BULLETIN OF THE UNIVERSITY OF VERMONT

SEPTEMBER 1973 We, the faculty of the University of Vermont, in the spirit and tradition of free universities throughout the world, are agreed upon the following statement of principles on academic freedom and responsibility.

We believe that incorporation of these principles into the organization of the University of Vermont will re-emphasize the importance of academic freedom to the basic health of the University, and also serve as a statement of policy on the rights and responsibilities of faculty members at this institution. It has been our intent to state these principles in terms broad enough so that they may be valid not only in these critical times when academic freedom and personal liberty are in jeopardy both at home and abroad, but also in the future insofar as the future can be foreseen.

The Necessity of Academic Freedom in Higher Education. The main purpose of a university has always been, must always be, to stimulate the thinking and the creative powers of its students and its faculty. As an institution it deals in ideas, not only old and accepted ones but new ones that may be full of explosive power. If they are explosive they are bound to be disconcerting, even painful, to some on the campus and to many beyond its borders. Inevitably they will be called dangerous by the timid and short-sighted, but to those who really believe in the fruitfulness of human thought, the real danger would appear only if the flow of such ideas should cease. For then indeed sterility would have taken over our campus. Our faculty would no longer deserve the name of intellectuals and our students, regardless of degrees attained, could no longer claim to be educated. They would leave our campus accustomed only to the commonplace, satisfied with the mediocre, ignorant or afraid of ideas which catch fire.

Academic freedom is therefore not solely a right or privilege of the faculty but is the fulfillment of the obligation on the part of the University to provide an atmosphere in which intellectual growth may take place.

Academic Freedom and Special Responsibilities of Faculty Members. We subscribe to the following statement on academic freedom and the responsibilities of faculty members adopted by the American Association of University Professors: "The teacher is entitled to full freedom in research and in the publication of the results, subject to the adequate performance of his other academic duties, but research for pecuniary return should be based upon an understanding with the administration of the institution.

"The teacher is entitled to freedom in the classroom in discussing his subject, but he should be careful not to introduce into his teaching contro-

FOUNDED 1791

BURLINGTON, VERMONT

The University of Vermont fully supports and complies with Title VI of the Civil Rights Act of 1964 and does not discriminate in any way in any of its policies on the basis of race, color, or national origin.

THE CATALOGUE • 1973-1974

THE CONTENTS

PERSONNEL	4
INTRODUCTION	36
STUDENT LIFE	41
THE ADMISSION OF STUDENTS	51
STUDENT EXPENSES	56
GENERAL INFORMATION	61
THE COLLEGE OF AGRICULTURL	72
THE COLLEGE OF ARTS AND SCIENCES	82
THE COLLEGE OF EDUCATION	93
THE COLLEGE OF ENGINEERING, MATHEMATICS,	104
and BUSINESS ADMINISTRATION	
DIVISION OF HEALTH SCIENCES	119
SCHOOL OF HOME ECONOMICS	131
SCHOOL OF NATURAL RESOURCES	133
ENVIRONMENTAL PROGRAM	136
THE GRADUATE COLLEGE	138
CONTINUING EDUCATION	141
COURSES OF INSTRUCTION	143
GENERAL INDEX	278
ACADEMIC CALENDAR	280

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.

Bulletin of the University of Vermont

VOLUME 71

SEPTEMBER 1, 1973

NUMBER 4

Published by The University of Vermont, 85 South Prospect Street, Burlington, Vermont 05401, 18 times a year: once in November, January, February, May and June; twice in September, October, December, March and April; three times in August. Second Class postage paid at Burlington, Vermont 05401.

CORRESPONDENCE

Admissions

Requests for a catalogue, or information	concerning admission
policies and procedures, rooms and tuition	Director of Admissions
Academic Divisions	
College of Agriculture	Dean
College of Arts and Sciences	Dean
College of Education	Dean
College of Engineering, Mathematics and	
Business Administration	Dean
School of Home Economics	Director
School of Natural Resources	Director
Environmental Program	Director
Graduate College	Dean
Division of Health Sciences	Dean
College of Medicine	Dean
School of Nursing	Director
School of Allied Health Sciences	Director
Continuing Education	Dean
Summer Session	Assistant Dean
Evening Division	Director

•

Accommodation for the Handicapped

The University has embarked on a program to remove architectural barriers to make facilities accessible to and usable by the handicapped. Questions should be referred to the Office of Architectural Barrier Control.

ACCREDITATION

University Programs are accredited by the following associations:

The New England Association of Colleges and Secondary Schools The National Council for Accreditation of Teacher Education The National Association of Schools of Music The American Medical Association The American Dental Association

2

The National League for Nursing The Engineers Council for Professional Development The American Chemical Society The Society of American Foresters

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



EDWARD CLINTON ANDREWS, JR., A.B., M.D., LL.D.

THOMAS P. SALMON, J.D., L.L.M.

March, 1968—March, 1974

BINGHAM JOHNSON HUMPHREY, B.S., Ph.D. GEORGE EDWARD LITTLE, JR., A.B. CHARLES THEODORE SCHECHTMAN, M.D.

March, 1969-March, 1975

C. DOUGLAS CAIRNS, S.B. THOMAS HENRY CANDON, B.S. ARTHUR HENRY JONES, B.S. FRANCIS ROBERT PEISCH, A.B., LL.B.

March, 1970-March, 1976

HOWARD ALFRED ALLEN, JR., B.S. HARRY JAMES BOLWELL, B.S.M.E. ALLEN OBER EATON, B.S., LL.B.

March, 1971—March, 1977

ROBERT EMMETT BOARDMAN, B.S. LUTHER FREDERICK HACKETT, A.B. MADELINE BAILEY HARWOOD, R.N. CAREY HARRIS HOWLETT, B.S.

March, 1972—March, 1978

DANIEL B. BURKE, B.A. PAUL R. LOW, Ph.D. CAJSA N. SCHUMACHER, B.A.

March, 1973-March, 1979

4

MERRITT S. HEWITT, JR., A.S. TIMOTHY J. O'CONNOR, JR., L.L.B. LOUISE R. SWAINBANK, A.B. LEONARD U. WILSON, B.A. Rye N.Y. Burlington, Vt. Burlington, Vt.

North Bennington, Vt. Brattleboro, Vt. St. Johnsbury, Vt. Waitsfield, Vt.

Burlington, Vt. Rutland, Vt. Morgan Vt

Morgan, Vt. Burlington, Vt.

Burlington, Vt.

Burlington, Vt.

Bridport, Vt.

So. Burlington, Vt.

Manchester Center, Vt.

Chagrin Falls, Ohio

Winchester, Mass.

New Britain, Conn.

Mt. Carmel, Conn.

Burlington, Vt.

Ex-Officio

President

Governor

\bigvee Officers of Instruction

EMERITI

NELLE ALEXANDER ADAMS (MRS. W. R.), M.A. WILLIAM RITCHIE ADAMS, Ph.D. ELLSWORTH L. AMIDON, M.D. HEINZ ANSBACHER, Ph.D. EARL LEE ARNOLD, Ph.D. FLORENCE EMILY BAILEY, M.S. HOWARD GORDON BENNETT, A.M. DAVID MARSH BOSWORTH, M.D. ALEC BRADFIELD, M.S. CHARLES E. BRAUN, Ph.D.

LELAND LAWRENCE BRIGGS, M.B.A. CONSTANCE LORRAINE BROWN, M.S. THOMAS STEPHEN BROWN, M.D. ROY ORVILLE BUCHANAN, B.S. Asso FRED DONALD CARPENTER, Ph.D., L.H.D. JOSEPH EDWARD CARRIGAN, A.M., LL.D.

RUPERT ADDISON CHITTICK, M.D. FAYE CRABBE, Sc.D. GEORGE CROOKS, Ph.D. MALCOLM DANIEL DAGGETT, Ph.D. LEON W. DEAN, À.B. JOHN BELLOWS DEFOREST, Ph.D. CHARLES GEORGE DOLL, Ph.D. FRED W. DUNIHUE, Ph..D. GEORGE DYKHUIZEN, Ph.D.

OLIVER NEWELL EASTMAN, M.D. JOHN CLIFFORD EVANS, B.S. PAUL DEMUND EVANS, Ph D. JOHN LOUIS PHILLIPPE FOREST, M.D. PERCY AUSTIN FRALEIGH, Ph.D. PAUL KENDRICK FRENCH, M.D. FRED WILLIAM GALLAGHER. Ph.D. WILLIAM LAWRENCE GARDNER, B.S.

ALEXANDER GERSHOY, Ph.D. RAYMOND AVERY HALL, A.M. DONALD CEDRIC HENDERSON, M.S. CHARLES WILLIAM HOILMAN, M.S. RICHARD JOHN HOPP, M.S. MURIEL JOY HUGHES, Ph.D. GEORGE VINCENT KIDDER, Ph.D., L.H.D.

FLORANCE BEESON KING, Ph.D. ELIZABETH KUNDERT, M.D. FRANK D. LATHROP, M.D. CARL LUCARINI, A.M. ELEANOR LUSE, Ph.D. EDD RUTHVEN MCKEE, M.S.E.E.

ALBERT GEORGE MACKAY, M.D.

Assistant Professor of Education Professor of Forestry Professor of Medicine Professor of Psychology Professor of Agricultural Engineering Professor of Home Economics Professor of Music Consultant Orthopedic Surgery Professor of Animal and Dairy Science Pomeroy Professor of Chemistry and Dean of the Graduate College Professor of Economics Associate Professor of Chemistry Professor of Anatomy Associate Professor of Electrical Engineering Professor of German Dean, College of Agriculture and Home Economics Professor of Psychiatry Professor of Nursing Professor of Chemistry

Professor of Romance Languages Associate Professor of English Professor of Romance Languages Professor of Geology Professor of Anatomy James Marsh Professor of Intellectual and Moral Philosophy Professor of Gynecology Associate Professor of Physical Education Protessor of History Instructor in Clinical Psychiatry Professor of Mathematics **Professor of Clinical Medicine** Professor of Medical Microbiology Associate Professor of Physical Education for Men Professor of Botany Associate Professor of Religion Associate Professor of Poultry Science Associate Professor of Electrical Engineering Professor of Plant and Soil Science Professor of English Professor of Classical Languages and Dean of College of Arts and Sciences Professor of Home Economics Assistant Professor of Clinical Psychiatry Associate Professor of Otolaryngology Assistant Professor of Chemistry Professor of Speech Professor of Electrical Engineering and Dean of College of Technology

Projessor of Surgery

5

SALLY BERRY MAYBURY, Ed.D. ALVIN REES MIDGLEY, Ph.D. REGINALD VENN MILBANK, M.S. ISABEL CLARK MILLS, M.A. HENRY LEE MILLS, D.V.M. PAUL AMOS MOODY, Ph.D.

CHESTER ALBERT NEWHALL, M.D. JOHN ALVIN NEWLANDER, Ph.D. GEORGE HUBERT NICHOLSON, M.A. ANDREW E. NUQUIST, Ph.D. LENA RAUB OAKLEY, M.A. MALCOLM S. PARKER, D.M.L. JAMES EUGENE POOLEY, A.M. Associ WILLARD BISSELL POPE, Ph.D. ARCHIBALD THOMSON POST, Ed.M.

HERBERT EVERETT PUTNAM, Ph.D. PHYLLIS MELVILLE QUINBY, B.S. LOUISE ADELE RAYNOR, Ph.D. LYMAN S. ROWELL, M.S., L.H.D. LAURENCE FORREST SHOREY, M.S. WILLIAM J. SLAVIN, M.D. ARTHUR BRADLEY SOULE, JR., M.D. WALTER ALVA STULTZ, Ph.D. KARL TREIAL, M.D. KEITH TRUAX, M.D. *BENJAMIN BOOTH WAINWRIGHT, A.M. MYRÓN ELLIS WITHAM, C.E. FLORENCE MAY WOODARD, Ph.D. RICHARD S. WOODRUFF, M.D. LLOYD ABRAM WOODWARD, M.S. ALBERT W. WURTHMANN, M.A. WILLIAM GREENHILL YOUNG, M.D. ELIZABETH K. ZIMMERLI, Ed.D. *DECEASED, JUNE 26, 1973

Associate Professor of Commerce and Economics Professor of Agronomy Professor Department of Civil Engineering Associate Professor of Art Instructor in Public Health Howard Professor of Natural History and Professor of Zoology Thayer Professor of Anatomy Professor of Animal and Dairy Science Associate Professor of Mathematics Professor of Political Science Associate Professor of Nursing Associate Professor of Romance Languages Associate Professor of Classical Languages and History Professor of English Associate Professor of Physical Education for Men Associate Professor of History Associate Professor of Dental Hygiene Associate Professor of Botany President Associate Professor of Electrical Engineering Professor of Obstetrics and Gynecology Professor of Radiology Professor of Anatomy Clinical Instructor of Psychiatry Associate Professor of Surgery Associate Professor of English Assistant Professor of Mathematics Professor of Commerce and Economics Assistant Professor of Pathology Associate Professor of Physics Assistant Professor of German Associate Professor of Psychiatry Associate Professor of Physical Education

FACULTY

Dates after names represent the year of appointment, either original or following a lapse of service

*Asterisk indicates member of Graduate Faculty

JOHN ABAJIAN, JR., M.D. (1940-42; 1946) JEROME S. ABRAMS, M.D. (1969) JOSEPH ANTHONY ABRUSCATO, Ph.D. (1969) Professor of Anesthesiology Professor of Surgery Associate Professor of Education *P. MARLENE ABSHER, Ph.D. (1968) Assistant Professor of Medical Microbiology *RICHARD GAYLON ABSHER, Ph.D. (1968) Associate Professor of Electrical Engineering VIJAY B. AGGARWAL, Ph.D. (1973) Assistant Professor of Mathematics *USSELL MAYNARD AGNE, Ph.D. (1969) ROBER T BASCOM AIKEN, M.D. (1941) Associate Professor of Education Associate Professor of Community Medicine HENRY P. ALBARELLI (1969) GEORGE W. ALBEE, Ph.D. (1971) Clinical Instructor in Medical Technology Professor of Psychology RICHARD J. ALBERTINI, M.D. (1972) Assistant Professor of Medicine **PETER D. ALDEN, M.D. (1964)** Clinical Assistant Professor of Medicine *CHRISTOPHER WHITNEY ALLEN, Ph.D. (1967) Associate Professor of Chemistry ROY F. ALLEN Ph.D. (1973) SAMUEL E. ALLEN, Ph.D. (1972) Assistant Professor of German Associate Professor of History SINCLAIR TOUSEY ALLEN, JR., M.D. (1948) VIRGINIA O. ALLEN. M.A. (1968) Professor of Medicine Associate Professor of Nursing Associate Professor of Economics *ABBAS ALNASRAWI, Ph.D. (1963) Professor of Physiology *NORMAN ROLAND ALPERT, Ph.D. (1966) Assistant Professor of Music Professor of Classics JANE P. AMBROSE, M.A. (1965) *ZUELL PHILIP AMBROSE, Ph.D. (1962) ELLSWORTH LYMAN AMIDON, M.D. (1933) Professor of Medicine

RICHARD WALKER AMIDON, M.D. (1949) ALISON LANE ANAND, M.A. (1967) JUDIT H C. ANDERSON, M.A. (1971) GERALD R. ANDERSON, M.A. (1970) RICHARD ARNOLD ANDERSON, M.D. (1967) * ALFRED JOHN ANDREA, Ph.D. (1967) ALLAN A. ANDREWS, Ph.D. (1970) *EDWARD C. ANDREWS, JR., M.D. (1958) *HEINZ LUDWIG ANSBACHER, Ph.D. (1946) MARK D. ARCHAMBAULT, M.D. (1971) FRANK HARRIS ARMSTRONG, Ph.D. (1968) MARK D. ARONSON, M.D. (1973) WALTER PAUL ASCHENBACH (1959) TAKA ASHIKAGA (1973) *HENRY VERNONATHERTON, Ph.D. (1949-51; 1953) ELIZABETH FISK ATWOOD, M.S. (1966) W. KIRK AVERY, Ed. D. (1971) DAVID BABBOTT, M.D. (1967) FRANK LUSK BABBOTT, JR., M.D. (1963) ROGER D. BAKER. M.D. (1971) DONALD JAMES BALCH, Ph.D. (1952-56; 1957) *BETTY BANDEL, Ph.D. (Jan. 1947) DAVID T. BARD, M.Ed. (1971) STEPHANIE A. BARNES, M.D. (1972) BERNARD BENJAMIN BARNEY, M.D. (1955-63; 1964) *HORACE GARDINER BARNUM, Ph.D. (1965) SISTER EVALUNE IRENE BARRETT, M.S. (1968) * RICHMOND JAY BARTLETT, Ph.D. (1958) LOUISE A. BASA, B.A. (1967-68; 1969) THOMAS CLINTON BATES, M.D. (1967) PETER E. BATTELLE, M.B.A. (1970) WILLIAM JOHN BECKETT, Ph.D. (1960) LOUISE T. BEDARD, R.N. (1970) *DAVID ELLIOTT BEE, Ph.D. (1969) WARREN LAZELL BEEKEN, M.D. (1965) JOHN FRYE BELL, M.D. (1947) * ROSS TAYLOR BELL, Ph.D. (1955) ROY WATSON BELL, M.B. (1969) * GEORGE RAYMOND BENOIT, Ph.D. (1967) ARTHUR BERGNER, M.D. (1970) RENÉE S. BERGNER, M.D. (1970) JOHN F. BERRY, M.S. (1968) * JOHN TREVOR BERRY, Ph.D. (1969) LEO W. BERTLEY, M.A. (1973) SIGNE T. BETSINGER, Ph.D. (1971) MALCOLM I. BEVINS, M.S. (1956) ARTHUR W. BIDDLE, Ph.D. (1970) CHARLES W. BIGALOW, M.S. (1964) Adjunct Assistant Professor of Resource Economics RICHARD LLOYD BINGHAM, M.S.W. (1969) JOHN C. BJORN, M.D. (1971) FLOYD O. BLACKWELL, Ph.D. (1971) JOHN HARDESTY BLAND, M.D. (1952) *FRANCIS ROYSTER BLISS, Ph.D. (1966) JOHN DOUGLAS BOARDMAN, M.D. (1955) * SAMUEL NATHANIEL BOGORAD, Ph.D. (1946)

Clinical Assistant Professor of Medicine Instructor in Music Assistant Professor of Physical Therapy Instructor in Philosophy Associate Professor of Medicine Assistant Professor of History Assistant Professor of Religion Professor of Pathology Professor of Psychology Clinical Instructor in Obstetrics & Gynecology Assistant Professor of Forestry Instructor in Medicine Associate Professor of Art Assistant Professor of Mathematics Professor of Animal Sciences Assistant Professor of Design Assistant Professor of Education Assistant Professor of Medicine Associate Professor of Community Medicine Clinical Instructor in Pediatrics Professor of Animal Sciences Professor of English Teaching Associate in Education Clinical Instructor in Surgery Assistant Professor of Surgery Associate Professor of Geography Assistant Professor of Nursing Professor of Plant and Soil Science Instructor in Sociology Clinical Assistant Professor of Pediatrics Assistant Professor of Business Administration Assistant Professor of Philosophy Instructor in Medicine Associate Professor of Mathematics Associate Professor of Medicine Clinical Associate Professor of Orthopedic Surgery Professor of Zoology Assistant Professor of Anesthesiology Adjunct Associate Professor of Plant and Soil Science Clinical Assistant Professor of Medicine Clinical Assistant Professor of Pediatrics Associate Professor of Hospital Administration Professor of Mechanical Engineering Professor of Home Economics

Adjunct Assistant Professor of Resource Economics Assistant Professor of English Clinical Assistant Professor of Psychiatry Clinical Associate Professor of Medicine Associate Professor of Community Medicine Associate Professor of Medicine Professor of Classics Associate Professor of Obstetrics and Gynecology

*BETTY MACHTEL BOLLER, D.Ed. (1960) *WESSON DUDLEY BOLTON, D.V.M. (1947)

*DAVID KENNETH BORAKER, Ph.D. (Mar. 1969)

Frederick and Fannie Corse Professor of English Professor of Education Professor of Animal Pathology Associate Professor of Medical Microbiology

JOSEPH BORNSTEIN, M.S. (1961)

RICHARD EMILE BOUCHARD, M.D. (1955) DALLAS BOUSHEY (1966) CHARLES BOWEN, D.M.D. (1972) * BERTIE REYNOLD BOYCE, Ph.D. (1966) BETTY A. BRADBURY, M.Ed. (1973) FED K. BRADSHAW, M.A. (1971) * JIM DUANE BRAMMER, Ph.D. (1969) THEODORE E. BRAUN, JR., M.D. (1970) PATRICIA A. BREARTON, M.S. (1972) MARY EVELYN BREEN, B.S. (1957) WALTER L. BRENNEMAN, M.A. (1969) WALLACE R. BREWER M.A. (1971) DONNA J. BRIGADA, A.S. (1973) *WILLIAM E. BRIGHT II, Ed.D. (1971) *PAUL BROCK, Ph.D. (1969) GEORGE WILSON BROOKS, M.D. (1953) T. ALAN BROUGHTON, M.A. (1966) *DAVID BASSET BROWN, Ph.D. (1969) **DEWEES HAROLD BROWN, M.D. (1963)** GRACE E. BROWN, B.S. (1970) G. STEPHEN BROWN, M.D. (1968) **JANET BROWN (1973)** * JOHN STEWART BROWN, JR., Ph.D. (1966) MARION HUNTINGTON BROWN, M.S. (1942) DENNIS W. BRUCKEL, M.S. (1966) LEON H. BRUNO, Ed. D. (1972) * GEORGE B. BRYAN, Ph.D. (1971) ROGER TRUE BRYANT, M.Ed. (1965) *DAVID P. BUCKE, JR., Ph.D. (1969) CLARENCE EDWARD BUNKER, M.D. (1968) ^{*} JOHN D. BURCHARD. Ph.D. (1970) R. CLAY BURCHELL, M.D. (1968) CAROL A. BURDETT, M.Ed. (1970) CHARLES S. BURGER, M.D. (1972) * JAMES WILLIAM BURGMEIER, Ph.D. (1969) JUANITA BURKE (1972) HENRY BURNHAM, M.A. (1968; 1970) *LEGRAND CANNON BURNS, JR., M.D. (1968) STANLEY LIVINGSTON BURNS, JR., M.D. (1960) *LEON F. BURRELL, Ph.D. (1971) **ROY VEDDER BUTTLES, M.D. (1950)** STEVEN M. CAHN, Ph.D. (1973) ROBERT NOLAN CAIN, M.D. (1953) CHARLES LYMAN CALAHAN, M.S. (1948) EDGAR JACOB CALDWELL, III, M.D. (1966) Cl MARTHA MARIE CALDWELL, M.S. (1954-59; 1960) NEDRA CALVI, M.S. (1972) * ANTHONY SAMIJEL CAMPAGNA. Ph.D. (1965) MARTIN JOHN CANNON, M.D. (1953) PHILIP Y. CANNON, D.D.S. (1972) *I.YNDON BELMONT CAREW, JR., Ph.D. (1969) *ROBERT V. CARLSON, Ed.D. (1971) HOWARD JULIAN CARPENTER, M.S. (1947) PHILIPPE CARRARD (1973) *CHARLES WARREN CASE, D.Ed. (1969) **THOMAS CASSESE (1973)** *ERLING WILLIAM CHAMBERLAIN, Ph.D. (1962)

Adjunct Associate Professor of Vocational Education and Technology Associate Professor of Medicine Assistant Professor of Anatomy Instructor in Dental Hygiene Associate Professor of Plant and Soil Science Instructor in Obstetrics and Gynecology Instructor of Zoology Assistant Professor of Zoology

Assistant Professor of Obstetrics and Gynecology Instructor in Nursing Associate Professor of Medical Technology Instructor in Religion Instructor in Political Science Teaching Assistant in Dental Hygiene Assistant Professor of Education Professor of Mathematics Clinical Professor of Psychiatry Associate Professor of English Assistant Professor of Chemistry Clinical Instructor in Medicine Assistant Professor of Dental Hygiene Associate Professor of Radiology Adjunct Assistant Professor of Nursing Associate Professor of Physics Professor, Home Economics Education Teaching Associate in Plant and Soil Science Adjunct Assistant Professor of Education Assistant Professor of Communication & Theatre Assistant Professor of Physical Education Assistant Professor of Geology Assistant Professor of Surgery Associate Professor of Psychology Clinical Professor of Obstetrics and Gynecology Instructor in Education **Clinical Assistant Professor of Medicine** Associate Professor of Mathematics Instructor in Dental Hygiene Clinical Instructor in Psychiatry **Clinical Instructor in Medicine** Professor of Medicine Assistant Professor of Education Clinical Associate Professor of Pathology Professor of Philosophy Assistant Professor of Surgery Adjunct Professor of Plant and Soil Science Clinical Assistant Professor of Medicine Associate Professor of Design Assistant Professor of Nursing Associate Professor of Economics Clinical Assistant Professor of Obstetrics and Gynecology Instructor in Dental Hygiene Associate Professor of Animal Sciences Associate Professor of Education Associate Professor of Mechanical Engineering Instructor in Romance Languages

Instructor in Romance Languages Associate Professor of Educatica Instructor in Physical Fducation Associate Professor of Munematics

*ALFRED HAYES CHAMBERS, Ph.D. (1948) Professor of Physiology and Biophysics Associate Professor of Music *JAMES G. CHAPMAN, Ph.D. (1968) DAVID S. CHASE, M.D. (1971) Clinical Instructor in Opthamology MARILYN CHASE, M.Ed. (1965) Assistant Professor of Physical Education *RICHARD XAVIER CHASE, Ph.D. (1966) JOSEPH A. CHAZAN, M.D. (1972) Associate Professor of Economics Clinical Associate Professor of Medicine ARTHUR H. CHENEY, JR., M.Ed. (1969) Assistant Professor of Education CHARLES CHRISTENSEN, JR., M.Ed. (1959) Assistant Professor of Physical Education *WALLACE WAYNE CHRISTENSEN, Ph.D. (1967) Professor of Forestry LU CHRISTIE, M.Ed. (1971) Instructor in Education **IAMES F. CLAPP, M.D. (1970)** Assistant Professor of Obstetrics and Gynecology SANDRA P. CLARK, B.S. (1972) Instructor in Medical Technology *VIRGINIA PRESCOTT CLARK, Ph.D. (1963-64; 1965) Associate Professor of English LORRAINE M. CLARKE, Ed.M. (1970) CAROL E. CLAWSON, B.S. (1972) Instructor in Nursing Clinical Assistant Professor of Physical Therapy OHN PATTON CLEMENTS, M.D. (1969) Associate Professor of Radiology Assistant Professor of Education *ZACHARIE J. CLEMENTS, Ph.D. (1971) JACKSON J. CLEMMONS, M.D. (1962) Associate Professor of Pathology *ELIZABETH ANN CLEWLEY, M.D. (1961) **Clinical Assistant Professor in Pediatrics** DENIS A. COBLE, M.S. (1972) ANGELA V. COBURN, M.C. (1972) Clinical Instructor in Medicine Clinical Assistant Professor of Physical Therapy *ROBERT WILLARD COCHRAN, Ph.D. (1954) Professor of English Adjunct Assistant Professor of Home Economics F. ALINE COFFEY, B.S. (1960) Adjunct Assistant Professor of Home Economics LAURENCE H. COFFIN, M.D. (1969) Associate Professor of Thoracic and Cardiac Surgery H. DANIEL COHEN, Ph.D. (1972) JULIUS GEORGE COHEN, M.D. (1950) Associate Professor of Physics Clinical Professor of Psychiatry Assistant Professor of Psychiaty STEPHEN M. COHEN, M.D. (1972) Assistant Professor of Surgery JAMES A. COIL, M.D. (1972) THEODORE A. COLLIER, M.D. (1972) Clinical Assistant Professor of Medicine JEAN AVERILL CONDON, M.A. (1967) Specialist in Physical Education Assistant Professor of Civil Engineering ARTHUR JAMES CONDREN, Ph.D. (1969) *DAVID R. CONGDON, M.D. (1972) *ROBERT A. CONQUEST, Ph.D. (1970) Clinical Instructor in Medicine Adjunct Assistant Professor of Psychology Assistant Professor of Education *DAVID R. CONRAD, Ed.D. (1972) Associate Professor of Botany *PHILIP WILLIAM COOK, Ph.D. (1963) Associate Professor of Mathematics *ROGER LEE COOKE, Ph.D. (1968) *ROBERT WILLIAM COON, M.D. (1955) MARGARET B. CORBIN, M.Ed. (1972) Professor of Pathology Clinical Assistant Professor of Physical Therapy Instructor in Philosophy JAMES P. CORCORAN, M.A. (1970) Professor of Education DEAN C. CORRIGAN, Éd.D. (1969) LUCIEN M. COTE, B.S. (1969) Clinical Instructor in Medical Technology Clinical Associate Professor of Pathology *REX DEE COUCH, M.D. (1962; 1967) JENNIFER A. COVER, M.S. (1972) WILTON WARNER COVEY, M.D. (1966) Instructor in Communication and Theater Clinical Instructor in Psychiatry RICHARD B. CRADDOCK, M.A. (1972) Instructor in Physical Education Professor of Pathology JOHN EDWARD CRAIGHEAD, M.D. (1968) Assistant Professor of Romance Languages GRANT CRITCHFIELD, Ph.D. (1968) MARY J. CRONIN, M.Sc. (1970) Associate Professor of Nursing MICHAEL W. CRONIN. M.A. (1970) Assistant Professor of Communication and Theatre Instructor in Physical Education JAMES M. CROSS, B.S. (1964) HAROLD D. CROSS, M.D. (1971) Clinical Associate Professor of Medicine **Clinical Instructor in Medicine ROBERT M. CROSS, M.D.** (1972) * ALBERT DARY CROWELL, Ph.D. (1955) DANIEL J. CUNNINGHAM, R.T. (1972) Adjunct Instructor in Radiological Technology Clinical Assistant Professor of Psychiatry NANCI A. CURTIS, M.D. (1970) Instructor in Medical Technology FLORENCE MARY CZERNIAWSKI, M.T. (1967) Instructor in Music ELIZABETH T. DAHL, B.Mus. (1960) Assistant Professor of Medicine ELLIOT DANFORTH, JR., M.D. (1970) * ROBERT VINCENT DANIELS, Ph.D. (1956-57; 1958) Professor of History Clinical Instructor in Psychiatry URSEL DANIELSON, M.D. (1972) Clinical Assistant Professor of Nursing ELIZABETH DAVIS, B.S. (1972) Clinical Instructor in Medicine GEORGE B. DAVIS, M.D. (1972) JOHN HERSCHEL DAVIS, M.D. (1968) Professor of Surgery Instructor in Mathematics MAX I. DAVIS, B.S. (1972)

PHILIP HOVEY DAVIS, M.D. (1958) Clinical Associate Professor of Orthopedic Surgery ROBERT EARLE DAVIS, M.D. (1968) Clinical Assistant Professor of Obstetrics and Gynecology Lyman—Roberts Professor of Classical Languages and Literature * JEAN MARGARET DAVISON, Ph.D. (1955) * JOHN AMERPOHL DAVISON, Ph.D. (1967) Associate Professor of Zoology ROBERT P. DAVISON, M.E. (1940) WILLIAM EARL DAVISON, M.F.A. (1966) Adjunct Professor, Extension Assistant Professor of Art * ROBERT FRANK DAWSON, Ph.D. (1964-65; 1969) Associate Professor of Civil Engineering ROBERT STUART DEANE, M.B.Bch. (1967) BARBARA DEANGELIS, B.A. (1972) Cla Associate Professor of Anesthesiology Clinical Assistant Professor of Physical Therapy Assistant Professor of Nursing and Sociology Professor of Economics and Political Science EDITH FAYE DECK, M.S. (1969) * LUBOMIR A.D. DELLIN, J.S.D. (1957) ALINE LOUISE DEMERS, M.S. (1960) Associate Professor of Nursing JAMES E. DEMEULES, M.D. (1972) Assistant Professor of Surgery W. LANDON DENNISON, JR., M.D. (1970) Clinical Assistant Professor of Dermatology GINO ALDO DENTE, M.D. (1950) *ROBERT WARREN DETENBECK, Ph.D. (1967) Professor of Anesthesiology Professor of Physics THOMAS M. DEVINE, M.A. (1972) IRENE DIAMOND, M.A. (1972) Adjunct Instructor in English and Education Instructor in Political Science JOSEPH D. DICKERMAN, M.D. (1972) *ALBERT INSKIP DICKERSON, JR., Ph.D. (1966) MARY JANE DICKERSON (MRS. A. I.) M.A. (1966) Assistant Professor of Pediatrics Assistant Professor of English Instructor in English Instructor of Mathematics ROBERT B. DICKSON, M.A. (1972) PETER A. DIETRICH, M.D. (1971) Assistant Professor of Radiology Assistant Professor of Psychology CLEASON S. DIETZEL, Ph.D. (1971) Instructor in Communication RAYMOND GEORGE DILLEY, M.A. (1965) and Theatre HEIKE A. DOANE, M.A. (1973) Instructor in German Visiting Professor of Botany CARROLL W. DODGE, Ph.D. (1970) RICHARD BOWDITCH DOES, Ph.D. (1969) Assistant Professor of Psychology PHILIP J. DONOGHUE, M.S. (1972) RAYMOND MADIFORD PEARDON DONAGHY, M.D. (1946) Professor of Neurosurgery J. EDWARD DONNELLY, M.A. (1952) Associate Professor of Physical Education **JOHN ROBERT DONNELLY, Ph.D. (1969)** Assistant Professor of Forestry *GERALD ALTON DONOVAN, Ph.D. (1960) Professor of Animal Sciences * BARRY L. DOOLAN, Ph.D. (1970) HELEN MARIE DOREMUS, D.V.M. (1970) HENRY MEADE DOREMUS, II, D.V.M. (1964) Assistant Professor of Geology Assistant Professor of Animal Pathology Associate Professor of Pharmacology Associate Professor of Animal Pathology ANNE M. DORSAM, M.M. (1972) Instructor in Music Professor of Animal Sciences *THOMAS W. DOWE, Ph.D. (1957) * RICHARD NEAL DOWNER, Ph.D. (1967) Associate Professor of Civil Engineering JOHN C. DRAKE, Ph.D. (1970) Assistant Professor of Geology Associate Professor of Mechanical Engineering Associate Professor of Pathology 6) Assistant Professor of Physical Education * HOWARD DUCHACEK, M.S.A.E. (1949) DAVID RICHARD DUFFELL, M.D. (1967) THOMAS CALVIN DUNKLEY, M.Ed. (1966) MICHAEL J. DUNN, M.D. (1969) Associate Professor of Medicine Associate Professor of Neurology PETER B. DUNNE, M.D. (1971) HERBERT ASHLEY DURFEE, JR., M.D. (1957) *ALEXANDER HARRY DUTHIE, Ph.D. (1964) * JULIUS SOLOMON DWORK, Ph.D. (1954) ROBERT WEBSTER EASTMAN, L.L.B. (1952) Professor of Obstetrics and Gynecology Professor of Animal Sciences Associate Professor of Mathematics Adjunct Assistant Professor of Political Science DWIGHT K. EDDY, M.E.E. (1955) WINSTON MILO EDDY, M.D. (1960) Adjunct Associate Professor of Resource Economics Professor of Medicine Assistant Professor of English MARGARET F. EDWARDS, Ph.D. (1971) ANN I. EGNER, B.A. (1968) Instructor in Education R. DAVID ELLERSON, M.D. (1970) Clinical Instructor in Pediatrics FRANK STONE EMANUEL, B.S. (1968) Instructor in Institutional Administration SYLVIA JANE EMANUEL (MRS. F. S.) M.S. (1966) Assistant Professor, Clothing and Textiles FAITH GRISCOM EMERSON, M.A. (1959) Associate Professor of Nursing

10

Assistant Professor of Neurology E. STANLEY EMERY, III, M.D. (1970) JOHN W. ENGROFF, Ph.D. (1972) Adjunct Assistant Professor of History and Education CLINTON A. ERB, Ph.D. (1971) Assistant Professor of Education ROBERT HODGSKIN ERDMANN, LL.B. (1967) Instructor in Business Administration PAUL ANDERSON ESCHHOLZ, Ph.D. (1969) Assistant Professor of English *BUD ETHERTON, Ph.D. (1968) Associate Professor of Botany * FREDERICK CHRISTIAN EVERING, JR., Ph.D. (1965) Associate Professor of Electrical Engineering Assistant Professor of Plant and Soil Science *DEAN RICHARD EVERT, Ph.D. (1970) Assistant Professor of History * TON BAKER FACKLER, Ph.D. (1968) Associate Professor of Urology WILLIAM THOMAS FAGAN, JR., M.D. (1954) DAVID SPERBER FAIGEL, D.D.S. (1954) Associate Professor of Dental Hygiene Instructor in Radiological Technology JAMES B. FALBY, B.S. (1971) Instructor in Physical Education CARL J. FALIVENE, A.B. (1971) Associate Professor of Dental Hygiene **JOHN EDWARD FARNHAM, D.M.D. (1963)** Clinical Associate Professor of Surgery Specialist in Physical Education SANDRA MORTON FARRELL, M.S. (1962-66; 1968) DOUGLAS PATTEN FAY, M.S. (1953) Associate Professor of Civil Engineering Professor of Communication and Theatre EDWARD JOSEPH FEIDNER, M.F.A. (1958) Associate Professor of Physical Therapy SAMUEL B. FEITELBERG, M.A. (1971) *JEREMY POLLARD FELT, Ph.D. (1957) Professor of History Instructor in the Experimental Program KAYE FELT, M.A. (1971) CHRISTIE K. FENGLER, M.A. (1970) *CHARLES LYNN FIFE, Ph.D. (Dec. 1966) Instructor in Art Associate Professor of Resource Economics HENRY C. FINNEY, Ph.D. (1973) Associate Professor of Surgery *KENNETH N. FISHELL, Ed.D. (1971) Professor of Education Instructor in Sociology LAURA F. FISHMAN, M.A. (1971) Clinical Assistant Professor of Medicine JOHN RICHARD FITZGERALD, M.D. (1961) Associate Professor of Neurosurgery Professor of Chemistry MARTIN EDWARD FLANAGAN, M.D. (1962) * TED BENJAMIN FLANAGAN, Ph.D. (1961) THEODORE ROSS FLANAGAN, Ph.D. (1953) Associate Professor of Plant and Soil Science Assistant Professor of Political Science RICHARD F. FLANNERY, M.A. (1970) SHARI B. FLEMING, M.M. (1970) Instructor in Music PAUL L. FLINN, B.S. (1973) Lecturer in Plant and Soil Science CURTIS M. FLORY, M.D. (1964) Clinical Assistant Professor of Pathology ARTHUR HOWARD FLOWER, JR., M.D. (1950) Clinical Associate Professor of Dermatology **JOSEPH CLAYTON FOLEY, M.D.** (1954) Professor of Radiology JEANNETTE R. FOLTA, Ph.D. (1969) Associate Professor of Sociology *MURRAY WILBUR FOOTE, Ph.D. (1947-51; 1953) Associate Professor of Microbiology and Biochemistry DOROTHY ELLEN FORD, M.D. (1968) Associate Professor of Rehabilitation Medicine ELIZABETH M. FOREMAN, M.S.N. (1969) Assistant Professor of Nursing *DONALD G. FORGAYS, Ph.D. (1964) Professor of Psychology Associate Professor of Nursing ROSE JULIET FORGIONE, M.A. (1964) Professor of Medicine BEN RALPH FORSYTH, M.D. (1966) and Associate Professor of Microbiology * DONALD CUSHING FOSS, Ph.D. (1968) Associate Professor of Animal Sciences JUDITH L. FOSTER, B.S. (1970) Instructor in Nursing ROGER SHERMAN FOSTER, JR., M.D. (1970) RAYMOND T. FOULDS, JR., M.F. (1948) *WAYNE LENIS FOX, Ph.D. (1969) Associate Professor of Surgery Adjunct Professor of Forestry Associate Professor of Education EDGAR W. FRANCISCO III, Ph.D. (1972) Adjunct Associate Professor of Economics and Business Administration ROLAND G. FRANK, Ed.D. (1971) Adjunct Assistant Professor of Education *STEVEN LESLIE FREEDMAN, Ph.D. (1965) Associate Professor of Anatomy EDWARD ESAU FRIEDMAN, M.D. (1963) Clinical Assistant Professor of Community Medicine and Rehabilitation Medicine JOHN WILLARD FRYMOYER, M.D. (1969) Associate Professor of Orthopedic Surgery *GERALD ROSS FULLER, Ed.D. (1968) Associate Professor of Vocational Education and Technology ROBERT WEEKS FULLER, M.S. (Jan. 1966) Adjunct Assistant Professor of Forestry * DANIEL WAYNE GADE, Ph.D. (1966) Associate Professor of Geography

* JAMES GERARD GALLAGHER, Ph.D. (1969) Instructor in Medical Microbiology DONNA L. GANE (1972) Clinical Instructor in Obstetrics and Gynecology JOSEPH HERBERT GANS, Ph.D. (1967) Professor of Pharmacology * KEITH M. GARDINER, Ph.D. (1972) Adjunct Professor of Mechanical Engineering SERAFINO GARELLA, M.D. (1972) Clinical Assistant Professor of Medicine Assistant Professor of Business Administration Clinical Professor of Obstetrics and Gynecology JAMES F. GATTI, M.A. (1972) RALPH GAUSE (1973) ALLEN F. GEAR, J.D. (1971) Instructor in Business Administration THOMAS HOWARD GENO, Ph.D. (1965) Assistant Professor of Romance Languages STOKES GENTRY, M.D. (1962) **Clinical Associate Professor of Pediatrics** ANTONIO ISAIAS GERMAN, M.D. (1965) * WALTER R. GIBBONS, Ph.D. (1971) Clinical Instructor in Pathology Assistant Professor of Physiology and Biophysics Adjunct Assistant Professor of Animal Sciences KENNETH S. GIBSON, M.S. (1964) THOMAS CHOMETON GIBSON, M.B. (1962) Associate Professor of Community Medicine and Medicine *ALPHONSE HENRY GILBERT, Ph.D. (1969) Assistant Professor of Resource Economics *BRADY BLACKFORD GILLELAND, Ph.D. (1965) Professor of Classics *RICHARD WILLIAM GLADE, Ph.D. (1958) Professor of Zoology ARTHUR A. GLADSTONE, M.D. (1933-36; 1941) Professor of Surgery TOBA GLADSTONE, M.S. (1972) CHARLES MORTON GLUCK, M.D. (1965) Clinical Instructor in Nursing Clinical Assistant Professor of Medicine Professor of Physical Education *ROBERT JOHN GOBIN, Ph.D. (1965) Instructor in Sociology ERIC P. GODFREY, M.A. (1970) DALE E. GOLDHABER, Ph.D. (1973) Assistant Professor of Home Economics RICHARD HERRON GOLDSBOROUGH, M.D. (1961) **Clinical Assistant Professor** of Otolaryngology Associate Professor of Psychology and Clinical Associate Professor of Psychiatry *STEVEN G. GOLDSTEIN, Ph.D. (1970) ARNOLD GOLODETZ, M.D. (1969) Associate Professor of Medicine and Rehabilitation Medicine ANTONIO J. GOMEZ, M.D. (1970) BRADLEY GORDON, B.A. (1972) *LAWRENCE R. GORDON, Ph.D. (1970) Assistant Professor of Neurology Instructor in German and Russian Assistant Professor of Psychology *LYMAN JAY GOULD, Ph.D. (1953 Professor of Political Science WILLIAM G. GRAHAM, M.D. (1971) Associate Professor of Medicine *ARMIN E. GRAMS, Ph.D. (1971) CORNELIUS O. GRANAI, JR., M.D. (1967) Professor of Human Development Clinical Instructor in Obstetrics and Gynecology RICHARD L. GRANT, M.D. (1971) Associate Professor of Psychiatry DUANE EDGAR GRAVELINE, M.D. (1966) Clinical Instructor in Medicine DAVID HENRY CRAY, M.D. (1962) JUDITH E. GRAY, M.S. (1970) MARY JANE GRAY, M.D. (1960) ROBERTA I. GREARSON, M.S. (1972) Clinical Instructor in Community Medicine Assistant Professor of Nursing Professor of Obstetrics and Gynecology Instructor in Medical Technology GARETH MONTRAVILLE GREEN, M.D. (1968) **Professor of Medicine** JANE A. GREENBERG, M.S. (1971) Instructor in Education DONALD CROWTHER GREGG, Ph.D. (1946) Pomeroy Professor of Chemistry *EDWIN CHARLES GREIF, M.S. (1950) HAROLD ALFRED GREIG, M.P.E. (1962) Professor of Business Administration Assistant Professor of Physical Education JACKIE M. GRIBBONS, M.A. (1966) PAUL T. GROSS, JR., Ph.D. (1971) RICHARD GORDON GRUNDLER, D.D.S. (1969) Instructor in Dental Hygiene JULES F. GRYCKIEWICZ, M.A. (1972) SALLY C. GUERETTE, M.S. Ed. (1969) Instructor in Education Assistant Professor of Physical Education ROBERT CESARE GUIDULI, M.D. (1966) Clinical Assistant Professor of Ophthalmology DIETER WALTER GUMP, M.D. (1966) Associate Professor of Medicine and Assistant Prof. of Microbiology Assistant Professor of Medicine WALTER D. GUNDEL, M.D. (1971) **ROBERT ERWIN GUSSNER, S.T. B. (1969)** Instructor in Religion Assistant Professor of English STANLEY T. GUTMAN, M.A. (1971) CARLETON RAYMOND HAINES, M.D. (1950-52; 1954) Clinical Associate Professor of Surgery PUZANT SETRAK HALEBIAN, D.D.S. (1965) Assistant Professor of Dental Hygiene CYNTHIA A. HALL, B.S. (1971) Teaching Associate in Nursing

Associate Professor *MARY STARRIIT HALL (MRS. R.W.) Ph.D. (1961-62; 1965) of English Professor of Philosophy *ROBERT WILLIAM HALL, Ph.D. (1957) WILLIAM DENNIS HALLÓRAN, M.A. (1971) Adjunct Assistant Professor of Vocational Education and Technology * WILLIAM HALPERN, Ph.D. (1969) Assistant Professor of Physiology and Biophysics BURT BENJAMIN HAMRELL, M.D. (Aug. 1968) and Biophysics and Clinical Instructor in Medicine *SAMUEL B. HAND, Ph.D. (1961) Professor of History Professor of Electrical Engineering *MORRIS HANDELSMAN, Ph.D. (1969) Associate Professor of Education *EDWARD MICHAEL HANLEY, Ph.D. (1969) Associate Professor of Forestry PETER ROBERT HANNAH, Ph.D. (1967 Professor of Medicine JOHN SHERWOOD HANSON, M.D. (1958) Professor of Military Science WILLIAM C. HAPONSKI, Ph.D. (1971) Adjunct Assistant Professor of Forestry MONTE R. HAROLD, M.W.T. (1970) CAROLYN HARRIS, B.S. (1973) LAWRENCE STANLEY HARKIS, M.D. (1968) *BETH A. HART, Ph.D. (1970) JOHN ELLIS HARTFORD, M.D. (1969) Instructor in Neurology Associate Professor of Pathology Assistant Professor of Biochemistry Assistant Professor of Anesthesiology Lecturer in Radiological Safety **JOHN F. HARWOOD, B.S.** (1964) Assistant Professor of Psychology structor in Mathematics Professor of Political Science *JOSEPH E. HASAZI, Ph.D. (1970) THEODORE R. HATCHER, M.S. (1972) *ROLF N.B. HAUGEN, Ph.D. (1947) Associate Professor of Anthropology Instructor in Communication and Theatre WILLIAM A. HAVILAND, Ph.D. (1965) DANIEL T. HAYES[MA. (1972) DANIEL T. HAYES[MA. (1972) MARGARET ELLEN HAYES, M.S. (1966) NANCY J. HAYNES, M.A. (1972) BARBARA J. HEADLEY, B.S. (1972) STANLEY E. HECHT, B.A. (1972) Specialist of Physical Education Assistant Professor of Communication and Theatre Clinical Instructor in Physical Therapy Instructor in Mathematics RICHARD S. HEILMAN, M.D. (1968) Associate Professor of Radiology Professor of Zoology *E. BENNETTE HENSON, Ph.D. (1965) FRANCIS R. HEWITT, M.A. (1970) DANIEL W. HIGGINS, M.F.A. (1969) Assistant Professor of Art Instructor in Art RAUL HILBERG, Ph.D. (1956) Professor of Political Science H. CHARLES HILL, D.D.S. (1972) Assistant Professor of Dental Hygiene (1968) Professor of Orthopedic Surgery Associate Professor of Pediatrics Clinical Instructor in Medical Technology FRANKLIN THEODORE HOAGLUND, M.D. (1968) WILLIAM ELWIN HODGKIN, M.D. (1964) JANET M. HODNETT, B.S. (1971) THOMAS WAYNE HOEKSTRA, Ph.D. (1970) Assistant Professor of Forestry Clinical Assistant Professor of Surgery STANLEY A. HOFFMAN, M.D. (1973) Clinical Assistant Professor of Medicine ROBERT ADAMS HOLDEN, M.D. (1966) J. LORIMER HOLM, M.D. (1970) Instructor in Radiology KENNETH W. HOOD, M.Ed. (1972 Adjunct Assistant Professor of Education Professor of Plant and Soil Science *RICHARD JOHN HOPP, M.S. (1947) GABRIEL Ř. HORST, Ph.D. (1971) Assistant Professor of Anatomy Associate Professor of Medicine Adjunct Professor of Resource Economics EDWARD SCHURR HORTON, M.D. (1967) VERLE R. HOUGHABOOM, Ph.D. (1947) AG MARTHA HILTON HOUGHTON, Ed. M. (1970) Lecturer in Communication and Theatre Professor of Community Medicine CHARLES SNEAD HOUSTON, M.D. (1966) PHILLIP LLOYD HOWARD, M.D. (1969) Assistant Professor of Pathology IAMES ROBINSON HOWE, Ph.D. (1964) Associate Professor of English *DAVID CHARLES HOWELL, Ph.D. (1967) Associate Professor of Psychology WALLACE J. HOWELL, JR., Ph.D. (1971) Assistant Professor of Communication and Theatre ROBERT BRUCE HUBER, Ph.D. (1946) Edwin P. Lawrence Forensic Professor of Speech Assistant Professor of English DAVID R. HUDDLE, M.A. (1971) THOMAS HUDSPETH, M.S. (1972) Instructor in Education HANS ROSENSTOCK HUESSY, M.D. (1960) Professor of Psychiatry Instructor in Vocational Education and Technology MARC E. HULL, M.Ed. (1971) *MAHENDRA SINGH HÙNDAL, Ph.D. (1967) Associate Professor of Mechanical Engineering *ALLEN STANDISH HUNT, Ph.D. (1961) Associate Professor of Geology *LYMAN CURTIS HUNT, JR., D.Ed. (1966) Professor of Education

*PATRICK H. HUTTON, Ph.D. (1968) *BEAL BAKER HYDE, Ph.D. (1965) ROBERT WELLS HYDE, M.D. (1967) JUDITH ANN INCALLS, B.S. (1970) EDWARD SUTER IRWIN, M.D. (1963) ELIZABETH E. ISHAM, B.S. (1969) *YOSHINORI ISHIKAWA, Ph.D. (1968) JOHN O. IVES, M.D. (1972) JOSEPH ANTHONY IZZO, Ph.D. (1956) *LOUIS MARIO IZZO, M.S. (1969) *JULIAN JOSEPH JAFFE, Ph.D. (1961) RICHARD H. JAGELS, Ph.D. (1969) GLADYS MARGARET JAMESON, M.Ed. (1968) CLINTON DALES JANNEY, Ph.D. (1959) RICHARD HARRY JANSON, Ph.D. (1958) *JUSTIN MANFRED JOFFE, Ph.D. (1969) ROBERT J. JOHNSON, M.D. (1971) W. HERBERT JOHNSTON, M.D. (1952) *DONALD BOYES JOHNSTONE, Ph.D. (1948) JANICE L. JONES, Ph.D. (1970) JOSEPH JÓNES, M.A. (1972) *LEONIDAS MONROE JONES, Ph.D. (1951) ROBERT E. JONES, JR., M.Ed. (1972) WARNER EDRICK JONES, M.D. (1968) HORACE W. JOSSELYN, D.D.S. (1971) CHARLES E. JOY, D.M.D. (1972) *DAVID W. JUENKER, Ph.D. (1964) *DAVID W. JUENKER, Ph.D. (1904) *ROY GEORGE JULOW, Ph.D. (1957) As HARRY HELMUTH KAHN, M.A. (1948-53; 1954) WILLIAM F. KANAR, M.D. (1971) INA D. KANE, B.S. (1972) *BRUCE S. KAPP, Ph.D. (1971) IRWIN SEYMOUR KAYE, M.D. (1966) *DOPETE V. KENN PB D. (1971) *ROBERT E. KEEN, Ph.D. (1971) PHILIP CONBOY KELLEHER, M.D. (1963) JAY EDGAR KELLER, M.D. (1950) PATRICIA A. KELLY, M.S.N. (1972) WILLIAM HOWARD KELLY, Ph.D. (1969) ELMORE M. KENNEDY, JR., Ph.D. (1971) *MARC Z. KESSLER, Ph.D. (1969) DONALD E. KEYSER, Ph.D. (1964) ALEXANDER KEYSSAR, M.D. (1971) *JOHN L. KICE, Ph.D. (1970) DANIEL U. KILEY (1970) DOUGLAS KINNARD, Ph.D. (1973) *DAVID LESLIE KINSEY, Ph.D. (1950) FLORA ELIZABETH KINSEY, (MRS. D. L.) (1969) JOSEPH P. KISKO, M.A.Ed. (1970) THOMAS ROBERT KLEH, M.D. (1965) KAREN RUTH KLEILER, M.S. (1969) *RICHARD M. KLEIN, Ph.D. (1967) MARTHA F. KNIGHT, M.Ed. (1968) ESTHER LUCILE KNOWLES, M.S. (1945) MAURICE EMILE KOHLER, Ph.D. (1965) MARTIN J. KOPLEWITZ, M.D. (1973) *ROY KORSON, M.D. (1950-52; 1954) LARRY KOST, M.S. (1973)

ROBERT JACOB HUNZIKER, M.D. (1963)

Associate Professor of Radiology Associate Professor of History Professor of Botany Clinical Associate Professor of Psychiatry Assistant Professor of Dental Hygiene Clinical Associate Professor of Ophthalmology Clinical Instructor in Medical Technology Instructor in Biochemistry Assistant Professor of Psychiatry Professor of Mathematics Assistant Professor of Radiologic Physics Professor of Pharmacology Adjunct Assistant Professor of Botany Assistant Professor, Human Development Human Development Professor of Radiology Professor of Associate Professor of Psychology Assistant Professor of Orthopaedic Surgery Assistant Professor of Radiology Professor of Microbiology and Biochemistry Assistant Professor of Medical Technology Instructor in Education Professor of English Assistant Professor in Military Studies Clinical Instructor in Medicine Instructor in Dental Hygiene Instructor in Dental Hygiene Professor of Physics Associate Professor of Romance Languages Associate Professor of German Clinical Assistant Professor of Psychiatry Clinical Instructor in Physical Therapy Assistant Professor of Psychology Assistant Professor of Pathology Assistant Professor of Zoology Associate Professor of Medicine Assistant Professor of Surgery Clinical Associate Professor of Nursing Associate Professor of Vocational Education and Technology Adjunct Professor of Mechanical Engineering Assistant Professor of Psychology Adjunct Assistant Professor of Home Economics Clinical Associate Professor of Medicine Professor of Chemistry Adjunct Professor of Civil Engineering Assistant Professor of Political Science Associate Professor of Music Instructor in Music Adjunct Assistant Professor of Vocational Education and Technology Clinical Assistant Professor of Ophthalmology Assistant Professor of Medical Technology Professor of Botany Instructor in Education Associate Professor, Housing Associate Professor of Romance Languages Associate Professor of Surgery Professor of Pathology Instructor in Mathematics

GAIL B. KRANICH, M.Ed. (1972) *ANDREW PAUL KRAPCHO, Ph.D. (1960) EDWARD L. KRAWITT, M.D. (1969) KARIN KRISTIANSSON, M.A. (1956) JOHN ERNEST KRIZAN, Ph.D. (1962) PATRICIA KRUPP, Ph.D. (1972) *MARTIN ERIC KUEHNE, Ph.D. (1961) RAYMOND FRANK KUHLMANN, M.D. (1951) RICHARD P. KUKLIS, M.B.A. (1970) VRINDA KUMBLE, M.A. (1971) ARTHUR F. SAUL KUNIN, M.D. (1957-63; 1964) EDWARD ANTHONY KUPIC, M.D. (1966) EDWARD THADDEUS KUSIÁK, M.Ed. (1969) *BERT KARL KUSSEROW, M.D. (1959) *GENE EARL LABER, Ph.D. (1968) IRIS I. LACASSE (1971) LLOYD FRANCIS LACASSE, B.S. (1969) ROBERT P. LAFIANDRA, M.D. (1972) *DAVID CHIN LAI, Eng.D. (1965) DONNA J. LALUMIERE, B.S. (1973) DENIS EMERY LAMBERT, M.A.T. (1964) KATHRYN LAMBERT, M.A. (1972) *LLOYD MILTON LAMBERT, JR., Ph.D. (1965) *KATHLEEN R. LAMBORN, Ph.D. (1970) *MERTON PHILIP LAMDEN, Ph.D. (1947) ADA R. LAMORAY (1972) *RICHARD H. LANDESMAN, Ph.D. (1969) CHRISTOPHER CHARLES LANE, M.A. (1969) *HELENE WANDA LANG, Ed.D. (1967) JANICE LYNN LANGE, M.S. (1967) JOHN CLIFFORD LANTMAN, M.D. (1957) H. PETER LAQUEUR, M.D. (1968) *ROBERT LOWELL LARSON, Ed.D. (1968) BETTY J. LATES, M.Ed. (1970 FRANK DAMRON LATHROP, M.D. (1970) MARGARET LAWLER, M.A.T. (1969) PETER P. LAWLOR, M.D. (1971) PETER LAWRENCE, D.D.S. (1968) *ROBERT BERNARD LAWSON, JR., Ph.D. (1966) BENJAMIN F. LAWTON, JR., D.M.D. (1972) GUY WHITMAN LEADBETTER, M.D. (1967) WILLIAM P. LEAMY, M.S. (1943) Adj *HERBERT L. LEFF, Ph.D. (1970) LESLIE RAYMOND LEGGETT, D.P.E. (1962) THOMAS R. LEINBACH, Ph.D. (1971)
 HAROLD LEITENBERG, Ph.D. (1965) EUGENE LEPESCHKIN, M.D. (Dec. 1946) LOWELL S. LETOURNEAU, (1969) CHARLES A. LETTERI, M.S. (1970) PAUL A. LEVI, JR., D.M.D. (1971) HYMAN BERNARD LEVINE, M.D. (1961) ARTHUR MAURICE LEVY, M.D. (1963) * GORDON FIELDING LEWIS, Ph.D. (1961) JOHN DOWNES LEWIS, M.D. (1968) *WILLIAM J. LEWIS, Ph.D. (1954) FRANK WAYNE LIDRAL, Ph.D. (1960) *HARRY LIGHTHALL, JR., Ph.D. (1955) *AULIS O. LIND, Ph.D. (1970) JOHN J. LINDSAY, Ph.D. (1964)

