau Kappa Alpha, the national honorary forensic fraternity.

The Radio-Television Workshop operates the campus radio station WRUV and produces many radio and television programs for broadcast on both commercial and educational stations. Open to all students, it provides opportunity for participation in broadcasting activities. The Workshop produces *Spotlight UVM,* a weekly documentary report of campus activities, provides student interviews for hometown stations; presents a daily newscast over a local station; and assists in the production of the university television series, *Living and Learning.*

WRUV, a student owned and operated closed-circuit station with professional equipment, broadcasts to the campus daily.

STUDENT PUBLICATIONS A college newspaper, literary magazine, and annual yearbook offer interested students the opportunity for journalistic, literary, and editorial expression. The newspaper, the *Vermont Cynic,* is published weekly by students. *Centaur,* the literary magazine, is published three or four times each year by students. The *Ariel,* the annual yearbook, is published by members of the senior class. The annual *Freshman Handbook* and the *Freshman Record Book* for all incoming students are published by a committee of the Student Association.

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.

LIBRARY FELLOWS This society of students, faculty members, alumni, and members of the public at large aids the libraries in carrying on various phases of their work by special contributions. Membership is open to all who are interested in books, knowledge, and the advancement of learning.

The Admission of Students

To be fully qualified for admission an applicant must have his application on file with the Director of Admissions before March 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-refeundable application fee of $10 is required of all out-of-state applicants.

Admission to the freshman class is determined after careful consideration of the high school record, rank in graduating class, recommendation of the high school principal, scores on the College Entrance Examination Board Scholastic Aptitude Test and a personal interview if requested by the Director of Admissions. The Scholastic Aptitude Test should be taken in December, January, or February of the senior year.

At least three quarters of the grades for high school courses should be at the college certifying level or higher as determined by each high school. The quality of work in the junior and senior years is especially important.

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

English	4 years
Mathematics (as specified below)	2 years
Foreign language, ancient or modern	2 years of one
Science	2 years
History	1 year

The two years of mathematics should be one year of algebra and one year of geometry. 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, 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 (other than United States History), science, 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.

SCHOOL OF DENTAL HYGIENE Enrollment is limited to women who are eligible to enter the freshman class of the University. Attributes necessary for success are good health, emotional stability, interest in the work, and the ability to get along well with people. Candidates who plan to practice in Vermont or Massachusetts must be seventeen years of age before the first of June preceding their entrance.

SPECIAL STUDENTS Special students are those who are not candidates for a degree in one of the regular curricula, or who are carrying fewer than twelve credit hours. Subject to the usual entrance requirements of the University, persons who are qualified for regular admission may, on payment of specified fees, pursue certain studies in regular college classes as special students. This arrangement is intended to accommodate those whose previous study and attainments enable them to pursue with profit special courses of study in particular departments. Students who have been dismissed for low scholarship may not re-enter as special students.

Special students are registered and enrolled in the same manner as regular students, and are subject to all regulations of the University. Credit for courses completed may be subsequently counted toward a degree. Special students are not eligible to hold University scholarships.

College Entrance Examinations

The College Entrance Examination Board will administer a series of tests during 1962 on May 19, August 8 and December 1, and in 1963 on January 12, March 2, May 18 and August 14. 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 and Records 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

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 and to permit enrollment in courses above the freshman level.

Preliminary Registration Program

The days immediately preceding the opening of class work are devoted to certain preliminary events designed to facilitate the adjustment of freshmen to conditions of life and study at college. The full schedule of events is given in a special circular, *Preliminary Days a The University of Vermont,* which is sent to all prospective freshmen by the Office of Admissions and Records one month before the opening of college.

All new students are given a reading ability test at the opening of the college year. Freshmen also take several placement tests on the basis of which some students are placed in more advanced courses. The scores on all tests are used in advising students regarding the course of study to pursue and vocational plans. A personal data report, physical examination, and registration photograph are also included in the program.

Student Expenses

The student expenses outlined in the following paragraphs are the anticipated charges for the academic year 1962-63. Changing costs, however, may require an adjustment of these charges.

APPLICATION FEES An application fee of $10.00 is charged each applicant for admission to the College of Medicine and to all non-residents of Vermont applying to an undergraduate college or school.

DEPOSIT A deposit of $35.00 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 or the College of Medicine 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 February, the deadline is December 1.

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

1. VERMONT RESIDENTS Tuition rates for Vermont residents for the year 1962-63 will be:

All Undergraduate Colleges and Divisions	$ 416.00 per year
College of Medicine	550.00 per year
Graduate and Special Students	18.00 per credit hour

2. NON-RESIDENTS OF VERMONT

All Undergraduate Colleges and Divisions	
Freshmen and transfers	
Sophomores, Juniors and Seniors	$1200.00 per year
College of Medicine	1500.00 per year
Graduate and Special Students	50.00 per credit hour

EXCEPTIONAL ENROLLMENTS A student taking fewer than twelve hours is enrolled as a special student.

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.

TUITION 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 the 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.

PIANO, ORGAN, VIOLIN AND SINGING

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

NURSING STUDENTS The tuition for the eight weeks session in the summer following the Freshman year is $104.00 for Vermont residents and $300.00 for non-residents. The charge for the six weeks session at the end of either the sophomore or junior year is the same as for enrollment in the regular summer session.[1] The eight-weeks program in Public Health Nursing for seniors requires approximately $300 additional to pay for room, board, transportation in the field, and transportation to and from the field assignment. Room and board for the semester spent at Boston University is approximately $450.

ROOM CHARGE Rooms in college residence halls are rented for the entire year and the prices are uniform in all residence halls. Single rooms rent for $335.00, all others rent for $290.00 per occupant per year. 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.

A payment of $50.00 is required by April 25 from each student returning to a University residence hall to hold a room reservation for the next year. If written notice of cancellation is received before July 1, the $50.00 charge will be refunded.

The University has established procedures under which it will assist fraternities by collecting room rents from their resident members.

BOARD All women students who live on Redstone Campus are required to have meal contracts at Simpson Hall. Twenty meals are served each week at a cost of $440.00 per year. All women living in Allen, Claggett, Sanders and Grassmount residence halls and all men living in Buckham, Chittenden, Converse and Wills residence halls are required to have meal contracts at the Waterman dining hall. Eighteen meals are served each week at a cost of $410.00 per year. Men living in Marsh, Tupper and Austin residence halls will have meal contracts for eighteen meals per week at the Marsh dining hall. 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. Special and unclassified students enrolled in less than twelve hours but more than three hours will be charged a fee of $15.00 per year. Special and unclassified students enrolled in three hours or less are not subject to the library fee.

[1] Enrollment in the summer sessions will not be required of students after September 1962.

ATHLETIC FEE An athletic fee of $30.00 per year is charged to all full-time students. This gives each student the privilege of using the facilities in the gymnasium at scheduled times, and provides admission to intercollegiate home games.

CREDIT CARD A card, value $10.00, is sold to each student each year. Library fines, breakage and other charges are assessed against the card. Any unused balance is refunded at the end of each year.

STUDENT ACTIVITY FEE All students who are enrolled in twelve semester hours or more in the College of Arts and Sciences, Technology, Agriculture and Home Economics, Education and Nursing, and the School of Dental Hygiene are charged a fee of $7.50 per semester. This fee is assessed, allocated, and controlled by Student Association and covers the support of student organizations and activities, and includes subscriptions to the *Vermont Cynic* and the *Ariel.* 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, special students, unclassified students, and students in the College of Medicine may, by paying this fee, become entitled to the benefits listed above.

LATE REGISTRATION FEE A late registration fee of $6.00 is charged students who fail to complete enrollment at the appointed times. In unusual cases, exemption from this charge may be made by the deans.

CHANGE OF ENROLLMENT FEE A fee of $3.00 is charged, except in the College of Medicine, for any change of enrollment requested by the student concerned. Deans may waive this fee in exceptional cases.

ADVANCED DEGREE FEE A fee of $25.00, 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	$ 416.00
Non-Resident Tuition	1200.00
Meal Contracts—Waterman, 18 meals per week	410.00
Simpson, 20 meals per week	440.00
Room (add $45.00 for single room)	290.00
Library and Athletic Fees	60.00
Student Association Fee	15.00
[1]Books and Supplies (estimated)	150.00
Resident Total	$1341.00
Non-Resident Total	$2125.00

[1] Engineering students add about $50 for instruments. Dental Hygiene students add about $75 each year for instruments and uniforms.

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 wherein, after arranging with the Treasurer's Office, the total charges for a semester may be divided into six equal monthly payments beginning with July 1st for the first semester and January 1st for the 2nd semester. By June 1st the total charges for the year are paid in full. There is a small service charge for this arrangement.

Refunds

In the event of withdrawal from college, refunds are made as follows:

1. During the first week of any semester the full tuition is refunded. Thereafter 20% of the tuition is deducted for each week that has elapsed.
2. No refund is made of the student fees.
3. Refund of board is made on a pro rata basis.
4. No refund is made of room rent.
5. Contracts for rooms are canceled for the remainder of the year for all students not enrolled for the second semester.

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 Cashier's Office. Applications for new accounts, deposits to individual accounts, and orders for checkbooks are accepted during office hours in the Cashier's Office. The bank's normal charge of 12½c per check is made for this service. The Cashier's Office cashes small personal checks for students in good standing who furnish satisfactory identification.

Student Aid

Many worthy and deserving students are unable to meet the financial charges 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 most desirable is determined by the Financial Aids Officer.

New students should request application forms for aid from the Director of Admissions or from the 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. These forms may be obtained from the local high school principal.

SCHOLARSHIPS During the past year, a total of $243,171 was awarded to students. Of this amount, $198,095 was provided by the University from scholarship endowments and in the form of prizes. Approximately ninety per

cent of the scholarships were awarded to residents of Vermont, however, there are a number of scholarships available to nonresidents.

Following are some of the scholarships and prizes available. A complete list of scholarships and loan funds will be found on page 204.

Memorial Scholarship Fund. Worthy students who are in need of funds and who meet the qualifications of scholarship, character, leadership, and indicate athletic promise are recommended to the Student Aid Committee by the Director of Intercollegiate Athletics.

Honor. A scholarship of two hundred dollars, credited toward the tuition of the freshman year only, is awarded in each accredited Vermont high school to the highest standing boy and girl eligible for admission to the University.

Prize Contests. In order to encourage student activities in the high schools and preparatory schools in Vermont, the University conducts annual contests in writing, debating and mathematics proficiency. Announcements of these contests are sent to all secondary schools in the State.

Wilbur Fund. The income from the fund is available on a basis of need to students who are residents of Vermont and who have earned entrance to college or who have college records that indicate excellent scholastic ability.

State Scholarships. There are a limited number of state scholarships of $200.00 a year each available to Vermont residents enrolled in the College of Medicine.

LOAN FUNDS Loan funds are apportioned annually to needy and deserving students, permitting them to pay a part of the cost of college attendance at some future time. The notes are payable following graduation.

NATIONAL DEFENSE EDUCATION ACT STUDENT LOAN PROGRAM The University participates in this loan program in which a student, depending upon ability and need, may borrow as much as $5,000 during his college years (maximum for one year, $1,000). Freshmen may borrow under this program. The applicant and his parents sign a promissory note which is non-interest bearing while the student is in college. Interest of 3% is charged on the unpaid balance of the loan beginning one year after the borrower ceases to be a full-time student. Loans are to be repaid in ten equal installments beginning one year after the borrower ceases to be a full-time student. Teaching full-time in a public school permits cancellation at the rate of 10% per year of teaching up to a maximum of 50% of the total loan and interest. Death and permanent disability is cause for total cancellation.

Application forms should be obtained from the Admissions Office.

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 all 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 and Records, who is chairman of the Committee on Residence.

Academic Discipline

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.

Reserve Officers' Training Corps

As a land-grant institution, the University provides military training in its curriculum as its contribution toward national defence. A senior division unit

of the Army ROTC is maintained. Its mission is to produce junior officers with qualities and attributes essential to their progressive and continued development as officers in the Army.

The Army ROTC curriculum is designed to develop the leadership potential of the individual. Instruction is given in subjects common to all branches of the Army, and qualified graduates of the four-year course are commissioned as lieutenants of armor, artillery, engineers, infantry, signal, quartermaster, ordnance or other branch depending upon aptitudes, the individual's choice, and the needs of the Army.

The Army Flight Training Program is open to selected senior Army ROTC students. It is designed to train a reserve pool of pilots and it affords trainees the opportunity to qualify for a civilian pilot's license.

All reservists should consult their Reserve advisers or the ROTC Department on campus as to possible advantages for them in taking the ROTC program.

THE BASIC COURSE A two-year course is required of all undergraduate, male students except the following:

1. *Veterans and Reservists.*
   a. Those who have served on active duty in the Armed Forces for one year or more may be excused from the entire basic course.
   b. Those who are definitely committed to a Reserve or National Guard program which requires at least six months of active duty or an over-all obligation, including active duty, Ready Reserve, and Standby Reserve, of at least six years may be excused from the entire basic course.
   c. Those who have served on active duty for six months but less than one year and do not have the Reserve obligation mentioned above may be excused from the first year of the basic course.
2. *Former ROTC Students.* Those who have successfully completed three or more years of an accredited Junior ROTC program may be excused from the freshman basic course upon presentation of a military training certificate.
3. *Transfer Students.* A student who transfers to this institution and who would be an accredited junior or senior at his former college may be excused from the entire basic course provided no ROTC training was offered at the former institution, or was offered on a voluntary basis; or provided he has successfully completed it if it were a required course.
4. *Those not physically qualified.*
5. *Noncitizens.*

Uniforms, arms, and equipment are furnished the student by the military department. The classes meet a maximum of three periods a week and carry two hours credit per semester. *These eight hours for the two years are in addition to the total number required for a degree in a specific curriculum.*

THE ADVANCED COURSE This is a two-year elective course open to juniors, and carries two hours credit per semester or eight hours for the full four semesters. In addition each student must complete one three-credit course in his regular academic enrollment that has been approved by the Military Department as furthering the professional qualifications of the student as a prospective commissioned officer in the United States Army. Students are selected by the department chairman and the President. Ex-service personnel, with the approval of the dean of the college, may apply in the spring of their sophomore year for Advanced Army ROTC. Each student receives a uniform allowance credit of $100.00 and a daily subsistence allowance which during recent years has averaged $27.00 per month. The Class meets at least five periods per week.

Attendance at a summer camp is mandatory. Duration of the Army ROTC summer camp is six weeks. During such attendance the student is paid at the pay scale of a private. Mileage at five cents per mile is paid to and from camp. Students attend camp between the junior and senior academic years, but deferment may be made, for cogent reason, when approved by the department.

On successful completion of the advanced course, ROTC students are normally commissioned as second lieutenants in the United States Army Reserve. Distinguished military students may receive regular commissions upon graduation.

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 Vermont Accident Insurance Company students are able to procure a policy providing for payment up to $500 for each accident and each illness. The cost for one year's coverage is $23.00 for men and $21.00 for women. Further details may be obtained from the Treasurer's Office.

Enrollment

Every student is required to register and enroll on the designated days. All charges for the ensuing semester must be paid, or otherwise provided for, before enrollment is completed. After enrollment, no changes of studies will be allowed except such as are authorized by the dean of the college in which the student is registered. After Saturday of the first full week of the semester, no enrollment or changes of studies will be permitted, except that a student may drop a course with his dean's permission during the first three weeks of a semester without incurring any academic penalty.

Auditing Courses

With the approval of his dean and the instructor concerned, a student who is regularly enrolled and carrying a normal program may audit a course. In

such cases no entry is made on the student's permanent record; no credit is given for the work; and no charge is made. Full tuition is charged those students who are not regularly enrolled in at least twelve credit hours.

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 and military science.

To be eligible for graduation, a student must have attained a grade average of 72 or above in the work required for graduation in his curriculum. Grades in courses accepted for transfer credit are excluded in computing this average.

To be eligible for a degree, a student must have completed eight semesters or the equivalent as a full-time student. Exceptions to this rule may be made in special cases by the University Council.

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. Courses taken in the regular session or in summer session at the University are counted toward residence.

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 students who have attained an average of at least 85 in their college credit courses during the preceding semester.

Grades and Reports

Scholarship is graded on a percentage scale. Grades are reported and recorded numerically. The minimum passing grade in the undergraduate colleges is 60; any grade lower than 60 represents a failure and indicates that the course must be repeated if credit is to be obtained.

All students enrolled in the undergraduate colleges receive reports of scholarship from the respective deans' offices after the close of each semester. These reports are also sent by the Recorder 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, both to the students concerned and to the parents or guardians.

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 ordererd. 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.

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.

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 lines of work are carried out 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 resident instruction division offers professional curricula in agriculture, agricultural engineering, and home economics and, in addition, two-year programs in forestry and preveterinary science. The curriculum in agriculture leading to the degree of Bachelor of Science in Agriculture provides a variety of options. The curriculum in agricultural engineering offered in cooperation with the College of Technology leads to the degree of Bachelor of Science in Agricultural Engineering. Young women may earn the degree of Bachelor of Science in Home Economics by selecting one of several options. The two-year preveterinary program prepares students for admission to other institutions for professional training. Forestry students complete their last two years at the University of Maine.

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 basic military science and physical education. The Agricultural Engineering Curriculum requires 137-141 semester hours of prescribed and elective courses. Normally 15 to 18 credit hours of courses exclusive of the aforementioned courses constitute a semester program.

In each field a list of courses is 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.

As part of the preliminary registration program, a mathematics placement test is given. Freshman mathematics courses are normally assigned on the basis of the scores made in these tests.

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 in the College of Agriculture 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. It is assumed that honors students will have mastered more subject matter upon graduation than other graduates.

Such students are selected on the basis of their academic performance usually as second semester freshmen or during 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

This curriculum leading to the degree of Bachelor of Science in Agriculture provides the following options:

Agricultural economics	Dairy industry
Agricultural education	Foreign agricultural service
Agronomy	Horticulture
Animal and dairy science	Poultry science
Botany	General agriculture

Every candidate for this degree must fulfill the requirements stated below, and present a total of 130 semester hours of credit plus credit for required courses in basic military science and physical education.

Required of All Students

A. 4 semester courses in English.
   2 semester courses in Mathematics.
   1 semester course in Speech.
B. 4 semester courses in physical and biological sciences: Chemistry, Physics, Geology, Botany, Zoology.
C. Social Sciences and Humanities
   a) 5 semester courses taken in at least three of the following areas:
      Economics and Agricultural Economics;
      Political Science;
      History;
      Sociology and Anthropology;
      Psychology.
   b) 2 semester courses chosen from the following areas:
      Philosophy; Religion; Music; Art;
      Literature in addition to any taken under A above;
      Foreign Language above the elementary level.

D. 4 semester courses in the College of Agriculture and Home Economics, outside the field of concentration and not included in the option requirements.

E. Option requirements. Each student must choose one of the options listed above. Specific courses to be taken in each option are listed in the description of each option on pages 56-61. These prescribed courses, where applicable, can be used to fulfill, wholly or partially, the requirements under B and C above. Additional departmental courses, supporting courses, and electives to fulfill the general requirements are chosen in consultation with the student's advisor or the chairman of the department.

The Freshman Year

Every candidate for the degree of Bachelor of Science in Agriculture is required to enroll in a uniform freshman year as follows:

English	2 semesters
Mathematics	2 semesters
Chemistry	2 semesters
Botany or Zoology	1 semester

Electives, preferably in agriculture.

Description of Options and Specific Requirements

AGRICULTURAL ECONOMICS Training in agricultural economics prepares students wholly or in part for appraising land; marketing activities; supervising agricultural loan departments in private banks; directing farmer cooperatives such as the production and farm loan association affiliated with the Farm Credit Administration; public relations research and sales work for the manufacturers of agricultural tools or products; organizational and publicity work for farm organizations and cooperative associations; positions in state, county, and local government service; research work in farm management, farm credit, taxation, marketing, farm population and rural life trends; for operating numerous enterprises where a knowledge of economic principles is an essential supplement to knowledge of the technical requirements of the business. This course of study satisfies the entrance requirements for graduate schools, for applicants for research or teaching fellowships in agricultural economics.

Required courses:

Agricultural Economics	2	World Agriculture
Agricultural Economics	21	Agriculture Cooperation
Agricultural Economics	22	Agricultural Business
Agricultural Economics	107	Farm Credit
Agricultural Economics	201-202	Farm Management
Agricultural Economics	204	Marketing Farm Products
Agricultural Economics	206	Public Problems of Agriculture
Agricultural Economics	281, 282	Seminar
Agricultural Education	102	Extension Methods
Economics	11-12	Principles of Economics

The electives will include a minimum of nine additional credit hours in Agricultural Economics or in Commerce and Economics.

AGRICULTURAL EDUCATION This option prepares students to teach vocational agriculture at the high school level and to teach young farmer classes and adult farmer classes. Preparation for advising local chapters of the Future Farmers of America is also given. The students are prepared for advanced study in the field of agricultural education. Many of the agencies and commercial concerns which

employ farm service personnel consider experience in teaching vocational agriculture as excellent preparation for work in their fields.

Required courses:

Agricultural Education	104	Leadership Training and Organization Methods
Agricultural Education	150	Methods of Teaching Vo-Ag I
Agricultural Education	155	Directed Practice Teaching in Vo-Ag
Agricultural Education	251	Methods of Teaching Vo-Ag II
Agricultural Education	253	Methods of Teaching Young and Adult Farmer Classes in Vo-Ag
Agricultural Education	282	Seminar
Agricultural Economics	2	World Agriculture
Agricultural Economics	201-202	Farm Management
Agricultural Economics	204	Marketing Farm Products
Animal and Dairy Science	1	Introductory Dairy Science
Animal and Dairy Science	105	Feeds and Feeding
Animal and Dairy Science	251	Dairy Cattle and Milk Production
Economics	11-12	Principles of Economics
Forestry	103-104	Woodland Management
Poultry Science	1	General Poultry Science
Psychology	1	General Psychology

Suggested courses to satisfy the D (p. 56) requirement: Agron. 1, 52; Agr. Eng. 1, 2, 101.

AGRONOMY This option is designed to give students a fundamental background in the theory and practice of crop and soil science and to prepare them for graduate study in these fields. By proper selection of electives, students may specialize in either crops or soils. Upon completion of four years' study, agronomy majors may enter federal, state or commercial employment in such areas as soil conservation, soil survey, soil analysis, fertilizers, field or forage crop production and management, seed production, weed control, and crop breeding, or engage in practical farming. Graduates are qualified to do research, teaching or extension work in the above or related fields.

Required courses:

Agronomy	21	Field Crops
Agronomy	22	Forage and Pasture Crops
Agronomy	52	General Soils
Agronomy	103	Soil Chemistry and Fertility
Agronomy	105	Soil Physics
Agronomy	281, 282	Seminar
Botany	1	Introductory Botany
Botany	103	Plant Physiology
Botany	116	Introductory Microbiology
Chemistry	21	Elem. Quantitative Analysis
Chemistry	35	Outline of Organic Chemistry
Geology	1	Introductory Geology
Physics	5-6	General Physics
Zoology	1	Introduction to Zoology

ANIMAL AND DAIRY PRODUCTION This option provides technical and practical instruction in the field of animal husbandry with emphasis on the selection, breeding and management of dairy cattle. It prepares students for the operation of dairy farms and livestock enterprises; for field work in federal and state extension services, breed associations, farm organizations and commercial concerns;

for positions in industries related to the processing and sale of dairy products and meats or with feed companies, dairy equipment and supply agencies; for graduate study leading to college teaching and research.

Required courses:

Animal and Dairy Science	1	Introductory Dairy Science
Animal and Dairy Science	2	Milk and Milk Products
Animal and Dairy Science	4	Introductory Animal Science
Animal and Dairy Science	44	Dairy Cattle Judging
Animal and Dairy Science	105	Feeds and Feeding
Animal and Dairy Science	109	Dairy Bacteriology
Animal and Dairy Science	206	Animal Nutrition
Animal and Dairy Science	251	Dairy Cattle and Milk Production
Animal and Dairy Science	260	Dairy Cattle Breeding
Animal and Dairy Science	282	Seminar
Agricultural Biochemistry	172	Elementary Biochemistry
Animal Pathology	105	Anatomy and Physiology
Animal Pathology	106	Animal Diseases
Botany	1	Introductory Botany
Chemistry	35	Outline of Organic Chemistry
Zoology	1	Introduction to Zoology
Zoology	115	Heredity

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 College of Agriculture and Arts and Sciences may select the botany option. The student receives general instruction in the physical and biological sciences while obtaining a liberal education. Such an undergraduate experience can be applied to many fields of future endeavor. A student takes beginning and general botany and physiology as prerequisite to four advanced courses. These courses are selected depending on the student's own interest in any one of the fields which constitute botany. In these courses he is introduced to the ideas, the 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, industry, government services, applied research, or biology teaching in the secondary schools. Others enter professional schools. Still others go on to graduate school to prepare themselves for more advanced positions.

Required courses:

Botany	1	Introductory Botany
Botany	103	Plant Physiology
Chemistry	131-132	Organic Chemistry
Physics	5-6	General Physics
Zoology	1	Introduction to Zoology

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

DAIRY INDUSTRY Technical and practical instruction in management of milk plants and the processing of milk and milk products prepares students for supervisory or management positions in the various fields of operation in the dairy industry, and also for advanced study and research in these fields. Choice of electives with assistance of an adviser enables students to choose one of the following major fields:

Required courses:

Animal and Dairy Science	1	Introductory Dairy Science
Animal and Dairy Science	2	Milk and Milk Products
Animal and Dairy Science	104	Dairy Testing and Quality Control
Animal and Dairy Science	109	Dairy Bacteriology
Animal and Dairy Science	114	Manufactured Dairy Products
Animal and Dairy Science	116	Dairy Plant Engineering
Animal and Dairy Science	153	Milk Processing
Animal and Dairy Science	211	Ice Cream and Frozen Dairy Products
Animal and Dairy Science	256	Dairy Plant Management
Animal and Dairy Science	282	Seminar

Major 1. Dairy Plant Management
Preparation for supervisory or management positions in the dairy industry. A minimum of six additional semester courses must be selected in the departments of Commerce and Economics, and Agricultural Economics, with the assistance of an adviser.

Major 2. Dairy Technology
Preparation for technical positions or advanced study and research in the dairy and related food industry. A minimum of five additional semester courses, to include Physics and Organic Chemistry, must be selected in the physical and biological sciences with the assistance of an adviser.

FOREIGN AGRICULTURAL SERVICE This option is designed to prepare students for opportunities in the vast field of foreign service with particular emphasis on agriculture. Positions available to graduates include those with commercial concerns engaged in foreign trade in agricultural products, with the agencies of the federal government engaged in world-wide activities, and with the international organizations contributing to the solution of world agricultural problems. Graduates are well qualified to enter graduate school.

Required courses:

Agricultural Economics	2	World Agriculture
Agricultural Economics	21	Agriculture Cooperation
Agricultural Economics	201-202	Farm Management
Agricultural Economics	204	Marketing Farm Products
Agricultural Economics	206	Public Problems in Agriculture
Agricultural Economics	281, 282	Seminar
Agricultural Education	102	Extension Methods
Economics	11-12	Principles of Economics
Economics	187, 188	Elementary Statistics
Economics	205	International Trade and Finance
Political Science	11, 12	Introduction to Political Science
Political Science	51, 52	International Relations

Twelve credit hours in Sociology, Anthropology or Psychology. Six credit hours foreign language above the elementary level.

HORTICULTURE Horticulture is one of the major divisions of Agriculture. It deals with plant resources of the earth. It is often defined by the plant subjects with which it is primarily concerned, such as pomology, or the study of fruits; floriculture, the study of flowers; olericulture, the study of vegetables; and landscape architecture. Food technology and processing are also the concern of the horticulturist. The curriculum is designed to prepare students for advanced

study. Although opportunities are available to holders of the B.S. degree it is becoming increasingly essential to present advanced degrees for positions in research, teaching, and industry.

Required courses:

Horticulture	51, 52	General Horticulture
Horticulture	56	Plant Propagation
Horticulture	281, 282	Seminar
Botany	1	Introductory Botany
Botany	103	Plant Physiology
Chemistry	35 or 131-132	Organic Chemistry
Physics	5-6	General Physics
Zoology	1	Introduction to Zoology

Two additional semester courses in Horticulture.
Six credit hours foreign language above the elementary level.
Other courses from supporting disciplines to be selected in consultation with the student's adviser.

POULTRY SCIENCE This option provides formal training in the theory and practice of poultry science. The phases emphasized are nutrition, genetics, production, marketing, products technology, incubation and hatchery management. This prepares students for graduate work, positions in resident teaching, extension, research, and industry.

Required courses:

Poultry Science	1	General Poultry Science
Poultry Science	56	Poultry Judging and Selection
Poultry Science	102	Incubation and Brooding
Poultry Science	103	Processing and Packaging Poultry Products
Poultry Science	201	Poultry Nutrition
Poultry Science	281, 282	Seminar
Agricultural Economics	201-202	Farm Management
Animal Pathology	105	Anatomy and Physiology
Animal Pathology	116	Poultry Diseases
Botany	116	Introductory Microbiology
Chemistry	35	Outline of Organic Chemistry
Economics	11-12	Principles of Economics
Zoology	1	Introduction to Zoology

GENERAL AGRICULTURE This option is designed for students wishing to return to farming, to become farm managers, to enter work allied to farming; for those seeking a general rather than a specialized knowledge in the field of agriculture; for those desiring to prepare for county extension work; and for those preparing to work in the general field of agriculture with commercial concerns such as feed, fertilizer or seed companies, meat packers, agricultural implement and equipment concerns, dairy products and supplies companies, and for organizational and publicity work for farm organizations. 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.

Students taking a major part of their work in forestry under this option may prepare for entrance to professional forestry schools granting the Master of Forestry degree. Students contemplating preparation for county extension work

should, not later than their sophomore year, seek the advice of the state extension leaders.

Required courses:

Agricultural Economics	201-202	Farm Management
Agricultural Education	102	Extension Methods
Agricultural Engineering	1 or 2	Farm Power, Machinery and Electricity; or Farm Structures and Utilities, and soil and Water Engineering

At least four semester courses from the following group:

Agricultural Engineering	1 or 2	Farm Power, Machinery and Electricity; or Farm Structures and Utilities, and Soil and Water Engineering
Agronomy	1	Introductory Crop Science
Agronomy	52	General Soils
Animal and Dairy Science	1	Introductory Dairy Science
Animal and Dairy Science	2	Milk and Milk Products
Forestry	103-104	Woodland Management
Horticulture	51, 52	General Horticulture
Poultry	1	Introductory Poultry Science

A minimum of twenty-one additional credit hours of agricultural courses, of which at least nine credit hours must be in courses numbered 100 and above.

The Agricultural Engineering Curriculum

The curriculum in Agricultural Engineering leads to the degree of Bachelor of Science in Agricultural Engineering. It provides fundamental training in engineering similar to that provided by the engineering curricula in the College of Technology. In addition, it provides specialized training in the several subdivisions of Agricultural Engineering. The curriculum, the teaching staff, and the course content are approved jointly by the College of Technology and the College of Agriculture and Home Economics.

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 program prepares the student for advanced study in agricultural engineering.

Employment opportunities exist in government agencies and schools; in manufacturing plants, utility companies, insurance companies and processing plants; in contracting, selling, farming, consulting, and many other types of work which demand college training in engineering or agriculture.

The specific courses required for graduation are given below. These courses, exclusive of electives, provide 119 semester hours of credit and student must select additional courses to meet the full requirement of 137 semester hours. The elective courses must be chosen so as to fulfill the requirements on page 89, entitled Humanistic-Social Studies for Engineering Students.

Normally, a student who has a good record in high school mathematics, which includes two years of algebra, one year of geometry and a half year of trigonometry, and who qualifies in the placement test in mathematics given at the University during freshman preliminary days, may enroll in Mathematics 5 or 11 during the first semester and Math 12 during the second semester; these

students may graduate in four years with 137 semester hours of credit. Students who do not qualify for Math 5 or 11 will enroll in Math 9 during their first semester and Math 10 in their second semester, but the graduation requirement is then 141 semester hours. Since graduation in four years requires the completion of sophomore mathematics, Math 21-22, by the end of the second year, students taking Math 9, 10 in their freshman year must take Math 12 in summer school between their freshman and sophomore years, or take more than four years to complete the curriculum.

The Freshman Year	1st SEMESTER	2nd SEMESTER
Freshman Math., 11, 12	5	5
Intro. Chemistry, 1-2	4	4
Freshman English, 1-2	3	3
Engin. Problems (M.E. 3)	1	.....
Mechanical Drawing (E.G. 1)	2	.....
Descr. Geometry (E.G. 2)	.....	2
General Physics, 14-	.....	3

The Sophomore Year	1st SEMESTER	2nd SEMESTER
Soph. Math., 21,22	3	3
Gen. Physics, 15, 16	4	5
Farm Shop, 101	3	.....
Statics (C.E. 24)	3	.....
Plane Surveying (C.E. 53)	4	.....
Dynamics (C.E. 130)	.....	3
General Soils (Agron. 52)	.....	3
Public Speaking (Speech 11)	.....	3

The Junior Year	1st SEMESTER	2nd SEMESTER
Junior Seminar, 181, 182	1	1
Diff. Equations (Math. 211)	3	.....
Mech. of Materials (C.E. 131)	3	.....
Thermodynamics (M.E. 113)	3	.....
Elec. Cir. & Mach. (E.E. 101)	4	.....
Soil & Water Engr., 155 or Farm Structures, 151	3	.....
Farm Power Mach., 158 or Farm Utilities, 152	.....	3
Agr. Mach. & Equip., 154 or Elec. in Agr., 156	.....	3
Hydraulics (C.E. 162) or Fluid Mech. (M.E. 142)	.....	3
Literature (Engl. 25, 26, 27, or 28)	.....	3
Electives	.....	6

The Senior Year	1st SEMESTER	2nd SEMESTER
Princ. of Econ. (C. & E. 11-12)	3	3
Farm Management (A. Econ. 201-202)	3	3
Senior Seminar, 183, 184	1	1
Farm Structures, 151 or Soil & Water Engr., 155	3	.....
Farm Utilities, 152 or Farm Power Mach., 158	.....	3
Electricity in Agr., 156 or Agr. Mach. & Equip., 154	.....	3
Electives	6	6

The Forestry Program

This program provides the first two years of study in a four-year forestry curriculum. The last two years of scientific, cultural, and professional education must be taken at an institution that confers the degree of Bachelor of Science in Forestry or Wildlife Management. Special arrangement with the University of Maine permits Vermont resident students in good standing to continue their forestry 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 forest school of their choice.

Beginning with the junior year the curriculum at the University of Maine provides for concentrations in General Forestry, Forest Management, Forest Utilization, Forest Science (Tree Growing or Wood Technology), Wildlife

Land Management, and Wildlife Science. Immediately following the junior year Forestry students take a one-week field trip to experimental forests in New England before the eight weeks instruction at the summer camp. Wildlife students study Ecology at the summer camp for one week before the eight weeks of instruction at the summer camp.

Professional forestry prepares men to manage large and small public woodlands for timber production and use; to manage wildlife areas; for technical and managerial work in the wood-using industries; for positions in the United States Forest Service, Wildlife Service, National Park Service, Soil Conservation Service, and other federal and state agencies; for research and teaching; and to function as private forestry consultants.

Forest Management and Wildlife Science

The Freshman Year	1st SEMESTER	2nd SEMESTER	The Sophomore Year	1st SEMESTER	2nd SEMESTER
Introductory Botany	.....	4	Introductory Chemistry	4	4
Freshman English	3	3	Forest Fire Control	2	.....
Dendrology	.....	4	Forest Mensuration	3	2
Introduction to Forestry	2	2	Forest Products	.....	3
Mechanical Drawing	2	.....	Introductory Physics	3	3
Mathematics 9, 2	3	3	Plane Surveying	4	.....
Political Science	3	.....	Introduction to Zoology	.....	4
Public Speaking	3	.....			

The Preveterinary Program

This program offers preparation for entrance to colleges of veterinary medicine. Adjustments of individual programs may be made to meet the requirements of different colleges. Students completing the prescribed courses with good grades and suitable qualifications may expect consideration for admission to veterinary colleges. Six months of experience after the age of 14 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 credit hours, plus training in military science (men only) and physical education, are required.

The Freshman Year	1st SEMESTER	2nd SEMESTER	The Sophomore Year	1st SEMESTER	2nd SEMESTER
Freshman English	3	3	Vertebrate Zoology	4	.....
Introductory Chemistry	4	4	Introductory Physics, 1-2	3	3
Introduction to Zoology, 1	4	.....	Organic Chemistry, 131-132	4	4
Introductory Botany	.....	4	American Govt. or History	3	3
Mathematics	3	3	Public Speaking (Speech 11)	.....	3
Elective	1–4	1–4	Elective	1–4	2–5

The Curriculum in Home Economics

This curriculum has two purposes: first, to provide a liberal education including the areas of learning which are related to home and family; second, to provide several options which are organized to give a more specialized training

and background for the interesting professions that are a part of home economics.

Every candidate for the degree of Bachelor of Science in Home Economics must present a total of 130 semester hours of credit, plus credit in required courses in physical education. All students are required to take 41 credit hours in non-home economics subjects and 30 credit hours of home economics subjects. The choice of additional credit hours required for graduation is dependent upon which of the following options the student plans to pursue:

Business and Liberal
Education
Family Living and Human (Child) Development
Food and Nutrition
Related Art, Clothing and Textiles

The food and nutrition option allows special adjustments in curriculum requirements for men taking institutional management.

Core Courses Required of all Students

A. Non-Home Economics	Hours	B. Home Economics	Hours
English	12	Orientation, 1	1
Speech	3	Design, 21	3
Political Science or History	6	Clothing Selection and Construction, 22	
Laboratory Science[1]	8	or	3
Psychology, 1	3	Survey of Textiles, 83	
Economics, 11, 12	6	Basic Concepts of Food and Nutrition, 43	4
Sociology, 21	3	Housing, 51	
4 semester courses in Physical Education	—	or	3
		Household Equipment, 54	
		Child Development and Personality, 63	3
		Principles of Home Management, 101	3
		Meal Management, 137	3
		Senior Seminar, 151	1
		Home Management Residence, 152	3
		Dynamics of Family Development, 163	3

BUSINESS AND LIBERAL OPTION This option provides a general education in home economics and liberal arts. The business major provides more concentration in commerce and economics courses and is planned to prepare a student for business positions in home economics. The liberal major allows for more concentration in liberal arts and science courses as well as general background in home economics.

Business Major

Required courses:

Clothing and Textiles	22	Clothing Selection and Construction
Clothing and Textiles	83	Survey of Textiles
Home Economics Education	169	Demonstration Techniques
Home Management	51	Housing
Home Management	54	Household Equipment

[1] Students choosing Food and Nutrition or Education Options must take Chemistry.

Home Management	204	Family Economics
Communications		6 credit hours additional
Commerce and Economics		9 credit hours additional
Home Economics		6 credit hours additional

Liberal Major

Clothing and Textiles	22	Clothing Selection and Construction
Clothing and Textiles	83	Survey of Textiles
Home Management	51	Housing
Home Management	54	Household Equipment
Home Management	204	Family Economics
Institutional Management	139	Food Service Management
Nursing	7	Nursing
Related Art	130	Home Furnishing I
Arts and Science		21 credit hours additional

EDUCATION OPTION This option provides a background which prepares students to teach Home Economics at elementary, junior high, secondary and adult levels, or to become home demonstration or 4-H club agents. Students must have a 75 average in their home economics subjects to be eligible for student teaching during their senior year. Preparation for Extension or 4-H club work may be fulfilled by appropriate selection and substitution of recommended courses: Extension Participation, Extension Methods, American History since 1900, Local Government, and Elements of Radio and Television Broadcasting.

Required courses:

Chemistry	1-2	*Introductory*
Clothing and Textiles	22	Clothing Selection and Construction
Clothing and Textiles	73	Pattern Design and Advanced Construction
Clothing and Textiles	83	Survey of Textiles
Food and Nutrition	135	Advanced Food Preparation
Food and Nutrition	144	Applied Normal Nutrition
Home Economics Education	115	Introduction to Home Economics Education
Home Economics Education	165	Methods of Teaching
Home Economics Education	167	Student Teaching
Home Economics Education	169	Demonstration Techniques
Home Economics Education	216	Teaching Adults
Home Management	51	Housing
Home Management	54	Household Equipment
Home Management	204	Family Economics
Institutional Management	139	General Institutional Management
Nursing	7	Home Nursing
Related Art	130	Home Furnishing I
Education		3 credit hours additional

FAMILY LIVING AND HUMAN (CHILD) DEVELOPMENT OPTION This option provides the knowledge which prepares a student to become a preschool teacher-family consultant, or to work in allied areas such as social work and/or family life education. This option through its Preschool Program provides opportunities for both study and experiences in the area of human development and family relationships. In the Preschool Laboratory the student has an opportunity to work with the preschool children and their parents. College students visit the homes of preschool children to observe dynamics of family living.

The Department of Home Economics is affiliated with the Merrill-Palmer Institute, Detroit, Mich. A student concentrating in Family Living and

Human Development may spend the second semester of the junior year at Merrill-Palmer. The cost of this semester, including transportation, is comparable to the cost of one semester at the University of Vermont.

Required courses:

Clothing and Textiles	22	Clothing Selection and Construction
Family Living	65	Experience with Preschool Children
Family Living	67	Creative Activities
Family Living	164	Introduction to Parent Education and Family Consulting
Family Living	172	Preschool Planning and Practicum
Family Living	263	Seminar in Family Relations and Human Development
Family Living	264	The American Woman
Food and Nutrition	144	Applied Normal Nutrition
Home Management	51	Housing
Psychology	201	Personality
Sociology	31	Sociological Analysis
Sociology	51	The Family

Work taken at Merrill-Palmer Institute may be substituted for the second semester requirements.

FOOD AND NUTRITION OPTION This option provides a background which prepares students for specialization in foods, nutrition or institutional administration. Academic requirements for the dietetic internship and membership in the American Dietetic Association may be met through selection of designated courses.

Required courses:

Agricultural Biochemistry	172	Elementary Biochemistry
Botany	116	Introductory Microbiology
Chemistry	1-2	Introductory Chemistry
Chemistry	35	Outline of Organic Chemistry
Clothing and Textiles	83	Survey of Textiles
Food and Nutrition	135	Advanced Food Preparation
Food and Nutrition	243	Nutrition and Diet
Home Management	54	Household Equipment
Home Management	204	Family Economics
Institutional Management	186	Quantity Food Production
Institutional Management	187	Institutional Administration
Zoology	1	Introduction to Zoology
Zoology	52	Physiology

Additional courses, taken as elective credit, for meeting academic requirements of the American Dietetic Association.