Instructor in Nursing Professor of Chemistry Associate Professor of Medicine Adjunct Associate Professor, Extension Professor of Physics Assistant Professor of Anatomy Professor of Chemistry Clinical Professor of Orthopedic Surgery Assistant Professor of Business Administration Adjunct Instructor, Extension Associate Professor of Medicine Associate Professor of Radiology Assistant Professor of Physical Education Professor of Pathology Associate Professor of Business Administration Adjunct Instructor, Division of Health Sciences Assistant Professor of Physical Education Clinical Instructor in Medicine Professor of Electrical Engineering Teaching Associate in Nursing Associate Professor of Physical Education Clinical Assistant Professor in Nursing Professor of Electrical Engineering Assistant Professor of Mathematics and Community Medicine Professor of Biochemistry Instructor in Dental Hygiene Assistant Professor of Zoology Visiting Associate Professor of Communication and Theatre Associate Professor of Education Assistant Professor of Physical Education Clinical Associate Professor of Community Medicine Clinical Associate Professor of Psychiatry Associate Professor of Education Instructor of Education Associate Professor of Otolaryngology Teaching Associate in Home Economics Clinical Instructor in Opthalmology Instructor in Dental Hygiene Associate Professor of Psychology Instructor in Dental Hygiene Professor of Urology Adjunct Assistant Professor of Animal Sciences Assistant Professor of Psychology Professor of Physical Education Assistant Professor of Geography Professor of Psychology and Psychiatry Professor of Medicine Clinical Instructor in Medical Technology Instructor in Education Instructor in Dental Hygiene Clinical Instructor in Medicine Associate Professor of Medicine Professor of Sociology and Anthropology Assistant Professor of Obstetrics and Gynecology Professor of Communication and Theatre Professor of Music Professor of Mathematics Associate Professor of Geography Assistant Professor of Forestry

PETER CASTLE LINTON, M.D. (1965) Assistant Professor of Surgery Assistant Professor of Art WILLIAM C. LIPKE, Ph.D. (1970) RICHARD C. LIPPINCOTT, M.D. (1971) Assistant Professor of Psychiatry and Rehabilitation Medicine RICHARD LEWIS LIPSON, M.D. (1963) Clinical Assistant Professor of Medicine GEORGE THOMAS LITTLE, Ph.D. (1950) Professor of Political Science JOHN ERNEST LITTLE, Ph.D. (1945) Professor of Microbiology and Biochemistry YING-HSIN LIU, Ph.D. (1972) Adjunct Professor of Mechanical Engineering JOYCE KENYON LIVAK, M.S. (1966) Assistant Professor, Human Nutrition and Food Professor of Zoology * JOHN HUTCHISON LOCHHEAD, Ph.D. (1942) Clinical Assistant Professor of Medicine MARSHALL G. LONDON, M.D. (1970) Professor of Communication *NORMAN THEODORE LONDON, Ed.D. (1960) and Theatre *LITTLETON LONG, Ph.D. (1949) VALENTINE M. LORD, M.S.W. (1971) Professor of English Instructor in Home Economics ROBERT B. LORENZ, Ph.D. (1969) Associate Professor of Education ROBERT B. LOW, Ph.D. (1970)
 Assistant
 JEROLD FRANCIS LUCEY, M.D. (1956)
 VICTOR W. LUDEWIG (1978)
 * WILLIAM HOSSFELD LUGINBUHL, M.D. (1960) Assistant Professor of Physiology and Biophysics **Professor of Pediatrics** Clinical Assistant Professor of Medicine Professor of Pathology *ELEANOR MERRIFIELD LUSE, Ph.D. (1947) Professor of Communication and Theatre Assistant Professor of Psychiatry CHRISTOPHER PATRICK McAREE, M.B. (1962) * JOHN JOSEPH McCORMACK, JR., Ph.D. (1966) *MAXWELL L. McCORMACK, JR., D.F. (1964) THOMAS J. McCORMICK, M.E.E. (1960) Associate Professor of Pharmacology Associate Professor of Forestry Adjunct Associate Professor of Medicine Clinical Professor of Medicine BRIAN H. McCRACKEN, M.D. (1972) *H. LAWRENCE McCROREY, Ph.D. (1966) Professor of Physiology and Biophysics Assistant Professor of Military Science JOHN H. McCUNE, B.S. (1971) RICHARD D. McDOWELL, M.S.S. (1971) Adjunct Assistant Professor of Psychology HARRY J. MCENTEE, M.A. (1970) Assistant Professor of Education J. BISHOP McGILL, M.D. (1952) JOHN MARSHALL McGINNIS, JR., M.D. (1969) GERALD FRANCIS McGINNISS, M.D. (1962) Assistant Professor of Surgery Assistant Professor of Otolaryngology Clinical Associate Professor of Psychiatry STEWART MCHENRY, Ph.D. (1973) * JERRY LEON MCINTOSH, Ph.D. (1964) Assistant Professor of Geography Associate Professor of Plant and Soil Science ELIZABETH FOOTE McKAY, M.S.W. (1969) Assistant Professor of Social Welfare ROBERT JAMES McKAY, JR., M.D. (1950) MARION CLAIRE McKEE, M.D. (1958) Professor of Pediatrics Clinical Associate Professor of Pediatrics and Clinical Instructor in Neurology FRANK P. McKEGNEY, JR., M.D. (1970) Professor of Psychiatry Associate Professors of Education *HUGH STRATTON McKENZIE, Ph.D. (1967) *RICHARD WARREN McLAY, Ph.D. (1968) Associate Professor of Mechanical Engineering E. DOUGLAS McSWEENEY, JR., M.D. (1964) * JOHN HAMILTON MABRY, Ph.D. (1963) Clinical Assistant Professor of Surgery **Professor of Community Medicine** Professor of Plant and Soil Science GEORGE BUTTERICK MacCOLLOM, Ph.D. (1966) MURDO MacDONALD, M.D. (1960) ALBERT GEORGE MACKAY, M.D. (1933) Clinical Instructor in Physiology Professor of Surgery Instructor in Dental Hygiene ROBERT STANFORD MacLELLAN, D.D.S. (1969) * WILLIAM HOOPER MACMILLAN, Ph.D. (1954) Professor of Pharmacology JAMES FREDERICK MADISON, M.D. (1964) Clinical Associate Professor of Dermatology JOAN G. MADISON, M.D. (1972) **Clinical Instructor in Medicine** JOHN VANSICKLEN MAECK, M.D. (1948) Professor of Obstetrics and Gynecology FREDERICK R. MAGDOFF, Ph.D. (1973) Assistant Professor of Plant and Soil Science FRANCES E. MAGEE, M.S.N. (1968) Assistant Professor of Nursing PAUL J. MAGNARELLA, Ph.D. (1971) HUGH M. MAIN, B.S. (1972) PATRICIA A. MALONE, B.S. (1967) Assistant Professor of Anthropology Clinical Instructor in Physical Therapy Adjunct Assistant Professor, Extension *FRANK MANCHEL, Ed.D. (1967) Associate Professor of English *WILLIAM C. MARCHANT, Ed.D. (1971) Assistant Professor of Education Instructor in Radiological Technology CHARLES H. MARSCHKE, B.A. (1972) CARLTON DEAN MARSHALL, M.D. (1966) Clinical Assistant Professor of Psychiatry

GILBERT ADAMS MARSHALL, M.S. (1947) Associate Professor of Mechanical Engineering WENDY J. MARSHALL, M.C.S.P. (1972) Clinical Instructor in Physical Therapy THOMAS WILLIAMS MARTENIS, M.D. (1967) Clinical Assistant Professor of Medicine HERBERT L. MARTIN, M.D. (1965) Professor of Neurology LUTHER HOWARD MARTIN, JR., Ph.D. (1967) Assistant Professor of Religion *FRANK MARTINEK, Ph.D. (1967) *CAROLINE D. MARVIN, M.A. (1972) JAMES WALLACE MARVIN, Ph.D. (1939) Professor of Mechanical Engineering Instructor in Home Economics Professor of Botany Clinical Instructor in Medicine and Psychiatry ROBERT L. MASSONEAU, M.D. (1968) HUNTINGTON MAVOR, M.D. (1909) ROBERT ARTHUR MAXWELL, Ph.D. (1962-65; 1967) Visiting Professor of Pharmacology Clinical Assistant Professor of Obstetrics JOHN R. MAZUR, M.D. (1973) and Gynecology Professor of Anesthesiology JOHN EDMUND MAZUZAN, JR., M.D. (1959) Assistant Professor of Obstetrics and Gynecology PHILIP B. MEAD, M.D. (1971) Teaching Associate in Education AUDREY W. MEADER, M.A. (1972) Associate Professor of Obstetrics CORNELIUS IRVING MEEKER, M.D. (1962) and Gynecology Associate Professor of Geography *HAROLD AUSTIN MEEKS, Ph.D. (1964) R. W. PAUL MELLISH, M.B. (1963) Professor of Pediatric Surgery *DONALD BURTON MELVILLE, Ph.D. (1960) JOHN D. MERCHANT, B.S. (1949) Professor of Biochemistry Adjunct Professor, Extension LEONARD S. MERCIA, M.S. (1954) Adjunct Associate Professor of Animal Sciences EDWARD F. MERRILL, B.S. (1969) Clinical Instructor in Medical Technology Adjunct Associate Professor of Home Economics SUSAN B. MERROW, M.Ed. (1946) *BRUCE ELWYN MESERVE, Ph.D. (1964) Professor of Mathematics MARION ELIZABETH METCALFE, (MRS. W. C.) B.A. (1966) Instructor in Music **Ássociate Professor of History** * WILLIAM CRAIG METCALFE, Ph.D. (1963) Associate Professor of Biochemistry *WILLIAM LAROS MEYER, Ph.D. (1962) Assistant Professor of Education HERMAN W. MEYERS, Ph.D. (1971) *GARY KEITH MICHAEL, M.B.A., C.P.A. (1965) Associate Professor of Business Administration Assistant Professor of German WOLFGANG MIEDER, Ph.D. (1971) Professors of Geography *EDWARD JERVIS MILES, Ph.D. (1962) RAYMOND LEE MILHOUS, M.D. (1968) Associate Professor of Rehabilitation Medicine DAVID ALLISON MILLER, M.S. (1969) Assistant Professor of Community Medicine Associate Professor of Thoracic DONALD BARKER MILLER, M.D. (1951) and Cardiac Surgery PAMELA A. MILLER, A.B. (1972) WILLARD MARSHALL MILLER, Ph.D. (1969) Instructor in Education Assistant Professor of Philosophy JEAN BEATTIE MILLIGAN, M.Ed. (1953) JOHN HOLLISTER MILNE, M.D. (1964) HOWARD JAY MINDELL, M.D. (1967) Professor of Nursing Clinical Assistant Professor of Medicine Assistant Professor of Radiology Assistant Professor of Education KEITH M. MISER, Ed.D. (1971) Associate Professor of Psychiatry WILLIAM EDWARD MITCHELL, Ph.D. (1967) * THOMAS JOHN MOEHRING, Ph.D. (1968) Associate Professor of Medical Microbiology Assistant Professor of Physical Therapy MARY S. MOFFROID, M.A. (1972) SAMUEL E. MOLIND, D.M.D. (1972) Instructor in Dental Hygiene MAUREEN KATHERINE MOLLOÝ, M.D. (1968) Clinical Assistant Professor of Orthopedic Surgery Instructor in Medical Technology PATRICIA MONACO, M.S. (1972) GIUSEPPINA C. MONETA, Ph.D. (1972) Associate Professor of Philosophy MAURICE EDWARD MONGEON, M.D. (1966) Clinical Assistant Professor of Medicine Assistant Professor of Dental Hygiene DALE BISHOP MONTGOMERY, D.M.D. (1965) PAUL AMOS MOODY, Ph.D. (1927) Howard Professor of Natural History and Professor of Zoology Assistant Professor of Éducation * JOHN W. MOORE, D.Ed. (1970) MILO J. MOORE, M.S. (1969) Adjunct Assistant Professor of Vocational Education and Technology DAVID C. MORENCY, M.A. (1973) Instructor in Mathematics Associate Professor of Anesthesiology JOHN G. MORGAN, M.B. (1970) Assistant Professor of Surgery DAVID MORLEDGE, M.D. (1972)

PAUL MICHAEL MORRISSEAU, M.D. (1970) RUFUS CLEGG MORROW, M.D. (1951) *ELLEN HASTINGS MORSE, Ph.D. (1960) VIVIAN MOSCA, M.A. (1973) DONALD EUGENE MÒSER, Ph.D. (1960) MICHAEL JEROME MOYNIHAN, M.D. (1966) H. NICHOLAS MULLER, III, Ph.D. (1966) TIMOTHY MURAD, B.A. (1971) MICHAEL P. MURPHY, B.A. (1970) RICHARD E. MURPHY, M.D. (1970)

Assistant Professor of Urology Professor of Otolaryngology Professor, Nutrition Instructor in Mathematics Professor of Mathematics Clinical Associate Professor of Medicine Associate Professor of History Instructor in Romance Languages Instructor in Physical Education

BARBARA LEE SPAULDING MURRAY, M.S. (1968) JOHN JOSEPH MURRAY, M.D. (1968)

- JOHN JOSEFH MORKAT, M.D. (1969)
 ROGER WALTER MURRAY, D.V.M. (1968)
 RICHARDE. MUSTY, Ph.D. (Jan. 1968)
 MILTON JOSEPH NADWORNY, Ph.D. (1952)
 STEPHEN WILLIAM NAGY, Ph.D. (1969)
 VICUNTYTY, NAL BOW, Ph.D. (1970) KENNETH L. NALIBOW, Ph.D. (1970) RICHARD MILTON NARKEWICZ, M.D. (1966)
- * ROBERT JAMES NASH, Ed. D. (1969) WILLIAM P. NEAL, M.A. (1970) WILLIAM HOWARD NEDDE, JR., M.S. (1967)
- *GARRISON NELSON, Ph.D. (1968) GEORGE E. NELSON, M.D. (1969) JOHN NELSON, M.D. (1973 DAVID S. NEWCOMBE, M.D. (1967) BEVERLY A. NICHOLS, Ph.D. (1971) GORDON R. NIELSEN, Ph.D. (1965)
- *KAY MILLIGAN NILSÓN, Ph.D. (1966) HOWARD L. NIXON, II, Ph.D. (1970) *CHARLES PRYOR NOVOTNY, Ph.D. (1968)

MITSUO NUMOTO, M.D. (1962) MANUEL NUNEZ-de-CELÀ, M.A. (1970)

- *WESLEY LEMARS NYBORG, Ph.D. (1960) *ELBERT AUSTIN NYQUIST, M.S., C.P.A. (1953) JOSEPH H. OAKEY, Ed.M. (1970) ROBERT EMMETT O'BRIEN, M.D. (1956) HIDEO OKINO, M.F.A. (1970) DONALD CLARK OLIVEAU, M.D. (1968) HERLUF V. OLSEN, JR., M.H.A. (1967) * JAMES PAUL OLSON, Ph.D. (1969)
- * JOSEPH CLARENCE OPPENLANDER, Ph.D. (1969) ROY W. ORTEL, M.D. (1971) *RALPH HARRY ORTH, Ph.D. (1959)
- MARILYN MAY OSBORN, M.Ed. (1968)

CLARE MARSHALL O'SHEA, M.D. (1955-64; 1967)

- * JOHN OGDEN OUTWATER, Sc.D. (1956) * JAMES HARRIS OVERFIELD, Ph.D. (1968) EDWIN MERTON OWRE, M.F.A. (1969)
- JAMES STEVEN PACY, Ph.D. (1967) *WILLIAM EDWARD PADEN, Ph.D. (1965) PAUL PAGANUZZI, Ph.D. (1961) DOROTHY PAGE, B.S. (1971) H. GORDON PAGE, M.D. (1954) MARY ELLEN HUNT PALMER, M.S. (1953) PHYLLIS E. PAOLUCCI, M.Ed. (1970) * IPPOCRATES PAPPOUTSAKIS, M.Mus. (1940)
- DAVID RAYMOND PARK, M.D. (1969) BRUCE LAWRENCE PARKER, Ph.D. (1965)

NINA PARRIS, M.A. (1972)

Clinical Assistant Professor in Obstetrics and Gynecology Assistant Professor of Nursing Clinical Assistant Professor of Pediatrics Associate Professor of Animal Pathology Associate Professor of Psychology Professor of Economics Assistant Professor of Physics Assistant Professor of German

> **Clinical Assistant Professor of Pediatrics** Associate Professor of Education Instructor in Communication and Theatre

Assistant Professor of Physical Education Assistant Professor of Political Science Assistant Professor of Medicine Assistant Professor of Medicine Associate Professor of Medicine Associate Professor of Physical Education Adjunct Assistant Professor of Entomology Associate Professor of Animal Sciences Assistant Professor of Sociology

Associate Professor of Medical Microbiology Associate Professor of Neurosurgery Instructor in Romance Languages Professor of Physics Professor of Business Administration Adjunct Associate Professor of Education Clinical Associate Professor of Medicine Assistant Professor of Art Assistant Professor of Psychiatry Professor of Hospital Administration Assistant Professor of Civil Engineering Professor of Civil Engineering Assistant Professor of Medicine Professor of English

Assistant Professor of Home Economics Education Clinical Instructor in Psychiatry Professor of Mechanical Engineering Associate Professor of History Assistant Professor of Art Associate Professor of Political Science Assistant Professor of Religion Professor of Russian Associate Professor of Physical Therapy Professor of Surgery Associate Professor of Nursing Instructor in Education Professor of Music Clinical Assistant Professor of Medicine

> Associate Professor of Plant and Soil Science Assistant Professor of Art

HAZEL PARRY, B.A. (1972) *RODNEY LAWRENCE PARSONS, Ph.D. (1967) ALAN KIMMEL PASKOW, Ph.D. (1968) CARROLL PASTNER, (MRS. S. L.) Ph.D. (1971) STEPHEN L. PASTNER, Ph.D. (1970) WAYNE CURTIS PATTERSON, Ph.D. (1965) HENRI ROGER PAUCKER, Ph.D. (1969) WILLIS K. PAULL, JR., M.S. (1972) EDWIN MATTSON PAXSON, M.D. (1957) RICHARD EDWARD PEASE, M.D. (1969) *NORMAN EUGENE PELLETT, Ph.D. (1967) PHYLLIS G. PERELMAN, M.Ed. (1963) DAVID L. PERKINS, M.D. (1970) *MERVYN WILLIAM PERRINE, Ph.D. (1961) JAMES P. PERRY, M.D. (1972) * JAMES ALLAN PETERSON, Ed.D. (1966) **ÖSCAR SYLVANDER PETERSON, JR., M.D. (1944)** *MARY MARGARET PETRUSICH, Ph.D. (1962) SHEILA Y. PETRY, M.A. (1971) C. ALAN PHILLIPS, M.D. (1966) CAROL FENTON PHILLIPS, M.D. (1968) LORRAINE W. PHILLIPS, D.N.S. (1970) RAYMOND V. PHILLIPS, Ph.D. (1958) ESTHER R. PIASETSKI, M.S. (1972) RONALD CHESTER PICOFF, M.D. (1965) DAVID BOGART PILCHER, M.D. (1969) **CLARENCE PINER (1970)** BLANCHE R. PODHAJSKI, M.A. (1970) *SIDNEY BORIS POGER, Ph.D. (1962) JON M. POLICH, A.B. (1972) NATALIE S. POMAR, M.A. (1972) ZANDER PONZO, Ph.D. (1970) MALCOLM H. POPE, Ph.D. (1972) CHARLES MARCEL POSER, M.D. (1968) *MILTON POTASH, Ph.D. (1951) AGNES TERESA PÓWELL, M.S. (1963) EDWARD V. POWELL, B.S. (1970) PLATT RUGAR POWELL, M.D. (1949) RICHARD W. POWERS, Ph.D. (1967) WILLIAM ARTHUR PRATT, M.D. (1954) WALTER F. PRESTON, JR., D.D.S. (1972) FAITH KENYON PRIOR, M.S. (1967) HOLLY B. PUTERBAUGH, M.S. (1971) * DAVID WILLIAM RACUSEN, Ph.D. (1958) NANCY A. RAPINSKI, B.S. (1972) * CHARLES RATHBONE, Ph.D. (1970) CHARLES LEWIS RAVARIS, M.D. (1965) EVELYN R. READ (MRS. T. L.), M.M. (1969) *THOMAS LAWRENCE READ, D.M.A. (1967) MILDRED A. REARDON, M.D. (1971) JOHN P. REED, B.A. (1972) RICHARD REA REED, D.D.S. (1969) CARL H. REIDEL, Ph.D. (1972 DOLORES REIDEL, M.Ed. (1973) PAUL THOMAS REINHARDT, B.S.E. (1968) *ERNEST REIT, Ph.D. (1965 PHILIP M. RHINELANDER, B.A. (1972) ROBERT A. RICE, Ph.D. (1970) VERONICA CHRISTINE RICHEL, Ph.D. (1969) DONALD L. RIFE, M.D. (1970) HEATH KENYON RIGGS, Ph.D. (1940-42; 1953) B. ALBERT RING, M.D. (1959)

Clinical Assistant Professor of Physical Therapy Professor of Physiology and Biophysics Assistant Professor of Philosophy Assistant Professor of Anthropology Assistant Professor of Anthropology Associate Professor of Psychology Associate Professor of German Assistant Professor of Anatomy Clinical Associate Professor of Pediatrics Assistant Professor of Anesthesiology Associate Professor of Plant and Śoil Science Instructor in Education Assistant Professor of Anesthesiology Professor of Psychology Clinical Instructor in Medicine Associate Professor of Education Professor of Radiology Professor of Education Instructor in Communication and Theatre Professor of Medicine and Medical Microbiology Associate Professor of Pediatrics Associate Professor of Nursing Professor of Education Instructor in Physical Therapy Associate Professor of Pathology Associate Professor of Surgery Instructor in Military Science Clinical Assistant Professor of Neurology Associate Professor of English Instructor in Sociology Instructor in German Assistant Professor of Education Associate Professor in Mechanical Éngineering and Orthopaedic Surgery Professor of Neurology Professor of Zoology Associate Professor of Human Nutrition and Food Instructor in Music Professor of Urology Assistant Professor of Education Clinical Instructor in Medicine Instructor in Dental Hygiene Assistant Professor, Family Economics Instructor in Mathematics Professor of Agricultural Biochemistry Clinical Instructor in Medical Technology Assistant Professor of Education Associate Professor of Psychiatry Instructor in Music Associate Professor of Music Clinical Assistant Professor of Medicine Instructor in Medical Technology Instructor in Dental Hygiene Professor of Forestry Instructor in Home Economics **Physical Education Specialist** Associate Professor of Pharmacology Instructor in Music Assistant Professor of Philosophy Associate Professor of German Clinical Assistant Professor of Psychiatry Professor of Mathematics Professor of Radiology

NOEL RING, M.A. (1972) *S. ALEXANDER RIPPA, Ed.D. (1960) YVON RIVARD, M.A. (1971) ANTHONY W. ROBBINS, M.D. (1972) ALTON O. ROBERTS, M.S. (1972) * DONALD STETSON ROBINSON, M.D. (1968) LINDA J. RODD, M.A. (1971) MARGARET DAMM ROLAND, Ph.D. (1966) *JON ERIK ROLF, Ph.D. (1970) *ALFRED BROOKS ROLLINS, JR., Ph.D. (1967) DIRK ROMEYN, M.D. (1967) Clinic ALFRED FELIX ROSA, Ph.D. (1969) JEAN G. ROSENBERG, M.S. (1973) DAVID ROSENBLOOM (1973 MERRILL J. ROSENFELD, M.A. (1971) WILLIAM C. ROSKAM, M.A. (1973) *WILFRED ROTH, Ph.D. (1964) *HOWARD ROTHSTEIN, Ph.D. (1962) *KENNETH S. ROTHWELL, Ph.D. (1970) M. PAULINE ROWE, M.Ed. (1939) BLANCHE E. ROYCE, M.Ed. (1970) VIRGINIA C. RUDWICK, M.T.D. (1970) JOHANNA M. RUESS, M.D. (1973) BARBARA McNEIL RULE, M.Ed. (1969) CARL FREDERICK RUNGE, M.D. (1969) *STANLEY RUSH, Ph.D. (1962) ELEANOR MARY RUSSELL, B.S. (1967) **JOSEPH N. RUSSO, M.D. (1968)** CHARLES BRUSH RUST, M.D. (1948) FRANCIS P. RYAN, M.D. (1971) WILLIAM JOHN RYAN, M.D. (1970) RICHARD ALAN RYDER, M.D. (1967) THOMAS DUDLEY SACHS, Ph.D. (Feb. 1962) HARVEY SALGO, M.A. (1969) PETER SALZBERG, M.A. (1972) SAMUEL SAMPSON, Ph.D. (1972) PHILIP G. SANFACON, M.D. (1972) *FREDERIC OBERLIN SARGENT, Ph.D. (1962) KENNETH P. SAURMAN, D.Ed. (1970) LOIS SABIN, B.S. (1972) JANET RUTH SAWYER, Ph.D. (1968) ROBERT NEWTON SAXBY, M.D. (1954) *LEONARD MICHAEL SCARFONE, Ph.D. (1963) STEPHEN A. SCHACHER, M.D. (1971) *WARREN IRA SCHAEFFER, Ph.D. (1967) WILLIAM MURRELL SCHENK, M.A. (1965) *ROBIN RUDOLF SCHLUNK, Ph.D. (1967) FREDERICK E. SCHMIDT, M.S. (1970) *WOLFE WILHELM SCHMOKEL, Ph.D. (1962-64; 1965) KAY F. SCHMUCKER, Ed.D. (1968) BETSY SCHNEIDER, M.Ed. (1968) EDWIN CALVIN SCHNEIDER, M.S. (1946) *PETER SCHOFIELD, D.Ph. (1970)

N. JAMES SCHOONMAKER, Ph.D. (1956) * HAROLD SEESSEL SCHULTZ, Ph.D. (1946) * HERBERT LOUIS SCHULTZ, Ed.D. (1957) J. DONALD SCHULTZ, M.D. (April 1970)

GEORGE ADAM SCHUMACHER, M.D. (1950) ROBERTA B. SCHWALB, M.A. (1958)

Instructor in Geography Professor of Education Assistant Professor of Romance Languages Clinical Associate Professor of Medicine Instructor in Education Associate Professor of Medicine and Pharmacology Instructor in Psychology Assistant Professor of Art Assistant Professor of Psychology Professor of History Clinical Instructor in Obstetrics and Gynecology Assistant Professor of English Instructor in Economics Assistant Professor of Political Science Instructor in Neurology Instructor in Neurology Professor of Electrical Engineering Professor of Zoology Professor of English Adjunct Professor, Extension Instructor in Education Instructor in Obstetrics and Gynecology Assistant Professor of Rehabilitation Medicine Assistant Professor of Nursing Assistant Professor of Medicine Professor of Electrical Engineering Instructor in Medical Technology Clinical Assistant Professor of Obstetrics and Gynecology Clinical Professor of Orthopedic Surgery **Clinical Instructor in Pediatrics** Clinical Assistant Professor in Medicine **Clinical Assistant Professor of Medicine** Assistant Professor of Physics Assistant Professor of Economics Instructor in Physical Education Professor of Sociology Assistant Professor of Medicine Professor of Resource Economics Associate Professor of Education Clinical Instructor of Nursing Associate Professor of Nursing Assistant Professor of Radiology Professor of Physics Assistant Professor of Medicine Associate Professor of Medical Microbiology Assistant Professor of Communication and Theatre Associate Professor of Classics Assistant Professor of Sociology Professor of History Assistant Professor of Education Instructor in Education Professor of Vocational Education and Technology Assistant Professor of Biochemistry **Professor of Mathematics** Professor of History Associate Professor of Music Assistant Professor of Community Medicine Professor of Neurology Associate Professor of Nursing and Clinical Assistant Professor of Obstetrics and Gynecology

20

MICHAEL J. SCOLLINS (1973) Instructor in Medicine IO ANN SCRANTON, M.S. (1968) Assistant Professor in Nursing RICHARD SEGURA, B.A. (1971) Assistant Professor of Military Studies KENNETH A. SEID, Ph.D. (1970) Assistant Professor of English MALCOLM FLOYD SEVERANCE, Ph.D. (1951-52; 1953) Associate Professor of **Business** Administration * PETER JORDAN SEYBOLT, Ph.D. (1969) Associate Professor of History JAMES DOUGLAS SHARPE, M.D. (Jan. 1965) Clinical Assistant Professor of Psychiatry WILLIAM IRELAND SHEA, M.D. (1952) Assistant Professor of Surgery JOHN SHEETZ (1970) LAWRENCE G. SHELTON, Ph.D. (1971) Instructor in Military Studies Assistant Professor of Home Economics * ALLEN GLASS SHEPHERD, III, Ph.D. (1965) Associate Professor of English ELIZABETH ANNE SHERMAN, B.S. (1969) Assistant Professor of Art DONALD G. SHIELDS, M.A. (1971) Assistant Professor of Communication and Theatre Assistant Professor of Education DAVID A. SHIMAN, Ph.D. (1971) TAMOTSU SHINOZAKI, M.D. (1967) Associate Professor of Anesthesiology LESTER SILBERMAN, M.D. (1971) Assistant Professor of Obstetrics and Gynecology * KENNETH ROGERS SIMMONS, Ph.D. (1963) Associate Professor of Animal Sciences MORRIS LEON SIMON, M.A. (1954) Associate Professor of Political Science Instructor in Home Economics NORMA J. SIMON, B.S. (1972) RENO THOMAS SÍMONE, JR., M.A. (1968) Assistant Professor of English JAMES EDWIN SIMPSON, M.D. (1953) Clinical Assistant Professor of Orthopedic Surgery Professor of Medicine ETHAN ALLEN HITCHCOCK SIMS, M.D. (1950) Associate Professor of Obstetrics WARREN FREDERICK SIMS, JR., M.D. (1966) and Gynecology * ROBERT ORVILLE SINCLAIR, Ph.D. (1953-55; 1956) Professor of Resource Economics *ROBERT ERIK SJOGREN, Ph.D. (1967) Associate Professor of Microbiology and Biochemistry Instructor in Physical Education DOROTHY D. SLACK, M.S. (1971) WILLIAM JOSEPH SLAVIN, M.D. (May 1943) Professor of Obstetrics and Gynecology ALBERT MATTHEW SMITH, Ph.D. (1957) DENNIS BERNARD SMITH, M.D. (1969) Professor of Animal Sciences Assistant Professor of Neurology AUR WOOD JAMES SMITH, M.D. (1909) FUR WOOD JAMES SMITH, M.D. (Jan. 1958) JANICE M. SMITH, M.A. (1972) MARK E. SMITH, M.A. (1970) NEIL GIBSON SMITH, M.A. (1968) WAL TER D. SOUCH DEC. M Ed. (1970) 53) Professor of Pharmacology Clinical Assistant Professor of Physical Therapy Instructor in Education Lecturer in Communication and Theatre Assistant Professor of Physical Education WALTER D. SODERBERG, M.Ed. (1970) Visiting Professor of Obstetrics and Gynecology Clinical Instructor in Psychiatry SAMUEL SOLOMON, Ph.D. (1968) FELIX SOMMER, M.D. (1965) ARTHUR BRADLEY SOULE, JR., M.D. (1929) M. PHYLLIS SOULE, B.S. (1968) Professor of Radiology Assistant Professor of Home Economics JOHN W. SPAVEN, B.S. (1945) *THOMAS JOHN SPINNER, JR., Ph.D. (1957-59; 1962) Adjunct Professor, Extension Professor of History LAURIE SPIVAK, B.F.A. (1972) THOMAS SPROSTON, JR., Ph.D. (1946) DEBORAH T. SPURLOCK, B.S. (1970) Instructor in Art Professor of Botany Instructor in Nursing *HORACE HARRISON SQUIRE, Ph.D. (1962) Associate Professor of Business Administration Clinical Associate Professor of Pediatrics Associate Professor of Sociology JAMES WARD STACKPOLE, M.D. (1962) *ROBERT EVERETT STANFIELD, Ph.D. (1969) PAUL BYRON STANILONIS, M.D. (1969) *ROLFE SEATON STANLEY, Ph.D. (1964) MICHAEL N. STANTON, B.A. (1971) Clinical Assistant Professor of Medicine Professor of Geology Assistant Professor of English Professor of Pathology ERNEST STARK, M.D. (1945) Clinical Instructor in Psychiatry JOHN NEWHALL STARK, M.D. (1967) *STANISLAW JAN STARON, Ph.D. (1961) RICHARD S. STAUDT, Ph.D. (1971) Professor of Political Science Adjunct Assistant Professor of Education Adjunct Assistant Professor of BURDETT KINNEY STEARNS, Ph.D. (1965) Civil Engineering Adjunct Professor, Extension DORIS H. STEELE, Ph.D. (1959) *RONALD ALBERT STEFFENHAGEN, Ph.D. (1966) Associate Professor of Sociology

*HENRY JOHN STEFFENS, PhD. (1969) Associate Professor of History * WILLIAM ALEXANDER STEPHANY, Ph.D. (1968) * DEAN FINLEY STEVENS, Ph.D. (1967) Assistant Professor of English Associate Professor of Zoology *WARREN R. STINEBRING, Ph.D. (1967) Professor of Medical Microbiology DOLORES S. STOCKER, Ph.D. (1971) Associate Professor of Education MARK A. STOLER, Ph.D. (1970) Assistant Professor of History WILLIAM W. STONE, M.A. (1946) WILLIAM HAYDN STOUCH, M.D. (1967) Adjunct Professor, Extension Clinical Assistant Professor of Medicine *NEIL RALPH STOUT, Ph.D. (1964) Professor of History KATHLEEN R. STRASSBURG, (Mrs. N.K.), M.A.T. (1965) Adjunct Assistant Professor of Home Economics NORMAN KENNETH STRASSBURG, M.Ed. (1946) Assistant Professor of Physical Éducation *MICHAEL JOHN STRAUSS, Ph.D. (1968) Associate Professor of Chemistry RICHARD I. SUGARMAN, M.A. (1970) Instructor in Philosophy PHYLLIS SULIMA, B.S. (1972) Clinical Instructor in Physical Therapy ANNE M. SULLIVÁN, M.S. (1969) Instructor in Medical Technology GERALD W. SWANSON, M.A. (1971) DONALD REED SWARTZ, M.D. (1967) Instructor in Philosophy Clinical Assistant Professor of Pediatrics *DAVID LUTHER SYLWESTER, Ph.D. (1965) Associate Professor of Mathematics and Community Medicine Assistant Professor of Physical Education Instructor in Physical Education HOLLIS A. SZABO, M.S. (1969) RICHARD L. SZABO, M.S. (1970) Professor of Medicine Clinical Assistant Professor of Obstetrics BURTON SAMUEL TABAKIN, M.D. (1954) DAVID LATHAM TABER, M.D. (1953) and Gynecology Professor of Radiology Clinical Instructor in Physical Therapy JOHN PETER TAMPAS, M.D. (1962) CAROL J. TANDY, B.S. (1972) RICHARD LAURENCE TANNEN, M.D. (1969) Associate Professor of Medicine JOHN S. TANNER, M.D. (1970) Clinical Instructor in Pediatrics LEONARD J. TASHMAN, Ph.D. (1971) Assistant Professor of Business Administration *CHARLES FRANCIS TAYLOR, Ph.D. (1964) Associate Professor of Electrical Engineering FRED HERBERT TAYLOR, Ph.D. (1943) Professor of Botany HOWARD CANNING TAYLOR, III, M.D. (1962) Associate Professor of Pathology PAULA M. TAYLOR, M.S. (1972) CHRISTOPHER MARLOWE TERRIEN, M.D. (1939) Instructor in Microbiology Clinical Associate Professor of Medicine GASTON A. TESSIER, B.S. (1972) Associate Professor of Health Administration LOUIS GEORGE THABAULT, M.D. (1939) WILFRED LOUIS THABAULT, M.D. (1958) Clinical Assistant Professor of Surgery Clinical Assistant Professor of Obstetrics and Gynecology * JOHN WALTER THANASSI, Ph.D. (1967) Associate Professor of Biochemistry GORDON C. G. THOMAS, M.D. (1968) Clinical Assistant Professor of Psychiatry HILAIRE D. THOMAS (1969) Clinical Instructor in Medical Technology HARRY L. THOMPSON, M.S. (1971) JOYCE L. THOMPSON, M.A. (1972) LAURENCE E. THOMSON, Ph.D. (1972) Adjunct Associate Professor of Education Instructor in English Adjunct Assistant Professor of Psychology RUTH THOMSON, M.S. (1969) Clinical Assistant Professor of Psychiatry WILLIAM S. TIHEN, M.D. (1971) Assistant Professor of Pathology WILLIAM ALLAN TISDALE, M.D. (1965) JAMES MARTIN TODD, Ph.D. (1969) Professor of Medicine Clinical Assistant Professor of Psychiatry HELENE WALLACE TOOLAN, (Mrs. J.M.) Ph.D. (1964) Associate Professor of Pathology Clinical Assistant Professor of Psychiatry JAMES MICHAEL TOOLAN, M.D. (1964) GEORGE L. TOOMEY Ed.D. (1972) Assistant Professor of Communication and Theatre DAVID M. TORMEY, M.D. (1968) Associate Professor of Community Medicine THOMAS DERMOTT TRAINER, M.D. (1960) Professor of Pathology *RAYMOND HERMAN TREMBLAY, Ph.D. (1953) Professor of Resource Economics * JACK TREVITHICK, Ph.D. (1946) Professor of English *MARSHALL MACDÓNALD TRÚE, Ph.D. (1966) JOHN Y. TRUMPER, M.D. (1970) Assistant Professor of History Clinical Instructor in Pediatrics CHARLES FREDERICK TSCHOPP, M.D. (1968) Associate Professor of Otolaryngology

HENRY M. TUFO, M.D. (1970) ARTHUR FREDERICK TUTHILL, M.S. (1943) JOHN CUSHMAN TWITCHELL, M.D. (1961)

* LOUIS MALDONADO UGALDE, Ph.D. (1962)

HELENA A. URE, M.S. (1968) NAMIK K. UZSOY, M.D. (1971) H. CARMER VAN BUREN, M.D. (1962) FREDERICK WILLIAM VAN BUSKIRK, M.D. (1946) PAUL VELTMAN, M.S.W. (1972) DENIS VERSWEYVELD, M.F.A. (1972)

 * HUBERT WALTER VOGELMANN, Ph.D. (1955) MARIE VOGELMANN, B.S. (1972)
 * BRANIMIR F. von TURKOVICH, Ph.D. (1971)

- JAMES R. WADSWORTH, V.M.D. (1951)
- * WILLIAM PHILIP WAGNER, Ph.D. (1966) LOUIS J. WAINER, M.D. (1969) DAVID HAWKES WAITE, M.A. (1969) H. ALAN WALKER, M.D. (Jan. 1969) JULIAN ARNOLD WALLER, M.D. (1968) LESTER JULIAN WALLMAN, M.D. (1948) MAURICE JAMES WALSH, M.D. (1968)

ROBERT D. WALZ, M.A. (1972) RICHARD RALPH WARNER, Ph.D. (1967) FRANK J. WATSON, M.A. (1971) ROBERT JAMES WATSON, D.M.D. (1968) LELON ASHLEY WEAVER, JR., Ph.D. (1962) *GEORGE DAYTON WEBB, Ph.D. (1966)

* FRED CLARENCE WEBSTER, Ph.D. (1951-53; 1956)

SELINA WILLIAMS WEBSTER, (Mrs. T.M.) M.S. (1948-51; 1960)

TRUMAN MARION WEBSTER, Ph.D. (1945) LAURA WEED, M.D. (1969)

LAWRENCE L. WEED, M.D. (1969) * JOHN GEORGE WEIGER, Ph.D. (1958-62; 1964) SHELDON WEINER, M.D. (1970)

FRANCIS ALEXANDER WEINRICH, M.A. (1950)

*JAMES GRAHAM WELCH, Ph.D. (1968)

*DAVID LLOYD WELLER, Ph.D. (1967)

* JOSEPH WELLS, Ph.D. (1968) GEORGE WILLIAM WELSH, M.D. (1956) *EUGEN EMMANUEL WELTIN, Dr. sc.nat. (1966) JOHN EGMONT WENNBERG, M.D. (1967) ALAN PHILIP WERTHEIMER, Ph.D. (1967) METER WESSELING, Ph.D. (1967) JANET S. WHATLEY (1973) Ass RONALD WHIPKEY, M.S. (1973) WENDELL JENNISON WHITCHER, Ph.D. (1952) CLARENCE C. WHITCOMB, M.D. (1973) WILLIAM NORTH WHITE, Ph.D. (1963)

SUSAN MARION WHITEBOOK, Ph.D. (1969)

*DAVID WHITEHORN, Ph.D. (1970) Assistant Pr *ROY ALVIN WHITMORE, JR., M.F. (1958) MARGARET BEACH WHITTLESEY, M.S. W. (1964)

*SAMUEL CLAUDE WIGGANS, Ph.D. (1963) *CLYDE R. WIGNESS, D.M.A. (1970) NANCY M. WILBUR, B.A. (1969)

Associate Professor of Medicine Professor of Mechanical Engineering Assistant Professor of Medicine and Instructor in Community Medicine Associate Professor of Romance Languages Assistant Professor of Nursing Clinical Instructor in Medicine Associate Professor of Medicine Professor of Radiology Assistant Professor of Home Economics Instructor in Art Professor of Botany Instructor in Music Professor of Mechanical Engineering Adjunct Associate Professor of Animal Pathology Associate Professor of Geology Clinical Instructor in Medicine Instructor in Communication and Theatre Clinical Instructor in Medicine Professor of Community Medicine Professor of Neurosurgery Clinical Instructor in Community Medicine Assistant Professor of Military Studies Associate Professor of Political Science Instructor in Education Instructor in Dental Hygiene Assistant Professor of Psychiatry Associate Professor of Physiology and Biophysics Professor of Resource Economics

Associate Professor, Clothing and Textiles Professor of German Clinical Associate Professor of Medicine Professor of Medicine Professor of Romance Languages Assistant Professor of Psychiatry Assistant Professor of Music Professor of Animal Sciences Associate Professor of Agricultural Biochemistry Associate Professor of Anatomy Associate Professor of Medicine Assistant Professor of Chemistry Associate Clinical Professor of Medicine Associate Professor of Political Science Assistant Professor of Romance Languages Assistant Professor of Medicine Assistant Professor of Romance Languages Lecturer in Plant and Soil Science Associate Professor of Chemistry Assistant Professor of Pathology Professor of Chemistry Assistant Professor of Romance Languages Assistant Professor of Physiology and Biophysics Professor of Forestry Associate Professor of Social Welfare Professor of Plant and Soil Science Assistant Professor of Music

Clinical Instructor in Medical Technology

KAREN FERN WILEY, M.A. (1969) * JAMES MATTHEW WILLARD, Ph.D. (1969) BARBARA A. WILLIAMS, M.A. (1971) BLAIR WILLIAMS, M.S. (1946-48; 1949) PATRICIA L. WILLIAMS, Ph.D. (1972)

*RONALD W. WILLIAMS, Ph.D. (1970) LEWIS R. WILLMUTH, M.D. (1970) HAROLD G. WILM, Ph.D. (1971)

* MARY SWEIG WILSON, Ph.D. (1969)

MAXINE D. WILSON (1973) CHRIS G. WOELFEL, Ph.D. (1968) GEORGE A. WOLF, JR., M.D. (1970) ARTHUR D. WOLK, M.D. (1970) GLEN MEREDITH WOOD, Ph.D. (1950)

NORMA LOWYN WOODRUFF, Ed.D. (1952) WILLIAM ALOYSIUS WOODRUFF, M.B. (1962) *CHARLES A. WOODS, Ph.D. (1971) *ROBERT CUMMINGS WOODWORTH, Ph.D. (1961)

A. PETER WOOLFSON, Ph.D. (1970) DOROTHY WOOTTON, M.S. (1973) *JOHN K. WORDEN, Ph.D. (1970)

IAN A. WORLEY, M.S. (1970) ALICE L. WRIGHT, M.D. (1971) NANCY WRIGHT, B.S. (1972) * ROBERT KINGMAN WRIGHT, Ph.D. (1966) *CLAUS ADOLF WULFF, Ph.D. (1965) *ROY EDWARD WUTHIER, Ph.D. (1969) JOAN M. WYLLIE, B.S. (1972) MARY F. WYNNE, B.S. (1971) *DHARAM PAUL YADAV, Ph.D. (Jan. 1970)

STANLEY O: YARIAN, Ph.D. (1970) BRIAN J. YOUNG, M.A. (1970) PAUL C. YOUNG, M.D. (1972) * WILLIAM JOHNSON YOUNG, II, Ph.D. (1968) ARMANDO E. ZARATE, Ph.D. (1970) LEONARD M. ZUBKO, M.M.E. (1970)

Instructor in Romance Languages Assistant Professor of Biochemistry Instructor in Mathematics Professor of Home Economics Assistant Professor of Communication and Theatre Associate Professor of Electrical Engineering Assistant Professor of Psychiatry Professor of Forestry Associate Professor of Communication and Theatre Instructor in Neurology Adjunct Associate Professor of Animal Sciences Professor in Medicine **Clinical Instructor in Pediatrics** Associate Professor of Plant and Soil Science Professor of Nursing Associate Professor of Psychiatry Assistant Professor of Zoology Associate Professor of **Biochemistry** Associate Professor of Sociology Assistant Professor of Dental Hygiene Assistant Professor of Communication and Theatre Assistant Professor of Botany Assistant Professor of Psychiatry Teaching Associate in Nursing Associate Professor of Mathematics Professor of Chemistry Associate Professor of Biochemistry and Clinical Associate Professor of Orthopaedic Surgery Clinical Instructor in Medical Technology Adjunct Assistant Professor of Home Economics Assistant Professor of Communications and Theatre Assistant Professor of Religion Assistant Professor of History Assistant Professor of Pediatrics Professor of Anatomy Assistant Professor of Romance Languages Adjunct Professor of Mechanical Engineering

Associates in Instruction and Research

ARNOLD R. BRODY, Ph.D. (1973) **STEPHEN CANTRILL (1973)** HARRY LIVINGSTON COLOMBO, M.D. STUART GRAVES (1973) WILLIAM HENRY HEIŃINGER, M.D. HERMAN CONRAD HERRLICH. Ph.D.

RONALD HOLLAND, M.D. (1973) M. STEPHEN HUNTLEY, Ph.D. YOSHINORI ISHIKAWA, D.Ag.Sci. RICHARD HARRY JAGELS, Ph.D. GEORGE J. JAKAB, Ph.D. (1973) FREDERICK M. LAING, M.S. (1953) GEORGE LUCCHINA, M.D. MARIA FRANCA MORSELLI, Ph.D. (1964) BERTHANN S. MULIERI, Ph.D. (1973)

Research Associate in Pathology Research Associate in Medicine Clinical Associate in Medicine Research Associate in Medicine **Clinical Associate in Medicine** Research Associate in Experimental Medicine

Research Associate in Medicine Research Associate in Psychology Research Associate in Biochemistry Research Associate in Botany Research Associate in Medicine Research Associate in Botany Research Associate in Physiology Research Associate in Botany Research Associate in Physiology and Biophysics CHIMEZIE S. NWIZU, Ph.D. (1973) ROBERT L. PECK, Ph.D. (1973) JAN R. SCHULTZ, M.S. CAROL J. SMITH, Ph.D. (1972) MAURICE JAMES WALSH, M.D.

Officers of Administration

EDWARD CLINTON ANDREWS, JR., A.B., M.D., LL.D. ALFRED BROOKS ROLLINS, JR., Ph.D. H. LAWRENCE McCROREY, Ph.D. WAYNEC. PATTERSON, Ph.D.

DEAN C. CORRIGAN, Ed.D. THOMAS WHITFIELD DOWE, Ph.D.

JOSEPH A. IZZO, JR., Ph.D. (1965)

WILLIAM HOSSFELD LUGINBUHL, M.D.

WILLIAM HOOPER MACMILLAN, Ph.D. RAYMOND VIRGIL PHILLIPS, Ph.D. RICHARD W. POWERS, Ph.D. (1967) JOHN G. WEIGER, Ph.D.

HARRIS GRIFFITH ABBOTT, A.S. (1969) MARTHA L. ADAMS, B.A. (1970) STEPHEN P. ADAMS, B.A. (1967) ABBAS ALNASRAWI, Ph.D. (1963) RICHARD WALKER AMIDON, M.D. (1950)

SARA WALTON ANDREWS, M.S.L.S. (1969)

JEFFREY ARONSON, B.A. (1972) HAROLD C. AVERY, JR., B.S. (March 1967)

SUSAN BADEN (1972) HERBERT A. BAHRENBURG, B.Ch.E. (1969) WILLIAM P. BALLARD, B.S. (1969) CAROLYN F. BARNES, M.L.S. (1972)

FREDERICK A. BARRETT (1961) RICHARD OTTO BARWIN, M.A. (1968) NORMAN C. BASLOW (Jan. 1970) THOMAS DAY SEYMOUR BASSETT, Ph.D. (1958)

JAMES HENRY BATES, M.Ed. (Jan. 1958)

ALICE D. BEAMAN (1959) DAVID E. BEE, Ph.D. (1969) RAMESH C. BHATT, M.S. (1973) EVELYN J. BIDDLE, B.A. (1971) Adminis NORMAN ASHLEY BISHOP, SR., B.S. (1965) NORMAN A. BLAIR, B.S. (1967) SELMA S. BLOOMBERG (1961) MARY R. BOTTOMLEY (1950) ARTHUR M. BRINK, JR., B.S. (1968) HELEN K. BRINK, B.A. (1970)

HECTOR E. BRODEUR, Dip. (1968) FLORENCE K. BRODIE (1933) DENNIS W. BRUCKEL, M.S. (1966)

President Vice President for Academic Affairs Associate Vice President for Academic Affairs Executive, Vice President

Dean, College of Education Dean, College of Agriculture and Director Agricultural Experiment Station Acting Dean, College of Engineering, Mathematics and Business Administration Dean of the Division of Health Sciences and Dean of the College of Medicine Dean, Graduate College Dean, Continuing Education Dean of Students Dean, College of Arts and Sciences

Land Surveyor Associate Accountant, Accounting Office Administrative Associate, Department of Medicine Associate Dean, College of Arts and Sciences Medical Director, University Health Services Reference Librarian, Dana Medical Library Assistant to the Dean, College of Arts and Sciences Associate Accountant, Grant Contract and Accounting Coordinator of Nursing, Regional Medical Program Superintendent, P.F.G. Complex Director of Off-Campus Housing Assistant Coordinator of Medical Record Information Services, Dana Medical Library Chief, Security Registrar Superintendent, Project Construction Curator, Wilbur Collection and University Archivist Executive Assistant to the Dean, **Division of Health Sciences** Assistant Director of Continuing Education Statistician, Dean's Office, College of Agriculture Assistant Radiological Safety Officer, Radiology Administrative Associate, Regional Medical Program Construction Engineer Director of Financial Planning and Analysis Staff Associate, Academic Program Support Assistant Registrar Alumni Secretary, External Affairs Administrative Associate, Dean's Office, College of Medicine Associate Accountant, Accounting Office Assistant Director of Purchasing Farm Manager, Plant & Soil Science Department

OFFICERS OF ADMINISTRATION

ROGER TRUE BRYANT, M.Ed. (1965) NANCY J. BUCKEYE, M.A. (1972) CLAIRE ELLEN BUCKLEY, M.S. (1968) JOHN LEWIS BUECHLER, M.A. (1962) JOHN ROBERT BUSHEY, B.S. (1966) WILLARD GUY CAMPBELL (1969) THOMAS CASSESE (1973) ROBERT W. CHAMBERS, B.A. (1966)

NORBERT FABIAN CHARBONNEAU, M.A. (1961)

ARTHUR H. CHENEY, JR., M.Ed. (1969)

PAUL AMEDEO CHRISTOFOLETTI (1969)

THOMAS PAUL CLAIRMONT, M.Ed. (1955) GEORGE NAY CLERKIN (1931) JAMES C. COBB, B.S. (1968) JOHN HAMILTON COONS, M.S. (1962) JOHN D. COOPER, M.B.A. (1972) LAWRENCE COPP, B.S. (1971) RICHARD B. CRADDOCK, M.A. (1972)

NANCY MAE CRANE, M.S. (1969) NORMAN L. CRANFORD (1968) KAREN L. CREECY, B.A. (1971)

GEORGE C. CROOKS, Ph.D. (1930) JAMES MICHAEL CROSS, B.S. (1964) MILTON HARLEY CROUCH, M.S. (1969) FRED A. CURRAN, M.Ed. (1969) FRENY B. DARUVALA, M.A. (1971) JOHN H. DAVIS, M.D. (1968) ROBERT POWERS DAVISON, M.E. (1957)

MALIA WARDEN DEAN, B.A. (1966) RICHARD VINAL DEGRASSE, B.S.E.E. (1967)

PENELOPE E. DELAIRE (1973) CLEASON S. DIETZEL, Ph.D. (1971)

RAYMOND GEORGE DILLEY, M.A. (1967) WILLIAM G. DILLEY (1967) RICHARD BOWDITCH DOES, Ph.D. (1969) HENRY MEADE DOREMUS, II, D.V.M. (1960)

ELIZABETH N. DOWNER, Ph.B. (1955)

CAROLYN E. DRUM, M.S. (1972) CHARLES ROGER DUNHAM, M.S. (1967)

JOHN W. DUNLOP, B.A. (1970) WILLIAM LINDSAY DUNLOP, M.L.S. (1968)

WALLACE KILBY EDWARDS (1966) BRIAN ELLINOY, P.D. (1973) ELWIN E. EMERY (1968) WILLIAM TAFT EMERY, B.S. (1968) JOHN ENGROFF, Ph.D. (1972)

PAUL DEMUND EVANS, Ph.D. (1930) VERONICA C. EVERING, A.B. (1965)

CARL J. FALIVENE, A.B. (1971) SAMUEL B. FEITELBERG, M.A. (1971)

Head Athletic Trainer Assistant Head of Acquisitions, Bailey Library Reference Librarian, Bailey Library Head of Special Collections, Bailey Library Director, Evening Division and Conferences Facilities Engineer, ETV Assistant Football Coach Writer-Editor for Social Sciences and the Arts, Public Relations

Operations Manager, Academic Computing Coordinator, Center for Research and Field Study Associate Accountant, Accounting Office Associate Registrar Treasurer

Systems Programmer, Academic Computing Associate in Development Administrative Associate, Student Personnel Staff Associate, Academic Program Support Assistant Football Coach, Intercollegiate Athletics Head, Reference Department, Bailey Library

Director of the Print Shop Coordinator of Medical Record Information Services, Dana Medical Library

Safety Consultant

Head Hockey Coach Assistant Director, Reader Services Assistant Director, Institutional Studies Clinical Goordinator, Speech Pathology Associate Dean, College of Medicine Associate Dean, College of Agriculture and Director. Extension Service

Assistant Director of Financial Aid Systems Engineer, Academic Computing

Reference Librarian, Bailey Library Counseling Psychologist, Counseling & Testing Service Information Director, ETV Transmitter Supervisor, ETV Director of Counseling and Testing Director, Animal Services, College of Medicine Executive Assistant to the Dean, College of Agriculture

Catalog Librarian, Bailey Library

Engineer, Department of Civil Engineering Manager, E.T.V.

Head, Acquisition Department, **Bailey** Library Director of Engineering, ETV

Pharmacist, Medicine Supervisor, Military Studies Assistant Director, Administrative Resources

Coordinator of University Year for Action, Student Personnel Bibliographer, Bailey Library Systems Programmer, Management

Information and Computing Head Football Coach Associate Dean, Division of Health Sciences and Director, School of Allied Health Sciences

OFFICERS OF ADMINISTRATION

JEREMY POLLARD FELT, Ph.D. (1957) BARBARA S. FINEMAN, B.A. (1967) LOIS MARIE FINLAY, M.A. (1969) KENNETH N. FISHELL, Ed.D. (1971) WILLIAM DAVID FITZGERALD (1967) JANET RUTH FORGAYS, M.Ed. (1967) BEN R. FORSYTH, M.D. (1966)

EDGAR W. FRANCISCO III, Ph.D. (1972)

A. W. FREEMAN, A.A.E. (1967) CONNELL B. GALLAGHER, M.A. (1970) FRANK J. GERRED, B.A. (1971) ELLEN MARGARET GILLIES, B.L.S. (1969) GERALD GOOLD, B.A. (1968)

LAWRENCE R. GORDON, Ph.D. (1970) JANE A. GREENBERG, M.S. (1969) JACKIE MARIE GRIBBONS, M.A. (1966) ROGER GRIFFITH, A.B. (1966) JOHN B. GUINNESS, B.S. (1971) M. CHERIE HAITZ, A.B. (1973) Ass

JOANNE HALL, M.L.S. (1971) LINDA ELIZABETH HALSTED, M.S. (1966)

CAROLYN E. HAMILTON, B.S. (1971)

PETER N. HARTBERG, A.B. (1969) JOHN FARWELL HARWOOD, B.S. (1964)

RICHARD BRUCE HATFIELD, B.F.A. (1970) GEORGE A. HEDENBURG, JR. (1967) FREDERICK OWEN HENEY (1962) E. BENNETTE HENSON, Ph.D. (1965) BRUCE L. HEWITT, M.A. (1970) BARBARA A. HIGGANS, B.A. (1970) MARGIT HOLZINGER (1957) CHARLES C. HOWE, B.S. (1969) THOMAS R. HUDSPETH, M.S. (1972)

LYMAN C. HUNT, JR., D.Ed. (1966) DALE D. HYERSTAY, B.A. (1971) ELWOOD M. ISLEY (1970) RICHARD H. JANSON, Ph.D. (1958) LYNVILLE WALTER JARVIS, M.A. (1967) DONALD B. JOHNSTONE, Ph.D. (1948) MYRON H. JORDAN (1952) PAUL BLAKESLEE KEBABIAN, B.S. (1966) DAVID E. KELLEY, B.S. (1968) WILLIAM HOWARD KELLY, Ph.D. (1969) ALAN GRANT KENNEDY (1941) CYNTHIA A. KENT, B.A. (1968) KARL A. KURT, Ph.D. (1969) MARGARET C. KURT, M.S. (1972)

LLOYD F. LaCASSE, B.S. (1969) DENIS EMERY LAMBERT, M.A.T. (1969) ROBERT LOWELL LARSON, Ed.D. (1968) RAYBURN VAUGHAN LAVIGNE, M.B.A. (1968) LESLIE R. LEGGETT, D. P. Ed. (1962) SUSAN LINDGREN (1973) ROBERT P. LIVERSIDGE, JR., M.A. (1970)

BRIAN LLOYD, M.S. (1973) CATHERINE LLOYD, M.A. (1969)

Director of Area and International Studies Publications and Library Coordinator Reference Librarian, Dana Medical Library Associate Dean, College of Education Associate Accountant, Accounting Office Counselor, Counseling and Testing Associate Dean for Long-Range Planning, Division of Health Sciences Director of Research, Regional Medical Program Transmitter Supervisor, ETV Catalog Librarian, Bailey Library Consultant, Administrative Resources Librarian, Dana Medical Library Administrative Associate, Continuing Medical Education Consultant, Academic Computing Counselor, College of Education Ďean of Women Science-Writer-Editor, Public Relations Associate Accountant, ETV Assistant Director of Hospital Library Development, Dana Medical Library Reference Librarian, Bailey Library Systems Programmer, Academic Computing Associate Director, Academic Program Support Production Manager, E.T.V. Associate Radiological Safety Officer, Department of Radiology **Publications** Specialist Assistant Director of Residence Halls Director of Stores Director, Lake Champlain Studies Center Associate in Development Acting Director, Regional Medical Program Curator, Fleming Museum Staff Associate, Institutional Studies Environmental Education Specialist Environmental Programs Director, Reading Center Director of Financial Aid Assistant Athletic Trainer Director, Fleming Museum Producer-Director, ETV Associate Dean, Graduate College Assistant Director, Financial Data Control Director of Libraries Staff Associate. Administrative Resources Assistant to the Dean, College of Agriculture Director of Financial Data Control Writer-Editor, Public Relations Staff Associate, Academic Program Support Administrative Supervisor of Nursing Staff University Health Services Ski Coach Director of Athletics Assistant to Dean, College of Education Executive Assistant Coach of Swimming Reference Librarian, Bailey Library Assistant Director of Education, **Regional Medical Program** Assistant Director, Living and Learning Center Staff Associate, Regional Medical Program

ROBERT BIRCHALL LORENZ, Ph.D. (1969)

PROCTOR MAYO LOVELL, M.B.A. GEORGE HENRY LUHR (1966) JOHN H. McCOLLUM, B.A. (1971) Con HARRY J. McENTEE Ph.D. (1970) DIANE L. McGEE, A. S. (1969) RUTH S. McNALLY (1960) WILLIAM E. MCNEIL, M.Ed. (1972) MURDO GLENN MACDONALD, M.D. (1960)

ANNE MACMILLAN, B. A. (1972) DONALD BREHAUT MACPHAIL, A.B. (1969)

NANCY MAGNUS (1961) FRANCIS C. MALLORY (1940)

CARL MANERI, M.B.A. (1972) KATHERINE MARSTON, M.A.T. (1972)

MANUEL C. MARTIN (1972) PAUL S. MASSIE, B.S. (1969) HERMAN W. MEYERS, Ph.D. (1971)

DAVID A. MILLER, M.S. (1969) JEAN B. MILLIGAN, M.N. (1953) KEITH M. MISER, Ed.D. (1971)

JOHN W. MOORE, D.Ed. (1970) KEITH G. MORGAN, M.S. (1969)

ALICE G. MOWER (1972) H.N. MULLER, III, Ph.D. (1966) MICHAEL P. MURPHY, B.A. (1970) WILLIAM HOWARD NEDDE, M.S. (1967) CHARLES W. NEWELL (1966) WILBUR E. NEWTON (1967) BEVERLY A. NICHOLS, Ph.D. (1971)

CLYDE C. NICHOLS, B.S. (1971)

SARA A. NIXON, M.L.S. (1971) JOANNA C. O'NEILL (1972) DAVID A. OSGOOD, M.Ph. (1973)

HELEN FICKWEILER OUSTINOFF, A.B. (1951)

HERBERT JAMES PAINTER, B.S. (1969) BARBARA TENNY PARKER, M.L.S. (1969)

NINA PARRIS, M.A. (1972) WILLIAM H. PECK, B.A. (1971) GARTH L. PETERSON, B.S. (1969) LOUIS MICHAEL PHILLIPS, B.F.A. (1967) DAVID PILACHOWSKI (1973) ROBERT F. POLWORTH, B.A. (1972)

WILLIAM L. POTTER, B.S. (1971) Superinter RAYMOND BROWN PRINDLE, JR., M.L.S. (1969) RONALD W. PURDUM, B.S. (1967)

THOMAS REES, M.B.A. (1972) CARL H. REIDEL, Ph.D. (1972) JAMES P. REUSCHEL, B.A. (Oct. 1968)

ALTON O. ROBERTS, M.S. (1972)

Director, Office of Instructional Resources_tDivision of Health Science Director of Administrative Support Services Director, Instrumentation & Model Facility Counselor and Assistant to the Dean, Education Coordinator, University Media Services AdministrativeAssociate, Medicine Assistant Registrar Counselor, Counseling and Testing Staff Physician, University Health Services Adviser to Foreign Students and Scholars Director of Administration, Division of Health Sciences Manager, Counseling and Testing Director of Medical Photography, Instructional Resources Program Manager, Regional Medical Program Coordinator, Title I Program, Continuing Education Transmitter Supervisor, ETV Assistant Director, University Media Services Coordinator, Center for Educational Research College of Education Administrative Associate, Medicine Associate Director, School of Nursing Assistant Dean of Students and Director of Residence Halls Director, Academic Program Support Assistant Director of Medical Records Program, Department of Medicine Administrative Associate, Psychiatry Director, Living and Learning Center Assistant Football Coach Track Coach Auditor Superintendent, Building Maintenance Division Coordinator of Women's Programs, Physical Education Systems Programmer, Management Information and Computing Reference Librarian, Dana Medical Library Administrative Associate, Regional Medical Program Coordinator, University Year for ACTION, Student Activities Assistant Director and Technical Services Librarian, Baily Library Accountant, Accounting Office Head, Catalog Department, Bailey Library Curator, Fleming Museum Assistant Director, Admissions Assistant Treasurer Film Director, ETV Reference Librarian, Bailey Library Health Education Analyst, Division of Health Sciences Superintendent, Administrative Support Services Catalog Librarian, Bailey Library Associate Director, Management Information and Computing Program Manager, Regional Medical Program

Director, Environmental Programs Administrative Associate, Department of Surgery

Instructor in Education

RICHARD SANDERS, B.B.A. (1971) BARBARA A. SCHMITT, B.A. (1972) KAY FRANCES SCHMUCKER, Ed.D. (1968) EDWIN CALVIN SCHNEIDER, M.S. (1946) J. DONALD SCHULTZ, M.D. (1970) ROBERT J. SEKERAK, M.S. (1972) PAUL J. SEVIGNEY (1972) MORRIS LEON SIMON, M.A. (1954) LAWRENCE R. SIMMONS, Ed.M. (1972) GARRY C. SIMPSON B.A. (1967) PAUL W. SIRE, M.A. (1971) Direc. GERALD E. SMITH (1969) Systems Desi JOHN FRANKLIN SMITH, A.B. (1964) LARRY L. SNYDER, A.B. (1969) JOHN DESMOND STANTON, B.S. (1969) RICHARD E. STEELE, Ph.D. (1971) LEE R. STEWART, B.S. (1970) DOLORES S. STOCKER, Ph.D. (1971) STEPHEN HUGH STODDARD (1964) RICHARD I. SUGARMAN, M.A. (1971)

PETER SALZBERG, M.A. (1972)

THOMAS J. SULLIVAN, M.S. (1973)

RODGER SUMMERS, B.S. (1969) CHARLES F. TAYLOR, Ph.D. (1964) THOMAS R. THOMAS, B.A. (1969) FRANCIS CHAMBERLAIN THOMPSON, JR., M.A. (1969)

GLORIA ANN THOMPSON, M.A. (1967) CHARLES A. TILLINGHAST, M.A. (1967) MARY TOOMEY, M.A. (1972) DAVID M. TORMEY, M.D. (1968) JACK TREVITHICK, Ph.D. (1946) VERNON W. TUXBURY, Jr., M.E.A.E. (1966)

HENRY J. TYMECKI, B.S. (Feb. 1967) LAWRENCE E. VAN BENTHUYSEN, B.A. (1953) M. ARLINE WATKINS, A.B. (1936) FRANK J. WATSON, M.A. (1971) GEORGE DONALD WEAVER, B.S. (1966) KAREN J. WEDGE, M.S. (1972) PAMELA WEED (1973) GEORGE WILLIAM WELSH, M.D. (Jan. 1956)

RONALD A. WHITCOMB (1967) RICHARD PATTERSON WHITTIER, B.A. (Sept. 1969)

GORDON R. WILKINS, B.A. (1970)

HAROLD G. WILM, Ph.D. (1971)

DONALD E. WILSON, B.A. (1970) CHARLES LEWIS WOLF, M.A. (1965) DEBORAH J. WOLK, B.A. (1973)

HAROLD DEAN WOODS, B.D. (1969)

Basketball Coach Associate Comptroller Administrative Associate, College of Technology Counselor, Testing Service Director, Architectural Barrier Control Staff Physician, University Health Services H.L.D.S. Director, Dana Medical Library Coordinator of Civil Defense Director of the Experimental Program Director of Placement Program Director, ETV Director of Management Information & Computing Systems Designer, Management Information & Computing Director, University Photo Service Director of Administrative Resources Associate Registrar Director of Admissions Assistant Director of Personnel Assistant to the President Director, Grant and Contract Accounting Associate Director of the Experimental Program Director, Dean's Office, Division of Health Sciences Assistant Director, Admissions Consultant, Academic Computing Acting Director of Academic Computing Director Instructional Communications, ETV Assistant Director of Residence Halls Associate Director of Evening Division Supervisor, Communication and Theatre Associate Dean, College of Medicine Director, Lane Series Administrative Associate. Dean's Office College of Agriculture Director of Personnel Director of Public Relations Assistant Director, University Store Coordinator, Education Director of Purchasing Director of Student Activities Reference Librarian, Bailey Library Director of Continuing Education for Health Sciences Transmitter Supervisor, ETV Director, Sports Information and Writer-Editor, Public Relations Administrative Associate, Dean's Office **Division of Health Sciences** Director of Water Resources Research Center, Environmental Programs Executive Assistant to the President Comptroller Adviser Financial Aid Comptroller **Director of Volunteer Programs**

RETIRED OFFICERS OF ADMINISTRATION

EDWIN ABBOTT MARY OLIVE BOYNTON HAROLD C. COLLINS, B.S. DAVID D. DEMSKY J. EDWARD DONNELLY, M.A. (1952) HORACE BYRON ELDRED RUDOLPH J. FISCHER FORREST WILKINS KEHOE

LAURA LOUDON MARJORIE ELLINDWOOD LUCE MARGARET MacDONOUGH NORVAL K. RAMSON MARY JEAN SIMPSON, Ph.B. Auditor Emeritus Librarian, Medical Library Director of Admissions Superintendent of Grounds and Custodians Director of Athletics Director of Audio -Visual Services Superintendent, Project Construction Superintendent of Buildings and Grounds, and Associate Registrar Assistant in Public Relations State Home Demonstration Leader County Extension Agent Transmitter Supervisor, ETV Dean of Women

Experiment Station Staff

AGRICULTURAL

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

THOMAS WHITFIELD DOWE, Ph.D. FRANK HARRIS ARMSTRONG, Ph.D. HENRY VERNON ATHERTON, Ph.D. DONALD JAMES BALCH, Ph.D. RICHMOND JAY BARTLETT, Ph.D. DAVID E. BEE, Ph.D. SIGNE T. BETSINGER, Ph.D. (1971) MALCOLM IRVING BEVINS, M.S. CHARLES W. BIGALOW, M.S. (1964) WESSON DUDLEY BOLTON, D.V.M. BERTIE REYNOLD BOYCE, Ph.D. DENNIS BRUCKEL, M.S. (1966) LYNDON B. CAREW, Ph.D. WALLACE WAYNE CHRISTENSEN, Ph.D. JOHN R. DONNELLY, Ph.D. ELIZABETH NANCY DOWNER, Ph.B. ALEXANDER HARRY DUTHIE, Ph.D. BUD ETHERTON, Ph.D. (1968) DEAN R. EVERT, Ph.D. (1970) CHARLES LYNN FIFE, Ph.D. THEODORE ROSS FLANAGAN, Ph.D. MURRAY WILBUR FOOTE, Ph.D. DONALD CUSHING FOSS, Ph.D. **ROBERT WEEKS FULLER, M.S.** ALPHONSE H. GILBERT, Ph.D. PETER ROBERT HANNAH, Ph.D. THOMAS W. HOEKSTRA, Ph.D. RICHARD JOHN HOPP, M.S. BEAL BAKER HYDE, Ph.D. RICHARD M. KLEIN, Ph.D. KARIN KRISTIANSSON, M.A. VRINDA KUMBLE, M.A. (1971) JOHN J. LINDSAY, Ph.D. (1964) JOHN E. LITTLE, Ph.D. (1945) GEORGE BUTTERICK MACCOLLOM, Ph.D. JAMES WALLACE MARVIN, Ph.D. MAXWELL LELAND McCORMACK, JR., D.F. THOMAS JAMES McCORMICK, M.E.E. JERRY LEON McINTOSH, Ph.D. SUSAN BREWSTER MERROW, M.Ed. ELLEN HASTINGS MORSE, Ph.D. MARIA-FRANCA MORSELLI; Ph.D. (1967) ROGER WALTER MURRAY, D.V.M. KAY MILLIGAN NILSON, Ph.D BRUCE LAWRENCE PARKER, Ph.D. NORMAN EUGENE PELLETT, Ph.D. DAVID WILLIAM RACUSEN, Ph.D. FREDERICK OBERLIN SARGENT, Ph.D. KENNETH ROGERS SIMMONS, Ph.D. ROBERT ORVILLE SINCLAIR, Ph.D. ROBERT ERIK SJOGREN, Ph.D.

Dean and Director Assistant Forester Dairy Bacteriologist Ánimal Scientist Soil Scientist Statistician Housing & Interior Design Specialist Associate Resource Economist Coordinator of Computer Services Animal Pathologist Associate Horticulturalist Assistant Plant and Soil Scientist Associate Animal Nutritionist Forester Assistant Forester Executive Assistant **Dairy Scientist** Plant Physiologist Assistant Horticulturalist Assistant Agricultural Economist Associate Agronomist Associate Biochemist Associate Poultry Scientist Assistant Wildlife Biologist Assistant Resource Economist Associate Forester Assistant Forester Horticulturist Cytogeneticist Plant Physiologist Associate Editor Assistant Editor **Recreation Specialist** Biochemist Entomologist Plant Physiologist Associate Forester Associate Editor Associate Soil Scientist Associate Nutritionist Nutritionist **Research** Associate Associate Animal Pathologist Associate in Dairy Manufacturing Associate Entomologist Ornamental Horticulturist Biochemist **Resource** Economist Animal Scientist Agricultural Economist, Farm Management Associate Microbiologist ALBERT MATTHEWS SMITH, Ph.D. JOHN WALLACE SPAVEN, B.S. THOMAS SPROSTON, JR., Ph.D. RAYMOND HERMAN TREMBLAY, Ph.D.

TERRY LAWRENCE TURNER, M.S. KENNETH EVERSON VARNEY, M.S. KATHLEEN BEAVINGTON WEBB, B.S. FRED CLARENCE WEBSTER, Ph.D. JAMES GRAHAM WELCH, Ph.D. DAVID LLOYD WELLER, Ph.D. ROY ALVIN WHITMORE, JR., M.F. SAMUEL CLAUDE WIGGANS, Ph.D. HAROLD WILM, Ph.D. (1971) GLEN MEREDITH WOOD, Ph.D. IAN A. WORLEY, Ph.D. (1970)

Dairv Scientist Editor Plant Pathologist Agricultural Economist, Farm Management Assistant Forester Associate Agronomist Associate Editor Agricultural Economist, Marketing Animal Scientist Associate Biochemist Forester Horticulturist Forester Associate Agronomist Assistant Ecologist

Mechanical Engineer

ENGINEERING

JOHN OGDEN OUTWATER, Sc.D.

RELATED SERVICES STAFF

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

THOMAS WHITFIELD DOWE, Ph.D. WESSON DUDLEY BOLTON, D.V.M. HOLLIS EARL BUCKLAND, B.S. KENNETH STEWART GIBSON, M.S. ROGER WALTER MURRAY, D.V.M. KAY MILLIGAN NILSON, Ph.D. HARRY LEONARD SAWYER, JR., B.S. JAMES ROGER WADSWORTH, V.M.D. ROBERT THOMAS WETHERBEE, M.S. Dean and Director Animal Pathologist Seed Analyst Dairyman Associate Animal Pathologist Associate in Dairy Manufacturing Associate Chemist Animal Pathologist Chemist

Extension Service Staff

The Cooperative Extension Service is a cooperative undertaking of the State of Vermont, the University of Vermont and State Agricultural College, the United States Department of Agriculture, and the several counties of the State. It has a State staff, with headquarters at the University, and a staff of county extension agents in the University Extension Service Centers in each county. Its purpose is "to aid in diffusing among the people . . . useful and practical information on subjects relating to agriculture, home economics, re-

source development, community development and related subjects, and to encourage the application of the same." It also brings general University educational information to the people of the State. Its programs are available to all the people of the State, including both adults and youth.

EXTENSION SERVICE STAFF

THOMAS WHITFIELD DOWE, Ph.D. ROBERT POWERS DAVISON, M.Ed. HENRY VERNON ATHERTON, Ph.D. DONALD JAMES BALCH, Ph.D. MARK S. BATTLES, B.S. (1972) MALCOLM IRVING BEVINS, M.S. CHARLES WHITNEY BIGALOW, M.S. WILLIAM H. BINGHAM, M.S WESSON DUDLEY BOLTON, D.V.M. RONALD F. BOUFFARD, B.S. (1972) CHARLES LYMAN CALAHAN, M.S. MARY C. CARLSON, B.A. F. ALINE COFFEY, B.S. WAYNE R. CROSIER, B.A. (1973) ROBERT W. DUMVILLE, B.A. DWIGHT KIMBALL EDDY, M.E.Ed. JAMES ALBERT EDGERTON, M.Ext.Ed. NORRIS ARTHUR ELLIOTT, B.S THEODORE ROSS FLANAGAN. Ph.D RAYMOND 1 HOMAS FOULDS, JR., M.F. KENNETH STEWART GIBSON, M.S. MONTE R. HAROLD, M.W.T. VERLE RANDALL HOUGHABOOM, Ph.D.

ESTHER L. KNOWLES, M.S. KARIN KRISTIANSSON, M.A. VRINDA KUMBLE, M.A. (1971) WILLIAM PATRICK LEAMY, M.S. JOHN JOSEPH LINDSAY, Ph.D. GEORGE BUTTERICK MacCOLLOM, Ph.D. THOMAS JAMES McCORMICK, M.E.Ea. JOHN DOTY MERCHAN'I, M.E.Ed. LEONARD SMITH MERCIA, M.S. ANN MISR, M.S. (1972) MILO J. MOORE, M.S. GORDON ROY NIELSEN, Ph.D. NORMAN EUGENE PELLETT, Ph.D. MONICA B. PORTER, B.A. FAITH KENYON PRIOR, M.S. M. PAULINE ROWE, M.E. FREDERICK OBERLIN SARGENT, Ph.D. SUSAN B. SOULE, B.S. JOHN WALLACE SPAVEN, B.S. DORIS HOSMER STEELE, Ph.D. WILLIAM WILLARD STONE, M.A.

BARENT W. STRYKER, III, M.S. KATHLEEN LEBARON STRASSBURG, M.A.T. ANDREW TESSMANN, B.S. NOAH THOMPSON, M.E.Ed. ENOCH HAROLD TOMPKINS, M.S. WILLIAM VERNON TUXBURY, M.Ed. TINA M. VALENTINETTI, B.S. JAMES ROGER WADSWORTH, V.M.D. WINSTON ARTHUR WAY, M.S. ANNE B. WEAVER, B.A. (1973) KATHLEEN BEAVINGTON WEBB, B.S. FRED CLARENCE WEBSTER, Ph.D. CHRIS G. WOELFEL, Ph.D. ALICE M. WRIGHT, B.S.

Dean Director Dairy Bacteriologist **Animal Scientist** Urban Youth Specialist Agricultural Economist Extension Economist Area Resource Development Specialist Animal Pathologist Government Liaison Specialist Horticulturist **Program** Assistant Nutritionist 4-H Community Development Assistant R.C.D.A. Resource Specialist Agricultural Economist Area Resource Development Specialist Area Community Affairs Specialist Associate Agronomist Forester Dairyman Marketing and Utilization Specialist Agricultural Economist, and Environmental Programs Coordinator Housing Specialist Associate Editor Assistant Editor Dairyman, DHIA **Outdoor Recreation Specialist** Entomologist Associate Editor Supervisor and Program Leader (Youth Work) Poultryman Urban Youth Specialist Housing and Utilities Engineer Specialist Entomologist **Ornamental Horticulturist** Director, Windsor Low Income Center Home Management Specialist Supervisor and Program Leader (Youth Work) **Resource Economist** Assistant Nutritionist Editor Supervisor and Program Leader (Home Economics) Supervisor and Program Leader and Rural Development Specialist Area Resource Development Specialist Clothing Specialist Agricultural Engineer Area Resource Development Specialist Trainer, Evaluator and Statistician Assistant to Director Health Education Specialist Animal Pathologist Agronomist 4-H Community Development Assistant Associate Editor Agricultural Economist, Marketing Dairyman Assistant Nutritionist

County Extension Agents

Addison County LUCIEN DEMERS PAQUETTE, M.E.Ed. (Agriculture) JOHN FRANKLIN STEPHENSON, M.E.Ed. (Agriculture)

Middlebury Middlebury
EXTENSION SERVICE STAFF

MRS. LEONA WARREN THOMPSON, B.S. (Home Economics) BERNARD MAURICE NADEAU, B.S. (Youth)	Middlebury Middlebury
Bennington County JOHN CALVIN PAGE, M.S. (Agriculture) WILLIAM SNOW, B.S. (Youth)	Bennington Bennington
Caledonia County PHILIP KAIR GRIME, M.E.Ed. (Agriculture) MRS. ALICE IOHNSON BLAIR, B.S. (Home Economics) PAMELA J. AINSWORTH, B.A. (1973) (Youth)	St. Johnsbury St. Johnsbury St. Johnsbury
Chittenden County ROBERT LACKIE CARLSON, B.S. (Agriculture) LOUELLEN WASSON, B.S. (Home Economics) ERIC C. NICHOLS, B.A. (1973) (Youth)	Essex Junction Essex Junction Essex Junction
Essex County TIMOTHY M. WHITE, B.S. (Agriculture) S. ELLEN ROWE, B.S. (Home Economics)	Guildhall Guildhall
Franklin Countw ERDEN WELLS BAILEY, B.S. (Agriculture) DONALD JAMES McFEETERS, M.S. (Agriculture) MARILYN S. WADE, B.S. (Home Economics) KATHERINE A. STAHL, B.A. (1973) (Youth)	St. Albans St. Albans St. Albans St. Albans
Grand Isle County ROBERT ELLIS WHITE, B.S. (Agriculture)	North Hero
Lamoille County SILAS HAMILTON JEWETT, B.S. (Agriculture) BEATRICE F. BUXTON, M.S. (Home Economics) NANCY J. LONG, B.S. (1973) (Youth)	Morrisville Morrisville Morrisville
Orange County GORDON VOLNEY FARR, B.S. (Agriculture) MRS. SHIRLEY HALL CUSHING, B.S. (Home Economics) MRS. JUDITH CLARK, B.A. (Youth)	Chelsea Chelsea Chelsea
Orleans County ROGER DAVIS WHITCOMB, B.S. (Agriculture) JOHN ROBERT PRICE, B.S. (Agriculture) MRS. MARION MCIVER BUCKLAND, B.S. (Home Economics)	Newport Newport Newport
Rutland County WILLIAM MICHAEL COREY, M.S. (Agriculture) DAVID PAUL NEWTON, M.S. (Agriculture) MRS. BETHIA NOBLE MUNGER, B.S. (Home Economics) CHESLEY PECK HORTON, M.Ed. (Youth)	Rutland Rutland Rutland Rutland
Washington County EDWARD L. BOUTON, B.S. (Agriculture) MRS. HAZEL C. BROWN, M.S. (Home Economics) DONALD ROBERT WHAPLES, M.S. (Youth)	Montpelier Montpelier Montpelier
Windham County RAYMOND IRVING PESTLE, JR., M.S. (Agriculture) NANCY T. LENT, B.S. (Home Economics) HOWARD HARRY SMITH, B.S. (Youth)	Brattleboro Brattleboro Brattleboro
Windsor County JOYCE WILLIAM SUMNER, B.S. (Agriculture) NANCY E. PARR, B.A. (1972) (Home Economics) EDWARD WALTER GOODHOUSE, B.S. (Youth)	Woodstock Woodstock Woodstock

Introduction

Webster defines a university as an educational institution of the highest level, typically with one or more undergraduate schools or colleges, together with a program of graduate studies and a number of professional schools, and authorized to confer various degrees, as the bachelor's, master's, and doctor's. A university is that and more—it is a community of scholars, skilled and seeking knowledge and understanding in a wide range of specialized fields, holding and seeking degrees in those fields; sharing a common campus and classrooms, laboratories, library, and other resources which support and make it possible for students and teachers to work together in pursuit of mutual and individual interests.

Today, more than ever, a university offers for the prospective student an opportunity to live and work in a community where he or she may find or make a place to suit his or her needs, and to achieve satisfaction and success commensurate with individual application.

It is still possible today, as probably it has always been, to achieve a degree without truly achieving an education and, regrettably, it is still true today that colleges and universities cannot always motivate each student to achieve his full potential or to find in formal education answers to the problems of his or her life.

But a university offers the student perhaps the broadest opportunity available in our free society to explore and advance his or her understanding of our heritage and the means which knowledge and understanding afford us of preserving and advancing what is best of our society.

The University of Vermont is the state and land-grant university of Vermont, one of a handful of U.S. institutions of higher education founded in the eighteenth century, the 20th oldest U.S. institution of higher learning authorized to grant degrees and the second founded by state legislative action to offer instruction at the university level.

It is a relatively small university—with approximately 8,000 students in its undergraduate, graduate and medical programs. It offers a wide range of opportunities (over 150 programs leading to 31 degrees) for students to elect to specialize through the College of Arts and Sciences, the College of Agriculture, the Cotlege of Education, the College of Engineering, Mathematics and Business Administration, the School of

Home Economics, the School of Natural Resources, Environmental Program, and the Division of Health Sciences with its College of Medicine, School of Allied Health Sciences, and the School of Nursing. Advanced degree programs are offered through the University's Graduate College. Summer and evening programs provide additional study opportunities through the Division of Continuing Education.

The University is located at Burlington, Vermont, with the Green Mountains on the east and Lake Champlain and the Adirondacks to the west.

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

The University of Vermont is a research, as well as a teaching center, and undergraduate as well as graduate and medical students have opportunities to participate in a varied program of research activity. Currently about 500 research projects supported by more than \$8,000,000 in grants from interested federal, state and private agencies are being carried out in such fields as cancer and heart research, muscular dystrophy, pollution, drug use, highway safety, color X-rays, ultrasound, thermal stress, origins of the cold war, ancient ethics and economic theory, leaf growth, microbial ecology of Lake Champlain and—perhaps a good place to stop—brain currents.

As the modern university emerges as an institution whose full resources serve a widening constituency, so are the education, research and service resources of the University of Vermont increasingly focused toward involvement with current and major problems and needs of our society. As a state and land-grant institution, the University of Vermont enjoys this role as a matter of tradition, and its faculty, staff and students are engaged in a wide range of programs which touch or affect the lives of citizens within the state and beyond its borders. Students and faculty have shown a growing interest in the need to foster and encourage a more meaningful dialogue both on and beyond the campus boundaries.

Regional Cooperation

The University of Vermont is an active participant with the Universities of Connecticut, Maine, Massachusetts, New Hampshire, and Rhode Island; and with Lowell Technological Institute, and the public two-year colleges and technical institutes in a program of regional cooperation aimed at increasing educational opportunities for qualified young men and women of the New England states. Under the program New England residents are given resident tuition privileges in certain specialized curricula. A special brochure detailing these specialized

curricula, has been prepared by the New England Board of Higher Education and is available through the Board, 20 Walnut Street, Wellesley, Mass. 02181.

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

REGIONAL PROGRAMS

OFFERED BY VERMONT	ТО			STUDENTS FROM	
	Conn.	Me.	Mass.	<i>N.H</i> .	R.I .
Canadian Area Studies	x	x	x	x	x
Classics		х			х
Dairy Technology		х		x	x
Radiologic Technology*	x	х	x	x	х
Latin					x
* Two-year program					

The University Libraries

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

The Bailey Library is a depository for United States and Canadian government publications, and acquires newspapers, pamphlets, maps, and materials in microfilm. The Special Collections Department includes books and manuscripts from the library of George P. Marsh, a significant Masefield poetry collection, and its Wilbur Collection is rich in books and manuscripts of those associated with the State, including Ira Allen, Henry Stevens and Dorothy Canfield.

The Physics and Chemistry Library is located in the Clinton D. Cook Physical Sciences building.

The University Archives in the Waterman Building contain the permanent official records of the University.

The Robert Hull Fleming Museum

The Museum houses the University collection of art and archaeolo-

38

gy. Through its displays, special exhibits, lectures, films and other activities, it has served the cultural life and educational needs of the campus and the people of Vermont since first established as the Park Gallery in 1873. Selections from a collection of some 6000 items covering the history of art are arranged to enrich teaching in various fields, particular galleries given to Ancient, Oriental, Tribal, American and European art. Two galleries are set aside for changing exhibitions that augment the collection, focusing on contemporary, of Museum staff contributions to art, architecture and the crafts.

The Museum also offers a program of lectures, gallery talks and discussions, of films, guide services for schools and interested groups, and, in collaboration with Art Education, classes for children.

The Museum Association, open to the public, is composed of friends whose support makes possible the continued growth of collection and activities.

A study center for students and faculty, particularly those in art history and museology, the Museum houses the Art Department collection of 35,000 slides and photographs and a reference library. Museum staff serve as part-time faculty. Students work with the collection and with exhibitions and other Museum projects.

The George Bishop Lane Artists Series

The George Bishop Lane Artists Series is one of the major collegiate artists series in the country, inaugurated in 1955 by a gift from the late Mrs. Lane, in honor of her husband, George Bishop Lane of the Class of 1883.

The Lane Series brings to the campus and community a continuing program of musical, theatrical, dance and other artistic productions.

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, including the London Philharmonia, the Vienna Philharmonic, the Philadelphia Orchestra, the Cleveland Orchestra, the Chicago Symphony Orchestra, the Moscow Philharmonic Orchestra with David Oistrakh, the Royal Ballet of London, the American Ballet Theatre, Rudolf Serkin, Artur Rubinstein, Van Cliburn, Isaac Stern, Nathan Milstein, Andres Segovia, The Vienna Choir Bous, the Weavers, the Robert Shaw Chorale, the Budapest String Quartet, Dave Brubeck, Errol Garner, Benny Goodman, Victor Borge, Al Hirt, Mantovani, Harry Belafonte, Joan Baez, Maurice Chevalier, Bill Cosby, Ella Fitzgerald, Henry Mancini, Sir John Gielgud, Roberta

Peters, the New York City Opera Company, the Metropolitan National Opera Company, the D'Oyly Carte Opera Company, and a number of plays including *Tea and Sympathy*, *Li'l Abner, Camelot*, *Man for All Seasons, Look Homeward, Angel, J. B., Hello, Dolly!*, *Hair, Jesus Christ Superstar*, Robert Merrill, Georg Solti (conducting the Chicago Symphony Orchestra), Lily Tomlin, Mary Travers, Godspell, and Applause.

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

Conferences and Institutes

An increasing number of groups hold educational conferences, institutes and seminars on the campus of the University, which is pleased to cooperate in making its facilities available for this purpose whenever it is possible to do so. Charges are made to cover costs to the University.

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

Educational Television

Vermont Educational Television is a state-wide network serving the schools and general public of the State of Vermont, and is owned and operated by the University of Vermont. The UHF television facility transmits in-school programming for grades 1 through 12 each week day. Evening programming includes network and locally-produced programs of both entertainment and instructional variety. In-service programs for specific vocational interests are aired, and courses are given for credit through the Evening Division of the University of Vermont.

Vermont Educational Television has received several national awards for locally produced programs.

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

Student Life

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

Student Personnel Services

Student Personnel Services are available to assist students in the development of individual or group goals. These services include the offices of Student Personnel Deans, Director of Intercollegiate Activities, Director of Testing and Counseling, Director of Admissions, Director of Financial Aid, Director of Placement, Director of University Health Services, Advisor to Foreign Students and Scholars, Director of Housing, and the Director of Student Activities.

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

COUNSELING AND TESTING CENTER The Counseling and Testing Center has been established to aid stu-

dents toward becoming maximally effective as students and as persons. To help each student benefit from his university career and develop to the full limit of his potential, professional psychological services are provided for a wide range of concerns—educational, vocational, and personal. The Center offers confidential individual or group counseling and testing to all matriculating students. Referral to other appropriate specialities such as Psychiatric Services, Reading Center, and Placement Office is also available.

CAREER PLANNING AND PLACEMENT SERVICE The Career Planning and Placement Service is organ-

ized to assist students and alumni in searching out and securing employment opportunities which will afford them the greatest satisfaction and utilization of their competencies. Many services are available through the office which will assist students and graduates in their occupational pursuits. An active on-campus career employment recruiting

program is offered along with group and individual advisement. Assistance is offered in establishing Placement credential files, interviewing techniques, and resume writing in preparation for entry into the job market. Students also have access to an expanding career library which contains full-time positions, occupational briefs, the latest job market trends, salary surveys, and company literature which will help them in researching the various career fields and employers. The office also provides part-time and summer job opportunities.

FINANCIAL AID The University Financial Aid office counsels students on financial problems and administers the University's Scholarship and Loan Funds.

VETERANS ADMINISTRATION BENEFITS Students who are eligible to receive educational benefits from the Vet-

erans Administration under the provisions of Public Laws 634 (veteran's child), 894 (disabled veteran), or 89-358 (veteran who served on active duty with the Armed Forces after January 31, 1955) should present a "Certificate for a Program of Education" or a "Certificate of Eligibility" to the Office of The Registrar at the time of registration. If the student is presently in training at another institution, he should complete a "Request for Change of School" form which may be obtained from his regional V.A. office. Questions regarding Veterans Administration benefits should be directed to the Office of The Registrar.

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

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

University Health Services

The University Health Service has resources for maintaining the well-

being of the students. There are provisions for medical, minor surgical, orthopedic, gynecologic, and short-term psychiatric care as is necessary. Problems requiring sophisticated and prolonged care may be treated at the Medical Center Hospital of Vermont, or when feasible, at a hospital nearer the student's home. When long-term psychiatric therapy is necessary, it must be accomplished through a psychiatrist outside the Health Services at the student's expense. Pre-participation physical examinations and care of athletes is supervised by Health Services physicians.

The University Health Service is staffed by a Director, full-time staff physicians, and consultants in several specialty areas. The Nursing Staff consists of an Administrative Supervisor and nine registered Staff Nurses. The two Trainers are Registered Physical Therapists who administer their care at the Infirmary and Patrick Gymnasium Training Room. A part-time laboratory technician completes the professional staff.

The Infirmary is open all year; a nurse and members of the Rescue Squad are present at all times; physicians present during the week-days, and a physician on call nights and weekends for emergencies.

With the student's permission, parents will be notified of serious illness, injury, or admission to hospital.

Each student required to pay the Health Service fee is entitled to such routine medical care as is needed and as the Health Service can render during the academic year. Five days of no cost in-patient care at the Infirmary are granted. Beyond five days, the student will be charged \$20.00 per day for in-patient care.

Medical excuses from class activities due to illness or injury must be administered by the University Health Service.

Housing

Full time undergraduate students may live in University residence halls. Upper class students who are actives or pledges of a fraternity or a sorority may register for University residence hall housing or chapter housing. All freshman students except those living at home and commuting, or those living with their spouse, must live in University housing.

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

Facilities for doing personal laundry are provided in residence areas as well as space for the storage of trunks, baggage, bicycles and skis. Bed linen and towels may be furnished by the student or rented from a commercial linen service which provides weekly delivery of two sheets, a pillow case, and three towels. Students provide their own window draperies, pillows, metal wastebaskets, bureau covers, desk and reading lamps. All students living in the residence halls must have board contracts.

In order to facilitate maximum educational growth from the residence hall experience, a diversity of residence halls and programs are offered. There are freshman halls, upperclass halls, an environmental hall, and a French house. Each residence hall is under the guidance and direction of a Resident Adviser who is a member of the Student Personnel Staff. In addition, the Resident Adviser is assisted by specially selected undergraduate Resident Assistants. These staff members encourage the development of intellectual, social, and cultural programs and assist the residents in their growth toward maturity and responsible self direction. Each student in the residence halls is a member of his residence hall student government organization which represents student opinion and which provides educational and social programs for its constituents.

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

C. Married Student Apartments. Located just outside Winooski on Route 15, at historic Fort Ethan Allen, the University's Married Student Apartments are a four-mile drive from the main campus. Built in 1969, the development consists of 89 partially furnished apartments located in eleven two-story buildings. There are 56 garden apartments (42 two-bedroom and 14 one-bedroom) and 33 town house apartments (all two-bedroom). A centrally located service building contains laundry facilities and a multi-purpose community room. Within the complex are three ample parking areas.

Each apartment is furnished with an electric stove, refrigerator and water heater, kitchen cabinets and shelves, garbage disposal, and wallto-wall carpeting. Every apartment has a private entrance and mailboxes are provided. The apartments are heated electrically and each room is individually controlled.

The apartments have achieved nationwide acclaim for their architectural design. Additional units are in the planning stage.

Detailed rental information may be obtained from the Director of Off-Campus Housing, 600 Dalton Drive, Winooski, Vermont, 05404.

D. Off-Campus Housing. University students eligible to live offcampus may utilize the facilities of the Residence Halls Office in locating suitable housing in the greater Burlington area. This office provides a free listing service by which community landlords and rental agents are able to make known their housing availability to those persons associated with the University.

Students may examine up-to-date listings for available apartments, houses, and rooms for rent and information about houses for sale at the Residence Halls Office or on a bulletin board just off the College Street entrance of Waterman Building on the main campus. The University is not responsible for the approval of off-campus housing facilities. It is impractical to send information concerning individual listings by mail. A catalog of available listings is issued each May, August, and December

Additional information concerning housing off-campus may be obtained by contacting the Residence Halls Office, 25 Colchester Ave., Burlington, Vermont, 05401.

Student Activities

The University officially recognizes the activities of a number of organizations supplementing the social, cultural and recreational needs of students. Because it is within this context that qualities of leadership may be developed, the University encourages participation consistent with its scholastic requirements. The students manage the affairs and finances of recognized organizations within the framework of the University's regulations.

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

THE BILLINGS CENTER The major function of this multi-purpose building, located in the former Billings Library,

is to provide the "where" for co-curricular activities in an atmosphere consistent with the goals of the University for individual development. Billings provides facilities for lectures and other programs sponsored by the various student organizations; small group conference rooms; study and recreational lounges; and snack bar facilities in the Catamount Den.

As the focal point of many student activities, most campus organization offices are located in Billings. Included are the Director of Student Activities; Student Association; Panhellenic Council; Fraternity Forum; *Cynic; Ariel;* Billings Center Governing Board; Concert Bureau; and Speakers & Films.

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. There are many opportunities for students to participate in the work of the standing or ad hoc committees.

INTER-RESIDENCE ASSOCIATION (IRA) The Inter-Residence Association is a government which represents

the students living in University residence halls. The government, consisting of an executive board, legislative council and judicial board, provides leadership for residence hall students, representing their interests to other constituencies within the University community.

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

The Phi Beta Kappa Society established the Vermont Alpha Chapter at the University in 1848, and initiates are chosen primarily on the basis of high scholastic standing, with emphasis on a broad distribution of liberal studies, including language and literature. The local chapter was the first in Phi Beta Kappa to initiate women into membership.

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

The Society of the Sigma Xi, established at the University in 1945,

initiates those who have proved their ability to do research in one of the sciences including students who have a high scholastic standing.

Other national honorary societies include Alpha Omega Alpha, medicine; Alpha Zeta, agriculture; Kappa Delta Pi, education; Tau Beta Pi, engineering; Omicron Nu, home economics; Delta Sigma Rho-Tau Kappa Alpha, debating; Sigma Phi Alpha, dental hygiene; National Collegiate Players, dramatics; and Alpha Lambda Delta, freshman women's scholastic; Ethan Allen Rifles, outstanding students in the Reserve Officers Training Corps; Pershing Rifles, a military fraternity.

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

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

ATHLETICS, RECREATION AND INTRAMURAL PROGRAMS A program of intercollegiate com-

petition for men is maintained in basketball, cross-country, football, golf, hockey, indoor track, skiing, soccer, swimming, tennis, track. The athletic policies of the University are under the recommendation 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 State Universities in New England, of the National Collegiate Athletic Association, the New England Intercollegiate Athletic Association, and the Eastern College Athletic Conference. The program of Physical Education offers an excellent program of intramural sports which provides for voluntary participation by students in all classes. Competition in nineteen different sports activities is arranged among fraternities, sororities, residence halls, independent groups, and individuals. In addition to regularly scheduled intramural contests, the facilities of Patrick Gymnasium are available at various times during the week for recreational free play in a wide variety of sports activities.

The Women's Recreation Association, open to all women students, sponsors intramural, extramural, and intercollegiate sports events for

women in a variety of team sports, individual, dual, and recreational activities. Through its program, WRA endeavors to provide opportunity for leadership and to encourage participation in and administration of recreational activities and service projects for all women students.

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

FRATERNITIES AND SORORITIES Chapters of Greek letter fraternities and sororities have long been recognized as

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

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

The University Band appears at football games, presents formal concerts, and makes a spring concert tour. The University Choir and the Choral Union give three annual concerts and the Madrigal Singers sing for various groups around the State. The University Orchestra presents two annual concerts, assists the Choir in a third, and plays for musical productions.

THE OFFICE OF VOLUNTEER PROGRAMS The Office of Volunteer Programs is a "partnership" between students and the University administration to make full use of facilities and human resources to meet the pressing human needs that

exist in the communities surrounding the campus and elsewhere in Vermont. OVP's task is to assist students who want to be involved by providing information on where needs are, assistance in project planning, guidance in working out academic linkages and other support services such as transportation, recruitment, financing, training and publicity.

Volunteers work independently or in projects organized by several volunteers, which may include community and faculty as well as students, under advisement of community agency personnel and OVP. A student Project Coordinator may assume responsibility for coordinating the work of volunteers in his project. The Project Coordinator participates in a weekly Project Coordinators Council to assist in development of new projects and to administer Student Association appropriations in support of volunteer efforts.

The federally funded University Year for Action program is provided by OVP as a means for experienced student volunteers to spend a full year in a community project while linking learning and action. Approximately 50 students each year work in areas such as health, education, legal services and social services, in projects that assist in meeting the problems of poverty. UYA volunteers mobilize resources, do liaison and organizational work to achieve planned objectives in their projects. A learning program is tailored to meet the personal and educational objectives of each student within the context of his year long project. UYA students are expected to live in the communities where they serve, on a subsistence stipend, and to utilize university and faculty resources as needed to achieve project objectives.

OVP Staff: Harold D. Woods, Director; John Engroff, Academic Coordinator; David Osgood, Field and Training Coordinator.

DRAMA, DEBATING, TELEVISION, AND RADIO The Arena Theatre in the Fleming Museum is the

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

The Lawrence Debate and Discussion Club provides opportunities for participation in all types of forensic activities—debate, discussion, oratory, after-dinner, and extemporaneous speaking. Members of the

club appear before service clubs, farm organizations, high schools, and other groups throughout the state. The members of the club participate in more than three hundred intercollegiate debates annually, with the beginners getting as extensive an experience as the veterans. The club travels to various discussion programs and to outstanding tournaments in the East. Outstanding performers receive recognition by election to Delta Sigma Rho-Tau Kappa Alpha, the national honorary forensic fraternity.

Two radio stations and one television station are located on campus. WRUV-AM is a wired-wireless station which has been broadcasting primarily to the campus since 1954. It is managed and staffed by undergraduate students. WRUV-FM is a 10-watt-educational station which began operation in 1965. Under faculty supervision, students operate this station as an integral part of the academic program in broadcasting offered by the Department of Speech. The station serves the area within 10-15 miles of the University. Opportunity is provided for students to participate in the production of these programs.

STUDENT PUBLICATIONS The opportunity for journalistic, literary, and editorial expression is open to students interested in membership on one of the three major student publication staffs: the newspaper, *Cynic*, published weekly; the literary magazine, The News and Weather; and the yearbook, the Ariel.

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.

Admission to the University

The University of Vermont welcomes applications from all interested students regardless of race, religion, nationality, or sex. Prospective freshmen and transfer students interested in applying for admission in either January or September can receive applications by writing to: Office of Admissions, Clement House, University of Vermont, Burlington, Vermont 05401. Applications for admission in January should be received in the Admissions Office by December 15, while applications for admission in September should be on file by February 1. An early notification program is available for prospective freshmen who are residents of Vermont. Vermonters applying under this program will be notified concerning admission by December 7 if the application, high school transcript, SAT scores and recommendations have been received by November 1. Upon filing an application, all candidates are required to pay a non-refundable \$15.00 application fee which is used to meet the cost of processing the application.

The University differs from a number of other colleges in *not* requiring a personal interview. The recommendations which teachers, guidance counselors, and others write on behalf of a student usually provide more valid and perceptive information about an individual than could be derived in a short interview. The application also gives each applicant an opportunity to provide any additional information which might be helpful. If for any reason the University feels that a personal interview would be helpful, the applicant will be contacted in order to make arrangements for an appointment.

Qualification for admission is determined on the basis of the secondary school record, rank in graduating class, recommendations, and College Entrance Examination Board Scholastic Aptitude Test results. Each application is carefully reviewed by the Admissions Office Staff and by the College or School to which the student is applying, and the candidate's record is thoroughly examined in order to determine whether the tudent has adequately prepared for the academic program of his choice.

Sons and daughters of alumni of the University of Vermont are given special consideration. Increasing competition means that the University must evaluate the application of each alumni son or daughter in terms of the total numbers of applications, their relative qualifications, and

ADMISSION TO THE UNIVERSITY

the limitation which must be placed on the number of applicants who may be offered admission in the various academic programs which are available.

Most prospective freshmen present at least 16 high school units, including a minimum of four years of English, two years of mathematics, two years of a foreign language, two years of science, and two years of social sciences.

The two years of mathematics should be one year of algebra and one year of geometry. Students who plan to specialize in engineering, forestry, mathematics or science should present both a second year of algebra and a course in trigonometry for a total of four years of mathematics. For students planning to major in nursing, high school courses in biology, chemistry, and physics are highly recommended.

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

Additional courses in mathematics, history, science, the fine arts and music, and a third year in the foreign language are recommended as desirable preparation for college. In evaluating the secondary school record, careful attention is given to the course load a student has been carrying and any advanced work is given special consideration. A student planning to major in music must arrange for an audition and interview with the chairman of the music department during the year preceding entrance.

Types of Enrollment

DEGREE STUDENTS Students who have presented appropriate credentials for admission and have been accepted as students in

a degree program.

NON-DEGREE STUDENTS Students who have presented minimum credentials and are permitted to undertake *limited*

course work for a purpose *other than* the earning of a degree. Nondegree students must be officially approved and registered as such, and are subject to all regulations of the University.

Undergraduate Non-degree Students, those seeking *only* undergraduate credit for course work taken, apply for approval to the Division of Continuing Education which will act as their college office.

Graduate Non-degree Students, those seeking graduate credit must apply for approval to the Graduate College.

College Entrance Examinations

The College Entrance Examination Board will administer a series of scholastic aptitude tests during 1973 on November 3, and December 1, and in 1974 on February 2, April 6, and June 22. Complete information may be obtained from the College Entrance Examination Board, P.O. Box 592, Princeton, New Jersey 08540.

Transferring to the University

Students interested in transferring to the University may apply for admission in either January or September. Applications for mid-year admission should be filed by December 15. Applications for fall admission should be filed by February 1. Transfer candidates should see that official transcripts of their high school and college records as well as a confidential report from the college previously attended are sent to the Office of Admissions in time for prompt consideration.

A student who transfers to the University from another accredited college or university may be given provisional credit for all courses satisfactorily completed, provided that similar courses are counted toward graduation at the University of Vermont. Transfer credit is not allowed for work completed with grade "D" or its equivalent, unless a more advanced course in the same subject has been passed with a higher grade in the institution from which the student transfers.

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

Advanced Placement and Advanced Credit

The University of Vermont welcomes applications from high school students who have taken college level courses offered in their high schools under the Advanced Placement Program of the College Entrance Examination Board. Scores of three or higher on advanced placement examinations are awarded appropriate credit by the Registrar. Test scores of two will be evaluated by the department in order to determine whether credit should be granted.

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

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

Credit by Examination

A matriculated student who wishes to do so may, under the following conditions, receive credit for a course by taking a special examination and paying the special examination fee charge of \$10 per credit hour.

A request for such an examination must be made in writing at least one month before the date of the examination, and it must be approved by the student's advisor, the chairman of the department in which the course is given, and the academic Dean, in that sequence. The student must neither have audited, previously received a grade, nor have attempted a prior special examination in this course at the University of Vermont or at any other institution of higher education. Upon passing the special examination, as determined by the examiner and the chairman of the department in which the course is given, the student receives credit, but not a grade, for the course. Credit by examination forms are available in the Office of the Registrar.

College Level Examination Program

The University of Vermont will grant credit on passing the College Level Examination Program (CLEP) General Examinations at the 50th percentile or better based on the sophomore norms (for those examinations which the relevant UVM departments have determined to be satisfactory. Departments may supplement CLEP results with their own examinations). The credit awarded will not exceed six (6) hours in each of five examinations for a total of thirty (30) hours. These credits may be applied toward distribution requirements and to the total hours specified for a particular degree program. No grade will be awarded and the number of credit hours will not be considered in determining cumulative average.

Pass-No Pass Option

Students, starting with the sophomore year, may elect to take certain of their courses on a pass-no pass option, with approval of their advisor. Please see page 69 for additional details.

Credit for Military Service

A veteran who has been accepted into a degree program may, upon presentation of DD Form 214, Report of Transfer or Discharge, receive certain credit for this experience. If the student has completed from six months to one year of military service, a total of up to six hours of credit may be accepted as meeting the requirements of Military Science at the freshman and sophomore levels in those Colleges in which credit for military science is allowed. If the student has completed more than one year of military service, up to 12 hours of credit may likewise be accepted. In addition, the individual will be exempt from the physical education requirement.

The university accepts all college level credits earned through the United States Armed Forces Institute providing that credit is applicable to the degree program and, in addition, credit is granted for service schools completed, as recommended by the American Council on Education.

Orientation Program

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

Student Expenses

The student expenses outlined in the following paragraphs are only anticipated charges for the academic year 1973-74. Changing costs may require an adjustment of these charges before the opening of college.

APPLICATION FEE An application fee of \$15.00 is charged each applicant for admission to the University.

ORIENTATION FEE AND ADVANCED TUITION PAYMENT All undergraduate applicants who have been ac-

cepted by the University are required to pay \$175.00 in order to reserve a place in the next enrolling class. Twenty-five dollars of this payment is used to cover the costs of attending an orientation session. The remaining one hundred and fifty dollars is applied to the initial semester's tuition bill. The orientation fee is non-refundable. Partial refunds of the advanced \$150.00 tuition payment will be granted under the following conditions:

1. Students accepted for the spring semester will receive a refund of \$75.00 (half of the advanced tuition payment) if they notify the Admissions Office on or before January 11 that they do not plan to attend. Students who decide not to attend after this date will forfeit the entire payment.

2. Students accepted for the fall semester will receive a \$75.00 refund (half of the advanced tuition payment) if they notify the Admissions Office on or before June 1 that they do not plan to attend. Students who decide not to attend after this date will forfeit the entire payment.

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

UNDERGRADUATE STUDENTS

- 1. VERMONT RESIDENT: Taking from 12-18 credit hours \$475.00 per semester, plus \$40.00 per credit hour for each hour in excess of 18.
- 2. NON-RESIDENT: Taking from 12-18 credit hours \$1,275.00 per semester, plus \$110.00 per credit hour for each hour in excess of 18.

GRADUATE STUDENTS

- 1. VERMONT RESIDENT: 12 credit hours \$475.00 per semester, plus \$40.00 per credit hour in excess of 12.
- 2. NON-RESIDENT: 12 credit hours \$1,275.00 per semester, plus \$110.00 per credit hour in excess of 12.

THESIS COMPLETION FEE 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. SPECIAL EXAMINATION FEE (See page 54).

FEES FOR COURSES IN MUSIC, PEREORMANCE STUDY Private lessons are approxi-

mately one half hour in length, fifteen being given in each semester. \$60.00 per credit hour will be charged each student for such courses.

FORESTRY SUMMER PROGRAM The tuition for the Forestry Summer Program (see page 134) for Vermont residents is \$200.00; for non-residents \$288.00. In addition, there may be charges for transportation.

TECHNICAL NURSING SUMMER PROGRAM The tuition for the summer session (see page 241) will be at the summer session credit hour rate. Room and board are available for those desiring University housing.

LATE REGISTRATION FEE Failure to complete financial arrangements and registration by specified dates will result in a late fee of \$10.00.

ADVANCED DEGREE FEE A fee is charged to each recipient of an advanced degree according to the following schedule: PhD., \$25.00; Masters Degree (With thesis), \$20.00; Masters Degree (No thesis), \$10.00.

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

guiar futuon for undergraduate students include u	ie ionowing.
Vt. Resident tuition	\$ 950.00
Non-resident tuition	
Meals (contract 20 per week)	
Room	
Library and Gym bond fees	
Student Health Service fee	
Student Association fee	
Residence Hall Activities fee	6.00
Books and supplies (estimated)	
Vt. resident total	\$2,450.50
Non-resident total	\$4,050.50
	D. ITT.

Engineering students add about \$50.00 for instruments. Dental Hygiene students add about \$225.00.

Students in the professional nursing program add about \$85.00 for uniforms and special equipment prior to beginning clinical nursing courses in the Junior year; students in the technical nursing program add about \$75.00 at the time of Freshman registration.

PAYMENT OF BILLS All tuition, fees, room and board charges are payable in full upon notification and not later than at the time of registration. Advance payments are acceptable; checks should be made payable to the University of Vermont.

The University has made arrangements with The Insured Tuition Plan of Boston for those who desire to budget annual costs in monthly installments. Information about the various payment programs is sent to each incoming student. For advance information, please write to: Richard C. Knight Insurance Agency, Inc.

Insured Tuition Payment Plan,

6 St. James Avenue,

Boston, Massachusetts. 02116

Students who cannot meet their financial obligations because of unusual circumstances are encouraged to contact the Accounting Office prior to registration to discuss possible payment arrangements.

The University reserves the right to withhold all information regarding the record of any student who is in arrears in the payment of outstanding charges.

- -- ····

Refunds

TUITION

- 1. In the event of voluntary withdrawal from college, during the first week of any semester, the full tuition is refunded; thereafter, 20 percent is retained by the University for each week that has elapsed.
- 2. Any student who has paid in full the tuition for a semester and who withdraws for reasons of health or other causes beyond his control before the end of the semester, may, with the permission of his college dean and in lieu of any refund (see paragraph 1 above) elect to enroll for a ninth (final) semester without charge for tuition.
- 3. If a student is suspended, no refund is made. However, if he re-enrolls within three years, the tuition charge will be reduced by the amount previously paid.
- 4. If a student is dismissed for cause, a refund of tuition is made proportionate to the number of weeks remaining in the semester at the time of dismissal.
- 5. In case of death of a student, tuition paid is refunded in full.
- 6. A student who changes his status from full-time to part-time (fewer than twelve hours) by an approved change of enrollment during the first three weeks of a semester may be entitled to a partial refund of tuition, and appropriate fees, since the charges will be adjusted to relate his new status.

GYM BOND FEE A gym fee of \$30.00 per year (\$15.00 per semester) is charged to all full-time students. Students have the privilege of using the facilities in the gymnasium at scheduled times. This fee is assessed by legislative act and turned over to the State of Vermont each year to the extent necessary to retire the bond issue that was used to fund the construction of Patrick Gymnasium.

STUDENT HEALTH SERVICE FEE A fee of \$24.00 each semester is charged to all full-time degree students. For the Fall 1973 semester a surcharge of \$1.00 will be added to support the UVM Rescue Squad. Non-degree and part-time degree students will be eligible for Health Services by paying this fee. See page 42 for services provided.

STUDENT ACTIVITY FEE Full-time undergraduate degree students enrolled are charged a fee of \$21.50 per year (\$10.75 per semester). This fee is allocated by the Student Association toward the support of student

organizations and student activities. First-year medical students who enter the College of Medicine after three years in the College of Arts and Sciences are charged this same tee. Graduate students, part-time students, and students in the College of Medicine may, by paying this fee, become entitled to the benefits listed above.

VERMONT PUBLIC INTEREST RESEARCH GROUP FEE In response to a student referendum, the University has

agreed to bill each undergraduate degree student a special optional fee of \$3.00 per semester. Funds collected help support the activities of the Vermont Public Interest Group.

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

LOCKER-TOWEL FEE All men enrolled in physical education activity courses and those who wish to have an assigned locker must pay a four dollar locker-towel fee each year or any portion thereof. This fee provides a lock and clean towel after each use of the gymnasium facility.

ROOM CHARGE Rooms in college residence halls are rented for the academic year and the prices are uniform in all residence halls. For each occupant of a room in a residence hall, \$292.50 per semester is charged. The charge for a single room, when available, is \$322.50. The charge for single occupancy of a double room, when available, is \$392.50 per semester. The residence halls are closed during the University recess periods and the University reserves the right to use student rooms to house University students in any of the residence halls during these recess periods. Normal charges for use of certain electrical appliances may be levied upon occupants of the residence halls. A \$3.00 per semester fee-is-charged each dormitory resident to be used for the Inter-Residence Association.