Therapeutic and Administrative Dietetics
(Hospital Internship Program)
Personnel Administration, 251
Education
Diet Therapy, 244
Institutional Marketing and Accounting, 288
or
Food Service Administration
Principles of Accounting, 13-14
Labor Economics, 141

Personnel Administration, 251
Institutional Marketing and Accounting, 288
or
Science—Foods and Nutrition
Education
Experimental Foods, 236
Diet Therapy, 244
Readings in Foods, 246
Readings in Nutrition, 248

For men interested in training in this increasingly important field the Department makes the following adjustments. Requirements in the following courses are waived: Home Management Theory and Residence, Family Economics, Child Development and Personality.

RELATED ART, CLOTHING AND TEXTILES OPTION This option provides the opportunity for concentrated study in fields of costume and textile designing, fashion illustration, merchandising, interior design, and textile testing.

Required courses:

Clothing and Textiles	22	Clothing Selection and Construction
Clothing and Textiles	73	Pattern Design and Advanced Construction
Clothing and Textiles	83	Survey of Textiles
Clothing and Textiles	123	Tailoring
Clothing and Textiles	182	Advanced Textiles
Clothing and Textiles	221	Costume Design and Draping
Home Management	51	Housing
Home Management	54	Household Equipment
	or 106	House Planning
Related Art	71	Costume Design
Related Art	120	History of Costume
Related Art	130	Home Furnishing I
Related Art	230	Home Furnishing II
Laboratory Science		3 credit hours additional

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, emotionally, and spiritually to play a responsible part in the world of thought and action.

It devotes itself to the inculcation of ideals and the cultivation of ideas. 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.

Its fundamental purpose is to instill the courage and conviction to exemplify the enduring values of American democracy.

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, as the mother tongue and the chief tool of thought and expression, 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 below, and present a total of 120 semester hours of credit, plus credit in required courses in military science and physical education.

Required of All Students

1. English. Freshman English the first year, and the second year either English-American Literature or World Literature.
2. 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.
3. Science. One laboratory course, normally the first year, to be chosen from botany, chemistry, geology, physics and zoology. A semester of botany may be combined with a semester of zoology to meet this requirement.
4. Physical Education and Military Science. Two years of physical education for men and women and two years of military science for men.
5. 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. There are certain restrictions to be met. (A) The field must be a well integrated whole, adapted to the student's special interests. (B) It must include a

minimum of twelve semester courses totalling not less than thirty-six semester hours, at least eighteen in one subject and at least twelve in a related subject. (C) 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. (D) 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.

Additional Distribution Requirements for Students Concentrating in Fields in the Following Divisions

1. Language[1] and Literature, or Music; History (American, Ancient, Medieval, or European Civilization) normally the first year; a second foreign language reaching the intermediate level[2]; a second year course in the social science division.

2. Social Science: History (American, Ancient, Medieval, or European Civilization) normally the first year; during the first two years a total of two year courses in different subjects, chosen from the following: economics, philosophy, political science, psychology, religion and sociology.

3. Science and Mathematics: Introductory Chemistry (except for students concentrating in mathematics), mathematics and physics as indicated below under requirements for special departments, and a total of at least four semester courses (12 semester hours) in departments other than the sciences and mathematics.

Additional Specific Requirements for Concentration in Special Departments

BOTANY Mathematics 9, 2 or 7, 8 or 11, 12; Physics 5-6; Chemistry 131-132; Zoology 1; Botany 1, 2, 103, and four additional semester courses. The advanced related course (six semester hours or more) is normally in one of the other sciences.

CHEMISTRY Mathematics 21; Physics 21-22; Chemistry 11-12, 21-22, 131-132, 141-142, 181-182, and 183-184. No advanced related course is required. Those who wish to qualify for accreditation by the American Chemical Society must also complete 237, six additional hours in advanced courses, and also German 11-12. Physics 171, 172 is recommended. Only those who so qualify will be recommended by the department as chemists.

ECONOMICS Courses in economics totalling at least twenty-four semester hours, including twelve or more of advanced grade. The related courses are chosen in consultation with the departmental adviser on the basis of the student's individual needs and plans. See page 72 for economics courses for which credit is granted in the Liberal Arts Curriculum.

ENGLISH Satisfactory completion of English-American Literature and six semester courses of advanced grade. The advanced related courses may be in

[1] It is strongly recommended by the respective 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.

[2] Students concentrating in English substitute an advanced literature course in foreign language for the second foreign language.

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.

GEOLOGY Mathematics 11, 12; Physics 5-6; Introductory Chemistry; eight semester courses in geology, of which four are of advanced grade; one advanced related course, six semester hours or more, in one of the other sciences or mathematics. A course in some other subject may be approved to meet particular needs.

GERMAN Satisfactory completion of eight semester courses in German, including at least four of advanced grade, and at least one advanced related year course, normally in a language.

GREEK Satisfactory completion of twenty-four semester hours, twelve of which must be of advanced grade, and one advanced related course of at least six semester hours.

HISTORY Satisfactory completion of twenty-four hours in history and twelve semester hours in a related subject in another department. At least twelve of the hours in history and six in a related subject must be in courses numbered above 100. The history courses must include: History 11, 12; at least six hours in American history; at least six hours in courses numbered above 250.

LATIN Satisfactory completion of eighteen hours in courses numbered above 100, and one advanced related course of at least six semester hours. Courses in Greek are strongly recommended, particularly to those who contemplate graduate work in classics.

MATHEMATICS Physics 5-6 or 21-22; Mathematics 21, 22 and six semester courses numbered above 100. The advanced related course, six semester hours or more, is normally in one of the sciences and is chosen in consultation with the department.

MUSIC 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 Satisfactory completion of Philosophy 1, 2, 4, 107, 108, 214, and either 201 or 206, and an advanced related course or courses, chosen in consultation with the departmental adviser to fit the needs of the individual students.

PHYSICS Mathematics 211, 212; six semesters of physics courses numbered above 100, including Physics 115, 116, and 271. A student who plans a heavy concentration should take Physics 5 with Mathematics 11, or Physics 1 with Mathematics 9, in the freshman year, postponing his language. Russian or German is recommended.

POLITICAL SCIENCE Satisfactory completion of four semesters of advanced courses in political science and an advanced course of six or more semester hours ordinarily in one of the other social sciences.

PSYCHOLOGY Satisfactory completion of at least twelve semester courses, eight in psychology, totalling at least twenty-four semester hours and including 1, 109-110, 223, and 281-282; the other four to be chosen in consultation with the department from mathematics, philosophy, physics, sociology, or zoology.

ROMANCE LANGUAGE Satisfactory completion of six semester courses of advanced grade, of which at least four must be in literature, and at least one advanced course, six semester hours or more, ordinarily in another foreign language or English.

SOCIOLOGY Satisfactory completion of 21, 31 and 251, and at least five additional semester courses in sociology, including three numbered above 100. A minimum of four semester courses in a related field must include two numbered above 100.

SPEECH Students concentrating in speech meet the "additional distribution requirements" as follows: Those whose advanced related course is in the Social Sciences meet the distribution requirements of that area; those whose advanced related course is in Language, Literature or Music meet the requirements of that area, but may, in place of a second foreign language, substitute (a) an advanced literature course in foreign language or (b) 12 hours of course work in Fine Arts (art, music, dance). They must complete satisfactorily nine semester courses in speech, as indicated below, and an advanced related course or courses (six semester hours or more) chosen in consultation with the departmental adviser. The courses in speech must include 1, 22, a one-semester course in three of the following five areas: public speaking (other than 11), oral interpretation, drama, radio and speech correction, and four semesters of advanced courses in no more than three areas.

ZOOLOGY Mathematics: One year of courses other than Mathematics 1, 2 (Mathematics 7, 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; Botany 1; Zoology 1, 41, 150, 281, 282, and five additional semester courses of which at least four are numbered above 100. The advanced related courses (six semester hours or more) may be in one of the other sciences or psychology. A student concentrating in zoology must attain an over-all average of 72 or above in the courses in mathematics and science required for concentration in the department.

Courses Offered in Other Colleges Acceptable for Credit Toward the B.A. Degree

Agr. Biochem. 172: Elementary Biochemistry
Agr. Biochem. 252: Plant Biochemistry
Agr. Biochem. 253: Microbial Biochemistry
Botany: all courses
Chem.: all courses except Outline of Organic Chemistry
Econ. 1-2: World Economic Geography
Econ. 11-12: Principles of Economics
Econ. 15-16: Economic History of the United States.
Econ. 141: Labor Economics
Econ. 181: Transportation
Econ. 183: Economic Life and Government Control
Econ. 187, 188: Economic Statistics
Econ. 201-202: Money and Banking
Econ. 203: Economics of Taxation
Econ. 204: State and Local Finance
Econ. 205: International Trade and Finance
Econ. 242: Collective Bargaining
Econ. 286: Economic Analysis
Econ. 292: International Economic Problems and Policies
Econ. 293-294: Money, Income and Prices
Econ. 295: History of Economic Thought
Econ. 296: Modern Economic Thought
Econ. 297, 298: Seminar
Educ. 202: Philosophy of Education
Family Living 161: Family Relationships
Forestry 208: Biological Statistics
Mathematics: all courses
Music Education 151-152: Secondary School Methods
Phys. Ed. 50: Dance Technique and Analysis
Sec. Educ. 102: Principles of Education
Sec. Educ. 252: Teaching Latin

THE RESTRICTED LIST A given student may elect from this list courses totalling not more than 12 semester hours, provided he has completed his basic distribution requirements, and provided that these courses are not to be counted as part of the minimum requirement for concentration:

Agr. Econ. 103: Rural Sociology
Chem. 35: Outline of Organic Chemistry
C. & T. 22: Clothing Selection
Civ. Engrg. 24: Statistics
Civ. Engrg. 130: Dynamics
Civ. Engrg. 131: Mechanics of Materials
Econ. 13-14: Principles of Accounting
Econ. 109-110: Business Law
Econ. 206: Securities Markets
Econ. 208: Investments
Educ. 145-146: Learning and Human Development
Family Living 111: Child Development
Food and Nutrition 43: Basic Concepts
Graphics 1, 2: Engineering Drawing
Home Mangement 102: Home Management
Related Art 21: Design
Sec. Educ. 180: Secondary Methods and Procedures
Sec. Educ. 181: Student Teaching in Secondary Schools
Sec. Educ. S225: Teaching Social Studies in Secondary Schools
Sec. Educ. S227: Teaching Science in Secondary Schools
Sec. Educ. S232: School Administration
Sec. Educ. S250: Guidance
Sec. Educ. S257: Teaching Mathematics

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 85 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 85 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.

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 course as to provide, in addition to a sound general education, appropriate preprofessional training for later work in the medical sciences, law, or theology.

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 and colleges 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 26-27) 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 taken in the sophomore year.

PREMEDICAL AND PREDENTAL The prevailing requirements for admission to an accredited medical college usually include not less than three years of undergraduate work, during which courses in biology, chemistry, English and physics must be completed. Any student who wishes to enter medical college should by the beginning of his sophomore year consult the catalogue of the college of his choice and arrange to include in his program courses required by that particular school.

Each student, in consultation with his advisor, plans a four-year program of courses which will fulfill the requirements for a Bachelor's degree. At the end of the sophomore year the student may enroll in the College of Arts and Sciences if a program of work leading to the Bachelor of Arts degree is desired. Those who wish to meet the minimum requirements for admission to medical college may follow the first three years of the program below. By successfully completing these three years and one year in an accredited medical college, they will qualify, on application, as candidates for a Bachelor of Science degree.

In the following outline, courses listed are normally taken in the year indicated. The program may be modified both for the needs of the individual student and to allow for concentration in a particular field. A student must have completed a total of 90 semester hours by the end of the third year to be considered for admission to a medical college.

The First Year	1st SEMESTER	2nd SEMESTER
Freshman English	3	3
Introductory Chemistry, 1-2 or 11-12	5–4	5–4
Mathematics, 7, 8 or 11, 12	3–5	3–5
Zoology	4 or 4	
Foreign Language (Elementary or Intermediate)	3–4	3–4

The Second Year	1st SEMESTER	2nd SEMESTER
English-Amer., 27, 28 or World Lit., 25, 26	3	3
Intermediate For. Lang.[1]	3	3
Quantitative Chemistry, 21-22	3	3
Physics, 5-6 or 21-22	4–5	4–5
Electives	3–6	3–6

The Third Year	1st SEMESTER	2nd SEMESTER
Organic Chemistry, 131-132	4	4
Zoology, 41[1]	4	.....
Social Science Electives	6	6
Courses in field of concentration and electives		

The Fourth Year

Courses in field of concentration and electives

The requirements for admission to colleges of dentistry vary but in all cases include at least two years of college work with at least one course each in biology, inorganic chemistry, physics, and English. Hence, the course of study advised as preparation for medicine may be used as a basis for selection by those interested in dentistry.

[1] Unless already completed.

The School of Dental Hygiene

The School of Dental Hygiene, established in the fall of 1949 on authorization and a grant of money by the State Legislature and accredited by the Council on Dental Education of the American Dental Association, offers a two-year curriculum leading to a Certificate in Dental Hygiene. The purpose is to meet the ever-increasing need for dental health service.

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 school 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 School of Dental Hygiene operates a ten-chair clinic and offers its service for examination and charting of the teeth, prophylaxis 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. All candidates who plan to practice dental hygiene in Massachusetts or Vermont must be seventeen years of age by the first of June preceding their entrance into the School. 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 by May 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 17, N. Y.

The Freshman Year	1st SEMESTER	2nd SEMESTER
Freshman English	3	3
Dental Anatomy	4	.....
Dental Histology and Embryology	2	.....
Chemistry	4	4
Dental Hygiene Orientation	1	.....
Instrumentation	.....	3
First Aid	.....	1
Microbiology	.....	4
Anatomy and Physiology	3	3

The Sophomore Year	1st SEMESTER	2nd SEMESTER
Psychology	.....	3
Introductory Sociology	3	.....
Oral Pathology	2	1
Radiology	1	1
Public Health	.....	2
Clinical Practice	5	5
Dental Health Education	.....	2
Pharmacology and Anesthesia	.....	2
Ethics and Office Management, Dental Assisting	1	1
Public Speaking	3	.....
Nutrition	3	.....

The College of Education and Nursing

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

This College also offers a curriculum of two calendar and two academic years leading to the degree of Bachelor of Science in Nursing.

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 professions of teaching and nursing. 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 and Nursing. Professional laboratory experiences are provided in the College of Education and Nursing and in schools and hospitals under the supervision of the College of Education and Nursing.

Education curricula in the College of Education and Nursing 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 advisors or with the dean of the college.

Fifth-Year Certificate in Education

A special fifth-year program culminating in a certificate of advanced study is offered for students who wish to work beyond the bachelor's degree but who need or desire more flexibility than is possible in any of the standard programs for master's degrees.

The certificate program is especially designed to meet the needs of teachers who are developing new teaching fields, for advanced students who are meeting requirements for state certification, and for experienced teachers who desire flexibility in choice of courses at both graduate and undergraduate levels.

Each certificate program is individualized to fit the qualifications and the professional objectives of the candidate. Undergraduate courses may be approved for the program when such courses appropriately support the candidate's professional objectives.

The program for the *Fifth-Year Certificate* is governed by the following regulations:

(1) Candidates must hold a bachelor's degree.

(2) Candidates must make written application on forms obtained from the Office of the Dean of the College of Education and Nursing.

(3) Candidates are admitted to the program by action of a faculty committee.

(4) A maximum of 12 credits may be applied to the program at the time of admission.

(5) A maximum of nine credits may be transferred from other institutions.

(6) Credits for the program may be earned in the regular academic year, the Summer Session, and the Evening Division.

(7) The program for each candidate must include a minimum of 30 credits approved by a faculty adviser.

(8) A minimum mark of 72 (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 and Nursing.

Elementary Education

The elementary education program is intended to prepare teachers for any of the elementary grades in schools of Vermont and other states. The degree 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.

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 an orientation to education in the freshman year. The purpose of this orientation is to give the student an oppor-

tunity to learn about the professional courses and experiences in the several education curricula and to consider the desirability of a career in education. Educational films, contacts with teachers and administrators from the field, presentations by upperclassmen, and opportunities for small group discussion are included in the orientation experiences.

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 50 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
Orientation to Education	1	2
Speech	3	3
Science	4	4
Freshman English	3	3
Approved Electives[1]	3–6	3–6

The Sophomore Year	1st SEMESTER	2nd SEMESTER
Child and Community	1 or	1
Psychology	3 or	3
World Geography	3 or	3
Literature	3	3
American History	3	3
Approved Electives[1]	6–9	6–9

The Junior Year	1st SEMESTER	2nd SEMESTER
Art for Elementary Schools	3	.....
Learning and Human Development	3	3
Children's Literature	3	.....
Methods and Materials	.....	3
Music	3	3
Teaching Reading	.....	3
Mathematics	3	3
Approved Electives[1]	3	3

The Senior Year	1st SEMESTER	2nd SEMESTER
Methods and Materials	3	.....
Music Methods	3	.....
Physical Education for Elementary Schools	2	.....
Student Teaching	7	.....
Philosophy of Education	.....	3
Health Education	.....	2
Approved Electives[1]	.....	12

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

Secondary Education

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

[1] A political science course in local and state government must be included during the four-year curriculum. Some of the electives must be concentrated in an academic major.

During the first two years the curriculum consists generally of basic courses in English, fine arts, foreign languages, mathematics, science, and social science. Orientation to education as a career is provided during the freshman year. 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 two teaching majors or one major and two minors in fields which are commonly taught in secondary schools, or candidates may elect to concentrate in one of two broad fields, such as general science or social science. A teaching major includes at least twenty-four semester hours in a given subject; a teaching minor, sixteen to eighteen semester hours. A single major in a broad field includes approximately fifty semester hours in related courses. The major-minor program must include advanced course work.

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, history, mathematics, political science, speech, and the sciences. Advisors can assist students in making choices which are in accord with student aptitudes and interests and which are likely teaching combinations. Outlines of suggested course sequences for majors and minors may be obtained from advisors 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 72 may not be credited toward a major or minor unless other grades in the field are sufficiently high to justify an exception.

EXPERIENCES IN PUBLIC SCHOOLS Students in secondary education have direct experiences in public schools at three points in the four-year curriculum. During the sophomore year students observe and participate as teacher assistants in local junior and senior high schools. Before returning to the University campus at the beginning of the junior year, students are encouraged to spend one or two weeks in schools of their home communities assisting teachers during the opening days of the new school year. 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 dean's office.

The Freshman Year	1st SEMESTER	2nd SEMESTER
Orientation to Education	1	2
Laboratory Science	4	4
English Composition	3	3
Foreign Language	3–4	3–4
History or Political Science[1]	3	3
Elective[2]	3	3

The Junior Year	1st SEMESTER	2nd SEMESTER
Learning and Human Development	3	3
Approved Electives in Teaching Fields[4]	12–15	12–15

The Sophomore Year	1st SEMESTER	2nd SEMESTER
Literature	3	3
Psychology	3 or	3
Participation	2 or	2
Foreign Language[8]	3	3
Approved Electives	6–9	6–9

The Senior Year	1st SEMESTER	2nd SEMESTER
Secondary Education Methods	3 or	3
Philosophy of Education	3 or	3
Student Teaching	.....	6
Approved Electives	12–15	3–6

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

PHYSICAL EDUCATION MINOR Students in the secondary education and elementary education curricula may qualify as physical education instructors in Vermont and certain other states by combining a minor program in physical education with other teaching majors.

Business Education

The curriculum in Business Education is intended to prepare teachers of business subjects for secondary schools in Vermont and other states. Freshman and sophomore years are concerned primarily with the development of a foundation in general education. Junior and senior years emphasize courses in business and in education. Students do seven weeks of practice teaching in the final semester of the senior year.

Beginning courses in typing and in shorthand make it possible for students to succeed in the program without previously developed skills in these subjects.

The Freshman Year	1st SEMESTER	2nd SEMESTER
Orientation to Education	1	2
English Composition	3	3
Social Science[7]	3	3
Mathematics	3	3
Speech	3	.....
Elective	3	6

The Junior Year	1st SEMESTER	2nd SEMESTER
Learning and Human Development	3	3
Elementary Shorthand[5]	4	.....
Intermediate Shorthand	.....	4
Elementary Typing[5]	3	.....
Intermediate Typing	.....	3
Business Correspondence	3	3
Business Law	3	3
Elective	3	.....
Participation	.....	2
Principles of Business Education	.....	2

The Sophomore Year	1st SEMESTER	2nd SEMESTER
English-American Literature	3	3
General Psychology	3 or	3
Principles of Economics	3	3
Laboratory Science	4	4
Principles of Accounting	4	4
Elective	3 or	3

The Senior Year	1st SEMESTER	2nd SEMESTER
Advanced Shorthand	4	.....
Advanced Typing	3	.....
Office Management	3	.....
Elective	3	.....
Sec. Seminar or Elective	3	.....
Student Teaching	.....	6
Philosophy of Education	.....	3
Teaching Business Subjects	2	.....
Secretarial Practice	.....	2
Transcription	.....	4

[1] If History is chosen, European Civilization is recommended.
[2] If recommended by advisor.
[8] An approved elective if intermediate language has been completed.
[4] All students are to elect a course in speech.
[5] Students may be exempt by demonstrating satisfactory proficiency.

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

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
Theory I	3	3
Survey of Musical Literature	3	3
Freshman English	3	3
Foreign Language (Intermediate)	3	3
Applied Music: Major, Piano[2], and String Class	3	3
Major Ensemble	1	1
Orientation to Education	1	2

The Sophomore Year	1st SEMESTER	2nd SEMESTER
Theory II	3	3
Literature[3]	3	3
Social Science[4]	3	3
Applied Music: Major, Piano[5], Voice[6] and Woodwind Class	4	4
Ensembles: Major, Secondary[7], and Chamber Music	3	3
Participation	2	or 2

The Junior Year	1st SEMESTER	2nd SEMESTER
Counterpoint	3	.....
Form and Analysis	.....	3
Orchestration	3	.....
Conducting	.....	3
History of Music	3	.....
Laboratory Science	.....	4
Learning and Human Development	3	3
Applied Music: Major, Brass Class	2	2
Ensembles: Major, Secondary, and Chamber Music	3	3

The Senior Year	1st SEMESTER	2nd SEMESTER
Practice Teaching in Music	7	.....
Elementary and Secondary Music Methods	5	.....
Philosophy of Education	3	.....
History of Music	.....	3
Applied Music: Major Recital; Percussion and Repair Class	.....	4
Ensembles: Major and Chamber Music	.....	2
Liberal Arts Electives	.....	9

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

The Nursing Curriculum

The faculty of the Department of Nursing believes that nursing is a profession whose members accept an ever broadening responsibility for the health needs of society. To achieve this, it is believed that concurrent learning experiences in general and professional education are essential in the preparation of graduates for the practice of professional nursing in beginning positions in the home, hospital and community, and in the provision of a foundation for the graduates' continued study and interest in nursing.

The objectives of the program are to assist the students to acquire skill in

[2] Keyboard Harmony will be studied in Piano; includes Functional Piano Facility.
[3] English 25, 26 (World Literature) recommended.
[4] History 11, 12 (European Civilization) recommended.
[5] Piano majors will study an applied minor.
[6] Voice majors will study an applied minor.
[7] Choir for instrumentalists; Band or Orchestra for vocalists.

the art of communication; to develop, implement, and evaluate a plan of nursing care which recognizes the physical, emotional, and spiritual needs of the patient and his family; to develop an awareness of the potential contribution of all groups concerned with health promotion and the nurse's role as a team participant; to stimulate an interest in the improvement of nursing care through participation in research and utilization of its findings; to develop an understanding of the responsibilities of a professional nurse and the role of professional nursing in meeting the health needs of the community.

The program is approved by the Vermont Board of Nursing and is fully accredited by the National League for Nursing, Inc., including Public Health Nursing. On completion of the program, the student receives the degree of Bachelor of Science in Nursing. Applicants must satisfy the general admission requirements of the University. High school courses in biology and chemistry are highly desirable. The department reserves the right to request the withdrawal of any student who fails to adjust satisfactorily in the practice of nursing.

The first academic year is spent at the University. Following this, there is a summer session of eight weeks, during which time instruction is correlated with guided clinical practice in the Mary Fletcher Hospital, which adjoins the campus. In the sophomore year and one semester of the junior year the program consists of academic work at the University and guided clinical practice in various units of the Mary Fletcher Hospital and other community agencies. In the junior year clinical experience is obtained at the Mary Fletcher Hospital and the Veterans Administration Hospital in Boston, Massachusetts; the latter in cooperation with Boston University School of Nursing.

In the senior year students continue study at the University in liberal arts and selected professional courses, with clinical experiences provided in the following resources: The Mary Fletcher Hospital, the Burlington Visiting Nurse Association, Inc., and the Family Care Unit, Department of Preventive Medicine, University of Vermont.

Throughout the four years students live in University residence halls either at the University of Vermont or at Boston University.

The Freshman Year	1st SEMESTER	2nd SEMESTER
Freshman English	3	3
Chemistry	4	4
Human Anatomy and Psychology	3	3
Speech	3	.....
Introduction to Nursing	2	4
Psychology	.....	3
Physical Education	(1)	(1)

The Summer Session (8 weeks)	CREDITS
Fundamentals of Nursing	3
Nutrition and Food Preparation	3
Microbiology	3

The Junior Year	CREDITS
Maternal-Child Nursing	10
Child Growth and Development	3
Psychiatric Nursing	6
Nursing in Long-Term Illness	6
Elective	3

The Sophomore Year	1st SEMESTER	2nd SEMESTER
Sociology	3	3
Medical and Surgical Nursing	9	9
Elective	.....	3
English	.....	3

The Senior Year	CREDITS
Public Health Nursing	6
Analysis of Selective Nursing Situations	4
English	3
Survey of Contemporary Nursing	2
Social Science	3
Approved Electives	12

The curriculum in the Department of Nursing is presently under revision. Some changes may become effective for the 1962-63 school year.

EXPENSES (See also pages 44-47.)

The cost of the program in nursing is approximately the same as for other undergraduate programs at the University with the following exceptions:

1. Beginning in September, 1962, all students in nursing will be required to carry Blue Cross and Blue Shield, or its equivalent, at not less than the maximum daily rate issued by Blue Cross (at present $20 per day).
2. Uniforms and other items of special equipment must be purchased.

Detailed information concerning cost of the program in nursing for each of the four years may be obtained from the Chairman of the Nursing Department.

Insofar as resources permit, the University provides financial aid in the form of scholarships, loans, prizes, and employment. Vermont students in the Nursing curriculum are eligible for Senatorial Scholarships.

PROFESSIONAL PERSONNEL IN COOPERATING AGENCIES

Robert B. Aiken, M.D., Commissioner of Health, Vermont State Department of Health
Grace Buttolph, Director, School of Nursing, Mary Fletcher Hospital
Philip Day, Director of Nursing Service, Mary Fletcher Hospital
Marie Farrell, Dean, Boston University School of Nursing
Anne Hargreaves, R.N., Assistant Professor of Nursing, Psychiatric Nursing Department, Boston University School of Nursing
M. Alfred Haynes, M.D., Director of Family Care Unit, Department of Preventive Medicine, University of Vermont
Esther Martinson, Director, Division of Public Health Nursing, Vermont State Department of Health.
Georgia Murchison, Director, Visiting Nurse Association

The College of Technology

The College of Technology includes the Department of Chemistry, Commerce and Economics, Civil Engineering, Electrical Engineering, Mechanical Engineering, and Mathematics. It offers a number of specialized professional curricula in these fields and in medical technology, 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, military science, 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	5	5	Quantitative Analysis	4	4
Freshman English	3	3	Sophomore English	3	3
Algebra, Trig., Anal. Geom.[1]	5	5	Calculus[2]	3	3
Elective	3	.....	German or Elective	4–3	4–3
General Physics 14-	.....	3	General Physics 15, 16	4	5

[1] See footnote under course offerings of the Department of Mathematics.

[2] Those students who must enroll in Math. 9 will be required to take Math. 10, 12, and 21. They will not be required to take Math. 22.

The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	1st SEMESTER	2nd SEMESTER
Physical Chemistry	5	5	Iden. of Organic Compounds	5	.....
Organic Chemistry	5	5	Senior Research	2–4	4
Advanced Physics or Mathematics	3	3	Advanced Chemistry Elective	3	3
Approved Elective or German	3	3	Advanced Physical Chemistry	3	3
Junior Seminar	1	1	Senior Seminar	1	1
			Approved Elective	3	3

German through the intermediate level is required.

A minimum of 132 approved semester hours is required for the degree in this curriculum, plus required courses in physical education and military science.

THE MASTER'S DEGREE IN CHEMISTRY The department offers work leading to the degree of Master of Science, the thesis problem being selected from the fields of inorganic, analytical, organic, or physical chemistry. Students who do not already have a reading knowledge of German must take German concurrently with their graduate work.

The First Year	1st SEMESTER	2nd SEMESTER	The Second Year	1st SEMESTER	2nd SEMESTER
Graduate Research[1]	5	5	Graduate Research	5	5
Advanced Chemistry[1]	6	6	Advanced Chemistry	6	6
Seminar	1	1	Seminar	1	1

The Commerce and Economics Curriculum

The Department of Commerce and Economics offers a specialized curriculum, leading to the degree of Bachelor of Science in Commerce and Economics. Those who wish a less intensive or less specialized training in economics may take the liberal arts curriculum, with a concentration in economics, and receive the Bachelor of Arts degree. An adviser from the department will assist students in building programs to meet their individual needs and plans.

The commerce curriculum is recommmended for those who are preparing for a business career. It is intended to provide sound basic training in the various phases of business activity. The several options enable students to emphasize such specialized studies as accounting, banking, finance, insurance, government service, industrial management, production, sales management, secretarial studies, and small business. The Department of Commerce and Economics 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.

[1] Identification of Organic Compounds required unless included in undergraduate training. Chemistry 247-248 or the equivalent required of all graduate students.

The normal program for the first two years in the commerce and economics curriculum is as follows:

The Freshman Year	1st SEMESTER	2nd SEMESTER	The Sophomore Year	1st SEMESTER	2nd SEMESTER
World Economic Geography	3	3	World Lit. or Eng.-Am. Lit.	3	3
Freshman English	3	3	Principles of Economics	3	3
Fundamentals of Mathematics	3	3	Economic History	3	3
Laboratory Science	4	4	Principles of Accounting	4	4
Foreign Language[1]	3–4	3–4	Foreign Language, Calculus or American Government[2]	3	3

During the junior and senior years, commerce and economics students normally choose one of the following options:

Accounting

The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	1st SEMESTER	2nd SEMESTER
Int. and Adv. Accounting	3	3	Auditing	3	.....
Fin. Statement Anal.	3	.....	Tax Accounting	.....	3
Cost Accounting	.....	3	Economic Statistics	3	.....
Money and Banking	3	3	C.P.A. Problems	.....	3
American Government[3]	3	3	Securities Markets	3	.....
General Psychology	3	.....	Financial Management	.....	3
Phil., Psych. or Soc. 21	.....	3	Business Law I	3	3
Approved Electives	3	3	Business Law II	.....	2
			Approved Electives	3	3

A minimum of 132 approved semester hours is required for the degree in this curriculum, plus required courses in physical education and military science.

Banking, Finance, and Insurance

The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	1st SEMESTER	2nd SEMESTER
Money and Banking	3	3	Taxation	3	.....
Securities Markets	3	.....	Investments	.....	3
Financial Management	.....	3	Insurance	3	3
Economic Statistics	3	3	Money, Income and Prices	3	3
American Government[3]	3	3	Business Law I	3	3
General Psychology	3	.....	Business Law II	.....	2
Phil., Psych. or Soc. 21	.....	3	Approved Electives	3	3
Approved Electives	3	3			

A minimum of 132 approved semester hours is required for the degree in this curriculum, plus required courses in physical education and military science.

Business Administration

The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	1st SEMESTER	2nd SEMESTER
Money and Banking	3	3	Securities Markets	3	.....
Economic Statistics	3	3	Financial Management	.....	3
General Psychology	3	.....	Investments	.....	3
Phil., Psych. or Soc. 21	.....	3	Business Law I	3	3
Principles of Marketing	3	.....	Taxation	3	.....
Problems of Marketing	.....	3	Money, Income and Prices	3	3
American Government[3]	3	3	Approved Electives	3	3
Approved Electives	3	3			

[1] In place of the foreign language, students may choose Mathematics 11-12 (plane trigonometry, plane analytic geometry, differential calculus) and 21 (calculus).

[2] American Government should be elected by students who have completed the intermediate language requirement.

[3] If completed, enroll in approved elective.

A minimum of 130 approved semester hours is required for the degree in this curriculum, plus required courses in physical education and military science.

Industrial Management

The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	1st SEMESTER	2nd SEMESTER
Labor Economics	3	.....	Principles of Marketing	3	.....
Collective Bargaining	.....	3	Problems of Marketing	.....	3
Industrial Management	3	.....	Motion and Time Study	3	.....
Scientific Management and Labor	.....	3	Plant Organization	.....	4
General Psychology	3	.....	Business Law I	3	3
Phil., Psych. or Soc. 21	.....	3	Cost Accounting	.....	3
American Government[1]	3	3	Approved Electives	6	3
Economic Statistics	3	3			
Approved Electives	3	3			

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

Marketing and Merchandising

The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	1st SEMESTER	2nd SEMESTER
Principles of Marketing	3	.....	Personal Salesmanship	3	.....
Problems in Marketing	.....	3	Sales Management	3	.....
Money and Banking	3	3	Advertising	.....	3
General Psychology	3	.....	Business Law I	3	3
Phil., Psych. or Soc. 21	.....	3	Cur. Marketing Developments	.....	3
American Government[1]	3	3	Approved Electives	6	6
Economic Statistics	3	3			
Approved Electives	3	3			

A minimum of 130 approved semester hours is required for the degree in this curriculum, plus required courses in physical education and military science.

Secretarial Studies

The Junior Year	1st SEMESTER	2nd SEMESTER	The Senior Year	1st SEMESTER	2nd SEMESTER
Business Communications	3	3	Office Management	3	.....
General Psychology	3	.....	Seminar (Secretarial)	3	.....
Phil., Psych. or Soc. 21	.....	3	Exec. Sec. Procedures	.....	3
Business Law I	3	3	Money and Banking	3	3
Public Speaking	3	.....	Advanced Typing	3	.....
Typing (Elem. and Interm.)[2]	3	3	Advanced Shorthand	4	.....
Shorthand (Elem. and Interm.)[2]	4	4	Transcription	.....	7
Approved Elective[3]	.....	3	Approved Electives[3]	3	6

A minimum of 140 approved semester hours is required for the degree in this curriculum, plus required courses in physical education and military science.

[1] Students who have completed this course will enroll in an approved elective.

[2] Students who have studied typing and/or shorthand in high school and qualify for advanced work in these fields, will take six hours of approved electives in the first semester and intermediate typing and shorthand during the second semester.

[3] Students will be guided in the selection of electives in the light of professional objectives.

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, economics, and English.

All freshman and sophomore men are required to complete the two basic courses in military science for a total credit of eight semester hours, which become an integral part of the record and are counted toward graduation. Two years of physical education are normally required of all students.

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

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

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

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

A minimum of twenty-four credit hours[1] is required in humanistic-social studies. To meet this requirement each student must satisfy the following distribution.

Required of all sudents	Minimum credit hours
1. Freshman English, 1-2 Must be taken the Freshman year	6
2. World or American Literature, 25, 26, 27, 28[1]	3
3. Principles of Economics, 11-12	6
4. A course from any Elective Area[1]	3
5. Courses from one Elective Area[2]	6
Minimum total	24

[1] *Management engineering students will take English 26 and omit Item No. 4.*

[2] These six hours may be taken from two of the Elective Areas listed if the student has completed six credit hours in Item No. 2.

Elective Areas

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

The Freshman Year For All Curricula

	1st SEMESTER	2nd SEMESTER
Mathematics,[1] 11, 12	5	5
Chemistry, 1-2	4	4
Engineering Graphics, 1-2	2	2
Freshman English, 1-2	3	3
Engineering Problems (M.E. 3)	1	.....
General Physics, 14—	.....	3

Civil Engineering

The Sophomore Year	1st SEMESTER	2nd SEMESTER
Calculus (Math. 21, 22)	3	3
General Physics, —15, 16	4	5
Surveying (C.E. 51-52)	4	4
Humanistic-Social Studies[2]	3	3
Statics (C.E. 24)	3	.....
Dynamics (C.E. 130)	.....	3

The Junior Year	1st SEMESTER	2nd SEMESTER
Differential Equations (Math. 211)	3	.....
Mech. of Materials I (C.E. 131)	3	.....
Engineering Geology (Geol. 21)	3	.....
Electrical Circuits and Machines (E.E. 101)	4	.....
Thermodynamics and Heat Transfer (M.E. 113)	3	.....
Humanistic-Social Studies[2]	3	6
Mech. of Materials Lab. (C.E. 114)	.....	1
Eng. Contracts (C.E. 151)	.....	2
Hydraulics (C.E. 162)	.....	3
Hydraulics Lab. (C.E. 168)	.....	1
Statically Determinate Struct. (C.E. 140)	.....	4

The Senior Year	1st SEMESTER	2nd SEMESTER
Concrete and Bituminous Lab. (C.E. 113)	1	.....
Reinforced Concrete (C.E. 155)	3	.....
Sanitary Eng. I (C.E. 165)	3	.....
Soil Mechanics (C.E. 173)	3	.....
Indet. Structures I (C.E. 175)	3	.....
Transportation Eng. (C.E. 174)	3	.....
Humanistic-Social Studies[2]	3	.....

	1st SEMESTER	2nd SEMESTER
Substructure Design (C.E. 158)	.....	4
Sanitary Eng. II (C.E. 166)	.....	3
Adv. Struct. Design (C.E. 176)	.....	4
Mechanics of Materials II (C.E. 231)	.....	3
Elective	.....	3
Public Speaking (Speech 11)	.....	3

A minimum of 142 approved semester hours is required for the degree in this curriculum, plus required courses in physical education and military science.

[1] See footnote under course offerings of the Department of Mathematics.
[2] See distribution of Humanistic-Social Studies on p. 89.

Mechanical Engineering

The Sophomore Year	1st SEMESTER	2nd SEMESTER
Calculus (Math. 21, 22)	3	3
General Physics (Phys. —15, 16)	4	5
Manufacturing Processes (M.E. 51, 52)	2	2
World Literature (Engl. 25)	3	.....
Statics (C.E. 24)	3	.....
Public Speaking (Speech 11)	3	.....
Dynamics (C.E. 130)	.....	3
Thermodynamics I (M.E. 92)	.....	2
Mechanical Instrumentation (M.E. 84)	.....	1

The Junior Year	1st SEMESTER	2nd SEMESTER
Heat Transfer (M.E. 266)	.....	3
Mech. of Materials (C.E. 131)	3	.....
Materials Lab. (C.E. 114)	.....	1
Mechanisms (M.E. 132)	.....	4
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
Fluid Mechanics (M.E. 142)	.....	3
Humanistic-Social Studies[4]	3	3

The Senior Year	1st SEMESTER	2nd SEMESTER
Adv. Heat and Power Engineering (M.E. 262)	.....	4
Industrial Materials (M.E. 101)	3	.....
Adv. Fluid Mechanics (M.E. 243)	4	.....
Machine Design I, II (M.E. 135, 6)	3	4
Thesis (M.E. 191 or Technical Elective[1]	3	.....
Thesis (M.E. 192) or Elective[2]	.....	3
Applied Mathematics (Math. 212)	.....	3
Engineering Analysis (M.E. 294)	.....	1
Humanistic-Social Studies[4]	6	3

A minimum of 139 approved semester hours is required for the degree in this curriculum, plus required courses in physical education and military science.

Electrical Engineering

The Sophomore Year	1st SEMESTER	2nd SEMESTER
Calculus (Math. 21, 22)	3	3
General Physics (Phys. –15, 16)	4	5
Statics (C.E. 24)	3	.....
Dynamics (C.E. 130)	.....	3
Electrical Circuits I (E.E. 25-26)	4	4
Humanistic-Social Studies[4]	3	3

The Junior Year	1st SEMESTER	2nd SEMESTER
Public Speaking (Speech 11)	.....	3
Differential Equations (Math. 211)	3	.....
Mech. of Materials (C.E. 131)	3	.....
Thermodynamics (M.E. 113)	3	.....
Electrical Circuits II (E.E. 125)	4	.....
Circuits and Fields I (E.E. 126	.....	3
Electrical Machines (E.E. 116)	.....	4
Electronics I (E.E. 109, 110)	3	4
Humanistic-Social Studies[4]	3	3
Elective[3]	2	3

The Senior Year	1st SEMESTER	2nd SEMESTER
Circuits and Fields II (E.E. 225-6)	4	3
Electrical Machines (E.E. 117)	4	.....
Servomechanisms (E.E. 210)	.....	3
Electronics II (E.E. 203)	3	.....
Fluid Mechanics (M.E. 142)	.....	3
Contracts (C.E. 151)	.....	2
Seminar (E.E. 281, 282)	1	1
Humanistic-Social Studies[4]	3	3
Elective[3]	3–4	3–4

[1] Technical Electives will be chosen from the departments of Chemistry, Physics, Engineering or Mathematics with the approval of the Mechanical Engineering Department faculty.
[2] Elective may be chosen from any area.
[3] Three hours of elective credit must be advanced mathematics, mathematical physics or electromagnetic wave theory.
[4] See distribution of Humanistic-Social Studies on p. 89.

A minimum of 141 approved semester hours is required for the degree in this curriculum, plus required courses in physical education and military science.

Management Engineering

The Sophomore Year	1st SEMESTER	2nd SEMESTER
Calculus (Math. 21, 22)	3	3
General Physics (Phys. –15, 16)	4	5
Principles of Economics (Econ. 11-12)	3	3
Manufacturing Processes (M.E. 51, 52)	2	2
Statics (C.E. 24)	3	.....
Dynamics (C.E. 130)	.....	3
Public Speaking (Speech 11)	3	.....

The Junior Year	1st SEMESTER	2nd SEMESTER
Prin. of Accounting (Ec. 13-14)	4	4
Differential Equations (Math. 211)	3	.....
General Psychology (Psych. 1)	3	.....
Thermo. and Heat Transfer (M.E. 132)	3	.....
Mechanisms (M.E. 132)	.....	4
Electrical Engineering Principles (E.E. 101-102)	4	4
Fluid Mechanics (M.E. 142)	.....	3
Mech. of Materials (C.E. 131)	3	.....
World Literature (English 26)	.....	3

The Senior Year	1st SEMESTER	2nd SEMESTER
Motion and Time (M.E. 175)	3	.....
Plant Organization (M.E. 176)	.....	4
Industrial Materials (M.E. 101)	3	.....
Corporation Finance (Econ. 207)	.....	3
Business Law (Econ. 109-110)	3	3
Labor Economics (Econ. 141)	3	.....
Statistics (Econ. 187-188)	3	3
Collective Bargaining (Ec. 242)	.....	3
Humanistic-Social Studies[1]	3	3

A minimum of 141 approved semester hours is required for the degree in this curriculum, plus required courses in physical education and military science.