Written notice is required of any student cancelling his room contract. Any student cancelling his contract after June 7 but before the beginning of the Fall semester, will be assessed a \$50.00 penalty. Unless specifically authorized by the appropriate Student Personnel Dean, no cancellations will be honored after the opening of the Fall Semester.

A room key deposit of \$1.00 per year is also required, and returned upon the surrender of the key.

BOARD All students who live in a University residence hall are required to have meal contracts. A student may elect any one of four different meal plans. The choices are:

20 meals a week—\$578.00 per year (\$289.00 per semester)

15 out of 20 meals a week—\$530.00 per year (\$265.00 per semester)

12 out of 20 meals a week—\$500.00 per year (\$250.00 per semester)

9 out of 15 meals a week-(Monday-Friday)-\$410.00 per year (\$205.00 per semester)

A student may eat in any of the six dining halls on campus.

LIBRARY BOND FEE A library fee of \$30.00 per year (\$15.00 per semester) is charged to all full-time students except those registered in

the College of Medicine. Students enrolled in less than twelve hours but more than three hours will be charged a fee of \$15.00 per year (\$7.50 per semester). Students enrolled in three hours or less are not subject to the library fee. This fee

is assessed by legislative act and turned over to the State of Vermont each year to – the extent necessary to retire the bond issue that was used to fund the construction of Bailey Library.

OTHER CHARGES AND FEES

1. Refund of payments for board is made on a pro rata basis.

2. There is no refund of room rent.

3. There is no refund of student fees (Library, Gymnasium, Health Service, Student Activity), except as noted under 6, above under TUITION).

Check Cashing Facilities

The University Store cashes small personal checks for students in good standing on presentation of a current validated student identification card.

Financial Aid

Many worthy and deserving students are unable to meet college expenses and for them the University provides, so far as its resources permit, aid in the form of scholarships, loans, and employment. The extent of need and the type of financial assistance which can be awarded is determined by the Director of Financial Aid.

Entering students who want to apply for financial aid may do so by indicating their intention in the spaces provided on the Admissions Application Form and also submitting the Family Financial Statement directly to the American College Testing Program (preferably no later than April 1) with the notation that it be forwarded to the University of Vermont. The Family Financial Statement forms may be obtained from your high school or by requesting one from the Office of Financial Aid, 330 Waterman Building, University of Vermont, Burlington, Vermont 05401. General Information Definition of "Vermont Resident" Adopted by Board of Trustees October 2, 1971

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

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

In determining whether a student is a "Vermont Resident" for tuition purposes, the following shall apply:

- 1. A student who has attained the age of majority or is an emancipated minor shall be deemed to be a Vermont Resident if the student shall have had his domicile in Vermont for a period of one (1) year preceding the beginning of the semester in which the student seeks to register.
- 2. A student who is an unemancipated minor at the beginning of a semester shall be deemed to be a Vermont Resident during such semester if and only if, his parents, guardian or whoever stands in loco parentis to the student, had their domicile in Vermont for one (1) year preceding the beginning of such semester.
- 3. A student who at the beginning of a semester 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 Vermont Resident during such semester if, and only if, the circumstances claimed to have made the student a resident shall have taken place at least one (1) year prior to the beginning of such semester; provided, however, that a guardianship of a minor student shall not be deemed a basis for residence, if the primary purpose of the guardianship is to qualify the minor for resident tuition.
- 4. Whenever a resident student shall lose his Vermont domicile (as in the case of a minor whose parent or guardian moves from Vermont but excepting women who lose such domicile by marrying non-residents) the student shall be reclassified as a non-resident effective at the beginning of the next semester for which the student enrolls; and it shall be incumbent upon any student whose status so changes from Vermont Resident to non-resident to inform the Dean of his college, or the Registrar, promptly, of the facts relating to his residence.
- 5. The term "domicile" shall mean the place where a person is physically present and where he intends to permanently remain as a true, fixed and permanent home.
- 6. A student who has attained the age of majority or is an emancipated minor shall be deemed to have his domicile in Vermont if:
 - a. his parents, guardian or whoever stands in loco parentis to the student were domiciled in Vermont at the time he reached his majority or was emancipated, and the student has not acquired a domicile in another state, or
 - b. he has established a bona fide domicile in Vermont in accordance with paragraph 5.

- 7. A student who is present in Vermont for the primary purpose of attempting to qualify for resident tuition status shall not be deemed to have a bona fide domicile in Vermont.
- 8. Neither a student's presence in Vermont for purposes of attending an educational institution, registration in Vermont for the purpose of the draft and voting, Vermont motor vehicle registration and drivers license, employment in Vermont, the ownership of real property in Vermont, or the payment of Vermont taxes shall, by themselves necessarily be determinative of a bona fide domicile in Vermont.
- 8a. A student who is eligible for tuition purposes to enroll as a resident student in another state shall not be enrolled as a "Vermont Resident."
- 9. A student from another state who enrolls in an educational institution of higher learning in Vermont shall create a rebuttable presumption that he is in Vermont for purposes of attending such institution and will not be deemed to have established a bona fide Vermont domicile.
- 10. In determining whether a student has established a bona fide domicile in Vermont it shall be relevant to ascertain whether the student is receiving support from or is being claimed as an income tax exemption by his parent, guardian or person standing in loco parentis.
- 11. Students enrolling at the University of Vermont shall be classified by the Director of Admissions as a resident or non-resident for Admission and Tuition Purposes. The decision by the Director of Admissions shall be based upon information furnished by the student and other relevant information. The Director of Admissions is authorized to require such written documents, affidavits, verifications or other evidence as he deems necessary.
- 12. The burden of proof shall in all cases rest upon the student claiming to be a Vermont Resident.
- 13. The decision of the Director of Admissions on the classification of a student as a resident or non-resident may be appealed in writing to the Residence Committee.
- 14. The Residence Committee may make exceptions to the above rules whenever justice requires.
- 15. Appeals from the decision of the Residence Committee may be made, in writing, to the Board of Trustees, whose decision shall be final.

Academic Discipline

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

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

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

The disciplinary authority of the University is vested in the President. In such cases as he considers proper, this authority may be delegated to the several deans and to appropriate judicial bodies. **The continuance of each student**

at the University, the receipt by him of academic credits, his graduation and the conferring of any degree or the granting of any certificate are strictly subject to the disciplinary powers of the University. The University is free to cancel his registration at any time on any grounds, if it considers such action to be for the welfare of the institution.

University policy on the above matters is explained in detail in "The Green Pages," a handbook of rules and regulations concerning students, which is issued annually. Each student is held responsible for knowledge and observance of these rules and regulations.

Policy Statement on Campus Dissent and Disruption Adopted by the Trustees on December 5, 1970

The University of Vermont is a place to learn and to teach. It is not a cloister—it does not live in a vacuum. It is both in the world and of the world. Its mission is to educate people for leadership in society.

Board of Trustees, May 1969

As the above quotation suggests, the University functions within the rules governing a larger society. It was created by that society for a special purpose: the facilitation of learning and teaching.

It follows that the University's regulations must conform with the law as well as take account of the particular role of educational institutions.

Fundamental to our entire philosophy is our firm belief that rights guaranteed by the First and Fourteenth Amendments to the Constitution of the United States must be protected on the campus as elsewhere in our society and further, that civil laws must prevail on the campus.

Within the University setting as within society at large, the exercise of one's rights must be tempered by recognition of the rights of others. For example, the exercise of free speech may unreasonably infringe upon the right to learn. It should not be surprising that conflict may arise between parties engaged in activities which are individually lawful, for a fundamental function of social organization is the reconciliation of competing interests.

Within the University setting more than any other, the appropriate means for conflict resolution is rational discourse. The processes fundamental to the existence of the University cannot be abandoned under stress, especially since they represent the most effective means for progress. Further, the criteria employed to seek lawful accommodation of various interests must grant special attention to the central mission of the University; learning and teaching.

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

It is within this context that the University rejects the use or threat of force as a means of resolving differences. Violence is both unnecessary and inappropriate for those who have access to reasoned discourse and is unacceptable within an institution dedicated to reason. For those who will not or cannot contend within this arena, the University must, after efforts at persuasion have

failed, resort to the use of any legal remedy deemed necessary. Such persons, consequently, may expect appropriate responses from either the University or civil authorities or both. Normally, the University will respond first, when failure to do so would present a clear and imminent threat to proper functions of the University. Civil action will be invoked when non-students are involved or when the severity of disruption requires such a step.

GUIDELINES

Since a clear differentiation between legitimate dissent and coercive disruption is difficult, it is the purpose here to provide explanatory guidelines:

1) The Board of Trustees, Administration, Faculty, Staff, Alumni, and Students recognize the crucial importance of maintaining open communication and dialogue in the process of identifying and resolving problems which evolve from the dynamics of University life.

2) Coercive disruption initiated by any person or persons within the University community will be met by that action of the University which is necessary to restore order and the communication required for rational solution of problems. Such action may include suspension, expulsion and/or arrest. Coercive disruption is generally defined here as activity which imposes the will of other persons or groups within the University community, outside of established procedures for the expression of opinion and the resolution of differences.

Coercive disruption is construed to include activity which:

a) Denies the rights of students, the faculty, the staff or guests of the University.

b) Disrupts or obstructs educational and other activities of the University.

c) Reacts to the expression of the peaceful discourse of dissent of others by attempting to deny their rights.

d) Obstructs or restricts free movement of persons on any part of the University campus.

e) Denies the proper use of offices or other facilities to the students, faculty, officers, staff, or guests of the University.

f) Endangers the safety of any person on the University campus.

g) Threatens, or results in, the destruction of property.

It is to be understood that the phrase "educational and other activities of the University," includes the duly registered and lawful activities of recognized student organizations as well as other agencies of the University.

3) Because of its purpose, nature and function, it would be self-defeating for a University to attempt to prohibit or to even discourage dissent. Lawful and peaceful demonstration as an expression of favor or dissent should be permitted and protected.

4) Members of the academic community must be free to organize, discuss, pass resolutions, distribute leaflets, circulate petitions, picket and take other action which is not only lawful, but consistent with University policies and procedures; but they have an obligation to preserve the University's free and unhampered search for truth.

5) The activities of an individual or group of individuals cannot be allowed, in the name of free speech, to disrupt or interfere with the educational program.

6) Trespassers may be arrested and removed from University premises. Failure of a person on University property to follow a reasonably founded request to leave University facilities, expressed by one duly authorized to make such a request, makes him a trespasser.

7) The University may decide to exercise its authority as property owner to eject members of the public who seriously abuse their privilege of coming upon the campus.

8) When groups organize a demonstration on campus which becomes disruptive, action may be taken against the group as well as individuals involved.

9) Becoming a member of the University community in no way abrogates, or compromises the rights which the Constitution of the United States guarantees to all persons. This principle applies to the adjudication of violations of campus policies as well as all other areas.

Policy Statement on Discrimination Adopted by the University Senate September 13, 1968

As a public institution, the University of Vermont opens its doors and facilities to any student on the basis of his or her character and ability and irrespective of race, religion, color or nationality.

Use of English

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

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

Reserve Officers' Training Corps

GENERAL Through Army ROTC college graduates receive regular or reserve commissions as officers in the United States Army. The University's Department of Military Studies offers courses in world military affairs to all University students, whether or not they are members of ROTC. Additionally, special courses for ROTC cadets offer basic education and training in military subjects, with emphasis on leadership.

PROGRAMS Two programs are offered: (1) A four year program comprising one

course per term and a summer camp for six weeks between junior and senior year. (2) A two year program comprising one course per term during the junior and senior years, and two summer camps for six weeks each. Students are given pay and travel allowance for summer camp(s).

SCHOLARSHIPS Scholarships, available for four, three, two years and one year, provide tuition, books, laboratory fees and similar educational expenses, plus \$100.00 a month. The commitment is four years on active duty.

Applications for the four-year scholarships are made during the senior year in high school. Normally the cut-off date for submission is in January. News media keep the public informed as to the exact date. Interested students should request application forms from the U.S. Army Headquarters nearest to their home. Students living in the Eastern United States should write to: Army ROTC, P. O. Box 12703, Phil., Pa. 19134.

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

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

Physical Education

One year of physical education, normally completed during the freshman or 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 a commercial insurance company, students are able to procure a student health insurance policy. The present cost for one year's coverage is \$26.00. Married students may procure coverage for their spouse and children. Further details may be obtained from the Infirmary.

Enrollment and Registration

Every student is required to enroll and register for each semester on the designated days, unless excused in advance by the dean of the college concerned. Any student in attendance who does not pre-enroll and register for the next semester at the designated time will be considered as a dropped student and may apply for readmission after one semester. Specific directions are published for each semester.

Changes in Enrollment

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

Auditing Courses

With the approval of the Dean and the instructor concerned, a regularly enrolled student carrying a normal program may audit a course. Others who do not wish to receive credit, or who have not met admission requirements, may also register as auditors. Auditors have no claim on the time or service of the instructor, the course is not entered on the permanent record, and no grade credit is given for the work. Tuition is charged at the applicable rate. Under no circumstances will a change be made after the enrollment period to allow for courses audited.

The approval of the Dean of Evening Division and Summer Session is necessary for auditing courses in those divisions.

Undergraduate Degree Requirements

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

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

To be eligible for graduation, a student must have attained a cumulative average sufficient to meet the minimum requirements for the college in which the student is officially enrolled. Grades in courses accepted for transfer credit are excluded in computing this average.

Every candidate for a degree is required to have taken 30 of the last 42 semester hours of credit in residence at the University except that those who have completed three years of premedical study in the University are awarded their degrees after successful completion of one year of study in any approved college of medicine. Other exceptions to this rule may be made only on recommendation of the Academic Council and in cases of undue hardship. To qualify for a second bachelor's degree the candidate must have fulfilled all the requirements for the degree and must have taken a full year of work in addition to that taken to qualify for the first degree.

Honors

The Bachelor's degree may be conferred with honors, by vote of the Senate, in recognition of general high standing in scholarship. Three grades are distinguished and indicated by inscribing on the diploma the words *cum laude*, *magna cum laude*, or *summa cum laude*. In the College of Medicine, the five students who have attained the highest average of marks during the entire four years' course are graduated *cum laude*. The names of those who receive these honors and of those who win academic awards are printed in the commencement program.

Dean's List

The deans of the undergraduate colleges publish at the beginning of each semester the names of those full-time students who stood in the top 20% of each class of their college during the preceding semester. Full-time enrollment in this case shall amount to a minimum of twelve-credit hours in courses in which grades of A, B,C, D or F have been given.

Grades and Reports

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

A٠	Excellent	4 points per semester hour
B	Good	3 points per semester hour
С	Fair	2 points per semester hour
D	Poor	1 point per semester hour
F	Failure	0 points per semester hour
		• •

Penalties for Low Scholarship

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

1. "On Trial"—

- a. "On trial" is an intermediate status between good standing and dismissal. The student remains enrolled but under stated academic conditions according to college policies.
- b. Students are placed "on trial" by the dean, or the designated committee of the college concerned, who may also set the special academic conditions of the trial in each case. Normally the period of trial is one semester.
- c. The circumstances under which students are placed "on trial" are as follows:
 - (1) Any student who is readmitted to the University after having been dismissed for low scholarship re-enters "on trial."
 - (2) Generally a student is placed "on trial" if in any semester he has failed half or more of the hours of his enrollment but has been permitted to continue in college.
 - (3) A student whose record has been consistently below the graduating average or generally unsatisfactory in any semester may be placed "on trial" or continued "on trial" even though he does not come within the provisions of section (2).
- d. A student who has earned fewer than thirty semester hours of credit and is "on trial" is barred from participation in all athletic and other student activities.

2. Separation—

a. A student is dismissed from the University if he receives grades below passing in one-half or more of the semester hours of his enrollment in any semester unless he is allowed to continue by action of the designated committee.

- b. A student who fails to meet the condition of his trial or whose record has been unsatisfactory and consistently below the graduation average may be dismissed for low scholarship even though he does not come within the provision above.
- c. A student dismissed for low scholarship must address his application for readmission to the college from which he was dropped.

PASS—NO PASS course enrollments have been approved by the University Senate for implementation in September 1968. The action was taken in two parts:

FIRST, that any degree program student, not on academic trial, be permitted to take as many as six courses (or as many courses as he has semesters remaining for future transfer students) during his undergraduate career on a Pass—No Pass basis, beginning in his Sophomore year. These courses may not include any required by the student's major department, either for the major or for the degree. The student must complete all work normally required in these courses and he will receive full credit toward graduation for passing them. The instructor will NOT be informed of the student's status and the Registrar will record grades of "D" or higher as PASS and grades of "F" as NO PASS. Neither "P" nor "NP" grades will affect the student's grade-point average.

SECOND, that, in addition, any John Dewey Fellow may be permitted to take all his courses in a given semester on a PASS—No Pass basis, including his required courses. He may do this, after consultation with his adviser, as many semesters as he chooses, beginning in his sophomore year. The instructor will be informed of the student's status and may impose special work requirements for the course. The student will receive full credit for passing these courses. He may request any of his instructors to file a written evaluation of his work (NOT a grade) with the Registrar to be available, at the student's request, to admissions committees, employers, and the like.

Procedure-

- 1. Obtain a PASS—NO PASS Request Form from the Registrar's Office and consult your academic adviser.
- 2. Obtain your adviser's endorsement that the request conforms to the policy established by the University Senate. Any question about a course or courses being appropriately elected as Pass—No Pass for a student will be resolved by the student's college dean.
- 3. Submit your request to be placed on Pass—No Pass status at the Registrar's Office during the first five weeks of the semester. Requests to be removed from that status must be filed during the same period.

NOTE: Non-degree students cannot take courses on pass-no-pass basis.

Repeated Courses

A student who repeats a course loses any previous credit on record for that course. The previous grade is included in computing his cumulative grade average.

Academic Advisers

The policy regarding the selection of academic advisers is determined by each college. Students having questions, or requesting a change of academic adviser, should consult the dean of their college.

Intercollege Transfers

A student who is or has been a member of any college of this University may transfer to another college of the University only with the consent of the deans of the two colleges concerned. In the case of veterans receiving educational benefits through the Veterans Administration, the change must also be approved by the adviser to veterans in the Registrar's Office.

Withdrawal

A student who wishes to withdraw from college must first notify his academic dean in person or in writing.

Attendance

Class Attendance—Every student is expected to attend all regularly scheduled classes. This is a major responsibility of the student toward himself and toward the University. The primary penalty for non-attendance lies in the student's lessened grasp of the subject matter of the course.

It is the responsibility of the student to inform the instructor regarding reason for absence from class.

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

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

Absence from Semester Final Examinations—

- 1. A student who is absent from an examination for any reason must report that fact and the reason, in person or in writing, to his academic dean within twenty-four hours. If the absence was due to illness, a statement from the University physician must be presented. On the basis of this information, the dean may excuse the absence, in which case the grade is reported as "incomplete," and the student may take the examination at a designated time.
- 2. If the absence is not reported as described above, or is not excused by the academic dean, the course is recorded as failed.

Priority of University Exercises

University academic responsibilities have priority over other campus events. Attendance at:

- 1. Regularly scheduled classes have priority over special scheduled common hour examinations.
- 2. Common hour examinations have priority over attendance at other activities.
Tardiness

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

Right of Appeal

Any student who believes that he has been unfairly treated in regard to absences may appeal to his academic dean.

Other grades are:

- Inc. Incomplete. This grade applies to work of acceptable quality when the full amount is not completed because of illness or other emergency. It can be awarded only with the permission of the student's college dean. The dean may set the limit of time when the work of the course is to be completed. In no case shall this time be set longer than the beginning of the corresponding semester of the next academic year.
- NP Not Passed, not used in average computation.
- P Passed, not used in average computation.
- W Withdrawn, without penalty, not used in average computation.
- WF Withdrawn, failing. This grade is weighted as an "F" in the computation of averages.
 - M Grade missing-Not turned in by the Instructor.

Each student, former student, or graduate student may procure one transcript of his record without charge. For additional orders the charge is one dollar for each transcript.

The College of Agriculture

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

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

The evolution of society necessitates continual progress and change. Thus the challenge of preparing students to excel now, yet adjust to future changes, is being met through programs designed to give a foundation in the social sciences and humanities plus a fundamental technical education. These programs encompass such areas of study as agriculture, preveterinary medicine, and biological sciences.

Most programs in the College of Agriculture leading to the Bachelor of Science degree require 120 semester hours of prescribed and elective courses, plus credit for required courses in physical education. The normal semester program includes fifteen to eighteen credit hours of courses plus physical education.

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

THE HONORS PROGRAM

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

Students are selected on the basis of their academic performance--

usually after the completion of the sophomore year. Their curricula are developed in consultation with their adviser and an honors committee. 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.

DEGREE REQUIREMENTS

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

Agricultural Economics	Dairy Technology
Animal Industry	Environmental Studies
Animal Technology	General Studies
Applied Technology and	Occupational and Extension
Agricultural Engineering	Education
Basic Animal Science	Plant and Soil Science
Biochemical Science	Preveterinary Science
Biological Science	Resource Economics
Botany	

The programs are broad and flexible, with sufficient areas of concentration and electives to meet the specific needs and desires of the student. Therefore, responsible departmental advising is important in the development of each student's program. Every candidate for this degree, in consultation with his adviser, must choose one of the above programs upon entering the college. The candidate must then fulfill the requirements stated below.

Required of All Students

A. The successful completion of a minimum of 120 credit hours of course work plus credit in required courses in physical education.

B. The successful completion of at least two courses in each of the following areas:

- 1. Fine arts and humanities
- 2. Science and mathematics
- English, speech/drama, and writing
- 4. Social sciences

Applicability of courses to specific areas will rest with the adviser and, if necessary, with the concurrence of the dean of the college. It is further recommended that courses chosen to fulfill these requirements be taken outside the department in which the student's program of study is located. Students desiring to complete teacher education programs and teacher certification must enroll in appropriate courses in the college of education. (see College of Education Advisor—306 Waterman)

PROGRAMS OF STUDY

BIOLOGICAL SCIENCES CORE Students initially interested in general biochemical sciences may enroll in this interdisciplinary core curriculum for the freshman and sophomore years. In addition to general college requirements listed on page 73 of this bulletin, students must complete during this time the following courses or their equivalents:

Biol. 1,2 (Botany Dept. listings)

Math. 26 or 11

Chem. 3, 16

General Biochem. (Microbiology & Biochemistry 201) Course descriptions are listed under appropriate department.

Programs available upon completion of the core curriculum are listed below. Students who wish to may select one of these more specific programs during their freshman and sophomore years.



A description of each program listed follows. They are listed in alphabetical order along with the other programs of the College.

Department of Animal Pathology

PREVETERINARY SCIENCE Veterinary Medicine today offers more challenges and new opportunities than ever before. Since there

are only 18 colleges of veterinary medicine nationwide and some have student contracts with neighboring states, candidates preparing for admission must compete with many applicants with superior grades. Cornell University and the University of Pennsylvania, the two nearest colleges, now require 3 years (90 semester hours) of preveterinary college work. In addition Cornell requires experience with farm animals and applicants are encouraged to work with a practicing veterinarian.

The preveterinary science program leads to the degree of Bachelor of Science. Students with a 3.2 point (B+) average or better may apply to colleges of veterinary medicine at any time after completion of admission requirements. The majority of applicants accepted have the Bachelor of Science degree. Opportunities for graduate veterinarians include large and small animal practice, teaching and research, public health, the armed services, pharmaceutical lab-

See Department of Microbiology & Biochemistry
See Department of Animal Pathology
See Department of Forestry

oratories, meat inspection, laboratory animal medicine and federal, state and municipal disease control work.

Elective courses will be selected in consultation with department advisers to provide concentration in a major undergraduate area. Students not accepted in colleges of veterinary medicine will thus have a field of concentration and could qualify for graduate college if they so desire.

	150	zna
	SEMES	STER
Freshman English	3	3
Intro. Chemistry	. 4	4
Prin. of Biology	4	4
College Algebra	3	
Plane Trigonometry	_	3
Electives	_	2-5
	Freshman English Intro. Chemistry Prin. of Biology College Algebra Plane Trigonometry Electives	Ist SEMES Freshman English 3 Intro. Chemistry 4 Prin. of Biology 4 College Algebra 3 Plane Trigonometry - Electives -

Note: No electives for 1st semester

		lst	2nd
The Sophomore Year		SEM	ESTER
Chem 131-132	Organic Chem	4	4
Physics 11, 12	Elem Physics	4	4
Biol, 101	Genetics	3	
C&T11	Public Speaking		3
	Social Sciences	3	3
	Flectives	2.5	2-5
	Electives	<u> </u>	2-5
		· Ist	2nd
The Junior Year		SEM.	ESTER
Microbiol 201	Genl. Biochem	4	
An Path 105	Animal Anatomy	3	
Math 25	Fund. of Calculus	3	
Microbiol 55	Intro Microbiol	_ 	4
An Path 106	Animal Diseases		3
An Sci 170	Gen. Physiology	·	3
An Sci 246	Adv. Nutrition		3
	Electives	6-9	3-6
		lst	2nd
The Senior Year		SEMI	ESTER
Electives selected in co	nsultation with student's advisor.	16-19	16-19
		10 10	

Department of Animal Sciences

Each student majoring in programs offered within this department shall successfully complete a minimum of eight semester courses in Animal Science, including at least five of advanced standing. Additional courses must be selected in consultation with the departmental advisers.

DAIRY TECHNOLOGY This program has been designed to provide the scientific,

technical, and practical instruction necessary to prepare the graduate for the numerous positions available in the dairy and food science field. The students who elect to place greater emphasis on the scientific aspect of Dairy Technology will find that they are prepared to work in quality control, research laboratories, and to do graduate study in dairy and food

chemistry or bacteriology. The student who desires to place greater emphasis on business and the social sciences may become qualified for numerous supervisory and management positions in the dairy and food industry.

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

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

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

Biological Science

A broad flexible curriculum in biological sciences leading to the Bachelor of Science degree is offered by the College of Agriculture. Students of varied interest and background can be accommodated in this program. An interdisciplinary committee composed of faculty members from the departments of Animal Science, Botany, Medicine, Microbiology and Biochemistry, Plant and Soil Science, and Zoology is responsible for the curricular content, advising students, and certification of graduates.

Graduates of the program may elect to continue their education in graduate or medical school or they may choose to work instead. Job opportunities include basic and applied research, teaching, administration, and technical writing.

The following courses or their equivalents are required of all students in the program:

Biol. 101 Genetics (see Zoology Dept. listings)

Biol. 103 General Structure and Function (see Zool.)

Physics 15, 16

Math. 110 or 200 Statistics

In addition, all students must take seven advanced courses in Biological Sciences distributed as follows: two in the area of Ecology, two concerned with Diversity of Life, and three in the area of physiology or mo-

76

lecular biology and biochemistry. These courses are selected in council with the advisor from those taught by the departments of Anatomy, Animal Pathology, Animal Science, Botany, Forestry, Geology, Medical Microbiology, Microbiology and Biochemistry, Pathology, Plant and Soil Science, Pharmacology, Physics, Physiology and Biophysics, and Zoology.

Department of Botany

BOTANY Students in both the College of Agriculture and the College of Arts and Sciences may major in Botany. An undergraduate together with a departmental adviser selects a program suitable to provide a liberal education including broad areas of botanical and other biological sciences, as well as physical sciences. An apprenticeship program in environmental action enables an undergraduate to work closely with a faculty member who is concerned with environmental preservation or planning, and gives the student the opportunity for decision making related to the Vermont environment. Students may choose to prepare themselves for careers that do not require education beyond the Bachelor's degree or they may prepare for graduate education leading to careers in botanical and biological fields such as medicine, dentistry, agricultural biology, biochemistry, environmental sciences, government service, secondary school teaching, and research.

Required courses: Mathematics 11, 12 or 25, 26; Physics 11, 12 or 15, 16; Chemistry 16 or preferably 131, 132; Biology 1, 2; Botany 101, 104, 105, and 109 or 160; two additional semester courses in Botany.

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

Environmental Studies

Students interested in Environmental Studies may enroll in the College of Agriculture (see page 135 [or its new catalog equivalent]). They may have a coordinate major in Environmental Studies or they may have a major in Environmental Studies.

GENERAL STUDIES PROGRAM This program is designed for students seeking a general rather than a specialized knowledge in the field of agriculture and related subjects. Through the proper selection of electives, a student may choose an area of concentration within the college and also select courses that contribute to a liberal education.

Required: In addition to the basic college requirements each student must satisfactorily complete twenty-four hours in the College of Agriculture. All additional courses must be selected in consultation with and have the approval of the student's adviser.

Department of Microbiology and Biochemistry

BIOCHEMICAL SCIENCE

Contemporary biology increasingly demands knowledge of events at the molecular level. Students who

plan a career of research or teaching in biology are well-advised to concentrate on the principles and methods of biochemistry during their undergraduate years. To this end the program in "Biochemical Science" provides a coordinated sequence of study in chemistry, biology, and biochemistry. Depending on the student's future plans and capability, three areas of concentration are possible: (1) Cellular Biochemistry which emphasizes the physiological and metabolic reactions of organisms; (2) Molecular Biology which focuses on the chemical and physical structures of subcellular particles; and (3) Nutritional Biochemistry which emphasizes the synthesis and utilization of nutrients. Specialization in one of these concentrations normally commences in the Junior Year after completion of the Biological Sciences Core (pg. 72) Students are required to complete a minimum of 3 hours of physical chemistry (or 8 hours for the Molecular Biology option), 12 hours of biochemistry and three advanced biology courses, two of which would be in their specialty (e.g., Nutrition, Physiology, Genetics, etc.).

DEPARTMENT OF PLANT AND SOIL SCIENCE

PLANT AND SOIL SCIENCE The Plant and Soil Science program permits the student interested in horticultural crops, agronomic crops, or soils, as they relate to the production of food, feed, and fiber, or to recreation and the environment, to concentrate in (1) General Plant and Soil Science, (2) Soil Science, (3) Plant Science, or (4) Ornamental Horticulture. This program is flexible and provides a liberal education in the biological sciences as a basis for understanding the environment.

Students majoring in Plant and Soil Science must take Principles of Plant Science, Introductory Soil Science, two semesters of Seminar, one semester of chemistry, one semester of mathematics, and one semester of animal sciences. They are also required to take the courses listed in one of the four concentrations. Courses in other departments may be substituted for one or two of these courses with the consent of the student's advisor. Students may place their primary interest in science, agribusiness, or vocational education. Those interested in teaching, extension, and research careers or in graduate study usually select additional basic science courses in biology, botany, chemistry, mathematics, physics, zoology, or in votec and education. Those interested in careers in commercial farming, foreign agriculture, industry, agribusiness, marketing, sales, or production usually select additional courses in animal sciences, resource economics, and business management.

GENERAL PLANT AND SOIL SCIENCE This concentration provides students with a broad training in the area of applied plant and soil science. Students selecting this concentration are required to take P&SS 106 and any four other courses in plant and soil science at or above the 100 level. They must also take three additional advanced courses in plant and soil science, botany, or forestry.

SOIL SCIENCE This concentration prepares students for careers in plant nutrition, soil classification and mapping, soil management and conservation, and for positions in the chemical and fertilizer industry. Students concentrating in Soil Science must take P&SS 162, 205, 261, 264, 266, Chem. 16, Bot. 104, and Geol. 1.

PLANT SCIENCE This concentration prepares students for a wide range of careers in agronomy or horticulture. They must take P&SS 106 and any four of the following courses: P&SS 111, 122, 125, 145, 191, or 222 plus any three of the following courses: P&SS 102, 162, 201, 205, 207.

ORNAMENTAL HORTICULTURE Students selecting this concentration receive training in the aesthetic and functional aspects of

plants as they are used to enhance man's social, psychic, and physical world. The *field* of *landscape design* under this concentration emphasizes the theory and practice of landscape design as it affects community and recreation horticulture, roadside and park management, and landscape design. Students selecting this concentration must take P&SS 51, 106, 125, 145, 152, Botany 213, Forestry 5, and Art 9.

Department of Resource Economics

Each student majoring in programs offered within this department shall successfully complete a minimum of 30 hours in the social sciences. Of these, at least 24 hours shall be in Resource Economics or Economics, of which at least 12 hours shall be Resource Economics courses requiring advanced standing. All courses must be selected in consultation with the student's departmental adviser.

AGRICULTURAL ECONOMICS This program provides students with a basic understanding of economic theory and concepts that apply to the fields of agribusiness, marketing, farm management, and agricultural policy. Students in this program prepare themselves for work in business management, farming, extension, sales, and marketing.

RESOURCE ECONOMICS The program in Resource Economics is now offered in the School of Natural Resources.

Department of Vocational Education and Technology

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

OCCUPATIONAL AND EXTENSION EDUCATION Five areas of concentration prepare students for teacher certification. Teaching field minors may be combined with these specializations. Students should contact this department regarding requirements for admission into the University teacher education program.*

One concentration prepares students for educational responsibilities in governmental agencies, private organizations, business, or industry.

1. Diversified Occupations Education: Prepare to teach life relevant subjects to grade 9-12 special needs pupils, when combined with a teaching field specialization in occupational or secondary education. Students may receive initial certification in secondary special education. Individualized study and field experiences are included.

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

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

4. Natural Resource and Agribusiness Education: Prepare to teach grades 7-12 general and occupational subjects, and may concentrate their studies in one of the many agricultural or renewable natural resource subject areas. Field experiences in schools are provided during the sophomore or junior year, and the senior year. Professional courses include 152, 155, 251 and 282.

5. Extension Education: Prepare for educational responsibilities in government agencies, private organizations, business, or industry by majoring in another program in the University and complete this concentration concurrently. Field practicum experiences are provided. Professional courses include 112, 156, 253 and 295.

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

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

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

Qualified non-degree students seeking teacher certification will usually complete professional courses, 152, 153-154, 157, 158, 159 and 251, plus selected courses in the College of Education.

APPLIED TECHNOLOGY AND AGRICULTURAL ENGINEERING This program offers students a choice of

two concentrations leading to a Bachelor of Science degree and one which provides the first two years of a Bachelor of Science in Agricultural Engineering degree.

1. Agricultural Engineering Technology: Technical and practical instruction related to buildings, utilities, machinery, soil and water; including relevance to problems of environmental concern. Prepare for employment in agribusiness and public service. Courses include 102, 121, 131, 140, and 162.

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

Prepare for professional engineering work in soil and water control, agricultural machinery and equipment, agricultural structures, the application of electricity and refrigeration to agriculture, and rural water supply and sanitation. The graduate is also prepared for research and graduate study in agricultural engineering.***

3. Residential Technology: Technical and practical instruction related to residential construction, site selection, equipment, electricity, water supply and sewage disposal, including environmental and socio-economic considerations.

Prepare for employment in the housing industry and public service. Some areas of employment are: Banks, Farmers Home Administration, Federal Housing Administration, and the manufactured home industry.

*** Freshman admission (at the Maine-resident tuition rate) to this curriculum at the University of Maine will be allowed for Vermont-resident students wishing to take all four years at one institution.

The College of Arts and Sciences

The College of Arts and Sciences aims to provide the opportunity for men and women to acquaint themselves with man and his environment: the natural, social and cultural environment and its relationship to man's intellectual and creative achievements; to provide an atmosphere of free inquiry in order to be able to perceive the kinds of alternatives available to man with respect to the problems, challenges and opportunities of life by means of continuous probing, weighing and critical evaluation prior to—but not necessarily in lieu of—choosing courses of thought and action while at the same time recognizing the increasing sense of humility that such learning imposes; above all, to deal with man as man and only secondarily with man as a job description.

The Liberal Arts Curriculum

The curriculum in liberal arts, leading to the degree of Bachelor of Arts, offers instruction in language, literature, philosophy, religion, the fine arts, the social sciences, the physical and biological sciences and mathematics.

Every candidate for this degree must fulfill the requirements described in sections I and II below, and present a total of 120 semester hours of credit, plus credit in required courses in physical education. At least 75 of the minimum 120 credit hours must be in subjects outside the major discipline.

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

The College expects entering students to be able to write correct, clear and effective English, and no student unable to do so shall obtain the B.A. degree.

I. Required for all students

In addition to the two semesters of physical education required of all students by the University, the following distribution requirements must be met: Each student shall present nine semester courses (3 credits, or more each) by choosing *three courses from each of any three of the following categories:*

A. LANGUAGE and LITERATURE

English	*Hebrew	
*French	*Italian	
*German	*Latin	
*Greek	Literature in translation	

No more than two of the three required courses may be chosen from any

*Russian *Spanish

* Intermediate level or above

one discipline. Students may not fulfill the requirement without offering a foreign language at the intermediate level or above.

B. FINE ARTS AND PHILOSOPHY

art theatre

music

communication

philosophy religion

No more than two of the three required courses may be chosen from any one discipline.

C. SOCIAL SCIENCES anthropology economics geography

history political science psychology

sociology

No more than two of the three required courses may be chosen from any one discipline.

D. SCIENCES AND MATHEMATICS

biology	geology
botany	physics
chemistry	zoology
chemistry	zoolo

mathematics

No more than two of the three required courses may be chosen from any one discipline. (Biology, botany and zoology are considered one discipline) **NOTE:** Linguistics 101, 102 may be considered as meeting the distribution requirements of category A or B or C at the student's option.

MAJOR FIELD Each student, in consultation with his adviser, must choose a major field during his sophomore year. The specific courses making up the field, as well as the student's entire program for the last two years, are chosen in consultation with the chairman of the department in which the major part of the work is to be taken and must have his approval. The following minimal requirements must be met.

- 1. The field must be a well integrated whole, adapted to the student's special interest.
- 2. It must include a minimum of 36 semester hours, at least 18 of which must be in the major discipline. Concentration requirements, including courses and necessary prerequisites may not exceed 60 semester hours, not more than 45 of which may be required in the major discipline.
- 3. Courses taken to fulfill distribution requirements may also be counted toward the major credit requirements.

INDIVIDUAL DESIGN MAJOR For those students whose needs and interests are not met by the major programs currently offered in the College, there exists the option for the student to initiate a non-departmental major chosen from among the various offerings in the College and tailored to their individual needs. The program must be sponsored by a faculty member and approved by the College Honors and Individual Studies Committee and presented in the student's sophomore year.

THE COLLEGE OF ARTS AND SCIENCES

II. Specific Departmental Requirements for Majors

ANTHROPOLOGY Anthropology, 21 and two of the following three: 24, 26, 50; and 225 and 290 (normally taken in the senior year; four other advanced courses.

AREA AND INTERNATIONAL STUDIES Requirements for concentration include the general distribution requirements in the College of Arts and Sciences, the foreign language of the selected area (Chinese or_Japanese, French, Spanish, Russian or Serbo-Croation), usually through the intermediate level; several options of courses in the social sciences and humanities, related to the selected area; and specialized area courses, reading and research, college honors, and area seminars, based on team teaching and supervised research.

ART Students may concentrate in one of the following:

STUDIO ART Twenty-four hours in studio, including three courses chosen from 1, 2, 3, 4 with three different instructors, four at the 100 level, and 281 or 282 in the senior year; nine hours in Art History, including 109 preceded by either 5, 6 or 9, 54; and six hours of related advanced critical, social or creative studies.

ART HISTORY Twenty-four hours in art history, including 5, 6; four courses at the 100 level and two at the 200 level, one of the latter in the senior year; six hours in the department chosen from 1, 2, 3, 4, 9; nine hours of related advanced historical and/or critical studies; and satisfaction of Group A in college requirements.

BIOLOGY Chemistry 1, 2 or 11, 12 to be taken the freshman year if possible; Physics 11, 12 or preferably 15, 16; Mathematics 25, 26, or 11, or 110, or 200; Biology 1, 2, 101, 102, 103; Zoology 104, Botany 105; plus three advanced courses selected in consultation with the advisor from among the offerings of several departments.

BOTANY Mathematics 11, 12 or 25, 26; Physics 11, 12 or 15, 16; Chemistry 16 or preferably 131, 132; Biology 1, 2; Botany 101, 104, 105, and 109 or 160, and two additional semester courses in Botany. Six credits of modern foreign language are strongly recommended. Students may patient the department to

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

CHEMISTRY Mathematics 13, 14 and 123 (or equivalent); 5, 6 (or equivalent); physics; Chemistry 11-12 (or 1, 2 and 123), 131, 132, 134, 141, 142, 201, 202 and 212. No advanced related course is required. These are the minimum requirements for a concentration in chemistry. This program does not provide an adequate background for graduate study nor for a professional career in chemistry. Those planning for graduate school or a career in chemistry should arrange to take as many of the following as convenient: Chemistry 213, at least six additional hours of advanced level chemistry courses, which may include Chemistry 197, 198, Math 271, and German through German 12. A student following these recommendations in their entirety will acquire 47 hours in chemistry and therefore will require 122 hours for graduation.

COMMUNICATION AND THEATRE Students may choose one of four options: Communication and public address: 1, 11, five

advanced level courses, two additional courses in the Department; plus nine hours of related courses.

Mass communication: 1, 63, 262, 263, one from (11, 14, 31, 41, 81); one from (161, 164, 167), three additional advanced level courses in the Department; plus nine hours of related courses.

Speech pathology-audiology: one from (11, 14, 31, 41, 81), 74, 101, 270, 271 or 272, 273, 281, one additional course in the Department; plus eleven hours of related courses.

Theatre: 39, eight additional courses in the Department; four of which must be at the advanced level; and five of which must be in Theatre; plus nine hours of related courses.

ECONOMICS Twenty-seven hours in Economics including 11, 12, 186, 188, 190, 285 or 295 and three courses from the Economics list which are numbered 100- or above. In addition, 12 credits chosen from among the following disciplines: anthropology, geography, history, mathematics, philosophy, political science, psychology, religion, sociology.

ENGLISH Twenty-four hours of advanced courses distributed according to departmental group requirements; satisfaction of the Group A College requirement; 12 hours (6 in courses numbered 100 or above) in a related field; students are encouraged to take advanced courses in history and classical and modern foreign languages and literature.

ENVIRONMENTAL STUDIES Students in the College of Arts and Sciences may select a major in the Environmental Program. Consult the appropriate section of this catalog.

GEOGRAPHY Twenty-seven hours in Geography (including Geography 11, 12, 71, 281, an additional six semester hours at the 200- level and nine other semester hours in Geography); four semester courses in approved related fields,

GEOLOGY Twenty-seven hours of Geology, including twelve hours at 100 level, and nine hours at 200 level. Twelve hours in Physical Science, Biological Science, Mathematics (Calculus or above), or Engineering. Field experience strongly recommended.

GERMAN Eight semester courses of advanced level including 101, 102 plus the senior seminar; four semester courses of English; two semester courses of European history to be selected from 11, 12, 13, 233, 234, 235, 236; an advanced related course to be selected in consultation with the department.

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

THE COLLEGE OF ARTS AND SCIENCES

HISTORY Twenty-seven hours (12 at the 100 level or above, including at least

6 at the 200 level), 6 hours in history outside the area of the United States; one foreign language through the intermediate level or a year of statistics and quantitative methods; 12 hours in another discipline approved by the department or within one of the areas taught in area studies. History 3 is recommended for majors. Every history major must submit to the department an acceptable research paper in history (which may have been done in one of his courses) by the end of his first senior semester.

LATIN _____Twenty-three hours in courses, numbered above 100 including 111, 112-

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

MATHEMATICS Thirty-six semester hours of courses numbered 11 or higher, including 102, 124 and fifteen additional semester hours in courses numbered 200 or above.

MUSIC 1, 2, 5-6, 105-106, 221, 222 and six hours of performance study including piano; six hours in another discipline as approved by the department. Students who wish to meet accreditation requirements of the National Association of Schools of Music will also complete one of the following combinations:

(a) 203, 205 and four advanced courses in music literature.

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

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

A senior recital is required of all students majoring in music. One foreign language through the intermediate level is required of students on combinations (a) or (b).

PHILOSOPHY Twenty-four hours including 3, another course under 100; 101, 102, 103, and three 200 level courses. An additional twelve hours

in a related discipline or disciplines is required. Students considering graduate work are urged to study a foreign language.

PHYSICS Twenty-five hours in physics, including 15, 16, or 24, 25; 128, 201 (not required of students taking 220 and 222 with laboratory), 211 and 213; mathematics through 121 or 123. An additional laboratory science and a reading knowledge of French, German or Russian are strongly recommended.

POLITICAL SCIENCE Twenty-seven hours including nine hours selected from the "core" courses (13, 21, 51, 71, 81) and fifteen hours at the level of 100 or above, of which at least nine hours must be at the 200 level; nine hours in a related discipline, of which six must be in courses numbered 100.

PSYCHOLOGY Minimum requirements are 1, 109, 110, 111, 112, 119 and two courses at the 200 level. All courses numbered 200 or above have 1, 109, 110, 111, 112, and 119 as prerequisites.

RELIGION Twenty-seven hours in religion, including 71; two courses chosen

from among 101, 112, 122; one course from the 140-159 range; one course from the 160-179 range; 201; plus nine hours in a related discipline.

ROMANCE LANGUAGES Twenty-four hours of advanced level courses in French or Spanish, of which at least twelve must be in literature and at least twelve must be in courses numbered above 200. In addition, the senior seminar is required of all majors. Related area: a minimum of twelve hours of courses from another department or departments, chosen in consultation with departmental major advisers and specifically approved by them.

RUSSIAN Ten semester courses at the advanced level to include 101, 102, 103, 104, 271, 272, 282, 191, 192 (or Linguistics 101, 102), four semester courses of another language which may consist of combinations of 2 semester courses in English or comparative literature and two semester courses of a foreign language at the 11, 12, level (Serbo-Croatian is strongly recommended for this requirement), plus three semester courses from the Russian and East European Area Studies program (chosen in consultation with major advisor).

Sociology The Class of 1974 and those in the Class of 1975 who so elect: A minimum of ten courses (30 credits) in sociology and two courses (6 credits) in the related fields of anthropology, economics, geography, history, political science or psychology. The courses in sociology must include 10, 100, 275 and 278 (formerly 22, 250, 251 and 255).

The Class of 1976 and all subsequent classes, and those in the Class of 1975 who so elect: Thirty hours in sociology, including a minimum of fifteen hours at the 200 level and six hours in the related fields of anthropology, communications and theater, economics, geography, history, politcal science or psychology. Required courses include 100, normally taken by the end of the sophomore year, and one of the following: 273, 274, 275, 278 or 279.

ZOOLOGY Mathematics 11 or 25; Physics 11, 12 or preferably 15, 16; Chemistry 1-2 or 11-12 to be taken the freshman year if possible; Biology 1, 2; 101, 102, 103; Zoology 104; plus seven hours chosen from Biology 105, and 200 level Zoology courses.

Special Provisions Concerning Credit

Courses offered in other colleges or divisions of the University of Vermont by departments which offer a major in Arts and Sciences (as approved by the Faculty of Arts and Sciences) receive full credit toward the B.A. degree. Courses offered in other colleges or divisions of the University by departments which do not offer a major in the College of Arts and Sciences may be taken without any limitation by Arts and Sciences students, but only 24 semester hours of such courses may be applied to the minimum 120 credits required for the B.A. degree. (At the present time, majors in departments outside the College are available in Botany, Chemistry, and Mathematics).

Preprofessional Preparation

Students who plan to enter professional colleges requiring previous col-

legiate preparation will find the variety of courses offered in the College of Arts and Sciences and the freedom of election in that college is such that all the requirements for any professional school may be met. Many students will desire so to direct their four-year undergraduate courses as to provide, in addition to a sound general education, appropriate preprofessional training for later work in the medical sciences, law, or theology.

Special advising is available in the College for students preparing for careers in education, journalism, law, and medical sciences.

BIOLOGY A major in Biology is offered to students enrolled in the College of Arts and Sciences. It has been designed for the student who wishes to concentrate in Biology while pursuing a liberal arts education. It will also serve as a basis for programs leading to graduate study in biological fields and as an appropriate major for students in premedical and predental programs.

The concentration consists of a year of elementary biology and single-semester courses in genetics, ecology, cellular biology, animal structure and function, and plant structure and development. This core is followed by three elective courses selected from a wide range of offerings in biologically oriented departments at the University. A year of chemistry, a year of physics, and mathematics (calculus or statistics) are also required.

JOURNALISM Admission to schools of journalism is generally open to academically qualified students who hold the Bachelor of Arts degree with concentration in any discipline. Interested students should take a broad program in the liberal arts, including work in the social sciences, in mass communication, and in English.

Law American law schools, as a rule, require graduation from a four-year college with a Bachelor's degree prior to admission. There is no prescribed curriculum which is requisite for admission, but the student is advised to develop a command of the English language as well as a comprehension of American politics, social, and economic institutions. For further details, kindly consult Professor L. J. Gould, Department of Political Science.

THEOLOGY Graduation from a four-year college is prerequisite for admission to most theological seminaries. Although no prescribed curriculum is demanded as preparation for such professional schools, the student is advised to elect substantially from the departments of languages (particularly classics), history, philosophy and religion, psychology, and social studies.

OPTOMETRY The requirements for admission to schools of optometry vary, but typically they include courses in English, mathematics, physics, chemistry and zoology with a minimum of two years of college work.

PHARMACY Under the Regional Plan (page 37) Vermont residents may prepare for pharmacy school at Connecticut or Rhode Island. This is a five-year program with two years of preprofessional work which includes English, mathematics, botany, chemistry, zoology, physics, social science, a course in fine arts, and orientation to pharmacy.

MEDICINE AND DENTISTRY The prevailing requirements for admission to an

accredited medical college include a minimum of three years of undergraduate work, but most institutions recommend four years. It is strongly urged that a student desiring to enter medical college should during his sophomore year consult catalogues of colleges to which he expects to apply, and arrange to include in his program courses required by those schools.

Each student, in consultation with his adviser, plans a four-year program of courses which will fulfill the requirements for a Bachelor's degree. To meet the minimum requirements of most medical colleges, the program should include the following:

Mathematics, one of the following options:

- (a) Mathematics 11, 12 (recommended for able students)
- (b) Mathematics 11 (adequate)

(c) Mathematics, 9, 11 or 9, 2 (adequate)

(d) Mathematics, 7, 8 (acceptable but not recommended for most students)

Chemistry, two years minimum, *with laboratory* Chemistry 1-2 or 11-12 (Chemistry 1-2 preferred)

Chemistry 131, 132 (required)

Chemistry 123 (required by many medical colleges)

Physics, one year minimum, *with laboratory* Physics, 15, 16 or 24, 25 (Physics 15, 16 preferred).

Biology, one year minimum, with laboratory

Biology 1, 2

Zoology 101 or 103

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

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

SECONDARY TEACHING Students in the College of Arts and Sciences may, upon application to the Dean of Education, be accepted into the teacher training program for secondary education. Application should be made before the end of the sophomore year. The prescribed courses in education, including student teaching, can count as electives in the Arts and Sciences program (utilizing the right to count 14 hours in non-Arts and Science courses plus certain education courses that can be counted without restriction). Students completing this program are eligible for Secondary Teacher's Certification.

College Honors

The honors program at both the junior and senior level is designed for the superior student with unusual initiative and intellectual curiosity, and provides an opportunity to pursue a special project without the restrictions of classroom routine. Such a student enters a program of reading, research, or creation under the direction of the department of his choice. A student may take honors in either or both years.

A student in the College of Arts and Sciences who, at the end of his junior year, has an average of 3.00 or above for the work of the sophomore and junior years may become an applicant for college honors in a particular subject. His program for the senior year must be approved not later than the end of the junior year by the department in which honors are sought and by the Committee on Honors, and he must present a satisfactory written report and pass an oral examination on the field of special study.

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

Departmental Honors

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

The Center for Area Studies

The Center for Area and International Studies is an inter-departmental activity conducted by the Committee on Area Studies. The chairman of the Committee serves as Director of the Center.

The purposes of the Center are to encourage and coordinate interdisciplinary and comparative study and research for selected foreign areas. The Center sponsors also interdisciplinary seminars and guest lectures.

The Center for Area Studies administers the program of concentration in Area Studies and offers the B.A. degree in the College of Arts and Sciences, based on the successful completion of courses in several academic disciplines with concentration in one of the four foreign areas: Asia, Canada, Latin America, and Russia and Eastern Europe. For the general requirements for concentration in Area Studies see under the Liberal Arts curriculum.

Undergraduates interested in taking Area Studies should consult as early as possible in their college careers, the Chairman of the Committee on Area Studies and/or the directors of the individual programs. The Center is located at 479 Main Street.

Undergraduates who select to major in Area Studies usually accumulate sufficient credits enabling them to also fulfill departmental requirements in one of the social sciences, humanities, or foreign languages.

90

Study Abroad

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

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

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

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

The University is a member of the Intercollegiate Center for Classical Studies in Rome. Properly qualified students may attend one or two semesters at the Center and receive full credit. For further information consult with the chairman of the Department of Classics.

The Government Research Center

The Government Research Center, established in 1950 as the Government Clearing House, provides research and informational services for students, state and local officials, members of civic groups, and the public. Activities include the following: developing opportunities for students to become acquainted with, and to gain practical experience in, the operation of government; maintaining liaison with state and local officials relative to the use of University resources in the study of problems in state and local government; operating a public affairs research center, conducting research projects, and publishing studies in state and local government; and preparing background materials for conferences on public questions.

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

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

The Government Research Center is a program of the Department of Political Science.

The Experimental Program

The Experimental Program of the College of Arts and Sciences is based on the "living-learning" residential college concept of decentralized university work. Students who are selected for the program live in a designated dormitory complex (if they choose to live on campus) and take a special instructional program based on small seminar groups, graded on a pass-fail basis. Upon successful completion of two years in the Experimental Program, students are awarded 60 credit hours and the distribution requirements in Arts and Sciences are considered satisfied. Students then take regular Arts and Sciences courses and complete departmental majors during their junior and senior years. However, they may continue to reside with the Experimental Program as upperclass participants. Specific departmental major requirements and advanced course prerequisites must still be met. (Students should consult their advisers as to the Experimental Program work that may be counted toward departmental major requirements and advanced course prerequisites.)

Students are admitted to the Experimental Program by invitation only, on the basis of a random sample of the entering freshman class in the College of Arts and Sciences. Invited students are not obliged to enroll in the Program, and those who do enroll may transfer to the regular program at the end of any semester, with appropriate credit being decided by the faculty of the Program. However, it is not possible for a student to transfer into the Experimental Program once he has begun work in the regular program.

Students in the Experimental Program normally take three seminars together with one conventional course in the regular program. All students have an adviser who is teaching in the program, and individual tutorials are occasionally provided in the case of special interests and preparation. (For seminar offerings, see under courses of instruction.)

College of Education

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

Undergraduate Programs are offered in: Art Education—Gr. K-12 Elementary Education-Gr. K-6 Music Education-Gr. K-12 Physical Education-Gr. K-12 Secondary Education—Gr. 7-12 Social Work

These curricula are designed to prepare teachers for the kindergartenelementary level, junior high schools, and assignments calling for subject specialities in elementary, secondary, and twelve-grade situations. Programs are composed of general education, professional education, and professional laboratory experiences.

The College of Education is developing an experimental approach in the area of reading-language arts, early childhood, and special education. The American Primary Experimental Program is an experimental professional program that prepares teachers for grades kindergarten through third (K-3). Any student who desires early childhood education certification endorsement, must be enrolled in the College of Education. The faculty-student advising process individualizes the program to the student's specific interests and career goals. Upon completion of their sophomore year, students may enter one of these specialized programs for the last two years of their undergraduate career. Additional information may be obtained from Mr. Zacharie Clements-Reading and Language Arts; Mr. Charles Rathbone-Early Childhood and APEX; and Mrs. Ann Egner—Special Education. Programs are also available for individually designed majors. Other programs such as open classroom, and middle school preparation are also in the discussion stage.

Effective with the Class of 1977 the required graduation cumulative average is 2.0. It is required that students achieve a cumulative average of 2.50 in the major field and education class work, as a prerequisite to approval for Student Teaching also effective with the Class of 1977.

The College of Agriculture offers, in cooperation with the College of Education, programs in Home Economics Education, Occupational and Extension Education and Applied Technology and Agricultural Engineering.

For further information refer to sections in this bulletin describing the College of Agriculture, Department of Vocational Education and Technology, and School of Home Economics.

General Education Requirements

Each student in the College of Education is required to select a minimum of sixty credit hours from the following five general areas, with the restriction that at least one course must be selected from each area, and taken for a letter grade. General education courses required for certification such as English and Social Science or the University requirement of two semesters of Physical Education activities may be used to satisfy the general education requirement in that area. Students may also apply required courses in their Major and Minor, Broad Field, or Area of Concentration, to meet requirements in general education.

- I. Arts and Letters
 - a. Art
 - b. Classics
 - c. Communication and Theatre
 - d. English
 - e. Music

II. Science and Mathematics

- a. Biology
- b. Botany
- c. Chemistry
- d. Geology
- e. Mathematics
- f. Physics
- g. Statistics
- h. Zoology

- **III.** Social Sciences
 - a. Anthropology
 - b. Economics
 - c. Geography
 - d. History
 - e. Political Science
 - f. Psychology
 - g. Sociology
- IV. Humanities
 - a. Foreign Language
 - b. Philosophy
 - c. Religion
- V. Health and Physical Education
 - a. Health Education
 - b. P.E. Methods
 - c. Selected Activities

Students in each teacher education program, beginning with the Class of 1974 (with the exception of those in Music Education), are required to include in their program the Personal Component (Ed. 198). The personal component offers students an opportunity to pursue an activity under self-direction. Each student is required to state the objectives for his study, to make a contractual arrangement with his personal component advisor, and to fulfill the terms of the contract. Options such as education colloquia, community action experience, seminars and discussion groups, individual counseling and group counseling, are available—Ed. 198 is open only to UVM students enrolled in the Teacher Education Program. It is required for Freshmen and Sophomores. All others with consent of the instructor. Two credit hours are required for graduation.

Admission and Accreditation

The College of Education has the responsibility for maintenance of standards approved by the National Council for the Accreditation of Teacher Education (NCATE). Initial admission of students is to the University of Vermont College of Education—admission to the teacher education program occurs after special tests in communication skills and other screening measures are administered. Students must also meet personal, academic, and professional criteria established for teacher education candidates. This admission procedure is in accordance with the College's standards as approved by the National Council for the Accreditation of Teacher Education.

All teacher education candidates are expected to complete admission procedures before the beginning of the junior year in order to fulfill degree requirements. Throughout one's program the Coordinator of Educational Career Planning, whose office is in 412 Waterman Building, will assist students in career planning and placement.

The programs to be described are the programs through which the UVM College of Education achieves accreditation by the National Council for Accreditation of Teacher Education and the Vermont State Department of Education Program Approval Plan. Students completing an NCATE accredited program are qualified to receive certification in most states. Those completing a program evaluated through the Vermont State Department of Education's Program Approval Plan will have reciprocity certification in neighboring states. Further information may be obtained from the Student Information Service Center, 306 Waterman Building.

Art Education

Kindergarten through Twelve

The program in Art Education qualifies candidates to teach art in grades K through 12. Students fulfill general education requirements and complete 42 hours in professional art education and required education courses, 48 hours in studio art, art history or related subjects, and the Personal Component (Ed. 198). Graduates satisfy College of Education requirements for teacher certification and College of Arts and Sciences requirements for an Art Major. The program allows sufficient additional advanced courses as recommended by the Art Department for admittance to Graduate School.

Students must be enrolled in the College of Education and application to the Art Education program must be made before the end of the sophomore year.

A typical program is as follows:

Freshman Year	lst SEMES	2nd TER	Sophomore Year	lst SEMES	2nd TER
*English	3	or 3	English literature elective	3	or 3
C& T 11, or 31 (81 with	-		Psychology I	3	or 3
permission)	3	or 3	Design (3 & 4 or		
Foundations of Ed (Ed. 2)	3	or 3	equivalent)	3	3
Social Science	3	or 3	Studio Electives	. —-	<u> </u>
One elective from the			Related Electives		-
Science and Math areas	3	or 3	Personal Component	_	
One elective from the			(Ed. 198)	1	1
Humanities area	3	or 3	Learning and Human Dev.		
Physical Education	1	1	(Ed. 145, 146)	3	3
Design (I and 2)	3	3			
Art History (5 and 6)	3	3			

*Recommended to meet specific state and national certification requirements. +Should accompany Student Teaching.

	lst	2nd		lst	2nd
Junior Year	SEMES	TER	Senior Year	SEMES	TER
Participation (Ed. 15)	2	or 2	<i>†</i> History of Educational		
Secondary Methods and			Thought (Ed. 190)	3	or 3
Procedures (Ed. 178)	3	or 3	Special Problems in Art Edu	JC.	
Curriculum & Practice			(Art 184)	3	or 3
in Art Ed. (Art 177)	3	_	Student Teaching		<i></i>
Issues in Art Ed.			(Ed. 181)	8-12	or 8-12
(Art 183)	3	_	Studio Seminar (Art 281)	3	_
Encounter with Art II			Studio Electives	_	_
(Art 141)	4	or 4	Related Activities		
Studio Electives	_	_			
Related Electives	_	_			

A minimum of 124 approved semester hours is required for the degree.

Students are responsible for obtaining information regarding teacher certification and degree requirements from the appropriate College of Education offices.

Elementary Education Kindergarten through Six

The elementary education program is designed to prepare teachers for assignments in grades Kindergarten through Six. The Bachelor of Science in Education and teaching certification are awarded upon satisfactory completion of our approved program. The program includes a planned sequence of professional courses and laboratory experiences.

The elementary education curriculum includes a general component of sixty credits selected from the following academic areas: Arts and Letters, Science and Mathematics, Social Sciences, Humanities, and Health and Physical Education (two semesters of Physical Education activities are required). Electives may be used to build an area of concentration of twenty-four to thirty-three credits. Specific information about academic majors or general education requirements may be obtained from advisors or from the Student Information Service Center, 306 Waterman Building.

The professional programs begin by introducing the student to education as a field of study. The student is made aware of the social foundations and relationships of education as well as the resources available concerning the field. Emphasis is placed on the need for examining educational literature and research as part of the process of making critical judgments. Continuous field experiences are available throughout the four years. The program also includes special content courses for elementary teaching. Information concerning field experiences (deadlines, requirements, etc.) may be obtained from the Coordinator of Professional Laboratory Experience, 412 Waterman Building.

In addition to the academic and professional requirements, certain courses are recommended to meet specific state and national requirements in elementary education. These are specified in the typical program.

Freshman Year SE	lst MEST	2nd ER	
Foundations of Ed. (Ed. 2) C & T 11 or 31 (or 81 with	3	or 3	Personal Component (Ed. 198)
permission)	3	or 3	General Electives and/or
*English	3	or 3	approved electives in
*Human Geography			Area of Concentration
(Geog. 11)	3	or 3	

1 or 1

*Recommended to meet specific state and national certification requirements.

	lst	2nd
Sophomore Year	SEMES	ΓER
Child and Community		
(Ed. 3 or 4)	1	or l
*Music Methods		
(EdMusic III)	. 3	
*Fundamental Concepts o	f Elemen	tary
School Mathematics		
(Math 125 & 126)	3	& 3
*American History		
(Hist. 23 & 24)	3	& 3
*English literature elective	: 3	or 3
Personal Component		
(Ed. 198)	1	or l
General Education elective	s and A rea	
of Concentration	innica	
or concentration		

	lst	2nd
Junior Year	SEMES	TER
Encounter with Art I		
(Art 140)	3	
Language Arts and Childre	en's	
Literature (Ed. 134)	3	_
Teaching Science and		
Social Studies (Ed. 144)		3
Language Arts and Readin	g	
(Ed. 121)	_	3
*American Political System	ns	
(Poli. Sci. 21)	3	or 3
General Education		
Electives and/or approve	ed	
electives in Area of		
Concentration		

lst	2nd
SEMES	TER
3	
ation	
ol	
2	& 2
3	or 3
) 8-12 o	r 8-12
\$	
es in	
	lst SEMES attion bl 2 3 8-12 o s s in

Secondary Education Seven through Twelve

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

The secondary education curriculum includes a general component of a minimum of sixty credits selected from the following five academic areas: Arts and Letters, Science and Mathematics, Social Sciences, Humanities, and Health and Physical Education (two semesters of Physical Education activities are required). The student must use electives during the four years to build major and minor fields of study or a Broad Field major. Students may apply required courses in their majors and minors or Broad Field to meet requirements in general education. Specific information about academic majors or general education requirements may be obtained from advisors or from the Student Information Services Center, 306 Waterman Building. The program includes a planned sequence of professional courses, laboratory experiences, and the Personal Component.

Teaching Fields

All teacher education candidates must have, prior to their student teaching, at least 30 credit hours in a teaching major and 18 hours in a teaching minor or at *Recommended to meet specific state and national certification requirements.

+Should accompany Student Teaching.

least 48-50 hours in a Broad Field major. The following are current approved majors, minors, and Broad Field majors (detailed outlines, developed in cooperation with the respective departments, are available at the Student Information Services Center, 306 Waterman Building).

MAJORS: Biological Science, Chemistry, Communication and Theater, Earth Science, English, French, Geography, German, History, Latin, Mathematics, Physical Science, Physics, Spanish.

MINORS: Anthropology, Biology, Chemistry, Communication and Theatre,

Earth Science, Economics, French, Geography, German, Health History, Latin, Mathematics, Physics, Psychology, Political Science, Russian, Sociology, Spanish.

BROAD FIELD MAJORS: Natural Science, Social Studies, Environmental Studies.

Students should select majors and minors which are logically related and which commonly occur as teaching combinations in secondary schools. The major-minor or Broad Field program must include credits in advanced courses.

EXPERIENCES IN PUBLIC SCHOOLS Students in secondary education usually have direct experiences in public schools throughout the four-year curriculum. Students observe and participate as teacher assistants in local junior and senior high schools. During the senior year students devote sixteen 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 one semester in advance of assignments, and the student must assume responsibility for meeting deadlines. Information about application and assignment procedures may be obtained from the Coordinator of Professional Laboratory Experiences, 412 Waterman Building.

A typical program is as follows:

Freshman Year	lst SEMES	2nd TER	One elective from the Science and Mathematics		
*English	3	or 2	area	3	or 3
C&T 11 or 31 (81			One elective from the		
with permission	3	or 3	Humanities area	3	or 3
Foundations of Education			Personal Component		
(Ed. 2)	3	or 3	(Ed. 198)	1	or l
*Social Science			Physical Education	1	& 1
(3 credits of U.S. History	,		General Education		
and 3 credits of Pol. Sci.			electives or approved		
21 are recommended)		3	electives in major and minor or Broad Field		

*Recommended to meet specific state and national certification requirements.

	lst	2nd		lst	2nd
Sophomore Year	SEMES	TER	Junior Year S	EMES	TER
*English literature elective	3	or 3	Participation (Ed. 15)	2	or 2
Psychology 1	3	or 3	Secondary Methods and		
Learning and Human Dev			Procedures (Ed. 178)	—	3
(Ed. 145, 146)	3	3	Special Subject Methods		
Personal Component			and Procedures (Ed. 179)		
(Ed. 198)	1	or 1	(Ed-Eng 182 for English		
General Education elective	S .		majors and Ed-Speech 294	É	
or approved electives			for Speech majors)	—	3
in major and minor or			General Education electives		
Broad Field			or approved electives in		
			major and minor or Broad	i	
			Field	3	or 3
			lst 2nd		
Ser	nior Year	7	SEMESTER		
· ·	History	of Edu	cational		
	Thoug	ht (Ed.	190) 3 or 3		
9	Student J	Feachin	ig (Ed. 181) 8-12or 8-12		
(General I	Educati	on electives		
	in app	roved e	lectives in		
	major	and mi	nor or		
	Broad	Field			

†Should accompany Student Teaching.

A minimum of 124 approved semester hours is required for the degree. Students are responsible for obtaining information regarding teacher certification and degree requirements from the appropriate College of Education offices.

Music Education Kindergarten through Twelve

The curriculum in music education, leading to the degree of Bachelor of Science in Music Education, is recommended to students who have sufficient training and natural musical ability to justify a career in music. Graduates are qualified for positions as instructors and supervisors of music in the public schools.

The program includes a general component of sixty credits selected from the following five academic areas: Arts and Letters, Science and Mathematics, Social Sciences, Humanities, and Health and Physical Education (two semesters of Physical Education activities are required). Students may apply required courses in Music to meet the general education requirements. Students in the Class of 1975 have the option of electing credits in the Personal Component (Ed. 198).

The prescribed program is:

	lst	2nd	Major Ensemble	1	1
Freshman Year	SEMEST	ER	Foundations of Education		
Theory I	3	3	(Ed. 2)	3	or 3
Survey of Music Lit.	3	3	C & T 11, or 31 (81 with		
Performance Study:			permission)	3	or 3
Major, Piano, ¹ &			Physical Education	1	1
String Class	3	3	Electives ²	3	3

¹Until functional piano facility achieved (See Performance, Page 234). ²To meet General Education distribution requirements. 99

Sonhomoro Vear	lst SEMES	2nd	Junior Vear	lst SEMES	2nd
Theory II	31.011.5	1 L K 9	Orchestration	SEMILS.	
Performance Study:	5	5	Counterpoint	3	
Major, Piano, ¹ Voice			History of Music	3	3
& Woodwind classes	4	4	Participation (Ed. 15)	2	or 2
Ensembles: Major, Second	ary		Performance Study:		
or Chamber Music ³	2	2	Major, Brass Class	3	3
Learning and Human Dev	· .		Ensembles: Major, Second	ary,	
(Ed. 145, 146)	3	3	or Chamber Music	2	2
Electives ²	6	or 6	Conducting		3
			Elective		3
			lst 2nd		
S	enior Ye Student	ar Teachi	SEMESTER		
			0		

ormor roa-	0 2010 200	
Student Teaching in		
Music (Ed. 181)	8-12 o	r 8-12
Elem. & Secondary Music		
Meth.	5	
Performance Study: Major		
Recital, Percussion & Re	epair	
classes	• 1	4
Ensembles: Major, Second	ary,	
or Chamber Music ³	-	2
Form & Analysis		3
+History of Educational		
Thought (Ed. 190)	3	or 3
Elective		3

A minimum of 128 approved semester hours is required for the degree.

Students are responsible for obtaining information regarding teacher certification and degree requirements from the appropriate College of Education offices.

Social Welfare Area

SOCIAL WELFARE Provides education for social work practice based on a liberal education in the Social Sciences and Humanities. Career opportunities in the field of social welfare are explored. The student, in consultation with his Advisor, selects elective courses which will give him the opportunity to develop his individual interests. A minimum of 120 credit hours of prescribed and elective courses is required for graduation.

Physical Education Kindergarten through Twelve

The physical education curriculum, open to men and women, includes a selection of courses from within the broad areas of General Education, General Professional Education, Specific Professional Education (including the physical education major and minor, if selected), and unstructured electives. Graduates are awarded a degree of Bachelor of Science in Education upon the completion of a 130 semester hour program.

The major program in physical education qualifies candidates to teach physical education in grades K-6, 7-12, K-12 depending upon the major option se-

³A second performance field may be substituted for one ensemble. †Should accompany Student Teaching.

THE COLLEGE OF EDUCATION

lected. Candidates may opt for a 30 credit specialty for teaching physical education in elementary schools, or a secondary school specialty. In either instance the candidate also selects an 18 credit area of concentration (minor). A third option provides for a 50 credit broad field major which prepares students for teaching in grades K-12 and includes introductory courses in Health and Recreation. There is no minor requirement with the broad field major. Candidates in all three major options will earn a minimum of eight (8) credits in activity skill courses where they will demonstrate competency in a variety of sports from intermediate to advanced levels.

All physical education majors will be required to purchase a special instructors uniform.

A typical broad field program is as follows:

	lst	2nd		lst	2nd
Freshman Year	SEMES	TER	Sophomore Year	SEMES	TER
Personal Component			Soc. Sci. Elect ²	3	3
(Ed. 198)	1	1	Learning and Human Dev	'.	
Science Elect ³	3-4	3-4	(Ed. 145, 146)	3	3
Physical Ed. Activities	2	2	Anatomy & Physiology	3	3
English Elect	3	or 3	Phys. Educ. Activities	2	2
English Lit. Elect	3	or 3	Movement Exp. for Child.	3	—
C & T 11 or 31 (81 with			Intro. to Recreation	2	
permission)	3	or 3	Development of Motor Sk.	-	2
Humanities Elect ¹	3	or 3	Care & Prev. of Ath. Inj.		2
Foundations of Educ.			Elem. Games & Rhythms		2
(Ed. 2)	3	-			
Foundations of Phys. Ed.		3			
Health Education	3	or 3			
Participation (Ed. 15)	2	or 2			
	lst	2nd		lst	2nd
Junior Year	SEMES	TER	Senior Year	SEMES7	ΓER
Kinesiology	3	or 3	P.E. for the Atypical	3	or 3
Physiology of Mus. Act.	3	or 3	Health Elective	3	or 3
Phys. Ed. in Elem. Sch.	3	or 3	Recreation Elect	3	or 3
Phys. Ed. in Sec. Sch.	3	or 3	Major Elect	3	or 3
Coaching or Dance Elect	3	or 3	Hist. of Educ. Thought		_
Intramural Programs	3		(Ed. 190)	3	or 3
Major Elect		3	Student Teaching		
Non Major Elect	3	3	(Ed. 181)	8-12 or	8-12
Non Major Elect	2-3	2-3	Non Major Elect	3-6 c	or 3-6

Physical Education majors will present a minimum of 130 approved semester hours for the degree.

Students are responsible for obtaining specific information regarding degree requirements and teacher certification from the appropriate College of Education Offices.

3. Science Elect: Any combination of courses from Biology, Botany, Chemistry, Physics, Mathematics, Psychology, or Sociology.

^{1.} Humanities Elect: Any course in Religion, Philosophy, or Foreign Language.

^{2.} Social Science Elect: Recommend American History and/or American Political Science.

THE COLLEGE OF EDUCATION

Fifth-Year Certificate in Education

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

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

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

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

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

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

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

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

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

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

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

(8) A minimum mark of C must be made in any course which is to be included in the program.

(9) No comprehensive examination or formal thesis is required for completion of the program, but the candidate will submit a culminating paper under the direction of his faculty adviser.

(10) The program must be completed within seven years after the time of admission.

Requests for further information about fifth-year programs should be directed to the College of Education Student Information Services Center, 306 Waterman Building.

International Education Field Study

The College of Education now offers a comparative education field experience in England and we have plans to develop programs in other parts of the world.

The purpose of these programs is two-fold: 1) to provide an in-depth experience in the educational system of another country; and 2) to give the students an opportunity to live in a society different from their own.

Traveling abroad has a number of advantages. First, it broadens the outlook of the person involved in the experience whether it be social, educational, or political. Second, it affords one an opportunity to observe people in their indigenous environment. Third, it allows for an exchange of ideas and philosophies. Finally, it adds a new dimension to one's life in being able to share one's thoughts and feelings with others of a different culture.

Specifically, the field experience in England is designed primarily to offer students something more than the usual "study abroad" program. In addition to the usual visits to places of local cultural interest, this program offers an opportunity for each student to relate his professional needs, interests, goals and aspirations to a specific educational area. Students will have the opportunity to visit many areas of cultural and personal interest but, in addition, will live with a family in the host country and work as a paraprofessional in one or more of the host nation's schools.

For further information contact Coordinator, International Education Program, University of Vermont, College of Education, Burlington, Vermont 05401

The College of Engineering, Mathematics and Business Administration

The College of Engineering, Mathematics and Business Administration includes the Departments of Business Administration, Civil Engineering, Electrical Engineering, Mechanical Engineering, and Mathematics and programs in computer science and statistics. It offers a number of specialized professional curricula in these fields, and in physics, chemistry and geology, leading to the degree of Bachelor of Science in the field of specialization. For students whose needs are met by a less structured curriculum, the Bachelor of Engineering and the undesignated Bachelor of Science degrees are offered. 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. 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 Bachelor of Science Degree

The College of Engineering, Mathematics and Business Administration offers instruction leading to a general Bachelor of Science Degree. This degree is designed for the student who wishes to plan a degree program with a broad scientific base. Each student with his advisor will plan an integrated sequence of courses which will meet the student's objective. The plan must be approved before the student completes his first four semesters of study. Students declaring a major in Environmental Studies may substitute appropriate Environmental Studies courses with the consent of the College of Engineering, Mathematics and Business Administration Studies Committee. Other majors may be approved upon application to the College Studies Committee.

General Requirements of all Students

Candidates for this degree must fulfill the following requirements and present a total of at least 120 semester hours of credit, plus credit in required courses in physical education.

THE COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION 105

Sciences¹ Mathematics² 30 credits 12 credits Humanities & Social Sciences Technical Electives Free Electives 24 credits³ 24 credits⁴ 30 credits⁴

SCIENCES Chemistry Engineering Sciences Geology Life Sciences Physics HUMANITIES AND SOCIAL SCIENCES Language Literature Fine Arts Philosophy Social Sciences

TECHNICAL ELECTIVES Chemistry Engineering Geology Life Sciences Mathematics Physics Technology Courses

The Business Administration Curriculum

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

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

A minimum of 120 approved semester hours is required for the Bachelor of Science in Business Administration degree plus required courses in physical education.

I. FRESHMAN-SOPHOMORE YEARS

Each student shall present nine semester courses (3 credits, or more each) by choosing *three courses from each of any three of the following four categories* (labeled 1, 2, 3 and 4 below). No more than two of the three required courses may be chosen from any one discipline, and students may not fulfill the requirement in Language and Literature without offering a foreign language at the intermediate level or above. Students must take Principles of

- 1. The distribution of courses in Sciences must be such that at least two courses must be taken from four of the five areas listed.
- 2. The Mathematics requirement must include either Math 12 or Math 14.
- 3. At least 6 credits of the 24 required in the Humanities and Social Sciences must be at the 100 level or above.
- 4. At least 18 credits of the 54 credits required in technical and free electives must be at the 100 level or above.

106 THE COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

Economics (11, 12) and Principles of Accounting (13, 14) in the first two years.

yu	AI 3.		
1.	Language and	l Literature	
	English	*Hebrew	*Russian
3	*French	*Italian	*Spanish
1	*German	*Latin	
4	*Greek	Literature in translation	
1	*Intermediate l	evel or above	
2.	Fine Arts and	Philosophy	
	art	music	philosophy
	drama	speech	religion
3.	Social Science	es 👘	
	economics		history
	geography		political science
	anthropology	,	psychology
	sociology		
4.	Sciences and	Mathematics	
	biology		geology
	botany		physics
	chemistry		zoology

mathematics

Note: No more than two of the three required courses may be chosen from any one discipline. (Biology, botany and zoology are considered one discipline.) Linguistics 101, 102 may be considered as meeting the distribution requirements of category 1 or 2 or 3 at the student's option.

II. JUNIOR-SENIOR YEARS

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

	Hours
Principles of Marketing, BA 121	3
Industrial Management, BA 143	3
Elementary Statistics, BA 188	3
Macroeconomic Theory, Econ. 1901	3
Introduction to Integrated Data	
Processing and Computers, BA 160	3

1. Accounting majors will substitute Econ. 101, Money and Banking.

In addition to the courses listed above, a student must take a minimum of 12 hours in his chosen area of concentration. Courses by areas of concentration are listed below:

Finance

	nours
Money and Banking, Econ. 101	3
Economics of Taxation, Econ. 103	3
Economics of State and Local Taxation, Econ. 104	3
International Trade and Finance, Econ. 105	3
Basic Federal Taxes, BA 164	3
THE COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION	107
---	-------
Principles of Investment, BA 206	3
Corporate Finance, BA 207	3
Marketing Management and Sales Promotion	
H	Iours
Problems in Marketing, BA 122	3
Personal Selling in the Economy, BA 123	3
Research Methods in Marketing, BA 127	3
Sales Management and Promotion, BA 130	3
Fundamentals of Advertising, BA 132	3

107

3

3

11......

Industrial Management

	riouis
Labor Economics, Econ. 141	3
Collective Bargaining, Econ. 142	3
Methods Engineering, M.E. 175	3
Plant Organization, M.E. 176	4
Personnel Administration, BA 251	3
Executive Decision-Making, BA 252	3
Scientific Management and Labor, BA 254	3
Cost Accounting, BA 272	3

Accounting

Accounting majors are required to take all the following courses.

Current Marketing Developments, BA 228

Marketing Management, BA 229

	Hours
Business Law, BA 9, 10	6
Intermediate Accounting, BA 161-162	6
Basic Federal Taxes, BA 164	3
Corporate Finance, BA 207	3
Advanced Accounting, BA 266	3
Auditing, BA 271	3
Cost Accounting, BA 272	3

The Chemistry Curriculum

The Department of Chemistry offers a curriculum leading to the 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.

A minimum of 120 approved semester hours is required for the degree in this curriculum, plus required courses in physical education. The student's program must include the following courses: Chemistry 11, 12 (or 1, 2 and 123), 131, 132, 134, 135, 141, 142, 184, 201, 202, 212, 213, at least 9 semester hours of advanced chemistry electives, which may include 197, 198; Physics 15, 16 or 24, 25; Math 13, 14, 123 (or equivalent), Math 271; proficiency in German equivalent to German 11, 12. In addition the student must take sufficient courses outside the natural sciences to satisfy the distribution requirements outlined by the College of Arts and Sciences (see pp. 85).

A typical program for those wishing to obtain the B.S. degree in Chemistry is as follows:

108 THE COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

	lst	2nd		lst	2nd
The Freshman Year	SEME	STER	The Sophomore Year	SEMES	TER
General Chem. 11, 12	5	5	Organic Chem. 131, 132	3	3
Mathematics, 13, 14	6 4	2 4	tory 134, 135	2	2
Physics 24		4	Physical Chem. 142, 141		3
	15	16	Mathematics 123, 271 Physics 25	4	3
			Electives	3	3
				16	14
	lst	2nd		lst	2nd
The Junior Year	SEMES	TER	The Senior Year	SEMES	TER
Adv. Inorganic Chem-			Advanced Chemistry		
istry 212, 213	3	3	Electives ¹	3	3
Adv. Chemistry Lab-			Research 197, 198 ²	3	3
oratory 201, 202	4	4	German or elective	3	3
Physical Chem. 141	3		Electives	6	3
German or elective	4	4	Seminar 184	-	1
Electives		6		15	13
	14	17			

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 (see p. 83).

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, Manufacturing and Management, and Mechanical Engineering, each leading to the degree of Bachelor of Science in the field of specialization.

The College of Engineering, Mathematics and Business Administration also offers the Bachelor of Science Degree to those qualified students in the community who are unable to attend regularly scheduled courses. Consult the Evening Division Bulletin for further information.

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

All junior engineering students visit Northeastern industrial centers during spring vacation. This plant inspection trip is required for graduation. The expense for the trip of several days is borne by the student. THE COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION 109

Students enrolled in the civil, electrical, and mechanical engineering curricula may become affiliated with their respective national professional engineering societies, the American Society of Civil Engineers, the Institute of Electrical and Electronics Engineers, and the American Society of Mechanical Engineers, as each organization has authorized a student chapter at the University of Vermont. Engineering students demonstrating high scholarship attainment combined with exemplary character are recognized by membership in the Vermont Alpha Chapter of Tau Beta Pi, the national engineering honor society. These student organizations' meetings present opportunities for students to conduct activities similar to those of the national societies. These include: technical papers presented by students and engineers actively engaged in their profession; attendance at conventions; and inspection trips. These provide helpful contacts with engineering practice and assist in the development of leadership qualities essential to success in the engineering profession.

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

ENGINEERING SCIENCES

Applied Mechanics Electrical Sciences Materials Thermal Sciences Computer Sciences

HUMANITIES AND SOCIAL SCIENCES Language Literature Fine Arts Philosophy Social Sciences

TECHNICAL ELCTIVES

Chemistry Engineering Geology Life Sciences Mathematics Physics Technology Courses

Program Approval

Any substitutions in the engineering core program require the approval of the College Studies Committee.

The Core Curriculum for Engineering Students

Freshman Year	lst	2nd	
	SEME	ESTER	
Chemistry 5	4	—	The following courses are also required:
Physics 24		4	Physics 25 4
Math 13,114	4	4	Math 123 4
Engr. 1, 2	4	4	Math elective 3
Humanities and Social	3	3	6 additional courses in social sciences
Studies	-	-	and numanities
	15	15	

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

Civil Engineering

The curriculum in Civil Engineering, leading to the degree of Bachelor of Science in Civil Engineering, offers instruction in community planning, construction engineering, environmental engineering, hydraulics and hydrology, materials, soil mechanics, structural engineering, and transportation engineering, as well as in the engineering sciences, mathematical sciences, natural sciences, humanities, and the human and social sciences. Every candidate for this degree must earn a minimum of 120 semester hours of credit plus the required courses in physical education.

Each student, with the approval of his advisor, must present a program of courses and study that satisfies the distribution requirements in the Group I, Group II, Group III and the Intern/Extern categories that follow:

A. Group I. A student must elect twelve courses from this group, by choosing at least three courses from each of three of the designated areas. The three remaining courses may be taken from any area or areas in this group.

Group I Areas

- 1. Business Administration
- 2. Education.
- 3. Humanities—Languages, Literature Fine Arts, and Philosophy.

B. Group II. A student must elect twelve courses from this group, by choosing at least three courses from each of three of the designated areas. The three remaining courses may be taken from any area or areas in this group.

Group II Areas

Engineering Sciences.
 Mathematical Sciences.

3. Natural Sciences—Earth, Life, Physical.

4. Social Sciences—Anthropology, Economics, Geography, History,

Science, Psychology,

C. Group III. A student must elect twelve courses from this group, by choosing at least three courses from each of three of the designated areas in Civil Engineering. The three remaining courses may be from any area or areas in this group, but they must contribute to his program objectives. At least nine of these courses must be in Civil Engineering.

Group III Areas

 Civil Engineering. Community Planning. Construction. Environmental Engineering. Hydraulics—Hydrology. Materials. Soil Mechanics. Structural Engineering. Transportation.

- 2. Other Engineering.
- 3. Agriculture.

Political

and Sociology.

- 4. Medicine.
- 5. Other Professions.
- 6. Special Areas of Support.

D. Intern/Extern. A student must satisfactorily complete three intern and one extern assignments. Intern assignments are individual or group investigations that are under the guidance of one or more faculty members. Extern assignments consist of practical engineering experiences in selected public and private organizations. Each student will work under the guidance of an experienced engineer or other professional person.

Electrical Engineering

	150	zna
The Sophomore Year	SEMES	TER
Humanistic-Social Studies	3	3
Mathematics, 123	4	
Elem. Probability, Math. 203	—	3
Physics 25, 128	4	4
Laboratory, E.E. 81, 82	1	2
Engineering Analysis II, E.E. 3	3	
Engineering Analysis III, E.E. 4	—	3
Engineering Computation I, E.E. 31	2	
Engineering Computation II, E.E. 32	—	2
	17	17

	lst	2nd		lst	2nd
The Junior Year	SEMES	STER	The Senior Year	SEMES	STER
Humanistic-Social			Humanistic-Social		
Studies	3	3	Studies	3	3
Electromagnetic Field			Approved Mathematics		
Theory, E.E. 143, 144	3	3	Elective	3	
Thermodynamics, M.E.			Solid State Physical Elec-		
115	3		tronics, E.E. 163	3	
Electronics I, E.E. 121	3	_	Laboratory, 185	2	
Laboratory, 183, 184	2	2	Energy Conversion I,		
Signals and Systems,			E.E. 113	3	-
E.E. 171	3		Electronics III, E.E. 123	3	_
Solid State			Information Trans-		
Physical Electronics			mission Systems,		
E.E. 162		3	E.E. 174		3
Control Systems, E.E.			Laboratory, E.E. 186	-	1
111	-	3	Laboratory, E.E. 188	-	1
Electronics II, E.E. 122		3	Energy Conversion II,		
			E.E. 114	-	3
	17	17	Wave and Diffusion		
			Analogies, E.E. 146		3
			Elective	-	3
				17	17

The above comprises what is termed the general option curriculum, for which a minimum of 132 approved semester hours is required, plus required

112 THE COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

courses in physical education. Two other options are offered, with changes from the general option curriculum as follows:

(A) A pre-medical option curriculum with a minimum of 138 approved semester hours in which the free and Math. electives in the senior year and three courses selected with departmental approval among E.E. 174, 162, 163, 113, 114 and M.E. 115 are replaced by Chemistry 131, 132, 140 and Biology 1, 2.

(B) A computer engineering option curriculum with a minimum of 134 approved semester hours, plus required courses in physical education, in which

- 1. Sophomore year, 2nd semester: Humanistic-Social course replaced by Math 124.
- 2. Junior year, 1st semester: M.E. 115 replaced by E.E. 236
- 3. Junior year, 2nd semester: Humanistic-Social course replaced by E.E. 237.
- 4. Senior year, 1st semester: Math elective replaced by Math 237 and E.E. 113 replaced by Math 218 or equivalent with departmental approval. E.E. 187 is an additional required course.
- 5. Senior year, 2nd semester: E.E. 114 and free elective replaced by Humanistic-Social courses and E.E. 146 replaced by Math 238.

Mechanical Engineering

	lst	2nd
The Sophomore Year ¹	SEME	STER
Engineering Math. III, Math. 123	4	
General Physics, 27	4	
Manufacturing Processes, M.E. 53	3	or 3
Humanistic Social Studies Elective	3	or 3
Statics, C.E. 01	3	_
Introduction to Modern Physics, Physics 128	_	4
Dynamics I, M.E. 133	_	3
Thermodynamics I, M.E. 92		3
Engineering Experimentation, M.E. 119	-	2
	14	15

¹ "Elementary proficiency in use of digital computers" required in Sophomore year.

The Junior Year	lst SEMES	2nd STER			
Materials I M.E. 100	3	_	Heat Transfer, M.E. 266	_	3
Thermodynamics II, M.E. 111 Applied Math. for Engrs.	3	_	Fluid Mechanics, M.E. 142 Engineering Design I,	_	3
and Scientists, Math. 271	3	_	M.E. 135 Humanistic-Social	_	4
Electrical Engineering			Studies ¹	3	3
Principles, E.E. 101, 102	4	4		16	17

The Senior Year	lst SEMES	2nd STER	Engineering Design Analysis and Sythesis,		
Materials II, M.E. 101	3		M.E. 294	_	2
Systems Control, M.E.			The Engr. Profession		
137	2		M.E. 200		2
M.E. Elective ²	3	4	Humanistic-Social		
Tech. Elective ³	3	_	Studies ¹	3	6
Thesis, M.E. 192, or					
M.E. Elective ²	—	3		14	17

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

A student who, at the end of his junior year, has a cumulative average of 3.0 or above may become an applicant for the honors program in a special area of study. If accepted the student will determine his own program under the guidance of his adviser.

Manufacturing and Management Engineering

	İst	2nd
The Sophomore Year	SEMES	TER
General Physics, Physics 27	4	_
Engrg. Math. III. Math. 123	4	
Statics, C.E. 01	3	
Intro. to Modern Physics, Physics 128		4
Applied Math. for Engrs. and Sc., Math. 271		3
Dynamics I, M.E. 133		3
Thermo. & Heat Transfer, M.E. 113		3
Princ. of Econ., Econ. 11, 12	3	3
	14	16
	lst	2nd
The Junior Year	SEME	STER
Electr. Engrg. Princ., E.E. 101, 102	4	4
Mat. I. M.E. 100	3	_
Mat. II, M.E. 101	3	
Materials Processing I. M.E. 131	_	3
Fluid Mechanics, M.E. 142		3
Technical elective ⁴	3	3
Humanistic-social elective	3	3
	16	16

1. See distribution of Humanistic-Social Studies on page 118.

 Any 200 level course with approval of the Mechanical Engineering Department.
 Technical electives from departments of engineering, mathematics or physical sciences.

114 THE COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

	lst	2nd
The Senior Year	SEME:	STER
Statistical Methodology I, Math. 200	3	_
Human Factors, M.E. 175	3	_
Materials Processing, II, M.E. 231	3	
Engrg. Economy, C.E. 225	3	_
Statistical Techniques in Mfg., M.E. 233		3
Plant Planning and Design, M.E. 176	. —	4
Engineering Design I, M.E. 135		4
Technical elective ⁵	—	3
Humanistic-social elective	3	
	15	17

A minimum of 126 approved semester hours is required for the degree in this curriculum, plus required courses in physical education.

A student who, at the end of his Junior year, has a cumulative average of 3.0 or above may become an applicant for the honors program in a special area of study. If accepted the student will determine his own program under the guidance of his adviser.

The Geology Curriculum

The curriculum is designed to prepare students for graduate study in geology and occupational activity at a professional level. Students are encouraged to combine geology with one or more related disciplines to develop a strong background for pre-professional training. Examples of such interdisciplinary fields include geochemistry, oceanography, geological engineering, geomathematics, environmental studies and geobiology. An advisor from the department will assist students in developing a curriculum tailored to individual needs. Students in the College of Arts and Sciences may also concentrate in geology and receive a Bachelor of Arts degree.

	lst		2nd
The Freshman Year	SEMESTER		SEMESTER
Mathematics 13	4	Mathematics 14	4
Chemistry 11	5	Chemistry 12	5
Geology 1	4	Liberal Arts Elective	3
English Elective	3	English Elective	3
0	_	Physical Education	1
	16		16

4. To be selected from the following: Econ. 9, 10, 121, 141, 207, 251.

5. To be selected from departments of engineering, mathematics or physical sciences.

The Sophomore Year		Physics 16		
Geology 111	4	Biology 2		4
Geology 145	3	Geology El	ective	3
¹ Physics 15		Liberal Art	s Elective	3
Biology I	4	Chemistry	Elective	3
Liberal Arts Elective	3	Geology 1	56	4
Physical Education	1			
,	15			
	15			17
The Lot X	lst			2nd
The Junior Year	SEMESTER			SEMESTER
Geology 121	3		<i>c</i>	0
Geology 155	.3	Geology 16	b	3
Ancillary Elective	3	Liberal Art	s Elective	e 3
Ancillary Elective	3	Ancillary E	lective	3
Computer Science or		Geology El	ective	. 3
Statistics	3	Engineerin	g Electiv	e 3
	15			
The Senior Year				15
Geology 238	3			
Geology 197	4	Geology 19	8	4
Geology Elective 200	3	Geology El	ective 200	0 3
Engineering Flective	3	Ancillary F	lective	° Š
Ancillary Elective	3	Two Liber	al Arts El	ectives 6
,	16			
	10			. 16
<u> </u>				
Synopsis				
Geology courses		05		
Specific courses		35		
Electives		12	47	
Ancillary				
Specific courses		29		
Electives		18	47	
Engineering Electiv	es	6	6	
Liberal Arts		18	18	
English Electives		6	6	126 hours
Physical Education		2	2	

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.

- 1. Students concentrating in geophysics must take Physics 24, 25, 128, and mathematics through differential equations, and additional courses in physics.
- 2. Courses in science, mathematics or engineering selected so as to develop a minor area of concentration.

116 THE COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

Two options are available in this degree program. Option A is offered to all students who want a broad program in mathematics. Option **B** is offered to those students who desire to specialize in the mathematics of computation. In addition, an option in statistics is available; details may be obtained from the Department of Mathematics.

Requirements for the Bachelor of Science in Mathematics degree:

OPTION A. General Mathematics

Mathematics: Math. 11, 12, 121, 102, 124 and at least 30 additional semester hours in courses numbered 200 or above.

Science: At least 20 hours of Science including either Physics 15, 16 or Physics 24, 25. Science courses must be chosen from the categories of physical science, biological science (including experimental psychology), agricultural science, medical science, and engineering. The student must complete at least four courses, (a minimum of 12 semester hours), in one department.

Humanities and Social Studies: Twenty-four semester hours from the elective areas listed below. These must be distributed over at least three areas, and must include at least nine semester hours in one area.

Elective Areas

1. Language

2. Literature

3. Fine Arts

4. Philosophy

5. Social Sciences

A minimum of 120 approved semester hours is required for the degree in this curriculum, plus required physical education courses.

Typical Program for entering freshmen:

1st Semester		2nd Semester	
Math. 11	5	Math. 12	5
Science	3 or 4	Science	3 or 4
Humanities and Social Studies	3	Humanities and Social Studies	3
Electives	3	Electives	3
Physical Education	1	Physical Education	1

OPTION B. Mathematics of Computation

Mathematics: Math. 11, 12, 33, 115, 116, 117, 121, 124 and at least 24 semester hours in courses numbered 200 or above.

Allied Elective: At least 24 semester hours in allied fields which include physical science, biological science, agricultural science, medical science, engineering, psychology, economics and business administration. Of these at least 6 semester hours must be in an approved science and at least 12 semester hours must be in courses numbered 200 or above.

Humanities and Social Studies: (Same as in Option A)

A minimum of 120 approved semester hours is required for the degree in this curriculum, plus required physical education courses.

Typical Program for entering freshmen:

	2nd Semester	
5	Math. 12	5
3	Math. 116	3
3 or 4	Allied Elective	3 or 4
3	Humanities and Social Studies	- 3
1	Physical Education	1
	5 3 3 or 4 3 1	2nd Semester 5 Math. 12 3 Math. 116 3 or 4 Allied Elective 3 Humanities and Social Studies 1 Physical Education

Students entering with Advanced Placement in Calculus may take Math. 12 or 121 in the first semester.

The Physics Curriculum

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

	lst	2nd		lst	2nd
The Freshman Year	SEME	STER	The Sophomore Year	SEMF	ESTER
Mathematics 11, 12			Mathematics 121, 124		
or 13, 14	4-5	4-5	or 123, 124	3-4	3
Chemistry 1, 2 or			Physics 25, 128	4	4
11,12	4-5	4-5	Elective ²	3-4	3-4
Physics 24 ¹	_	4	Elective ²	3	3
Elective ²	3-4		Elective ²	3	3
Elective ²	3	3			
				16-18	16-17
	14-17	15-17			
The Junior Year	lst	2nd	The Senior Year	lst	2nd
·	SEME	STER		SEME	STER
Physics 211, 216	3	3			
Physics 213, 214	3	3	Physics 273, 274	3	3
Physics 201, 202 ³	3	3	Physics 197, 198 ³	3	3
Mathematics Elective ⁴	3	3	Physics 265	3	
Elective ²	3-4	3-4	Elective ²		3-4
			Elective ²	3-4	3-4
	15-16	15-16	Elective ²	3	3
				15-16	15-17

A minimum of 120 semester hours is required for the degree in this curriculum plus required courses in physical education.

- 1. Physics 15, 16 is acceptable for students wishing to begin their study of physics in the first semester.
- 2. Students majoring in physics are required to comform to the general distribution requirements in humanities and social studies of the College of Engineering, Mathematics, and Business Administration, but must take at least 18 credits of electives from the areas listed on page 118. English 1, Written Expression, is recommended for students needing or wanting to improve their writing skill.
- 3. With departmental permission, a student may replace Physics 201, 202 or 197, 198 with laboratory experience in industrial employment, or Physics 220 and 222 with laboratory, or with junior-senior level laboratory course offerings of other departments. Any difference in academic credits may be included among electives. In the senior year, Physics 201, 202 may be repeated in place of Physics 197, 198.
- 4. The undergraduate major is required to take at least two advanced courses in mathematics beho d the sophomore year. In addition the student is required to become competent in computer programming.

118 THE COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

HUMANITIES AND SOCIAL STUDIES The objective of the requirements in humanities and social studies for all programs

is to broaden the student's understanding of man and the relationships in human society.

Each Freshman student should, in consultation with his adviser, make a preliminary plan of an integrated sequence of courses based on his own interest. The sequence should constitute a continuing program extending through at least three undergraduate years. At the end of the first year the student will declare his elective area_of_concentration_and, in_consultation with his adviser, will prepare a plan of an integrated sequence of courses.

A minimum of nine credit hours is required in the elective area. Students are encouraged to attempt more advanced courses in their elective areas.

ELECTIVE AREAS

- 1. Language
- 2. Literature
- 3. Fine Arts
- 4. Philosophy
- 5. Social Sciences

The Division of Health Sciences

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

The Division reserves the right to require the withdrawal of any student from any curricula whose health, academic record or performance and behavior in the professional careers is judged unsatisfactory.

The College of Medicine Requirements for Admission

Applicants to The University of Vermont College of Medicine are expected to complete the required courses of study by July 1 preceding the September admission date—in a college or university accredited by the National Committee of Regional Accrediting Agencies of the United States.

Required are one year each of the following college level courses:

Biology

Physics (including laboratory) General or inorganic chemistry Organic chemistry

In addition, because a physician requires a broad and balanced cultural background as well as a technical education, the College recommends as appropriate to an adequate premedical program:

English—at least one and preferably two years of composition and or literature.

Mathematics—dependent upon secondary school preparation but should include at least an introduction to calculus.

Behavioral Sciences—one or two years in the areas of psychology, sociology or anthropology.

The Humanities—at least two years of course work in history, philosophy, religion or the arts.

The College of Medicine encourages its prospective students to concentrate while in college in a field of knowledge of their choice, whether in the sciences or humanities, and to pursue these interests in depth. It seeks students with diverse collegiate and extra-collegiate backgrounds, but insists that their pattern of performance has demonstrated intellectual drive, independent thinking, curiosity and discipline.

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

The scholastic record of the applicant in his premedical work.

Maturity, readiness, non-academic aptitude and motivation for the study and practice of medicine as determined by information from the applicant's undergraduate faculty and by personal interview with the Admissions Committee.

The applicant's scores on the Medical College Admission Test. Applicants are urged to take the Test in May preceding application.

The Committee strives to select as students those applicants who will benefit most from the College's specific educational program. Within the selection process, the needs of society are considered in addition to those of the individual applicant.

Applicants who present competitive credentials and in the judgement of the Admissions Committee are residents of Vermont, Massachusetts, Maine and Rhode Island are given preferential consideration. Sons and daughters of alumni of the College of Medicine are given special consideration.

The final closure date for receiving applications is November 1 preceding the September admission.

An application fee of \$15.00 (not refundable) is payable on request of the Office of Admissions.

THE CURRICULUM

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

Basic Science Core

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

Clinical Science Core

The Clinical Core extends from January of the sophomore year until December of the junior year. During this twelve-month period each student receives twelve weeks of instruction in medicine, twelve weeks of instruction in surgery, eight weeks in pediatrics, eight weeks in obstetrics and gynecology, and eight weeks in psychiatry. There will be a brief summer vacation. During this year the student works under the supervision of a physician within the wards and clinics of the Medical Center Hospital in providing primary care to patients.

Senior Major Program

The final portion of the curriculum, the Senior Major Program, extends through the final one and one-half years prior to graduation. This period is divided into sixteen rotations of one month duration. The major program enables each student to select that course of study best suited to his career objectives. Majors are offered in each of the preclinical sciences plus medicine (to include Family Practice), surgery and its subspecialties, obstetrics—gynecology, pediatrics, neurology, psychiatry, rehabilitation medicine and community medicine.

An integral part of each clinical major includes a number of required clinical and laboratory experiences as well as elective rotations. These elective rotations are not restricted to the disciplines in which the student is majoring and may include approved learning experiences away from Burlington. Many students see this as an opportunity to work and study in a large urban setting, at another medical school or a foreign medical center. Students should anticipate spending variable periods of time away from Burlington in the course of pursuing their required training. A system of faculty advisers has been developed to counsel each student on a one-to-one basis throughout the planning and course of this major program and in anticipation of later graduate education. Although the majority of students elect to pursue a clinical major, students so desiring may commit their entire major program to study in one of the preclinical sciences. While these programs are individualized, it is expected that graduate study, research and a thesis will form the basis for each. Qualified students may simultaneously enroll in the Graduate College of the University as candidates for the Master of Science degree while fulfilling the requirements for the M.D. degree within the College of Medicine.

The School of Allied Health Sciences

The Program in Dental Hygiene

The Department of Dental Hygiene offers a two-year curriculum leading to an Associate in Science degree and a Certificate in Dental Hygiene.

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

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

Requirements for admission to study in the Dental Hygiene Program are identical with general University requirements, with the additional requirement that applicants write the Dental Hygiene Aptitude Test. Information and application forms for this test are available from the American Dental Hygienists' Association, 211 East Chicago Ave, Chicago, Ill. 60611. Applicants are encouraged to have a personal interview, preferably after their application is completed.

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

The courses of study are designed to give the student a well rounded foundation in basic sciences, specific knowledge in dental sciences and an understanding of the humanities. Clinical experience is obtained in the department's dental hygiene clinic where patients of all ages and with varieties of problems receive service, and in community oral health care situations. Dental hygiene students also have an opportunity to increase their communication skills through oral health education presentations in schools in the area.

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

The Freshman Year	İst	2nd	The Sophomore Year	lst Sen	2nd nester
English Anatomy 9	3		Microbiology 55 Clinical Dental	4	
Chemistry 3 Oral Tissues 11-12 Dental Hygiene 1-2	4 3 2	3	Hygiene 81-82 Myofunctional Therapy 81	4	4
Physical Education Psychology 1	ī 		Public Speaking, Speech II	3	-
Nutrition H141 Radiology 61		3 · 2	Oral Pathology 53-54 Periodontology 55	2 2	2
0,	16	17	Pharmacology and Anesthesiology 51-52 Anthropology 21	1	1
			Dental Materials 91 Dental Practice 62	_	1 3
			Elective	·	3

17

17

^{*}A minimum of 66 approved semester hours plus one semester of physical education and a grade point average of 2.0 is required for the Associate Degree in this curriculum. A grade course of "C" or better is required for all professional courses.

The Program in Medical Technology

The Department of Medical Technology offers an integrated Associate Degree Medical Laboratory Technician (MLT) and a Baccalaureate Degree Medical Technology (MT) curriculum. After completion of the Associate Degree program, the graduate may be eligible for certification by the Board of Registry of the American Society of Clinical Pathologists as MLT (ASCP) and shall have obtained an employable skill. Those students accepted into the final two years of the program leading to the Baccalaureate Degree will be provided the option of greater education and experience in depth and breadth in the entire field of Medical Technology, or if the student so desires, specialization in one of the disciplines within Medical Technology.

The minimum requirements for the first two years are as follows:

	Credit Hours	
	lst	2nd
	Sem	ester
English	3	_
Mathematics*	3-5	
Chemistry 3	4	
Anatomy 9	3	
Laboratory Science 11		3
Medical Technology 3	1	
Elective	(3)	(3)(6)
Biochemistry 102		4
Physiology 10		3
	17-19	13(16)

*Achievement Tests are required for all students planning course work at the collegiate level. The purpose of requiring these achievement tests is for placement only.

The Second Year:

	· lst	2nd	
	Semester		
Microbiology 55	4	_	
Chemistry 16	4	—	
M.T. 20,21,22,23*	(10)(8)	(8) (10)	
Electives		6	
Dynamics of Health Care		2	
	18(16)	18/16)	
	10(10)	10(10)	

*Each course offered twice each semester. Students will be assigned to these courses on a rotating basis.

A minimum of 60 approved semester hours plus university requirements for physical education and a grade point average of 2.0 is required for the Associate Degree in this curriculum.

Due to limitations imposed by physical facilities, the number of students admitted to the final two years of the Baccalaureate Degree program will be limited. Students desiring to be admitted to the final two years should make application to the Department of Medical Technology in the spring of the second year. The deadline date for application will be announced early in the second semester. It will be necessary for each applicant to show evidence of technical proficiency, good academic achievement, and adherence to high standards of professionalism. A Selection Committee will review each applicant and make recommendations to the Chairman of the Department. Personal interviews may be requested. The Department Chairman will make the final decision and notify the applicants by April 1.

All students accepted for the additional two years leading to the Baccalaureate Degree, regardless of their specialty area, will enroll in the following:

Biochemistry 111-112	8
Physics 11-12	
Pathology 101	3
Allied Health 199	3
Instrumentation	4
Electives	21

The remainder of the curriculum is designed to provide advance instruction in theory and practice within the specialty area.

A minimum of 126 credit hours plus Physical Education is required for the Bachelor of Science degree.

THE PROGRAM IN PHYSICAL THERAPY

The Department of Physical Therapy offers a four-year curriculum leading to a Bachelor of Science degree. In the freshman and sophomore years, students will concentrate on the necessary prerequisite courses. These prerequisites are in the humanities, sciences, and social sciences. In the sophomore year, the student will begin the basic sciences of anatomy and physiology and an introductory course in Physical Therapy. The junior and senior years are devoted to the professional program with time to further explore the humanities and social sciences required for a liberal education. During the professional program, the clinical education experiences will provide the student with concurrent opportunities to apply the acquired knowledge and skills. The program of study is:

	lst	2nd		İst	2nd
The Freshman Year	SEME	ESTÈR	The Sophomore Year	SEMI	ESTER
*English	3	_	Physics 11, 12	4	4
C&TI	_	3	*Electives	_	6
Chemistry 3, 16	4	4	Anatomy 101, 102	5	4
Biology 1, 2	4	4	Physiology 101, 102	4	4
*Mathematics	3		Physical Therapy 21	2	—
Psychology 1	_	3			
Elective	_	3		15	18
Physical Education 1,2	1	1	*(Optional/Advisor)		
	15	18			

*Courses dependent on Freshman Placement

THE DIVISION OF HEALTH SCIENCES

125

	lst	2nd		lst	2nd
The Junior Year	SEME	ESTER	The Senior Year	SEMH	ESTER
Physical Therapy 123	2	—	Physical Therapy 151-152	6	3
Physical Therapy 111	3	—	Psychology (PT-161)	3	
Pathology 101	3	_	Physical Therapy 153	2	
Physical Therapy 121-122	4	5	Physical Therapy 133	1	
Physical Therapy 131-132	1	2	Electives	6	
Physical Therapy 142		3	Physical Therapy 158		
*Electives	3	6	Clinical Education II	_	5
Physical Therapy 144	_	2	Physical Therapy 172	_	2
			Physical Therapy 174		2
	16	18	Physical Therapy 176	_	2
*(Ontional (Advisor)					
(Optional/Adviser)				18	14

PT 128 Clinical Education 16 wk. period (May-June) 3

The Program in Radiologic Technology

The Department of Radiologic Technology offers a program designed to provide academic and clinical instruction leading to the Associate in Science Degree. Graduates are eligible to write the examination of the American Registry of Radiologic Technologists in one of three specialty areas; radiography (x-ray), nuclear medicine, or radiation therapy. Due to definite enrollment limitations in each specialty, applicants must state their preference. Subsequent requests to transfer to another specialty will be permitted only if vacancies exist.

	lst	2nd
First Year	SEMEST	ER
Math 9	3	
English	3	
Physics 3	4	
R.T. 1,2	3 8	ţ.
Anat 9	3	
PSL 10	ş	\$
R.T. 14	អូ	i i
R.T. 12	3	i
Elective	3	j
Physical Ed.	, 1	
	1	
	17 17	

Summer

Twelve week internship at the Medical Center Hospital of Vermont or other affiliated institution.

Second Year

Radiography Technology		
Radiopathology (RT14)		
Dynamics of Health Care		2
Radiographic Sci (RT 31)	3	
Radiographic Techniques (RT 33, 34)	3	3
Clinical Practicum (RT 71, 72)	4	5
Electives ¹	6	6
	16	16

THE DIVISION OF HEALTH SCIENCES

Post Graduate			
12 week internship at Medical Center Hospital of Vermo	nt or	other	affiliated
institution.			
Nuclear Medicine Technology			
Dynamics of Health Care			2
Outline of Chemistry (Chem 3)		4	
Nuclear Medicine Tech (RT 41)		3	
Nuclear Medicine Tech (RT 42)		3	
Clinical Practicum (RT 71, 72)		3	3
Nuclear Medicine Tech (RT 44)			3
Electives ¹		3	6
		16 -	14

Post-Graduate 12 week internship at the Medical Center Hospital of Vermont or other affiliated institution

Radiation Therapy Technology		
Dynamics of Health Care		. 2
Rad Therapy Tech (RT 51)	3	
Clinical Practicum	3	3
Rad Therapy Tech (RT 52)		3
Rad Therapy Tech (RT 54)		3
Electives ¹	9	3
	15	14

Post-Graduate

12 week enternship at the Medical Center Hospital of Vermont or other affiliated institution

1. Electives

At least three courses must be taken from the list below with at least one course from each category.

A. FINE ARTS AND PHILOSOPHY (art, drama, music, speech, philosophy, religion)

B. SOCIAL SCIENCES (anthropology, economics, geography, history, political science, paychology, sociology)

A minimum of 60 approved semester hours plus university requirements in pshysical education and a grade point average of 2.0 is required for the Associate Degree in this curriculum.

The School of Nursing

The School of Nursing offers two distinct educational programs to prepare qualified individuals for the practice of nursing. The Professional Nursing program is four years in length and leads to the Bachelor of Science degree. The Technical Nursing program is two years in length and leads to the Associate in Science degree. Both programs are approved by the Vermont State Board of Nursing and accredited by the National League for Nursing, Inc.

Transfer between the two programs is possible in accord with University policy and with consent of the department concerned. Effective with students entering in the fall of 1973, a minimum 2.0 quality point average is required for graduation.

126

Professional Nursing Program

The Department of Professional Nursing offers a curriculum leading to the Bachelor of Science degree. This curriculum is designed to provide the opportunity for qualified individuals to prepare for professional practice in beginning positions in various settings, to acquire a foundation for continued formal study in nursing, and to enhance growth toward maturity as individuals, professional persons, and citizens. The graduates of this program are eligible for licensure as registered nurses, and may advance without further formal education to positions which require beginning administrative skills.

The curriculum, conducted in four academic years, provides an approximate balance in general and professional education. Courses in the sciences—biological, physical and social—serve as a foundation for the professional nursing courses.

A revised curriculum was initiated with the class of 1975. Students in the class of 1974 will complete the program described in the March 1972 Bulletin of the University of Vermont (p. 125).

	lst	2nd		lst	2nd
The Freshman Year	SEMI	ESTER	The Sophomore Year	SEME!	STER
English	3		Human Development	3	3
English or Elective General Psychology.		3	Introductory Microbiology, MCBI 55	4	
Psv. 1	•	3	Mammalian Anatomy and		
Outline of Chemistry,		0	Physiology, Zool. 5-6	3	3
Chem. 3-4	4	4	Nursing 102		3
Principles of Sociology,			Nursing 104		3
Soc. 10	3		Nutrition & Health,		
Public Speaking, C.&T. 11	3		N.Ec. 141		3
Electives	3	6	Electives	6	3
Physical Education	1	1			
				16	18
	17	17			
				lst	2nd
	lst	2nd	The Senior Year	SEME	STER
The Junior Year	SEMI	ESTER	Nursing 145	9.	
Human Development	3	_	Nursing 146	—	9
Nursing 125	9	_	Nursing 151	3	_
Nursing 126	_	9	Nursing 152		6
Electives	3	6	Elective	3	_
	15	15		15	15

A typical program of studies in the present curriculum follows:

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

Social Sciences—15 credits Including Psychology 1 and Sociology 10 Humanities and Languages—15 credits Including English—3 credits plus English 1 if required Including Philosophy 3 credits Including Communication and Theater 11—3 credits Human Development—9 credits Home Economics 62, 63 and 64 or approved equivalents General Electives—15 credits

Students are encouraged to study a foreign language, mathematics, or other .discipline of their choice.

A minimum of 126 approved semester hours is required for the Bachelor of Science degree plus required credits in physical education.

Technical Nursing Program

The Department of Technical Nursing offers a curriculum leading to the Associate in Science Degree. The curriculum is designed to prepare qualified individuals to give direct nursing care to patients of all age groups and to promote development of the individual as a responsible member of society. The graduates of this program are eligible for licensure as registered nurses and are prepared for nursing practice in hospitals, clinics, nursing homes and other health agencies.

The curriculum is two academic years and one four-week summer session in length. General education courses account for approximately one-half of the total required credits and nursing courses for the remaining one-half. Nursing courses are taught concurrently with general education courses throughout the two years and include classroom instruction and guided clinical experiences in selected agencies.

The program of studies follows:

TTL T I WANT	lst	2nd	(TTL) () 1	lst	2nd
The Freshman Year	SEME	SIEK	The Sophomore Year	SEMES	IEK
English Elective	3	-	Electives	3	3
General Psychology, Psy. 1	3	_	Dynamics of Health Care,		
Principles of Sociology,			AH 2	2	
Soc. 10	—	3	Nursing Seminar,		
Approved Elective*		3	Nursing 30		2
Anatomy, Anat. 9	3		Nursing Care		
Physiology, PSL 10		3	of Children		
Clinical Nutrition, H.Ec. 41	—	3	and Adults,		
Fundamentals of Nursing,			Nursing 27-28	10	10
Nursing 11-12	5	5	0		
Physical Education				15	15
					
	15	17			

Summer Session-4 weeks Nursing Care of Children and Adults, Nursing 14

4 credits

*English History Philosophy Religion

A minimum of 65 approved semester hours, plus required credits in physical education courses, is required for the degree.

128

Advanced Standing

The School of Nursing provides an opportunity for individuals who have had prior experience in the health field to receive advanced standing in the program to which admission is sought. Admission to the program is essentially the same as for other applicants to the University. In accord with University policy, the student may apply for credit by examination in general education and selected nursing courses.

Individuals planning to seek admission with advanced standing are urged to write to the School of Nursing for more detailed information and to arrange for a personal interview prior to applying for admission or taking courses for college credit at this or another institution.

General Information

Applicants must satisfy the general admission requirements for the University. High School courses in biology, chemistry, and physics are highly recommended.

Grades in nursing courses are based on achievement in theory and in laboratory practice, both of which must be satisfactory to receive a passing grade. The School of Nursing reserves the right to require the withdrawal from nursing of any student whose health, academic record, or performance and behavior in nursing is judged unsatisfactory.