Agricultural Engineering

For the Agricultural Engineering Curriculum see pages 61-62.

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
Freshman English, 1-2	3	3
Mathematics,[2] 11, 12	5	5
Laboratory Science[3]	4–5	4–5
Approved Elective	3	.....
General Physics, 14–	.....	3

The Sophomore Year	1st SEMESTER	2nd SEMESTER
English-American or World Lit.	3	3
Mathematics, 21, 22	3	3
German, French or Russian	4	4
General Physics, –15, 16	4	5
Approved Electives	3	3

[1] See distribution of Humanistic-Social Studies on p. 89.
[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 laboratory science until after the language requirement has been met.

The Junior Year	1st SEMESTER	2nd SEMESTER
German, French or Russian[1]	3	3
Mathematics Electives[2]	6	6
Advanced Science[3]	3–4	3–4
Approved Electives	6	6

The Senior Year	1st SEMESTER	2nd SEMESTER
Mathematics Electives[2]	9	9
Advanced Science[3]	3–4	3–4
Approved Electives	3	3

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

The Medical Technology Curriculum

The curriculum is divided into two parts, a three-year preclinical period and a final clinical year of twelve months which is under the supervision of members of the faculty of the College of Medicine.

The program of the preclinical period is designed to provide the student with a background in basic fundamentals essential for the professional work of the clinical year. The clinical year includes didactic courses in the College of Medicine and practical laboratory experience, primarily in the laboratories of the Mary Fletcher Hospital but also in other local health facilities.

After graduation an additional two and one-half months of practical supervised experience in the affiliated laboratories is required. At the end of this additional period, those satisfactorily completing the program will be recommended to the Registry of Medical Technologists as eligible to take the examination for certification by that body.

The Freshman Year	1st SEMESTER	2nd SEMESTER
Freshman English	3	3
Introductory Chemistry	4	4
Introductory Zoology	4	.....
Mathematics (Algebra and Trigonometry)	3	3
Approved Non-Science Electives	.....	3
Introduction to Medical Technology	0	.....
Biology (Botany or Zoology)	.....	4

The Sophomore Year	1st SEMESTER	2nd SEMESTER
English-American or World Lit.	3	3
Elementary Quantitative Analysis	3	3
Zoology (Vertebrate and Comparative Anatomy)	4	4
Approved Non-Science Electives	6	6

The Junior Year	1st SEMESTER	2nd SEMESTER
Organic Chemistry	4	4
Introductory Physics	3	3
Approved Non-Science Electives	9	9

The Senior Year	1st SEMESTER	2nd SEMESTER
Biochemistry for Medical Technologists	4	4
Bacteriology	7	.....
Basic Techniques	6	3
Clinical Pathology	.....	2
Hospital Assignments	.....	6

A minimum of 127 approved semester hours is required for the degree in this curriculum, plus required courses in physical education and military science.

[1] If an intermediate language is taken initially, an elective may be substituted.
[2] Beyond Mathematics, 22.
[3] Physical Science or Engineering courses beyond the Sophomore level, to constitute a minor specialization.

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 fifty-two different programs leading to the Master's degree and four programs leading to the degree of Doctor of Philosophy.

Attention is also drawn to the special fifth-year program (cf. p. 77) offered by the College of Education and Nursing leading to a certificate of advanced study in Education.

Master of Education

Programs are planned on an individual basis, and are designed primarily for teachers who intend to qualify for various administrative positions in public school systems. Candidates for this degree must spend at least one Summer Session in residence as a wider selection of advanced courses in Education is available in summers than in regular sessions.

Master of Arts in Teaching

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

Agriculture
Botany
Chemistry
Commercial Subjects
English
French
Geology
German
Greek
History
Home Economics
Latin
Mathematics
Music
Physics
Spanish
Zoology

Master of Science

Programs are offered in the following fields:

Agricultural Biochemistry
Agricultural Economics
Agronomy
Anatomy
Animal and Dairy Science
Animal Pathology
Biochemistry
Botany
Chemistry
Civil Engineering
Commerce
Electrical Engineering
Forestry
Geology
Home Economics
Horticulture
Mechanical Engineering
Medical Electronics
Medical Microbiology
Microbiology
Pathology
Pharmacology
Physics
Physiology and Biophysics
Poultry Science
Zoology

Master of Arts

Programs are offered in the following fields:

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

Doctor of Philosophy

Doctoral programs are offered for qualified students in the fields of Biochemistry, Chemistry, Microbiology, Pharmacology, and Physiology and Biophysics.

Admission

Students seeking admission to the Graduate College must make application to the Dean of the Graduate College.

Applicants should be persons who, prior to the date of their first enrollment, will hold a baccalaureate degree or will have completed work equivalent to that required for a baccalaureate, and whose undergraduate records indicate that they are capable of successful study at the graduate level. Graduates of unaccredited institutions must support their application with satisfactory scores on the Graduate Record Examinations; full information concerning these examinations may be obtained from the Educational Testing Service, Box 592, Princeton, N. J.

Admission is limited to (a) students who intend to become candidates for advanced degrees, other than Doctor of Medicine, and (b) 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 special students in the appropriate undergraduate college.

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

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.

A deposit of $35 is required of each applicant upon enrollment or admission to the Graduate College. This deposit will be returnable when the student graduates or withdraws from the College. A duly admitted student who later decides not to enter the College is eligible to receive a partial refund of this deposit, provided that he notifies the Dean of his change in plans well in advance of the date of his first enrollment (cf. p. 44, Expenses).

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

College Regulations Concerning Masters' Degrees

Acceptance to Candidacy

Applications must be made on forms supplied by the Dean's office, and must be approved both by his office and by the department concerned. Acceptance to candidacy is granted only in cases where the student has fully met all undergraduate prerequisites in his chosen field of concentration and has demon-

strated to the full satisfaction of the department concerned his capacity for successful study at the graduate level.

Not until a student has been accepted to candidacy is the department obliged to help plan his over-all degree program, supervise his research, and so forth. *Students are therefore advised to apply for acceptance to candidacy as soon as they become eligible for it.*

Minimum Residence Requirements

Each candidate for the Master's degree must satisfactorily complete at least twenty hours of graduate credit while in residence on The University of Vermont campus, either in the regular academic year or in summer sessions.

Maximum Time Limits

A program leading to the Master's degree must be completed within three years if it is pursued on a full-time basis during the regular academic year; if the program is pursued during summer sessions, it must be completed within seven years. Only in special cases will credits earned outside these time limits be re-evaluated and accepted; requests for such re-evaluation must be addressed to the Dean and must be accompanied by a full statement of the extenuating circumstances. This time limit applies both to study at The University of Vermont and to courses taken in other institutions and presented for transfer of credit.

Graduate Credit

Courses numbered 200 and above are offered for graduate credit, and, if taken by graduate students, must be taken for graduate credit.

Courses numbered between 100 and 199 are normally courses for undergraduates. Graduate credit can be allowed for any course so numbered only when a graduate student has already been accepted to candidacy and has obtained in advance the approval of his department and the Dean for the inclusion of this particular course in his Master's degree program. Under no circumstances will graduate credit be allowed for a course numbered below 100.

Transfer of Credit

A maximum of eight semester hours of credit for graduate courses taken in other institutions can be transferred into the program of a duly accepted candidate for the Master's degree. Such courses must have been taken in a fully accredited college or university which offers graduate study and must be acceptable at that institution in partial fulfillment of its requirements for an advanced degree. Credit cannot be transferred for (1) courses which would not, if taken at The University of Vermont, receive graduate credit, (2) courses in which a grade lower than 80 (B—) was received, (3) extension courses, (4) correspondence courses, (5) courses which are inappropriate for inclusion in any Master's program offered by the Graduate College. No transfer 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 off-campus courses offered by The University of Vermont. A maximum of three hours of graduate credit per semester is permissible to Master's candidates who are full-time teachers in public schools. Graduate credit cannot be allowed for courses which would not offer graduate credit if given in regular or summer sessions at The University of Vermont. Only students whose academic qualifications would qualify them for admission to the Graduate College can be granted graduate credit for work done in off-campus courses. Therefore students seeking graduate credit for such courses who have not been admitted to the Graduate College must have their academic credentials approved by the Dean before graduate credit can be granted. No credit for extension courses is allowable in a doctoral program.

General Academic Requirements for Master's Degrees

A total of thirty semester hour credits is the minimum number required by the Graduate College for the Master's degree, of which at least fifteen must be earned in formal courses and seminars. Credit for the preparation of a thesis under the direction of the particular department, when required, is included in the minimum number of required credit hours.

Each student must maintain an average of 85 (B). A course in which a grade lower than 75 (C—) is received will not be accepted in partial fulfillment of requirements for an advanced degree.

Each Master's 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.

Master of Arts and Master of Science

FIELD OF SPECIALIZATION In judging the attainments of candidates, great emphasis is placed upon ability to do original research in the chosen field of specialization. Hence the number of courses required will vary with the preparation and needs of the individual student. In order to plan his individual program, a new student should consult as early as possible with the chairman of the department in which he is specializing.

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.

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. The original copy of this thesis must be presented to the Dean for deposit in the University Libraries; some departments require that additional copies be presented to the department. The number of credit hours

to be earned in thesis research varies between six (minimum) and fifteen (maximum), the precise number being decided on an individual basis by the department concerned.

RELATED STUDY Sometimes a graduate program will 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 by the department in which the student is specializing.

Master of Education

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. A graduate program is planned in view of a student's undergraduate curriculum and in the light of his aims and purposes in pursuing the Master's degree, and in such a way that its subject matter will be concentrated as far as possible within a general area of study. Each program must include at least thirty semester hours of approved course work. 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 not later than his first semester of residence, or, if he has been a student in summer session, prior to his second summer in residence.

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.

Master of Arts in Teaching

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. Apart from this requirement, a student will specialize 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 and must be acceptable to the department or departments concerned.

In his undergraduate and graduate work a student must complete eighteen semester hours in Education which must include the following courses or their equivalent: History or Philosophy of Education, General Methods and Procedures, Student Teaching, and Educational Psychology or Principles of Education.

Final Examinations

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

I. *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.

II. *For the Degree of Master of Education:*
   a. A written comprehensive examination (three-hour minimum) in the field of Education.

III. *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.

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

Professional Degrees in Engineering

The advanced degrees of Civil Engineer, Mechanical Engineer, and Electrical Engineer will be granted only to engineering graduates of The University of Vermont. At least four years must have elapsed since the candidate graduated. For at least three years the candidate must have held positions of responsibility in his profession and have shown ability to design and execute important engineering work.

At least six months before the end of the year in which the degree is sought the candidate must present to the Dean of the Graduate College a statement of his technical training and experience, together with the topic upon which he proposes to submit a thesis. The thesis must embody the results of original investigation upon some technical subject. The professional record and thesis topic must be approved by the College of Technology and by the Executive Committee of the Graduate College.

The thesis must be presented to the Dean of the Graduate College not later than three weeks prior to commencement. The thesis must then be approved by the College of Technology and by the Executive Committee of the Graduate College.

College Regulations Concerning the Degree of Doctor of Philosophy

At the present time The University of Vermont offers five academic programs leading to the degree of Doctor of Philosophy. Programs are offered in Biochemistry, Chemistry, Microbiology, Pharmacology, and Physiology and Biophysics.

Acceptance to Candidacy

In addition to being fully eligible for acceptance to candidacy for a Master's degree (cf. p. 95), a student must have completed satisfactorily one year of graduate study at The University of Vermont before he is eligible for acceptance to candidacy for the degree of Doctor of Philosophy.

Upon admission to the Graduate College, the prospective candidate for the Ph.D. degree will be assigned an interdepartmental 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 chairmen concerned, and the Dean of the Graduate College. This Committee will also be responsible for administering and evaluating language examinations.

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 and the number of credits to be awarded for it will be determined by the Thesis Committee.

Transfer of Credit

Not more than twenty-five hours of credit for appropriate graduate courses taken in residence at other institutions will be acceptable for transfer into a Doctoral program.

Minimum Academic Requirements

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.

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 individual Studies Committees in consultation with the candidate. Details of each program can be obtained from the appropriate department chairman or from the Dean.

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. The candidate must submit three bound type-script copies of the completed thesis to the Dean of the Graduate College. A minimum of twenty credits will be allowed for thesis research.

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 or demonstrate fluent command (ability to read, write and converse) of one foreign language appropriate to his field. The choice of the languages is to be determined by the candidate's department, and the testing of the candidate is to be the joint responsibility of the candidate's department and the language departments involved.

The language requirements must be completed before the comprehensive examination is taken.

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 three copies of the thesis have been submitted to the Dean. One re-examination only will be permitted.

Expense and Financial Aids

For information concerning tuition, deposits and other fees, see pages (43-47). Graduate students may receive financial aid on the same basis as undergraduate students, see pages (47-48). Information on loans may be obtained from the Dean of Men or the Dean of Women.

Fellowships

The Graduate College offers each year four Graduate Fellowships, each of $500 plus a tuition scholarship, which 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. Applications for Graduate Fellowships should be addressed to the Dean and must be completed not later than March 15 of the academic year preceding the year for which the application is made.

The George H. Walker Dairy Fellowship is awarded every third year, the next award to be made in 1962-63. It provides a stipend not less than $700 plus a 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.

The College was assigned in 1959 and in 1960 three National Defense Fellowships for prospective Ph.D. candidates in Biochemistry. For 1961-62, three National Defense Fellowships for prospective Ph.D. candidates have been awarded to the Department of Chemistry and two fellowships have been assigned to the Department of Physiology and Biophysics. Three additional fellowships have been awarded to the Department of Chemistry for 1962-63. Applications should be made to the chairmen of the departments concerned.

Teaching Fellowships and Research Fellowships

Graduate Teaching Fellows are normally appointed for nine months with an initial stipend of at least $1,900, Graduate Research Fellows for eleven months

with an initial stipend of at least $2,200. Teaching and Research Fellows are awarded scholarships to cover tuition up to twelve hours a semester; they are eligible also for reappointment for a second year.

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 Ph.D. 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 obligatory 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.

Applications for Graduate Teaching Fellowships and Graduate Research Fellowships should be addressed to the chairman of the department concerned and should be filed not later than March 15 of the academic year preceding that for which the application is made. Fellowships for the year 1962-63 are offered by the following departments: Agriculture, Biochemistry, Agricultural Economics, Agronomy, Animal and Dairy Science, Biochemistry, Botany, Chemistry, Economics, Education, Electrical Engineering, Experimental Medicine, Geology, German, Graphics, History, Horticulture, Mathematics, Mechanical Engineering, Medical Microbiology, Music, Pathology, Pharmacology, Physics, Physiology and Biophysics, Political Science, Poultry Science, Psychology, Romance Languages and Zoology.

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; and 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 in any given year by July 1 preceding the September admission. Ordinarily courses taken in other than a liberal arts college will not meet our admission requirements.

Eligibility for admission to the College of Medicine of an applicant 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 a final determinant in accepting students.

A maximum of fifty 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.
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 December 1 for early consideration.

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

The Curriculum

FIRST YEAR Anatomy, physiology and biochemistry are integrated in such a fashion that topics are considered simultaneously by all departments in so far as possible. Thus when the abdomen is being dissected, the physiology of the gastro-intestinal system and the biochemistry of digestion are being considered at the same time. The students are introduced to psychobiology and preventive medicine during the first year.

SECOND YEAR The curriculum is divided into three parts and correlated in time.

Course A—Morphology, Physiology, and Chemistry of the Abnormal—runs throughout the entire year and includes pharmacology, pathology, clinical pathology, medical microbiology, psychopathology, preventive medicine and surface anatomy.

Course B—Elicitation of Data—includes history taking and examination which are taught cooperatively by the various specialists under the general supervision of an internist. This is given in the second semester only.

Course C—Introduction to Clinical Medicine—consists of didactic lectures and case presentations covering elementary medicine, pediatrics, surgery, obstetrics, gynecology and oral medicine, and is given in the second semester.

The schedule varies from week to week because the subject material presented by the different departments is correlated.

THIRD AND FOURTH YEARS The third and fourth years provide a continuing clinical clerkship under the direction of the major clinical departments. A one and a half-month vacation is afforded during the summer at the end of the third year. The schedule provides for clerkship experience in general and specialty hospitals, and includes ambulatory patient services in the Family Care Unit, the outpatient departments of the general hospitals, and in the home. Up to three months of elective time is provided for the student to pursue in depth an area of his interest.

Teaching Facilities

The College of Medicine Building, the College of Medicine Annex, Mansfield House and Phase I of the new College of Medicine building contain offices,

lecture rooms, medical library, student and research laboratories. Clinical facilities for teaching in the third and fourth years include the two Burlington hospitals with a total of 618 beds (not including bassinets) and 132,170 patient days.

In Burlington there are three outpatient departments with 16,406 patient visits annually, and the Home Care Service with 1,125 home visits annually. Elective preceptorships with general practitioners are available.

Program of Non-Western Studies

A Program of Non-Western Studies is conducted at the University with the purpose of increasing and improving the instruction about areas of the world other than North America and Europe. Under the Program, selected faculty members are released from some regular teaching duties in order to conduct research and to share in a Seminar. The Program includes representatives from several Vermont colleges and universities. Visiting professors are brought to the University campus to serve as expert consultants to the Program and occasionally to offer courses on aspects of the Non-Western world for University undergraduates and in the Evening Division. The faculty participants in the Program, as well as the visiting professors, are available for public appearances individually or as an inter-disciplinary group. A particular effort has been made to improve the holdings of the University Library for the areas studied. In 1959 the Program emphasized the Middle East, in 1960 South Asia, in 1961 Southeast Asia, and in 1962 China.

Center for Area Studies

The development of a Center for Area Studies was authorized by the Trustees of the University of Vermont in February, 1962. The purposes of the Center are to encourage and coordinate interdisciplinary study of selected foreign areas, to promote research on foreign areas, and to stimulate general interest in these areas. The Committee on Area Studies plans for and proposes course offerings on various foreign areas under the respective departments.

For 1962-63 the Center for Area Studies has planned programs of undergraduate study on two areas, Latin America, and Russia and Eastern Europe. Each program is based on a combination of appropriate courses in foreign language, history, political science, economics, and sociology, and will provide the concentration required of candidates for the A.B. degree.

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.

The University Extension

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

The Summer Session

Summer Session offers courses on both the graduate and undergraduate level in many subjects, including art, botany, chemistry, commercial subjects, conservation, dramatic art, economics, education, English, French, geography, German, history, home economics, mathematics, music (instrumental and vocal), philosophy, physical education, physics, political science, psychology, 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.

Through work in the Summer Session it is possible to earn the degrees of Master of Arts, Master of Science, Master of Arts in Teaching, and Master of Education. A special bulletin giving a full description of courses will be sent upon application to 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, 147 Waterman Building. Length of courses varies from five to eighteen weeks.

Any person taking a course for credit towards a degree at the University is advised to secure the approval of the appropriate dean. All persons desiring graduate credit must secure the approval of the Dean of the Graduate College.

The Government Clearing House

The Government Clearing House, established in 1950, 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 for the development of in-service training programs and for 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.

Most of the activities of the Government Clearing House 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 1930's 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 Clearing House 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 Information Center

The World Affairs Information Center, located in the Old Mill on the University campus, is the focus for programs and services to further greater understanding of world affairs and responsible citizens' participation in U. S. foreign policy. The Center is staffed jointly by the Political Science Department of the University and the Vermont Council on World Affairs. A library on world affairs, national foreign policy, and international organizations is maintained at the Center for the use of Vermont citizens and University members.

The Center cooperates with the United States Department of State, the United Nations, and many other national and local organizations in arranging speakers, programs, material for distribution, hospitality for visitors from abroad, and consultations with Vermont groups on various aspects of world affairs. The Center serves as a coordinating agent and occasionally sponsors activities such as specialized conferences, courses and contests throughout the State of Vermont.

The Audio-Visual Services Division

The Audio-Visual Services Division, located in The Old Mill Building, includes an Audio-Visual Aids Library, an Audio-Visual Equipment Service and a Photographic Service.

The Aids Library owns over 1600 sound 16mm, educational films; 1200 3¼ x 4 slides; and a growing collection of 2 x 2 slides, filmstrips and filmstrip sets, tape and disc recordings. New college level materials are purchased annually. The Vermont State Department of Education contributes aids for elementary and secondary schools which are distributed as an extension service of the University.

Equipment Service makes available to campus and outside users projection equipment for 16mm sound motion pictures, slides and filmstrips; opaque and large transparent materials; tape recorders and record players. Lamps and other projector parts, as well as maintenance service, are supplied by this Department.

Photographic Service, on assignment from administrative departments and faculty, produces motion and still pictures, lantern slides and transparencies, and maintains a file of photographs and negatives from which selections may be made for University publications.

Conferences and Institutes

Conference activity is a rapidly increasing part of University life, both throughout the regular college year and during the summer, when 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.

Junior Year Study Abroad

A University of Vermont student who wishes to attend a foreign university in his junior year and receive transfer credit should consult with the dean of his college and receive approval, in advance, of his plan and program. In general to gain approval a student will be expected:

a) to have completed two full years (sixty semester hours) of work;
b) to have an average of not less than 80;
c) to have a valid objective, appropriate to his academic program and not avaliable at the University of Vermont;
d) to have a good working knowledge of the language of the country to which he proposes to go.

Definite preference will be given to programs sponsored by approved Universities and Colleges in this country.

Courses of Instruction

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

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 above 300 are limited to graduate students.

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

The form 17, 18 indicates that the separate semester courses may be taken independently for credit.

The form 17-18 indicates that the semester courses may not be taken independently for credit and, unless otherwise stated, they must be taken in the sequence indicated.

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

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

Professors Johnstone (Chairman) and J. E. Little; Associate Professor Foote; Assistant Professor Racusen

172 ELEMENTARY BIOCHEMISTRY (3-4) Introductory treatment of the chemistry of carbohydrates, proteins, lipids, enzymes, vitamins, and hormones and their relation to processes of biological significance. Basic principles of analytical procedures involved in biochemical methods. *Prerequisite:* Chemistry 131-132 or 35. Five hours. Dr. 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. The staff.

251 MODERN BIOCHEMICAL TECHNIQUES (1-4) Laboratory work and supplementary lectures on radioisotopic tracer techniques, paper chromatography, radioautography and biochemical preparation. *Prerequisite:* 172 or Medical Biochemistry 201 and departmental permission. Three hours. Dr. Racusen.

252 PLANT BIOCHEMISTRY The composition, energy utilization, and metabolism of plant cells with emphasis on the leaf. Special topics include the chemistry and action of growth substances and herbicides, the origin of life, and comparative biochemistry of plant and animal cells. *Prerequisite:* 172 or Med. Biochem. 201 and departmental permission. Three hours. Dr. Racusen. Alternate years, 1963-64.

253 MICROBIAL BIOCHEMISTRY (2-3) The chemical composition, energy utilization and metabolism of microbial cells. *Prerequisite:* 172 or Medical Biochemistry 201, Botany 116; and departmental permission. Three hours. Dr. Johnstone. Alternate years, 1963-64.

381, 382 GRADUATE SEMINAR Topical seminar with discussion of assigned and collateral reading. Required of departmental graduate students. One hour. The staff.

391, 392, 393, 394 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.

Agricultural Economics

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Associate Professors F. C. Webster (Chairman), Sinclair, Tremblay; Instructor Bevins

2 WORLD AGRICULTURE (2-2) 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. Dr. Tremblay.

21 AGRICULTURE COOPERATION Nature and development of cooperative business enterprises, their organization, financing, and business management. *Prerequisite:* sophomore standing. Two hours. Dr. Webster, Mr. Bevins.

22 AGRICULTURAL BUSINESS (2-2) Mangement problems of rural business firms, especially those handling farm produce and supplies. Theoretical and practical considerations in the organization and operation of agricultural businesses with emphasis on financial and legal organization, accounting and budgeting procedures, and tax policies. *Prerequisite:* sophomore standing. Three hours. Mr. Bevins.

103 RURAL SOCIOLOGY The origin, characteristics, forms of organization, levels of living, mobility, and geographic distribution of rural people, and their relationship to urban society. *Prerequisite:* junior standing or permission of the department. Three hours. Dr. Samenfink.

107 FARM CREDIT (2-2) Types and sources of credit used by farmers. Lending practices and problems of credit agencies. Appraisal of farm real estate and personal property. *Prerequisite:* junior standing. Three hours. Dr. Sinclair.

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. The staff.

201-202 FARM MANAGEMENT (2-2) Organization and operation of a successful farm business. *Prerequisite:* Economics 11-12 or concurrent enrollment; junior standing. Three hours. Dr. Tremblay.

204 MARKETING FARM PRODUCTS (2-2) Distribution of farm products and the problems involved. Emphasis on the Vermont situation. *Prerequisite:* Economics 11-12. Three hours. Dr. Webster.

206 PUBLIC PROBLEMS OF AGRICULTURE Price fluctuations as they affect farming, agricultural legislation, land use, costs of local government, and other problems of contemporary interest to farmers. *Prerequisite:* Economics 11-12. Three hours. Dr. Sinclair.

251 RESEARCH METHODS Philosophy of scientific research, research project organization and procedures, analysis and reporting of research results. *Prerequisite:* Senior standing and permission of the department. Three hours. I or II. Dr. Webster.

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/or economics, senior standing, and permission of the department. Three hours. I or II. Dr. Sinclair.

256 SPECIAL TOPICS IN AGRICULTURAL ECONOMICS Readings and discussion of specific topics in agricultural economics at advanced level. *Prerequisite:* Permission of the department. Three hours. I or II. The staff.

281, 282, 283, 284 AGRICULTURAL ECONOMICS SEMINAR Discussion of problems and research in agricultural economics and other social sciences. *Prerequisite:* senior or graduate standing, or permission of the department. One hour. The staff.

391, 392, 393, 394 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

Associate Professor Gaylord (Chairman); Mr. Davison

102 EXTENSION METHODS (1-2) Methods and techniques of extension teaching. *Prerequisite:* junior standing. Two hours. Mr. Davison. Alternate years, 1963-64.

104 LEADERSHIP TRAINING AND ORGANIZATION METHODS (2-2) Methods and techniques by which officers, group members and administrators may increase the effectiveness of organizations. The course is designed to provide experience in applying the methods treated. *Prerequisite:* junior standing, or permission of department. Three hours. Dr. Gaylord.

150 METHODS OF TEACHING VOCATIONAL AGRICULTURE I (1-2) Making farm surveys; determining needs, problems, and objectives in vocational agriculture for the individual student and the community; planning the course of study and teaching calendars; selecting, planning and supervising farming programs of all-day students; recruiting and enrolling students; orientation to the work of a vocational agriculture teacher. *Prerequisite:* junior standing, or permission of the department. Two hours. Dr. Gaylord.

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 for home visits to supervised farming programs during the summer, and the first week of high school. *Prerequisite:* 251 and 253 or permission of the department. Eight hours. Dr. Gaylord.

251 METHODS OF TEACHING VOCATIONAL AGRICULTURE II (2-2) Selecting teaching positions, analyzing content and method; teaching plans; techniques and instructional aids; advising FFA chapter; supervising farming programs; teaching farm mechanics, evaluating student progress; supervised study, guidance, counseling and maintenance of discipline. *Prerequisite:* senior standing; 104 and 150 or permission of the department. Three hours. Dr. Gaylord.

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 150 or permission of the department. Three hours. Dr. Gaylord.

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 or permission of the department. One hour. Dr. Gaylord.

301, 302, 303, 304 RESEARCH IN AGRICULTURAL EDUCATION Investigation of a research topic under the direction of an assigned staff member. Credit as arranged.

Agronomy

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professor Midgley (Chairman); Associate Professor Wood; Assistant Professors Bartlett and Flanagan

1 INTRODUCTORY CROP SCIENCE Basic principles involved in the establishment and management of agronomic crops. *Prerequisite:* Botany 1 or permission of department. Three hours. Dr. Wood.

21 FIELD CROPS (2-2) Theory and practice of producing, improving and managing field crops. *Prerequisite:* Botany 1 or permission of department. Three hours. Dr. Flanagan. Alternate years, 1963-64.

22 FORAGE AND PASTURE CROPS (2-2) Theory and practice of producing, improving and managing forage and pasture crops including study of silage and hay making. *Prerequisite:* Botany 1 or permission of department. Three hours. Dr. Wood.

52 GENERAL SOILS An introduction to the chemistry, physics, and biology of soil in its role as a substrate for plants. Three hours. Dr. Midgley.

103 SOIL CHEMISTRY AND FERTILITY (2-2) Chemistry of soils and fertilizers in relation to nutrient uptake, plant growth, and the management of soil fertility. Colloidal properties of clays and humus and their effects on soil acidity and ion availability; soil and plant analysis and its application. *Prerequisite:* 52; Chem. 1-2 or 11-12. Three hours. Dr. Bartlett. Alternate years, 1962-63.

105 SOIL PHYSICS (2-2) Physical properties of soils and their influence on plant growth. Retention and movement of heat, gas, water and ions in soils are studied together with management operations such as plowing, tillage, drainage, and irrigation. *Prerequisite:* 52; Physics 1-2 or 5-6, or Chem. 1-2 or 11-12. Three hours. Dr. Bartlett. Alternate years, 1963-64.

153 CONSERVATION OF NATURAL RESOURCES A study of natural resources including soils, water, atmosphere, wild life, and minerals. Interrelationships, management, and the social and economic aspects of depletion and conservation are emphasized. *Prerequisite:* Junior standing. Three hours. Dr. Flanagan. Alternate years, 1963-64.

197, 198 SENIOR RESEARCH (0-3) 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. The staff.

226 SPECIAL TOPICS IN SOILS AND CROPS Correlation of advanced information in soils with that of crops. Soil chemistry, physics, microbiology and soil management are related to crop production, other topics suited to the needs of the students. *Prerequisite:* 103 or 105; Chem. 21 or 35, and permission of department. Three hours. Dr. Midgley. Alternate years, 1962-63.

281, 282 AGRONOMY SEMINAR Discussion of agronomic topics. Students present papers on selected subjects. *Prerequisite:* senior or graduate standing or permission of the department. One hour. The staff.

391, 392, 393, 394 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 and Dairy Science

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Director Dowe (Chairman); Professor Bradfield; Associate Professors Atherton and Smith; Assistant Professors Balch, Fitzsimmons and Merrill

1 INTRODUCTORY DAIRY SCIENCE (2-3) Fundamental principles of management, feeding, selection, and breeding of dairy cattle. Three hours. Mr. Fitzsimmons.

2 MILK AND MILK PRODUCTS (2-2) Introduction to products made from milk. History, development, role of these products in the dairy industry, markets, and principles of processing. Three hours. Mr. Bradfield.

4 INTRODUCTORY ANIMAL SCIENCE (1-3) Size, scope and functions of our modern livestock industry. The types and breeds of livestock of major economic importance; horses, beef cattle, sheep, and swine. Practical application of selection and management principles. Two hours. Mr. Balch.

22 DAIRY PRODUCTS JUDGING AND SELECTION (2-1) Critical study of the various dairy products; relation of judging and selection to consumer acceptance; market standards and grading. *Prerequisite:* sophomore standing. Two hours. Mr. Bradfield.

44 DAIRY CATTLE JUDGING (0-6) Judging, fitting, and showing of dairy cattle. *Prerequisite:* 1. Two hours. Mr. Fitzsimmons.

93 LIVESTOCK PRODUCTION (2-3) Production and management of horses, sheep, swine and beef cattle. *Prerequisite:* 4. Three hours. Mr. Balch.

104 DAIRY TESTING AND QUALITY CONTROL (2-3) 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. *Prerequisite:* Chem. 2. Three hours. Dr. Atherton.

105 FEEDS AND FEEDING (3-2) Fundamentals of livestock feeding and evaluation of livestock rations with emphasis on ingredients and nutritive value. *Prerequisite:* Chem. 2. Four hours. Dr. Smith.

109 DAIRY BACTERIOLOGY (1-4) Relation of microorganisms to milk and milk products, methods of examination and control. Three hours. Dr. Atherton.

114 MANUFACTURED DAIRY PRODUCTS (2-3) Methods and technical problems in manufacture of products made from milk. *Prerequisite:* 2, junior standing. Three hours. Dr. Atherton. Alternate years, 1963-64.

116 DAIRY PLANT ENGINEERING (2-2) Theory and practical problems in selection and use of dairy processing equipment. *Prerequisite:* Physics 5; junior standing. Three hours. Mr. Bradfield, and Agricultural Engineering Department. Alternate years, 1963-64.

153 MILK PROCESSING (2-2) Technical aspects of producing and processing milk and cream; sanitary regulations and laboratory tests. *Prerequisite:* permission of the department. Three hours. Mr. Bradfield.

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. The staff.

206 ANIMAL NUTRITION Nutrients, their function and utilization, and requirements for growth, reproduction and lactation. *Prerequisite:* 105; Chem. 131-132 or 35. Three hours. Dr. 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. Bradfield. Alternate years, 1963-64.

251 DAIRY CATTLE AND MILK PRODUCTION (2-2) Physiology of milk secretion; practical application of feeding and management principles. *Prerequisite:* 105; senior standing or permission of department. Three hours. Mr. Fitzsimmons.

256 DAIRY PLANT MANAGEMENT Organization and operation of milk processing and manufactured milk products plants. *Prerequisite:* 153; Economics 11-12; junior standing. Two hours. Mr. Bradfield. Alternate years, 1962-63.

260 DAIRY CATTLE BREEDING (2-3) Theory and application of genetic principles to breeding of dairy cattle. *Prerequisite:* Zoology 115; senior standing or permission of department. Three hours. Mr. Fitzsimmons.

281, 282 ANIMAL AND DAIRY SCIENCE SEMINAR Reports and discussions of problems and special investigations in selected fields. One-two hours. Maximum credit 1 hour senior, 3 hours graduate. The staff.

391, 392, 393, 394 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.

116 POULTRY DISEASES (2-2) Anatomy and Physiology of the fowl. General principles of sanitation. Major diseases of chickens and turkeys. *Prerequisite:* Botany 116. 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. The staff.

391, 392, 393, 394 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.

Art

COLLEGE OF ARTS AND SCIENCES

Professors Colburn[1] *(Chairman), Kent; Assistant Professors Janson and Mills; Instructor Aschenbach*

1 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. Dr. Kent.

2 RENAISSANCE ART The origin and development of the Renaissance in painting, sculpture, and architecture in Italy and its spread throughout Europe, from the early 15th century to the 17th century and the Baroque. Studies of original material in the museum collection. *Prerequisite:* sophomore standing or permission of instructor. Three hours. Dr. Janson. Alternate years, 1962-63.

3 MEDIEVAL ART Architecture, sculpture, and painting in Western Europe from the year 1000 to the early 15th century. *Prerequisite:* sophomore standing or permission of instructor. Three hours. Dr. Janson. Alternate years, 1962-63.

4 MODERN ART Contemporary trends in painting and sculpture from the period of French Impressionism; emphasis on European influences. *Prerequisite:* junior standing. Three hours. Mrs. Mills.

5 ROCOCO AND ROMANTIC ART Architecture, painting and sculpture from the late Baroque to the Age of Steam, 1700-1850. Studies of original material in the museum collection. *Prerequisite:* sophomore standing or permission of the instructor. Three hours. Dr. Janson. Alternate years, 1963-64.

6 MODERN ARCHITECTURE Major masters and movements in modern architecture from 1850 to the present. *Prerequisite:* sophomore standing or permission of instructor. Three hours. Dr. Janson. Alternate years, 1963-64.

7 PAINTING IN AMERICA Development of painting in America from colonial times to 1900. Social and economic forces which at times channelled American artistic expression. *Prerequisite:* sophomore standing. Two hours. Mr. Colburn.

8 AMERICAN ARCHITECTURE American building and design from colonial times to Frank Lloyd Wright. Major trends and their reflection on the Vermont scene. *Prerequisite:* sophomore standing. Two hours. Dr. Janson.

11,12 ARTS AND CRAFTS Experiences in functional design using various media to develop good taste and creative ability. Lectures relate the history and appreciation of arts and crafts to students' work. *Prerequisite:* sophomore standing. Three hours. Mrs. Mills.

21, 22 DRAWING AND PAINTING Composition and painting techniques. Emphasis on a clearer understanding of modern schools of painting and on individual development. By permission, the course may be taken a second time for credit. *Prerequisite:* sophomore standing. Three hours. Mr. Colburn.

[1] Sabbatical leave 1962-63.

41, 42 SCULPTURE An introductory course in sculpture, dealing with both formal and technical problems. *Prerequisite:* sophomore standing. Three hours. Mr. Aschenbach.

For courses in Art Education, see Elementary Education 170.

Botany

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professors Marvin (Chairman), Gershoy, Sproston, and Taylor; Associate Professor Raynor; Assistant Professors Cosenza and Vogelmann

1 INTRODUCTORY BOTANY (3-3) Fundamental principles of biology illustrated by the morphology, physiology, and reproduction of vascular plants. Study of forms and functions, leading to an understanding of the plant as a dynamic unit. Four hours. I, II. The staff. (An equivalent course is offered in Summer Session.)

2 GENERAL BOTANY (2-4) Plant groups, their relationships to each other. Plant distribution, geographical and historical. The role of plants in the world today. *Prerequisite:* 1. Four hours. Dr. Raynor.

S10 FIELD BOTANY (2-4) Native plants and their habitats. Field identification and laboratory study. A projected series of courses encompassing the plant kingdom. Four hours. The staff. Summer Session only.

101 ECONOMIC BOTANY (2-3) Relation of plants to human history and contemporary life. Botanical and economic aspects of plants as sources of foods, drugs, and other products of importance in everyday living. Library study, periodic reports and visits to plant utilizing industries replace formal laboratory. *Prerequisite:* 1; junior standing or permission of the department. Three hours. Dr. Taylor. Alternate years, 1963-64.

103 PLANT PHYSIOLOGY (2-6) Mechanisms of absorption, translocation, synthesis, and utilization of materials. The role of internal and external factors in growth. *Prerequisite:* 1; credit or concurrent enrollment in Chem. 35 or 131. Five hours. Dr. Marvin.

110 TAXONOMY (1-4) Principles of classification; phylogeny of vascular plants, the evolution of the angiosperms; the species concept; variation; development and migration of floras; modern techniques and biosystematics. *Prerequisite:* 1; junior standing. Three hours. Dr. Vogelmann. Alternate years, 1963-64.

113 ECOLOGY (2-2) Structure and organization of plant communities; succession, climax formations; effect of environmental factors; quadrating and other field techniques. *Prerequisite:* 103 or permission of the department; junior standing. Three hours. Dr. Vogelmann. Alternate years, 1962-63.

116 INTRODUCTORY MICROBIOLOGY (2-4) Systematic study of microorganisms, predominently bacteria, emphasizing fundamental principles and basic laboratory techniques. Relationships of microbiology to public health, food spoilage, fermentations, soil enrichment, and sanitation. *Prerequisite:* 1 or Zool. 1, or permission of the department; Chem. 1-2. Four hours. Dr. Cosenza.

117 PLANT PATHOLOGY (2-4) Diagnosis, life history, and control of plant diseases caused by fungi, viruses, bacteria, nematodes. *Prerequisite:* 1. Four hours. Dr. Sproston.

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 department. *Prerequisite:* senior standing. Three hours. The staff.

251 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 or permission of the department. Four hours. Dr. Taylor. Alternate years, 1962-63.

253 FUNGI (2-4) The reproductive processes of the common molds, yeasts, and actinomycetes and their classification. Physiological studies; antibiosis. *Prerequisite:* 103 or permission of the department. Four hours. Dr. Sproston. Alternate years, 1963-64.

255 GENETICS AND CYTOGENETICS (3-2) Fundamental principles of genetics. Analysis of concepts of variation, mendelian inheritance, cytoplasmic inheritance, gene action, population genetics, and biometry; meiotic chromosome behavior in diploids, polyploids and species hybrids. *Prerequisite:* 1; Zool. 1; Bot. 2 and a second course in Zoology, 31 or 41, are strongly recommended; senior standing. Four hours. Dr. Gershoy.

256 CYTOLOGY (2-4) Dynamics of the protoplast; nuclear division, gamete formation, syngamy and substitute methods of reproduction. Interrelation of chromosomal and genetic phenomena. *Prerequisite:* 255 or Zool. 115; Chem. 131-132 or 35 or permission of the department. Four hours. Dr. Gershoy. Alternate years, 1963-64.

258 PLANT GROWTH (2-4) The nutrition of plant cells, growth hormones, cyclic variation of environmental factors, morphogenesis. *Prerequisite:* 103; Chem. 131-132 or 35 or permission of the department. Four hours. Dr. Marvin. Alternate years, 1962-63.

259 MORPHOLOGY AND EMBRYOLOGY (2-4) Comparative study of body form, ontogeny of reproductive structures and phylogenetic relationships in the embryophytes; emphasis on seed plants. *Prerequisite:* 2; senior standing or permission of the department. Four hours. Dr. Raynor. Alternate years, 1962-63.

381, 382 BOTANY SEMINAR A topical seminar with discussion of assigned and collateral reading. Required of botany graduate students. One hour. The staff.

391, 392, 393, 394 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.

Chemistry

COLLEGE OF TECHNOLOGY

Professors Cook (Chairman), Braun and Gregg[1]; Associate Professors Crooks and Whitcher; Assistant Professors Brown, Criss, Flanagan, Krapcho, Kuehne and Lucarini

Note: Credit cannot be granted for: 1-2 and also 11-12; 3-4 and also 1-2; 35 and also 131-132; 140 and also 141-142.

[1] Sabbatical leave 1962-63.

1-2 INTRODUCTORY CHEMISTRY (3-3) General inorganic chemistry. Lectures, recitations and laboratory, including elementary qualitative analysis. Acceptable prerequisite to advanced courses. *Prerequisite:* at least one year of high school mathematics. Four hours. Dr. Gregg, Dr. Crooks and Miss Brown.

3-4 OUTLINE OF CHEMISTRY (3-2) 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. Dr. Crooks and staff.

11-12 GENERAL CHEMISTRY (3-6) Lectures, recitations and laboratory, including general experiments in elementary qualitative analysis. Recommended for those concentrating in physical science. *Prerequisite:* at least one year of high school mathematics. Five hours. Dr. Cook 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. The staff.

21-22 ELEMENTARY QUANTITATIVE ANALYSIS (2-6) Theory and practice of quantitative methods, gravimetric and volumetric. Theoretical discussion of indicators, buffers and pH. *Prerequisite:* 1-2 or 11-12. Four hours.[1] Dr. Whitcher and Mr. Lucarini.