All students in the School of Nursing are responsible for transportation to and from the agencies which are used for clinical experiences. These include the Medical Center Hospital of Vermont; the Burlington Visiting Nurses' Association, Inc.; the Vermont State Hospital, Waterbury; and other selected agencies.

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

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

Continuing Education

In cooperation with the professional association, voluntary and official agencies, and health care institutions or agencies, continuing education programs are arranged to meet the needs of registered nurses.

PROFESSIONAL PERSONNEL IN COOPERATING AGENCIES

- Mrs. Elizabeth Davis, B.S., R.N., Executive Director, Burlington Visiting Nurse Association, and Clinical Assistant Professor
- Mrs. Tobah Gladstone, M.S., R.N., Psychiatric Nurse Clinician, Medical Center Hospital of Vermont, and Clinical Instructor
- Mrs. Vera Hanks, R.N., Chief, Patient Care Services, Vermont State Hospital
- Patricia Kelly, M.S., R.N., Director of Nursing, Medical Center Hospital of Vermont, and Clinical Associate Professor.
- Kathryn Lambert, M.S., R.N., Associate Director of Nursing, Medical Center Hospital of Vermont, and Clinical Assistant Professor
- Mrs. Lois Sabin, B.S., R.N., Director for Educational Programs, Vermont State Hospital, and Clinical Instructor

SCHOOL OF HOME ECONOMICS

The School of Home Economics concerns itself with man's physical, social and psychological relationship to his environment and offers the following five programs, each leading to a bachelor of science degree. Concentrations within programs offer a variety of backgrounds for professional careers.

CLOTHING, TEXTILES AND DESIGN Prepares students for careers in merchandising, consumer research and counseling, fashion and textile designing, and promotional work in industry and the Extension Service. Professional requirements include courses in Clothing, Textiles and Design, Humanities, Social Sciences and Chemistry.

EARLY CHILDHOOD AND HUMAN DEVELOPMENT Two concentrations are offered in this program each providing

study opportunities and practical experiences that focus on the nature of the developmental process. In human development the approach is interdisciplinary and ontogenetic, close ties being maintained with other programs in the school and other departments in the University. A year of resident study at the Merrill-Palmer Institute in Detroit, Michigan, may be arranged. The student is prepared for work in agencies dealing with children and families, and graduate studies.

The concentration in Early Childhood provides the student with academic and work experiences focusing on the developmental needs of young children. It is closely aligned with the concentration in human development and cooperates with Elementary Education. Students prepare to work in public and private settings for young children and their families. Students are encouraged to elect courses from other departmental and college offerings and to participate in community programs. A year of study at the Merrill-Palmer Institute in Detroit, Michigan, may be arranged.

HOME ECONOMICS EDUCATION Prepares for a variety of teaching opportunities including high school Consumer and Homemaking programs, the newly developing areas of middle and elementary education in Living Arts, Adult Teaching, Occupational Home Economics, and positions in the Extension Service. All students who plan to specialize in any phase of education must make application to Teacher Education and must have a 2.5 average in their home economics subjects to be eligible for student teaching during their senior year. (See Teacher Education at UVM.)

HOUSING AND HOME MANAGEMENT Careers include work with utility companies or appliance dealers and a wide variety of opportunities in planning and management of housing and interiors.

THE SCHOOL OF HOME ECONOMICS

Students may prepare to work as consultants for urban renewal relocation, city planning, architectural and building firms. Promotional work may be found with consumer education and research, newspapers and magazines, radio and TV. Emphasis may be directed toward one of the following professional goals: Housing and Equipment, Housing and External Environment, Housing and Interior Design, Family Economics or Home Management. Professional requirements may be chosen from the Humanities, Social Sciences and Physical Sciences.

HUMAN NUTRITION AND FOODS Students may develop a strong background for professional careers, graduate study or college teaching by selecting a concentration in dietetics, foods, hospitality, human nutrition, or nutrition education. The concentration in dietetics is designed to meet academic requirements for membership in the American Dietetic Association; those interested in careers as administrative, therapeutic, clinic, or public health dietitians, are advised to plan on an internship after completing their undergraduate program.

132

The School of Natural Resources

Programs of study in the School of Natural Resources are aimed at providing a philosophical and scientific basis for professional work in the use and management of natural resources, with particular reference to the areas of forestry, wildlife ecology, recreation resource management, and natural resource economics. The School is a newly organized unit on the campus and its full program is currently in a planning stage. In addition to already established areas noted above, planning is now underway for new programs of study in water resources, land use planning, and environmental engineering.

The four-year undergraduate program leads to the Bachelor of Science degree and qualifies the graduate for employment in a variety of positions with federal and state agencies, various resource-using industries, resource associations and consulting firms, and other employers of natural resource specialists.

DEPARTMENT OF FORESTRY Curricula in the Department of Forestry provide a liberal education in the humanities and sciences

and a professional education in forestry and wildlife ecology. The programs are designed to prepare individuals for positions in forestry, in wildlife ecology, or for graduate study in the forest or wildlife sciences.

A minimum of 138 semester credit hours of prescribed and elective courses is required for graduation.

Forestry and Wildlife Ecology

	Ist	2nd	Introduction to Forestry,		
The Freshman Year	SEMES	STER	For. I	2	—
College Algebra, Math. 9 ¹	3	_	Freshman Seminar,		
Trigonometry, Math. 2	_	3	For. 2	_	1
Engineering Graphics,			Introductory Chemistry,		
M.E. 1	_	2	Chenr.3	4	
English	3	3	Electives		3-5
Principles of Biology,					
Biol. 1, 2	4	4			

1. Qualified students may substitute Math. 11 or 13 for Math. 9 and 2.

THE SCHOOL OF NATURAL RESOURCES

Principles of Economics, Econ. 11, 12	3	3			
Dendrology, For. 5 Plane Surveying C F 12	4	_	Electives	2-3	2-3
Silvics, For. 122		3	For. 144		3
Math. 110	_	3	Forest Biometry I,		
Elementary Statistics.	()21/12()	- 210	Physics 5	4	
The Sophomore Year	lst SEMES	2nd FER	Public Speaking, Speech 11 Elementary Physics,	_	3

summer rieta riogram	
Forest Biometry II, For. 140 ²	
Forest Bioecology, For. 100 ²	
Wildlife Biometrics, For. 170 ³	

4 4 4

FORESTRY This program emphasizes the science and technique of coordinating the management of forest and wildland for forest products, water, wildlife, and recreation. Graduates may be employed by Federal and State agencies, by forest products and related industries, and by private consulting forestry firms.

A. Forestry Program

	lst	2nd		lst	2nd
The Junior Year	SEME	STER	The Senior Year	SEMES	STER
Forest Fire Control,			 Forest Economics, 		
For. 132		2	For. 151	3	
Silviculture, For. 123	3		Forest Management,		
Forest Entomology,			For. 136		3
For. 107	3		Forest Recreation,		
Wood Technology,			For. 135	3	
For. 162	_	3	Timber Harvesting,		
Technical Reporting,			For. 163	3	
VOTEX 174	3	_	Forest Pathology,		
American Government,			For. 112	_	3
Pol. Sci. 21	3		Forest Policy and Ad-		
Electives ⁴	4-6	11-13	ministration, For. 153	3	
			Seminar, For. 282		1
			Principles Wildlife		
			Mang't., For. 174	_	3
			Electives ⁴	4-6	6-8

WILDLIFE ECOLOGY This program emphasizes the science and technique of managing wildlife populations in forests and in other types of wildlands. Graduates may be employed principally by Federal and State agencies.

- 2. For forestry majors only—courses in eight week program immediately following the second semester of the sophomore year.
- 3. For wildlife majors only—course in four week program immediately following the second semester of the junior year.
- 4. Restricted elective areas include—(a) a total of nine hours from two or more of the following: Arts, Humanities, Mathematics, Military Science, or Social Sciences; (b) one approved course in communications; (c) one approved course in earth sciences.

B. Wildlife Ecology Program

	lst	2nd		lst	2nd
The Junior Year	SEMES	STER	The Senior Year	SEME	STER
Structure & Function,			Wildlife Diseases, An.		
Zoo. 103, 104	4	4	Path. 110	_	3
Silviculture, For. 123	3	_	Wildlife Mang't I,		
Systematics & Phylogeny,			For. 271	4	
Bot. 109	3		Seminar, For. 282		1
Principles Wildlife			American Gov't Pol.		
Mang't, For. 174		3	Sci. 21	3	
Avian Biology,			Forest Entomology,		
An. Sci. 158	—	4	P&SS 107	3	
Game Mammals,			Technical Reporting,		
For. 175	4		VOTEX 174	3	
Environmental Zoology,			Electives ⁴	3-5	12-14
Zoo. 102		4			
Electives ⁴	2-4	1-3			

RECREATION RESOURCE MANAGEMENT This program is designed to prepare students for professional careers in the

management of recreational resources. These recreational resources include national, state, regional, county and urban parks, campgrounds and recreation areas, as well as privately managed ski areas, campgrounds, hunting and fishing preserves, and other specialized recreational areas and facilities.

Due to the diversity of recreation resources and opportunities, students are given the opportunity to pursue a course of study which is both geared to their area of interest and compatible with professional requirements. Professional compatibility of the curriculum is developed and maintained through periodic consultations with professionals in the field.

All majors in Recreation Resource Management are required to successfully complete a series of core courses during the freshman and sophomore years. Upon completion of the sophomore year the student may elect to concentrate in one of three areas: Private Recreation Management, Rural-Urban Park and Recreation Management, and Outdoor Recreation Management. In addition to formal course work, each student must also complete two months of seasonal employment in his chosen area of concentration prior to graduation.

RESOURCE ECONOMICS This program deals with the application of economic theory to natural resource allocation problems. It pre-

pares an individual to use the logic of economics and the perception of conservation to recommend the efficient and equitable use of natural resources. Graduates will be prepared for positions in natural resource management, planning, and administration.

Students interested in Environmental Studies may ENVIRONMENTAL STUDIES enroll in the School of Natural Resources (see page 133), They may have a coordinate major or major in Environmental Studies.

The Environmental Program

The Environmental Program is an interdisciplinary effort to strengthen the educational, research, and service missions of the University related to the study of man and his environment. Students and faculty from each of the University's colleges combine their diverse skills and experience in a variety of academic and action-oriented programs, on campus and in the community, which enrich the understanding of cultural and biophysical environments essential to the quality of life.

A Director and small staff, assisted by an Executive Committee of students and faculty, direct the activities of the Environmental Program. Faculty members from a broad range of academic departments serve in the Environmental Studies Advising Group as advisers to undergraduates. Program offices are located in The Bittersweet where students are invited to visit with the staff regarding their interests and future plans. The Environmental Resource Center is also located in The Bittersweet to assist faculty and students with research and action projects, and to provide current information on regional and state environmental activities.

The Environmental Studies Curriculum

The curriculum in Environmental Studies offers students a wide variety of alternatives, including an individually-designed interdisciplinary *Major in Environmental Studies* and several options which combine study in a traditional major with a *Coordinate Major in Environmental Studies*.

Students entering the University as freshmen may apply for admission to Environmental Studies through several of the University's undergraduate colleges. Choice of the appropriate college or school will depend on the individual's interests and educational objectives. Those seeking a liberal arts program will normally register in the College of Arts and Sciences. Those interested in the applied sciences or education will usually register in the College of Agriculture; College of Engineering, Mathematics, and Business Administration; the School of Natural Resources; School of Home Economics or the College of Education. Choice of the appropriate college should be made only after careful study of the Catalogue and, if possible, consultation with the Director of the Environmental Program or his staff.

College of Agriculture; College of Engineering, Mathematics, and Business Administration; the School of Natural Resources; School of Home Economics.

Degree Requirements

Students must complete the distribution requirements and minimum credithour requirements of their College of registration, and the following core course sequence:

Required Core Courses		Credit Hours
Environmental Studies 1		3
Environmental Studies 2 (selected elective)		3
Environmental Studies 100		3
Environmental Studies 204		3
	Total	12

Incoming students will be assigned an adviser by the Environmental Program Director. Not later than the sophomore year, in consultation with this adviser, the student will select one of the following Major programs:

COORDINATE MAJOR IN ENVIRONMENTAL STUDIES For the majority of students, this program offers the best

combination of career opportunities and personal interests. In addition to completing the Required Core Courses listed above, a student must complete the degree requirements for a departmental major in his or her college of registration *plus one* of the following coordinate options:

1. Major Specialization Option. At least 3 advanced, environmentally-focused courses in the major field, or a closely-related field. These courses may, if appropriate, satisfy both departmental and Environmental Studies major requirements.

2. Minor Specialization Option. At least 3 advanced courses in a second major field, constituting an environmentally-focused minor.

3. Supporting Program Option. At least 4 advanced courses with environmental emphases which support the major program, and usually in at least two fields outside the major department.

4. Environmental Education Option. This option is for students in the College of Education seeking certification in Environmental Studies in elementary or secondary education. See page 98 of the Catalogue.

MAJOR IN ENVIRONMENTAL STUDIES For selected students whose needs and interests cannot be met by the major programs

currently offered by the undergraduate colleges, the Major in Environmental Studies provides the option of an individually-designed, interdisciplinary major program. Admission to the Major in Environmental Studies requires approval of the student's Environmental Studies adviser and successful completion of the Major Seminar (E.S. 51).

Required Courses		Credit Hours
Core Courses (E.S. 1, 2, 100, 204)		12
Environmental Studies 51		3
Individually-designed program*		24+
Environmental Studies 201		3
Environmental Studies 202-203		TBA**
		<u> </u>
	Total	42+

*Selection of courses and planning of the individually-designed program will usually be accomplished as a course project in the Major Seminar (E.S. 51).

**TBA—Credit to be arranged. Usually a minimum of 6 credits.

The Graduate College

The purpose of the Graduate College is to serve the needs of the college graduate who desires a broader and more thorough knowledge of scholarship and research in his chosen field. The College offers the following programs leading to the Master's degree and to the degree of Doctor of Philosophy. Each student is expected to be familiar with the general regulations and procedures of the Graduate College, and with the specific degree requirements in his chosen field of study. For detailed information refer to the Graduate College Bulletin available from the Graduate College Office, 335 Waterman Building.

Master of Arts.

Programs are offered in the following fields:

Communication English French Geography German Greek History Latin Mathematics

Music Political Science Psychology Spanish

Master of Science

Programs are offered in the following fields:

Agricultural Economics Anatomy Animal Sciences Animal Pathology Biochemistry Biomedical Engineering Biostatistics Botany Chemistry Civil Engineering Economics of Natural Resource Planning Electrical Biophysics Electrical Engineering Forestry Geology Home Economics Mechanical Engineering Medical Microbiology Medical Technology Microbiology Pathology Pharmacology Physics Physiology and Biophysics Plant and Soil Science Speech Pathology Zoology

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:

THE GRADUATE COLLEGE

Agriculture Botany Chemistry English French Geography Geology German Greek History Home Economics Industrial Education Latin Mathematics Music Physics Spanish Zoology

Master of Science for Teachers

This degree is designed primarily for secondary school teachers who wish to strengthen their backgrounds in their subject matter field, and who desire flexibility in choosing courses at levels best suited to their needs. Programs are planned on an individual basis.

Mathematics Biology (Botany & Zoology) Physical Sciences (Chemistry & Physics)

Master of Education

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

AdministrationReading and LanguageSpecial EducationFoundations of Education(Elementary and Secondary) Student Personnel Services in
School CounselingSchool CounselingArts Education(Elementary and Secondary) Teacher Education

Master of Business Administration

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

Master of Extension Education

This degree is designed to provide opportunity for those who work in nonschool educational and counseling programs to develop knowledge and understanding in activities related to program management and educational methodology.

Programs are planned on an individual basis with special attention to fields such as:

Agriculture	Family Centered Services
Home Economics	Business and Industry
Youth Organizations	,

THE GRADUATE COLLEGE

Doctor of Philosophy

Programs are offered in the following fields:

Anatomy Animal Sciences Biochemistry Botany Chemistry Electrical Engineering Mechanical Engineering Microbiology Pharmacology

Physics Physiology and Biophysics Plant and Soil Science Psychology Zoology

Fifth Year Certificate in Education

A special fifth year program culminating in a certificate of advanced study is offered by the Department of Education for students who wish to work beyond the bachelor's degree. It 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. Information about the certificate program may be obtained by contacting the Dean of the College of Education.

Concurrent Degrees

Post-sophomore fellows in medicine are permitted to use credit from appropriate medical courses toward an M.S. or a Ph.D. They are enrolled in the Graduate College for one or more years to pursue research and enroll in such courses as would normally not be included within a medical program. Such persons, therefore, are working toward an M.D. and M.S. or Ph.D., but completion of each degree may occur at a different time.

All courses for which graduate credit is received at UVM in a master's degree program, whether a master's degree is received or not, may be applied toward a Ph.D. at UVM provided they are appropriate for the Ph.D. program.

No provision is made for a person to employ the same credit to satisfy two master's degrees at the University of Vermont.

140

Continuing Education

Through Continuing Education the University provides opportunities for formal and informal study to persons who have not attended college, who require additional training in their work, or who wish to pursue previously unexplored areas of study.

The Summer Session

Summer Session offers courses in many subjects at both the graduate and undergraduate level.

The offerings are diversified to meet the needs of those who desire courses leading to a bachelor's degree; those who wish to do graduate work; 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.

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

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

Evening Division

The University's Evening Division program provides educational opportunities for adults. 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 pleasure or 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, Grasse Mount. Length of courses varies from ten to fifteen weeks.

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

Non-Degree Student Enrollment

Through Continuing Education Non-Degree students have an opportunity to enroll in courses offered in the day program. Non-degree students are those who have presented minimum credentials and are permitted to enroll in one of the colleges of the University to undertake course work for a purpose other than the earning of a degree.

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

Undergraduate Non-degree Students, those seeking only undergraduate credit for course work taken, apply for approval to the Division of Continuing Education which will act as their college office.

Graduate Non-degree Students, those seeking graduate credit, must register through the Graduate College.

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

All non-degree students who would like assistance in planning educational programs and selecting courses should contact the Division of Continuing Education at Grasse Mount. (telephone 656-2085)

Conferences and Institutes

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

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

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

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

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

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

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

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

Two hyphenated numbers (17-18) indicate that the semester courses may not be taken independently for credit and, unless otherwise stated, they must be taken in the sequence indicated.

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

Odd-numbered courses are generally offered the first semester: evennumbered courses are generally offered the second semester; variations from this arrangement may be indicated by the Roman numeral I for the first semester or II for the second semester.

The form (2-3) immediately following the course title indicates the number of class hours respectively of lecture and of laboratory.

Allied Health

DIVISION OF HEALTH SCIENCES

2 DYNAMICS OF HEALTH CARE Introduction to the whole pattern of comprehensive health care; a core course for students in the health career programs. Two hours. Nursing and Allied Health staff.

199 ALLIED HEALTH This course is designed to introduce procedures and methods of instruction in various teaching situations. Enrollees have the opportunity to design and participate in a teaching activity. Concurrent offering is an introduction to the basic principles in management, supervision, and administration. Project emphasis on investigation of concepts for projecting new patterns to meet the needs of future health care systems. Two lectures per week, four projects. Three hours. Staff.



Professor Young (Chairman); Associate Professors Freedman and Wells; Assistant Professors Boushey, Horst, Krupp and Paull.

9 INTRODUCTORY HUMAN ANATOMY 2.3 Designed principally for students in the Allied Health professions, this course focuses upon topographic human anatomy. By use of prosections, radiographs, microscopic slides and other illustrative materials, the student studies the major regional relationships in the human body, as well as the appropriate microscopic correlations in organ systems. Departmental permission. 3 hours. Staff.

101 GROSS ANATOMY FOR PHYSICAL THERAPISTS (3-6). This course is designed to place emphasis upon the structural and functional aspects of the human musculoskeletal, peripheral nervous, cardiovascular and respiratory systems. Lectures will correlate clinical applications of functional anatomy where appropriate. Detailed regional dissections, radiographs, prosections, skeletal materials and other materials will be utilized in the laboratory. Departmental permission. 5 hours. Staff.

102 NEUROANATOMY—HISTOLOGY FOR PHYSICAL THERAPISTS (2-3). With primary emphasis upon the structural basis of central nervous system function, this course will also examine the functional micromorphology of other organ systems (esp., musculoskeletal, cardiovascular, respiratory and integumentary). This course is designed to supplement Anatomy 101. Lectures will focus upon the principles of functional organization, with clinical examples where appropriate while the laboratory will utilize microscope slides, movies and gross preparations of the central nervous system. Prerequisites: Anatomy 101. Departmental permission. 3 hours. Staff.

Animal Pathology

COLLEGE OF AGRICULTURE

Professors Bolton (Chairman) and Joseph Gans; Associate Professors Murray and Henry Doremus; Adjunct Associate Professor Wadsworth.

105 ANIMAL ANATOMY Gross and microscopic structure of the organ systems of the mammalian body with emphasis on farm animals. Three hours. Dr. Murray

106 ANIMAL DISEASES Fundamentals of disease recognition and prevention in domestic animals. Special disease problems in cattle and horses with emphasis on control measures. *Prerequisite:* 105 recommended. Three hours. Dr. Murray.

107-108 LABORATORY ANIMAL TECHNIQUES (2-2) Laboratory procedures used in the examination of blood, fecal, urine, milk, and tissue specimens. Preparation of tissue sections. *Prerequisite:* departmental permission. Three hours. Dr. Joseph Gans.

110 WILDLIFE DISEASES Common diseases and parasitic problems of large game animals, small fur-bearing animals, waterfowl and game birds. Autopsy techniques and diagnostic laboratory procedures. *Prerequisite:* 2 courses in biology or zoology. Three hours. Dr. Bolton. Alternate years, 1974-75.

197, 198 SENIOR RESEARCH Work on a research problem under the direction of a qualified staff member. Findings submitted in written form as prescribed by the department. *Prerequisite:* senior standing. Three hours. Staff.

217-218 LABORATORY ANIMALS (2-2) Life cycles, nutrition, housing, breeding, disease prevention, colony management, preoperative and postoperative care, and humane methods of handling. *Prerequisite:* departmental permission. Three hours. Dr. Henry Doremus.

220 LABORATORY ASSIGNMENTS Rotating assignments in the Animal Pathology Laboratory and Division of Animal Services under the guidance of the professional staff. *Prerequisite:* departmental permission. Three hours. Staff.

Animal Sciences

Professors Atherton, Balch, Duthie, Smith (Chairman), and Welch; Associate Professors Carew, Foss, Nilson, and Simmons; Adjunct Associate Professors Mercia, and Woelfel, and Adjunct Assistant Professor Gibson.

2 INTRODUCTORY ANIMAL SCIENCE Fundamental principles of anatomy, physiology, nutrition, breeding and management of animal species important in our agricultural economy. Three hours. Mr. Smith and staff.

33 INTRODUCTORY DAIRY TECHNOLOGY (2-2) Basic information on milk and milk products and application of this information in laboratory exercises. Three hours. Mr. Duthie.

ANIMAL SCIENCES

43 FUNDAMENTALS OF NUTRITION. A comprehensive study of specific nutrients in terms of their availability, function, utilization, and requirements in mammalian species. Three hours. Mr. Carew.

44 DAIRY CATTLE SELECTION (2-3) Fundamental principles of dairy cattle selection and breeding. Three hours. Mr. Gibson. Alternate years, 1974-75.

104 FOOD TESTING AND QUALITY CONTROL (2-2) Composition and properties of basic food materials. Standard methods of bacteriological and chemical analysis and their significance in product quality. Three hours. Mr. Atherton.

109 FOOD MICROBIOLOGY (2-3) Desirable and undesirable activities of microorganisms in foods. Laboratory methods in quality control. Microbial contamination, tood spoilage, and food-borne disease. Three hours. Mr. Atherton.

114 MANUFACTURED DAIRY PRODUCTS (2-3) Methods and technical problems in manufacturing milk products such as cheese, butter, evaporated and dry milks. *Prerequisites*: 33, junior standing. Three hours. Mr. Nilson. Alternate years, 1973-74.

121 SENSORY EVALUATION OF FOODS (1-4) Taste and odor as basic components of flavor, sensory tests for consumer acceptance studies and practical training in flavor identification. Three hours. Mr. Duthie. Alternate years, 1974-75.

153 MILK PROCESSING (2-2) Technical aspects of processing fluid milk and fluid milk products. *Prerequisite:* departmental permission. Three hours. Mr. Nilson. Alternate years, 1974-75.

158 INTRODUCTION AVIAN BIOLOGY (3-3) Designed for students with general interests in biology. Topics-Evolution, comparative structure and function, behavior, migration and orientation, flight, identification, population regulation. Four hours. Mr. Foss.

160 ANIMAL BREEDING (2-3) Theory and application of genetic principles of breeding of livestock. *Prerequisite:* 2. Three hours. Staff. Alternate years, 1973-74.

170 GENERAL PHYSIOLOGY. An intermediate course, especially designed for the biology student to increase his knowledge of animal functions at the organ system level in mammals. *Prerequisite:* Animal Pathology 105 or equivalent. Three hours. Messrs. Foss and Simmons.

177 ADVANCED LIVESTOCK PRODUCTION (2-3) Organization and operation of livestock enterprises. Theory and application of feeding, breeding and management programs and principles. *Prerequisite:* junior standing. Three hours. Mr. Welch. Alternate years, 1973-74.

187, 188 LIGHT HORSE PRODUCTION AND MANAGEMENT (2-3) The problem of light horse production. Application of the principles of selection, management and horsemanship. *Prerequisite:* 187 for 188; junior standing. Three hours. Mr. Balch.

190 POULTRY SCIENCE Scientific principles employed in poultry enterprises including evolution, genetics, breeding, incubation, hatching, brooding and rearing, nutrition, pathology, housing, and marketing. *Prerequisite:* junior standing. Three hours. Mr. Carew. Alternate years, 1973-74.

197, 198 UNDERGRADUATE RESEARCH Research activity under the direction of a qualified staff member. Findings submitted in written form as prescribed by

146

the department. *Prerequisites:* junior standing and department permission. Three hours. Staff.

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: sanitary control. *Prerequisites:* 104; credit or concurrent enrollment in 109; junior standing. Three hours. Mr. Nilson. Alternate years, 1973-74.

246 ADVANCED NUTRITION (See home economics 246) Three hours. Mr. Welch.

249 NUTRITION SEMINAR (See home economics 249) Three hours. Miss Morse and Mr. Welch.

251 ADVANCED DAIRY CATTLE MANAGEMENT (2-3) Organization and operation of dairy enterprises. Theories and methods of application of feeding, breeding, and management programs and principles. *Prerequisite:* 43. Three hours. Mr. Woelfel. Alternate years, 1973-74.

256 DAIRY PLANT MANAGEMENT (2-3) Organization and operation of milk processing and manufactured milk products plants. *Prerequisites*: 153, Ag. Ec. 62; junior standing. Three hours. Mr. Nilson. Alternate years, 1974-75.

271 ENDOCRINOLOGY (2-2) Anatomy, physiology, glandular interrelationships, and assay methods of the endocrine glands and their hormones. *Prerequisite:* departmental permission. Three hours. Mr. Simmons.

275 PHYSIOLOGY OF REPRODUCTION AND LACTATION (2-2) Fundamental principles of the physiology of reproduction and lactation with the primary emphasis on farm animals. Three hours. Mr. Simmons. Alternate years, 1974-75.

281, 282 ANIMAL AND DAIRY SCIENCE SEMINAR. Reports and discussions of problems and special investigations in selected fields. One-three hours. Maximum credit two hours senior, three hours graduate. Staff.

291 SPECIAL PROBLEMS IN ANIMAL AND DAIRY SCIENCE Reading, discussion, and special laboratory investigation in the field of animal and dairy science. *Prerequisite:* departmental permission. A student may enroll more than once for a maximum of six hours. Staff.

294 HISTORY OF NUTRITION (See home economics 294). One hour. Miss Morse.

\setminus Anthropology

COLLEGE OF ARTS AND SCIENCES

Associate Professor Haviland (Chairman), Mitchell, Woolfson; Assistant Professors, Magnarella, C. Pastner, S. Pastner; Instructor Basa.

Anthropology

21 THE CULTURES OF MAN The culture concept; the lifeways of non-Western societies of varying social complexity. Three hours. Staff.

24 WORLD PRE-HISTORY The origins and antiquity of culture; the nature of archaeological data and interpretation. Three hours. Ms. Basa.

26 PHYSICAL ANTHROPOLOGY An introduction to the study of the evolution and racial differentiation of man. Three hours. Mr. Haviland.

50 LANGUAGE IN CULTURE This course is designed to provide background in linguistic anthropology. Three hours. Mr. Woolfson.

51 FIELD METHODS IN LINGUISTICS Training in the Anthropological methods of obtaining linguistic data. Each student will work with an informant whose native language is other than English. At the end of the semester, each student will present a phonemic inventory of the pertinent sounds in the language he or she has explored. *Prerequisite:* 50 or Linguistics 101. Mr. Woolfson

131 PRIMITIVE RELIGION (See Religion 131).

160 NORTH AMERICAN INDIANS An ethnographic survey of the major native American cultures of Mesoamerica and the United States against the background of aboriginal culture history, and problems arising from contact with European cultures. *Prerequisite:* 21. Three hours. Mr. Haviland

161 CULTURES OF SOUTH AMERICA An ethnographic survey of the major native American cultures south of Mesoamerica against the background of aboriginal culture history, and their relation to the present day culture spheres of Euro-America, Indo-America and Plantation America. *Prerequisite:* 21. Three Hours. Mr. Haviland

162 CULTURES OF AFRICA An ethnographic survey of representative native societies of sub-Saharan Africa and of major colonial/immigrant minorities. Emphasis is placed on changes occuring as results of colonialism, independence and modernization. *Prerequisite:* 21. Three hours. Ms. Basa

166 PEOPLES OF THE MIDDLE EAST A cultural survey of the peoples living in the lands from Egypt to Afghanistan with emphasis on the Arabs, Turks and Persians. *Prerequisite*: 21. Three hours. Mr. Magnarella.

167 NATIVE AND CONTEMPORARY PEOPLES OF CANADA An exploration of the cultures of Canada's minorities—both native and immigrant; focuses on the background traditions of these minorities and the cultural conflicts engendered in the Canadian experience. *Prerequisite:* 21, or Geography 102, or History 214, or History 216. Three hours. Mr. Woolfson.

170 PASTORAL PEOPLES An examination of the social and economic organization of peoples whose main livelihood is the migratory herding of animals, against a backdrop of environmental pressures and participation in larger social systems. *Prerequisite*: 21. Three hours. Mr. Pastner.

175 ETHNOGRAPHY OF ART The analysis of the art of tribal and non-western peoples, with emphasis on the visual arts of Africa, Oceania and North American Indians. Particular attention is paid to the relation of art to social organization and ideological systems. *Prerequisite:* 21. Three hours. Ms. Pastner.

180 CULTURAL ECOLOGY Interrelationships of social groups and their natural environments and resource bases, with primary emphasis on non-industrial cultures. Empirical and theoretical materials from hunting-gathering, pastoral and peasant peoples will be examined from the perspectives of anthropology and geography. *Prerequisite:* 21 or Geography 11. Three hours._Messrs. Gade and Pastner (team taught).

193, 194 COLLEGE HONORS

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

212 CULTURE AND PERSONALITY The cross-cultural comparison of personality development; the problem of delineating modal personality types. *Prerequisite:* Sociology 10, Anthropology 21 and one 100 level course in Sociology or Anthropology, Three hours. Messrs. Mabry, Magnarella, Steffenhagen.

225 CURRENT ANTHROPOLOGICAL THEORY Schools of Anthropological thought examined in relation to data on non-western societies and the historical and social context in which the anthropologist works. Included are Evolutionism, Cultural Ecology, Functionalism, Relativism, Diffusionism, Structuralism and the Cognitive school. *Prerequisite:* 21 plus one 100 level course. Three hours. Mr. Magnarella, Mr. Pastner, Ms. Pastner.

228 SOCIAL ORGANIZATION The study of social relationships of peoples living in various cultures and in different parts of the world; focuses on such topics as residence, descent and kinship in tribal organization and community life. *Prerequisite:* 21 and one 100 level course. Three hours. Messrs. Magnarella and Mitchell.

229 POLITICAL AND ECONOMIC ANTHROPOLOGY The analysis of traditional exchange and subsistence systems and the ways these relate to interest-based, or political behaviors. *Prerequisite:* 21 and one 100 level course. Mr. Pastner.

262 CULTURAL GEOGRAPHY (Same as Geography 262).

283 CULTURE CHANGE The study of Socio-cultural transformations in nonwestern countries with emphasis on such topics as industrialization, urbanization and modernization and their impact on the lives of previously traditional peoples. *Prerequisite:* 21 and one 100 level course, or 21 and six hours in the social sciences. Three hours. Mr. Magnarella

284 URBAN ANTHROPOLOGY The study of urbanization and urban life in non-western countries including such topics as urban-rural ties, peasant migrations, and socio-cultural adjustment to urban living. *Prerequisite:* 21 and one 100 level course, or 21 and six hours in the social sciences. Three hours. Mr. Magnarella.

290 SEMINAR *Prerequisite:* twelve hours of Anthropology and senior standing. Three hours. Staff.

295-296 ADVANCED SPECIAL TOPICS Prerequisite: 21 and one 100 level course.

Area and International Studies

COLLEGE OF ARTS AND SCIENCES

Executive Committee: Professors Daniels, Dellin, Felt (Chairman), Gould, Mabry, Miles, and Seybolt.

Asian Studies: Professors Alnasrawi, A. Andrews, I. Andrews, Brewer, Engroff, Gussner, Leinback, Little, Magnarella, C. Pastner, S. Pastner, Roland, Seybolt (Director), Swanson, Wong, and Yadav. Canadian Studies: Professors Haugen, Laber, London, Metcalfe, Miles (Director), Muller, Rivard, Stanfield, Thompson, Williams, Woolfson, and Young.

Latin American Studies: Professors Doolan, Gade, Gould, Haviland, Murad, Parker, Simon, True, Ugalde, Weiger, Wesseling, and Zarate.

Russian and Eastern European Studies: Professors Basa, Daniels, Dellin,, Flannery, Mabry (Director), Meeks, Nalibow, Pacy, N. Paganuzzi, P. Paganuzzi, and Staron.

General and Other Colleges: Professors Barnum, Felt, Geno, Hilberg, Kahn, Kohler, Julow, Sargent, Schmokel, Shiman, Stone, Tremblay, Vogelmann, and Webster.

193, 194 College Honors

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

297, 298 SEMINAR Conducted by a team of area specialists and covering selected topics through interdisciplinary and comparative approaches. *Prerequisite:* permission by the executive committee of Area Studies. Other area courses are offered by the individual academic departments. For specific requirements for each area, consult the Director of the appropriate program.

College of Arts and sciences

Art

Professors J. Davison and R. Janson (Chairman); Associate Professor Aschenbach; Assistant Professors W. Davison, Hewitt, Lipke, Owre, Roland, Sherman, Okino; Instructors Fengler, Higgins, Spivak, Versweyveld.

Studio Art

l INTRODUCTORY STUDIO Introduction to visual thinking and awareness, projects focusing on basic concepts of two- and three-dimensional objects and images. Three hours. Staff.

2 BASIC DRAWING The structure and reconstruction of visual experience through drawing, and the traditional transformation of three-dimensional experiences on to a two-dimensional surface. Three hours. Staff.

3 Two DIMENSIONAL STUDIES Primary concern with surfaces and imagery utilizing various aspects, depending on section and instructor, of painting, drawing, graphics and photography. Three hours. Staff.

4 THREE DIMENSIONAL STUDIES Exploration of manipulative materials and structural form, utilizing various aspects, depending on section and instructor, of ceramics, fine metals, sculpture and construction. Three hours. Staff.

NOTE: Art 1 will be closed to students with more than one of 2, 3, 4 while 3 or 4 may in certain cases be taken more than once if with a different instructor.

21, 22 DRAWING An intense investigation of drawing and elements that re-

late to the discipline. Assignments, individual projects and group critiques. *Pre-requisite:* 2. Three hours. Owre.

111, 112 FINE METALS Advanced techniques in enamels and silver jewelry. Independent work emphasizing design and skill. *Prerequisite:* 4 and permission. Three hours. Spivak.

113, 114 CERAMICS Advanced techniques in throwing and hand building. Clay and glaze technology, kiln theory and construction. Independent work in ceramic design and execution. *Prerequisite:* 4 and permission. Four hours. Okino.

121, 122 PAINTING The structure and process of the tradition of painting; with emphasis on the visualization of space and the dimensions and dynamics of color. *Prerequisite*: 1 or 2 and 3. Three hours. Hewitt.

131, 132 PRINTMAKING: ETCHING AND SILKSCREEN Including stencil, resist and photo-silkscreen. *Prerequisite*: 1 or 2 and 3 and instructor's permission, 131 for 132. Four hours. Davison.

133, 134 PRINTMAKING: LITHOGRAPHY Methods and materials in planographic printing, and lithography, stressing design and technical control. *Prerequisite:* 1 or 2 and 3 and instructor's permission, 133 for 134. Four hours. Davison.

141, 142 SCULPTURE Will deal with advanced explorations of manipulative materials. *Prerequisite:* 4 and one of 2, 21, 22. Three hours. Aschenbach.

151 VISUAL ENVIRONMENT An exploration of public spaces, structures, architectural detail, landscaping, roadways, lighting, etc. Field trips, meetings with planners, and architects, projects. *Prerequisite:* 1 or 2 and 3 or 4. Three hours. Owre.

161, 162 PHOTOGRAPHY An introduction to photographic processes as methods of seeing, on visual discovery through informed manipulation of materials. *Prerequisite:* 3. Three hours. Higgins.

193 College Honors

195 SPECIAL TOPICS

197 READING AND RESEARCH Prerequisite: departmental permission. Three hours. Staff.

281 DIRECTED STUDIES Individual or group studies in a special area. *Pre-requisite:* six hours advanced in the chosen area and permission. Three hours. Staff.

Art History

5, 6 ART HISTORY Painting, sculpture, and architecture in the western world. First semester: Egyptian through Gothic; second semester: Renaissance to the present. *Prerequisite*: 5 for 6. Three hours. Roland.

9 VISUAL STUDIES A non-historical examination of visual experience, artifacts, buildings and environment, with focus on the distinction between aesthetic and ordinary visual data. Three hours. Lipke.

51 GREEK ART History of art in Greek lands in ancient times. Emphasis on sculpture, architecture, and vase painting. *Prerequisite:* sophomore standing. Three hours. J. Davison.

52 ROMAN ART Development of Roman art styles out of Greek forms. Emphasis on wall painting. Augustan official sculpture, later imperial architecture, mosaic. *Prerequisite*: sophomore standing. Three hours. Staff.

54 MODERN ART Painting and sculpture from French Impressionism to the present; emphasis on European influences. *Prerequisite:* sophomore standing. Three hours. Roland.

101 MEDIEVAL ART Art and architecture in western Europe from the Early Christian to early 15th Century. Emphasis on Romanesque and Gothic. *Prerequisite:* 6 or 51. Three hours. Roland.

102 NORTHERN EUROPEAN ART 1400-1600 Netherlandish and German art of the period. Special attention to John van Eyck, Rogier van de Weyden, Hugo van de Goes, Durer, Bosch, and Bruegel. *Prerequisite:* 6. Three hours. Fengler.

103 ITALIAN RENAISSANCE ART Painting, sculpture and architecture in Italy, 1400-1600. *Prerequisite:* 6. Three hours. Fengler.

104 BAROQUE ART European art and architecture, 1600-1750. Prerequisite: 6. Three hours. Roland.

105 ROCOCO AND ROMANTIC ART European architecture, sculpture, and painting, circa 1750-1850, and the origins of the modern movement. *Prerequisite:* 6. Three hours. Fengler.

106 MODERN ARCHITECTURE Building and Design since 1850. Visits with architects and to modern buildings in the area. *Prerequisite:* 6 or 9. Three hours. Lipke.

107 AMERICAN PAINTING Painting in America from Colonial Times to the twentieth century. Use of the Fleming and Shelburne Museum collections. *Pre-requisite:* 6. Three hours Lipke.

108 AMERICAN ARCHITECTURE The Colonial Period to Frank Lloyd Wright. Research on buildings of historical interest in the area. *Prerequisite:* 6 or 9. Three hours. Janson.

109 ART SINCE 1945 Direction and background of recent American painting and sculpture, and parallel developments in Europe. Readings and discussions of critical viewpoints. *Prerequisite:* 54, advanced studies in studio, or instructors permission. Three hours. Lipke.

194 COLLEGE HONORS

196 SPECIAL TOPICS

198 READINGS AND RESEARCH Prerequisite: departmental permission. Three hours. Staff.

207 STUDIES IN AMERICAN ART Selected areas of art and design, particularly as represented in the Fleming and Shelburne Museums. *Prerequisite:* By permission to students of Art History, American History or Literature. Three hours. Janson, Lipke.

210 STUDIES IN MODERN ART Topics in 19th and 20th century art, individual research and reports. *Prerequisite:* 105 or 6 and 54, and permission. Three hours. Roland, Lipke.

282 DIRECTED STUDIES Individual or group studies in a special area. *Pre-requisite:* six hours advanced in the chosen-area-and-permission. Three hours. Staff.

285, 286 MUSEUM STUDIES Contemporary museum techniques as concerning the research, care and administering of a collection (Fall) and as furthering aesthetic insight and the communication of ideas (Spring). Use of the Fleming Museum as a laboratory. *Prerequisite:* junior standing & instructor's permission. Three hours. Parris, Lipke.

Biochemistry

COLLEGE OF MEDICINE

Professors Lamden and Melville (Chairman); Associate Professors Meyer, Thanassi, Woodworth, and Wuthier; Assistant Professors Hart, Schofield, and Willard; Instructor Ishikawa.

102 ANALYTICAL BIOCHEMISTRY (2-4) Lectures, conferences, and laboratory exercises concerned with the theory and techniques of importance in the quantitative analysis of biological materials. Primarily for students of medical technology but open to others with permission of the department chairman. *Prerequisite:* Chemistry 1-2. Four hours. Drs. Lamden and Woodworth.

111-112 BIOCHEMISTRY (2-4) Lectures, conferences, and laboratory exercises concerned with mammalian biochemistry, particularly as it relates to man. Topics include the chemistry and metabolism of carbohydrates, lipids, proteins, and nucleic acids; enzymes, digestion, and biological oxidations; blood, hemoglobin, plasma proteins, and iron metabolism; respiration, acid-base balance, and mineral metabolism; hormones and control mechanisms. Laboratory work involves the application of quantitative biochemical principles to the analysis of body constituents. Primarily for students of medical technology but open to others with permission of the department chairman. *Prerequisite:* 102 or quantitative chemistry; organic chemistry. Four hours each semester. Dr. Hart.

191, 192 UNDERGRADUATE REARCH Participation in a research program currently being pursued by a faculty member of the Department. A written report is due at the end of each semester. *Prerequisite:* Chemistry 1, 2 or 11, 12. Some programs may require additional courses in chemistry. Credit as arranged, up to 4 hours per semester. Staff.

Botany

COLLEGE OF AGRICULTURE

Professors Dodge,¹ Gershoy,² Hyde (Chairman), Klein, Marvin, Sproston, Taylor and Vogelmann; Associate Professors Cook and Etherton; Assistant Professor Worley; Adjunct Assistant Professor Jagels.

1. Visiting professor.

2. Emeritus.

BOTANY

Biology

1, 2 **PRINCIPLES OF BIOLOGY** (3-3) Introduction to the structure, functions, and evolution of animals and plants. Emphasis on concepts important for advanced study in a Life Science and for understanding the biological world of which man is a part. *Prerequisite:* 1 for 2. Four hours. Botany and Zoology Staffs.¹

3 BIØLOGY AND MAN An introduction for nonscience majors. Selected biological processes relevant to man and his world, problems resulting from <u>man's interaction with his environment such as overpopulation and</u> environmental pollution; biological principles and concepts necessary for an understanding of these problems. Three hours. Botany and zoology staffs.¹

Botany

4 INTRODUCTION TO PLANT BIOLOGY (3-3) An introduction to structure, function, and reproduction of vascular plants in terms of the dynamics of plant life. Practical implications of basic botanical information in the applied plant sciences. Four hours. Staff.¹

6 THE GREEN WORLD A survey of the plant world. Esthetic, cultural, social, medical; and historical aspects of plant biology. Three hours. Mr. Klein.

101 GENETICS (see Biology 101.)

104 PHYSIOLOGY OF THE PLANT BODY (3-3) Study of the plant as a whole, growth and development, water and mineral relations, environmental factors, and regulatory processes. *Prerequisites:* 4 or Biology 1, 2; Chemistry 1, 2. Four hours. Mr. Etherton.

105 PLANT DIVERSITY (3-3) A survey of major plant groups. Structural and developmental changes associated with the evolution of vascular plants. *Prerequisite:* 4 or Biology 1, 2. Four hours. Mr. Taylor.

109 SYSTEMATICS AND PHYLOGENY (2-3) Classification; evolution of flowering plants; characterization and recognition of major families; species and generic concepts; biosystematics; taxonomic keys; preparation of herbarium specimens. *Prerequisite:* 4 or Biology 1, 2. Three hours. Mr. Vogelmann.

112 FOREST PATHOLOGY (2-2) The principal diseases of forest trees and deterioration of forest products, with emphasis on prevention and control. *Prerequisite:* 4 or Biology 1, 2. Three hours. Staff.

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

151 PLANTS AND MAN The place of plants in man's affairs. The influence of plants on exploration, migration and the development of civilizations. The role of plants in the world today, with special emphasis on food, drug, fiber and other useful plants and on the botanical features which contribute to their usefulness. *Prerequisite:* Principles of Biology or Botany 4. Three hours. Mr. Taylor.

1. Credit will not be given for both Biology 1 and Botany 4. Credit will not be given for both Biology 1, 2 and Biology 3. Botany and Zoology majors will not receive credit for Biology 3.

BOTANY

152 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:* 4 or Biology 1, 2. Four hours. Mr. Taylor. Alternate years, 1974-75.

160 GENERAL ECOLOGY Analysis of the environment and its effects upon organisms; interrelationships among organisms; ecological adaptations. *Prerequisite:* 4 or Biology 1, 2. Three hours. Mr. Worley.

162 GENERAL ECOLOGY LABORATORY (0-3) Field work and experiments to illustrate concepts presented in Botany 160. *Prerequisite:* previous or concurrent enrollment in 160. One hour. Mr. Worley.

193, 194 HONORS IN BOTANY.

197, 198 UNDERGRADUATE RESEARCH AND APPRENTICESHIPS Individual projects under the direction of a faculty member. The project may involve original research, readings, or apprenticeships. *Prerequisite:* junior standing. Three to six hours.

201 ELECTRON MICROSCOPY (2-4) Theory and practice of electron microscopy including microscope operation, specimen preparation, and interpretation of electron micrographs. *Prerequisite:* departmental permission. Four hours. Mr. Jagels.

205 MINERAL NUTRITION OF PLANTS (see Plant and Soil Science 205).

207 WATER RELATIONS OF PLANTS (see Forestry 207).

210 PLANT RESPONSE TO ABIOTIC TOXICANTS Examples of damage and current hypotheses relating to injury response. Interactions of biotic and abiotic factors; air and water pollutants; nutritional disorders; pesticides. *Prerequisite:* 104 or Biology 103. Three hours. Staff. Alternate years, 1974-75.

213 PLANT COMMUNITIES (2-2) Plant sociology; structure and organization of the plant community; sampling methods and analysis of data; climatic and edaphic factors; field work. *Prerequisite:* 109 or departmental permission. Three hours. Mr. Vogelmann. Alternate years, 1973-74.

232 BOTANY FIELD TRIP Trips to selected environments outside Vermont. Led by several faculty members representing different fields of Botany. Emphasis will be on overall, integrated approach to ecology, structure, and function. One hour. Staff. Christmas or spring vacation or end of school year.

250 MICROTECHNIQUE (1-4) Theory and practice in the preparation of biological materials for anatomical and cytological study, including histochemistry and photomicrography. *Prerequisite:* introductory chemistry; some knowledge of organic chemistry, anatomy, or cytology is desirable. Three hours. Mr. Cook and Mr. Jagels. Alternate years, 1973-74.

253 MYCOLOGY (2-4) Reproductive processes and classification of the common mushrooms, molds, and yeasts. Physiological studies; antibiosis. *Prerequisite:* Chemistry 131, 132 or departmental permission. Four hours. Mr. Sproston. Alternate years, 1973-74.

255 GENETICS AND CYTOGENETICS Advanced analysis of recombination in plants and animals. Molecular nature of meiotic processes and control of gene expression with particular reference to the nucleolus. *Prerequisites:* 101; Chemistry 16 or 131, 132. Three hours. Mr. Hyde.

BUSINESS ADMINISTRATION

256 CYTOLOGY Principles of structure in biological macro-molecules and cellular organelles such as membranes, chloroplasts, and chromosomes. Their composition, origin and relationship between their structure and function. *Pre-requisites:* Biology 103 or permission of the instructor; Chemistry 16 or 131, 132. Three-hours. Mr. Hyde.

257 PHYSIOLOGY OF THE PLANT CELL (3-2) Detailed study of photosynthesis, plant cell membrane function, and plant cell growth. *Prerequisites:* Botany 104, Chemistry 131, 132 or Chemistry 16, Physics 11, 12 or 15, 16. Four hours. Mr. Etherton.

259 PLANT GROWTH AND DEVELOPMENT (3-3) Chemical and physical factors regulating growth and development of plant tissues and the plant body. Morphogenesis and differentiation. *Prerequisites:* 104, departmental permission. Four hours. Mr. Klein. Alternate years, 1974-75.

260 Phycology (2-4) The morphology, classification, and general biology of the algae, with special consideration of the freshwater forms. *Prerequisite*: 105, or two courses in zoology or botany above 100. Four hours. Mr. Cook. Alternate years, 1973-74.

270 BIOPHILOSOPHY AND SURVIVAL Biological rhythms, polarity, holism, dichotomy, spirals, and their significance in evolution and survival. *Prerequisites:* two intermediate courses in botany or zoology and permission of the department. Three hours. Mr. Sproston.

281, 282 BOTANY SEMINAR A topical seminar consisting largely of presentations of personal research by faculty and graduate students from within and outside the University. May be jointly sponsored with related departments. Required attendance of botany graduate students and seniors in botanical research programs. Without credit. Staff.

295 SPECIAL TOPICS *Prerequisite:* permission of the department.

Business Administration

COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

Professors Greif and Nyquist; Associate Professors Gross, Laber, Michael, Severance (Chairman) and Squire; Assistant Professors Battelle, Gatti, Kuklis and Tashman; Instructor Erdmann and Gear.

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

9, 10 BUSINESS LAW First semester: concepts of law as related to business, including law of contracts, sales, bailments, and negotiable instruments. Second semester: business and laws of agency, partnerships, and corporations. *Prerequisite:* 12, or concurrent enrollment. Three hours. Messrs. Erdmann and Gear.

13, 14 PRINCIPLES OF ACCOUNTING (2-4) Prerequisite: 13 for 14. Four hours, Staff.

104 ECONOMICS OF STATE AND LOCAL TAXATION Revenues, expenditures, and debt management problems of state and local governments; analysis of state and local fiscal relationships. Three hours. Mr. Tashman.

121 PRINCIPLES OF MARKETING The place of marketing in our economy. Analysis of the marketing structure by functions, institutions, and commodities. Three hours. Messrs. Greif and Kuklis.

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 SELLING IN THE ECONOMY The personal selling function as a communication activity. Behavioral science areas are explored for insight into the selling process. Individual projects. *Prerequisite:* 122. Three hours. Mr. Greif.

127 RESEARCH METHODS IN MARKETING Introduction to the problems of methodology and design in marketing research. Basic design of proof, selection of economic designs, scaling techniques. Bayesian applications, factor analysis, and forecasting methods. *Prerequisite:* 122. Three hours. Mr. Kuklis.

130 SALES MANAGEMENT AND PROMOTION Methods of selection, testing, training, compensation, and control. Principles and practices of creative selling. Sales organization analysis and the coordination of related department functions. *Prerequisite*: 121. Three hours. Messrs. Greif and Kuklis.

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

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. Three hours. Mr. Squire.

160 INTRODUCTION TO INTEGRATED DATA PROCESSING AND COMPUTERS A general introduction to business data processing and the components and characteristics of electronic digital computers. Programming systems, systems analysis, system design, elementary flow charting, and processing procedures. *Prerequisite:* 14. Three hours. Mr. Gross.

161-162 INTERMEDIATE ACCOUNTING An intensive examination of accounting theory, valuation methods, and classification procedures related to balance sheet accounts. Second semester: consideration of balance sheet accounts continued; together with methods and techniques of financial analysis. *Prerequisite:* 14. Three hours. Messrs. Nyquist and Michael.

164 BASIC FEDERAL TAXES Prerequisite: 14. Mr. Michael.

181 TRANSPORTATION AND PUBLIC UTILITIES Social and economic aspects of transportation problems as revealed by analysis of the nature, history, and problems of transportation public utilities agencies of the United States. Three hours. Mr. Laber.

183 GOVERNMENT AND BUSINESS Economic causes and consequences of government activities and their impact upon the private sector of the economy. Three hours. M. Squire.

 $\frac{1}{2}$

BUSINESS ADMINISTRATION

188 ELEMENTARY STATISTICS (2-2) Descriptive statistics: frequency distributions, measures of central location, measures of variation; Introduction to Probability; Theoretical Distribution: normal, binomial, and student's t; Tests and Hypotheses; Elements of Index Numbers; Introduction to correlation and regression. Three hours. Mr. Tashman.

206 PRINCIPLES OF INVESTMENTS An analysis of the investment process, including an examination of types of financial assets, the markets in which such assets are traded, and factors affecting their values. *Prerequisite:* 14. Three hours. Mr. Battelle.

207 CORPORATE FINANCE A study of the sources of financing and the efficient utilization of funds by corporations. Topics include capital budgeting, capital structure, dividend policy, and problems of financing new business ventures, large and small. *Prerequisite:* 14. Three hours. Messrs. Battelle and Laber.

228 CURRENT MARKETING DEVELOPMENTS Modern marketing theory and practice. Topics include: the nature of consumer changes; urban and suburban trading centers; the distribution cycle; marketing legislation; functional and institutional changes. *Prerequisite:* 122. Three hours. Mr. Greif.

229 MARKETING MANAGEMENT Formulation of overall policies and planning strategies for marketing programs. Product planning and development; channel selection; market and sales forecasts; advertising and sales campaigns. *Prerequisite*: 122. Three hours. Mr. Greif.

251 PERSONNEL ADMINISTRATION The personnel function in organizations; selecting and training employees; job analysis and evaluations; evaluating employees; wages and wage administration; problems of morale; human relations in the supervision of personnel. *Prerequisite*; 141. Three hours. Mr. Nadworny.

252 EXECUTIVE DECISION-MAKING Synthesis of the management and operation of a firm in terms of production, marketing, personnel, and finance. The process of decision-making, planning and execution of policies. *Prerequisite:* 121, 143, and 207. Three hours. Mr. Squire.

254 SCIENTIFIC MANAGEMENT AND LABOR Development of scientific management; reactions and relationship of organized labor to it. Long-range effects of scientific management on the structure and policies of industry and organized labor. *Prerequisite*: 143. Three hours. Mr. Nadworny.

266 ADVANCED ACCOUNTING Accounting for partnerships, ventures, consignments, installment sales, insurance, statement of affairs, receivers, realization and liquidation, estates, trusts, home offices and branches, and parent and subsidiary accounting. *Prerequisite:* 162. Three hours. Mr. Nyquist.

271 AUDITING Prerequisite: 266. Three hours. Mr. Michael.

272, 273 COST ACCOUNTING Second semester, special topics with an emphasis on budgeting, cost control and capital budgeting. *Prerequisite:* 14, 272 for 273. Three hours. Mr. Nyquist.

276 C.P.A. PROBLEMS Review of questions and problems from past C.P.A. examinations, coupled with a study of the opinions of the Accounting Principles Board. *Prerequisite:* 266. Three hours. Mr. Nyquist.

277 INTRODUCTION TO OPERATIONS RESEARCH Application of quantitative techniques to the formulation and solution of economic and business problems.

Topics include demand and cost analysis, forecasting methods, linear programming, inventory and queuing theory. *Prerequisite:* 188. Three hours. Staff.

289 QUANTITATIVE METHODS IN BUSINESS (2-2) Prerequisite: 188. Three hours. Staff.

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

COLLEGE OF ARTS AND SCIENCES

Chemistry

Professors Gregg, Flanagan, Kice (Chairman), Krapcho, Kuehne, and White; Associate Professors Allen, Whitcher and Wulff; Assistant Professors Brown, Strauss, and Weltin.

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

1, 2 INTRODUCTORY CHEMISTRY (3-3) The important principles, ideas and concepts of general chemistry. Either this course, or Chemistry 11, 12 should be elected by all students planning subsequently to take any 100 level course in chemistry. *Prerequisites:* 1 or 11 for 2. Four hours. Staff.

3 OUTLINE OF GENERAL CHEMISTRY (3-3) A one-semester course in the principles, ideas and concepts of general chemistry, with particular emphasis on those aspects of the subject of importance to the biological and health sciences. Four hours. Staff.

4 OUTLINE OF ORGANIC AND BIOCHEMISTRY (3-3) A brief introduction to some of the important and interesting aspects of organic and biochemistry. Credit cannot be granted for both Chemistry 4 and 16. *Prerequisite:* Chemistry 1, 3, 5 or 11. Four hours. Staff.

5 CONCEPTS OF CHEMISTRY (3-3) A one-semester course in the principles, ideas and concepts of general chemistry for students in engineering programs. Four hours. Staff.

7 EARTH, AIR, FIRE AND WATER (3-3) An introductory course intended for non-science majors. It deals with man's chemical understanding of his surroundings. Concepts of energy, structure, and change as related to the observable universe. Emphasis on understanding topics of current interest and on the chemical interpretation of biological systems. Four hours. Staff.

11, 12 GENERAL CHEMISTRY (3-6) Includes general experiments in elementary qualitative and quantitative analysis. Recommended for those concentrating in chemistry or physics. *Prereguisites:* one year of high school chemistry and concurrent enrollment in Mathematics 11 or 13 for Chemistry 11. Chemistry 11 for 12. Five hours. Staff.

CHEMISTRY

13, 14 THE CHEMICAL BOND Nature of interatomic and intermolecular forces. Stereochemistry, bond energies, and crystal structures are considered. *Prerequisite:* 1, 2 or 11, 12. One hour. Mr. Gregg.