35 OUTLINE OF ORGANIC CHEMISTRY (3-4) Organic chemistry primarily for students in agriculture, home economics and nursing. *Prerequisite:* 1-2 or 11-12. Five hours. Dr. Krapcho and staff.

131-132 ORGANIC CHEMISTRY (3-6) Organic chemistry for chemistry majors, premedical students and those concentrating in the biological and physical sciences. *Prerequisite:* 1-2 or 11-12; 21-22 recommended. Five hours.[2] Dr. Braun, Dr. Krapcho and 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. *Prerequisites:* 1-2, Physics 5-6 or the equivalent. Three hours. Dr. Cook.

141-142 PHYSICAL CHEMISTRY (3-6)[3] The kinetic theory and its application to gases; thermodynamics and the application to liquids and solutions; chemical equilibria; fundamentals of electrochemistry and atomic structure. *Prerequisite:* Physics 21-22; Math. 12, 21; Chem. 1-2 or 11-12; Chem. 21-22 recommended. Five hours.[2] Dr. Criss and Dr. Flanagan.

Advanced Inorganic Chemistry

108 INORGANIC PREPARATIONS Laboratory preparations of inorganic compounds. *Prerequisite:* 1-2. Two hours. Dr. Crooks.

[1] May be taken by certain students for three hours credit, with only one three-hour laboratory period.

[2] May be taken by certain students for four hours credit, with only one three-hour laboratory period.

[3] May be taken without the laboratory work for three hours credit by permission of the department.

212 ADVANCED INORGANIC CHEMISTRY Chemistry of the elements; relation of structure to properties and to coordination compounds, complex ions, radioactivity, and stereoisomerism. *Prerequisite:* credit or concurrent enrollment in 141-142. Three hours. Dr. Criss.

Advanced Analytical Chemistry

221 ADVANCED THEORETICAL CHEMISTRY Selected topics in theoretical chemistry with reference to analytical applications. *Prerequisite:* credit or concurrent enrollment in 141-142. Three hours. Dr. Whitcher.

Advanced Organic Chemistry

231-232 SPECIAL TOPICS IN ORGANIC CHEMISTRY An elaboration of structural and configurational isomerism, modern acid-base theory, molecular rearrangements and organic free radicals. *Prerequisite:* 131-132; credit or concurrent enrollment in 141-142. Three hours. Dr. Gregg. Alternate years, 1962-63.

233-234 PHYSICAL ORGANIC Physical organic chemistry, emphasis on structural aspects and reaction mechanisms. *Prerequisite:* 131-132; credit or concurrent enrollment in 141-142. Three hours. Dr. Cook or Krapcho. Alternate years, 1963-64.

237 IDENTIFICATION OF ORGANIC COMPOUNDS AND ADVANCED TECHNIQUES IN ORGANIC CHEMISTRY (3-8) Methods, both chemical and physical, of identifying organic compounds, their separation, and the determination of their functional groups. Experiments with infrared and ultraviolet spectroscopy, vapor phase chromatography, thin layer, paper and column chromatography, selective oxidations and reductions, synthetic reactions, isolation and purification of a natural product. *Prerequisite:* 131-132; credit or concurrent enrollment in 141-142. Five hours. Dr. Krapcho or Dr. Kuehne.

238 ORGANIC REACTIONS Discussion, from the preparative viewpoint, of applications, limitations, and experimental conditions of the more important reactions of organic chemistry. *Prerequisite:* 131-132; credit or concurrent enrollment in 141-142. Three hours. Dr. Krapcho or Kuehne. Not offered every year.

251, 252 ADVANCED ORGANIC CHEMISTRY A more detailed description of reactions encountered in basic organic chemistry. Topics include mechanisms of important classes of organic reactions, condensation reactions, synthetic methods, stereochemistry, electronic theory, tautomerism, free radicals; kinetic, radioisotope and stereochemical approaches to mechanism studies, and the application of acid-base theory to organic mechanisms. *Prerequisite:* 131-132; credit or concurrent enrollment in 141-142, 251 for 252. Three hours. Dr. 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:* 251-252; or concurrent enrollment in 252 or the equivalent with permission of the instructor. Three hours. Alternate years, 1962-63. Dr. Kuehne.

334 NATURAL PRODUCTS–THE TERPENES Chemistry of mono-sesqui-di and triterpenes, including degradations, structure proofs, total syntheses, rearrangements reactions and biogenesis. *Prerequisite:* as for chemistry 332. Three hours. Dr. Kuehne. Alternate years, 1963-64.

Advanced Physical Chemistry

247-248 ADVANCED PHYSICAL CHEMISTRY Higher level consideration of the topics discussed in 141-142. Emphasis on thermodynamics, kinetics and spectra. Statistical mechanics and quantum theory introduced. *Prerequisite:* 141-142; concurrent enrollment in Math. 22. Three hours. Dr. Flanagan.

246, 249 SPECIAL TOPICS IN PHYSICAL CHEMISTRY Advanced level discussion of specific topics in physical chemistry; molecular and atomic spectra, theory of solutions, quantum theory or statistical mechanics. *Prerequisite:* 247-248 or its equivalent. Three hours. The staff.

341 CHEMICAL THERMODYNAMICS Systematic study of the application of thermodynamics in the solution of chemical problems. *Prerequisite:* 247-248. Three hours. Dr. Criss or Dr. Flanagan.

342 CHEMICAL KINETICS Velocity of chemical reactions in homogeneous and heterogeneous systems. *Prerequisite:* 247-248. Three hours. The staff.

Seminars and Research

Seminars are required of graduate students and juniors and seniors concentrating in chemistry.

181-182 JUNIOR SEMINAR (2-0) One hour. Mr. Lucarini.

183-184 SENIOR SEMINAR (2-0) One hour. The staff.

197-198 SENIOR RESEARCH (0-6, 0-12) The student elects a field for special study in inorganic, analytical, physical or organic chemistry and works under the direction of a staff member. Findings submitted in written form and suitably bound. Required of seniors in the Chemistry Curriculum. Two hours. I. Four hours. II. The staff.

381, 382, 383, 384 GRADUATE SEMINAR (2-0) One hour. The staff.

391, 392, 393, 394 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.

Classics

COLLEGE OF ARTS AND SCIENCES

Professor Kent (Chairman); Associate Professors Pooley and Gilleland; Assistant Professor Davison

Greek

1-2 ELEMENTARY GREEK Essentials of Attic Greek. Prose compositions and selected readings from Greek authors. No prerequisite. Four hours. Dr. Gilleland.

11-12 INTERMEDIATE GREEK Plato's *Euthyphro* and *Apology;* selections from the *Iliad* and the *Odyssey. Prerequisite:* 1-2 or its equivalent. Three hours. Mr. Pooley.

111-112 PROSE COMPOSITION *Prerequisite:* 11-12. One hour. Dr. Gilleland.

201 GREEK ORATORS Selected speeches of Lysias and Demosthenes. *Prerequisite:* 11-12. Three hours. Dr. Gilleland. Alternate years, 1962-63.

202 GREEK COMEDY Two plays of Aristophanes. *Prerequisite:* 11-12. Three hours. Dr. Davison. Alternate years, 1962-63.

203 GREEK HISTORIANS Thucydides, Books I and II; selections from Herodotus and Xenophon's *Hellenica. Prerequisite:* 11-12. Three hours. Dr. Kent. Alternate years, 1963-64.

204 GREEK TRAGEDY Sophocles' *Antigone* and Euripides' *Medea,* or two equivalent plays. *Prerequisite:* 11-12. Three hours. Dr. Davison. Alternate years, 1963-64.

205 GREEK PHILOSOPHERS Plato, Republic, Books I and II; selections from the pre-Socratics and from Aristotle. *Prerequisite:* 11-12. Three hours. Dr. Kent Alternate years, 1963-64.

252 GREEK EPIGRAPHY Introduction to Greek inscriptions, with emphasis on those of historical interest. *Prerequisite:* 201 or 203. Three hours. Dr. Kent. Alternate years, 1962-63.

381, 382 SEMINAR Graduate level study of Greek authors not read in the candidate's undergraduate program. Credit as arranged. The Staff.

391, 392, 393, 394 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 Literature in Translation, see General Literature 51; for Greek Philosophy, see Philosophy 107.

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. Mr. Pooley.

11-12 INTERMEDIATE LATIN Extensive review of Latin syntax. Cicero, *In Catilinam I, II; Pro Archia.* Vergil, *Aeneid,* Books I and II. *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. Drs. Gilleland and Kent.

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. Dr. Kent.

[1] Students who have completed two years of high school Latin more than two years prior to their entrance into the University may be permitted by action of the department to enroll in Latin 1-2 for credit.

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. Dr. Davison.

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

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

223 ADVANCED PROSE COMPOSITION *Prerequisite:* 111-112. Three hours. Mr. Pooley. Alternate years, 1963-64.

251 ROMAN LETTERS Selected letters of Cicero, Pliny, and Fronto. *Prerequisite:* 203, 204 or concurrent enrollment. Three hours. Mr. Pooley. Alternate years, 1963-64.

252 COMEDY Two plays of Plautus and Terence. Development of this literary form. *Prerequisite:* 203, 204 or concurrent enrollment. Three hours. Mr. Pooley. Alternate years, 1963-64.

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. Dr. Gilleland. Alternate years, 1962-63.

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. Dr. Kent. Alternate years, 1962-63.

256 SATIRE Selections from Horace and Persius; Juvenal, *Satires,* I, III, X. Development of this literary form. *Prerequisite:* 203, 204 or concurrent enrollment. Three hours. Dr. Gilleland. Alternate years, 1962-63.

381, 382 SEMINAR Graduate level study of Latin authors not read in the candidate's undergraduate program. Credit as arranged. The staff.

391, 392, 393, 394 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 Latin Literature in Translation, see General Literature 52; for The Teaching of Latin, see Secondary Education 252.

Commerce and Economics

COLLEGE OF TECHNOLOGY

Professors Nadworny (Chairman), Greif, Lohman[1]*, and Woodard; Associate Professors Maybury*[2]*, Nyquist, Dellin, Huq, LeSourd, and Severance; Assistant Professors Pratt, Wick, and Wolotkin; Instructors Karatzas, and Eldridge*

1-2 WORLD ECONOMIC GEOGRAPHY Geography as a basis for economic development; importance of resources to production, exchange, consumption, population, and national economies. Three hours. Dr. Woodard and Dr. Dellin.

[1] Sabbatical leave 1961-62.
[2] Sabbatical leave second semester 1961-62.

11-12 PRINCIPLES OF ECONOMICS Fundamental economic principles as an aid to the understanding of modern economic society. *Prerequisite:* sophomore standing. Three hours. The staff.

13-14 PRINCIPLES OF ACCOUNTING (2-4) Problems of financial control of business, with laboratory practice. *Prerequisite:* sophomore standing. Four hours. Messrs. Nyquist and Wolotkin.

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. *Prerequisite:* sophomore standing. Concurrent enrollment in 11-12 recommended. Three hours. Dr. Woodard and Mr. Eldridge.

49 GENERAL TYPING Typing techniques and mastery of the keyboard to develop accuracy in typing skill for personal use. Open to all students except secretarial studies majors and business education teacher trainees. Two hours. I and II. Dr. Maybury.

136 ALPHABETIC SHORTHAND AND TRANSCRIPTION Principles of writing shorthand, using letters rather than the traditional shorthand symbols. Writing combined with typing skill through instruction in transcribing on the typewriter. For students who wish skill competency for general or vocational use in a short time. *Prerequisite:* senior standing or consent of instructor. Four hours. Dr. Maybury.

165, 166 BUSINESS COMMUNICATIONS Principles involved in solving business problems through written communication. Format and composition are considered. Practice in writing letters and reports required. *Prerequisite:* junior standing. Three hours. Dr. Maybury.

169 OFFICE MANAGEMENT Organization and supervision of office activities from the standpoint of the office manager; principles and procedures of office job analysis; selection and training of personnel; office structure with regard to production standards, office forms, systems, equipment and supplies, flow of work, physical layout; cost control. *Prerequisite:* senior standing. Three hours. Dr. Maybury.

Banking, Finance, and Insurance

109, 110 BUSINESS LAW I First Semester: fundamental legal concepts of the American system of law as related to business, as the law of contracts, sales, bailments, and negotiable instruments. Second semester: the legal aspects of business with reference to the law of agency, partnerships, and corporations. *Prerequisite:* 11-12. Three hours. Mr. Wick.

111 ECONOMICS OF LIFE INSURANCE Types of life insurance contracts and their application; premium and reserve computation, social security, and other forms of life insurance. *Prerequisite:* 11-12 and 13-14. Three hours. Dr. Lohman.

112 PROPERTY AND CASUALTY INSURANCE Principles underlying property and casualty insurance. *Prerequisite:* 11-12 and 13-14. Three hours. Dr. Lohman.

120 BUSINESS LAW II Law in relation to financial instruments; documents of title for collateral security, chattel mortgages, real estate mortgages, and suretyship and guaranty. *Prerequisite:* 109. Two hours. Mr. Wick.

201-202 MONEY AND BANKING Functions of money, credit, and banking in modern economic society. The theory of the internal and external value of money; control of the money market; interrelationship of monetary and fiscal policies and their effects upon national and international price movements. *Prerequisite:* 11-12. Three hours. Dr. Lohman and Mr. Karatzas.

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:* 11-12. Three hours. Dr. LeSourd.

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:* 11-12. Three hours. Dr. LeSourd.

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:* 11-12, and a year of history. Three hours. Dr. Huq.

206 SECURITIES MARKETS Organization and operation of organized and over-the-counter securities markets; types of securities; primary and secondary markets in the process of capital formation; securities price behavior; government and selfregulation of securities markets. *Prerequisite:* 11-12 and 13-14. Three hours. I. Dr. Lohman.

207 FINANCIAL MANAGEMENT The finance function in business: funds procurement and their effective utilization. Case analyses. *Prerequisite:* 11-12 and 13-14 or equivalent. Three hours. II. Dr. Lohman.

208 INVESTMENT ANALYSIS Standards used in the analysis of securities; supervision of individual and institutional security investments; current factors influencing security values. *Prerequisite:* 206. Three hours. Dr. Lohman.

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:* 11-12. Three hours. Mr. Greif.

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. Mr. Greif.

123 PERSONAL SALESMANSHIP A practical approach to modern salesmanship through class participation and individual demonstration, emphasizing the approach to, presentation, and close of the sale. *Prerequisite:* 121. Three hours. Mr. Greif.

131 SALES MANAGEMENT New and established trends of the sales manager's job. Method of selection, training, testing, compensation, and control; including marketing policies and the coordination of related departmental functions. *Prerequisite:* 121. Three hours. Mr. Greif.

132 FUNDAMENTALS OF ADVERTISING Advertising as an economic and social influence. Principles and techniques of copy preparation, media of selection and advertising activities. Practice in preparation of advertising copy and layout. *Prerequisite:* 121. Three hours. Mr. Greif.

228 Analysis of Current Marketing Developments Exploration of current marketing developments to gauge their force, direction, and consequences. Topics include: the nature of changes and concentrations in population; income levels; decentralization of shopping centers; government regulation of business and the maintenance of competition. Individual projects required. *Prerequisite:* 121. Three hours. Mr. Greif.

329 Marketing Management Integration and coordination of the marketing function: planning and developing the product; testing, branding, packaging, and labeling; sales program and campaign; sales organization and management; and, control of sales functions. Case analyses. *Prerequisite:* 121 and 128. Three hours. Mr. Greif.

Industrial and Personnel Management

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:* 11-12. Three hours. Dr. Nadworny.

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:* 11-12. Three hours. Dr. 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. Dr. Nadworny.

243 Developments in Labor-Management Relations Analysis of issues in collective bargaining: impact of long-term agreements; shifting wage and related benefits demands; impacts of shifting industrial and occupational structures on collective bargaining; interpretation of federal labor laws in relation to collective bargaining procedures; implications, and limits, of mediation and arbitration in disputes settlement. *Prerequisite:* 242. Three hours.

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. Dr. 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, or consent of instructor. Three hours. Dr. Nadworny.

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. Dr. 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 or consent of instructor. Three hours.

For Motion and Time Study and Plant Organization, required of students in this option, see Engineering, Mechanical (M.E. 175, 176).

Accounting

161 INTERMEDIATE ACCOUNTING Accounting records, end-of-year procedures, statements, analysis of working capital, profit and loss analysis, corporations, current and fixed assets, investments, liabilities, reserves, determination of net income, and the statement of application of funds. *Prerequisite:* 13-14. Three hours. Mr. Nyquist.

162 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:* 161. Three hours. Mr. Nyquist.

163 FINANCIAL STATEMENT ANALYSIS Analytical study of the balance sheet and income statement. Trend percentages, common-size statements, working capital analysis, ratios, and other methods of analysis. *Prerequisite:* 13-14. Three hours. Mr. Wolotkin.

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:* 13-14. 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:* 162. Three hours. Mr. Nyquist.

272 COST ACCOUNTING Manufacturing costs; nature and uses of cost accounting; job-lot cost plan; cost accounting for materials; labor; factory burdens; process manufacturing costs; operational cost accounting; cost standards; residual and by-products; joint products. *Prerequisite:* 13-14. Three hours. Mr. Wolotkin.

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:* 162. Three hours. Mr. Nyquist.

353 BUDGET PROCEDURE AND CONTROL Principles and procedures of preparing budgets and analyzing performance under a budgetary program. De-

velopment 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 Social and economic aspects of transportation problems as revealed by analysis of the nature, history, and problems of transportation agencies of the United States. *Prerequisite:* 11-12; Pol. Sci. 1, 2. Three hours. Staff.

183 ECONOMIC LIFE AND GOVERNMENT CONTROL Economic causes and consequences of government regulation and control of business activities. *Prerequisite:* 11-12; Pol. Sci. 1, 2. Three hours. Staff.

187, 188 ELEMENTARY STATISTICS (2-2) Theory and interpretation of statistics. First semester: data collection, graphical presentation, frequency distribution, measures of central tendency and dispersion, tests of significance, and analyses of variance. Second semester: index number theory and construction, time series, the fitting of linear and non-linear trend lines, and two-variable, multiple and partial correlation. *Prerequisite:* 11-12; Math. 7, 8 or 11. Three hours. Dr. Huq.

286 ECONOMIC ANALYSIS Analysis of consumer demand, supply, market price under competitive conditions and monopolistic influences, and the theory of income distribution. *Prerequisite:* 11-12 and one other semester course. Staff.

288 QUALITY CONTROL (2-2) Application of statistical tools to industrial problems. Control charts, sampling plans, index numbers, and measurement of trends. *Prerequisite:* 187. Three hours. Dr. Huq.

290 THE SOVIET ECONOMY Economic development of the USSR, resource planning and sector growth, geonomic foundation, and foreign economic policies. Seminar. *Prerequisite:* six hours of advanced courses in economics, and six hours of political science or European history; senior standing. Three hours. Dr. 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:* six hours of advanced courses in economics and six hours of political science or European history; senior standing. Three hours. Dr. 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:* 11-12. Three hours. Dr. Huq.

293-294 MONEY, INCOME AND PRICES Analysis and description of cyclical fluctuations. Second semester: problems of cyclical control, employment, price levels, overall planning. *Prerequisite:* 201-202 or concurrent enrollment. Dr. LeSourd.

295 HISTORY OF ECONOMIC THOUGHT Development of economic ideas from classical antiquity to modern times. The Classical, Historical, Socialist, Op-

timist, Marginalist, and Neoclassical Schools. *Prerequisite:* 286 or 201-202 and consent of instructor. Three hours. Dr. Huq.

296 MODERN ECONOMIC THOUGHT Survey of the leading 20th Century economists and their doctrines including: J. B. Clark, Thorstein Veblen, Alfred Marshall, W. C. Mitchell, J. A. Hobson, J. M. Keynes and J. R. Hicks. *Prerequisite:* 295. Three hours. Dr. Huq.

297, 298 SEMINAR For students concentrating in the department. Review of recent books and periodical literature; discussions of topics of contemporary interest; student reports based upon personal investigation. *Prerequisite:* senior standing; consent of chairman. Three hours. Staff.

300, 301 INDEPENDENT READING AND RESEARCH Designed to meet the special research problems of graduate students. Consent of the department required. Hours to be arranged. The staff.

341 MANAGERIAL ECONOMICS Techniques used in management decision-making and forward planning. Demand and cost analysis, forecasting methods, capital management and budgetary planning. *Prerequisite:* 187, 188 or its equivalent and 286. Three hours. Staff.

342 OPERATIONS RESEARCH FOR MANAGERIAL ECONOMICS Application of advanced quantitative methods to operating problems in business. Operations research techniques including programming, both linear and curvilinear, and queuing theory are presented. *Prerequisite:* 341 and mathematics 7, 8 or 11, 12. Three hours Staff.

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 and decision-making. *Prerequisite:* 187, 188 or its equivalent and mathematics 7, 8 or 11, 12. Three hours. Dr. Huq.

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. Dr. Huq.

391, 392, 393, 394 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.

Secretarial Studies

Students who have had instruction in typing and shorthand in high school will be enrolled in the proper level typing and shorthand courses on the basis of qualifying tests administered during the second semester by the department.

133 ELEMENTARY TYPING Typing technique for beginners. Emphasis on speed and accuracy. Experience with business material, letters and reports, tabulation, typing from rough draft. *Prerequisite:* junior standing or the consent of the instructor. Three hours. Miss Pratt.

134 INTERMEDIATE TYPING Further development in typing business forms, statistical matter, and documents. *Prerequisite:* 133 or the consent of the instructor. Three hours. Miss Pratt.

135 ADVANCED TYPING Development of typing skills in the production of advanced business projects. Speed and accuracy in production emphasized. *Prerequisite:* 134 or the consent of the instructor. Three hours. Miss Pratt.

137 ELEMENTARY SHORTHAND Gregg shorthand writing for the beginner. Shorthand fundamentals and a basic shorthand vocabulary. Application to business material. *Prerequisite:* junior standing or consent of the instructor. Four hours. Miss Pratt.

138 INTERMEDIATE SHORTHAND Development of the principles of Gregg shorthand writing. Writing speed and reading ability through dictation and transcription of business material. *Prerequisite:* 137 or the consent of the instructor. Four hours. Miss Pratt.

139 ADVANCED SHORTHAND Advanced Gregg shorthand writing; development of word construction in an extensive vocabulary, dictation and transcription practice with a variety of more difficult business and professional material. *Prerequisite:* 138 or the consent of the instructor. Four hours. Miss. Pratt.

140 TRANSCRIPTION Correlating the skills of shorthand and typing, in transcription of a variety of business problems. *Prerequisite:* 135 and 139 or the consent of the instructor. Seven hours. Miss Pratt.

179 SEMINAR Study of basic principles governing secretarial activity on the executive level. A problem solving experience which relates office tasks in proper sequence as found in the functioning office. Development of judgment, initiative, and responsibility for making decisions and executing them. Visits of specialists in business and field trips for observation of offices are arranged. *Prerequisite:* senior standing. Three hours. Dr. Maybury.

180 EXECUTIVE SECRETARIAL PROCEDURES Synthesis of skills and job knowledge obtained from professional courses efficiently applied to a variety of secretarial duties.

Dental Hygiene

SCHOOL OF DENTAL HYGIENE

Dr. Sawabini (Chairman); Assistant Professor Quinby; Instructors Conklin, Faigel, M. C. Heininger, P. L. Heininger, Howe, Reiman, Slack, and Bannister

1 ORIENTATION TO DENTAL HYGIENE (1-0) The dental hygiene movement; history, growth, status of dental hygienist, scope of operations, standards and ethics, personal qualifications and personality traits. One hour. Miss Quinby.

2 INSTRUMENTATION (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 staff.

11 DENTAL 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.

21 GENERAL AND DENTAL HISTOLOGY AND EMBRYOLOGY (1-2) 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. Two hours. Dr. Reiman.

32 First Aid (1-0) Basic principles of first aid taught to prevent and cope with emergencies that arise in the dental office. One hour. Mrs. Heininger.

53-54 Oral Pathology (2-0) (1-0) General pathology of the more common diseases affecting the human body. Pathology of the teeth and their supporting structures. Two hours, first semester; one hour, second semester. Dr. Sawabini.

52 Pharmacology and Anesthesiology (2-0) The reactions and uses of drugs. Anesthesia, general and local, as used in dental practice. Two hours. 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. Miss Quinby and staff.

74 Public Health (2-0) Public health as it applies to community sanitation; communicable disease control; organization, powers and function of health departments and voluntary health agencies; relation of dentistry to public health. Two hours. Dr. Howe.

81-82 Dental Hygiene Clinic Practice (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 staff.

91-92 Dental Assisting, Dental Materials, Ethics and Office Management (1-0) Principles of professional ethics and economics; office management and essentials of practice building; dental assistant and materials used in dental practice. One hour. Dr. Conklin.

Education

COLLEGE OF EDUCATION AND NURSING

Professors King (Chairman), Bennett, Lidral, and Pappoutsakis; Associate Professors Gilleland, Rippa and Steeves; Assistant Professors Adams, Boller, Christensen, Keach, Keppel, Mehorter, Mills, Schultz, Start, Weinrich, and Wills; Instructors Collins, Fuller, McDonald, and Schelper[1]

1, 2 Orientation to Education Orientation to education as a career; consideration of courses and experiences in education curricula, introduction to education as a profession. One hour; two hours. The staff.

41, 42, 43, 44 Techniques of Coaching—Football; Track and Cross Country; Basketball; Baseball Lecture and laboratory. *Prerequisite:* Sophomore standing. Credit only for students in the physical education minor. One hour. Staff.

[1] Resigned Jan. 1962.

116 HEALTH EDUCATION Role of the classroom teacher in the program of school and community health. Physical development and well-being of the human body. Two hours or three hours. Mr. Christensen.

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. *Prerequisite:* Junior standing. Three hours. Mr. Mehorter and Dr. Rippa.

152 METHODS OF TEACHING SPORTS Fundamental skills, techniques, and teaching methods in team, dual, and individual sports. One hour. The staff.

153 METHODS OF TEACHING DANCE Methods, procedures, and devices in teaching creative rhythm activities and all forms of dance; folk, square, ballroom and modern, for men and women. One hour. Miss Schelper.

154 RECREATIONAL LEADERSHIP Recreation and recreation education; theory and practice of recreational activities for youth and adults. Two hours. Miss Wills.

155 PHYSICAL EDUCATION IN SECONDARY SCHOOLS Practice in activity and activity-teaching skills in team, individual, dual, recreational sports and other media of physical education suitable for secondary grades. Two hours. Mr. Christensen.

156 HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION The development of physical education; functions of physical education in society; underlying principles and concepts. Three hours. The staff.

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. The staff.

202 PHILOSOPHY OF EDUCATION Educational theory and philosophy past and present; contributions of leading educational philosophers; the interrelationships of education, society, and philosophy. *Prerequisite:* 12 semester hours in education and psychology. Three hours. Drs. Boller and Keppel.

205 HISTORY OF AMERICAN EDUCATION History of principles and practices in American education as they relate to social, economic, political, and cultural developments. *Prerequisite:* 12 hours in education and psychology, or a major in history. Three hours. Dr. Keppel.

211 EDUCATIONAL MEASUREMENTS Essential principles of measurement in education; test construction, application, and analysis. *Prerequisite:* 12 semester hours in education and psychology. Three hours. Dr. Steeves.

217 SECONDARY SCHOOL CURRICULUM Principles and problems in curriculum development for secondary schools. *Prerequisite:* 12 hours of education and psychology. Three hours. Dr. Rippa.

222 READING PROBLEMS—UPPER GRADES AND JUNIOR HIGH SCHOOL Principles of remedial teaching, causes of reading difficulties, and materials for remedial work in reading. *Prerequisite:* 12 hours in education and psychology, including an introductory course in the teaching of reading. Three hours. (Not offered 1961-62.)

Elementary Education

3, 4 CHILD AND COMMUNITY Supervised experiences with children's groups in the community. One hour. Dr. Boller and Mr. Keach.

100 PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL Development of a program of physical education for the elementary school. Principles, methods and materials appropriate for the several age and grade groups. Two hours. Miss Fuller.

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

121 TEACHING READING Principles underlying teaching reading; materials of instruction; reading readiness; vocabulary development; development of correct study skills; observation in elementary schools. Three hours. Mrs. Adams.

134 CHILDREN'S LITERATURE 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. Three hours. Mrs. Adams.

144 METHODS AND MATERIALS I Curriculum, teaching methods, materials in language arts, social studies, science, and arithmetic in the elementary school. Observations and participation in elementary schools. Three hours. Dr. Boller and Mr. Keach.

160 METHODS AND MATERIALS II Classroom management, instructional planning, and methods of teaching in all core subjects in the elementary school. Three hours. Dr. Boller and Mr. Keach.

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. Dr. Boller and Mr. Keach.

170 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.

Secondary Education

15 PARTICIPATION Thirty clock hours of observation and participation in classroom work in junior and senior high schools. Discussion meetings on campus. Two hours. Dr. Steeves and staff.

180 SECONDARY METHODS AND PROCEDURES General methods of secondary school instruction; classroom problems common to all teachers. *Prerequisite:* satisfactory completion of 6 hours in education; senior standing. Three hours. Dr. Steeves.

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:* 180, high achievement in professional courses and in appropriate teaching fields; approval by the chairman of the department of education. Candidates must make written application at least one full semester in advance of the teaching assignment. Six hours. Drs. Keppel, Rippa and Steeves

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; current approaches to guidance problems of the intellectually gifted; counseling techniques for classroom teachers. *Prerequisite:* 12 semester hours in education and psychology. Three hours. Dr. Rippa.

252 TEACHING LATIN Seminar on problems of language, literary interpretation and criticism, Roman civilization, bibliography, with allied studies helpful to prospective teachers. *Prerequisite:* Latin 102 and 112. Three hours. Dr. Kent.

255 THE SCHOOL AS A SOCIAL INSTITUTION The development of a sociological perspective for the analytical exploration of selected public school practices and problems. Sociological and sociopsychological concepts and methods will be drawn from research in other institutional spheres and applied to the study of the school. *Prerequisite:* 12 semester hours in education and psychology or 9 semester hours in sociology. Three hours. Mr. Keach.

297, 298 PROBLEMS IN EDUCATION Individual research problem to be selected by the student in consultation with a staff member. Enrollment by permission of the Dean and the staff member who will direct the study. Open to seniors and graduate students who have at least 12 hours in education and psychology. Credit to be arranged. The staff.

391, 392, 393, 394 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.

Business Education

104 PRINCIPLES OF BUSINESS EDUCATION Basic principles, practices, problems and trends in business education. *Prerequisite:* Psychology 1. Two hours. Mr. McDonald.

105 TEACHING BUSINESS SUBJECTS Principles and techniques in the organization and the teaching of business subjects in the high school. *Prerequisite:* 104. Two hours. Mr. McDonald.

Music Education

For applied music class study see Music 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:* Education 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 Music Education 131 and approval of the instructor. 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. Dr. Lidral.

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:* Education 145-146 or Psychology 1 and 205. Three hours. Dr. Lidral.

Other Courses in Education

In addition to the courses offered during the academic year, the following courses are offered in summer sessions and in the evening division program.

Number	*Title*	*Credit Hours*
S5	Junior High School Mathematics	3
S7	Educational Psychology	3
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
S117	Alcohol Education	3
S118	Guiding Elementary School Pupils in Music Experiences	3
S119	Elementary School Music (Music for grades I-III)	3
S122	Developmental Reading	3
S127	Science for Teachers	3
S132	Teaching Arithmetic	3
S142	Audio-Visual Materials and Methods	3
S150	Intensive Teacher Training	3
S172	The Creative Process Through Art	3
S175	Driver Education, Advanced	2
S200	The History of Arithmetic	3
S201	Administration of the Athletic Program	3
S203	Principles of Physical Education	3
S204	History of European Education	3
S206	Comparative Education	3
S209	Workshop in the Education of Teachers of the Mentally Retarded	6
S210	Workshop in the Education of Teachers of the Mentally Retarded II	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
S223	Reading Clinic	2–4
S225	Teaching Social Studies in the Secondary School	3
S226	Conservation	6
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
S241	Science Methods (Science for Elementary Schools)	3
S242	Modern Trends in Elementary Education	3
S243	Reading and Study in the Secondary School	3
S244	Social Studies in the Elementary School	3
S256	Basic Concepts of 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	4
S271	Laboratory Experiences in Kindergarten Education	4
S277	Seminar in Educational Psychology	3
S280	Professional Problems in Education	3
S301	Research Methods in Education	3
S307	Counseling (Techniques and Group Procedures in Guidance)	3
S308	Group Testing in Guidance	3
S309	Administration of the Guidance Program	3
S310	Occupational Information	3
S312	Individual Testing	3
S330	Seminar in Educational Administration (Supervision)	3

Engineering, Agricultural

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Associate Professors Schneider (Chairman) and 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 prac-

tices and surveying. Not for credit for B.S.A.E. degree candidates. Three hours. Mr. Schneider.

101 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.

151 FARM STRUCTURES (2-2) Design of farm structures, materials, structural requirements, functional requirements, insulating, heating, and ventilating. *Prerequisite:* C.E. 131 or concurrent enrollment. Three hours. Dr. Arnold. Alternate years, 1962-63.

152 FARM UTILITIES (2-2) Water systems; plumbing; sewage disposal; refrigeration. *Prerequisite:* M.E. 142 or C.E. 162 or concurrent enrollment; Physics 16. Three hours. Dr. Arnold. Alternate years, 1962-63.

154 AGRICULTURAL MACHINERY AND EQUIPMENT (2-2) Theory, design, operation and maintenance of agricultural machinery and equipment. *Prerequisite:* C.E. 130 and C.E. 131. Three hours. Dr. Arnold. Alternate years, 1963-64.

155 SOIL AND WATER ENGINEERING (2-2) Engineering problems involved in the application of hydrologic and agronomic data to the design, location, and construction of farm ponds, drainage, irrigation systems, and erosion control facilities. *Prerequisite:* C.E. 53 or permission of the department; Agronomy 52. Three hours. Dr. Arnold. Alternate years, 1963-64.

156 ELECTRICITY IN AGRICULTURE (2-2) Theory and engineering practices in the application of electricity to agriculture. *Prerequisite:* E.E. 101. Three hours. Dr. Arnold. Alternate years, 1962-63.

158 FARM POWER MACHINERY (2-2) Theory, design, operation, and maintenance of tractors and their engines. *Prerequisite:* M.E. 113, C.E. 131 or concurrent enrollment. Three hours. Dr. Arnold. Alternate years, 1963-64.

181, 182 JUNIOR SEMINAR (1-0) Review and discussion of current agricultural engineering research, student reports and studies of agricultural engineering problems. *Prerequisite:* junior standing and permission of the department. One hour. The staff.

183, 184 SENIOR SEMINAR (1-0) Review and discussion of current agricultural engineering research, student reports and studies of agricultural engineering problems. *Prerequisite:* 181, 182 or permission of the department. One hour. The staff.

Engineering, Civil

COLLEGE OF TECHNOLOGY

Professor Milbank (Chairman); Associate Professors Knight, Root and Fay; Assistant Professor Ragan; Instructor Eldred[1]

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:* Math. 21 or concurrent enrollment. Three hours. I, II.

[1] On military leave 1961-62.

51, 52 SURVEYING (3-4) First semester: fundamental surveying methods; measurement of lines, angles and difference in elevation; surveying; areas; topographic plotting; elementary engineering astronomy; electronic computer application. Second semester: elements of photogrammetry and photo interpretation; geodetic surveying; theory of curves; earthwork calculations. *Prerequisite:* Math. 11; 51 or 53 for 52. Four hours.

53 PLANE SURVEYING (3-4) Use of the steel tape, level, and transit; elements of topographic surveying; special problems as presented and solved in fields affected. For those not enrolled in civil engineering. *Prerequisite:* Math. 10 or 11 or 2. Four hours.

113 CONCRETE AND BITUMINOUS LABORATORY (0-3) Testing materials used in concrete and bituminous mixtures; design of mixes to obtain specified compressive and flexural strengths; investigations of durability, yield, economy, and the effect of admixtures. *Prerequisite:* 131 and 173 or concurrent enrollment. One hour.

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.

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 Math. 21. Three hours. I, II.

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 Math. 21. Three hours. I, II.

140 STATICALLY DETERMINATE STRUCTURES (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 graphic statics and design computations, including use of electronic computation methods. *Prerequisite:* 131. Four hours.

151 ENGINEERING CONTRACTS (2-0) Contract law and engineering specifications, ethics and professional conduct. *Prerequisite:* junior standing. Two hours. I, II.

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.

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.

162 HYDRAULICS (3-0) Mechanics of liquids; flow meters; flow in pipe systems; flow in open channels; elements of fluid mechanics; elements of hydraulic machinery. *Prerequisite:* 130 and M.E. 113. Three hours.

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.

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, Chem. 1-2. Three hours.

168 HYDRAULICS LABORATORY (0-3) To be taken in conjunction with 162. Laboratory studies for illustration of theory and behavior of metering devices; pipe line flow and hydraulic machinery. One hour.

173 SOIL MECHANICS I (2-3) Identification, description, and physical properties of soils; subsurface exploration; engineering characteristics of natural deposits of soil. Stress distribution, consolidation of soil masses, shear strength evaluation, and stability of slopes. Laboratory practice in sampling, classification, and testing for index properties. Introduction to experimental methods in permeability, consolidation, and shear testing. *Prerequisite:* 140. Three hours.

174 TRANSPORTATION ENGINEERING (3-0) Relation of highway, waterway, railway, pipeline, and airway transportation. Consideration of economic and planning studies, soils, drainage, highway and airport surfaces, geometric design of modern highways. Design of municipal airports with access roads. *Prerequisite:* 173. Three hours.

175 INDETERMINATE STRUCTURES I (3-0) Analysis of statically indeterminate structures by consistent deformation, least work, slope deflection, and moment distribution; prefaced by determinations of deflections by virtual work, moment area, conjugate beam, and Williot-Mohr diagram. Continuous structures and rigid frames considered. *Prerequisite:* 140. Three hours.

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.

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.

232 ADVANCED DYNAMICS (3-0) Study of Coriolis acceleration; gyroscopic forces; dynamic measurements; vibrations, earthquakes, and blast shocks on structures. *Prerequisite:* 130, 131, Math. 211. Three hours.

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, Math. 212. Three hours.

235 PHOTOELASTICITY (2-3) Development of the theories of photoelastic streses analysis; 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, Math. 211. Three hours.

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 M.E. 142. Three hours.

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 M.E. 142. Three hours.

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.

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.

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.

391, 392, 393, 394 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.

Engineering, Electrical

COLLEGE OF TECHNOLOGY

Professors Essler (Chairman), and Smith; Associate Professors Buchanan, Hoilman[1] and Shorey; Assistant Professor Dudevoir[2]

25-26 ELECTRIC CIRCUITS I (3-3) Basic electric circuit elements and their behavior in d-c and a-c circuits with lumped constants. Magnetic circuits and electro-magnetic interactions. *Prerequisite:* Physics 14, concurrent enrollment in Math. 21 and Physics 15 for 25, Math. 22 and Physics 16 for 26. Four 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:* Math. 22 and Physics 15, 101 for 102. Four hours.

[1] On Sabbatical leave 1962-63.
[2] On leave 1962-63.

109, 110 ELECTRONICS I (3-0), (3-3) Physical principles of vacuum tubes, gas tubes and solid-state devices. Analysis and design of circuits used in communication equipment. *Prerequisite:* 26 or 102 or Physics 242 and permission of instructor for 109; and 125 or Physics 115 and permission of instructor for 110. Three hours for 109, four hours for 110.

116, 117 ELECTRIC MACHINES (3-3) A study of the principal types of rotating machinery from the physical and mathematical standpoint. *Prerequisite:* E.E. 125. Four hours.

125 ELECTRIC CIRCUITS II (3-3) Polyphase electric circuits, non-sinusoidal waves, coupled circuits and transformers, and applications. *Prerequisite:* 26 or Physics 242 and permission of instructor; concurrent enrollment in Math. 211. Four hours.

126 CIRCUITS AND FIELDS I The transient behavior of electro-mechanical circuits and of electromagnetic wave theory. *Prerequisites:* 125 or Physics 242 and permission of instructor; Math. 211. Three hours.

203 ELECTRONICS II Analysis and design techniques for transistor and vacuum tube circuits. Fourier and graphical representation of signals. Relation of gain, band width and noise to signal amplification and transmission. *Prerequisite:* 110. Three hours.

204 ELECTROMAGNETIC WAVE THEORY Maxwell's equations, the Poynting vector, guided waves and radiation. Engineering applications are stressed. *Prerequisite:* 110 and Math. 211. Three hours.

206 U.H.F. CIRCUITS (3-3) Circuits and techniques for use at ultra-high frequencies. *Prerequisite:* 203 and 225. Four hours.

207, 208 SPECIAL TOPICS (2-3) Formulation and solution of theoretical and practical problems dealing with electrical circuits, apparatus, machines or systems. *Prerequisite:* 125. Three hours.

209 TRANSIENT PHENOMENA (2-2) Mathematical investigation of transient phenomena in electrical and electromechanical circuits. *Prerequisite:* 126. Three hours.

210, 311 SERVOMECHANISMS First semester: A study of the theory, performance and stability of servomechanism systems of control. Second semester: Multiple loop systems; position control systems with load disturbances; synthesis of servo systems. *Prerequisite:* 101 or 116, 126 or Physics 242, Math. 211 and permission of instructor; 210 for 311. Three hours.

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 permission of the instructor. Three hours.

212 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 permission of the instructor. Three hours.

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 117, and permission of instructor. Three hours.

225, 226 CIRCUITS AND FIELDS II (3-3), (3-0) Behavior of electric filters, lines and fields with applications to power, communication and control systems. *Prerequisite:* 125 and 126, 225 for 226. Four hours, 225; three hours, 226.

230 CREATIVE ENGINEERING (4-0) Creative techniques and problems approach to applications of these methods to current industrial problems. *Prerequisite:* Math. 211, at least four hours in Electricity and Magnetism or Electrical Engineering in courses numbered above 100, and permission of instructor. Three hours.

231 TRANSISTORS (2-0) 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. Biasing methods for stabilization in multistage amplifiers. Equivalent circuits for high frequency operation; oscillators and pulse switching circuits. *Prerequisite:* 110. Two hours.

241 DIGITAL COMPUTER LOGIC, CIRCUITS, AND SYSTEMS The logical design of automatic digital computers treats computers as tools of applied mathematics. Brief review of the arithmetic and numerical analysis the designer needs; Boolean algebra as an aid to circuit design. Circuits and components for the transmission, storage and modification of information are discussed, and their combination into arithmetic units, memory devices, program controls and other major mechanisms is studied. Reference is made to the existing computer art as it appears in patents and in commercially available computers for business and scientific computation. *Prerequisite:* 110 or Physics 171 and Math. 121. Three hours.