16 INTRODUCTORY ORGANIC CHEMISTRY (3-3) A one-semester introduction to the more important and interesting aspects of organic chemistry. (Does not satisfy medical school entrance requirements regarding undergraduate preparation in organic chemistry.) Credit cannot be granted for both Chemistry 16 and 4. *Prerequisite:* Either Chemistry 1, 3, 5 or 11. Four hours. Staff.

123 QUANTITATIVE ANALYSIS (3-3) Theory and practice of gravimetric and volumetric methods of analysis. Theoretical discussion of indicators, buffers, pH, etc. *Prerequisite:* 1, 2. Not open to students with credit for 11, 12. Four hours. Mr. Whitcher.

131, 132 ORGANIC CHEMISTRY (3-3) Organic chemistry for chemistry majors, premedical students, and those concentrating in the biological and physical sciences. *Prerequisite:* 1, 2 or 11, 12; 131 for 132. Four hours (may be taken without laboratory for three hours credit by chemistry majors who intend to enroll in 134 and 135). Messrs. Krapcho and Kice.

134 ORGANIC CHEMISTRY LABORATORY (0-6) Laboratory practice in organic synthesis with an emphasis on separation and purification procedures. Introduction to spectral methods of structure identification. *Prerequisite:* 131. Two hours. Mr. Krapcho.

135 ADVANCED ORGANIC CHEMISTRY LABORATORY (0-6) Chemical and physical methods of identifying organic compounds. Advanced synthetic and separation procedures. *Prerequisite*: 131, 134. Two hours. Staff.

140 PHYSICAL CHEMISTRY FOR BIOLOGICAL SCIENCE STUDENTS Aspects of physical chemistry most pertinent to work in the biological sciences: acid-base equilibrium, theory of solutions, thermodynamics and kinetics. *Prerequisite:* 2, physics 16. Three hours. Mr. Flanagan.

141, 142 PHYSICAL CHEMISTRY Elementary quantum chemistry, introduction to statistical mechanics, thermodynamics, properties of solutions and chemical kinetics. *Prerequisite:* 2 or 12; physics 16; mathematics 123 or 121 for 141. Three hours. Messrs. Weltin, Flanagan and Wulff.

201, 202 ADVANCED CHEMISTRY LABORATORY (1-8) Modern analytical, physical and synthetic techniques. Syntheses requiring advanced methods such as controlled atmosphere box, autoclave, photochemical reactor, etc. Selected basic physical chemistry experiments. Development of techniques used for measurement of a variety of phenomena, e.g. thermochemistry, kinetics, electrochemistry, spectroscopy. Students wishing to take one semester only may concentrate in a particular area of interest, such as instrumental analysis. *Prerequisite:* 11, 12 or 123; credit for or concurrent enrollment in 141 and 142. Four hours. Messrs. Allen, Brown, Flanagan and Wulff.

212 ADVANCED INORGANIC CHEMISTRY Structure, bonding, and reactions of inorganic compounds. Ionic compounds, the lanthanides; theories of acids and bases; electron-deficient bonding; covalent bond chemistry; simple models for structure prediction; introduction to crystal field theory; substitution reactions of transition metal complexes. *Prerequisite:* 142 or equivalent. Three hours. Messrs. Allen and Brown.

160

CHEMISTRY

213 ADVANCED INORGANIC CHEMISTRY Application of symmetry concepts to inorganic chemistry; ligand field theory and electronic spectra; multiply-bonded systems; metal carbonyls; introduction to organometallic chemistry; biologically important inorganic complexes. *Prerequisite:* 212. Three Hours. Messrs. Allen and Brown.

223 CHEMICAL INSTRUMENTATION The design and usage of modern instruments to facilitate chemical research. Topics such as temperature measurement and control, pH measurement and control, pressure measurement and control, etc., will be discussed. Three hours. Staff. Offered as occasion warrants.

231 PHYSICAL ORGANIC CHEMISTRY-PRINCIPLES Structure-reactivity relationships, molecular properties and their interpretation. Methods and results of investigations of mechanisms of common organic reactions. *Prerequisites:* 132; 142 or 247 or permission of instructor. Three hours. Alternate years, 1972-73. Messrs. White, Strauss or Krapcho.

235 MOLECULAR ORBITAL THEORY An introduction to the Huckel molecular orbital method. Energy levels and orbitals, molecular properties and their interpretation. Effects of substituents on electronic structure. Extensions of the Huckel method. *Prerequisites:* 132, 142, or equivalent. Three hours. Mr. Weltin.

242 CHEMICAL KINETICS AND MECHANISMS Theoretical and experimental aspects of chemical kinetics. Use of kinetics to deduce mechanisms of organic and inorganic reactions. Gaseous reactions, catalysis, isotope and solvent effects, chain reactions and very fast reactions. *Prerequisite*: 141, 142. Three hours. Messrs. Flanagan, Kice, Krapcho and White.

246 FUNDAMENTALS OF SPECTROSCOPY A general discussion of molecular spectroscopy, rotational and vibrational states of molecules, symmetry of vibrations; introduction to electronic spectra. *Prerequisite*: 141, 142, mathematics 124 or permission of the instructor. Three hours. Mr. Weltin. Alternate years, 1973-74.

247 INTRODUCTION TO QUANTUM MECHANICS General considerations of quantum mechanics. Development of techniques pertinent to the application of quantum mechanics to chemical problems. *Prerequisite:* 141, 142 or equivalent. Three hours, Mr. Weltin.

248 CHEMICAL THERMODYNAMICS Systematic study of the application of thermodynamics to chemical problems. Concepts of statistical thermodynamics to be introduced. *Prerequisite*: 141, 142 or equivalent. Three hours. Mr. Wulff.

249 STATISTICAL MECHANICS Development of statistical mechanics and its application to problems of chemical interest. *Prerequisite:* 141-142 or equivalent; 247 recommended. Three hours. Mr. Flanagan. Alternate years, 1972-73.

251, 252 ADVANCED ORGANIC CHEMISTRY Detailed discussion of fundamental principles and reactions in organic chemistry. Stereochemistry, conformational analysis, ring strain, reactivity criteria in the main reaction classes, reaction mechanisms, and important synthetic methods are discussed. *Prerequisite:* 131, 132, credit for or concurrent enrollment in 141, 142, 251 for 252. Three hours. Messrs. Kuehne, Krapcho, and Strauss.

282 ORGANOMETALLIC CHEMISTRY A systematic survey of the syntheses, properties, structures, bonding and reactions of organometallic compounds. Variation of the structure and stability of the metal-carbon bond throughout the

CHINESE

periodic system. Prerequisite: 212. Three hours. Messrs. Allen and Brown. Alternate years, 1974-75.

284 PHYSICAL INORGANIC CHEMISTRY Ligand field theory, magnetic properties, magnetic resonance techniques (NMR, ESR, and NQR), Mossbauer spectroscopy, and optical activity. *Prerequisites:* 213 or equivalent, 246 or permission of the instructor. Three hours. Alternate years. Mr. Allen.

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

184 SENIOR SEMINAR Oral and written presentation of a subject of current chemical interest. *Prerequisite:* audit of 381. One hour. Staff.

197, 198, 199 UNDERGRADUATE RESEARCH Special study in inorganic, physical, or organic chemistry and with an assigned staff member. Findings submitted in written form. *Prerequisite:* 1, 2 or 11, 12 and departmental permission. Credit as arranged with a maximum of four hours per semester and twelve hours for the undergraduate program. 197 is offered in the fall, 198 in the spring, and 199 in the summer.

COLLEGE OF ARTS AND SCIENCES

Mr. Swanson and Staff.

Classics

Chinese

1-2 ELEMENTARY CHINESE A study of Mandarin Chinese designed to give the beginning student the fundamental grammar and vocabulary for speaking, reading and writing the modern national language. 3-3 hours. Staff.

11, 12 INTERMEDIATE CHINESE A continuation of Chinese 1-2 designed to enable the student to converse in everyday Chinese, and to read and write simple texts. *Prerequisite:* Chinese 2 or equivalent. Three hours. Staff.

21, 22 INTRODUCTION TO CLASSICAL CHINESE An introduction to pre-Han classical Chinese literature. Emphasis will be on syntax, sentence structure, and style of various authors. *Prerequisite:* Chinese 2 or permission of the instructor. Three hours. Mr. Swanson.

COLLEGE OF ARTS AND SCIENCES

Professors Gilleland, Ambrose (Chairman), Bliss, and Davison; Associate Professor Schlunk.

Greek

(There are no prerequisites to any Greek course. Students who have previously studied Greek should consult the department.)

162

1-2 ELEMENTARY GREEK Four hours. Staff.

11, 12 INTERMEDIATE GREEK Review of syntax. Readings. Three hours. Staff.

GREEK 32¹ MYTHOLOGY Greek myth in literature, art, and music from antiquity to modern times. No prerequisites. 3 hours. Mr. Ambrose.

111, 112 PROSE COMPOSITION Required of students who concentrate in Greek. One hour. Mr. Gilleland.

151 GREEK DRAMA IN TRANSLATION Three hours. Staff. On demand.

153 GREEK HISTORIANS IN TRANSLATION Three hours. Staff. On demand.

193, 194 College Honors

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

201 GREEK ORATORS Three hours. Mr. Gilleland. Alternate years, 1973-74.

202 GREEK COMEDY Three hours. Mr. Ambrose. Alternate years, 1972-73.

203 GREEK HISTORIANS Three hours. Mr. Bliss. Alternate years, 1972-73.

204 GREEK TRAGEDY Three hours. Mr. Ambrose. Alternate years, 1973-74.

205 GREEK PHILOSOPHERS Three hours. Mr. Schlunk. Alternate years, 1972-73.

206 GREEK EPIC Three hours. Miss Davison. Alternate years, 1973-74.

Latin

(There are no prerequisites to any Latin course. Students who have had two years of high school Latin normally enroll in Latin 5 or Latin 12. Those who have had more normally enroll in Latin 101.)

1, 2 ELEMENTARY LATIN For students who present less than two years of high school Latin.² Four hours. Staff.

5 ADVANCED ELEMENTARY LATIN Extensive review of Latin syntax. Selections from prose writers. Three hours. Staff.

12 INTERMEDIATE LATIN Selections from Vergil and Ovid. Three hours. Staff.

32³ ETYMOLOGY Derivation of English words from Greek and Latin bases. Training in analysis of unfamiliar words; special attention to scientific vocabulary. No previous knowledge of Greek or Latin required. Three hours. Staff.

101, 102 SURVEY OF LATIN LITERATURE Selections from the principal Roman authors. Three hours. Staff.

- 1. This course may be used towards the distribution requirement of the College of Arts and Sciences in either category A or B.
- 2. Students who have completed two years of high school Latin more than two years prior to their entrance into the University must obtain departmental permission to enroll in Latin 1,2 for credit.
- 3. This course may be applied to category A of the college distribution requirements as part of the non-foreign language courses.

111, 112 LATIN PROSE COMPOSITION Required of students who major in Latin and of those who wish to be recommended to teach Latin. One hour. Mr. Bliss.

152 ROMAN EPIC IN TRANSLATION Three hours. Staff. On demand.

154 ROMAN SATIRE IN TRANSLATION Three hours. Staff. On demand.

193, 194 College Honors

195, 196 SPECIAL TOPICS

197, 198 READINGS AND RESEARCH

203 REPUBLICAN PROSE Three hours. Mr. Gilleland.

204 EPIC POETS Three hours. Mr. Ambrose.

227 ROMAN LYRIC POETS Three hours. Mr. Schlunk. Alternate years, 1972-73.

251 ROMAN LETTERS Three hours. Mr. Bliss. Alternate years, 1973-74.

252 COMEDY Three hours. Mr. Bliss. Alternate years, 1973-74.

253 ROMAN ORATORY Mr. Gilleland. Alternate years, 1973-74.

255 HISTORIANS OF THE EMPIRE Three hours. Miss Davison. Alternate years, 1972-73.

256 SATIRE Three hours. Mr. Gilleland. Alternate years, 1973-74.

271 SILVER LATIN Three hours. Mr. Bliss. Alternate years, 1972-73.

For The Teaching of Latin, see secondary education 179.

For Roman Art, see art 52.

Communication and Theatre

COLLEGE OF ARTS AND SCIENCES

Professors Feidner, Huber, Lewis, London (Chairman), Luse, and Manchel; Associate Professors Lane and Wilson; Assistant Professors Bryan, Cronin, Haynes, Howell, Schenk, Shields, Toomey, Waite, Williams, Worden, and Yadav; Instructors Cover, Dilley, Hayes, and Petry; Lecturers Houghton and Smith; Coordinators Daruvala and M. Toomey.

Communication and Public Address

1 FOUNDATIONS OF ORAL COMMUNICATION Three hours. I, II. Mr. Lewis and Staff.

3 PARLIAMENTARY PROCEDURE *Prerequisite:* sophomore standing. One hour. Mr. Huber.

11 PUBLIC SPEAKING Three hours. I, II. Staff.

14 GROUP DISCUSSION Theory and performance in small group communication, including preparation, language, leadership, analysis, reasoning, organization and interpersonal relations. Three hours. I, II. Staff.

31 ORAL INTERPRETATION OF LITERATURE A study of communicating orally to an audience, from the printed page, the meaning and beauty of a literary work. Three hours, I, II. Mr. London and Staff.

81 VOICE AND ARTICULATION Elements of speech and phonetics for the improvement of voice and articulation in communication. *Prerequisite:* sophomore standing. Three hours. I, II. Miss Luse.

101 PHONETICS Acoustic and physiologic phonetics. Analysis of English speech sounds used in the International Phonetic Alphabet. *Prerequisite:* sophomore standing. Three hours. Miss Luse and Mr. Shields.

111 ADVANCED PUBLIC SPEAKING: EMOTIVE MEANS OF PERSUASION Human motivation, attitudes, emotion, stereotypes, attention, and audience psychology as applied in the speaking situation. *Prerequisite*: 11. Three hours. Mr. Huber and Staff.

112 ADVANCED PUBLIC SPEAKING: LOGICAL MEANS OF PERSUASION Inductive, deductive, causal, and analogical reasoning as applied in the speaking situation. *Prerequisite:* 11. Three hours. Mr. Huber and Staff.

113 ADVANCED PUBLIC SPEAKING: STYLISTIC ELEMENTS Study of speech style and rhetorical criticism by analysis of great speeches and by writing longer speeches. *Prerequisite:* six hours, including 11. Three hours. Mr. Huber.

121 GENERAL SEMANTICS An analysis of the relationship between language and human behavior. *Prerequisite:* 1. Three hours. Mr. Lewis.

193, 194 COLLEGE HONORS

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

201 THEORIES OF HUMAN COMMUNICATION A behavioral approach to the role of language, meaning, perception, thinking and social context in human communication process. *Prerequisite:* Nine hours of related courses, including 1. Three hours. Mr. Yadav.

210 CLASSICAL ORIGINS OF COMMUNICATION THEORY Prerequisite: Nine hours of related courses. Three hours. Mr. Waite.

212 **PERSUASIVE** COMMUNICATION Selected contemporary approaches to persuasion and the study of recent research contributions. *Prerequisite:* Nine hours, including 111. Three hours. Staff.

213 THEORIES OF SPEECH ANALYSIS Principles of speech criticism applied to speakers, speeches, and speech movements. *Prerequisite:* Nine hours of related courses. Three hours. Mr. Waite.

214 Issues IN AMERICAN PUBLIC ADDRESS *Prerequisite:* 213. Three hours. Mr. Waite and Ms. Williams.

215 GROUP COMMUNICATION *Prerequisite:* Nine hours of related courses, including 14. Three hours. May be repeated up to nine credit hours. Mr. Cronin.

223 INTERPERSONAL COMMUNICATION *Prerequisite:* Nine hours of related courses, including 121. Three hours. Mr. Lewis and Mr. Yadav.

225 CROSS-CULTURAL COMMUNICATION A study of cultural factors and cognitive process in cross-cultural communication. *Prerequisite:* Nine hours of related courses. Three hours. Mr. Yadav.

COMMUNICATION AND THEATRE

283, 284 SEMINAR Prerequisite: Departmental permission. Three hours. Staff.

294 SEMINAR FOR PROSPECTIVE TEACHERS OF COMMUNICATION Prerequisite: Twelve hours. Three hours. Mr. London.

Mass Communication

63 SURVEY OF MASS COMMUNICATION The historical development, socioeconomic and political impacts of the press, radio, television and film in American society. Three hours. I, II. Mr. Howell and Mr. Yadav.

161 AUDIO PRODUCTION A practicum in the use of audio recording techniques and technology as employed in broadcasting, film and multi-media presentations. *Prerequisite:* 63. Three hours. Mr. Howell.

162 WRITING FOR MASS COMMUNICATION *Prerequisite:* 63. Three hours. Mr. Worden.

164 BASIC TELEVISION PRODUCTION Prerequisite: 161. Three hours. Mr. Dilley.

165, 166 DEVELOPMENT OF THE MOTION PICTURE Prerequisite: junior standing, 165 for 166. Three hours. Mr. Manchel.

167 BASIC FILMMAKING Theories of film expression. Students produce films. Three hours. Mr. Worden.

260, 261 SEMINAR IN MASS MEDIA An intensive examination of selected areas of study related to mass media. *Prerequisite:* Nine hours of related courses, including 63. Three hours. Staff.

263 INTERNATIONAL MASS COMMUNICATION Mass media systems of other countries. *Prerequisite:* Nine hours of related courses. Three hours. May be repeated up to nine credit hours. Mr. London.

264 ADVANCED TELEVISION PRODUCTION Emphasis on the following types of programs: educational, news, documentary, dramatic and variety. Laboratory use of the ETV studio. *Prerequisite:* 164. Three hours. Mr. Dilley.

265 CINEMATOGRAPHY Advanced study of film expression and production of student films. *Prerequisite:* 167 or permission of the instructor. Three hours. Mr. Worden.

266 SEMINAR IN FILM *Prerequisite:* Six hours of related courses, including 165 or 166. Three hours. May be repeated up to nine credit hours. Mr. Manchel.

267 THE CONTEMPORARY CINEMA Lectures, screenings, and reports on modern filmmakers, recent trends and new techniques. *Prerequisite:* six hours of related courses, including 165 or 166. Three hours. Mr. Manchel.

268 THE BLACK MAN IN FILM A study of black artists in movies from 1895 to the present, with an emphasis on American films. *Prerequisite:* six hours of related courses, including 165 or 166. Three hours. Mr. Manchel.

Speech Pathology-Audiology

74 INTRODUCTION TO DISORDERS OF ORAL COMMUNICATION Prerequisite: sophomore standing. Three hours. Mrs. Wilson and Staff.

270 LEARNING AND DEVELOPMENT OF SPEECH AND LANGUAGE Speech and language acquisition in relation to current learning theory and methods of

linguistic analysis. *Prerequisite:* nine hours of speech and psychology, including 74. Three hours. Mrs. Wilson.

271 SPEECH PATHOLOGY I Etiology, symptomatology, and principles of habilitation for voice disorders (including the laryngectomized) and cleft palate. Observation required. *Prerequisite:* Twelve hours of speech and psychology, including 281. Three hours. Miss Luse.

272 SPEECH PATHOLOGY II The nature of articulation and the etiology, diagnosis, and treatment of disorders of articulation. *Prerequisite:* Twelve hours of speech and psychology, including 74, 101. Three hours. Staff.

273 **PRINCIPLES OF** AUDIOLOGY An introduction to clinical audiology including a consideration of hearing disorders, tests of the hearing function, and hearing conservation programs. *Prerequisite:* Twelve hours of speech and psychology, including 74. Three hours. Mrs. Houghton.

275, 276 CLINICAL STUDY Supervised practicum experiences with children and adults presenting disorders of speech, hearing, and language. *Prerequisite:* Twelve hours in speech and hearing science courses, including 271 or 272; departmental permission. Credit as arranged. Staff.

281 ANATOMY-PHYSIOLOGY OF SPEECH Prerequisite: nine hours of speech and psychology. Four hours. Miss Luse.

282 ANATOMY-PHYSIOLOGY OF AUDITION *Prerequisite:* nine hours of speech and psychology. Four hours. Mr. Patterson.

Theatre

39 INTRODUCTION TO THEATRE Three hours. I, II. Messrs. Bryan and Feidner:

41 ACTING *Prerequisite:* 39; sophomore standing. Three hours. I, II. Messrs. Feidner and Lane.

141 ADVANCED ACTING Periods and styles of acting, intensive character analysis, frequent acting projects, including at least one public performance. *Prerequisite:* 41 and departmental permission. Three hours. Messrs. Feidner and Lane.

142 PLAY DIRECTING Prerequisite: six hours, including 39. Three hours. Mr. Feidner.

151 STAGECRAFT Scenic elements of play production; analysis of theatre forms, study and application of basic elements of scenery construction. *Prerequisite:* 39. Three hours. Mr. Schenk.

154 BASIC SCENE DESIGN Fundamental principles of scenic design, history and practice. *Prerequisite:* 39. Three hours. Mr. Schenk.

245 THE CLASSICAL THEATRE Earliest dramatic rituals and the theatres of Greece and Rome as evidenced by historical remains and extant dramas. *Pre-requisite:* 39 plus three hours. Three hours. Mr. Bryan. Alternate years, 1974-75.

246 THE MEDIEVAL AND RENAISSANCE THEATRE Medieval and renaissance theatre, accompanied by an evaluation of relevant historical materials and representative dramas. *Prerequisite:* 39 plus three hours. Three hours. Mr. Bryan. Alternate years, 1974-75.

247 SEVENTEENTH AND EIGHTEENTH CENTURY THEATRE Dramas and theatrical conditions in Europe and America from the closing of the English theatres

DENTAL HYGIENE

to the end of the eighteenth century. *Prerequisite:* 39 plus three hours. Three hours. Mr. Bryan. Alternate years, 1973-74.

248 NINETEENTH AND TWENTIETH CENTURY THEATRE Backgrounds, theatrical conventions, and dramas representative of Romanticism, Realism, and revolts against Realism. *Prerequisite:* 39 plus three hours. Three hours. Mr. Bryan. Alternate years, 1973-74.

252 LIGHTING Theory and practice in the illumination of stage productions and the creation of aesthetic effects. *Prerequisite*: 151. Three hours. Mr. Schenk.

254 ADVANCED SCENE DESIGN Analysis of the drama from the standpoint of its visual creation upon the stage; audience-stage relationships, styles of production. *Prerequisite*: 154. Three hours. Mr. Schenk.

Dental Hygiene

DIVISION OF HEALTH SCIENCES

Assistant Professor Hill (Chairman); Associate Professors Faigel, Farnham; Assistant Professors Brown, Ingalls, Montgomery, Wootton; Instructors Bowen, Brigada, Burke, Grundler, Josselyn, Joy, Lamoray, Lawton, Levi, Preston, Reed and Watson.

1 DENTAL HYGIENE (2) Study of the theories and the practice of dental hygiene with emphasis on patient education and preventive procedures. Two hours. Staff.

2 DENTAL HYGIENE (0-6) Continuation of Dental Hygiene 1 including special patient care and clinical practice of dental hygiene procedures. Three hours. Staff.

11 ORAL TISSUES (2-4) The study of the morphology and physiology of oral tissues both microscopically and macroscopically. The identification of individual tooth forms. Three hours. Ms. Ingalls.

12 ORAL TISSUES The study of the functions of the oral tissues, head and neck anatomy, occlusion, mastication, comminution, and deglutition. Two hours. *Prerequisite:* Oral Tissues 11. Ms. Ingalls.

51-52 PHARMACOLOGY AND ANESTHESIOLOGY (1-0) (1-0) The reactions and uses of drugs. Anesthesia, general and local, as used in dental practice. One hour. Dr. MacLellan.

53-54 ORAL PATHOLOGY (2-2) General pathology of the more common diseases affecting the human body. Pathology of the teeth and their supporting structures. Two hours. Dr. Farnham.

55 PERIODONTOLOGY (1-0) Classification of periodontal disease, clinical picture, etiological factors, and types of treatment. Two hours. *Prerequisite:* Oral Tissues 11 and 12. Drs. Faigel and Levi.

61 RADIOLOGY (1-1) Study, demonstration, and practice of fundamentals of intra-oral radiographic technic including electrophysics; angulation of the machine; placement and complete processing of films. Two hours. Ms. Brown.

168

62 DENTAL PRACTICE (1-4) Discussion and project participation in the planning, development, and implementation of dental health education, public health dentistry, and the private practice of dentistry. Three hours. Ms. Burke, Dr. Montgomery.

81-82 CLINICAL DENTAL HYGIENE (0-15) Clinical practice with patients from simple to more difficult cases both children and adults. Field practice at local dental clinics, hospitals, and private institutions. Four hours. *Prerequisite:* Dental Hygiene 1 and 2.

91 DENTAL MATERIALS (1-0) Study of the materials used routinely in dental practice. One hour. Staff.

COLLEGE OF ARTS AND SCIENCES

Economics

Professors Dellin (Chairman) and Nadworny; Associate Professors Alnasrawi, Campagna, and Chase; Assistant Professor Salgo, Wicker; Instructor Rosenberg.

3 CURRENT ECONOMIC PROBLEMS Designed primarily for non-majors to deal with some of the current issues and problems which face contemporary economies. Each section stresses usually different problems, according to the discretion and specialization of the instructor. Three hours, Staff.

11, 12 **PRINCIPLES OF ECONOMICS** Economics 11 presents an analysis of the business firm, price formation under competitive and monopolistic conditions, and the role of factors of production in the distribution of income. Economics 12 emphasizes national income analysis and the role of government fiscal and monetary policy as it affects employment stability and growth. 11 and 12 which can be taken in any order, are usually prerequisites for all courses numbered 100 and above. Three hours. Staff.

15, 16 ECONOMIC HISTORY OF THE UNITED STATES Three hours. Mr. Nadworny.

101 MONEY AND BANKING Commercial and central banking with special attention given to the Federal Reserve System, monetary theory and policy. *Prerequisite:* 12. Three hours. Messrs. Alnasrawi and Wicker.

103 PUBLIC FINANCE Revenues and expenditures of federal, state and localgovernments and intergovernmental relationships; the effects of expenditures and taxation upon individuals, business institutions, and the national economy. *Prerequisite:* 11 and 12. Three hours. Mr. Campagna.

105 INTERNATIONAL TRADE AND FINANCE Theories of international values, adjustment of international balances, foreign exchange, international aspects of money and banking, and tariffs. *Prerequisite:* 11, 12. Three hours. Mr. Alnasrawi.

141 LABOR ECONOMICS Labor as an economic factor: the labor force, wages, productivity, and income. Wage and hour legislation, social security, and unemployment insurance. *Prerequisite:* 11, 12. Three hours. Messrs. Nadworny and Chase.

142 COLLECTIVE BARGAINING Issues and practices in labor-management relationships. Collective bargaining impacts on the economy. The grievance

.

ECONOMICS

process, arbitration, and labor relations laws. Prerequisite: 141. Three hours. Mr. Nadworny.

186 MICROECONOMIC THEORY Analysis of consumer demand, supply, market price under competentive conditions and monopolistic influences, and the theory of income distribution. *Prerequisite*: 11, 12. Three hours. Staff.

188 ELEMENTARY STATISTICS (2-2) Descriptive statistics: frequency distributions, measures of central location, measures of variation; Introduction to Probability; Theoretical Distribution: normal, binomial, and student's t; Tests and Hypotheses; Elements of Index Numbers; Introduction to correlation and regression. *Prerequisites:* Economics 11, 12. Three hours. Staff.

190 MACROECONOMIC THEORY Keynesian and post-Keynesian theories of economic development; government policies in relation to the problems of employment, stability and growth in developed economies. *Prerequisite:* 11, 12. Three hours. Mr. Campagna.

193, 194 College Honors

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

216 ECONOMIC DEVELOPMENT Theories of economic growth applied to underdeveloped areas of the contemporary world, including the political and social determinants of economic progress. *Prerequisite*: 11, 12. 190 recommended. Three hours. Mr. Alnasrawi.

217 REGIONAL ECONOMIC GROWTH Theoretical models of regional growth; relationships among growth theory, international trade theory, and location theory. Interregional factor movements related to historical patterns of income growth at the state level in the U.S. *Prerequisites:* 186, 190. Three hours. Mr. Laber.

234 MONETARY THEORY Analysis of Classical, Keynesian, and modern macroeconomic models; micro and macro demand for and supply of money; portfolio choice; term structure of interest rates and the influence of financial intermediaries. *Prerequisite:* 190. Three hours. Staff.

238 ECONOMIC HISTORY OF MODERN EUROPE A comparative historical study of the process of economic growth as experienced in Britain, France, Germany, and Russia since 1760. For the economic history of pre-industrial Europe see history 237. *Prerequisite:* 11, 12 and history 12. Three hours. Staff.

240 WAGE AND EMPLOYMENT THEORY Microeconomic analysis of the pricing of labor. Theoretical economic and behavioral models of the role and effects of institutions on the wages, allocations, and levels of utilization of labor resources. *Prerequisites:* 186, 190; 141 highly desirable. Three hours. Mr. Chase.

241 MANPOWER IN AN ADVANCED ECONOMY Fundamental changes in the structure of the American labor force; income, education, occupational distribution, and unemployment factors. Implications and impacts of governmental and private sector programs on manpower training and allocation. Income maintenance and manpower. *Prerequisite:* 141. Three hours. Messrs. Chase and Nadworny.

256 AMERICAN BUSINESS AND ECONOMIC HISTORY Evolution of firms and industries in U.S. economy. The roles of federal and state governments and of

legislation. Development of American management. Prerequisite: 143. Three hours. Mr. Nadworny.

258 PROBLEMS OF COMMUNISM (same as political science 258) A comparative study of economic and political problems of applied communism with particular emphasis on current developments in selected Communist countries. *Prerequisite:* Twelve hours in history and/or social sciences. Three hours. Mr. Dellin.

267 INTRODUCTION TO ECONOMETRICS Classical least-squares regression model; tests of significance; problems of the linear model—collinearity, identification, auto-correlation; FORTRAN programming and computer usage in econometric research. *Prerequisite*: 186, 188, and 190. Three hours. Staff.

285 COMPARATIVE ECONOMIC SYSTEMS Major economic systems of mixed capitalist and socialist variety, their theoretical models, basic institutions and policies from a comparative point of view. *Prerequisite:* 11, 12 and six hours in another social science. Three hours. Mr. Dellin.

290 THE SOVIET ECONOMY Analysis of the economic development, structure, performance and direction of the Soviet Union. Seminar. *Prerequisite:* 11, 12 and six hours in another social science. Three hours. Mr. Dellin.

291 ECONOMIC PATTERNS AND POLICIES OF EASTERN EUROPE An area approach to the resources, organization, and domestic and foreign economic policies of the Communist countries of Eastern Europe, with special emphasis on recent changes. *Prerequisite:* 12 and six hours in another social science. Three hours. Mr. Dellin.

292 INTERNATIONAL ECONOMIC PROBLEMS AND POLICIES Important aspects of international cooperation and conflict in the economic sphere; quest for foreign markets, raw materials, investment opportunities, and population outlets, as well as East-West trade. *Prerequisite:* 11, 12. Three hours. Messrs. Alnasrawi and Dellin.

293 WEST EUROPEAN ECONOMIES A study of the evolution of the economic systems of West European countries, with particular emphasis on the Common Market and its foreign Economic relations. *Prerequisite:* 11, 12 and six hours in another social science. Mr. Dellin.

295 DEVELOPMENT OF ECONOMIC THOUGHT Development of economic ideas. The Pre-Classical, Classical, Socialist, Neo-Classical, Keynesian Schools and individual theoreticians. *Prerequisite:* 186 and 190 or concurrent enrollment. Three hours. Messrs. Dellin and Chase.

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

Education

COLLEGE OF EDUCATION

Professors Boller, Corrigan, Fishell, Gobin, Hunt, Leggett, Rippa; Associate Professors Carlson, Case, Fox, Hanley, Lang, Larson, McKenzie, Nash, Nichols,

Peterson, Petrusich, Saurman, Stocker, Tong, Whittlesey; Assistant Professors Abruscato, Agne, Avery, Bright, Burrell, Chase, Cheney, Christensen, Clements, Conrad, Dunkley, Erb, Greig, Lange, Marchant, McEntee, McKay, Meyers, Moore, Nedde, Ponzo, Rathbone, Shiman, Soderberg, Strassburg; Instructors Burdett, Christie, Egner, Greenberg, Guerette, Knight, Kusiak, LaCasse, Lates, Paolucci, Perelman, Royce, Schneider, Slack, Smith, Szabo, H., Szabo, R., Watson; Physical Education Specialists Condon, Farrell, Hayes, Reinhardt. Affiliated Faculty: Professors Hand, Lidral, Meserve, Pappoutsakis; Associate Professors Fuller, Lorenz, Schultz; Assistant Professors Biddle, Geno, Read, Weirich, Wigness; Instructors Sherman.

For students who are not in teacher education, courses in education are open only by permission of the office of the Dean of the College of Education. In preservice programs, 200-level courses in education are recommended only for graduate students.

2 FOUNDATIONS OF EDUCATION Social foundations of education: development of American education; education as a profession. Three hours. I or II. Staff.

55 SPECIAL TOPICS Designed so that its content and structure may accommodate special issues in education not especially appropriate within the boundaries of an existing course. *Prerequisite:* 12 hours in Education and related areas. Two to six hours. Staff.

142 AUDIO-VISUAL MATERIALS AND METHODS Designed to increase teacher capabilities in the use of instructional media and in the integration of media into the classroom and curriculum. Emphasis will be given to technology as it relates to individualizing instruction and to meeting the needs of learners in various kinds of groups. Activities will be directed to preparation of materials and the collation of sources of media used in elementary education. Laboratory time will be provided in the course structure. Three hours. Staff.

145, 146 LEARNING AND HUMAN DEVELOPMENT The developing individual; psychology of learning with particular application to human development; measurement and evaluation of learning and development; opportunities for related field experiences. Three hours. Staff.

185 FUTURE COGNITION A survivable future will require the development of expanded cognitive and affective abilities, consensus on values, and new behaviors and skills. Alternative futures will be examined to determine the implications for these abilities and the implications for current educational processes. Students will develop scenarios of alternative futures. Three hours. Mr. Case.

190 APPROACHES TO EDUCATION Senior Interdisciplinary Seminar A study of ideas and values, historic and contemporary, with emphasis upon the ideological bases of American education. Drawing from theory and research in the humanities and social sciences, this course helps the student to develop new perspectives as a guide toward resolving some of the crucial issues of our time. *Prerequisite:* senior standing. Three hours. Ms. Boller, Mr. Conrad, Mr. Nash, Mr. Rippa, Mr. Shiman.

197 **READINGS AND RESEARCH** Individual research problem or directed reading in an area of special interest to the student. *Prerequisite:* permission of the instructor. Variable credit, one to four hours per semester. Course may be repeated for a maximum of eight hours credit. Ms. Boller.

198 PERSONAL COMPONENT The personal component offers students an opportunity to pursue an activity under self-direction. Each student is required

to state the objectives for his study and make a contractual arrangement with his personal component adviser to fulfill the terms of the contract. Each contract holds one credit. Options such as education colloquia, community action experience, seminars and discussion groups, individual counseling, group counseling, and others will be provided during the four years. The course may be repeated for a maximum of seven hours credit. Only open to UVM students enrolled in Teacher Education Programs. Required for freshman and sophomores. All others with consent of instructor. Mr. Shiman and Staff.

202 PHILOSOPHY OF EDUCATION Educational theory and philosophy past and present; contributions of leading educational philosophers; the interrelations of education, society, and philosophy. *Prerequisite:* 12 hours in education and related areas. Three hours. Ms. Boller, Mr. Nash, or Mr. Rippa.

204 SEMINAR IN EDUCATIONAL HISTORY: The Struggle for Equality for Opportunity A study of selected topics in the history of education from the "Golden Age" of Greece to the present. Special attention to the nature of the education in democratic and authoritarian social orders. Discussions and research will revolve around such topics as the education of women, the plight of American Indians, and the quest of the black people throughout the world for equality and freedom. *Prerequisites*: 12 hours in education and related areas, or permission of instructor. Three hours. Mr. Rippa.

205 HISTORY OF AMERICAN EDUCATION History of principles and practices in American education as they relate to social, economic, political, and cultural developments. Discussions will focus on key ideas of historic and contemporary significance. *Prerequisite*: 12 hours in education and related areas, or permission of instructor. Three hours. Mr. Rippa.

206 COMPARATIVE EDUCATION An examination of educational policies and practices in selected countries throughout the world. Special attention will be paid to those topics that relate to important issues in American education. *Prerequisite:* 12 hours in education and related areas. Three hours. Mr. Shiman.

211 EDUCATIONAL MEASUREMENTS The essential principles of measurement in education. Topics include measures of achievement, analysis of standard tests, construction of objective tests and inventories. *Prerequisite:* 12 hours in education and related areas. Three hours. Staff.

212 CHILD AND ADOLESCENT DEVELOPMENT A study of the growth and development of the individual from infancy to adulthood with special emphasis upon implications for teaching and learning. *Prerequisite:* 12 hours in education and related areas. Three hours. Staff.

216 INTRODUCTION TO INDIVIDUALIZED INSTRUCTION FOR CLASSROOM TEACH-ERS Introduction to the individualization of instruction for language behaviors, including the analysis, measurement and evaluation of reading, spelling and written and oral communication. Each student is required to complete a classroom project with an elementary school child. *Prerequisite:* 12 hours in education and related areas and permission of the instructor. Juniors and seniors. Three hours. Staff.

220 PERSONALITY DEVELOPMENT Approaches to understanding human behavior in applied settings. With emphasis on behavior development as an interpersonal process. *Prerequisite:* 12 hours in education and psychology. Three hours. Mr. Peterson.

222 IMPROVEMENT OF READING INSTRUCTION IN THE ELEMENTARY SCHOOL Analysis of philosophies, programs and instructional practices for teaching

reading in the elementary school. Examination and evaluation of basal textbook, individual and specialized reading programs. *Prerequisite:* twelve hours in education and or related areas including an introductory course in reading or consent of instructor. Three hours. Staff.

223 READING PROGRAMS IN SECONDARY SCHOOLS AND COLLEGES Relationship of reading to learning; study of organization, instructional procedures, and materials for developing reading improvement programs for secondary and college students; reading in content areas. *Prerequisite:* twelve hours in education and/or related areas or consent of instructor. Three hours. Mrs. Lang.

224 INTRODUCTION TO BEHAVIORAL PRINCIPLES OF EDUCATION This course will involve an analysis of specific teachers' and childrens' behavior in the classroom setting that function to either facilitate or impede the attainment of educational goals. Emphasis will be on the application of basic behavioral principles in the regular class setting that will improve student's academic and social behaviors. 12 hours in Education and related areas and permission of the instructor. Junior and Seniors. Three hours. Staff.

234 LITERATURE AND LANGUAGE FOR CHILDREN AND YOUTH Characteristics, interests, and reading habits of children and young people; criteria for selection and evaluation of literature; organizing book units for teaching literature and for content areas; books for children and youth. *Prerequisite:* 12 hours in education and related areas or consent of instructor. Three hours. Mrs. Lang.

242 MODERN TRENDS IN ELEMENTARY EDUCATION Study of modern educational principles and practices in today's elementary schools. Emphasis will be on communication in the classroom, interaction between students and teachers, materials and emerging trends as they affect the elementary school. The course will deal with different teaching modes that may assist in the development of more critical analysis of the teaching act. *Prerequisite:* 12 hours in education and related areas. Three hours. Mr. McEntee and Ms. Petrusich.

248 EDUCATIONAL MEDIA Modern instructional aids, theory and practice; educational media related to psychology of teaching and learning. *Prerequisite:* twelve hours in education and related areas. Three hours. Staff.

252 SEMINAR IN AESTHETIC EDUCATION A critical examination of aesthetic values transmitted in contemporary schools. Consideration of ways to expand aesthetic awareness among children, youth and adults. The aesthetic quality of natural and man-made environments with implications for present and future educational practice will be given special attention. *Prerequisite:* 12 hours in education and related areas. Three hours. Mr. Conrad.

254 ANTHROPOLOGY OF EDUCATION Introductory examination of theories and research of cultural anthropology and education. An anthropological perspective on education grounded in the cultural realities of life in the American school. Study of the interrelationship of culture and man—his educational values, beliefs, and practices. *Prerequisite:* 12 hours in education and related areas. Three hours. Mr. Nash.

255 THE SCHOOL AS A SOCIAL INSTITUTION Professional role of the modern educator and the values underlying educational policy will focus on such contemporary issues as political pressures on public schools, problems of integration, place of religion in education, and impact of the culturally different child on school and community. *Prerequisite:* 12 hours in education and related areas. Three hours. Ms. Boller, Mr. Conrad, Mr. Nash, or Mr. Rippa.

275 ANALYSIS OF READING AND RELATED LANGUAGE DIFFICULTIES Analysis

and evaluation of learning difficulties with emphasis on reading and writing: nature of difficulties; procedures and materials for assessing reading performance. Involvement with children is required. *Prerequisite:* 12 hours in education and related areas, including an introductory course in reading or consent of instructor. Three hours. Mr. Clements.

276 LABORATORY EXPERIENCES IN READING AND RELATED LANGUAGE INSTRUC-TION Approaches to be used for the prevention and correction of reading and written language difficulties. Supervised teaching of individuals and/or small groups experiencing reading and language problems. Apprenticeships in reading instructional programs. *Prerequisite:* Ed. 275 Analysis of Reading and Re-' lated Language Difficulties or consent of instructor. Three to six hours. Mr. Clements.

292 ISSUES IN CONTEMPORARY EDUCATION Designed so that its content and structure may accommodate special issues in education not especially appropriate within the boundaries of an existing course. *Prerequisite:* 12 hours in Education and related areas. Two to six hours. Staff.

295, 296, 297, 298 LABORATORY EXPERIENCE IN EDUCATION Supervised field work designed to give student experience in specialized areas for their professional development. *Prerequisite*: permission of the Coordinator of Professional Laboratory Experiences. Credit as arranged. Mr. Meyers and Staff.

Elementary Education

3, 4 CHILD AND COMMUNITY Supervised experiences with children's groups in the community. Students should plan a schedule which will enable them to have blocks of time, such as a morning or afternoon, free of regular classes. *Prerequisite*; sophomore standing. One hour. Ms. Boller and Ms. Greenberg.

111 MUSIC METHODS FOR THE ELEMENTARY CLASSROOM TEACHER (see page).

112 SCHOOL MUSIC (see page 99).

121 READING AND LANGUAGE ARTS Principles, underlying teaching reading; materials of instruction; reading readiness; vocabulary development; development of correct study skills; reading in the Language Arts program; observation in elementary school. Three hours. Mrs. Lang, Mrs. Stocker and Mr. Clements.

122 DEVELOPMENTAL READING Consideration of current practices and controversial issues relative to teaching reading. Study of recent innovations, methods, materials, as well as the organization and evaluation of various reading programs. *Prerequisite:* for Elementary Education Majors, 121; all others consent of Director of Reading Center. Three hours. Staff.

134 CHILDREN'S LITERATURE AND LANGUAGE ARTS Traditional and modern children's literature in prose and poetry; appreciation and evaluation of literature for children of all age levels; techniques of story telling; literature in the Language Arts program. Three hours. Mrs. Lang, Mrs. Stocker, Mr. Clements.

144 TEACHING SCIENCE AND SOCIAL STUDIES Teaching Methods, curriculum planning in social studies and science for the primary through middle school. A variety of nationally developed curriculum projects will be examined and microtaught; AAAS Science: A Process Approach, Elementary Science Study, Science Curriculum Improvement Study, Conceptually Oriented Program in Elementary Science, Environmental Studies, Taba Social Studies, Man: A Course of

Study. Students should plan a schedule which will enable them to have blocks of time, such as a morning or afternoon, free of regular classes. Three hours. Mr. Agne and Ms. Petrusich.

160 TEACHING MATHEMATICS AND CRITICAL THINKING IN THE ELEMENTARY SCHOOL An investigation of the modern approach to mathematics with emphasis on instructional strategies, curriculum resources, and problem solving. Students will construct learning aids, develop individualized learning units, and have opportunity to use various manipulative devices. Three hours. Mr. Agne and Mr. Erb.

Secondary Education

15 PARTICIPATION A minimum of thirty clock hours of observation and participation in classroom work in a formal learning environment. Weekly seminars on campus. Students should plan a schedule which will enable them to have blocks of time, such as a morning or afternoon, free of regular classes. *Prerequisite:* sophomore standing and acceptance by the Coordinator of Professional Laboratory Experiences. Two hours. Mr. Meyers and Staff.

178 SECONDARY METHODS AND PROCEDURES This course is designed to prepare students for teaching in the secondary school. Experiences such as microteaching, role playing, classroom simulation, analysis of classroom behavior, and preparation of individualized materials are integral portions of the course. *Prerequisite:* satisfactory completion of Ed. 145 & 146, senior standing, and acceptance in a teacher education program. Three hours. Mr. Abruscato.

179 SECONDARY METHODS AND PROCEDURES IN SPECIAL SUBJECT AREAS (Latin, mathematics, romance languages, and social studies.) *Prerequisite:* prior or simultaneous enrollment in Ed. 178 and acceptance in a teacher education program. Variable credit, two or three hours, i.e. Latin 3 hrs., mathematics 3 hrs., romance language 3 hrs., and social studies 3 hrs. (English majors enroll in Ed. Eng. 182 and Speech majors in Ed. Speech 294. Speech minors are encouraged to enroll in 294.) Staff.

181 STUDENT TEACHING Teaching in the elementary or secondary schools under the guidance of cooperating teachers, principals, and college supervisors. For most undergraduates this is a full-time, 16 week, 12 credit experience during a semester. *Prerequisite:* acceptance in a teacher education program, and acceptance by the Coordinator of Professional Laboratory Experiences. Variable credit, three to twelve hours. Mr. Meyers and Staff.

182 SEMINAR FOR PROSPECTIVE TEACHERS OF ENGLISH (see page 198 English 182).

217 SECONDARY SCHOOL CURRICULUM Principles and problems in curriculum development. An analysis of recent curricular innovations in American secondary schools. *Prerequisite:* twelve hours of education and related areas. Three hours. Mr. Abruscato.

294 SEMINAR FOR PROSPECTIVE TEACHERS OF SPEECH (see page 166 Speech 294).

Art Education

140 ENCOUNTER WITH ART I Purpose and methods in contemporary Art Education Studio Workshops, discussions, lectures, and some field work in creative art activities. Course designed for elementary education majors. Three hours. Staff.

176

141 ENCOUNTER WITH ART II Purpose and methods in contemporary Art Education. Student required to work as studio intern for six hours per week. Evolution and discussion of the various teaching procedures used. Information dealt with will be common to secondary level. Four hours. Staff.

177 CURRICULUM AND PRACTICE IN ELEMENTARY AND SECONDARY ART EDUCA-TION The study and implementation of curriculum development in elementary and secondary Art Education. Students will plan and teach art classes at the Art Education Center. *Prerequisite:* permission of instructor. Three hours. Staff.

183 SEMINAR: CURRENT ISSUES IN ART EDUCATION Research and discussion of issues relevant to contemporary art education. *Prerequisite:* permission of instructor. Three hours. Staff.

184 SPECIAL PROBLEMS IN ART EDUCATION Individual investigation of a selected problem in Art Education under the supervision of staff. Reports and group discussions. *Prerequisite:* 177, 141, or permission of instructor. Three hours. Staff.

Music Education

For class performance study see 234 under Music Department.

131 MUSIC METHODS Methods and materials in the teaching of vocal and instrumental music in elementary and secondary schools. *Prerequisite:* 145, 146 and senior standing in music education. Five hours. Mr. Schultz.

Physical Education

For information on the curriculum for prospective teachers of physical education and athletic coaches see page 100 and 178.

PHYSICAL EDUCATION Two to three hours weekly. One credit. Staff.

One year of physical education is required of undergraduate students. The program is centered around the physical activity needs, abilities, and interests of young adults. The aims are to help all to improve physical fitness; to provide opportunity to establish skills in basic movement; to bring performance in elected physical activities to a high level of satisfying proficiency; to find enjoyment in physical activity and lasting interest in continuing voluntary participation.

Activities

Aquatics Competitive Swimming Life Saving Scuba Skin Diving Springboard Diving Swimming Synchronized Swimming

Dance Ballet Folk & Square Modern Social Team Sports Basketball Flag Football Ice Hockey Lacrosse Officiating Soccer Softball Speedball Volleyball

Individual & Lifetime Sports

Archery Badminton Bowling Conditioning Cross Country Ski Downhill Ski Fencing Golf Gymnastics Handball Horseback Riding Ice Skating Judo Karate Modern Gymnastics Outdoor Education Paddleball Squash Tennis Track & Field Trampoline Wrestling

Students who elect downhill skiing, horseback riding, bowling, ice skating, ballet, or karate will have additional fees for transportation and/or instruction. Those in skiing, skating, and judo usually provide their own equipment and gear.

Every student requesting a locker for physical education must pay a four dollar locker-towel fee.

Physical Education—Professional

21 FOUNDATIONS OF PHYSICAL EDUCATION Review of Historical, Philosophical and Scientific Foundations as a basis for physical education and an introduction to the scope and rule of school physical education and to the opportunities and obligations associated with physical education as a profession. Three hours. Mr. Christensen & Mr. Soderberg.

22 FIRST AID AND SAFETY EDUCATION First aid knowledge and skill required to respond to common emergency situations. Content includes treatment for wounds, burns, shock, broken bones, internal poisoning, as well as techniques for bandaging, artificial respiration, and transportation. Red Cross certification as First Aid Instructor for successful performance. Two hours. Staff.

26 WATER SAFETY Advance performance skills in swimming, diving, survival and rescue techniques. Theory and practice in the techniques of teaching aquatic skills. Red Cross certification as Water Safety Instructor or Instructor for Beginning Swimming. *Prerequisite:* current Red Cross Lifesaving Certificate. Two hours. Ms. Farrell, Mr. Lambert, Mrs. Szabo.

50 INTRODUCTION TO DANCE A survey of various aspects of dance. Background in the historical and educational basis of dance. Opportunity to explore ethnic forms, performance, technique, choreography and/or other areas of interest. *Prerequisite:* skill, competency and permission of instructor. Three hours. Ms. Hayes.

52 DEVELOPMENT OF MOTOR SKILLS Orientation to an understanding of the basic motor skills which form the foundation for all active planning in the physical education program. Two hours. Mr. Dunkley, Ms. Nichols.

100 TEACHING PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL Planning, organization and practice in skills appropriate for teaching movement patterns to children aged 4-12. Three hours. (two hours, elementary education majors only) Mr. Dunkley, Ms. Nichols.
EDUCATION

116 HEALTH EDUCATION Concepts of personal health related to problems of daily living. Areas of concern include mental health, sex education, nutrition and weight control, fatigue and relaxation, chronic and communicable disease, stimulants and depressants. Three hours. (Two hours for elementary education majors only.) Mrs. Slack, Mr. Tong, Mr. Gobin.

123 COACHING BASEBALL AND FOOTBALL Theory and technique of coaching interscholastic baseball and football. Includes practice, game and schedule organizations. *Prerequisite:* skill competency in baseball and football, and junior standing. Three hours. Mr. Falivene and Staff.

124 COACHING TRACK AND WRESTLING Analysis and practice of the skills, technique and knowledge involved in coaching interscholastic track and wrestling. *Prerequisite:* skill competency in track and wrestling, and junior standing. Three hours. Mr. Nedde. Alternate years 1972-73, 1974-75.

125 COACHING SOCCER AND BASKETBALL Theory and technique of coaching interscholastic soccer and basketball. Includes practice game and schedule organization. *Prerequisite:* Skill competency in soccer and basketball, and junior standing. Three hours. Mr. Soderberg and Mr. Salzberg.

126 COACHING GYMNASTICS AND AQUATICS Analysis and practice of skills, techniques and knowledge involved in teaching and coaching gymnastics and aquatics. *Prerequisites:* Skill competency in gymnastics and aquatics, and junior standing. Three hours. Mr. Dunkley and Staff. Alternate years 1972-73, 1974-75.

127 COACHING WOMEN'S TEAM SPORTS Classroom and laboratory experiences designed to aquaint students with skill progressions, teaching techniques, selection and care of equipment, source materials, and coaching techniques of the following activities: soccer, speedball, field hockey, volleyball, softball, lacrosse, and basketball. *Prerequisite:* skill competency and junior standing. Three hours. Ms. Condon and Staff.

128 COACHING WOMEN'S INDIVIDUAL AND DUAL SPORTS Classroom and laboratory experiences designed to acquaint students with skill progressions, teaching techniques, selection and care of equipment, source materials, and coaching techniques in a variety of individual and dual sports including golf, tennis, skiing, skating, and others. *Prerequisites:* skill competency and junior standing. Three hours. Ms. Lange and Staff.

140 SEMINAR IN PHYSICAL EDUCATION Strategy, analysis, techniques and contemporary issues in selected areas of physical education. Variable credit based upon the nature of the semester topic selection. One-three credits. Staff.

145 SEMINAR IN ATHLETICS Contemporary issues, strategy, analysis and problem areas related to selected comparative sports. Variable credit. One-three credits. Staff.

150 SEMINAR IN HEALTH EDUCATION In-depth content, methods, materials and units of instruction for selected areas of health education. Special emphasis upon current health problems. Variable credit, one-three. Staff.

154 INTRODUCTION TO RECREATION Development of the recreation movement, its culture, social and economic background in American society. Techniques of leadership, community resources, supervision and evaluation methods in community recreation programs. The organization and objectives of recreation programs in various types of communities with emphasis upon the tax supported programs. Mr. Tong.

EDUCATION

155 PHYSICAL EDUCATION IN THE SECONDARY SCHOOL Theories of teaching which include unit plan development, classification and grouping of students for instruction, and a variety of teaching methods including the use of a problem solving approach to learning. Laboratory experience in teaching activity skills to youths from age of 12-18 years. *Prerequisite:* junior standing. Three credits. Mr. Gobin.

156 THE PHYSICAL EDUCATION CURRICULUM The role of physical education in the comprehensive school curriculum. Philosophy and techniques of curriculum_innovation. Emphasis_upon_inter-relationships_that_exist_between_student needs and interests, teaching methodology, evaluative procedures, community involvement and administrative organizational patterns. *Prerequisite:* PE 100 or 155. Three hours. Mr. Gobin.

157 CARE AND PREVENTION OF ATHLETIC INJURIES Prevention, recognition and care of injuries related to school physical education and athletic programs. Mr. Bryant.

158 ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION Organization and administration of instructional programs, intramurals, inter-scholastic athletics, school recreational programs, schedules, personnel, budgets, equipment, records, tests, and public relations. Three hours. Mr. Christensen.

166 KINESIOLOGY Study of joint articulation, muscular action, and basic principles of body mechanics as a foundation for the analysis of motor performance in physical education activities, athletics, and physical therapy. *Prerequisite:* One year Biol. Sci. Three hours. Mr. Leggett or Mr. Kusiak.

167 PHYSIOLOGY OF MUSCULAR ACTIVITY Study of physical exercise upon the circulatory, respiratory, digestive, and nervous system. Relationship of endurance, fatigue, training and nutrition to the efficiency of physical performance. *Prerequisite:* one year Bio. Sci. Three hours. Mr. Leggett or Ms. Lange.

168 TESTS AND MEASUREMENTS IN PHYSICAL EDUCATION Principles and techniques in evaluation of instruction in health and physical education. Emphasis is given to test selection, administration, construction, application of statistical procedures, and development and interpretation of research data. Three hours. Accelerated. Mr. Greig or Mr. Kusiak.

169 HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION The development of physical education; functions of physical education in society; underlying principles and concepts. Three hours. Accelerated. Mr. Gobin or Mr. Greig.

170 PHYSICAL EDUCATION FOR THE ATYPICAL Recognition, prevention, and correction of functional and structure deviations from normal body mechanics. Special emphasis given to the organization of programs adapted to the needs of physically, emotionally, and mentally handicapped children. *Prerequisite:* P.E. 100 or 155. Three hours. Mr. Gobin.

173 PRACTICUM IN FIELD EXPERIENCE Individually prescribed teaching experience involving work with youth groups in activities related to Health, Physical Education, or Recreation. Responsibilities will approximate those commonly associated with student teaching. *Requisite:* PE 100, 155, or permission of the dept. Variable credit (2-4 hours). Staff.

192 INTRAMURAL PROGRAMS Organization and administration of intramural sports programs for Junior High through college levels. Philosophy, program planning, units of competition, and financing of intramural programs. Laboratory experience organization, supervision and officiating the UVM Intramural Program. *Prerequisite:* PE 22 or 157 and junior standing. Three hours. Mr. Strassburg.

197 **R**EADING AND RESEARCH For course description see the College of Education listing.

201 ADMINISTRATION AND ATHLETIC PROGRAMS Designed to provide the athletic director, school administrator, and teacher-coach with a background for effective administration of the athletic program of schools. Area considered include scheduling, budgeting, management, equipment, policy, public relations, and educational justification. *Prerequisite:* 12 hours of education and psychology. Three hours. Mr. Leggett.

203 PRINCIPLES OF PHYSICAL EDUCATION Principles basic to sound philosophy of physical education for appraisal of historical development; relationship to health education, recreation and other areas; foundation and functions of physical education in contemporary society. *Prerequisite:* junior standing. Three hours. Mr. Gobin or Mr. Greig.

208 SCHOOL HEALTH PROGRAMS Organization of the total school health program. Problems and administration in the area of school environment, health services, health education, and school-community relationship. Special emphasis on health appraisal of children in grades 1 through 12. Prerequisite: P.E. 116 (Health Education) or equivalent. Three hours.

HOME ECONOMICS EDUCATION (see Home Economics Education page 131).

VOCATIONAL EDUCATION (see Vocational Education and Technology Department page 79).

Other Courses in Education

In addition to the courses previously described, the following courses are also offered, usually in the Summer Session and Evening Division.