261 RADIATION ELECTRONICS (1-3) 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 16 or 172. Two hours.

275 SOLID STATE PHYSICAL ELECTRONICS Electrical conduction phenomena in semi-conductors, junction transistors and thermionic emitters. The ideas developed are applied to various solid state devices. *Prerequisite:* 102 or 109 or Physics 172. Three hours.

281, 282, 283, 284 SEMINAR Presentation and discussion of advanced electrical engineering problems and current developments. *Prerequisite:* senior or graduate engineering enrollment. One hour.

301 NONLINEAR SYSTEM ANALYSIS 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:* Math. 211 and degree in Physical Sciences or Engineering. Three hours.

391, 392, 393, 394 MASTER'S THESIS RESEARCH Investigation of research topic under the direction of an assigned staff member culminating in an acceptable thesis. Credit as arranged.

Engineering, Mechanical

COLLEGE OF TECHNOLOGY

Professor Outwater (Chairman); Associate Professors Duchacek, Marshall, and Tuthill; Assistant Professor Carpenter

3 ENGINEERING PROBLEMS Nature of engineering principles and the kinds of work done in the fields of engineering. Development of skill and systematic methods in the solution of problems related to engineering. Enrollment restricted to freshman engineering students. One hour.

51, 52 MANUFACTURING PROCESSES (1-3) Metal machining, casting, welding forming and inspection methods including economic factors and choice of methods. Laboratory involves further study of variables, applications and limitations of some of the more common processes. *Prerequisite:* E.G. 2; 51 for 52. Two hours.

84 MECHANICAL INSTRUMENTATION (1-0) Engineering measurement, laboratory instruments, their use, limitation and calibration. *Prerequisite:* concurrent enrollment in 92. 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:* Math. 21, Physics 15. Two hours.

101 INDUSTRIAL MATERIALS (2-3) 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:* Chem. 2; Physics 16. Three 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, prime movers, compressors, heat transfer. *Prerequisite:* Physics 15; Math. 21. Three hours.

117 MECHANICAL ENGINEERING LABORATORY (0-3) Coordinated with M.E. 111 to verify and demonstrate thermodynamic principles and applications. Steam calorimetry, the first law with both fixed and variable flow, combustion, air compression, refrigeration. *Prerequisite:* concurrent enrollment in 111. One hour.

132 MECHANISMS (3-3) Analysis and synthesis of displacements, velocities, and acceleration in machines; application of analyses to cams, gears, and other mechanisms, with emphasis on graphical methods. Study of rolling contact, cam and gear design, flexible connectors, computing mechanisms, and miscellaneous mechanisms. *Prerequisite:* E.G. 2; C.E. 130. Four hours.

135 MACHINE DESIGN I (3-0) Statically indeterminant members, deflection of beams, columns, connections, energy methods, theories of failure, continuous beams, thick-walled cylinders. *Prerequisite:* 132, C.E. 131. Three hours.

136 MACHINE DESIGN II (3-3) A continuation of 134 with emphasis on the dynamics and vibration of machines. Design problems correlating various engineering fundamentals and considering practical limitations. *Prerequisite:* 52, 135. Four hours.

142 FLUID MECHANICS (3-0) Fluid statics. Kinematics of fluid flow; thermodynamics of steady flow of any fluid; dynamics of an ideal fluid; viscosity; dimensional analysis and dynamic similarity; pipe and channel flow for incompressible fluids; momentum and propulsion; resistance and lift of immersed bodies; compressible fluid flow in nozzles; mathematical study of fluid motion. *Prerequisite:* 111 or 113; C.E. 130. Three hours.

164 AIR CONDITIONING (3-3) Application of the fundamental principles of thermodynamics, heat transfer and fluid mechanics to the design and performance of air conditioning systems and equipment. *Prerequisite:* 111 or 113; 142. Four 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 MOTION AND TIME STUDY (3-0) Principles and methods of analyzing work; job improvement; stop watch studies; elemental and predetermined time standards and miscellaneous related topics. *Prerequisite:* junior or senior standing. Three hours.

176 PLANT ORGANIZATION (2-6) Analysis of plant requirements as to location, 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 the approval of the department. 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:* 136. Three hours.

211 ADVANCED MECHANICAL STRUCTURES I (3-0) The torsion problem and membrane analogy; thick cylinders and rotating discs; beams on elastic foundation and the bending of plates and shells. *Prerequisite:* 151, Math. 211. Three hours.

222 ADVANCED MECHANICAL STRUCTURES II (3-0) Stress and strain at a point in three dimensions; the theory of elasticity with two-dimensional examples; development of strain energy method with applications to beams, curved bars and plates; elastic bodies in contact. Advanced properties of materials. *Prerequisite:* 211. Three hours.

232 COMPRESSIBLE FLOW (3-0) One-dimensional compressible flow; unsteady fluid motions; two-dimensional flow at subsonic and supersonic speeds. *Prerequisite:* 243. Three hours.

243 ADVANCED FLUID MECHANICS AND FLUID MACHINERY (3-3) Steady compressible flow; compressible flow in pipes and channels with heat and friction; boundary layer effects; general features and factors influencing design of fluid machinery; performance features of pumps, compressors, fluid couplings, torque converters, turbines; fluid vibrations; mathematics of two-dimensional flow, vorticity and circulation, stream functions. *Prerequisite:* 142 and Math. 211. Four 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.

262 ADVANCED HEAT POWER ENGINEERING (3-3) Application of theoretical thermodynamic cycles to actual plant and machine; analysis of the elements of internal combustion engines, gas turbines, and steam power plants; investigation of nuclear and other energy sources; development of station energy balances; economic factors. *Prerequisite:* 111 or 113, 266. 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 Math. 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 Math. 211. Three hours.

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 ANALYSIS (0-3) Application of scientific principles to the analysis of comprehensive engineering problems. Emphasis given to the development of a well ordered logical approach to the statement and solution of problems and to the conclusions and decisions involved. *Prerequisite:* senior standing. One hour.

301 ADVANCED MACHINE DESIGN (3-0) Advanced mechanics of materials and applications to mechanical design according to the interests of the student. *Prerequisite:* 136. Three hours. I or II.

391, 392, 393, 394 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.

Engineering Graphics

COLLEGE OF TECHNOLOGY

Associate Professor Paquet

1 MECHANICAL DRAWING (0-6) Fundamentals of drafting; use of instruments, freehand lettering, orthographic projection, sections, auxiliary views, dimensioning, screw threads and elementary pictorials. Two hours.

2 DESCRIPTIVE GEOMETRY (0-6) The fundamentals of descriptive geometry; point, line and plane problems, revolution, single curved, warped and double curved surfaces, intersection and development of surfaces. Two hours.

3 GRAPHICS (0-3) Use of drafting methods in solving engineering, scientific and mathematical problems to supplement the conventional representational uses. Topics covered include projective constructions, periodic curves, empirical equations and graphical calculus. *Prerequisite:* 1 or concurrent enrollment. One hour.

4 ADVANCED GRAPHICS (0-3) Advanced descriptive geometry, graphical scales, elementary nomography, and new methods in the field of pictorials. *Prerequisite:* 1; 2 or concurrent enrollment. One hour.

6 NOMOGRAPHY (0-3) Theory and construction of graphical computing charts. *Prerequisite:* 1 and 2. One hour.

English

COLLEGE OF ARTS AND SCIENCES

Professors Bogorad (Chairman), Bandel, Hughes, Marston[1]*, Pope*[2]*, and Trevithick; Associate Professors Jones, Long, McArthur, and Wainwright; Assistant Professors Caswell, Cochran, Orth, and Philbrick; Instructors Arnold, Burr, Fosso, Hall, Holder, Murbe, O'Hara, Weaver, and Woodruff*

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. The staff.

13 PERIODICAL WRITING A study of newspaper and magazine journalism, including analysis of various types of news stories, features, and articles and emphasizing practice in journalistic writing. *Prerequisite:* 1-2. Three hours. I, II. Dr. Cochran.

16 EXPOSITORY WRITING Writing and analysis of expository essays. *Prerequisite:* 1-2. Three hours. I, II. Dr. Long.

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. Three hours. Dr. Bandel.

25, 26 WORLD LITERATURE A detailed study, in English translation, of selected masterpieces of world literature. Lectures, discussions, and reports. *Prerequisite:* 1-2. Three hours. The staff.

[1] Sabbatical leave first semester 1962-63.
[2] Sabbatical leave 1961-62.

27, 28 ENGLISH-AMERICAN LITERATURE Selected English and American authors from early to modern times. Required of students concentrating in English. Lectures, discussions, and reports. *Prerequisite:* 1-2. Three hours. The staff.

102 MEDIEVAL LITERATURE The forms (in translation) of medieval literature, excluding Chaucer. Lectures, discussion, and reports. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Hughes. Alternate years, 1963-64.

201 CHAUCER The principal works of Chaucer, with emphasis on Chaucer's literary scope, talents, and position in medieval literature. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Hughes.

206 RENAISSANCE DRAMA Drama in England from its beginning to 1642, exclusive of Shakespeare. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Long. Alternate years, 1962-63.

207-208 SHAKESPEARE Literary study and textual interpretation of most of Shakespeare's works. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Bandel.

211 RENAISSANCE POETRY Major poets of Tudor and Stuart England, from Wyatt and Surrey to Donne and his followers, with emphasis on Spenser and the development of Elizabethan lyric poetry. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Long. Alternate years, 1962-63.

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:* 25, 26 or 27, 28. Three hours. Dr. Bogorad. Alternate years, 1963-64.

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:* 25, 26 or 27, 28. Three hours. Dr. Bogorad. Alternate years, 1962-63.

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:* 25, 26 or 27, 28. Three hours. Dr. Bogorad. Alternate years, 1962-63.

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:* 25, 26 or 27, 28. Three hours. Dr. Jones.

227, 228 ENGLISH NOVEL English fiction from its origins through the nineteenth century. Masterpieces are stressed and read critically. *Prerequisite:* 25, 26 or 27, 28. Three hours. Mr. Wainwright. Alternate years, 1963-64.

231, 232 VICTORIAN LITERATURE A study of the lives and the works, except the novels, of the significant writers from 1832 to 1900. *Prerequisites:* 25, 26 or 27, 28. Three hours. Mr. Wainwright. Alternate years, 1962-63.

237 MODERN NOVEL Representative British and American novelists since 1915. Limited to seniors, except with permission of the instructor. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Marston.

238 MODERN DRAMA European and American plays which represent the principal trends in the dramatic renaissance of the late nineteenth and the twentieth centuries. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Bandel.

239 MODERN POETRY *Prerequisite:* 25, 26 or 27, 28. Three hours. Mr. Wainwright.

240 MODERN SHORT STORY Short stories of outstanding modern writers; recent techniques and trends in this type of literature. Limited to seniors, except with permission of the instructor. *Prerequisite:* 25, 26 or 27, 28. Three hours. Mr. Wainwright.

251, 252 AMERICAN NOVEL 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:* 25, 26 or 27, 28. Three hours. Dr. Trevithick, Alternate years, 1962-63.

253 AMERICAN COLONIAL LITERATURE Intellectual and literary origins, in the seventeenth and eighteenth centuries, of American culture. Works of Edwards, Taylor, Franklin, Woolman, Hamilton and Jefferson. Lectures, discussions, oral and written reports. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Trevithick. Alternate years, 1963-64.

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:* 25, 26 or 27, 28. Three hours. Dr. Trevithick. Alternate years, 1963-64.

256 LITERATURE OF THE AMERICAN FRONTIER Frontier, local-color and regional writing in America from the eighteenth century to the First World War, including Parkman, Harte, Mark Twain, Garland and others. Lectures, discussions and reports. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Marston. Alternate years, 1963-64.

258 AMERICAN POETRY Major American poets from the 18th century to the First World War, including Poe, Whitman, Emily Dickinson, Robinson, Frost, and others. Lectures, discussions and reports. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Marston. Alternate years, 1962-63.

260 MODERN ENGLISH Descriptive study of the structure of Modern American English. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. McArthur.

261 OLD ENGLISH The sounds, words and structure of Old English; simple prose texts and selected passages from *Beowulf*. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. McArthur. Alternate years, 1962-63.

271 BIBLIOGRAPHY Methods of literary study, research, and scholarship. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Pope. Alternate years, 1962-63.

272 HISTORY OF CRITICISM Principles and theories of criticism from Aristotle to the twentieth century. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Jones. Alternate years, 1963-64.

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 intention and sense, mood, tone, imagery,

stanzaic form, and meter. Lectures, discussions, reports. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. Bogorad.

275, 276 CREATIVE CRITICISM A seminar in modern critical techniques, with creative application of these techniques through the writing of critical papers on poetry, drama, and fiction both contemporary and traditional. *Prerequisite:* 25, 26 or 27, 28. Three hours. Dr. McArthur.

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:* 25, 26 or 27, 28, and one of the following: 13, 16 or 18. Three hours. Dr. McArthur.

281 SEMINAR FOR PROSPECTIVE TEACHERS OF ENGLISH Grammar and language; literary interpretation and criticism; allied problems useful to teachers of English. *Prerequisite:* 25, 26 or 27, 28; and 260. Three hours. Dr. Hughes.

391, 392, 393, 394 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.

Forestry

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professor W. R. Adams (Chairman); Associate Professor Whitmore; Assistant Professor Thompson

1, 2 INTRODUCTION TO FORESTRY (0-6) (2-0) First semester: Field identification and characteristics of the more important forest trees; forestry and conservation sciences. Second semester: Introduction to specialization in forestry and conservation. *Prerequisite:* 1 for 2. Two hours. Dr. Adams, Messrs. Thompson and Whitmore.

4 DENDROLOGY (3-3) Classification and silvical characteristics of the more important native and exotic forest trees. Twig identification. *Prerequisite:* 1. Four hours. Mr. Thompson.

21 FOREST FIRE CONTROL Forest fire behavior as influenced by fuels, weather, topography; causes and effects of fire; fire danger measurement; methods of preventing and controlling fires; use of fire in forest management. *Prerequisite:* sophomore standing. Two hours. Mr. Whitmore.

26 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:* 2 or 103. Three hours. Mr. Whitmore.

29, 30 FOREST MENSURATION (2-3) (1-3) First semester: Tree measurement techniques, volume determination of standing timber and wood products; growth and yield determinations. Second semester: Methods of mathematical and graphical analysis of forest tree stand and product measurements, continuous forest inventory. *Prerequisite:* 4 or 103; 29 for 30. Three hours; two hours. Mr. Thompson.

103-104 WOODLAND MANAGEMENT (2-3) Establishment, protection, and management of farm woodlands and small forest areas. Characteristics, qualities, uses, and identification of commercial timbers. *Prerequisite:* junior standing. Three hours. Dr. Adams and Mr. Whitmore.

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. The staff.

208 BIOLOGICAL STATISTICS Application of statistics to the analysis of biological data; interpretation of statistical analysis. *Prerequisite:* Math. 9; senior standing. Three hours. Dr. Adams.

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

391, 392, 393, 394 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.

General Literature

COLLEGE OF ARTS AND SCIENCES

51 GREEK LITERATURE IN TRANSLATION Lectures on the development of various branches of Greek literature and on its chief authors, with emphasis on Homer and the drama. Readings in standard translations from the major authors. No knowledge of Greek required. *Prerequisite:* junior standing and one survey course in any literature. Three hours. Dr. Davison.

52 LATIN LITERATURE IN TRANSLATION Lectures on the development of Latin literature and on the principal Latin authors. The relation of Latin literature to Greek and English literature. Readings in standard translations from the major authors. No knowledge of Latin required. *Prerequisite:* junior standing and one survey course in any literature. Three hours. Dr. Davison.

62 GERMAN LITERATURE IN TRANSLATION Lectures on the development of German literature; reading and discussion of representative works. No knowledge of German required. *Prerequisite:* junior standing and one survey course in any literature. Three hours. Mr. Kahn.

72 ROMANCE LITERATURE IN TRANSLATION Comparative study of various literary movements in France, Spain, and Italy. *Prerequisite:* junior standing and one survey course in any literature. Three hours. Dr. Parker.

Geography

COLLEGE OF EDUCATION AND NURSING

Assistant Professor Vincent H. Malmstrom, Visiting

3 WORLD GEOGRAPHY A 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. Three hours.

Geology

COLLEGE OF ARTS AND SCIENCES

Professor Doll[1] *(Chairman), Associate Professor Doten; Assistant Professor Hunt*

1-2 INTRODUCTORY GEOLOGY (3-2) Composition, structure, and surface forms of the earth, and the agencies active in their production; general survey of the earth's history as recorded in the rocks. Field trips. Four hours.

11 MINERALOGY (2-3) Crystallographic, chemical and physical properties of minerals, and their identification. *Prerequisite:* 1-2. Three hours.

14 PETROLOGY (2-2) Origin and characteristics of igneous, sedimentary, and metamorphic rocks and related ore deposits. *Prerequisite:* 11. Three hours.

21 ENGINEERING GEOLOGY (2-2) The 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, not open to others. Three hours.

101 OPTICAL MINERALOGY (1-4) Optical properties of non-opaque minerals and their determination by means of the polarizing microscope. *Prerequisite:* 14. Three hours.

102 PETROGRAPHY (1-4) Classification, origin and composition of the more important igneous, sedimentary and metamorphic rocks, by means of the polarizing microscope and thin sections. *Prerequisite:* 101. Three hours.

111 STRUCTURAL GEOLOGY (2-2) Structural features of the earth's crust produced by earth movements. Mechanics of folding, fracturing, faulting, and rock flowage, and the relation of such structures to mountain building. *Prerequisite:* 14. Three hours.

112 FIELD GEOLOGY (1-6) Field methods in the geologic mapping of an assigned area. Conference weekly on the problems and progress of the field work; written report and a field map of the area. *Prerequisite:* 111. Three hours.

121 PALEONTOLOGY (2-2) Invertebrate fossils; their evolution, morphology and classification; their importance in the interpretation of earth history. *Prerequisite:* 1-2. Three hours.

151-152 ECONOMIC GEOLOGY (2-2) Characteristics, occurrence, distribution, production, and uses of the more important mineral resources. First semester: non-metallics; second semester: metallics. Trips to localities of economic interest. *Prerequisite:* 111. Three hours.

207 IGNEOUS GEOLOGY (2-2) Paragenesis of igneous rocks; laboratory work on selected suites of specimens. *Prerequisite:* 102. Three hours. Alternate years, 1963-64.

208 METAMORPHIC GEOLOGY (2-2) Metamorphic processes and types of metamorphic rocks, with appropriate laboratory study of metamorphic suites. *Prerequisite:* 102. Three hours. Alternate years, 1963-64.

[1] Sabbatical leave first semester 1961-62.

215 GEOMORPHOLOGY (2-2) The land forms of the surface of the earth and their origins; external and internal forces modifying the earth. The physiographic provinces of North America. *Prerequisite:* 14. Three hours. Alternate years, 1962-63.

216 GLACIAL GEOLOGY (2-3) The origin, mechanics and effects of past and present glaciations. *Prerequisite:* 215. Three hours. Alternate years, 1962-63.

223 SEDIMENTATION (2-2) Processes active in the erosion, transportation and deposition of sediments, their consolidation into sedimentary rocks, and methods of sedimentary petrology. *Prerequisite:* 14. Three hours. Alternate years, 1962-63.

224 STRATIGRAPHY (2-2) Sequential development and distribution of the sedimentary rocks. *Prerequisite:* Three hours. Alternate years, 1062-63.

281-282 SEMINAR Review and discussion of current geological literature. Graduate students and seniors. One hour. The staff.

391, 392, 393, 394 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; Instructor Huber

1-2 ELEMENTARY GERMAN Emphasis on the spoken language of everyday use. Oral and written practice in speaking, reading, and comprehension, based on the memorization of texts in the form of dialogues. Tape recordings of all materials are available in the language laboratory as an aid to speaking and comprehension. *Credit is allowed only if German* 11-12 *is also completed.* Four hours. The 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. The 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. Dr. 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 permission of the instructor. Three hours. Mr. Wurthmann.

205 GOETHE'S FAUST Reading, analysis, and interpretation of Parts I and II of *Faust*. Readings in other works by Goethe and on the Faust theme in German and other literatures. *Prerequisite:* 101-102. Three hours. Dr. White. Alternate years, 1963-64.

206 GERMAN LITERATURE: 1800-1850 Reading and interpretation of works representative of the main literary trends of this period. Lectures and reports on selected poetry, prose works and dramas by Kleist, the Romantics, Grillparzer, Heine, and others. *Prerequisite:* 101-102. Three hours. Dr. White. Alternate years, 1963-64.

207 GERMAN LITERATURE: 1850-1900 Reading and interpretation of works of the period in poetry, prose and drama. Lectures and reports on selected works by such representative authors as Hebbel, Keller, C. F. Meyer, Nietzsche, Stifter, and Wagner. *Prerequisite:* 101-102. Three hours. Dr. White. Alternate years, 1962-63.

208 GERMAN LITERATURE: THE 20TH CENTURY Readings, reports, lectures on authors of the period in poetry, prose and drama. Representative works of Brecht, George, Hauptmann, Hofmannsthal, Kafka, Thomas Mann, Rilke, and others will be read. *Prerequisite:* 101-102. Three hours, Dr. White. Alternate years, 1962-63.

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. Staff.

232 SEMINAR FOR PROSPECTIVE TEACHERS OF GERMAN Problems in the linguistic structure of German. Elementary introduction to linguistics through analysis of modern, colloquial German with reference to problems useful to teachers. Open to seniors and graduate students. *Prerequisite:* 121-122 or the equivalent. Three hours. Dr. 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, 392, 393, 394 MASTER'S THESIS RESEARCH Investigation of a research topic under the direction of assigned staff member, culminating in an acceptable thesis. Credit as arranged.

Hebrew

COLLEGE OF ARTS AND SCIENCES

Assistant Professor Kahn

1-2 ELEMENTARY HEBREW The spoken language of everyday use with oral, aural and written practice in speaking, reading, and comprehension based on the memorization of texts in the form of dialogues. Three hours. Mr. Kahn. Alternate years, 1963-64.

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, 1962-63.

History

COLLEGE OF ARTS AND SCIENCES

Professors Schultz (Chairman), and Evans; Associate Professors Daniels, Pooley, and Putnam; Assistant Professors Davison, Felt, and Keppel; Instructors Newhall, and Hand

1, 2 ANCIENT HISTORY Ancient Greek and Roman worlds. Three hours. Dr. Davison.

5, 6 MEDIEVAL EUROPE Europe from the late Roman Empire to the Renaissance, with emphasis on political and cultural developments. *Prerequisite:* 5 for 6. Three hours. Mr. Pooley.

11, 12 EUROPEAN CIVILIZATION European ideas and institutions in world history. *Prerequisite:* 11 for 12. Three hours. Drs. Evans, Bassett, Daniels, Felt, and Hand, Messrs. Pooley and Newhall.

21-22 THE AMERICAN COLONIES American history to 1783. *Prerequisite:* sophomore standing. Three hours. Dr. Putnam.

23, 24 HISTORY OF THE UNITED STATES American history since 1783. *Prerequisite:* sophomore standing; 23 for 24. Three hours. Drs. Schultz, Felt, and Keppel.

26 HISTORY OF VERMONT Vermont since its foundation. *Prerequisite:* completion of or enrollment in 23. One hour. Dr. Bassett.

40 BIOGRAPHY The biographical approach to history. *Prerequisite:* senior standing. Three hours. Dr. Schultz.

111 THE RENAISSANCE Fifteenth-Century Europe. *Prerequisite:* six semester hours in European history. Dr. Evans.

112 THE REFORMATION Sixteenth-Century Europe. *Prerequisite:* six semester hours in European history. Three hours. Mr. Newhall.

123-124 AMERICAN HISTORY SINCE 1900 *Prerequisite:* six semester hours in history including 12 or 24. Three hours. Dr. Putnam.

191, 192 SENIOR HONORS RESEARCH Three hours. *Prerequisite:* three hours of a history course numbered above 250 and permission of the chairman of the department.

203, 204 LATIN-AMERICAN HISTORY Political, social and economic development since the Spanish Conquest. *Prerequisite:* junior standing and history 11, 12 for 203; 203 for 204. Dr. Felt.

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. *Prerequisite:* junior standing and history 11, 12 or 23, 24. Three hours. Dr. Putnam.

243 RUSSIAN HISTORY Czarist Russia. *Prerequisite:* junior standing and history 11, 12. Three hours. Dr. Daniels.

244 ENGLISH HISTORY England in world history to 1715. *Prerequisite:* junior standing and history 11, 12. Three hours. Dr. Schultz.

251-252 CONTEMPORARY HISTORY The world since 1918, stressing the background of current events. *Prerequisite:* junior standing and history 11, 12. Three hours. Dr. Evans.

253 RUSSIAN HISTORY Soviet Russia. *Prerequisite:* history 12 and 243 or permission of instructor. Three hours. Dr. Daniels.

254 ENGLISH HISTORY England in world history since 1715. *Prerequisite:* history 12 and 244. Three hours. Dr. Schultz.

255, 256 EUROPE IN THE MODERN AGE European political, social, and intellectual history; emphasis on the eighteenth and the nineteenth centuries. *Prerequisite:* junior standing and history 11, 12. Three hours. Dr. Evans and Mr. Newhall.

257, 258 AMERICAN STATESMEN Thought and practical politics of American statesmen. *Prerequisite:* junior standing, 23 for 257; 24 and 257 for 258. Three hours. Dr. Schultz.

259-260 AMERICAN FRONTIERS The westward movement to the end of the nineteenth century and its influence in shaping American ideals and institutions. *Prerequisite:* twelve semester hours in history. Three hours. Dr. Putnam.

281, 282 SEMINAR Advanced study in American history. By permission. Three hours. Dr. Bassett.

391, 392, 393, 394 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.

Home Economics

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Professors Trotter (Chairman), and Samenfink; Associate Professors Brown, Caldwell, Knowles, Morse, and Williams; Assistant Professors McCarthy, Newton, Wakefield, Webster, and Wilson; Instructors Hanline and Livak; Mmes. Cook and Lepeschkin

Home Management

51 HOUSING Sociological and economic aspects of family shelter including selection of site, problems of 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.

101 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.

105 EXPERIMENTAL EQUIPMENT (1-4) Performance measurement and rating of household equipment. *Prerequisite:* H.M. 54. Three hours. Miss Knowles.

106 HOUSE PLANNING An advanced study of housing design to meet family requirements, application of home management principles. *Prerequisite:* 51, 101. Three hours. Miss Knowles.

153 HOME MANAGEMENT RESIDENCE Practical application of home management and group living in the Home Management Residence. A charge of $87.50 is made to cover partial cost of board and operating expenses. Students not living on campus are charged for room rent proportional to that paid by students in University residence halls. *Prerequisite:* 101, 137. Three hours. I, II. Miss Hanline.

203 HOME MANAGEMENT PROBLEMS Application of economic and sociological principles to some problems of the home and family. *Prerequisite:* 101, Psychology 1. Three hours. Misses Knowles and Hanline.

204 FAMILY ECONOMICS The consumer and the market. Use of credit, savings and investments, insurance and estate planning for the family. *Prerequisite:* Economics 12, H.M. 101. Three hours. Miss Knowles.

301 READINGS IN FAMILY ECONOMICS Critical survey of the literature and recent research in family economics. Three or four hours. Dr. Trotter and staff.

Home Economics Education

115 INTRODUCTION TO HOME ECONOMICS EDUCATION Homemaking education in relation to philosophy, professional contacts, and growth toward teacher competencies. Observation of secondary school programs, place of homemaking in general education. *Prerequisite:* junior standing. Two hours. Miss Hanline.

165 METHODS OF TEACHING Methods of teaching homemaking in junior and senior high schools, and of general administration of homemaking departments in secondary schools. *Prerequisite:* 115, Psychology 1. Three hours. Miss Brown.

166 SPECIAL PROBLEMS IN HOME ECONOMICS EDUCATION Individual investigation of a problem selected to meet special needs of students. *Prerequisite:* 165. Two or three hours. Misses Brown and Hanline.

168 STUDENT TEACHING Supervised observation and teaching in approved secondary schools in Vermont. *Prerequisite:* 165. Seven hours. Miss Brown.

169 DEMONSTRATION TECHNIQUES (0-4) Practice in the presentation of information and the teaching of skills by visual methods. *Prerequisite:* junior standing. Two hours. I, II. Miss Hanline.

216 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:* 165; and Education 145-146 or Agricultural Education 104, or equivalent. Two hours. Miss Brown.

Family Living

61 THE FAMILY, THE INDIVIDUAL AND MARRIAGE A functional course designed to aid young men and women to prepare for marriage and family living. Three hours. I, II. Dr. Samenfink.

63 CHILD DEVELOPMENT AND PERSONALITY (2-2) Study of 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. Three hours. I, II. Dr. Samenfink, Miss Wilson.

65 EXPERIENCE WITH PRESCHOOL CHILDREN (1-4) An opportunity to more fully understand the toddler and the preschool child as well as oneself while observing and working with the children and parents in the Preschool Laboratory. *Prerequisite:* 61. Three hours. I, II. Miss Wilson, Dr. Samenfink.

67 CREATIVE ACTIVITIES (1-4) A study of the various creative activities used in working with preschool and kindergarten children. *Prerequisite:* 61. Three hours. Miss Wilson. Alternate years, 1962-63.

163 DYNAMICS OF FAMILY DEVELOPMENT Developmental growth of parents and children in the various stages of the family life cycle. *Prerequisite:* Sociology 21. Three hours. I, II. Dr. Samenfink.

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. Dr. Samenfink. Alternate years, 1963-64.

172 PRESCHOOL PLANNING AND PRACTICUM (2-14) Preschool theory and philosophy past and present; planning and conducting programs of the preschool laboratory. *Prerequisite:* 63, 65 and 67. Nine hours. Miss Wilson, Dr. Samenfink.

263 SEMINAR IN FAMILY RELATIONS AND HUMAN DEVELOPMENT Theory and research on the family. *Prerequisite:* 63, 163 and Sociology 51. Three hours. Dr. Samenfink. Alternate years, 1963-64.

264 THE AMERICAN WOMAN Focuses on recent literature regarding the role of women and the unique tasks they face in maintaining stability in a dynamic 20th century world. *Prerequisite:* 163 and Sociology 51. Three hours. Dr. Samenfink. Alternate years, 1963-64.

Clothing and Textiles

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. Miss Newton and Mrs. Webster.

73 PATTERN DESIGN AND ADVANCED CONSTRUCTION (0-6) Techniques of designing and altering flat patterns. Advanced construction techniques and Paris original design. *Prerequisite:* 22. Three hours. I, II. Mrs. Webster.

83 SURVEY OF TEXTILES (2-2) Fibers, their properties and manufacturing processes. Identification, care and use of clothing and household fabrics. Three hours. Miss Newton.

123 TAILORING (0-6) Construction techniques with emphasis on tailoring problems. *Prerequisite:* 73. Three hours. Miss Newton.

182 ADVANCED TEXTILES (1-4) Historical and sociological background to textiles and textile design; testing techniques and recent developments in the field. *Prerequisite:* 83. Three hours. Miss Newton.

221 COSTUME DESIGN AND DRAPING (1-4) Analysis of current fashion. Development of original design by draping techniques. *Prerequisite:* 73, 120, or permission of department. Three hours. Mrs. Webster.

Related Art

21 DESIGN (1-4) Theory and application of the elements and principles of design. Three hours. Miss Caldwell and Mrs. Webster.

71 COSTUME DESIGN (1-4) Application of design fundamentals and principles to fashion planning. Techniques of fashion illustration. *Prerequisite:* 21. Three hours. Miss Caldwell.

120 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:* 71 or permission of the instructor. Three hours. Miss Caldwell.

130 HOME FURNISHING I (1-4) Application of design fundamentals to the problems involved in furnishing the home. *Prerequisite:* 21. Three hours. Miss Caldwell and Miss Newton.

230 HOME FURNISHING II (1-4) Interior design; period furnishing, its present use and influence upon modern furnishing. *Prerequisite:* 130. Three hours. Miss Caldwell.

Food and Nutrition

43 BASIC CONCEPTS OF FOOD AND NUTRITION (3-2) Food selection and preparation in relation to human growth and health. Basic principles of food selection presented through demonstration lectures. Four hours. I, II. Miss Williams.

48 ELEMENTARY NUTRITION AND FOOD PREPARATION (3-2) For preclinical nursing students only. Not for college credit. Miss McCarthy.

S88 NUTRITION AND FOOD PREPARATION (2-2) Fundamentals of normal nutrition; laboratory experience in calculating food values; planning adequate meals; basic food preparation techniques. For nursing students in summer session. Three hours. Miss McCarthy.

89-90 DIET MODIFICATION IN DISEASE Diet modification in the treatment of disease. The role of diet in the nursing care. Laboratory work is integrated with hospital experience. For students in nursing. Integrated with Nursing Education 19-20 Medical and Surgical Nursing. One hour. Miss McCarthy.

135 ADVANCED FOOD PREPARATION (2-4) Scientific principles and fundamental processes underlying food preparation and preservation with practical applications. *Prerequisite:* 35, Chemistry 2. Four hours. Miss Williams.

137 MEAL MANAGEMENT (1-5) Principles and practice in planning, preparing and serving family meals at different cost levels. *Prerequisite:* 35, 43. Three hours. I, II. Miss Williams.

144 APPLIED NORMAL NUTRITION (2-2) Nutrition and the individual; food habits and the problems involved in food selection to promote good nutrition. *Prerequisite:* 43. Three hours. Miss Williams and Miss McCarthy.

236 EXPERIMENTAL FOOD PREPARATION (1-4) Methods and techniques in experimental work in foods. Independent laboratory study of problems in food preparation. *Prerequisite:* 135; Agricultural Biochemistry 172. Three hours. Miss Williams.

243 NUTRITION AND DIET (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 172; Zoology 52. Four hours. Dr. Morse.

244 DIET THERAPY (2-2) Adaptations of the normal diet in conditions affected by or affecting the untilization of food. *Prerequisite:* 243. Three hours. Miss Wakefield.

246 READINGS IN FOODS Critical survey of the literature on the recent developments in food research. *Prerequisite:* senior standing; 135; Agricultural Biochemistry 172. Two or three hours. The staff.

248 READINGS IN NUTRITION Critical survey of the literature on recent developments in nutrition. *Prerequisite:* 243. Two or three hours. The staff.

Institutional Management

139 FOOD SERVICE MANAGEMENT (1-2) Managerial responsibility, menu planning, cost calculation and organization necessary for preparing and serving food for groups. Basic techniques of organization, management, time and motion studies and floor plans in relationship to school lunch and community feeding problems. *Prerequisite:* 137. Two hours. Miss Wakefield. (Not open to dietetic majors.)

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

187 INSTITUTIONAL ADMINISTRATION Survey of the field; organization, management and personal problems; time and motion studies; sanitation; food cost control. *Prerequisite:* 186. (May be taken concurrently.) Three hours. Miss Wakefield.

288 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:* 186, 187. Four hours. Miss Wakefield.

Home Economics Seminars and Research

1 ORIENTATION Problems of adjustment to college life; evaluation of professional opportunities in home economics. One hour. Dr. Trotter.

151 SENIOR SEMINAR Home economics as a profession. Professional ethics and responsibilities of a home economist. Readings and discussion of research and progress in the field. One hour. Dr. Trotter.

197, 198 SENIOR PROBLEMS Supervised study in a field of home economics. Findings submitted in a form prescribed by the department. One to three hours. The staff.

386, 387 GRADUATE SEMINAR Designed for graduate students concentrating in the department. Advanced study in a special field; opportunities for independent work are provided. Three hours. Dr. Trotter.

391, 392, 393, 394 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. The staff.

Horticulture

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

Associate Professor Hopp (Chairman); Mr. Calahan

51, 52 GENERAL HORTICULTURE (3-0) (2-2) First semester: the requirements of horticultural crops for productive growth. Second semester: fundamentals supporting some of the horticultural practices. *Prerequisite:* Botany 1 or permission of the department, 51 for 52. Three hours. The staff.

54 SMALL FRUIT CULTURE (2-2) Fundamental principles underlying plant growth and fruit production; relation of these principles to practice. *Prerequisite:* Botany 1. Three hours. The staff.

56 PLANT PROPAGATION (2-2) History, theory, and practice of multiplying plants by various methods. *Prerequisite:* Botany 1. Three hours. Mr. Hopp.

151 ADVANCED TREE FRUITS (2-2) Cultural practices and the principles involved in modern fruit production. *Prerequisite:* 52. Three hours. Mr. Calahan. Alternate years, 1962-63.

152 PLANT BREEDING (2-2) Application of the principles of genetics to practical plant breeding. *Prerequisite:* Zool. 115. Three hours. Mr. Hopp. Alternate years, 1962-63.

153 ADVANCED VEGETABLE CULTURE (2-2) A study of the culture of the more important vegetable crops and a review of some of the recent experimental work. *Prerequisite:* 52. Three hours. Mr. Hopp. Alternate years, 1963-64.

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. The staff.

201 PLANT NUTRITION (2-4) Effect of soil management, fertilizers, environmental factors and mineral deficiencies on the functioning and performance of plants. *Prerequisite:* Botany 103, or permission of the department. Four hours. The staff. Alternate years, 1963-64.

281, 282 HORTICULTURE SEMINAR Discussion of horticultural topics. Students are required to prepare and present papers on selected subjects. Open to graduate students and seniors by permission. One hour. The staff.

391, 392, 393, 394 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.

Mathematics

COLLEGE OF TECHNOLOGY

Professors Schoonmaker (Chairman) and Fraleigh; Associate Professors Dwork, Izzo, Moser, Nicholson, and Riggs; Assistant Professor Lighthall; Instructors Bohmont, Merriam, and Wagner

1 ELEMENTARY COLLEGE ALGEBRA For students who do not intend to concentrate in science or mathematics. Recommended minimum preparation: one year each of secondary school algebra and geometry. Offered only in Summer Session. Three hours.[1]

2 PLANE TRIGONOMETRY For students who do not intend to concentrate in science or mathematics. *Prerequisite:* 1 or 9. Three hours.

4 MATHEMATICS OF FINANCE Mathematical theory of finance applied to interest and investments, annuities, and life insurance. *Prerequisite:* 1 or 9. Three hours.

[2]5 PLANE ANALYTIC GEOMETRY AND CALCULUS Introductory course for students who intend to concentrate in science or mathematics. It prepares students for Mathematics 12. *Prerequisite:* 2, or sufficiently high scores on the algebra and trigonometry placement tests. Three hours.

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. For students in the arts, social sciences, and others. *Prerequisite:* one year each of secondary school algebra and geometry, 7 for 8. Three hours.

[2]9 COLLEGE ALGEBRA For students who intend to concentrate in science or mathematics, but who are not sufficiently well prepared to take Mathematics 5, 10, or 11. *Prerequisite:* two years of secondary school algebra and one year of secondary school geometry. Three hours.

[2]10 PLANE TRIGONOMETRY, ANALYTIC GEOMETRY AND CALCULUS For students who intend to concentrate in science or mathematics. A full treatment of plane trigonometry followed by an introduction to plane analytic geometry and calculus. This course prepares students for Mathematics 12. *Prerequisite:* 9, or a sufficiently high score on the algebra placement test. Five hours.

[2]11 ALGEBRA, TRIGONOMETRY, ANALYTIC GEOMETRY AND CALCULUS For students who intend to concentrate in science or mathematics. A few topics

[1] Students who present two units of high school Algebra for entrance will not receive credit for Mathematics 1.

[2] The enrollment of students who desire eventually to take Mathematics 12 will depend on their previous record and their score on a mathematics placement test. Students not qualified to enroll in Mathematics 5, 11, or 10 will be enrolled in Mathematics 9. (The order 5, 11, 10, and 9 represents various levels of preparatory achievement from highest to lowest.) 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.

from college algebra; review of plane trigonometry; introduction to plane analytic geometry and calculus. This course prepares students for Mathematics 12. *Prerequisite:* High school trigonometry, or equivalent, and a sufficiently high score on the algebra placement test. Five hours.

[1]12 PLANE ANALYTIC GEOMETRY AND CALCULUS For students who intend to concentrate in science or mathematics. Continuation study of analytic geometry, differential and integral calculus and their applications. *Prerequisite:* 5, 10 or 11. Five hours.

21, 22 SOPHOMORE MATHEMATICS For students who intend to concentrate in science or mathematics. Solid analytic geometry; partial differentiation; multiple integrals; infinite series and elementary differential equations. *Prerequisite:* 12; 21 for 22. Three hours.

125, 126 NUMBERS 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.

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:* Consent of the department. Three hours.

207, 208 ADVANCED CALCULUS The calculus beginning with limits, continuity, differentiation, and Riemann integrals; treatment of those topics not included in the earlier course as a foundation for more advanced courses in analysis and applied mathematics. *Prerequisite:* 22; 207 for 208. Three hours.

209 PROJECTIVE GEOMETRY Principle of duality, perspectivity, projectivity, harmonic sets, cross ratio, the theorems of Pascal and Brianchon, and poles and polars. *Prerequisite:* 22. Three hours. Alternate years, 1962-63.

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:* 22. Three hours. Alternate years, 1962-63.

211 DIFFERENTIAL EQUATIONS Solutions of linear ordinary differential equations, the Laplace transformation, and series solutions of differential equations. *Prerequisite:* 22. Three hours.

212 APPLIED MATHEMATICS Boundary-value problems, orthogonal functions and vector analysis. *Prerequisite:* 211. Three hours.

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.

[1] See footnote page 161.

220 VECTOR ANALYSIS Introduction to vector methods including the elements of vector algebra and vector calculus with applications to physics and mechanics. *Prerequisite:* 22. Three hours. Alternate years, 1962-63.

221 MATHEMATICAL STATISTICS Frequency distributions including: the calculation of moments, standard deviations and related quantities, the theory of least squares and its application to scientific problems, the Chi-square test and Student's t-test with a discussion of the validity of statistical results. *Prerequisite:* 22. Three hours.

224 THEORY OF PROBABILITY Permutations and combinations, stochastic variables, moments, probability distribution functions, joint distribution functions, normal, binomial and Poisson distributions, Stirling's Theorem, The Central Limit Theorem and the laws of large numbers. *Prerequisite:* 221. Three hours. Alternate years, 1963-64.

225, 226 TOPOLOGY Introduction to the fundamental concepts of general topology: topological spaces, Moore-Smith convergence, product spaces, quotient spaces, embedding, metrization, and compact spaces. *Prerequisite:* 22, 225 for 226. Three hours. Alternate years, 1962-63.

227 DIFFERENTIAL GEOMETRY Analytic metric differential geometry of curves and surfaces in ordinary three dimensional space; curvature, torsion, Frenet formulas, involutes, evolutes, developable and ruled surfaces, and geodesic curves. *Prerequisite:* 22. Three hours. Alternate years, 1963-64.

228 NUMBER THEORY Divisibility, prime numbers, Diophantine equations, congruence of numbers, and methods of solving congruences. *Prerequisite:* 22. Three hours. Alternate years, 1963-64.

231, 232 FUNCTION OF A COMPLEX VARIABLE Differentiation and integration of a function of a complex variable, mapping of elementary functions, infinite series, properties of analytic functions, analytical continuation, calculus of residues, contour integration, integral functions, meromorphic functions, Riemann surfaces, and conformal representation. *Prerequisite:* 208; 231 for 232. Three hours. Alternate years, 1962-63.

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. Alternate years, 163-64.

241 MODERN HIGHER ALGEBRA Fundamental concepts of modern higher algebra, logic, groups, rings, fields, integral domains, lattices, Boolean algebra and order systems. *Prerequisite:* 12 and consent of instructor. Three hours.

242 THEORY OF DETERMINANTS AND MATRICES Basic concepts, theorems, and applications of determinants and matrices including the theory of vector spaces and quadratic forms. *Prerequisite:* 241. Three hours.

243 THEORY OF GROUPS The study of the various kinds and structures of groups. *Prerequisite:* 241. Three hours. Alternate years, 1963-64.

244 GALOIS THEORY The study of Galois theory leading to the insolvability of general quintic equations by radicals and theorems on constructions with ruler and compasses. *Prerequisite:* 243. Three hours. Alternate years, 1963-64.

251 THE THEORY OF DIGITAL COMPUTING MACHINES AND NUMERICAL ANALYSIS Mathematical theory underlying digital computing machines including assigned problems on the IBM 1620, and 7090 at M.I.T., including programming in machine language, symbolic and fortran languages. The last third of the course is devoted to elementary numerical analysis. *Prerequisite:* 22, Math. 242 highly desirable. Three hours. Alternate years, 1962-63.

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 1620 computer. *Prerequisite:* 251. Three hours. Alternate years, 1962-63.

391, 392, 393, 394 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.

Medical Technology

COLLEGE OF MEDICINE

INTRODUCTION TO MEDICAL TECHNOLOGY During the first semester of the freshman year, the students attend a series of weekly, one-hour sessions held in the medical technology laboratory, Medical Alumni Building. One hour.

101 BASIC TECHNICS (3-6) Principles, procedures, and sources of error in medical laboratory tests. Hematology, bacteriology, serology, parasitology, blood bank, urinalysis and basal metabolism. Fall semester. Six hours. Dr. Heckman.

102 BASIC TECHNICS (1-4) Continuation of 101; histological technic, introduction to diagnostic exfoliative cytology. Spring semester. Three hours. Limited to students of medical technology except by permission of departmental chairman. Dr. Coon and staff.

103 SEMINAR IN CLINICAL PATHOLOGY Limited to students of medical technology. Spring semester. Two hours. Dr. Heckman.

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.

HOSPITAL ASSIGNMENTS Rotating assignments in various departments of hospital, medical college, and public health diagnostic laboratories to give experience in medical laboratory procedures. Spring semester. Six hours. Dr. Coon and staff.

Military Science and Tactics

ARMY ROTC

Col. Blanchard (Chairman); Captains Hussey, Cram, Serafin, Brodin, Serven, and Short

1-2 OUR ARMY AND HISTORY Organization of the Army and ROTC; rifle marksmanship; American Military History; school of the soldier and exercise of command. Two hours.

11-12 FUNDAMENTALS FOR SMALL UNIT LEADERS Military map and aerial photograph reading; United States Army and national security; introduction to operations and basic tactics; school of the soldier and exercise of command. Two hours.

101-102 THE ARMY LEADER Leadership; military teaching methods; organization, functions, and missions of the arms and services; small unit tactics and communications; school of the soldier and exercise of command. Two hours.

111-112 COMMAND Operations; logistics; administration and personnel management; military law; role of the United States in world affairs; service orientation; school of the soldier and exercise of command. Two hours.

Music

COLLEGE OF ARTS AND SCIENCES

Professors Lidral (Chairman), Bennett (Emeritus), and Pappoutsakis; Associate Professor Kinsey; Assistant Professors Schultz, Start, and Weinrich; Temporary Instructors Auchter, and Dahl

Students in all music courses are required to attend all 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. Pappoutsakis.

9-10 INTRODUCTORY MUSIC Required of students in elementary education, elective to others. First semester: ear training, music reading and writing, elementary theory; second semester: history and appreciation. Three hours.[1] Mr. Pappoutsakis.

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

201-202 ADVANCED HARMONY AND HARMONIC ANALYSIS *Prerequisite:* 7-8. Three hours. Dr. Kinsey.

203, 204 ORCHESTRATION First semester: characteristics of instruments, arranging for orchestra; second semester: advanced exercises in orchestral scor-

[1] Enrollment in Music 5 will cancel credit for Music 9 and enrollment in Music 1 or 2 will cancel credit in Music 10.

ing. *Prerequisite:* 105-106 or the equivalent; 203 for 204. Three hours. Mr. Pappoutsakis.

205-206 COUNTERPOINT First semester: tonal counterpoint; second semester: canon and fugue. *Prerequisite:* 105-106 or the equivalent; 205 for 206. Three hours. Mr. Bennett, Dr. Kinsey.

208 FORM AND ANALYSIS Creative approach to aural and sight analysis of musical construction. *Prerequisite:* 105-106 or the equivalent; 205 recommended. Three hours. Drs. Kinsey, Lidral.

209, 210 ARRANGING, VOCAL AND INSTRUMENTAL First semester: arranging for vocal ensembles of various sizes and functions including mixed groups, men's and women's glee clubs, and chamber groups. Second semester: arranging for instrumental ensembles of various sizes including marching, concert, and school bands, and chamber groups. *Prerequisite:* 203. Three hours. Dr. Lidral, Mr. Schultz. Alternate years, 1962-63.

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

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. Staff.

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 or 7-8. Three hours. Dr. Lidral.

223, 224, 225, 226 MUSIC LITERATURE Advanced studies in the literature of music. *Prerequisite:* 105-106 and 221, 22. Three hours. Mr. Bennett, Dr. Lidral.

281, 282 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, 382, 383, 384 SEMINAR Study of special topics appropriate to student needs. 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.

For Music Education, see page 134.

For School Music, see Elementary Education 113.

Applied Music

For the fees for instruction, see page 45.

A senior recital in the applied major field is required of all music education and applied music majors. Regular appearances in informal recitals are required

of all applied music students. Appearance in one formal departmental recital a year 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:* Consent of instructor. One hour.[1] Mr. Schultz, Dr. Lidral, Mr. Pappoutsakis.

45, 46 CHAMBER MUSIC (0-2) Study and performance of masterworks for small groups. Outside practice required. *Prerequisite:* Consent of instructor. One hour.[1] Mrs. Start and staff.

51, 52 INDIVIDUAL STUDY Private study in piano, voice, strings, woodwinds, brass, percussion, and harp. [1]One or two hours. Staff.

53, 54 ORGAN Preparation for recital and church service playing, including hymns and accompaniments. [1]One or two hours. Mr. Weinrich.

71, 72 CLASS STUDY (0-2) Required of music education students, elective to others. Class study in applied music fields of voice, strings, woodwinds, brass, and percussion. [1]One hour. staff.

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 or 7-8; 211 for 212. Three hours. Mr. Pappoutsakis.

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

253, 254 ADVANCED ORGAN Private study in organ leading to public recital performance. *Prerequisite:* advanced standing in organ. [1]One or two hours. Mr. Weinrich.

[1] Indicated courses in applied music may be taken for several years, but no student may receive credit toward graduation totalling more than six semester hours in major 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 either Music 1, 2, or 5-6, or 9-10 and participation in major 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.

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, teaching experience, and consent of instructor. [1]Two hours. Staff.

274 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 consent of instructor. One hour. Mr. Schultz.

Nursing

COLLEGE OF EDUCATION AND NURSING

Professor Lodge (Chairman); Associate Professors Milligan, Woodruff; Assistant Professors Davis, Demers, Emerson, Lombard, Palmer, Schwalb, Thompson; Instructors Menzies, Larsen; Consultant Surawicz

1-2 INTRODUCTION TO NURSING First semester: The profession of nursing and community health; the hospital and the patient's reaction to it. Second semester (2-4): The practice of nursing with emphasis on meeting the patient's personal needs; applying scientific principles; developing social, communicative, and manual skills. Beginning hospital experience. I, two hours; II, four hours. Miss Milligan.

3 FUNDAMENTALS OF NURSING (Summer Session) Continued study of the practice of nursing; development of patient-centered care; acquisition of skills; experience in laboratory and hospital with patient contact. *Prerequisite:* 1-2. Three hours. Miss Milligan.

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

12 MICROBIOLOGY (Summer Session) The general principles of microbiology as a basis for understanding the role of microorganisms in health and disease. Microbial control, infection, and immunity; Applications to environmental sanitation. Three hours. Miss Woodruff.

15-16 HUMAN ANATOMY AND PHYSIOLOGY Fundamentals of structure and function of the normal human body. Laboratory: anatomical and physiological principles through dissection, physiological experiments and examination of histological preparations. For students of nursing and dental hygiene. Three hours. Miss Woodruff.

19-20 MEDICAL AND SURGICAL NURSING Medical and surgical nursing integrated with pharmacology, pathology, geriatrics, communicable diseases, diet therapy, emergency nursing, social and health aspects, rehabilitation and principles of health teaching. Clinical practice provides the opportunity for the student to apply theoretical learning. Nine hours. Misses Demers, Lombard, Thompson and Mrs. Palmer.

118 SURVEY OF CONTEMPORARY NURSING Influence of contemporary social, educational, political and economic developments on nursing; problems and issues in the profession today; fields of work and professional organizations in nursing and responsibilities of the professional nurse. Two hours. Miss Lodge.

[1] See footnote page 167.

123 MATERNAL-CHILD NURSING Concepts and skills necessary for promotion of maternal and child health through a family centered approach. Instruction and clinical practice in the care of mothers and children. Ten hours. Misses Davis and Schwalb.

127 PSYCHIATRIC NURSING Psychiatric nursing in a hospital for the mentally ill and in allied community agencies. Interpersonal relationships are explored as they influence patient care. Students participate in varied treatment programs. Presented at Boston University. Six hours. Miss Larsen.

129 NURSING IN LONG TERM ILLNESS Team approach to the nursing care of patients with long term illness. The identification of the elements and principles of administration and application of these in nursing care. Presented at Boston University. Six hours.

136 PUBLIC HEALTH NURSING Accent is on greater depth of study for broader understandings in the areas of health promotion, disease prevention, bedside care and rehabilitation of families and individuals in their own environment. Consideration of public health practice throughout the world is stimulated by class discussion and guided experience in a community agency. Six hours. Misses Emerson and Menzies.

181 ANALYSIS OF SELECTIVE NURSING SITUATIONS Comprehensive nursing care; concepts of leadership and guidance of learners. Clinical practice is provided in these areas. Four hours. The staff.

Philosophy and Religion

COLLEGE OF ARTS AND SCIENCES

Professor Dykhuizen (Chairman); Assistant Professors Hall, Kahn and Sadler; Instructor Beckett

Philosophy

1 INTRODUCTION TO PHILOSOPHY The chief problems of philosophy. *Prerequisite:* sophomore standing. Three hours. Drs. Dykhuizen, Hall and Mr. Beckett.

2 LOGIC Principles and conditions of correct thinking with emphasis on the detection of fallacies of thought. *Prerequisite:* sophomore standing. Three hours. Mr. Beckett.

4 ETHICS Examination of the ideas underlying man's moral behavior to develop an acceptable and coherent theory of conduct. *Prerequisite:* sophomore standing. Three hours. Drs. Dykhuizen, Hall and Mr. Beckett.

81 SYMBOLIC LOGIC Newer techniques of logical analysis; discussion of logistic systems; general inquiry into the nature of deductive logic. *Prerequisite:* one course in philosophy or permission of the instructor. Three hours.

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.

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. Dr. Hall. Alternate years, 1963-64.

107, 108 HISTORY OF PHILOSOPHY First semester: ancient and medieval philosophy; second semester: modern philosophy. *Prerequisite:* 1; junior standing. Three hours. Dr. Dykhuizen.

109 RECENT AMERICAN PHILOSOPHY The thought of leading contemporary American philosophers. *Prerequisite:* 1; junior standing. Three hours. Dr. Dykhuizen.

113 AESTHETICS An analysis of some principal theories of art and the beautiful as exemplified in music, literature and painting. *Prerequisite:* 1; junior standing or consent of instructor. Three hours. Dr. Hall.

201 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. Dr. Hall.

206 SOCIAL PHILOSOPHY The meanings and values inherent in social life. *Prerequisite:* 1 or 4; junior standing. Three hours. Dr. Hall.

214 INTELLECTUAL BACKGROUND OF MODERN LIFE Intellectual movements which have influenced the thought and life of today. *Prerequisite:* senior standing or permission of the instructor. Three hours. Dr. Dykhuizen.

215 PLATO A systematic analysis of the Dialogues of Plato on the following topics: theory of knowledge, ethics and political philosophy, and fine art. *Prerequisite:* six hours in philosophy or consent of the instructor. Students concentrating in the classics may be admitted. Three hours. Dr. Hall.

281, 282 READINGS IN PHILOSOPHY Selected classics in philosophical literature. The choice of classics will be determined according to the interest of students and instructor. *Prerequisite:* six hours of advanced courses in philosophy or consent of the instructor. Three hours each semester. The staff.

For Economic Philosophy, see Economics 295 and 296; 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. *Prerequisite:* sophomore standing. Three hours. Dr. Sadler.

11 BIBLE The religious thought of selected writers of the Bible. *Prerequisite:* sophomore standing. Three hours. Mr. Kahn. Alternate years, 1962-63.

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 31; junior standing. Three hours. Dr. Sadler.

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; junior standing. Three hours. Dr. Sadler.

202 CONTEMPORARY TRENDS Significant modern developments in the world religions. *Prerequisite:* 1, 2; junior standing. Three hours. Dr. Sadler.

211 READINGS IN ORIENTAL RELIGION Selected primary sources, representing major schools of thought in the religions of India, Japan, and China. *Prerequisite:* 1, junior standing, and consent of the instructor. Three hours. Dr. Sadler.

Physical Education

COLLEGE OF EDUCATION AND NURSING

For requirements in physical education see page 51.

MEN

Associate Professors Post (Chairman), and Evans; Assistant Professors Christensen, LaPointe and Strassburg; Instructor Greig

The uniform required in this program consists of T-shirt, shorts, supporter, white socks, sweat clothes, basketball shoes or white tennis shoes. The T-shirts, shorts, and sweat clothes must be obtained at the University store. The other items of equipment may be purchased there, also.

FRESHMAN AND SOPHOMORE PHYSICAL EDUCATION A seasonal sports program with attention to: posture; body-building exercises; fundamentals and skills of various sports and physical activities. To develop and improve: skills; coordination and endurance; habits of exercise; an intelligent attitude toward and interest in sports activities. Fall-winter: football, touch football, cross country, tennis, calisthenics, boxing, golf, basketball, volleyball, apparatus and tumbling, handball, swimming, skiing, badminton. Winter-spring: badminton, basketball, calisthenics, volleyball, handball, boxing, golf, soccer, apparatus and tumbling, swimming, skiing, indoor and outdoor track, softball, tennis, baseball. Two hours weekly. One hour. The staff.

WOMEN

Assistant Professor Wills (Chairman); Instructors Darby, Davenport, Dimitroff, Gosseline and Schelper[1]

The uniform required consists of a regulation short and shirt, white rubber-soled tennis shoes, white ankle socks, black leotard and dance tights. All uniforms must be the regulation style and color.

1-2 FRESHMAN PHYSICAL EDUCATION Two hours weekly. One hour.

11-12 SOPHOMORE PHYSICAL EDUCATION Two hours weekly. One hour. Provides a seasonal sports program with emphasis on outdoor activities with individual and dual sports and a knowledge of the role of physical education in everyday living.

The physical education program for women is designed to provide a variety of activities for selection by freshmen and sophomore women acccording to their needs and interests. The purpose of the program is

1. To develop an awareness of the physical self.

[1] Resigned February 1962.

2. To provide an opportunity for applying basic movement patterns in new sports and dance activities.
3. To provide an opportunity to increase proficiency in activities already learned.

22 FIRST AID (1-1) Standard and Advanced First Aid Courses of the American Red Cross. Red Cross certificate for successful completion. Open to men and women. One hour credit except in the College of Arts and Sciences.

26 WATER SAFETY (2-2) American National Red Cross Water Safety Instructors' Training Course. Red Cross certificate for successful completion. *Prerequisite:* at least 18 years of age; hold an active Red Cross Senior Life Saving Certificate. Open to men and women. Two hours credit except in the College of Arts and Sciences.

50 DANCE TECHNIQUE AND ANALYSIS (1-4) The history, technique, theory and composition elements of movement as found in dance and the related arts. Training through technique, improvisation, compositional problems and performance. *Prerequisite:* sophomore standing or consent of instructor. Open to men and women. Three hours.

For Physical Education Minor courses, see under Department of Education.

Physics

COLLEGE OF ARTS AND SCIENCES

Professors Crowell (Chairman), Nyborg, Skapsi[1] and Walbridge; Associate Professor Rooney; Assistant Professor Sachs

1-2 INTRODUCTORY PHYSICS (2-2) For students not concentrating in a science. Mechanics, heat, sound, light, electricity, magnetism, and atomic physics. Demonstration lectures, presenting experimental facts and theoretical conclusions coordinated with laboratory work. *Prerequisite:* one year each of secondary school algebra and geometry. Three hours. The staff. (Not offered after 1962-63.)

5-6 GENERAL PHYSICS (3-2) First semester: mechanics and heat. Second semester: sound, light, electricity, magnetism and atomic physics. *Prerequisite:* Math. 1, 2 or equivalent. Four hours. The staff.

14-15 GENERAL PHYSICS (3, 3-2) For students concentrating in engineering or a physical science. First semester: mechanics and calorimetry. Second semester: electricity and magnetism, thermodynamics, and geometric optics. *Prerequisite:* for Physics 14, concurrent enrollment or credit in Math. 10 or 11; for Physics 15, 14 and concurrent enrollment or credit in Math. 21. Three hours; four hours. Staff.

16 GENERAL PHYSICS (3-4) Physical optics and introduction to modern physics. *Prerequisite:* 15[2]. Five hours. Staff.

81, 82 THE CULTURAL BACKGROUND OF THE DEVELOPMENT OF SCIENCE (3-0) History of formation of the scientific method from the earliest begin-

[1] On leave 1962-63.
[2] May be replaced by Physics 5-6 with the consent of the department.

ning until the present time; rise and fall of different scientific concepts and theories; accumulation of information from observation and experiment and the evolution of the experimental method; relation between science, technology and their contemporary cultural and social environment. *Prerequisite:* a one year college course in mathematics, and either physics or chemistry. Three hours. Dr. Skapski.

115 ELECTRICITY AND MAGNETISM (3-2) Fundamental principles of electricity and magnetism with emphasis on electric circuits. Resistance and direct current circuits; capacitance and inductance with applications to transient phenomena and alternating current circuits. *Prerequisite:* 15[1]; Math. 22 concurrently, or Math. 21 concurrently with consent of the Department. Four hours. Dr. Nyborg.

116 MECHANICS (3-0) Mechanics of a particle, including central forces, formed and coupled vibrations; introductory rigid body motion. *Prerequisite:* 15[1]; Math. 22 concurrently. Three hours. Dr. Nyborg.

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, Chem. 2, Math. 12. Four hours. Dr. Nyborg.

171, 172 MODERN PHYSICS (2-2) First semester: behavior of electrons in electric and magnetic fields, photoelectricity, thermionic emission, simple vacuum tube circuits, particles and waves. Second semester: atomic structure, X-rays and crystals, nuclear transformations, nuclear power and semi-conductors. *Prerequisite:* 16[1] or 22[1] and Math. 21 for 171; 171 or E.E. 109 for 172. Three hours. Mr. Rooney. (Not offered in 1962-63.)

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; Math. 212 concurrently. Three hours. Alternate years, 1962-63.

242 ELECTROMAGNETISM (3-0) Fundamental principles of electric and magnetic fields. Electrostatic theory and magnetic fields of steady currents. Electromagnetic energy relationships and introduction to electromagnetic theory. *Prerequisite:* 115; Math. 211. Three hours. Dr. Crowell.

261 OPTICS (3-2) Geometrical theory of reflection and refraction, mirrors and lenses; wave properties of light, interference and diffraction, polarized light. *Prerequisite:* 16[1] and Math. 21. Four hours. Dr. Sachs. Alternate years, 1963-64.

271, 272 ADVANCED MODERN PHYSICS (3-0) Background and concepts of relativity, quantum theory, and nuclear physics. First semester: relativity, electron physics, atomic structure and spectra, wave mechanics. Second semester: molecular and solid state physics, X-rays, nuclear physics. *Prerequisite:* 115 and 116 or E.E. 110 or Chem. 142 and Math. 211. 271 for 272. Three hours. Dr. Crowell.

273 THERMODYNAMICS (3-0) Basic concepts of thermodynamics including the characteristic functions, and their application to determination of equi-

[1] May be replaced by Physics 5-6 with the consent of the department.

librium conditions in homogeneous and heterogeneous systems. *Prerequisite:* 15[1] or 22[1] and Math. 22. Three hours. Dr. Nyborg. Alternate years, 1963-64.

275 INTRODUCTION TO KINETIC THEORY AND STATISTICAL MECHANICS (3-0) Fundamental concepts of statistical theories. Meaning of models and constructs. Partition functions and their application to problems. Classical and non-classical distributions. *Prerequisite:* 15[1] or 22[1] and Math. 211. Three hours. I, II. Dr. Crowell. Alternate years, 1963-64.

276 SOLID STATE PHYSICS Crystal structure and classification of solids. Mechanical, thermal and electromagnetic properties of solids. Free electron model of conductors and band theory. *Prerequisite:* 271; Mathematics 212 or 220. Three hours. Alternate years, 1963-64.

304 QUANTUM MECHANICS (3-0) Development of the Schroedinger theory from DeBroglie's approach, and application of wave mechanics to simple physical systems including hydrogen atom. Characteristic features of Heisenberg matrix mechanics. Relation between wave and matrix mechanics. *Prerequisite:* 271, and either Math. 220 or Math. 212. Three hours. Alternate years, 1962-63.

311 ADVANCED DYNAMICS (3-0) Classical Mechanics presented as the basis of the concepts and methods of modern physics. Variational methods. Lagrangian and Hamiltonian formulations, canonical transformations. *Prerequisite:* Math. 211 and either 220 or 212. Three hours. Alternate years: 1962-63.

312 ELECTROMAGNETIC THEORY (3-0) Mathematical theory of electricity and magnetism. Field equations, energy and radiation. *Prerequisite:* 242, Math. 211 and 212 or 220. Three hours. Dr. Crowell. Alternate years, 1960-61.

281, 282, 283, 284, 285, 286 SEMINAR 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. One hour. The staff.

391, 392, 393, 394 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.

Political Science

COLLEGE OF ARTS AND SCIENCES

Professors Nuquist (Chairman), Babcock, Haugen, G. T. Little and Shen[2]*; Associate Professors Gould, Hilberg; Assistant Professors Simon and Steele; Instructors Eastman, Staron, and Thompson*

1,2 AMERICAN GOVERNMENT First semester: state and local governments; Second semester: national government. Three hours. The staff.

11, 12 INTRODUCTION TO POLITICAL SCIENCE First semester: elements of political science. Second semester: comparative governmental institutions. Students should not elect both 1, 2 and 11, 12. Three hours. The staff.

[1] May be replaced by Physics 5-6 with the consent of the department.
[2] Visiting professor.

51 INTERNATIONAL RELATIONS The major world events; the state system; international law and diplomacy; population, resources, and ideas; war. *Prerequisite:* sophomore standing. Three hours. Dr. Hilberg, Mr. Staron.

52 INTERNATIONAL ORGANIZATION Principles of multilateral relations among states; development and practice in the United Nations, regional and specialized international organizations from a political view. *Prerequisite:* 51. Three hours. Drs. Hilberg, Little, and Mr. Staron.

54 GEOGRAPHIC BACKGROUNDS OF POLITICS Elements of political geography; data of physical relations as they affect politics among states. *Prerequisite:* 51. Three hours. Dr. Little.

61, 62 LOCAL GOVERNMENT First semester: government of counties, towns, and other rural units. Second semester: municipal government. *Prerequisite:* sophomore standing. Three hours. Dr. Nuquist.

71 GOVERNMENT OF GREAT BRITAIN Organization, functions, and procedures of the British government. The nature and role of English law. *Prerequisite:* sophomore standing. Three hours. Mr. Staron.

72 GOVERNMENTS OF CONTINENTAL EUROPE *Prerequisite:* sophomore standing. Three hours. Mr. Thompson. Alternate years, 1962-63.

74 GOVERNMENTS OF THE BRITISH EMPIRE AND THE COMMONWEALTH Governmental systems in the British Commonwealth and overseas territories, with particular emphasis on Canada and Commonwealth cooperation. *Prerequisite:* sophomore standing. Three hours. Dr. Haugen. Alternate years, 1963-64.

75 GOVERNMENTS OF THE FAR EAST Political development and organization of China, Japan, and some other states of Asia. *Prerequisite:* sophomore standing. Three hours. Dr. Shen. Alternate years, 1962-63.

76 GOVERNMENTS OF LATIN AMERICA Analysis of the formal and informal political structure of the Latin American states with emphasis upon contemporary developments. *Prerequisite:* sophomore standing. Three hours. Dr. Gould. Alternate years, 1962-63.

191, 192 HONORS OR SPECIAL READINGS For undergraduates only. Three to six hours. The staff.

211, 212 POLITICAL THEORY First semester: development of political theory. Second semester: recent political theory. *Prerequisite:* 1, 2 or 11, 12; one other course or one sophomore course in social science; senior standing. Three hours. Mr. Simon and Dr. Babcock.

216 AMERICAN POLITICAL THOUGHT American political thought from the colonial period to recent times. *Prerequisite:* 1, 2 or 11, 12 and one other course or Economics 11-12 or History 23, 24; junior standing. Three hours. Mr. Simon.

221, 222 CONSTITUTIONAL LAW First semester: historical and analytic study of judicial review, federalism, the taxing power, the commerce power, the suffrage, Second semester: historical and analytic study of the war power, the executive power, due process of law, citizenship, Bill of Rights, equal protection of the laws. *Prerequisite:* 1, 2 or 11, 12; one other course, or Economics 11-12, or History 23, 24; junior standing. Three hours. Dr. Gould.

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:* 241. Three hours. Dr. Nuquist. Alternate years, 1963-64.

227 INTERNATIONAL LAW Principles and applications of public international law. *Prerequisite:* 51; one other year course in social science; junior standing. Three hours. Dr. Little. Alternate years, 1962-63.

231 THE LEGISLATIVE PROCESS Congressional organization and procedure. *Prerequisite:* 11, 12 or 1, 2; one other course or one sophomore course in social science; junior standing. Three hours. Dr. Haugen. Alternate years, 1963-64.

232 LAWMAKING AND PUBLIC POLICY Influence of the executive and problems of congressional control. *Prerequisite:* 1, 2, or 11, 12; one other course or one sophomore course in social science; junior standing. Three hours. Dr. Haugen. Alternate years, 1963-64.

241 ORGANIZATION AND FUNCTION OF PUBLIC ADMINISTRATION *Prerequisite:* 1, 2 or 11, 12; one other course or one sophomore course in social science; junior standing. Three hours. Dr. Nuquist.

242 ADMINISTRATIVE PROCEDURES *Prerequisite:* 241 or 263. Three hours. Dr. Nuquist. Alternate years, 1962-63.

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:* 11 and 12, or 2 and 51; junior standing. Three hours. Dr. Hilberg.

253-254 WORLD POLITICS Analysis of the foreign policies of countries other than the United States; selected problems in Europe, Latin America, and the Pacific Area. *Prerequisite:* 51, 52; junior standing. Three hours. Dr. Shen. Alternate years, 1963-64.

256 INTERNATIONAL ADMINISTRATION Theory and practice in international agencies. *Prerequisite:* 51, 52; junior standing. Three hours. Dr. Little. Alternate years, 1962-63.

263 STATE GOVERNMENT Organization and administration of state government. *Prerequisite:* 1, 2 or 11, 12; one other course or one sophomore course in social science; junior standing. Three hours. Dr. Haugen.

265, 266 INTERGOVERNMENTAL RELATIONS First semester: problems of the federal system. Second semester: national-state-local cooperative administration of selected public functions. *Prerequisite:* 1, 2 or 11, 12; one other course or one sophomore course in social science; junior standing. Three hours. Dr. Haugen. Alternate years, 1962-63.

271, 272 POLITICAL PARTIES AND PRESSURE GROUPS First semester: political parties. Second semester: citizen participation and interest groups. *Prerequisite:* 1, 2 or 11, 12; one other course or one sophomore course in social science; junior standing. Three hours. Dr. Steele.

281, 282 POPULAR GOVERNMENT Seminar for seniors concentrating in political science who intend to pursue graduate study in a branch of this subject or to enter the public service. Three hours. Dr. Hilberg.

291, 292 READING AND RESEARCH For advanced undergraduates and graduate students. Three to six hours. The staff.

391, 392, 393, 394 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

Associate Professors Henderson (Chairman) and Donovan

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

56 POULTRY JUDGING AND SELECTION (1-2) Physiological and morphological characters correlated with egg production. Judging of standard bred poultry, laboratory practice in judging both utility and exhibition poultry. *Prerequisite:* 1. Two hours. Mr. Henderson.

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

103 PROCESSING AND PACKAGING POULTRY PRODUCTS (2-2) The 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 $25.00. *Prerequisite:* 1; junior standing. Three hours. Mr. Henderson. Alternate years, 1962-63.

151 POULTRY BREEDING (2-0) Analysis of the procedure and techniques of practical application of genetic principles used in poultry breeding. Trap nesting, selection pressures, heritability, mating systems. *Prerequisite:* Poultry 1. Two hours. Dr. Donovan. Alternate years, 1963-64.

201 POULTRY NUTRITION (3-2) Digestion, absorption and metabolism of nutrients for maintenance, growth and reproduction. Developing and testing experimental concepts, including deficiency studies. *Prerequisite:* A&DS 105; Chem. 131-132 or 35. Four hours. Dr. Donovan.

281, 282 POULTRY SEMINAR A topical seminar designed for all students with an interest in current trends in the poultry industry. Required of poultry seniors. *Prerequisite:* Poultry 1. One hour. The staff.

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. The staff.

391, 392, 393, 394 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 Chaplin[1] *(Chairman) and Ansbacher*[2]*; Associate Professor Murdock; Assistant Professors Kraeling, Perrine and Slamecka; Instructor Martin*

1 GENERAL PSYCHOLOGY Introduction to the entire field, emphasizing the normal adult human being. *Prerequisite:* sophomore standing. Three hours. The staff.

101 SOCIAL PSYCHOLOGY Principles, problems and research techniques of social psychology; beliefs and attitudes; groups, morale, leadership. *Prerequisite:* 1; junior standing. Three hours. Dr. Perrine.

105 CHILD PSYCHOLOGY Development of the individual from birth to adolescence. *Prerequisite:* 1; junior standing. Three hours. Dr. Kraeling.

109-110 STATISTICAL AND EXPERIMENTAL METHODS (2-4) Descriptive and inferential statistics; general knowledge and appreciation of the scientific method in psychology. The student will design, conduct, and interpret the results of experiments in several different areas. *Prerequisite:* 1; junior standing; Math. 9 or the equivalent. Four hours. Dr. Murdock.

206 PERSONALITY The individual and life problems from the field-theoretical and phenomenological approach with emphasis on Alfred Adler's viewpoint. *Prerequisite:* 1; junior standing. Three hours. Dr. Ansbacher.

208 ABNORMAL PSYCHOLOGY The more unusual mental processes; methods of observing and interpreting them; their bearing on our understanding of the normal mind. *Prerequisite:* 1; junior standing. Three hours.

222 PHYSIOLOGICAL PSYCHOLOGY (2-2) Relationships between psychological processes and the functions of the nervous system and endocrine glands. *Prerequisite:* 1; junior standing. Three hours. Dr. Chaplin.

223 SYSTEMATIC PSYCHOLOGY A comparative study of the leading contemporary schools of psychological thought. *Prerequisite:* 1; junior standing. Three hours. Dr. Chaplin.

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. Three hours. Dr. Ansbacher.

230 LEARNING Major theoretical and experimental approaches to the psychology of learning. Topics will include: generalization, discrimination, latent learning and concept formation. *Prerequisite:* 109-110. Three hours. Dr. Slamecka.

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. *Prerequisite:* 109-110. Three hours. Dr. Perrine.

281-282 SEMINAR Review and discussion of current psychological research. Required of graduate students and seniors concentrating in psychology. *Prerequisite:* 110, 223. One hour. The staff.

[1] Sabbatical leave second semester 1961-62.
[2] Sabbatical leave 1961-62.

381-382 ADVANCED READINGS Readings, with conferences, to provide those working for the M.A. degree with the background for, and specialized knowledge relating to, their research. Credit as arranged. The staff.

391, 392, 393, 394 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.

Romance Languages

COLLEGE OF ARTS AND SCIENCES

Professors Daggett[1] *(Chairman) and Johnston; Associate Professor Julow; Assistant Professors Hubbell, Parker, and Towne; Instructors Baker, Easterling, Heller, Hopkins, Lamb, Souville and Weiger*

French

1-2 ELEMENTARY FRENCH Grammar, pronunciation, composition, translation, dictations, and use of the spoken language, for those who present less than two years of preparatory French. *Credit is given only if Intermediate French is also completed.* Four hours. Dr. Julow and others.

11-12 INTERMEDIATE FRENCH Grammar, composition, translation, and conversation. Conducted chiefly in French. *Prerequisite:* 1-2 or two years of preparatory French. Three hours. Dr. Parker and others.

101-102 FRENCH LITERATURE: 19TH CENTURY Outstanding authors of the romantic, realistic, and naturalistic schools. This course is a prerequisite for all other courses in French literature. *Prerequisite:* 11-12. Three hours. Drs. Daggett, Johnston and Julow.

121-122 COMPOSITION AND CONVERSATION Composition, conversation, and phonetics. Required of those who wish to be recommended to teach French. *Prerequisite:* good standing in 11-12. Three hours. Dr. Parker and others.

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:* 101-102, 203 for 204. Three hours. Dr. Johnston. Alternate years, 1963-64.

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:* 101-102. Three hours. Dr. Parker. Alternate years, 1963-64.

213 FRENCH LITERATURE: 17TH CENTURY Selected works of the century with emphasis on Corneille, Racine, and Molière. *Prerequisite:* 101-102. Three hours. Dr. Julow. Alternate years, 1962-63.

216 FRENCH LITERATURE: 16TH CENTURY Selected works of the period with emphasis on Rabelais and Montaigne. *Prerequisite:* 101-102. Three hours. Dr. Daggett. Alternate years, 1962-63.

[1] Sabbatical leave, second semester, 1962-63.

217 SPECIAL STUDIES ON FRENCH LITERATURE Selected authors representative of French thought and literary merit. Three hours. Dr. Johnstone. Alternate years, 1962-63.

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:* 121-122. Three hours. Dr. Daggett.

281-282 SENIOR SEMINAR Special readings and research. Required of all senior concentrators. One hour.

381, 382 GRADUATE SEMINAR Offered for resident candidates for the Master of Arts degree; opportunities for independent work are provided. Three hours.

391, 392, 393, 394 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 Grammar, composition, translation, and practice in the spoken language. *Prerequisite:* permission of the department. Three hours. Dr. Johnston.

11-12 INTERMEDIATE ITALIAN Grammar, composition, translation, and conversation. *Prerequisite:* 1-2 or its equivalent. Three hours. Dr. Johnston.

Spanish

1-2 ELEMENTARY SPANISH Grammar, composition, and translation, practice in pronunciation and use of the spoken language. For those who present less than two years of preparatory Spanish. *Credit is given only if Intermediate Spanish is also completed.* Four hours. Mr. Hubbell and others.

11-12 INTERMEDIATE SPANISH Readings from selected authors. Composition, grammar, and practice in conversation. Conducted chiefly in Spanish. *Prerequisite:* 1-2 or two years of preparatory Spanish. Three hours. Mr. Towne and others.

101-102 INTRODUCTION TO SPANISH LITERATURE Selections from the outstanding works of Spanish literature from the medieval period to the present. Outside reading, and reports. *Prerequisite:* 11-12. Three hours. Mr. Hubbell.

121-122 CONVERSATION AND COMPOSITION Composition, conversation, and phonetics. Required of those who wish to be recommended to teach Spanish. *Prerequisite:* good standing in 11-12. Three hours. Mr. Weiger.

205 INTRODUCTION TO SPANISH-AMERICAN LITERATURE Selections from outstanding authors from the colonial period to *modernismo;* Garcilaso de la Vega, Sor Juana, Juan Montalvo, Ricardo Palma, Sarmiento, and José Hernandez. Outside readings, and reports. *Prerequisite:* 101-102. Three hours. Mr. Hubbell. Alternate years, 1963-64.

206 CONTEMPORARY SPANISH-AMERICAN LITERATURE Selections from outstanding authors of the 20th century; Ruben Darío, Gabriela Mistral, Pablo

Neruda, Ricardo Güiraldes, and Eduardo Barrios. Outside readings and reports. *Prerequisite:* 101-102. Three hours. Mr. Hubbell. Alternate years, 1963-64.

207 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:* 101-102. Three hours. Mr. Hubbell.

208 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:* 207. Three hours. Mr. Hubbell.

213, 214 SPANISH LITERATURE: GOLDEN AGE Selected readings from the novel, poetry, drama of the 16th and 17th centuries with special attention to Cervantes and the dramatists. *Prerequisite:* 101-102, 213 for 214. Three hours. Alternate years, 1962-63.

223-224 ADVANCED COMPOSITION AND CONVERSATION Translation into Spanish of difficult English prose, free composition and discussion of questions of style. Advanced conversation. Required of those who wish to be recommended to teach Spanish. *Prerequisite:* 121-122. Three hours. Mr. Weiger.

281-282 SENIOR SEMINAR Special readings and research. Required of all senior concentrators. One hour.

Russian

COLLEGE OF ARTS AND SCIENCES

Assistant 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 unabridged works by Puskin, Lermontov, Chekov, and others. *Prerequisite:* 1-2. Three hours.

101-102 INTRODUCTION TO RUSSIAN LITERATURE Reading and discussion of selected works of Russian literature. Practice in hearing, writing, and speaking Russian. *Prerequisite:* 11-12. Three hours.

Sociology

COLLEGE OF ARTS AND SCIENCES

Associate Professor Oren (Chairman); Assistant Professors Lewis and V. C. Little; Instructors Maher and Scheans

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. *Prerequisite:* sophomore standing. Three hours. I, II. Staff.

41 SOCIAL PROBLEMS Conflicts and problems in modern industrial society. *Prerequisite:* 21. Three hours. Dr. Scheans.

51 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:* 21. Three hours. Dr. Lewis.

54 MINORITY GROUPS Patterns of dominance and submission among groups of differing "racial" and ethnic designation in modern societies and in "underdeveloped" areas. *Prerequisite:* 21. Three hours. Dr. Oren.

72 INTRODUCTION TO SOCIAL WORK History, philosophy, fields, and objectives of social work; process of social case work through discussion of cases. *Prerequisite:* 21; Psychology 1. Three hours. Dr. Little.

101 SOCIOLOGICAL ANALYSIS Major conceptual tools of sociology; approaches to their use in the analysis of contemporary social processes. *Prerequisite:* 21 or junior standing. Three hours. I, II. Staff.

205 SMALL-GROUP DYNAMICS Analysis of processes and problems in interaction at the level of the social microcosm; implications for the understanding of large-scale social organization. *Prerequisite:* 9 hours of sociology, including 101. Three hours. Dr. Oren.

210 POPULATION ANALYSIS The demographic and ecological analysis of societies; particular reference to contemporary world problems. *Prerequisite:* 9 hours of sociology, including 101. Three hours. Mr. Maher.

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:* 9 hours of sociology, including 101. Three hours. Dr. Lewis.

214 PUBLIC OPINION Analysis of attitude formation and the bases in social structure of differing tendencies toward collective behavior; implications for the analysis of political institutions. *Prerequisite:* 9 hours of sociology, including 101. Three hours. Mr. Maher.

221 CULTURE AND PERSONALITY Reltationship 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:* 9 hours of sociology, including 101, and Psychology 1. Three hours. Dr. Oren.

225 CULTURAL CHANGE Internal and external conditions for modifications in group behavior; role of the individual innovator in these processes; concept of innovation as the basis for the study of cultural dynamics. *Prerequisite:* 9 hours of sociology, including 101. Three hours. Dr. Scheans.

228 SOCIAL ANTHROPOLOGY Evaluation of the comparative method in anthropology; its use in the formulation of generalizations concerning the nature

of society. *Prerequisite:* 9 hours of sociology, including 101. Three hours. Dr. Scheans.

251 SOCIAL RESEARCH METHODS The logic and techniques of sociological inquiry. *Prerequisite:* 12 hours of sociology, and consent of instructor. Three hours. Staff.

282 READINGS IN CURRENT SOCIOLOGICAL LITERATURE Seminar to acquaint advanced students with contemporary issues in sociology and with the professional periodicals of sociology and related fields. *Prerequisite:* 12 hours of sociology, senior standing, and consent of instructor. Three hours. Staff.

Speech

COLLEGE OF ARTS AND SCIENCES

Professors Huber (Chairman) and Luse[1]; Associate Professors Everhart and Lewis; Assistant Professors Feidner and Wamboldt; Instructors Ackley, Frederickson, London and Travis

1 BASIC SPEECH Elements of speech and phonetics for the improvement of voice and articulation in communication. Class exercises and performance. Three hours. I, II. The 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. Dr. 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. The staff.

12 ARGUMENTATION Inductive, deductive, causal, and reasoning from analogy as applied to the speaking situation; designed to develop through performance skill in logical expression of thought. *Prerequisite:* 11. Three hours. I, II. Dr. 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 processes involved in discussion leadership. *Prerequisite:* 11. Three hours. Messrs. London and Travis.

31 ORAL INTERPRETATION OF LITERATURE Principles and techniques of oral interpretation of literature; analysis and appreciation of poetry, prose and drama through the development of ability in communicating the logical, emotional and aesthetic values of literature to an audience. Three hours. I, II. Drs. Huber, Luse, Wamboldt, and Messrs. Feidner and London.

41 ACTING Fundamentals of acting, including improvisation, character analysis, and styles of acting. Performance in short classroom acting projects required. *Prerequisite:* sophomore standing. Three hours. I, II. Mr. Feidner.

42 ACTING Acting for those who have demonstrated some ability in Speech 41. Periods and styles of acting, intensive character analysis, frequent

[1] Sabbatical leave second semester 1961-62.

acting projects, including at least one public performance. *Prerequisite:* Speech 41 and permission of the instructor. Three hours. Mr. Feidner. Alternate years, 1962-63.

61 INTRODUCTION TO BROADCASTING Radio and television broadcasting; development, structure, and use. Laboratory in speaking for broadcast and in operation of equipment. *Prerequisite:* sophomore standing. Three hours. Dr. Lewis.

71 VOICE SCIENCE The physical, anatomical, physiological, and phonetic factors of speech. *Prerequisite:* 1; sophomore standing. Three hours. I. Dr. Luse. Alternate years, 1962-63.

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:* 1; sophomore standing. Three hours. Drs. Luse and Everhart.

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. Dr. Huber. Alternate years, 1962-63.

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. Dr. Huber. Alternate years, 1962-63.

140 PLAY PRODUCTION Lecture and laboratory in the physical elements of play production; scene design, lighting, construction of sets and properties, and stage management. *Prerequisite:* six hours of speech or permission of the instructor. Three hours. Mr. Ackley. Alternate years, 1963-64.

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 41 or permission of the instructor. Three hours. Mr. Feidner. Alternate years, 1963-64.

145, 146 DEVELOPMENT OF WESTERN THEATRE History of the theatre and drama in western civilization from earliest rituals to the contemporary theatre. Plays from all major periods are read and discussed. *Prerequisite:* junior standing; English 25, 26 or 27, 28. Three hours. Mr. Feidner. Alternate years, 1962-63.

161 RADIO AND TELEVISION BROADCASTING The social, psychological, historical, educational, and technical aspects of radio and television with laboratory work in announcing, interviewing, and production of various types of programs. *Prerequisite:* six hours, including 1. Three hours. Dr. Lewis.

162 WRITING FOR RADIO AND TELEVISION Principles and techniques of writing for radio and television; adaptations, documentaries, and dramatic scripts. *Prerequisite:* 161 or permission of the instructor. Three hours. Dr. Lewis.

171, 172 SPEECH CORRECTION The etiology, symptoms and treatment of voice disorders; the problems of stuttering and organic disorders of speech. The etiology, symptoms and rehabilitation of various auditory disorders. *Prerequisite:* 74. Three hours. Drs. Luse and Everhart. Alternate years, 1963-64.

273 PRINCIPLES OF AUDIOLOGY Anatomy and physiology of the ear; administration and interpretation of diagnostic hearing tests; principles of rehabilitation for the hard of hearing; hearing conservation in the public school. *Prerequisite:* 12 hours of speech and psychology, including Speech 74. Dr. Falck.

275, 276 CLINICAL STUDY IN SPEECH DIAGNOSIS AND THERAPY Observation and practice in diagnosis and therapy of speech disorders. One or two hours[1]. I, II. (May be repeated up to five credit hours.) *Prerequisite:* 74. Dr. Everhart.

World Problems

COLLEGE OF ARTS AND SCIENCES

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. Mr. Beckett and others.

Zoology

COLLEGE OF ARTS AND SCIENCES

Professors Moody[2] *(Chairman) and Lochhead; Associate Professors Bond, Potash and Torch; Assistant Professors Bell and Glade*

1 INTRODUCTION TO ZOOLOGY (3-3) Fundamental life processes of animals, particularly at the cellular level, to give the general student an appreciation of these processes, and the science student a background for further study in zoology. *Prerequisite:* a course in high school chemistry is strongly recommended. Four hours. Dr. Torch and staff. I and II.

2 PRINCIPLES OF EVOLUTION (3-2) Biological principles connected with the development of life on earth; evidences that evolution occurs. *Prerequisite:* 1. Four hours. Dr. Bell and staff.

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[3]. Three hours.

21 ORGANIC EVOLUTION A non-laboratory course on the theory of evolution. For material covered see description of 2. A student may not receive credit for both 2 and 21. *Prerequisite:* sophomore standing. Three hours. Dr. Moody.

41, 42 COMPARATIVE VERTEBRATE ANATOMY (2-4) Survey of Phylum Chordata; outline of basic vertebrate body plan; functional anatomy and

[1] Not accepted for credit toward the A.B. degree.

[2] Sabbatical leave, first semester, 1962-63.

[3] Does not satisfy the requirement of a course in laboratory science in the College of Arts and Sciences, or the requirement of a course in biology for premedical and predental students. Students will not receive credit for both this course and Zoology 42.

phylogeny of the organ systems of vertebrates, beginning with an agnathan and concluding with a mammal. *Prerequisite:* 1; 41 for 42. Four hours. Dr. Bond.

52 PHYSIOLOGY Chemical and mechanical fundamentals of animal physiology, with special reference to man. *Prerequisite:* 1, junior standing; some knowledge of chemistry. Three hours. Dr. 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. Dr. Potash. Alternate years, 1963-64.

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

111 EMBRYOLOGY (2-4) General principles of development exemplified by typical invertebrate and vertebrate embryos. *Prerequisite:* 41, junior standing. Four hours. Dr. 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. Dr. Glade. Alternate years, 1962-63.

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. Dr. 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 31; junior standing. Four hours. Dr. Lochhead.

202 ADVANCED COMPARATIVE ANATOMY (2-4) Special topics in vertebrate anatomy, with emphasis on evolutionary changes in form and function of selected structures. Laboratory devoted to individual dissection projects. Seminars for student reports. *Prerequisite:* 42, 111, and consent of the instructor. Four hours. Dr. Bond. Alternate years, 1962-63.

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. Dr. Bell.

216 HUMAN GENETICS Principles of human inheritance; population genetics; interaction of heredity and environment; application of principles of heredity to human problems on both individual and social levels. *Prerequisite:* 115 or Botany 255. Three hours. Dr. Moody.

220 PROTOZOOLOGY (2-4) Recognition, morphology, reproduction and physiology of the more important taxonomic groups of the Protozoa. *Prerequisite:* a course in zoology numbered above 100, and inorganic chemistry. Four hours. Dr. Torch.

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 consent of the instructor. Four hours. Dr. Glade. Alternate years, 1963-64.

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; Chem. 131-132. Four hours.

236 FRESH-WATER BIOLOGY (2-4) Organisms of lakes, ponds and streams; their adaptations to varying physical, chemical and biotic conditions. *Prerequisite:* a course in zoology numbered above 100, and inorganic chemistry. Four hours. Dr. Potash. Alternate years, 1962-63.

255 COMPARATIVE ANIMAL PHYSIOLOGY (2-6) General principles of function mainly in invertebrate animals. *Prerequisite:* 104 or 150 or 236 and consent of the instructor; Chem. 131-132. Four hours. Dr. Lochhead.

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 consent of the instructor. Four hours. Dr. Glade. Alternate years, 1963-64.

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. Dr. Moody.

281-282 SEMINAR Review and discussion of current zoological research. Required of graduate students and seniors concentrating in zoology; open to others by special permission only. One hour. The staff.

381, 382 ADVANCED READINGS Readings, with conferences, intended to contribute to the programs of graduate students' advanced study in phases of zoology in which formal courses are not available. *Prerequisite:* graduate standing; an undergraduate major in zoology. Credit as arranged.

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.

The Alumni Council

Under an alumni reorganization plan approved at the June, 1957 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 approve or disapprove projects put forth in the alumni name, and to be the seat of authority in all such matters; 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 initiate and carry 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. The president and vice-president are elected annually, and neither office may be held by the same individual for more than two consecutive one-year terms.

The Council is composed of fifty or more members, who shall be the president, and immediate past president for the University's Alumni Association; two members elected by and representative of each of the seven class and club officers Association; one representative from each of seventeen prescribed regions of the country, and approximately twenty members-at-large nominated by the nominating committee of the Council. Members of the Council, except for the representatives of the Alumni Association, shall be elected for a term of one year, and, if eligible, may be re-elected for not more than three consecutive terms. Vacancies may be filled in between elections by appointment of the Council President.

The officers and members of the Council:

Honorary: John T. Fey, President of the University
Ex-Officio: C. P. Smith, Jr., '13, 87 St. Paul St., Burlington, Vt.
President: Lawrence H. Averill, '27, 1532 Potterham Rd., Birmingham, Mich.
Vice President: Leon D. Latham, Jr., '25, 112 Ethan Allen Pkwy., Burlington, Vt.
Director of Alumni Relations: Lawrence F. Killick, '22, Alumni House, University of Vermont.
Alumni Field Secretary: Raymond L. Finehout, '55, Alumni House, University of Vermont.
Alumni Secretary: Mrs. Constance S. Zolotas, '32, Alumni House, University of Vermont.

Members-at-Large:
Donald C. Gregg, '35, 199 Howard St., Burlington, Vt.
Lawrence F. Killick, '22, Alumni House, UVM, Burlington, Vt.
Leon D. Latham, Jr., '25, 112 Ethan Allen Pkwy., Burlington, Vt.
George C. Stanley, '18, 72 Fairmount St., Burlington, Vt.
Morris R. Wilcox, '16, 105 Oakwood Rd., So. Burlington, Vt.
Ray R. Allen, '11, South Hero, Vt.
Robert P. Davison, '35, 12 West Hillcrest Rd., Essex Jct., Vt.
Chester B. Eaton, '34, 10 Harvard St., Rutland, Vt.
Robert P. Kenney, '41, 114 Cliff Rd., Milton, Mass.
Millard D. McCarthy, '36, Lake Whittemore Dr., Spencer, Mass.
Bingham J. Humphrey, '27, 680 Evergreen Ave., Mt. Carmel, Conn.
Keith W. Calkins, '47, 39 Nearwater Ave., Massapequa, L. I., N. Y.
Benjamin F. Butterfield, '24, 751 Harding St., Westfield, N. J.
Arthur Q. Penta, M.D. 1925, 1301 Union St., Schenectady, N. Y.

Lawrence H. Averill, '27, 1532 Potterdam, Rd., Birmingham, Mich.
Dena S. Zolotas, '32, 61 Cliff Street, Burlington, Vermont
Frank E. Dion, '52, 155 East Avenue, Burlington, Vermont
John F. Galascione, '57, 111 Taylor Avenue, Somerville, N. J.
Raymond L. Finehout, '55, Jericho Center, Vermont.
Richard K. Simonds, '52, 16935 Maumee, Grosse Pointe 30, Mich.
Robert P. Davis, '41, Cabot, Vt.
Kenneth E. Boyden, '32, So. Hadley, Mass.
Harold C. Billings, '18, Springfield, Vt.
Lawrence J. Doolin, '23, 1364 Indian Creek Dr., Philadelphia 31, Pa.

Regional:
Mrs. C. Antoinette Hubbard Loudon, '33, 17 Ledgemere St., Burlington, Vt.
Max Burton Davison, '24, Morrisville, Vt.
Clarence J. Douglas, '29, Winter St., Northfield, Vt.
Mrs. Harriet Platt Bolles, '33, Bellows Falls, Vt.
Rodney S. Belden, '53, 100-2 Middlesex Rd., Waltham 54, Mass.
James F. Burke, '17, Box 205, Dorset, Vt.
Peter M. Haslam, '51, P. O. Box, Contoocook, N. H.
Elmer L. Nicholson, '39, 68 Frederick St., Newington, Conn.
Mrs. Nancy Goodwin Reynolds, '42, 15 Abingdon Sq., Apt. 26, New York 14, N. Y.
John J. Zellinger, M.D. 1944, 46 Trinity Pl., New Rochelle, N. Y.
Lloyd S. Coughtry, '36, Mt. Kemble Rd., Morristown, N. J.
Alfred E. Brooks, '26, 100 Hoover Rd., Rochester, N. Y.
Neil Tolman, '26, 1625 Eye St., N.W., Washington 6, D. C.
Elias Lyman, Jr., '38, 125 Ninth St., Wilmette, Ill.
Robert T. Palmer, '23, 6315 Norway Rd., Dallas, Tex.
Harold C. Simonds, '22, 1717 LaVista Pl., Pasadena, Calif.

Class Chairmen:
Lyman C. Hunt, '12, 48 University Ter., Burlington, Vt.
John J. Spasyk, '42, 178 West St., Essex Jct., Vt.

Class Secretaries:
Mrs. Ruth Harrington Lane, '21, 47 Hillcrest Rd., Burlington, Vt.
Mrs. Florence Farr Hard, '23, 82 Adams St., Burlington, Vt.

Class Agents:
Feno H. Truax, '37, Box 22, Vergennes, Vt.
Robert D. Paterson, '42, 110 Summit St., Burlington, Vt.

Club Chairman:
Stewart P. Washburn, '51, 33 Chestnut St., Dorchester, Mass.

Club Secretaries:
Robert D. Taisey, '50, 30 West 60th St., New York 19, N. Y.
Helen M. Wippich, '53, 12 Canterbury Lane, Roslyn Heights, L. I., N. Y.

Club Development Committee Chairmen:
Douglas L. Liston, '48, 23 Ardmore Rd., Worcester, Mass.
Edward D. Sowka, '34, 196 Westchester Ave., Crestwood, Tuckahoe 7, N. Y.

Association of UVM Club Legislative Committee Chairman:
Reginald Arnold, '30, Bradford, Vt.

Athletic Council:
Loren F. Palmer, '29, 308 Maple St., Burlington, Vt.
W. R. Buck, '19, 414 Colchester Ave., Burlington, Vt.
William S. Gilbertson, '50, 69 Tracy Dr., Burlington, Vt.
Robert P. Davison, '35, 12 West Hillcrest Rd., Essex Jct., Vt.

Student Enrollment Chairman:
John F. Galascione, '57, 11 Taylor Avenue, Somerville, N. J.

Enrollment Statistics

Summary of Resident Enrollment

Fall Semester, 1961-62

The Undergraduate Colleges:	*Men*	*Women*	*Total*
Arts and Sciences	1084	468	1552
Technology	628	107	735
Education and Nursing	80	461	541
Agriculture and Home Economics	181	160	341
TOTAL	1973	1196	3169
College of Medicine	183	9	192
Graduate College	139	35	174
Unclassified	63	30	93
School of Dental Hygiene	----	44	44
TOTAL	2358	1314	3672

Undergraduate Colleges by Classes:	*Men*	*Women*	*Total*
Senior	369	220	589
Junior	417	226	643
Sophomore	524	326	850
Freshman	663	424	1087
TOTAL	1973	1196	3169

	In-State			*Out-of-State*			
	M	*F*	*T*	*M*	*F*	*T*	*Total*
Arts and Sciences	408	228	636	676	240	916	1552
Technology	400	42	442	228	65	293	735
Education & Nursing	63	227	290	17	234	251	541
Agric. & Home Economics	125	74	199	56	86	142	341
Graduate	83	25	108	56	10	66	174
Medicine	44	3	47	139	6	145	192
Unclassified	48	27	75	15	3	18	93
Dental Hygiene	0	23	23	0	21	21	44
TOTAL	1171	649	1820	1187	665	1852	3672

In addition to the above regularly enrolled students are the following:

Pre-Clinic Nurses 51

GRAND TOTAL—FALL SEMESTER 1961—3723

Enrollment by Divisions

I. COLLEGE OF ARTS AND SCIENCES

	In-State			*Out-of-State*			*Total*
	M	*F*	*T*	*M*	*F*	*T*	*In & Out*
Class of 1962	86	42	128	107	50	157	285
Class of 1963	91	42	133	127	41	168	301
Class of 1964	89	54	143	205	73	278	421
Class of 1965	142	90	232	237	76	313	545
TOTAL	408	228	636	676	240	916	1552

II. College of Technology

	In-State			Out-of-State			Total
	M	F	T	M	F	T	In & Out
Class of 1962	90	5	95	37	7	44	139
Class of 1963	100	11	111	40	7	47	158
Class of 1964	102	12	114	56	24	80	194
Class of 1965	108	14	122	95	27	122	244
Total	400	42	442	228	65	293	735

By Curricula:	Men	Women	Total
Engineering—undecided	10	0	10
Civil Engineering	94	2	96
Electrical Engineering	110	0	110
Management Engineering	16	0	16
Mathematics	27	16	43
Mechanical Engineering	75	0	75
Commerce and Economics	277	24	301
Professional Chemistry	18	6	24
Medical Technology	1	59	60
Pre-Medical	0	0	0
Total	628	107	735

III. College of Education and Nursing

	In-State			Out-of-State			Total
	M	F	T	M	F	T	In & Out
Class of 1962	8	47	55	2	44	46	101
Class of 1963	17	47	64	2	51	53	117
Class of 1964	18	51	69	6	70	76	145
Class of 1965	20	82	102	7	69	76	178
Total	63	227	290	17	234	251	541

By Curricula:	Men	Women	Total
Elementary	2	155	157
Junior High	1	0	1
Secondary	73	122	195
Business	1	17	18
Music	3	16	19
Nursing	0	151	151
Total	80	461	541

IV. College of Agriculture and Home Economics

	In-State			Out-of-State			Total
	M	F	T	M	F	T	In & Out
Class of 1962	32	16	48	7	9	16	64
Class of 1963	32	13	45	8	14	22	67
Class of 1964	31	20	51	17	22	39	90
Class of 1965	30	25	55	24	41	65	120
Total	125	74	199	56	86	142	341

By Curricula:	Men	Women	Total
Agricultural (General)	118	11	129
Agricultural Engr.	20	0	20
Pre-Forestry	22	0	22
Pre-Veterinary	21	6	27
Home Economics	0	143	143
Total	181	160	341

V. GRADUATE COLLEGE

	Men	*Women*	*Total*
In-State	83	25	108
Out-of-State	56	10	66
TOTAL	139	35	174

VI. COLLEGE OF MEDICINE

	In-State			*Out-of-State*			*Total*
	M	*F*	*T*	*M*	*F*	*T*	*In & Out*
Class of 1962	11	0	11	26	1	27	38
Class of 1963	13	1	14	35	2	37	51
Class of 1964	8	0	8	44	1	45	53
Class of 1965	12	2	14	34	2	36	50
TOTAL	44	3	47	139	6	145	192

VII. UNCLASSIFIED DIVISION (Special Students)

	In-State			*Out-of-State*			*Total*
	M	*F*	*T*	*M*	*F*	*T*	*In & Out*
Arts & Sciences	20	15	35	11	3	14	49
Technology	19	3	22	2	0	2	24
Agriculture & H. Ec.	5	1	16	1	0	1	7
Educ. & Nur.	4	8	12	1	0	1	13
TOTAL	48	27	75	15	3	18	93

VIII. SCHOOL OF DENTAL HYGIENE

	In-State	*Out-of-State*	*In & Out Total*
Second Year	9	8	17
First Year	14	13	27
TOTAL	23	21	44

IX. UNDERGRADUATE MARRIED STUDENTS

	M	*F*	*T*	*% of Class*
Class of 1962	64	19	83	14.1%
Class of 1963	36	8	44	6.8%
Class of 1964	20	4	24	2.8%
Class of 1965	15	8	23	2.1%
TOTAL	135	39	174	5.5%

Degrees Granted

JUNE 1961

School of Dental Hygiene

Sandra Lee Bailey, Waterbury
Barbara Louise Bigelow, Brookfield
Susan Dahl Davis, Burlington
Patricia Mary Jens, Randolph
Phyllis Ruth McNellis, Pittsford, N. Y.
Linda Ruth Mintzer, Burlington
Wilma Ann Phillips, Barre
Mary Patricia Ploof, Burlington
Elizabeth Ann Poplawski, Burlington
Jacqueline Ryer, St. Albans
Dolores Ann White, Greenwich, Conn.
Sheila Miller White, Burlington
Sarah Josephine Wisell, Bristol
Donna Jean Woodbury, South Burlington

College of Education and Nursing

Bachelor of Science in Nursing

Judith Mary Audette, Burlington
Jean Anna Baccei, Proctor
Sally Margaret Brown, Newington, Conn.
Julia Anne Cass, Ontario, N. Y.
Esther May Colburn, Dover, Mass.
Wealtha Mae Collins, St. Johnsbury
Roberta Ann Crouch, Gardner, Mass.
Joan Mary Ellen Curtis, Keene, N. H.
Carol Lynn Dustin, Randolph
Lynda Jane Foley, Burlington
Dianne Fay George, Haverhill, Mass.
Nancy Lou Arnold Gorman, Gettysburg, Pa.
Sandra May Hutton, Scotia, N. Y.
Dawn Marie Kolodziej, Amsterdam, N. Y.
Esther Joan Lawes, Orleans
Nancy Nason Lillicrap, Derby Line
†Jane Frances Mackin, Chatham, N. J.
*Joy Bagley McNeil, Elmwood, Conn.
Joan Meyerhoff, Schenectady, N. Y.
Nancy Winnifred Miller, Braintree, Mass.
Sally Jean Nadon, Northfield
Dorothy Remick Nelson, St. Johnsbury
Carol Elizabeth Newcomb, Haworth, N. J.
Jeanne Marie Ottaway, Whitesboro, N. Y.
Grace Elisabeth Patten, Cuttingsville
†Marjorie Anne Richards, Schenectady, N. Y.
Barbara Scott-Smith, Arlington
Carolyn Ann Sherwin, Wells River
Muriel Elizabeth Wills, Cold Spring Harbor, N. Y.
†Gail Marcia Wagner, Englewood Cliffs, N. J.

Bachelor of Science in Business Education

Joanne Rae Burnham, Gorham, Me.
Juanita Audrey Gardner, Newport
Karen Ann Kellers, Elberow, N. J.

Bachelor of Science in Music Education

Patricia Ann Merlone, Hamden, Conn.
Jay Allen Sheperd, Enosburg Falls

Bachelor of Science in Education

†Robert Eben Ashton, Jr., Sheldon
Phyllis Barbara Babbitt, Westfield, N. J.
*Mary Shepard Babcock, Swanton
Maurice Joseph Barry, Bellows Falls
James Lyons Battersby, *magna cum laude*, Burlington
Alice Frances Battles, Randolph
Barbara Ann Bergen, Oradell, N. J.
Frances Bonita Berlin, West Orange, N. J.
Bonnie Isabel Biggs, Barre
*Barbara Elaine Bouvier, Bristol
Barbara Susan Bradshaw, Brattleboro
Sandra Barrup Burgess, Burlington
John Robert Bushey, St. Albans
Bruce Raymond Cleveland, Wolcott
Katherine Fitch Coburn, St. Johnsbury
Judith Elaine Conant, McIndoe Falls
Margaret Elizabeth Connolly, Tenafly, N. J.
†Neil Hayden Crandall, Springfield
Jean Evelyn Cutler, Brattleboro
Mary Margaret Day, Springfield
Linda Diamond, Brooklyn, N. Y.
Joyce Laura Edson, Vernon
Elizabeth Ruth Elkavich, Quincy, Mass.

* As of October 15, 1960.
† As of February 25, 1961.

Judith Anne Enright, Fair Haven, N. J.
Penelope Susan Fienemann, Milton
Toni Franceschi, Burlington
Mary Elizabeth Gage, Amityville, N. Y.
*Pearl Doris Gallant, Montreal, Que., Can.
George Galo, Proctor
Sharon Margaret Garrity, Englewood, N. J.
Nancy Anne Gibson, West Allenhurst, N. J.
Claire Rosamond Harvey, Richmond
Amalia Jane Homeister, South Ryegate
Katharine Elisabeth Howard, West Bridgewater, Mass.
Geraldine Shippee Hungerford, Vernon
Judith Ann Hunt, Burlington
Ann Carol Jones, Waitsfield
*Marion Isabel King, Readsboro
Barbara Rogers Krauk, Wethersfield, Conn.
Nancy Louisa Kurlbaum, Broadalbin, N. Y.
Harriett Pudvah Lovejoy, Wells River
Judith Holmes Macomber, Exeter, N. H.
Donna Jean Macy, Roslindale, Mass.
John Gerald Marmillo, Mechanicsville, N. Y.
*Gwendolyn Ann McGrath, Wallingford
Thelma Althea Miller, Sea Girt, N. J.
Marianne Elisabeth Monnier, Glen Cove, N. Y.
Rhea Dolorese Paro, Burlington
Linda Mae Phillips, Glen Rock, N. J.
Hester Silverman Rabinovitch, Burlington
Suzanne Rowledge, Scotia, N. Y.
*Mary Ellen Russell, Rutland
†Bernhardt Alexander Smyle, South Burlington
Phyllis Jean Spring, New Canaan, Conn.
Carol Payson Suhr, White Plains, N. Y.
Sarah Ann Temple, Leominster, Mass.
*Charles Daniel Thurston, St. Johnsbury
Elma Jean Torrance, Brick Town, N. J.
Martha Yenney Wahl, Wethersfield, Conn.
Ann Grace Wakefield, Burlington
Sarah Elizabeth Wearne, Delmar, N. Y.
*Nancy Lee Wilde, Waterbury
Madeleine Joy Wishnie, Forest Hills, N. Y.
Judith Ann Woodard, Barton
*Edna Thomson Wright, Manchester Center
†Mary Lou Reedy Zimmerman, Coeymans Hollow, N. Y.

College of Technology

Bachelor of Science in Chemistry

Kenneth Robert McCormick, St. Johnsbury
Claudia Margaret Noyes, Bradford
Daniel Lester Simpson, South Burlington

Bachelor of Science in Commerce and Economics

Robert David Agel, Burlington
George Robert Anderson, Barre
*Tom Sheldon Arthur, Orwell
William Raymond Benner, Jr., West Chester, Pa.
†Grant LeRoy Corson, Flushing, N. Y.
†Jason Peter Cotton, Rutland
Donald Theophile Devost, Burlington
Frank Wilbert Diller, Yonkers, N. Y.
Bette Jean Dunn, Tenafly, N. J.
William Ross Eckhardt, Burlington
*Robert Henry Flance, Manhasset, N. Y.
Robert Kyle Forman, Bennington
Dawson Brower Frock, Bedford Village, N. Y.
Clifford Charles Fuller, Burlington
Sandra Forbes Garrard, Teaneck, N. J.
Glenn Edward Gouthro, Burlington
Steven Michael Grossman, Freeport, N. Y.
Thomas Ross Hackett, Burlington
†Richard Allan Harris, Belle Harbor, L. I., N. Y.
*Norman Himes, North Bennington
David Edwin Hungerford, Orange, Conn.
Ivan Arthur Keness, Milburn, N. J.
Paul Henry Loseby, Rutland
Samuel Ellis MacDonald, Burlington
†Reginald Charles McDonough, Burlington
*Robert Coleman McClelland, Lebanon, Pa.
Peter Cass McGibney, South Burlington
David James Merrill, South Burlington
*Robert Adams Mitchell, Springfield
Judith Ellen Morse, Glens Falls, N. Y.
Kenneth Bernard Newman, Bronx, N. Y.
Paul Maurice O'Connor, Bellows Falls
†Alfred George Peterson, Springfield
*William Henry Potter, Jr., New Bedford, Mass.
Stephen Robert Prober, Hewlett, N. Y.
*James Chadbourne Puffer, Braintree, Mass.
David Walter Reirden, Swanton
David Westervelt Riemann, North Bennington
*Robert Preston Rollins, Barton
Robert Henry Ronan, Jr., Lyndonville
*William Carroll Rowell, Hardwick
Johns Wesley Shannon, Barre
William Francis Sliney, Jr., Burlington
John Desmond Stanton, Rochester, N. Y.
Jane Elizabeth Umpa, Nashua, N. H.
Gary Richard Vervoort, Manhasset, N. Y.
Marvin Vipler, Catskill, N. Y.
James Allan Willard, Shelburne
Harry Harbourt Zingg, Montclair, N. J.

* As of October 15, 1960.
† As of February 25, 1961.

Bachelor of Science in Civil Engineering

Stanley Stewart Ather, Waterbury
Gilles Marcel Blais, Derby Line
Joseph Roland Buley, Richmond
John Harold Coombs, Poughkeepsie, N. Y.
David Clark Fifield, South Hero
Raymond Paul Gendron, North Troy
George Allen Gunn, Nanuet, N. Y.
Wayne Alfred Jarvis, St. Albans
Raymond Howard Johnson, Jr., St. Johnsbury
Cyrus Kermanj, Teheran, Iran
John Stanley Maynes, Rutland
Robert Michael Murphy, Wells River
Samuel Willis Overstreet, Jr., Ticonderoga, N. Y.
Donald Bernard Sargent, Johnson
Frank Dilworth Walter, Jr., Blairstown, N. J.
*Walter Atchison Westhelle, Springdale, Conn.

Bachelor of Science in Electrical Engineering

Gary George Anair, Hardwick
Paul Martin Austin, Brattleboro
Richard Arthur Bean, Canaan
Newell James Benjamin, Jr., Franklin
Stephen Leonard Berry, Burlington
Richard James Bombard, Winooski
Cedric Harry Farrow, West Barnet
Roger Conant Follett, Montpelier
Wayne Lynford Foster, Montpelier
†Janson Martin Hurd, North Springfield
Gerard Mitchell Larose, East Berkshire
John Harold Martel, Jr., Rutland
Robert Harvey Miller, Brattleboro
Peter Richard Poster, Brooklyn, N. Y.
Paul Arthur Robinson, Manchester
Herbert Hunter Ruzicka, South Burlington
Dieter Wittkowski, Hamburg, Germany

Bachelor of Science in Mechanical Engineering

†Albert Ernest Aube, Middlebury
Richard Arnold Austin, Ludlow
Neil Alan Bartlett, Richford
William Erwin Bingham, Burlington
Clifford Frederic Cempe, Wakefield, Mass.
Norman Earle Cox, Bradford
Charles Hager Eldred, Burlington
Philip James Hamer, Bellows Falls
David Arnold Merrill, Ludlow
Dwayne Lyle Perkins, Danville
John A. Phillips, III, Middlebury
Charles Philip Smith, Burlington
Warren Robert Smith, Burlington
Joseph Stephen Smyrski, West Rutland
*Peter Hasbrouck Snyder, Newburgh, N. Y.
Harold Junie Stewart, Pawlet

Bachelor of Science in Management Engineering

†Thomas Caleb Buffum, North Clarendon
†Robert Edwin Desorcie, Highgate Center
†Richard Francis DiLorenzo, Hartford, Conn.
*Robert James Wedwaldt, Wallingford

Bachelor of Science in Mathematics

Robert Joshua Denner, Bronx, N. Y.
Roland Andrew Henry, Alburg

Bachelor of Science in Medical Technology

Sarah Anne Bradley, Sudbury, Mass.
Evelyn Ruth Pflug, Westfield, N. J.
Linda Sharon Sack, Hartford, Conn.
Pauline Dorothy Sole, Essex Junction
Janet Louise Tinker, Belgrade Lakes, Me.

College of Agriculture and Home Economics

Bachelor of Science in Agriculture

Walter Norman Bone, South Ryegate
Raymond Lawrence Bunker, Fair Haven
Dale Allen Burroughs, Newbury
Carl Roger Butterfield, Jacksonville
John Edwin Chesney, Stamford, Conn.
Miller Rhinehart Collins, Lanesboro, Mass.
*Howard Walter Cutts, Townshend
*Stanley Grayson, New York, N. Y.
*Charles Leonard Hines, III, Lincoln, R. I.
†Galen Otis Hutchison, Jr., Brandon
*Christopher John Michael Jones, Floral Park, N. Y.
†Harlan Page Kellogg, Benson
Leslie Cobb Lewis, Woodstock

* As of October 15, 1960.
† As of February 25, 1961.

Roger Norman Luneau, St. Albans
Herbert John Lyford, Chelsea
†James Walton McBride, Vergennes
†William Richard Mooza, Baldwin, N. Y.
*Daniel Frederick Mosman, Brattleboro
Bernard Maurice Nadeau, Brattleboro
Joseph Howard Nichols, Burlington
†Donald John Redshaw, Southbury, Conn.
Antony Parker Smart, Sag Harbor, N. Y.
*Avery Leete Smith, Bellows Falls
†Lindsay Thomas Townsend, Sutton
Richard Lee Wexler, New York, N. Y.

Bachelor of Science in Agricultural Engineering

David John Howe, Tunbridge
John Timothy Ide, Danville
Kenneth Oscar Switzer, Huntington

Bachelor of Science in Home Economics

Carolyn Louise Abbott, Weston, Mass.
Susan Jane Adams, Stowe
Lois Rae Beadle, Orleans
Janet Catherine Carpenter, Brattleboro
Danielle Alice Dole, Burlington
Suerae Louise Fisk, Natick, Mass.
†Phyllis Ruth Hammond, North Haven, Conn.
Sandra Smolnik Hurd, Springfield
Bessie Anne Jackson, Vergennes
Betsy Whitcomb Judd, Enosburg Falls
Deborah Keith, Braintree, Mass.
Linda Anne Kinaman, White Plains, N. Y.
Sarah Lynda Kittle, Jeffersonville
Diane Wilder Landry, Summit, N. J.
Gayle Ann McQuilkin, Montreal, Que., Can.
Brenda Kay Marino, Freeport, N. Y.
Patricia Louise Morse, Northfield
Beverly Lillian Seaver, Northfield
Lorraine Adele Snow, Bellows Falls

College of Arts and Sciences

Bachelor of Arts

Arthur Joel Abrams, North Bergen, N. J.
William Barker Adams, Montpelier
John James Alifano, Jr., Springfield, Mass.
†John Arthur Allard, Proctor
Roland Judson Allen, South Fallsburg, N. Y.
William Garland Amidon, Lyndonville
John Edward Andrews, Tenafly, N. J.
George Rioch Anthonisen, Hanover, N. H.
Michael Apsell, Mamaroneck, N. Y.
*Barry Rogers Austin, Burlington
Catherine Abi Bailey, St. Johnsbury
*Homer Andrew Bailey, Lyndon Center
†John Kay Bancroft, Hingham, Mass.
Jonathan Herbert Barber, Brattleboro
Nancy Stoughton Barber, Old Bennington
Merrill Douglas Benson, Alburg
†Arnold David Berliner, Roslyn Heights, N. Y.
Robert Watson Billings, Burlington
Eric Bruce Birmingham, Flossmoor, Ill.
*Linda Margaret Bowman, Pittsford, N. Y.
Carl Everton Braun, Burlington
Caroline Elizabeth Braun, Wilmington
JoAnn Bregstein, Brooklyn, N. Y.
Nan Whitfield Cisney Bronfen, Burlington
Katherine Ann Brother, Wilton, Conn.
Howard Sanford Brown, New Rochelle, N. Y.
Wayne Thomas Bruns, Portland, Me.
Clara Lou Washburn Bryan, Bethel
Stephen Mark Caplan, New Haven, Conn.
William Clark Carrigan, Rutland
James Thomas Casey, Rensselaer, N. Y.
*John Dudley Chadwick, Darien, Conn.
*Albert Wayne Chaffee, Whitehall, N. Y.
Elsa Chapin, Montpelier
Frank Lawrence Chupka, Jr., Winooski
Virginia Prescott Clark, *magna cum laude,* Burlington
Ruth Louise Clifford, Bethel
Gordon Underwood Cobleigh, Douglaston, N. Y.
Robert Charles Coleman, Flushing, N. Y.
Sandra Jean Concannon, Marlboro, Mass.
Richard Jesse Cooper, Windsor
†Emile Pierre Coulon, Boston, Mass.
John William Cruickshank, Jr., Northfield
*Richard Lawrence Dailey, Rutland
Catherine Louise Davidson, White Plains, N. Y.
Carole Mary Demas, Brooklyn, N. Y.
Kenneth Louis DiStefano, Montclair, N. J.
Donald Malcolm Dresser, Champlain, N. Y.
Ann Drexler, Larchmont, N. Y.
Ann Frances Durney, Anacortes, Wash.
Robert James Duryea, Portsmouth, N. H.
Harold Arthur Eastman, Quechee
Robert Charles Eaton, Burlington
Gerald Fred Edelstein, Rockville Center, N. Y.
*David Martin Ettinger, New York, N. Y.
Stanley Everett, Glen Oaks, N. Y.
Katherine Angela Famiano, Schenectady, N. Y.
Barry Feltingoff, Far Rockaway, N. Y.

* As of October 15, 1960.
† As of February 25, 1961.

Robert Stephen Ferretti, Flushing, N. Y.
Allan Lewis Fischer, Burlington
Arthur Lawrence Fitzgerald, Worcester, Mass.
Merle Gordon Fitzgerald, West Barnet
Robert John Fleming, Bridgewater
*Allyn John Foss, Morrisville
*William Henry Frazier, Yonkers, N. Y.
*Wayne Leslie Ganson, Vergennes
Bernard Edgar Germain, Winooski
Jerome Gersten, Brooklyn, N. Y.
Sara Ellen Gilligan, Nutley, N. J.
Robert Allen Goldman, Brattleboro
Robert David Goldman, Port Chester, N. Y.
Audrey Yvette Gordon, Brooklyn, N. Y.
†George Gordon, New Rochelle, N. Y.
Truman William Grandey, II, Morrisville
†Barbara Elizabeth Griffin, Castleton
Ralph Peter Guiduli, Barre
Richard Roland Guyette, South Burlington
*Lawrence William Hacker, New Rochelle, N. Y.
Sarah Hale, Alexandria, Va.
Judith Ann Hamilton, Jackson Heights, N. Y.
Judith Venable Hanna, Chatham, N. J.
Allen Leo Harrington, Springfield
Franklin Henry Harrington, Bennington
Bea Fales Harvey, Rochester
John Joseph Harvey, Bennington
†Brian Charles Harwood, Waterbury
Margo Jean Hathaway, Colchester
Pamela Thompson Havens, Simsbury, Conn.
Ronald David Hector, Brattleboro
William Austin Hill, III, Burlington
Joan Ellen Hirschland, White Plains, N. Y.
Robert Joseph Hobbie, Cranfield, N. J.
Olive Marie Holmes, Uncasville, Conn.
Linda Ann Hufnagel, Dumont, N. J.
Virginia Oles Boyd Huntington, Albany, N. Y.
Charles Joseph Ippolito, Bridgeport, Conn.
Jamie Jay Jacobs, Colchester
Myrl Clark Jaquith, Woodstock
Douglas Robert Jarrett, Burlington
Adele Maria Kahwajy, Bennington
Joseph Kangisser, Worcester, Mass.
Robert Irving Keimowitz, *cum laude,* Middletown, N. Y.
Raymond Whitman Kelsey, Jr., Marblehead, Mass.
David George Kenny, Delmar, N. Y.
Ronald Francis Kilburn, Bellows Falls
Allan Harvey Kleger, New Bedford, Mass.
†Allan Dow Knickerbocker, Jericho
Roger Joseph Knisley, Chester Depot
John Christian Kozler, Little Ferry, N. J.
Steven Michael Kuperstein, Swampscott, Mass.
*William Louis Ladue, Jr., Essex Junction
*Rudolph Ernest Lampron, Springfield
†Bradley Merle Lawrence, Montpelier
Martha Ann Lawton, Brookfield Center, Conn.
*Carol Judith Lee, Merrick, N. Y.
Jane Ann Leon, New York, N. Y.
John Philias Leonard, Burlington
Joseph Costello Levins, Rutland
†Arthur M. Levison, Brookline, Mass.
Ellen Batters Lissner, Little Neck, N. Y.
John Edward Locke, New Boston, N. H.
David Bruce Loman, Cresskill, N. J.
Susan Mildred Lopez, Brooklyn, N. Y.
Morton Albert Lord, Burlington
Peter Stephen Lorman, Malverne, N. Y.
Tatiana Standertson Loveland, Stowe
Sarah Cowles Lyddon, Rochester, N. Y.
*Peter Graham Lyford, Wilder
Robert Kinney McBride, South Hero
Frederick Mandell, Norwich, Conn.
Robert Nickerson Manning, Castleton
Elaine Diane Margolin, Jamaica, N. Y.
Jan Howard Mashman, New Rochelle, N. Y.
David Francis Maunsell, Burlington
Richard Alan Metcalf, Springfield
Kay Frances Mingolla, Barre
Mary Susan Minotti, Burlington
Jane Barre Wells Molloy, North Adams, Mass.
William Joseph Morrison, Danielson, Conn.
Paul Michael Morriseau, Burlington
William Randall Morton, South Paris, Me.
Paul Philip Murphy, Lewiston, Me.
Peter Edward Nelson, West Newton, Mass.
Sandra-Lea Nelson, Newbury
Alan Michael Nichamoff, Floral Park, N. Y.
John Michael Nigro, West Newton, Mass.
Mary Jane Niquette, Winooski
Jean Ann O'Brien, Montpelier
†Lawrence David Ostrow, New York, N. Y.
David Jordan Pallin, Chelsea, Mass.
Nancy Ann Paquin, Bennington
John Leslie Parker, Newport
*Vincent John Parran, New Hyde Park, N. Y.
*Thaddeus Stanley Pawlaczyk, West Rutland
Susan Ann Pearlberg, Burlington
Marc Pecker, Bronx, N. Y.
James Munro Pedley, Rochester, N. Y.
Rosalind Margaret Pekala, Northampton, Mass.
Gordon Samuel Perlmutter, *cum laude,* Burlington
Sandra Ann Peters, Westbrook, Me.
Graham Herbert Phelps, Burlington
Charles Spencer Phillips, Jr., Bradford
Daniel John Prescott, Essex Junction
Mary Amelia Prespare, Rutland
Frank David Quint, Andover, Mass.
David Samuel Rauch, Rockaway, N. J.
Constance Covey Robbins, Attleboro, Mass.
James Arthur Rogers, Northfield
*Kenneth Paul St. Germain, Burlington
*John Henry Saliba, Burlington
Stephen Mark Samuelson, New York, N. Y.
Alan Lester Saroff, Stamford, Conn.

* As of October 15, 1960.
† As of February 25, 1961.

Steven William Schaub, Brattleboro
Daryl Jane Schoenknecht, Livingston, N. J.
Nancy Jean Scott, Beverly, Mass.
Suzanne Little Sells, Arlington, Va.
Bruce John Sherwin, Newington, Conn.
Charles William Siegel, Burlington
George Millard Simmons, Jr., Newburgh, N. Y.
Hope Barbara Simon, Great Neck, N. Y.
John Martin Simonds, Burlington
Frederick Almon Smith, Bristol
*Orland Francis Smith, Jr., Providence, R. I.
Martin Isadore Sonkin, Brentwood, N. Y.
Gordon Hector Sprigg, Jr., Charlotte
Judith Gail Staggenborg, Tenafly, N. J.
Frank Aaron Steeg, Flushing, N. Y.
Roderick Ladd Stone, Hardwick
Linda Louise Sturdevant, Danbury, Conn.
Corinne Elizabeth Szeglin, Glen Rock, N. J.
*Judith Teplin, New Rochelle, N. Y.
*Charles Robert Tetzlaff, Montpelier
Christine Hilda Theroux, McIndoe Falls
Caroline Louise Thomas, Montreal, Que., Can.
†Arthur Charles Thorner, Manchester
Charles Robert Tierney, Burlington
*David Colvin Tilton, Essex Junction
Raymond Palmer Tuggey, Pittsfield, Mass.
Joan Stewart Tyler, North Monroe, N. H.
Margaret Caroline Tyler, Rutland
Frederick William Van Buskirk, Jr., Burlington
*Gordon Adelbert Vancor, Saxtons River
Lucille Jane Wasick, West Rutland
Anthony Frederick Wasilkowski, Winooski Park
Daniel Jacob Weine, *cum laude*, Camden, N. J.
Louise Betty Magram Weiner, Burlington
Robert Breger Weiss, Purchase, N. Y.
Gerard Michael West, Winooski
Peter Joseph White, Laurelton, N. Y.
Shelia Lorraine Whitney, Randolph
Stanton Williams, Charlotte
Barbara Lynn Wirth, Ridgewood, N. J.
Virginia Ann Worstell, Stewart Manor, N. Y.
Bradford Taylor Young, Colchester
Roger Shepard Zimmerman, Winthrop, Mass.

SPECIAL HONORS

History

Frederick Mandell

Philosophy and Religion

Martha Ann Lawton

Physics

Richard Roland Guyette

Political Science

Charles Robert Tierney

Psychology

Robert Irving Keimowitz
Gordon Samuel Perlmutter

Zoology

Linda Ann Hufnagel
Jan Howard Mashman
Marc Pecker
Alan Lester Saroff

Graduate College

Master of Education

*Gerald Frederick Avery, B.A. (New Hampshire), 1951; Tucson, Ariz., *in absentia*
*Henry Aubrey Beebe, B.A. (Goddard), 1950; St. Albans
†Milton Earle Howard, B.S. (St. Cloud Teachers), 1949; Poultney
*Francis Glenn LaValley, B.S. (Springfield), 1949; South Burlington
*Charlene Craig Leonard, B.S. (UVM), 1956; Burlington
*Audrey Foote Mach, B.S. (Skidmore), 1943; Pawlet
*Edgar Howes Mayo, B.A. (UVM), 1950; Northfield
*Armand Paul Premo, B.S. in Ed. (UVM), 1951; Enosburg Falls
*Theodore Karl Tischler, Jr., A.B. (Dartmouth), 1948; Saxtons River
*Earl Francis Wingate, Jr., B.S. in Ed. (UVM), 1952; Burlington
†Stephenson Searles Youngerman, Jr., B.A. (Norwich), 1951; Hyde Park

* As of October 15, 1960.
† As of February 25, 1961.

Master of Arts in Teaching

Florence Gertrude Greene, B.S. in Ed. (UVM), 1946; Burlington
*Doris Porter Miller, B.S. (Fitchburg Teachers), 1944; Rutland
*John Arnold Myers, A.B. (Dartmouth), 1953; Londonderry

Master of Science

Agricultural Biochemistry

*Wai-yiu Cheung, B.S. (Taiwan Provincial College of Agriculture), 1956; Taiwan, China, *in absentia*
Thesis: Some Preliminary Studies on the Electrophoretic Separation of Leaf Proteins.

Agricultural Economics

Gordon Earl Butler, B.S. (UVM), 1952; Montpelier
Thesis: Capital Problems Associated with the Transfer of Vermont Dairy Farms.

Agronomy

*Tao-kuang Ming, B.S. (Taiwan Provincial College of Agriculture), 1954; Taiwan, China, *in absentia*
Thesis: Some Physiological Studies on Quackgrass *Agropyron repens L.*

Anatomy

Peter Dodds Upton, B.A. (Dartmouth), 1958; Burlington
Thesis: The Submissural Organ and Water Metabolism.

Animal and Dairy Husbandry

Donald Albert Klein, B.S. (UVM), 1957; Williston
Thesis: The Effects of Untreated and Treated Farm Water Supplies Upon Milk Quality.
Robert Bidwell Bruce, B.S. (Connecticut), 1947; Shelburne
Thesis: The Effects of Implanted Diethylstilbestrol and Oral Chlortetracycline on Suckling Lambs.

Botany

Peter Bent Adams, B.S. (UVM), 1959; Burlington
Thesis: Studies on the Resistance of *Ginkgo Biloba L.*
Robert Malcolm Dole, Jr., B.A. (UVM), 1959; Georgetown, Mass.
Thesis: A Postglacial History of the Vegetation of Northwestern Vermont.
JoAnn Isabel Fish, B.S. (Rosary Hill), 1954; Buffalo, N. Y.
Thesis: Cross-Pollination in the Genus *Lotus.*
Richard Louis Homola, B.S. (Muhlenberg), 1956; Northampton, Pa.
Thesis: A study of Embryo Development in Some Tetraploids and in Species Hybrids of the Genus *Lotus.*
George Edward Milo, Jr., B. A. (UVM), 1958; Burlington
Thesis: Physiological Studies on the Biosynthesis of *Lambertellin* and its Characterization.
Harley E. Tomlinson, B.S. (UVM), 1959; Burlington
Thesis: An Investigation of Some Metabolites Extracted from Cultures of *Lambertella hicoriae* Whetzel.

Chemistry

*Keith Allan Maas, S.B. (MIT), 1958; Burlington, Wis., *in absentia*
Thesis: Preliminary Studies on the Free Radical Bromination of Substituted Toluenes.
Courtland Kolbus Spicer, B.S. (Connecticut), 1959; Jewett City, Conn.
Thesis: Some Studies in the Chemistry of N-Bromosuccinimide.
Ronald Stewart Stone, S.B. (MIT), 1959; Jamaica Plain, Mass., *in absentia*
Thesis: Further Studies in the Kinetics of Inhibited Autoxidation.

* As of October 15, 1960.

Harold John Wimette, B.A. (St. Michael's), 1959; Burlington
Thesis: Thermodynamics of the Pyrrole-Pyridine Association by Infrared Spectroscopy.

Electrical Engineering

Thaddeus John Kobylarz, B.S.E.E. (Newark College of Engineering), 1958; Winooski
Thesis: Ratio Digital Counting Mechanism.
Charles Everett Leonard, B.A. (Williams), 1953; B.S. (MIT), 1954; Burlington
Thesis: A Power Transistor Curve Tracer.
Stephen Clay Plumb, B.S. (UVM), 1957; Burlington
Thesis: Application of Macro-Programming Techniques to Circuit Analysis with Digital Computers.
John Carmen Romano, B.S. (UVM), 1958; Rutland, *in absentia*
Thesis: Determination of Loss Responsibilities between Independent Users of Interposed Transmission Facilities.
Shih-Yung Tong, B.S. (National Taiwan University), 1955; Taiwan, China
Thesis: A Study of Economic Power Transmission by a Digital Computer.

Home Economics

Joyce Kenyon Livak, B.S. (UVM), 1942; Richmond
Thesis: Ascorbic Acid and Dehydroascorbic Acid Content of Fresh Vegetables Purchased in a Northern Vermont Supermarket.

Medical Microbiology

Carolyn Doreen Bohan, B.A. (Mt. St. Mary College), 1958; Manchester, N. H.
Thesis: Serological Studies of the Soluble Antigens of *Clostridium Perfringens* Types A-F by Agar Gel Diffusion.
Christine Hedy Ries Stephens, B.S. (UVM), 1959; Maplewood, N. J.
Thesis: A Comparative Study of Albumins as Inducers of Precipitins in Guinea Pigs.

Pharmacology

Norma Vesey Colclough, B.S. (Syracuse), 1956; Underhill, *in absentia*
Thesis: The Effect of S, 2-Aminoethylisothiouronium Dibromide (AET) on the Peripheral Blood and Bone Marrow Cells of the Rabbit Following Co-60 Gamma Radiation.

Physiology and Biophysics

Gretchen Hebb Bean, B.S. (Marlboro), 1957; Burlington
Thesis: Longitudinal and Transverse Excitation of Striated Muscle.

Zoology

Stanley Paul Leibo, A.B. (Brown), 1958; Providence, R. I.
Thesis: A Study of Possible Effects of Dose Volume of an Erythropoietic Extract on Certain Hematological Values in Female Albino Rats.

Master of Arts

Economics

Christopher Wray Brown, B.S. (Marlboro), 1952; Brattleboro, *in absentia*
Thesis: The Uses of Direct Placements in Corporate Finance.

English

*Hellmut Hermann Ammerlahn (Frankfurt), 1958; (Gottingen), 1959; Victoriastrabe, Germany, *in absentia*
Thesis: Evolution and God: Shaw and His Bibles.
Anne Margot Roy Nasjleti, B.S. (Mount Holyoke), 1955; Wilbraham, Mass.
Thesis: Troilus and Cressida.

* As of October 15, 1960.

Maxwell Reader, B.S. (Sir George Williams), 1944; B.S. (United Theological), 1950; Essex Junction
Thesis: Two Views of Man in American Literature: A Comparison of Jonathan Edwards and Ralph Waldo Emerson.

History

*Arthur Robert Kirwin, Jr., A.B. (St. Michael's), 1957; Albany, N. Y., *in absentia*
Thesis: A Study of the Hungarian Revolution of 1848-1849.

Mathematics

Joyce Evelyn Merriam, B.A. (UVM), 1959; North Troy
Thesis: A Study of Certain Selected Factors Noted in the Diagnosis and Treatment of Lung Cancer.

Psychology

Olga Sears, B.A. (UVM), 1959; Burlington
Thesis: Relationships Between Aspects of Self-Concept and Personality Adjustment.

College of Medicine

Doctor of Medicine

Donald Skinner Bicknell, B.A., Barton
Alden Hirsh Blackman, B.A., Providence, R. I.
Charles Gerard Brennan, A.B., *cum laude,* Brookline, Mass.
John Charles Collins, Jr., B.A., Manchester, Conn.
Raymond Wade Covill, B.S., Bedford, N. H.
Victor Joseph DePratti, B.S., *cum laude,* Athol, Mass.
Elizabeth Day Fields, B.S., Waterbury
Wilfrid Leon Fortin, B.A., Manchester, N. H.
Robert Cesare Guiduli, B.A., Barre
George Hughes Hansen, B.S., Rutland
Edward Keith Howard, B.A., Burlington
Thomas Gerald Howrigan, B.S., Fairfield
Rudolph Martin Keimowitz, B.A., Middletown, N. Y.
John Bradley Lafave, B.A., Malone, N. Y.
Thomas Edward Lally, B.S., Franklin, N. H.
Kenneth Spero Latchis, A.B., Brattleboro
Kenneth Jay Levin, A.B., Manchester, N. H.
Alan Blair Mackay, A.B., Burlington
Allen Wray Mathies, Jr., B.A., M.S., Ph.D., *cum laude,* Colorado Springs, Colo.
John Marshall McGinnis, Jr., Natick, Mass.
William James McSweeney, B.S., Burlington
John Charles Mesch, B.A., Hanover, N. J.
Charles Eldor Moisan, Jr., B.A., Burlington
Patrick Edward Moriarty, B.S., Springfield, Mass.
Richard Dodge Morrison, B.A., Essex Junction
Willard Jackson Morse, Jr., B.S., Waterford, Conn.
Donald Robert Morton, B.S., Presque Isle, Me.
Albert John Murphy, B.S., Manchester, N. H.
James Edward O'Brien, B.S., M.S., Ph.D., Hamden, Conn.
Evan Orphanos, B.S., Lynn, Mass.
Leonard Martin Parker, B.A., Mattapan, Mass.
Charles Arthur Pitman, B.A., Bayside, N. Y.
Herbert Gerhard Prakelt, B.S., Townshend
George Benjamin Reservitz, B.S., Brockton, Mass.

* As of October 15, 1960.

David Alan Stephens, B.A., Burlington
Andrew Melville Stewart, B.A., Hanover, N. H.
Albert Howard Stone, B.A., St. Albans
Edwin Laurie Tolman, A.B., Waban, Mass.
John Alfred Vaillancourt, B.A., *cum laude*, Swanton
Marianne Vas, Hartford, Conn.
Margaret Miles Waddington, B.S., Burlington
William Taylor Wallace, Jr., A.B., Claremont, N. H.
Miles Edward Waltz, B.A., Keene, N. H.

Degrees Honoris Causa

Dorothy Matilda Collins Montpelier, Vermont	Doctor of Education
Norris Cotton Lebanon, New Hampshire	Doctor of Laws
William Carl Fels Bennington, Vermont	Doctor of Laws
Maurice Stanley Friedman Bronxville, New York	Doctor of Laws
Donald Albert Gannon Wellesley Hills, Massachusetts	Doctor of Laws
William D. Hassett Northfield, Vermont	Doctor of Laws
Julius Rudel New York, New York	Doctor of Music

DEPARTMENTS OF ARMY AND AIR SCIENCE

Commission of Second Lieutenant, United States Army

*Roberto Carlos Eaton, Infantry
*Paul Maurice O'Connor, Transportation Corps

Commission of Second Lieutenant, United States Army Reserve

*Stephen Leonard Berry, Infantry
Robert Watson Billings, Medical Service Corps
Dale Allen Burroughs, Infantry
Carl Roger Butterfield, Quartermaster Corps
William Clark Carrigan, Medical Service Corps
Frank Wilbert Diller, Jr., Armor
*Ralph Peter Guiduli, Infantry
David John Howe, Corps of Engineers
John Timothy Ide, Artillery
Douglas Robert Jarrett, Army Intelligence
Roger Joseph Knisley, Army Intelligence
John Stanley Maynes, Artillery
Richard Alan Metcalf, Artillery
Peter Edward Nelson, Infantry
Dwayne Lyle Perkins, Ordnance Corps
Daniel John Prescott, Quartermaster Corps
Kenneth Oscar Switzer, Artillery
Marvin Vipler, Artillery
*Stanton Williams, Infantry

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

Ants Luse, Infantry
Kenneth Robert McCormack, Signal Corps
Peter Cass McGibney, Artillery
John Terrell Moore, Infantry

Commission of Second Lieutenant in the United States Air Force Reserve

*Roland Judson Allen
William Raymond Benner
Joseph Roland Buley
*Charles Hager Eldred
William Austin Hill, III
Ronald Francis Kilburn
Morton Albert Lord
*John Harold Martel, Jr.
James Arthur Rogers
*Gordon Hector Sprigg, Jr.

* Distinguished Military Graduate.

Commission of Second Lieutenant in the United States Air Force Reserve, Upon Completion of Degree Requirements

Richard Thomas Aldinger
Vernon Franklin Fowler
*Thomas Ross Hackett
Frederick Weed Harrington
James Earle McCarthy
Stanley Everett Van Horn, Jr.

Commission of Second Lieutenant in the United States Marine Corps Reserve

Raymond Howard Johnson, Jr.

Academic Awards

Presented during the year 1960-1961

ALPHA ZETA PROFICIENCY AWARD—John R. Donnelly, '63.

AMERICAN INSTITUTE OF CHEMISTS AWARD—Daniel Lester Simpson, '61.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS AWARD—Peter R. Poster, '61.

WARREN R. AND MILDRED L. AUSTIN AWARD—Charles R. Tierney, '61.

B'NAI B'RITH AWARD—Truman W. Grandey, '61.

BORDEN AGRICULTURAL AWARD—James W. McBride, '61.

BURPEE AWARD IN HORTICULTURE—Mikhail E. Nasrallah, B.Sc. (Agriculture), 1960; American University of Beirut.

EDWARD PAGE BUTLER DEBATING AWARDS—*First:* Marilyn Van Graber, '62; *Second:* Betsy R. Lisman, '63; *Third:* Elaine S. Zak, '64.

CARBEE MEDICAL AWARD—Leonard Martin Parker, B.A.

FRED DONALD CARPENTER GERMAN AWARD—Natalie Nisbet, '63.

CHEMICAL RUBBER COMPANY ACHIEVEMENT AWARD—Douglas J. Filler, '64 (Chemistry); Rudolph L. Polli, '64 (Chemistry); Rhoda L. Whitney, '64 (Chemistry); Robert H. Israel, '64 (Mathematics).

CHEMIST CLUB OF NEW ENGLAND AWARD—Daniel Lester Simpson, '61.

CORSE TRAVELING FELLOWSHIP AWARD—Truman W. Grandey, '61.

FAYE CRABBE AWARD—Sally Jean Nadon, '61.

GOLDBERG AWARD—Jamie J. Jacobs, '61.

HOWARD AWARDS—*First:* Anne M. Larrow, '63; *Second:* Carleen R. Otis, '63; *Third:* Rodney A. Fisk, '63 and Carol B. Shapiro, '63.

ELWIN LEROY INGALLS AWARD—Elizabeth J. Soule, '62.

INSTITUTE OF RADIO ENGINEERS AWARD—Stephen L. Berry, '61.

INTERFRATERNITY SCHOLASTIC CUP—Phi Sigma Delta.

A. ATWATER KENT AWARD—Wayne L. Foster, '61.

KIDDER MEDAL—James L. Battersby, '61.

LAMB FOUNDATION ESSAY AWARDS—*First:* Alan Blair Mackay, A.B.; *Second:* James Edward O'Brien, B.S., M.S., Ph.D.

ROBERT ASHTON LAWRENCE DEBATING AWARDS—*First:* Marilyn Van Graber, '62; *Second:* Charles R. Tierney, '61; *Third:* Robert H. Ronan, Jr., '61; *Fourth:* Betsy R. Lisman, '63; *Fifth:* William L. Germain, '63, and Gilbert M. Tornabene, '63.

ROBERT ASHTON LAWRENCE AND GEORGE EDWIN LAWRENCE DEBATING AWARDS—*First:* Charles R. Tierney, '61; *Second:* Marilyn Van Graber, '62.

* Distinguished Military Graduate.

EDMUND F. LITTLE CUP—Charles H. Eldred, '61.
MORTAR BOARD SCHOLASTIC CUP—Sanders Hall.
OMICRON NU CUP—Constance P. Anderson, '63.
PANHELLENIC IMPROVEMENT AWARD—Alpha Epsilon Phi.
EDWARD H. PHELPS AWARD—Stanley S. Ather, '61.
SEYMOUR HORTICULTURAL AWARD—William E. Xiques, '61.
MARY JEAN SIMPSON CUP—Patricia L. Morse, '61.
KIRBY FLOWER SMITH LATIN PRIZE—Janet Margaret Rousse, '64.
TAU BETA PI AWARD—Abraham N. Daudelin, Jr., '63.
THOMAS TROPHY—Kenneth O. Switzer, '61.
UNITED BUSINESS EDUCATION ASSOCIATION AWARD—Joanne R. Burnham, '61.
VERMONT CERTIFIED PUBLIC ACCOUNTANTS AWARD—Donald T. Devost, '61.
GEORGE H. WALKER DAIRY AWARD—Leslie C. Lewis, '61.
WALL STREET JOURNAL AWARD—David H. Hall, '61.
WIRTHMORE 4-H AWARD—Edwin C. Walker, '64.
WOODBURY AWARD IN MEDICINE—John Alfred Vaillancourt, B.A.

Loan Funds, Scholarships, and Awards

Loan Funds

THURSTON M. ADAMS MEMORIAL FUND Preference given to students in Agricultural Economics.

AMERICAN AGRICULTURALIST RESEARCH FOUNDATION—For juniors and seniors in Home Economics.

CATHERINE ARMSTRONG LOAN FUND For women only.

REV. STEPHEN G. BARNES To provide loans or gifts for needy students to attend religious conferences.

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.

MATTHEW HENRY BUCKHAM Any needy girl.

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.

ROBERT M. CARTER Agriculture and Home Economic students.

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.

DENTAL MEMORIAL LOAN FUND Established by Vermont Dental Society for financial assistance to second year dental hygiene students.

LEONARD PERLEY DICKINSON For students in engineering, preference to be given to those in electrical engineering.

DONALD DRESSER MEMORIAL FUND No restrictions.

FACULTY EMERGENCY LOAN FUND For faculty members only.

ASA FISKE Established for women students by Annette Fiske Mereness in memory of her father.

ELLIS EDWIN FOSTER LOAN FUND Preference to graduates of Peoples Academy of Morrisville, Vt.

MARY GRAVES Established for women students by Annette Fiske Mereness in memory of her mother.

GREATER NEW YORK CITY ALUMNI LOAN FUND Preference given to students from the greater New York area.

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

STEPHEN DWIGHT AND LIDA MASON HODGE For women students in the College of Arts and Sciences.

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.

CORNELIUS A. JEUDEVINE Established by Allen E. Jeudevine as a memorial to his son to aid Vermont men in obtaining a liberal education.

KELLOGG FOUNDATION LOAN FUND Medical students.

LADIES OF THE FACULTY For woment students. Not more than fifty dollars is loaned to any one student.

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.

NATIONAL DEFENSE STUDENT LOAN FUND.

NEW ENGLAND SOCIETY IN THE CITY OF NEW YORK LOAN FUND Temporary loans.

CHARLES D. AND CARRIE D. ORDWAY Bequeathed by Charles D. Ordway in 1933, for Vermont students.

MARY MAUD PATRICK Established by Epsilon Sigma as a memorial to Mary Maud Patrick for students in elementary education.

PHI BETA KAPPA Available to members of the senior class; preference being shown to members of the society.

ELIZABETH D. AND CLIFFORD R. PROCTOR Established in 1953 for students in the College of Medicine.

RIXFORD MANUFACTURING COMPANY For students from Highgate.

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.

MARY A. SHAW AND FANNY E. SHAW Established by Mrs. Willard Pope, daughter of Mary A. Shaw, for women students.

F. H. AND GRACE M. SHEPARDSON For deserving students, subject to such regulations as the Board of Trustees shall prescribe.

JAMES A. SINGISER MEDICAL STUDENT LOAN FUND Established by James A. Singiser, M.D., to aid needy medical students.

HORACE E. STEVENS, Class of 1870 Established in 1926 by his relatives for students in engineering.

TERRILL-HOLBROOK For women students, preference being shown to those in Home Economics.

MRS. HAROLD T. WHITE MEDICAL STUDENT LOAN FUND Preference given to medical 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.

Scholarships

LIZZIE P. ALLEN Founded in 1900 by Lizzie P. Allen, a descendant of Ira Allen, founder of the University.

ANONYMOUS Craftsbury preference.

FRANKLIN BALDWIN Established in 1915 by bequest of Mr. Baldwin for students from Putney.

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

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.

ADA S. BLAIR Established by bequest in 1926.

ELIZABETH F. BRIGHAM Established by bequest in 1910; preference to be given to students from Brigham Academy.

MARCIA P. BROWNE Established by bequest for women students.

RALPH J. BUGBEE SCHOLARSHIPS in Agricultural Engineering given by the Central Vermont Public Service Corporation. Four scholarships at $200 each, annually.

EMORY N. BURRITT Established by bequest for woment students.

SARAH L. BURRITT Established by bequest for women students.

EZRA HOYT BYINGTON Founded in 1905 in memory of Mr. Byington by Mrs. Louisa 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.

MOSES D. CARBEE, Class of 1873 Established by a bequest from Mrs. May D. Carbee in memory of her husband; available for medical students.

DR. WALTER CARPENTER Established by bequest; preference to be given to sons of clergymen and physicians.

DEAN JOSEPH E. CARRIGAN Established in 1957 by the people of Vermont to honor Dean Carrigan. The income from the fund is used to provide scholarships for Vermont boys and girls attending the College of Agriculture and Home Economics.

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.

CONNECTICUT LIGHT AND POWER No restriction.

JOHN H. CONVERSE, Class of 1861 Established in 1882.

LIZZIE S. CONVERSE Founded by bequest of Sarah Elizabeth Converse for students of classics.

CORSE FELLOWSHIP OF $1200 Established by bequest of Frederick M. Corse, Class of 1888, awarded annually to a Bachelor of Arts Graduate of The University of Vermont. The applicant must have been a language major, and must be preparing for a career in college teaching.

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 husbandry, on the basis of need, character, and scholarship.

CRAFTSBURY Founded in 1900 for relatives of Mr. and Mrs. Nathan S. Hill, or residents of Craftsbury or Isle La Motte.

PHILIP HENRY CREER Founded by Ev-Gov. Redfield Proctor for students from Proctor.

EASTERN MILK PRODUCERS ASSOCIATION SCHOLARSHIP FUND 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.

ESSO 4-H Awarded each year by the Esso Standard Oil Company of New Jersey to an incoming freshman in the College of Agriculture on the basis of need, character, and scholastic ability, plus at least three years of 4-H work. If satisfactory grades are maintained, two hundred dollars per year will be paid the recipient for the succeeding three years.

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.

JOHN M. EVANS Established in 1958 in memory of himself and his wife, Mary Hinckley Evans, for worthy students in civil engineering.

ROLLO J. FRANCISCO Established by bequest in 1951.

GAMMA PHI BETA FOUNDATION SCHOLARSHIP FUND For a female undergraduate student of at least sophomore standing.

GENERAL SCHOLARSHIP.

DR. EDWARD EVERETT HAWES Established by bequest in 1946; available for medical students.

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.

DAVIS HOLLIS.

DR. CHARLES H. HOOD Given by the Charles H. Hood Dairy Foundation. Six of $250 each awarded to upperclass students studying milk production.

LOUISA H. HOWARD Founded in 1882; available for men.

CHARLES A. HOYT, Class of 1858 Established by bequest in 1904.

CLARK AND EDWARD S. ISHAM SCHOLARSHIP FUND Established by Lois C. Isham to aid needy boys.

ISLE LAMOTTE Founded in 1884 by Nathan S. Hill; for students from Isla LaMotte or from Craftsbury.

SARAH B. JACOBS Founded in 1882; available for graduates of Brigham Academy only.

EDITH BLANCHE KIDDER Established by Joseph W. Kidder for students in the College of Medicine; preference to be given to legal residents of Barre.

ROBERT J. KIMBALL Founded in 1900 for students from Randolph. The Trustees of Randolph High School may make nominations for this scholarship.

CELINDA A. B. LILLEY Founded in 1880 for women students.

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.

DANIEL PITKIN MINER Established by bequest in 1943; for native-born students, not over twenty-five years of age.

MORETOWN AND MIDDLESEX Founded by the Rev. E. C. Bass, Class of 1859.

JUSTIN S. MORRILL Founded in 1900 by Senator Justin S. Morrill; for students from Strafford.

NEW YORK ALUMNI ASSOCIATION Men or women from N. Y. or vicinity awarded by N. Y. Alumni Association.

JOHN ORDRONAUX Founded in 1909; for students in the Academic and Medical Colleges.

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.

ARTHUR W. AND LOUISE S. PERKINS Established in their memory in 1947 by their son 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.

MINNIE A. PICKERING Established in 1938 by gift in memory of her daughter.

RALSTON PURINA $500 awarded at 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.

CHARLES W. RICH, Class of 1836 Founded in 1883 for students in the College of Arts and Sciences.

SEARS-ROEBUCK FOUNDATION Three of $200 for men in agriculture and two of $100 for women in home economics are awarded annually to incoming freshmen; one for $250 for a sophomore in agriculture. Awarded on the basis of need, scholarship, and farm origin.

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.

ANNA C. SMITH SCHOLARSHIP FUND To aid deserving and needy students from the Ludlow, Vermont area.

SAMUEL SIDNEY SMITH Founded in 1896 by bequest of Mrs. Elisa Smith in memory of her husband.

SOLDIERS' Founded in 1913 by a group of Civil War Veterans for students who are descendants of soldiers in the Civil War.

SOPHIA STOW Endowed in 1937 by bequest of George L. Stow, '73, in memory of his mother; for students of classical languages.

DR. H. C. TINKHAM Established by bequest in 1956; for students in the College of Medicine.

VERMONT ELECTRICAL ASSOCIATION SCHOLARSHIP FUND Awarded to a junior or senior majoring in Electrical Engineering who is a resident of Vermont.

VERMONT HOME DEMONSTRATION COUNCIL SCHOLARSHIP $200, awarded to a Vermont girl who is enrolled in and has completed at least one year of Home Economics at the University of Vermont.

DR. DANIEL WASHBURN Founded in 1853 for young men; preference to be given to those studying for the ministry.

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.

HATTIE LAURA WETHERBY WESTON Established by bequest in 1936.

JOHN A. S. WHITE Established by bequest; for students from Washington County or from Vermont.

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.

LELAND MASON WILLEY Preference to students majoring in Chemistry.

NORMAN WILLIAMS.

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.

Awards

THE ALPHA LAMBDA DELTA AWARD, a book, is presented by the National Council to the senior member who has the highest average for four years. Certificates are awarded to the senior members who have maintained an average of 87.5 or more for four years.

THE ALPHA ZETA PROFICIENCY AWARD is given to that agricultural student who in his freshman year is deemed the most proficient in scholarship, extracurricular activities, and self-support.

AMERICAN INSTITUTE OF CHEMISTS AWARD, for excellence in the study of Chemistry.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERING AWARD, a certificate, is awarded annually to the student member who has been the most outstanding in the activities within the branch for the academic year.

THE AMERICAN LEGION AWARD, plaque to the cadet commander of the Army ROTC Company receiving the highest efficiency rating for the year's work.

THE ARMY RESERVE OFFICERS ASSOCIATION AWARD, medal to the Army ROTC cadet in MS IV who has shown the greatest versatility and participation in the ROTC program.

THE ARMY SUPERIOR CADET AWARDS, ribbons to the outstanding Army ROTC cadet in military proficiency in each class.

THE ATHLETIC COUNCIL MANAGERIAL AWARD of twenty-five dollars is awarded annually to that senior sports manager who has shown the greatest proficiency.

THE WARREN R. AND MILDRED L. AUSTIN AWARD, to the student ascertained and found to have shown the most interest and endeavor in knowledge of international organization for the principles and purposes of the United Nations.

THE AWARD OF THE ASSOCIATION OF THE U. S. ARMY, medal to the army ROTC cadet in MS III who is judged to have contributed most through his leadership to advancing the standing of the ROTC unit and the Military Department of the University of Vermont.

THE BENEDICT ESSAY AWARD was 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 the subject of international arbitration.

THE BENNETT ESSAY AWARD, endowed by Philo Sherman Bennett, provides an annual award for the best essay discussing the principles of free government.

THE B'NAI B'RITH AWARD of $25 is given annually by the Joseph Frank Lodge of Burlington to that student who has done most to encourage interfaith cooperation and activities.

BORDEN AGRICULTURAL AWARD is awarded annually to that eligible student in the College of Agriculture who on entering his senior year has the highest average grade of all eligible students in all preceding college work. Students who have included in their courses of study two or more dairy subjects are eligible for the award.

THE BURPEE AWARD IN HORTICULTURE, an annual award of $100 donated by the W. Atlee Burpee Company, is made on the basis of scholarship, practical experience, and interest in flower and vegetable growing.

THE BUTLER DEBATING AWARDS were endowed by Edward Page Butler, 1870, for the promotion of extemporaneous debate. From the income of this fund of $1200 three awards are made annually to the three women students who have shown the greatest ability in debate.

THE CARBEE MEDICAL AWARD was established by Mrs. May D. Carbee in memory of her husband, Moses Dyer Carbee, M.D., 1873. The income from the fund is given annually to the student in the College of Medicine who shows the greatest proficiency in the subject of obstetrics.

THE CARPENTER GERMAN AWARD is presented in honor of Professor Fred D. Carpenter to that student in the intermediate German course who has demonstrated the greatest degree of progress and improvement.

THE 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, is awarded annually to that member of the varsity tennis squad who has demonstrated the greatest degree of progress in tennis proficiency during the season.

CHEMICAL RUBBER COMPANY UVM ACHIEVEMENT AWARDS Given annually to each of the highest ranking students in the beginning courses in chemistry, mathematics and physics.

THE CONVERSE AWARDS IN COMMERCE AND ECONOMICS were established by John Heman Converse, 1861, by gift of a fund of $1000, the income from which may be used in whole or in part for prizes.

THE FAYE CRABBE AWARD, established in honor of Faye Crabbe by the alumnae and faculty of the University of Vermont School of Nursing, is presented annually to the senior majoring in nursing who has excelled in the areas of scholarship, nursing ability, and service to the University.

THE 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 throughout the year in the principal matches in which the rifle team competes.

THE EMERSON AWARD IN HISTORY, offered annually in memory of Samuel Franklin Emerson, Professor of History for forty-two years, is awarded to an undergraduate for the best original essay on any topic chosen from any field of history.

THE GOLDBERG AWARD, a gold watch, is awarded annually by Phi Chapter of Phi Sigma Delta Fraternity to that senior man who has achieved an over-all average of at least 77, participated successfully in intramural athletics, contributed to the University as a sincere and respected individual, exemplifying the character and personality of Bailey Herman Goldberg, 1950. Preference is given to a student who plans to continue with graduate study.

HAMILTON WATCH COMPANY AWARD, a watch, 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.

THE HOWARD AWARDS were provided by a bequest of $1250 from Mrs. Hannah T. Howard, the income of which is awarded to students in the College of Arts and Sciences for excellence in the work of the freshman year.

THE ELWIN LEROY INGALLS AWARD is provided from a fund established in 1934 to honor Elwin Leroy Ingalls, 1896, who had then completed twenty years of continuous service as State 4-H Club Leader. It is awarded annually to a University student of outstanding merit as shown in character, 4-H Club record, and scholastic attainment in college.

INTERFRATERNITY SCHOLASTIC CUP, awarded to the fraternity having the highest average during the preceding semester.

THE A. ATWATER KENT AWARD IN ELECTRICAL ENGINEERING is provided by the income of a fund of $5,000 and is awarded annually to the most improved senior in electrical engineering. The names of the recipients are placed on a tablet which is located in the Waterman Building.

THE KIDDER MEDAL is provided by the income of a fund of $400, established in memory of D. F. T. Kidder, 1880, a trustee of the University. The specially engraved gold medal is awarded to the male student in the senior class ranking first in character, leadership, and scholarship.

LAMB FOUNDATION ESSAY AWARDS to the students showing greatest comprehension and appreciation of the Doctor-Patient relationship.

LAWRENCE DEBATING AWARDS were established by Edwin Winship Lawrence, 1901. The first group of three awards is established in memory of his brother, Robert Ashton Lawrence, 1899, and is offered annually to students who exhibit the greatest proficiency in debate. A $10,000 fund provides for these awards.

The second group of awards, established in memory of his brother, Robert Ashton Lawrence, 1899, and his father, George Edwin Lawrence (Middlebury College, '67), is awarded to the four students participating in a joint debate between representatives of the University and Middlebury College who, in the opinion of the judges chosen, show the greatest proficiency in this debate.

THE EDMUND F. LITTLE CUP is provided by the income from a fund established by Arlington P. Little, 1901. It is awarded annually for meritorious work in mechanic arts.

THE LOYAL LEGION MEDAL is presented annually by the Vermont Commandery of the Military Order of the Loyal Legion to the most proficient junior cadet of the Reserve Officers' Training Corps.

THE MERCK INDEX AWARDS given annually by the Merck Co. for proficiency in Chemistry to the outstanding junior and to the outstanding senior.

THE MORTAR BOARD SCHOLARSHIP CUP is awarded annually to the women's dormitory attaining the highest scholarship average for the first semester.

THE OMICRON NU CUP is awarded to the student in home economics who attains the highest scholastic average during her freshman year.

THE OUTING CLUB SKI TROPHY is awarded annually to the member of the varsity ski team who has shown outstanding leadership, character, and athletic attainment in skiing during the past year.

PAN-HELLENIC AWARD is presented annually to the sorority whose scholastic average shows greatest improvement in the fall semester.

THE PHELPS AWARD IN CIVIL ENGINEERING, derived from a fund of $900, was endowed in memory of Edward Haight Phelps, 1872, by his father, Edward J. Phelps. The award is made annually to an outstanding senior in civil engineering.

THE INSTITUTE OF RADIO ENGINEERING AWARD, a certificate and a voucher for one year's dues as a member after graduation, is awarded annually to the student member who has shown the greatest professional development, accomplishment, and interest in the activities of the student branch.

THE COLONEL WADSWORTH RAMSEY-SMITH TROPHY AND AWARD, in the amount of ten dollars, are awarded annually to the outstanding senior cadet of the Reserve Officers' Training Corps. The name of the senior is inscribed on the trophy, a saber, which is maintained by the Military Department. This award is presented by Mrs. Ramsey-Smith, in honor of her husband.

THE SEMANS TROPHY, presented by the local chapter of Tau Epsilon Phi Fraternity in memory of Henry Semans, 1924, is awarded annually to a senior for outstanding qualities of leadership, loyalty and service to the University, active participation in athletics, and winning the respect and regard of his fellow students.

THE SEYMOUR HORTICULTURAL FUND of $2500 was given by William W. Seymour in memory of his father, Henry E. Seymour, 1835. The income from the fund is used in part for an award for that senior who has done the best work in original horticultural research.

THE MARY JEAN SIMPSON CUP is awarded annually to that senior woman who best exemplifies the qualities of character, service, and constructive influence which Miss Simpson strove to set before the women students during her term of office as Dean of Women.

THE KIRBY FLOWER SMITH LATIN AWARD is derived from a $3000 fund established by his wife as a memorial to Kirby Flower Smith, 1884. An award is made annually to the student having the highest standing in second year college Latin.

LA SOCIETE DES 40 HOMMES ET 8 CHEVAUX AWARD, medal to the Army ROTC cadet in MS IV for academic achievement throughout the advanced course.

THE SONS OF THE AMERICAN REVOLUTION MEDALS are presented annually by the Vermont Society, Sons of the American Revolution, one to the member of each class in the Reserve Officers' Training Corps who is outstanding in character, conduct, leadership, and in theoretical and practical knowledge of the year's course.

THE STROH TROPHY is awarded annually in honor of Charles Stroh, 1934, to the member of the baseball team who achieves the highest total of runs-batted-in during scheduled games each year.

THE SUNDERLAND MEMORIAL TROPHY is awarded annually to that 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. Each recipient's name is engraved on the permanent trophy, and the Boulder Society makes a suitable personal award.

TAU BETA PI AWARD for the sophomore in engineering who has achieved the highest scholastic average for the first three semesters.

THE THOMAS TROPHY is awarded annually to that senior student in agriculture who most closely exemplifies the character of John M. Thomas.

VERMONT CERTIFIED PUBLIC ACCOUNTANTS AWARD, annually to the outstanding student in accounting.

THE VETERANS OF FOREIGN WARS MEDAL AND PLAQUE, presented by the Howard Plant Post 782, are awarded annually to the freshman cadet of the Army ROTC unit who demonstrates the highest proficiency in leadership, drill, and military science. His name is inscribed upon the plaque, which is maintained by the military department.

THE GEORGE H. WALKER DAIRY AWARD is derived from a fund of $2000, donated by George H. Walker, one of the founders of the Walker-Gordon Milk Company. It is awarded annually to an outstanding senior in dairy studies.

THE WALL STREET JOURNAL AWARD, a silver medal and a one-year subscription to the *Wall Street Journal*, is awarded annually to the member of the senior class who shows the greatest proficiency in the field of finance.

THE WASSON ATHLETIC AWARD is derived from an endowment of $250, given by Mrs. Pearl Randall Wasson in memory of her husband, Dr. Watson L. Wasson, 1901. The income provides a prize for the member of the senior class who has maintained the highest standard of academic scholarship and athletic attainment.

WIRTHMORE 4-H AWARD of one hundred dollars is awarded annually to a freshman 4-H member who has done outstanding work in 4-H dairy or dairy feeding projects.

THE WOODBURY MEDICAL AWARDS are derived from a fund of $1000 created by Mrs. Pauline S. Woodbury in memory of her husband, Dr. Urban A. Woodbury, 1859. The first award is awarded annually to the student who has shown the greatest proficiency in the clinical subjects in his senior year. The second award is awarded to that member of the sophomore class who has received the highest standing of the class in all subjects of the freshman and sophomore years.

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Academic Calendar

Spring Semester 1962

February	2, Friday	Second semester enrollment[1]
February	3, Saturday	Second semester enrollment
February	5, Monday	Classes resume
February	23, Friday	Kake Walk Holiday
February	24, Saturday	Kake Walk Holiday
April	18, Wednesday	Spring recess begins
April	25, Wednesday	Classes resume
May	1, Tuesday	Honors' Day
May	24, Thursday	No classes
May	25, Friday	Final examinations begin
June	5, Friday	Examination period ends
June	10, Sunday	Commencement

Fall Semester 1962

September	11, Tuesday	Preliminary Days Program begins
September	11, Tuesday	Opening Convocation
September	14, Friday	Enrollment for all new students
September	15, Saturday	Enrollment for all other students
September	17, Monday	Classes begin
November	21, Wednesday	Thanksgiving recess begins; no classes
November	26, Monday	Classes resume
December	20, Thursday	Winter recess begins; no classes
January	3, Thursday	Classes resume
January	14, Monday	Midyear examinations begin
January	23, Wednesday	Examination period ends

Spring Semester 1963

February	1, Friday	Second semester enrollment
February	2, Saturday	Second semester enrollment
February	4, Monday	Classes resume
February	22, Friday	Kake Walk Holiday
February	23, Saturday	Kake Walk Holiday
April	8, Monday	Spring recess begins
April	17, Wednesday	Classes resume
May	1, Wednesday	Honors' Day
May	23, Thursday	No classes
May	24, Friday	Final examinations begin
May	30, Thursday	Memorial Day
June	4, Tuesday	Examination period ends
June	9, Sunday	Commencement

[1] For medical enrollment dates see College of Medicine Bulletin.

CALENDAR

1962

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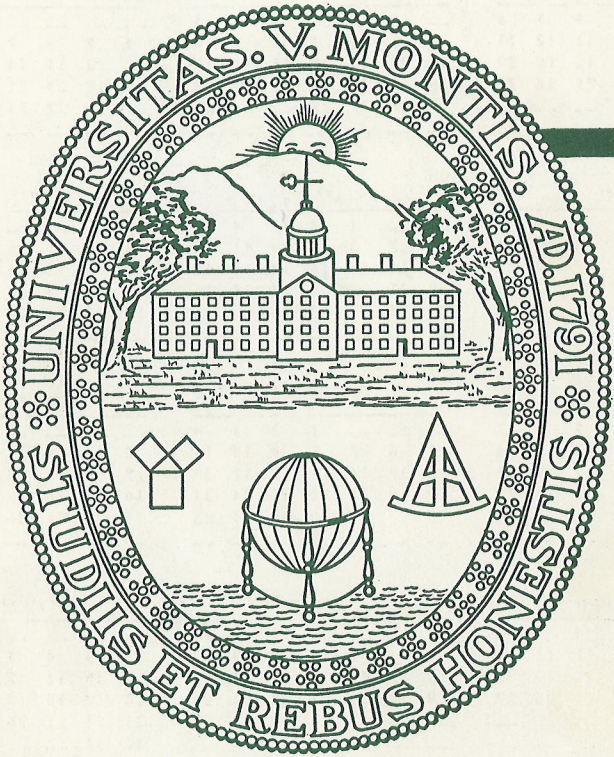
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