1

Number	Title	Hours
7	Educational Psychology	3
53	Psychology of the Exceptional Child	3
75	Driver Education Workshop, Basic	3
132	Teaching Arithmetic	3
150	Intensive Teacher Preparation	4
172	The Creative Process Through Art	3
175	Driver Education, Advanced	3
201	Administration of Athletic Programs	3
203	Principles of Physical Education	3
208	School Health Programs	3
209	Education of Teachers of the Mentally Retarded-I Ear	ly
	Years	3-6
210	Education of Teachers of the Mentally Retarded-II Lat	er
	Years	3-6
214	The Slow Learner (Education of the Exceptional Child)	3-6
215	The Gifted Child	3
218	Workshop in Curriculum	4
219	Workshop in Economic Education	4
995	Teaching Social Studies in the Secondary School	3

Cradit

EDUCATION

227	Teaching Science in the Secondary School	3
228 -	Literature in the Junior-Senior High School Curriculum	
	(Literary Criticism for Teachers)	3
229	Communicative Arts in Secondary Schools (Teaching	
	English in Secondary Schools)	3
240	Musical Creativity in the Junior High School	3
241	Science for the Elementary School	3
243	Recent Trends in Music Education	3
244	Social Studies in the Elementary School	3
253	Practicum in Music Education	1-4
256	Methods and Materials in Elementary School Mathematics	3
257	Teaching Mathematics in the Secondary Schools	3
259	Teaching Foreign Language	3
260	Improvements in Teaching Bookkeeping and Basic Busi-	
	ness Subjects	3
261	Seminar in Business Education	3
262	Principles, Problems, and Trends in Business Education	3
263	Improvement in Teaching Secretarial Subjects	3
264	Business Education Curriculum	3
270	Kindergarten Methods and Organization	3
271	Laboratory Experiences in Kindergarten Education	3
290	Basic Concepts in Music Education	3
291	Psychology of Music	3
	· · · · · · · · · · · · · · · · · · ·	

(For detailed descriptions of 200 and 300 level courses see Graduate College Bulletin)

Social Welfare Program

2 FOUNDATIONS OF SOCIAL WORK An introductory course in Social Work to develop an understanding of existing social service delivery systems and their history. Three hours. Staff.

51 HUMAN NEEDS AND SOCIAL SERVICES Study of problems of social functioning and social services to meet such problems. Three hours. Staff.

166, 167 SOCIAL WELFARE AS A SOCIAL INSTITUTION Philosophy, purpose, history of social welfare; review of fields and processes of social work. *Prerequisites:* Sociology 22, Psychology 1, Economics 3, Political Science 21. Three hours. Staff.

168, 169 SOCIAL WORK AS A PROFESSION Means of intervention or methods employed by social workers in providing services on individual, group and community levels. *Prerequisites:* SW 166, 167. Three hours. Staff.

170 FIELD EXPERIENCE Field experience under supervision will be given in social agencies four and one-half days each week. Weekly seminar. *Prerequisites:* senior standing; SW 51, 166, 167, 168. Fifteen hours. Staff.

291, 292 SPECIAL PROBLEM Supervised study in the field of social welfare. Not for graduate credit. Three hours. Staff.

182

Engineering, Civil

COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

Professor Oppenlander (Chairman); Associate Professors Dawson, Downer, and Fay; Assistant Professor Olson; Engineer Dunham; Adjunct Professors Kiley and Knight; Adjunct Assistant Professor Stearns.

01 STATICS (3-0) Fundamentals of statics; composition and resolution of forces; the analysis of force systems in two and three dimensions; and centroids and moments of inertia. *Prerequisite:* mathematics 14. Three hours. Staff.

02 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; and simple harmonic motion. *Prerequisite:* 01. Three hours. Staff.

10 SURVEYING (3-4) Fundamental surveying methods; propagation of errors as applied to surveying measurements; triangulation; control surveys; and traverse adjustments. *Prerequisite:* mathematics 13. Four hours. Staff.

11 GEOMETRONICS (2-4) Selected items in analytical photogrammetry; celestial observations, elements of photo-interpretation; theory of curves; and digital terrain analysis. *Prerequisite*: 10 or 12 and mathematics 14. Three hours. Staff.

12 PLANE SURVEYING (3-4) Fundamental surveying methods; elements of topographic surveying; and special problems according to student interest. For those not enrolled in civil engineering. *Prerequisite:* mathematics 2 and 9. Four hours. Staff.

100 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:* 01. Three hours. Staff.

101 MECHANICS OF MATERIALS LABORATORY (0-3) Experimental stress analysis methods; fundamental properties of metals, plastics, and wood; and the effects of size, shape, method and speed of loading, and strain history on these properties. *Prerequisite:* 100. One hour. Staff.

120 ENGINEERING CONTRACTS (2-0) Contract law; engineering specifications; and ethics and professional conduct. *Prerequisite:* junior standing. Two hours. Staff.

140 TRANSPORTATION ENGINEERING (3-0) Analysis of transportation systems; planning studies for highways, airports, rail and mass transport, pipelines, and belt systems; traffic flow phenomena; geometric design; economic analysis during planning, design, and construction phases; and critical path scheduling techniques. *Prerequisite:* 10, and junior standing. Three hours. Messrs. Dawson and Oppenlander.

150 SANITARY ENGINEERING I (3-0) The theory and design of water supplies, treatment processes, and distribution systems. *Corequisite:* 160. Three hours. Staff.

151 SANITARY ENGINEERING II (2-3) The theory and design of waste water collection systems and primary, secondary and tertiary waste water treatment plants; and laboratory studies on waste water characteristics and treatment. *Prerequisite:* 150, chemistry 1-2. Three hours. Staff.

160 HYDRAULICS (3-3) Mechanics of fluids with emphasis on incompressible fluids; flow meters; flow in closed conduits and open channels; elements of hydraulic machinery; laboratory studies of flow in closed conduits and open channels; and experiments with hydraulic machinery. *Prerequisite:* 02. Four hours. Mr. Downer.

161 FUNDAMENTALS OF FLUID MECHANICS (3-0) An introduction to the statics and dynamics of fluids. One-third to one-half of the semester will be spent on acquiring the necessary level of competence in mathematics, statics, and dynamics. *Prerequisite:* one year of college calculus and one year of related science. Three hours. Staff.

162 APPLIED FLUID MECHANICS (3-3) The application of basic principles of fluid mechanics to practical problems; flow in closed conduits and open channels; and hydraulic structures and machinery. *Prerequisite:* 161. Four hours. Staff.

163 **PRINCIPLES OF HYDROLOGY** (3-0) A systematic analysis of the distribution and movement of water in the environment; detailed discussion in non-mathematical terms of the occurrence, distribution, and movement of water through the main phases of the hydrologic cycle; precipitation, interception, evaporation, soil moisture, groundwater, and runoff; and methods of measurement of a wide range of hydrologic parameters. *Prerequisite:* junior standing and one year of college science. Three hours. Mr. Downer.

170 STRUCTURAL ANALYSIS I (3-3) Analysis and design of statically determinate structures; 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 loads; base plates; eccentric connections; and laboratory practice in graphic statics and design computations. *Prerequisite:* 100. Four hours. Staff.

171 STRUCTURAL ANALYSIS II (3-0) Analysis of statically indeterminate structures by consistent deformation, least work, slope deflection, and moment distribution; determinations of deflections by virtual work, moment area, conjugate beam, and Williot-Mohr diagram; continuous structures; and an introduction to structural dynamics. *Prerequisite:* 170. Three hours, Staff.

172 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 and aluminum; and laboratory problems in design of steel building frames and continuous girder and truss bridges. *Prerequisite*: 171. Four hours. Staff.

173 REINFORCED CONCRETE (3-0) Analysis of stresses in plain and reinforced concrete members; design of reinforced concrete structures; and theory of prestressed concrete. *Prerequisite:* 171 or concurrent enrollment. Three hours. Mr. Dunham.

180 SOIL MECHANICS (3-3) Identification, description, and physical properties of soils and other particulate systems; subsurface exploration; and engineering characteristics of natural deposits; consideration of stress distribution, permeability, consolidation, shear strength, and stability of soils;

ENGINEERING, CIVIL

and laboratory practice in testing for index properties, permeability, consolidation, shear, and the effects of additives and cementing agents on particulate systems. *Prerequisite:* 100. Four hours. Mr. Olson.

181 SUBSTRUCTURE ANALYSIS AND DESIGN (3-3) Evaluation of subsoil conditions and earth pressures; and design of retaining walls, substructures for buildings and bridges, and cofferdams. *Prerequisite:* 173 and 180. Four hours. Mr. Olson.

190 SPECIAL PROJECTS (3-0) Independent investigation of a special topic under the guidance of a faculty member. The course work may consist of library investigations, unique design problems, and laboratory and field studies. Preparation of a formal report on the problem is required. *Prerequisite:* senior standing and departmental permission. Three hours. Staff.

200 MECHANICS OF MATERIALS II (3-0) The study of stresses and strains at a point under plane and three-dimensional loading using Mohr's circle; failure theories and energy methods; and plastic design and buckling of plates and shells. *Prerequisite*: 172 or concurrent enrollment. Three hours. Staff.

210 AIRPHOTO INTERPRETATION (2-3) Techniques in aerial photographic interpretation; principles of stereoscopic viewing and identification of the airphoto features related to land form, vegetation, drainage, soil color tone, and topography, and cultural features; special techniques in remote sensing; and the use of airphoto interpretation in soil identification, agricultural and forest surveys, water and air resource studies, regional and urban planning, and site and route locations. *Prerequisite:* senior or graduate standing. Three hours. Mr. Olson.

220 CONSTRUCTION ENGINEERING (3-0) Discussion of construction processes; relationship of techniques to design details and specification requirements; sequence studies by means of CPM and PERT; measurements of construction efficiency, cost estimating, and specifications; and case studies of local projects. *Prerequisite:* senior or graduate standing. Three hours. Mr. Dunham.

225 ENGINEERING ECONOMY (3-0) Mathematical comparison of alternatives to maximize the financial return on engineering decisions and processes; project feasibility studies and design decision making; effect of taxes on engineering decisions; and analysis of risk and uncertainty. *Prerequisite:* senior or graduate standing. Three hours. Staff.

226 CIVIL ENGINEERING SYSTEMS ANALYSIS (3-0) Development of operations research techniques including linear and dynamic programming, inventory theory, replacement theory, queuing models, networks, and scheduling; procedures for solving complex problems; and application of systems analysis to problems in civil engineering. *Prerequisite:* senior or graduate standing. Three hours. Messrs. Dawson and Oppenlander.

230 URBAN PLANNING TECHNIQUES (3-0) Theories on the size, spacing, and functions of cities; economic, social, and physical determinants of various landuse elements; basic studies for urban planning; and the process of land-use planning including location and space requirements and the development of the land-use plan. *Prerequisite:* senior or graduate standing. Three hours. Messrs. Dawson and Oppenlander.

231 URBAN PLANNING ANALYSIS (3-0) History and development of urban planning; approaches to planning with attention to city design and appearance,

ENGINEERING, CIVIL

quantitative methods in planning, and social welfare planning; plan implementation; organization and administration of planning agencies; and financial planning. *Prerequisite:* senior or graduate standing. Three hours. Mr. Oppenlander.

232 COMMUNITY DESIGN Basic principles and methods of planning and designing the total community; site selection; and elements of physical layout and design. Design projects dealing with community elements such as subdivisions, industrial parks, new towns, etc. Three hours. Messrs. Oppenlander and Sargent.

233 REGIONAL PLANNING (see Resource Economics 223).

240 TRAFFIC ENGINEERING CHARACTERISTICS (3-0) Basic components of highway travel including driver, vehicle, roadway, environmental, and pedestrian characteristics; traffic flow and intersection characteristics; highway and intersection capacities; performance of traffic systems; and techniques for measuring traffic characteristics. *Prerequisite:* senior or graduate standing. Three hours. Staff.

241 TRANSPORTATION SYSTEMS ENGINEERING (3-0) Interdisciplinary aspects of transportation systems and their technological characteristics; mathematical analysis and synthesis of system problems; economic consideration of transportation; fiscal studies and financial planning; and administration of transportation systems. *Prerequisite:* senior or graduate standing. Three hours. Staff.

242 TRAFFIC ENGINEERING OPERATIONS Design and application of traffic control devices including signals, signs, and markings; regulation of traffic flows, speeds, and parking; safety engineering; design of off-street parking facilities; and evaluation of traffic engineering improvements. *Prerequisite*: 240. Three hours. Staff.

243 HIGHWAY GEOMETRIC DESIGN Theory and practice of geometric design for rural and urban highways; route location; design controls and standards; and design of geometric elements including sight distance, horizontal and vertical alinements, cross-section, intersections, and interchanges. Three hours. Mr. Oppenlander.

244 U'RBAN TRANSPORTATION SYSTEMS Transportation planning process for urban areas; inventory, use, and desire studies for urban transportation; techniques of travel forecasting and trip generation, distribution, and assignment; planning, design and operation of mass transit systems; location and design of terminal facilities. Three hours. Mr. Oppenlander.

250 DESIGN OF WATER TREATMENT FACILITIES (1-6) Design of treatment systems to provide water for domestic and industrial use; and source evaluation, demand projections, specific treatment processes, distribution systems, economics, and case studies. *Prerequisite*: 150. Three hours. Staff.

251 DESIGN OF WASTEWATER TREATMENT FACILITIES (1-6) Design of treatment systems for processing wastewaters from municipal and industrial sources; and population projections, site location, collection systems, lift stations, choice and sizing of unit processes, specification writing, cost estimates, and bid document preparation. *Prerequisite:* 151. Three hours. Staff.

252 INDUSTRIAL WASTE DISPOSAL (3-0) Fundamental chemical, physical, and biological processes employed in treatment and disposal of pollutants from the following industries: mining and metal processing, refinery and petrochemi-

186

cal, pulp and paper, food and meat processing, textiles, and electric generation. *Prerequisite:* 151. Three hours. Staff.

253 AIR POLLUTION ABATEMENT (3-0) Identification of specific air pollutants and their effects on humans, plants, and materials; concepts, principles, and application of air pollution control processes; and electrostatic precipitation, scrubbing, cyclonic separation, filtration, absorption, catalytic oxidation, and dispersion. *Prerequisite:* Chemistry 5 and Physics 25. Three hours. Staff.

254 SOLID WASTES (3-0) The significance of solid wastes generated from municipal, industrial, agricultural, and mining sources; the optimization and design of collection, disposal, and/or recycle systems; and sanitary landfills, incineration, composting, and material recovery. *Prerequisite:* Chemistry 5 and Physics 25. Three hours. Staff.

255 UNIT OPERATIONS OF WATER AND WASTEWATER TREATMENT (1-6) Examination of major physical, chemical, and biological processes used in treating water and wastewater; theory and methods of obtaining data from bench through full scale units; analysis of data to obtain process optimization and design. *Prerequisite:* 151. Three hours. Staff.

260 Hydrology (3-0) The basic theory of precipitation, run-off, infiltration, and ground water; precipitation and run-off data; and application of data for use in development of water resources. *Prerequisite:* 160 or Mechanical Engineering 142. Three hours. Mr. Downer.

261 OPEN CHANNEL FLOW (3-0) Application of the basic laws of fluid mechanics to flow in open channels; boundary layer theory; design of channels and transition structures; non-uniform flow; and non-uniform, spatially-varied flow problems. *Prerequisite:* 160, Mathematics 271. Three hours. Mr. Downer.

263 MEASUREMENTS IN APPLIED HYDROLOGY (2-3) Design of hydrologic experiments; observational methods, equipment and problems in describing precipitation, runoff, air temperature, relative humidity, wind movement, solar radiation, evaporation, soil temperature, infiltration, soil moisture, soil density, soil water pressure, sediment load, and snow density; data reduction and handling techniques; and application to the instrumentation and study of the hydrology of a small watershed. *Prerequisite:* 163 or 260. Three hours. Mr. Downer.

270 ADVANCED INDETERMINATE STRUCTURES (3-0) Matrix analysis of one, two, and three dimensional indeterminate structures using the finite-element approach; formulation and solution by the flexibility and direct stiffness matrix methods; emphasis on computer applications. *Prerequisites:* 171 and a basic knowledge of matrix algebra. Three hours. Staff.

271 PRESTRESSED CONCRETE STRUCTURES (3-0) Ultimate strength theory for concrete structures with emphasis on prestress effects; prestressed beam analysis, load balancing methods, columns, and piles, bent analysis, yield-line theory, and circular prestressing in domes and tanks; and discussion of current design specifications. *Prerequisite*: 173. Three hours. Mr. Dunham.

280 APPLIED SOIL MECHANICS (3-0) Use of soil mechanics in the evaluation of building foundations, braced excavations, earth structures; lateral earth pressures, pile foundations, pier and caisson foundations, slope stability, and construction problems. *Prerequisite:* 180. Three hours. Mr. Olson.

281 HIGHWAY AND AIRPORT PAVEMENT DESIGN (3-0) Structural design of flexible and rigid pavements; types of wheel and axle configurations; soil

classification; compaction of soils; frost action; subsurface drainage; design of bases and subbases; soil stabilization, theory of stresses in flexible pavements; plate bearing, triaxial and CBR methods of design; Westergaard analysis for rigid pavements; design of joints and reinforcing steel; and pavement evaluation. *Prerequisite*: 140, 180. Three hours. Mr. Olson.

282 ENGINEERING PROPERTIES OF SOILS (2-3) Study of soil properties that influence the engineering behavior of soils; subject areas include soil mineralogy, physicochemical concepts, plasticity properties, permeability and compaction; and laboratory study of soil index properties, permeability, and compaction tests. *Prerequisite:* 180. Three hours. Mr. Olson.

283 ADVANCED ENGINEERING PROPERTIES OF SOILS Detailed study of soil properties that affect the compressibility and shear strength of natural soil deposits. Laboratory work includes extensive studies of consolidation and compressibility and use of the latest methods of shear strength determination. Three hours. Mr. Olson.

284 THEORETICAL SOIL MECHANICS Theories of soil mechanics, failure conditions, mechanical interaction between solids and water; and problems in elasticity and plasticity pertaining to earth masses. Three hours. Mr. Olson.

290 ENGINEERING INVESTIGATION (3-0) Independent investigation of a special topic under the guidance of a staff member. The course work may consist of literature investigations, unique design problems, and/or laboratory and field studies. Preparation of an engineering report is required. *Prerequisite:* senior standing or departmental permission. Three hours. Staff.

Engineering, Electrical

COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

Professor Roth (Chairman), Handelsman, Lai, Lambert and Rush; Associate Professors Absher, Evering, Taylor and Williams.

3 ENGINEERING ANALYSIS II (3-0) Input-output relations of systems. Ordinary linear differential equations with specific application to linear systems. Response of systems to exponential excitation and concept of complex frequencies. Impulse response. Steady-state response of linear systems. System functions. Resonance. Network theorems. Energy and power. Prerequisite: Math. 11 or 13. Three hours.

4 ENGINEERING ANALYSIS III (3-0) Signal flow graphs. Simulation of systems by analog computers. Transient response of linear systems. State-space approach. Response of mechanical systems, electromechanical systems, acoustic systems, magnetic networks, etc. *Prerequisite:* 3. Three hours.

31 ENGINEERING COMPUTATION I (2-0) Analog and hybrid computing devices. Simulation of linear algebraic and dynamic systems. Various mathematical operations. Non-linear problems. Conversion between analog and digital domains. Scaling. *Prerequisite:* concurrent enrollment in Math. 123. Two hours.

32 Engineering Computation II (2-0) Introduction to digital computers.

Hardware and software structure. Solution of electrical engineering problems using digital computer techniques. *Prerequisite:* E.E. 31. Two hours.

91, 92 THEORY AND PRACTICAL APPLICATIONS OF ELECTRICAL, MAGNETIC AND ELECTRONIC CIRCUITS (3-0) For non-engineering students. Typical topics include audio systems, television and computers. *Prerequisite:* High school algebra. May not be taken for credit in place of E.E. 101, 102. Three hours.

101, 102 ELECTRICAL ENGINEERING PRINCIPLES (3-3) Principles of electric and magnetic circuits; application of these principles to the theory and performance of selected power, control and communication equipment. Prerequisite: mathematics 123 and physics 27, 101 for 102. Four hours.

111 CONTROL SYSTEMS (3-0) Theoretical background for analysis and synthesis of feedback control systems. Concepts of stability, transfer functions, signal flow, performance criteria, compensation and the classical root-locus and frequency response methods. State variable approaches. Analog simulation as a design tool. *Prerequisite:* 4. Three hours.

113 ENERGY CONVERSION I (3-0) Principles basic to electromechanical energy conversion devices and systems. Concepts associated with the interchange of energy among electrical magnetic and mechanical circuit elements. Continuous energy conversion in the ideal and practical rotating machine. Machine dynamics. *Prerequisite:* 4. Three hours.

114 ENERGY CONVERSION II (3-0) Six basic methods of Direct Energy Conversion (DEC): thermoelectric devices, thermionic devices, magnetohydrodynamic (MHD) converters, solar cells and fuel cells, electrohydrodynamic (EHD) converters. Modern solid state theories of DEC. The past, present, and future of DEC. *Prerequisite*: 113, 163. Three hours.

121 ELECTRONICS I (3-0) Properties of semiconductors. PN junctions. Application of diodes. Circuit models for transistors, vacuum tubes, and other active devices. Biasing techniques and regions of operation. *Prerequisite*: 4. Three hours.

122 ELECTRONICS II (3-0) Properties of amplifiers. Amplifier design. Feedback and oscillation in electronic circuits. High-frequency circuit models and limitations. *Prerequisite*: 121. Three hours.

123 ELECTRONICS III (3-0) Analysis of pulse and digital circuits. Design of transistor logic gates, multivibrators, and blocking oscillators. *Prerequisite*: 122. Three hours.

143, 144 ELECTROMAGNETIC FIELD THEORY (3-0) Basic laws and elementary applications of electromagnetic fields; electrostatics, magnetostatics, Faraday's law, Maxwell's equations, plane waves, transmission lines, waveguides, and antennas. *Prerequisite:* 4. Three hours.

146 WAVE AND DIFFUSION ANALOGIES (3-0) Electromagnetic waves on lines in space. Vibration of strings and membranes. Mechanical waves in fluids and solids. Electromechanical transducers. Thermal waves Diffusion process. *Prerequisite*: 144. Three hours.

162 SOLID STATE PHYSICAL ELECTRONICS I (3-0) Theories of conductivity, dielectric constant, magnetic permeability, optical properties, piezoelectricity, ferroelectricity, pyroelectricity, magnetostriction. *Prerequisite:* physics 128. Three hours.

163 SOLID STATE PHYSICAL ELECTRONICS II (3-0) Introduction to the physics of atoms and crystals through quantum and statistical mechanics. Application of these principles to semiconductor devices. *Prerequisite:* 162, physics 128. Three hours.

171 SIGNALS AND SYSTEMS (3-0) Fourier series and Fourier integral. Pulse, periodic, and random signals and their spectra. Correlation functions and power spectra of signals. Transmission of signals through linear systems. *Prerequisite:* 4, mathematics 203. Three hours.

174 INFORMATION-TRANSMISSION SYSTEMS (3-0) Introduction to information transmission. Modulation and demodulation. Noise and noise figures. Comparison of information transmission systems. Transmission lines and propagation. *Prerequisite:* 171. Three hours.

Laboratories

Each student will keep a laboratory notebook which will be collected and checked periodically by the instructor. He will prepare one experiment in a form suitable for publication and will present his paper to the class and other interested persons. The student will be graded on the notebook as well as the final written and oral presentation.

81 SOPHOMORE LABORATORY (0-3) Direct current measurements, nonlinear resistive elements, electron ballistics, the cathode ray oscilloscope, transients in RC circuits, alternating current measurements, sinusoidal behavior of RL and RC circuits, transients and sinusoidal behavior of RLC circuits. One hour.

82 SOPHOMORE LABORATORY (1-3) Alternating current bridges, resonant harmonic analyzer, acoustic resonance, measurement of charge, current, voltage, power, resistance, capacitance, inductance, and time. *Prerequisite:* 81. Two hours.

183 JUNIOR LABORATORY (1-3) Two dimensional field mapping; electrostatic field plots, duals, and analogs; magnetic fields and circuits; magnetic forces and the magnetic field as an energy source. Input-output characterizations of linear time invariant systems. Introduction to active circuits; amplification and oscillation. *Prerequisite:* 82. Two hours.

184 JUNIOR LABORATORY (1-3) Active device characteristics, Power supplies, a.m. and f.m. modulation and detection. Transformers, magnetic amplifiers, a-c and d-c machines. *Prerequisite*: 183. Two hours.

185 SENIOR LABORATORY (1-3) Electrical conductivity in solids, the Hall effect, properties of gaseous conductors and dielectric materials. Control systems. Electromechanical transducers. *Prerequisite:* 184. Two hours.

186 SENIOR LABORATORY (0-3) Design and construction of pulse and digital circuits including logic gates, astable multivibrators, bistable multivibrators, monostable multivibrators, and locking oscillators. *Prerequisite:* 185. One hour.

187, 188 SENIOR PROJECT (0-3), (0-3) Experimental or theoretical project selected by the student and conducted under staff supervision. One hour.

201 LINEAR SYSTEM THEORY (3-0) Introduction to linear system theory and application to the processing and control of information. Mathematical models and classification of systems. Lagrangian and Hamiltonian formulation. Timeinvariant and time-varying differential systems. Characterization by impulse response and integral transforms. Methods of analysis. Adjoint system and implications. Characterization and analysis of linear discrete-time systems. *Prerequisite:* Math 124 or equivalent background. Three hours. Staff.

202 NETWORK ANALYSIS (3-0) Introduction to modern network analysis through a topological study of networks with emphasis on electrical networks. Graph theory. Fundamental principles and theorems. State variable characterization of linear, nonlinear and time-varying networks. Other methods of characterization. Analysis using linear algebra concepts. Computational problems. *Prerequisite:* EE 171 and Math 124 or equivalent background. Three hours. Staff.

205, 206 NETWORK SYNTHESIS (3-0) Design of linear and nonlinear networks using the digital computer. Review of classical realizability theory of passive networks. Computer oriented topics including: Linear algebraic computational and numerical integration problems. Concepts of modelling. Optimization methods. Worst case design. Use of analysis programs. Discussion of recent methods and developments. *Prerequisite:* 202. Knowledge of programming helpful but not necessary. Three hours. Staff.

230 DIGITAL COMPUTER LOGIC, CIRCUITS AND SYSTEMS (3-0) The logical design digital computers. Boolean algebra as an aid to circuit design. Circuits and components for the transmission, storage and modification of information and their combination into arithmetic units, memory devices, program controls and other major mechanisms. *Prerequisite:* 123 or physics 213. Three hours. Staff.

231 COMPUTER APPLICATIONS TO DESIGN AND MANUFACTURING (3-0) Computer hardware and software concepts. Basic and advanced APL (Program Language), practical computer applications in information management and process control. *Prerequisite:* department permission. Three hours. Staff.

232, 233 HYBRID COMPUTERS (3-0) Systems design concepts and use of interconnected analog and digital computers as an engineering tool are stressed. Selected problems from mathematics, biological and physical sciences are solved on a hybrid computer. The use of logic and decision as well as analog/digital and digital/analog conversion are stressed. *Prerequisite:* 123 or departmental permission. Three hours.

235 ELECTRONIC INSTRUMENTATION FOR SCIENTISTS (3-3) Introduction to electrical components and circuit theory, electrical measurements, oscilloscopes, power supplies, amplification by vacuum tubes and transistors, oscillators, comparison measurements, servo systems, operational amplifiers for measurement and control, electronic switching circuits, timing and digital counting systems. This course may not be taken for credit by students in Electrical Engineering. *Prerequisite:* College physics and calculus or permission of the instructor. Four hours. Mr. Evering.

236, 237 FUNDAMENTALS OF DIGITAL COMPUTER DESIGN (3-0), (3-0) Fundamentals of logic design. Design of combinational and sequential logic circuits. Implementation of arithmetic operations. Memory systems. Instruction codes. Dynamic storage allocation. No graduate credit for electrical engineering majors. *Prerequisite:* Math 116 or E.E. 32 or equivalent, 236 for 237. Three hours.

238 COMPUTER ASSISTED DESIGN (2-0) Circuit design, modeling and analysis via visual display computer terminals. Use of ASTAP system to analyze device characteristics and diffusion parameters. *Prerequisite:* E.E. 261 and departmental permission. Two hours. Staff.

ENGINEERING, ELECTRICAL

239 TRANSIENT PHENOMENA (3-0) Study of complex variable basis of Laplace and Fourier Transforms; applications to transient behavior of lumped and distributed parameter systems, root locus. Nyquist criterion and two dimensional field problems. *Prerequisite:* 4. Three hours. Mr. Rush.

240 BOUNDARY VALUE PROBLEMS IN ELECTROMAGNETISM (3-0) Solution of classical problems of electromagnetism using images, conformal mapping and separation of variables methods. *Prerequisite*: 144. Three hours. Mr. Rush.

242 THEORY AND APPLICATIONS OF TIME-VARYING FIELDS (3-0) Maxwell's Equations and boundary conditions for time varying systems. Propagation and reflection of electromagnetic waves, guided electromagnetic waves, resonant cavities, and microwave networks. *Prerequisite:* 240 or departmental permission. Three hours. Mr. Evering.

244 RADAR SYSTEMS ENGINEERING (3-0) Radar theory including antennas, propagation, signal detection and parameter estimation. Applications including search and track radars, aircraft control and landing, radio/radar astronomy, and modern phased array radars. *Prerequisite:* EE 174. Three hours. Mr. Handelsman.

251 APPLICATIONS OF LINEAR ALGEBRA (3-0) Introduction of basic definitions and concepts of linear algebra; formulation and solution of engineering problems. Definitions of linear vector and function spaces, subspaces and manifolds, linear operators, change of basis, spectral representation of operators, the eigenvalue problem, matrices and functions of matrices. Application to problems of state variable analysis, field theory, mechanics, quantum mechanics and signal theory. *Prerequisite:* Graduate standing in EE or Physics or departmental permission. Three hours. Mr. Rush.

261 TRANSISTOR ENGINEERING (3-0) Introduction to energy band theory and the effective mass concept. Analysis of the transport properties of holes and electrons. Characteristics of PN junctions. Theory of transistors as developed from drift and diffusion properties of carriers. Charge control model of transistor switch. *Prerequisite*: mathematics 121 or 123. Three hours. Mr. Lambert.

262 TRANSISTORS (3-0) The fundamental principles of semi-conductor operation. P and N type conductivity; the PN junction; construction of the junction transistor. Circuit analysis of transistor operation in terms of hybrid parameters. Equivalent circuits for high frequency operation; oscillators and pulse switching circuits. *Prerequisite*: 261. Three hours. Staff.

272 INFORMATION THEORY (3-0) Introduction to probability concepts of information theory; entropy of probability models; theoretical derivations of channel capacity; coding methods and theorems, sampling theorems. *Prerequisite:* mathematics 203. Three hours.

281 through 284 SEMINAR (1-0) Presentation and discussion of advanced electrical engineering problems and current developments. *Prerequisite:* senior or graduate engineering enrollment. One hour.

285 CREATIVE ENGINEERING (3-0) Creative techniques and applications to typical problems of commercial importance in fields of process control, biomedical engineering communications, circuit design. *Prerequisite:* graduate standing in EE or departmental permission. Three hours. Mr. Roth.

287, 288 SPECIAL TOPICS (3-0) Formulation and solution of theoretical and practical problems dealing with electrical circuits, apparatus, machines or systems. *Prerequisite:* 4. Three hours.

Engineering, Mechanical

COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

Professors von Turkovich (Chairman), Berry, Outwater, Martinek, and Tuthill; Associate Professors, Carpenter, Duchacek, Hundal, Marshall, and McLay; Assistant Professor, Pope; Adjunct Professors, Gardiner, Liu and Zubko.

1 TECHNICAL GRAPHICS I (0-6) Familiarization with and use of drawing materials and equipment; geometric constructions; free hand sketching and lettering; pictorials; charts and graphs; orthographic projection and multiview drawings; topographic drawings; introduction to descriptive geometry. Two hours. Mr. Tuthill.

2 ENGINEERING GRAPHICS II (0-6) A continuation of the application of orthographic principles to technical problems covering intersections and development. Axonometric projection. *Prerequisite:* 1. Two hours.

53 MANUFACTURING PROCESSES (2-3) Theory and principles of casting and molding, metal forming, welding, machining and finishing processes with emphasis on economics and design. *Prerequisite:* 2. Three hours.

73 CREATIVE DESIGN (3-0) Application of fundamental engineering principles to the solution of real engineering problems through formulation, selection, synthesis, analysis, optimization, oral and written presentation. *Prerequisite:* sophomore standing in ME. Three hours.

92 THERMODYNAMICS I (3-0) Engineering thermodynamics with particular emphasis on energy forms, the development of thermodynamics laws, equilibrium, fixed and variable mass systems, reversibility, and entropy. *Prerequisite:* mathematics 14, physics 18. Three hours.

100 MATERIALS I (3-0) (See C.E. 100, Mechanics of Materials I).

101 MATERIALS II (3-0) Electronic, atomic and crystal structures; imperfections; phases in solids; equilibrium diagrams; non-equilibrium transformations; thermodynamics of solids and surfaces; rates of reaction diffusion; corrosion. *Prerequisite:* 100. Three hours. Staff.

102 MATERIALS III (3-0) Mechanical testing; fracture and failure mechanisms; strengthening mechanisms; ceramics; polymers; plastic deformation. *Prerequisite*: 101. Three hours. Staff.

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. Three hours.

113 THERMODYNAMICS AND HEAT TRANSFER (3-0) Fundamental principles of engineering thermodynamics; application of these principles to thermodynamic cycles; heat transfer. *Prerequisite:* physics 18; mathematics 14. Three hours.

115 THERMODYNAMICS (3-0) The first and the second law of the classical thermodynamics; introduction to statistical mechanics, Boltzmann, Bose-Einstein and Fermi-Dirac statistics, partition function; microcanonical, canonical and grand canonical ensembles; kinetic theory of gases; introduction to statistical

thermodynamics; derivation of thermodynamic properties of perfect gases and solids; Maxwell relations; chemical equilibrium; the behavior of real gases and liquid; phase equilibrium and multicomponent systems. *Prerequisite:* physics 28, mathematics 14. Three hours.

119 ENGINEERING EXPERIMENTATION (1-1) Engineering Measurements; experimental error; test sequences; data analysis. Experiments using the project method to investigate engineering principle, instrument capability and the theory of experimentation. *Prerequisite:* junior standing. Two hours.

131 MATERIALS PROCESSING I (2-3) The fundamentals of forming and material removal in the solid state, in particular, underlying aspects of plastic deformation, energy requirement and overall economics are stressed. *Prerequisite:* CE 100. Three hours.

133 DYNAMICS I (3-0) Fundamentals of kinematics; analysis and synthesis of displacement, velocity and acceleration with respect to fixed and moving frames of reference; principles of particle and rigid body motion; conservation principles of dynamics and their application in the solution of dynamics problems; dynamic analogies between mechanical, fluid and electrical systems. *Prerequisite:* CE 01. Three hours.

135 ENGINEERING DESIGN I (3-3) Application of the principles of kinematics, dynamics, strength of materials and design to the design of machine elements including consideration of function; production and economic factors; with special emphasis on engineering mechanics. *Prerequisite:* 133, CE 100. Four hours.

137 SYSTEMS CONTROL (2-0) Concepts of control, stability and interaction of systems with particular reference to design of mechanical, pneumatic, hydraulic and other control circuits. *Prerequisite*: mathematics 271. Two hours.

142 FLUID MECHANICS (3-0) Dynamics of an ideal fluid; energy and momentum relations; similitude flow in conduits; boundary layer mechanics; compressibility phenomena; wing theory; hydrodynamic lubrication; fluid machines and controls. *Prerequisite*: 111 or 113, 133. Three hours.

175 HUMAN FACTORS (2-3) Human sensory capabilities and limitations, design of information input, human motor activities and space relationships, introduction to work measurement. Three hours. *Prerequisite:* junior standing.

176 PLANT PLANNING AND DESIGN (3-3) Analysis of facilities and services requirements, materials handling, office and clean room layout, mathematical and computer techniques, safety and plant conservation. Four hours. *Prerequisite:* junior standing.

191, 192 THESIS (0-9) Investigation of a research or design project under the supervision of an assigned staff member culminating in an acceptable thesis. *Prerequisite:* senior standing and departmental permission. Three hours.

200 THE ENGINEERING PROFESSION (2-0) The professional practice of engineering; laws and professional attitudes regarding design, standards patients, safety, liability, insurance, industrial hygiene and contracts. *Prerequisite:* senior standing. Two hours.

202 DYNAMICS II (3-0) Advanced topics in dynamics of particles and systems of particles. Space motion in fixed and moving frames of reference. Impulse and momentum. Central force motion. Kinematics and kinetics of rigid bodies.

ENGINEERING, MECHANICAL

Euler's equations of motion. Gyroscopic effects in mechanical systems. *Prerequisite:* 133. Three hours. Staff.

203 MECHANICAL VIBRATIONS (3-0) Vibration phenomena in single and multi-degree of freedom systems. Response of systems to periodic and transient excitation. Isolation of shock and vibration. Impedance; matrix and numerical methods for vibraticn problems. *Prerequisite:* senior standing. Three hours. Mr. Hundal.

204 ADVANCED SYSTEMS ANALYSIS (3-0) Lumped-parameter and distributedparameter systems analysis of mechanical thermal, hydraulic, pneumatic and electromechanical systems; system response to periodic, transient and random excitation. *Prerequisite:* senior standing. Three hours. Staff.

206 APPLICATION OF COMPUTERS IN ENGINEERING (4-0) Utilization of analog, digital and hybrid computers as engineering tools for the solution of complex engineering problems. *Prerequisite:* senior standing. Four hours. Mr. Hundal.

211 ADVANCED MECHANICAL STRUCTURE I (3-0) Statically indeterminate problems in bending; general expression of strain energy; theorem of Castigliano and the unit load method; theory of curved beams; beams on elastic foundations; unsymmetrical bending; torsion of thin sections. *Prerequisite:* senior standing. Three hours. Mr. McLay.

222 ADVANCED MECHANICAL STRUCTURES II (3-0) Theory and applications of the force, and displacement matrix methods of analysis; basic theory of elasticity including analysis of stress, the equilibrium equations; analysis of strain, the compatibility equations, and generalized Hooke's law; introduction to plasticity; problems of plane stress and plane strain; finite differences and variational methods. *Prerequisite:* senior standing. Three hours. Mr. McLay.

231 MATERIALS PROCESSING II (2-3) Fundamentals of forming from liquid state, plastics forming, metal joining, powder metallurgy. *Prerequisite:* 113, CE 100. Three hours. Mr. Berry.

233 STATISTICAL TECHNIQUES IN MANUFACTURING (3-0) Quality control engineering methods including correlation, variance and time series analysis. Principles of experimental design and operating research in manufacturing. *Prerequisites*: 53 or 131, Math 31, Math 200. Three hours. Staff.

243 ADVANCED FLUID MECHANICS (3-0) Foundations of compressible flow; isentropic flow; normal and oblique shock waves; Prandtl-Myer flow; flow with friction and with heating and cooling; flow in electric and magnetic fields; potential flow; linearized flows; method of characteristics. *Prerequisite:* 142. Three hours. Mr. Duchacek.

244 COMPRESSIBLE FLOW (3-0) Introduction to flow in two and three dimensions; steady irrotational flow; small perturbations; the hodograph method; the Karman-Tsien, Prandtl-Glauert, and Gothert's methods; supersonic airfoils; the method of characteristics; oblique shocks; shock waves and boundary layer interaction. *Prerequisite:* 243. Three hours. Mr. Duchacek.

245 ADVANCED FLUID MECHANICS LABORATORY (0-3) Mechanics of fluids with emphasis on compressible flow; flow-measurement; fluid machinery; aerodynamics; compressible flow in nozzles and ducts; high Mach number effects; field mapping. *Prerequisite:* 243 or concurrent enrollment therein. One hour. Mr. Duchacek.

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. Mr. Duchacek.

252 ENGINEERING DESIGN II (3-3) Application of the principles of kinematics, dynamics, strength of material, fluid mechanics and thermodynamics to the design of mechanical systems and their components; application of computers to design; design optimization; group projects in design; construction and evaluation. *Prerequisite*: 135. Four hours. Mr. Carpenter.

262 THERMAL SYSTEMS (3-3) Application of engineering thermodynamics to the analysis of thermodynamic machines and processes; problems on gas turbine, jet propulsion, nuclear power plants, energy conversion devices and other areas of current interest. *Prerequisite:* senior students. Four hours. Mr. Tuthill.

264 THERMAL EVIRONMENTAL ENGINEERING (3-0) The principles of psychrometrics, heat transfer and fluid mechanics applied to thermal environments and their control for man, animal or process. *Prerequisite:* 111, 142, 266. Three hours.

266 HEAT TRANSFER (3-0) Fundamental principles of heat transfer; conduction, convection, radiation; steady and unsteady state; the electric analogy; applications to heat transfer equipment. *Prerequisite:* 111 or 113 and mathematics 271. Three hours. Mr. Duchacek.

267 ADVANCED THERMODYNAMICS (3-0) A rigorous detailed study of the laws of thermodynamics and of ideal and actual thermodynamic processes. *Prerequisite:* 111 or 113 and mathematics 271. Three hours. Mr. Tuthill.

272 MECHANICAL BEHAVIOR OF MATERIALS (3-0) Elastic and plastic behavior of single crystals and polycrystals; dislocations; approximate plastic analysis; anisotropic materials; hardness; residual stress, brittle, transitional and ductile fractures; fatigue; damping; creep and surface phenomena. *Prerequisite:* senior standing. Three hours. Mr. Outwater.

281, 282 SEMINAR (1-0) Presentation and discussion of advanced mechanical engineering problems and current developments. *Prerequisite:* senior or graduate engineering enrollment. One hour. Staff.

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. Staff.

294 ENGINEERING DESIGN ANALYSIS AND SYNTHESIS (2-0) The application of fundamental principles of engineering and allied sciences, combined with economic considerations to decision-making processes in engineering problems. *Prerequisite:* senior standing. Two hours.

295, 296 SPECIAL TOPICS (3-0) Advanced study and discussion in areas dependent on the interest of the students. *Prerequisite:* senior or graduate standing and departmental permission. Three hours. Staff.

297 NUCLEAR ENGINEERING (3-0) Neutron chain reactions and the criticality condition; the slowing down of neutrons in an infinite medium; one-speed diffusion of neutrons in a multiplying and non-multiplying system combined slowing down and diffusion; bare and reflected homogeneous reactors; time-dependent behavior of reactors; reactor control theory; reactor accident and transient analysis. *Prerequisite:* senior standing. Three hours. Staff.

COLLEGE OF ARTS AND SCIENCES

English

Professors Bandel, Bogorad, Cochran, Jones, Long, Orth and Rothwell (Chairman); Associate Professors Broughton, Clark, Hall, Howe, Poger, and Shepherd; Assistant Professors Biddle, Bradley, Dickerson, Edwards, Eschholz, Gutman, Huddle, Rosa, Seid, Simone, Stanton, and Stephany; Instructor Owre. Adjunct faculty, Devine.

Unless otherwise indicated, all courses in the Department of English carry three hours of credit.

1 WRITTEN EXPRESSION Primarily a course in writing with some selected readings as examples of style and ways of treating similar content. Staff.

3 GENRE COURSE: DRAMA An approach to the play as a work of literature. Writing of relevant essays required. Staff.

4 GENRE COURSE: FICTION Examines a variety of fictional forms to include the short story, novella, and the novel. Writing of relevant essays required. Staff.

5 GENRE COURSE: POETRY An exploration of the forms of poetry, past and present, British and American. Writing of relevant essays required. Staff.

6 THEME COURSE Exploration of a single literary theme—such as Love and Marriage, War and Violence—in a variety of different genres. See Department bulletin board on third floor Old Mill for pre-enrollment announcements. Staff.

7,8 BRITISH LITERATURE Staff.

9, 10 AMERICAN LITERATURE Staff.

11, 12 WORLD LITERATURE Staff.

13 INTRODUCTION TO THE ENGLISH LANGUAGE Topics will include consideration of language as a part of human behavior, history of the language, dialects of American English, lexicography, and the new analysis of English. Staff.

50 EXPOSITORY WRITING Prerequisite: sophomore standing. Mr. Howe, Mrs. Owre.

53 CREATIVE WRITING Mr. Broughton, Ms. Edwards, Mr. Huddle.

Unless otherwise indicated, the prerequisite for any course in the Department of English numbered 99 to 199 is normally three hours of English and Sophomore standing.

101 CHAUCER Mr. Stephany.

107, 108 SHAKESPEARE Miss Bandel, Mr. Howe, and Mr. Rothwell.

121, 122 THE ROMANTIC PERIOD Mr. Jones, Mr. Stanton.

133, 134 THE DEVELOPMENT OF AMERICAN LITERATURE The emergence and growth of a national literature. First semester: Colonial times to the Civil War; second semester: from the Civil War to the present. Mr. Poger and Mr. Shepherd.

135, 136 CANADIAN LITERATURE The development of a national literature. Required of students in the Canadian Area Studies Program. Mrs. Thompson.

138 MODERN BRITISH NOVEL Mr. Stanton.

ENGLISH

140 MODERN SHORT FICTION Mr. Cochran, Mr. Gutman, Mr. Jones, and Mr. Shepherd.

141 MODERN AMERICAN NOVEL American novelists from 1915 to 1945. Mr. Biddle, Mr. Cochran, Mr. Eschholz, Mr. Gutman, Mr. Poger, Mr. Shepherd.

142 CONTEMPORARY AMERICAN NOVEL Significant American novelists since 1945. Mr. Cochran, Mr. Gutman, Mr. Shepherd.

143 LITERATURE OF BLACK AMERICA Poetry, fiction, and drama by black writers since the turn of the century. Mr. Gutman, Mr. Orth.

151 PHILOSOPHY AND LITERATURE See Philosophy.

159 CONTEMPORARY AMERICAN POETRY American Poetry since 1950. Ms. Edwards.

161 UTOPIAN AND ANTI-UTOPIAN FICTION Themes and literary characteristics of selected English and American utopias and dystopias from the Renaissance to the present. Mr. Bogorad.

177, 178 ADVANCED CREATIVE WRITING A workshop. Students follow their own interests in poetry, prose, fiction, and drama. Permission of instructor required. *Prerequisite*: 17. Mr. Broughton, Ms. Edwards, Mr. Huddle.

182 SEMINAR FOR PROSPECTIVE TEACHERS OF ENGLISH Grammar and language; literary interpretation and criticism; allied problems useful to teachers of English. *Prerequisite*; 16, 261. Mr. Biddle.

192 MAJOR DEVELOPMENTS IN ENGLISH LITERATURE Studies in literary periods, movements and ideas. Primarily for seniors concentrating in English. *Prerequisite:* senior standing and English major. Staff.

193, 194 COLLEGE HONORS. Not to exceed 8 hours per semester.

195, 196 SPECIAL TOPICS Not to exceed 3 hours per semester.

197, 198 READING AND RESEARCH Not to exceed 3 hours per semester.

Unless otherwise indicated, the prerequisite for any course numbered 199 to 299 is three hours of English and Junior standing.

200 OLD ENGLISH The sounds, words, and structure of Old English; simple prose texts and selections from *Beowulf*. Mr. Dickerson. Alternate years, 1973-74.

202 MEDIEVAL LITERATURE The forms (in translation) of medieval literature, with emphasis on Arthurian materials. Mr. Stephany.

204 MIDDLE ENGLISH Literary, historical, and linguistic considerations of Middle English texts, excluding Chaucer. Mr. Dickerson. Alternate years, 1972-78.

205, 206 ENGLISH DRAMA TO THE CLOSING OF THE THEATRES FIRST Semester: From the drama in the Middle Ages to Marlowe and Jonson. Second Semester: Jacobean Drama (exclusive of Shakespeare), to include Webster, Tourneur, and Ford, to the closing of the Theatres in 1642. Mr. Howe, Mr. Rothwell.

209, 210 ELIZABETHAN PROSE AND POETRY The major writers of the Tudor and Stuart periods. Mr. Long. Alternate years, 1973-74.

212 MILTON Paradise Lost, Paradise Regained, Samson Agonistes, some minor poems, and selected prose works. Mr. Bogorad.

217 RESTORATION AND EIGHTEENTH-CENTURY DRAMA Development of English drama from Dryden to Sheridan. Mr. Howe, Mr. Seid. Alternate years, 1972-73.

218 RESTORATION AND EIGHTEENTH-CENTURY PROSE AND POETRY Significant writers from Dryden to Johnson. Mr. Bogorad. Alternate years, 1972-73.

227, 228 ENGLISH NOVEL English fiction from its origin through the nineteenth century. Mrs. Hall, Mr. Stanton.

231, 232 VICTORIAN LITERATURE Significant writers from 1832 to 1900. Mr. Long. Alternate years, 1972-73.

235 MODERN BRITISH DRAMA British and continental plays of the 19th and 20th centuries. Staff.

236 MODERN AMERICAN DRAMA Recent and contemporary. Mr. Orth.

239 MODERN BRITISH POETRY Mr. Poger.

242 LITERATURE OF THE SOUTHERN RENAISSANCE Selected short stories, novels, and poetry by Glasgow, Faulkner, Warren, Tate, Styron, and others. Mr. Shepherd. Alternate years, 1973-74.

244 MODERN IRISH LITERATURE Irish literature from 1890 to the present. Mr. Bradley. Alternate years, 1973-74.

251, 252 AMERICAN NOVEL OF THE NINETEENTH CENTURY First semester: Hawthorne, Melville, and others; second semester: Twain, Howells, James and others. Mr. Biddle, Mr. Eschholz, Mr. Shepherd.

253 AMERICAN COLONIAL LITERATURE Intellectual and literary origins, in the seventeenth and eighteenth centuries, of American culture. Mather, Taylor, Edwards, Franklin, Jefferson, Freneau and Brown. Mr. Rosa.

254 EMERSON, THOREAU AND THEIR CIRCLE Mr. Orth. Alternate years, 1973-74.

256 REGIONAL WRITING IN AMERICA Selected works by Cooper, Harte, Garland, Twain, Faulkner, and others, including units on local color and Southwest humor. Mr. Cochran. Alternate years, 1974-75.

257 AMERICAN POETRY TO WORLD WAR I Major American poets to 1917, including Poe, Whitman, Dickinson, and others. Mr. Cochran.

258 MODERN AMERICAN POETRY Major American poets from World War I to 1950. Ms. Edwards, Mr. Poger.

261 STRUCTURE OF THE ENGLISH LANGUAGE Descriptive study of Modern American English. Mrs. Clark.

262 HISTORY OF THE ENGLISH LANGUAGE The principles of historical linguistics and their application to English. Mrs. Clark. Alternate years, 1972-73.

264 ENGLISH STYLISTICS Introduction to English stylistics through consideration of changing conceptions of style, evaluation of selected methods of stylistic analysis, and comparison of various literary styles. Mrs. Clark. Alternate years, 1973-74.

266 AMERICAN ENGLISH DIALECTS The emergence of American English with special attention to dialectology. *Prerequisites:* English 13, Linguistics 101 or by permission of the Instructor. Mr. Eschholz.

273 TECHNIQUE AND CRITICISM OF POETRY Intensive analysis of various kinds of poetry to develop appropriate critical methods and standards. Mr. Bogorad.

275 HISTORY OF CRITICISM Principles and theories of criticism from

ENVIRONMENTAL STUDIES

Aristotle to the twentieth century. Mrs. Hall, Mr. Stanton. Alternate years, 1973-74.

276 CONTEMPORARY CRITICISM Mr. Poger.

278 MODERN TRADITION Special topics necessary for the understanding of the critical, intellectual and literary works of the modern period: Symbolism, Realism, Self-consciousness, Nature, the Unconscious, Myth and others. Mr. Poger, Mr. Gutman.

Environmental Studies

COLLEGE OF ARTS AND SCIENCES COLLEGE OF AGRICULTURE COLLEGE OF EDUCATION SCHOOL OF NATURAL RESOURCES SCHOOL OF HOME ECONOMICS

Professor Reidel (Director)

1 INTRODUCTION TO ENVIRONMENTAL STUDIES The ecological, economic, political-legal, social-psychological, aesthetic, and technological ramifications of environmental problems and issues from an interdisciplinary perspective. Three hours. Worley and Hudspeth.

2 This is a cross-listing designation for several courses in various undergraduate colleges which provide a more focused follow-up to E.S. 1, and an introduction to a particular discipline or professional field with emphasis on study of the environment.

51 MAJOR SEMINAR An analysis of environmental problems from the perspectives of various academic disciplines and professional fields, with emphasis on interdisciplinary problem solving and research. *Prerequisite:* E.S. 1; permission of instructor. Three hours. Reidel.

100 ENVIRONMENTAL THEORY A comparative analysis of emerging concepts of man/environment relationships; the history, philosophy, and theoretical framework of environmental studies. *Prerequisites:* E.S. 1; Sophomore standing. Three hours. Reidel, Worley.

191 ENVIRONMENTAL PRACTICUM Individual field projects under direction of a faculty member. Research, creative projects, internships. Credit arranged. *Prerequisite:* Permission of Environmental Program.

195, 196 Special Topics.

201 RESEARCH SEMINAR Planning, design, and methods of research for the study of environmental problems. Open to junior majors in environmental studies. *Prerequisites*: E.S. 51, 100. Three hours. Reidel. (1974-75)

202, 203 SENIOR PROJECT AND THESIS Individual research under staff direction. *Prerequisite:* E.S. 201, Permission of Environmental Program, Major in Environmental Studies. Credit arranged, Staff. (1974-75)

204 SEMINAR IN ENVIRONMENTAL STUDIES Review and discussion of current environmental research and literature. *Prerequisite:* senior standing, Major or Coordinate-Major in Environmental Studies. Three hours, Staff. (1974-75)

Extra-Departmental Courses

COLLEGE OF AGRICULTURE

Environmental Quality

191 ENVIRONMENTAL PRACTICUM A field project with work on some environmental problem giving the student practical experience. Students may enroll more than once. Credit to be arranged. *Prerequisite:* Permission of instructor and junior standing. Staff.

195, 196 ADVANCED ENVIRONMENTAL QUALITY Analysis of problems of the environment; solutions; practical methods; problem solving mechanisms and decision making; theoretical, technological, and sociological influences. Integrated treatment through an interdisciplinary approach. *Prerequisite:* Senior standing or permission of the instructor; 195 for 196. Three hours. Staff.

COLLEGE OF ARTS AND SCIENCES

Chemistry

7 EARTH, AIR, FIRE AND WATER (3-3) See course description under Chemistry, page 159.

General Literature

61, 62 GERMAN LITERATURE IN TRANSLATION Lectures on the development of German literature; reading and discussion of representative works in English translations. No knowledge of German required. *Prerequisite:* sophomore standing and one year course in any literature. Three hours. Miss Richel.

81, 82 RUSSIAN LITERATURE IN TRANSLATION First semester: Russian masters of the nineteenth century. Second semester: twentieth century writers from the symbolists to the present. *Prerequisite:* sophomore standing and one year course in any literature. Three hours. Mr. Nalibow.

151, 152 DEVELOPMENT OF PROSE FICTION First semester: Latin, Spanish, French; second semester: French, Russian, English, and Italian. Three hours.

Linguistics

101, 102 An introductory course designed to acquaint the student with the methods and theory of systematic observation and explanation of language phenomena (linguistics). *Prerequisite:* 101 for 102. Three hours.

Meteorology

161 INTRODUCTORY METEOROLOGY An introductory study of weather elements and the dynamic process under which they combine and act. Special consideration of the interaction of earth and atmosphere. *Prerequisite:* mathematics 11; a year of college chemistry (1-2), geology, or physics. Three hours. Mr. Vollkommer.

COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

Engineering

1 ENGINEERING DESIGN CONCEPTS (4-0) Introduces the student to engineer-

GEOGRAPHY

ing and engineering design through direct exposure to engineering problem solving. The relationship of engineering to contemporary societal needs is strongly stressed. Instruction in computer programming and computer practicum are included. Open to all students. Four hours.

2 ENGINEERING DESIGN COMMUNICATION (1-6) The student is introduced to visual, written, oral and computational techniques as they pertain to engineering curriculum through participation in design projects and lectures. Four hours.

Technology

7 MAN'S PLACE IN THE UNIVERSE (1-0) See course description under Technology, page 271.

51 TECHNOLOGY AND SOCIETY (3-0) See course description under Technology, page 271.

52 TECHNOLOGY AND THE ENVIRONMENT (3-0) See course description under Technology, page 271.

53 ENERGY AND THE ENVIRONMENT (3-0) See course description under Technology, page 271.

54 OUR ELECTRONIC WORLD (3-0) See course description under Technology, page 271.

251 TECHNOLOGY AND SOCIETY SEMINAR (3-0) See course description under Technology, page 272.

COLLEGE OF MEDICINE Pharmacology

290 PHARMACOLOGY (4-3) See course description under Pharmacology, page 223.

Forestry

(see NATURAL RESOURCES, page 236)

Geography

COLLEGE OF ARTS AND SCIENCES

Professor Miles, Vander Meer (Chairman); Associate Professors Barnum, Gade, Meeks; Assistant Professors Leinbach, Lind; Instructor Ring.

Note: The normal introductory sequence is 11, 12 although 14, 12 is a recommended alternative, especially for students in economics and business administration.

11 INTRODUCTION TO HUMAN GEOGRAPHY Basic geographic concepts. The cultural diversity among people as it affects the organization and use of the environment. Required of elementary education students. Three hours. I, II. Staff.

12 WORLD NATURAL ENVIRONMENTS The patterns of man's natural environment with particular attention to land-forms, climate, soil, vegetation and water resources. Three hours. I, II. Staff.

14 INTRODUCTION TO ECONOMIC GEOGRAPHY Elementary spatial models of economic patterns, processes and relationships.

33 WORLD GEOGRAPHY Survey of the major regions and nations of the world. Three hours. I, II. Staff.

GEOGRAPHY

101-110 **REGIONAL** COURSES The character and development of the contemporary cultural, economic, and political patterns of the area against the background of its physical and resource base. *Prerequisite:* six hours in the social sciences and sophomore standing.

101 GEOGRAPHY OF AFRICA Mr. Miles.

102 GEOGRAPHY OF CANADA Mr. Miles.

103 GEOGRAPHY OF USSR Mr. Meeks.

105 GEOGRAPHY OF EUROPE Mr. Barnum.

106 GEOGRAPHY OF LATIN AMERICA Mr. Gade.

107 GEOGRAPHY OF THE UNITED STATES Mr. Meeks.

108 GEOGRAPHY OF EAST ASIA Staff.

109 GEOGRAPHY OF SOUTH ASIA Staff.

110 AUSTRALIA-NEW ZEALAND-OCEANIA

151 CLIMATOLOGY Elements of weather and climate, and their interaction with one another to produce world climate patterns. Daily weather analysis to facilitate understanding of various climatic systems. *Prerequisite:* sophomore standing. Three hours. Mr. Lind.

161 REMOTE SENSING OF ENVIRONMENT Geographic analysis and evaluation of aerial imagery produced by remote sensors and its relationship to environmental problems in the social and physical sciences. Laboratory sessions involve earth satellite and aircraft imagery. *Prerequisite:* sophomore standing or permission of the instructor. Three hours. Mr. Lind.

171 CARTOGRAPHY Introduction to maps and map preparation, principles of map construction, kinds of information suitable for map presentation, techniques of map drawing, methods of map reproduction, graphs and frequency distributions. *Prerequisite:* sophomore standing. Three hours. I, II. Mr. Barnum.

180 CULTURAL ECOLOGY (Same as Anthropology 180) Interrelationships of social groups and their natural environments and resource bases, with primary emphasis on non-industrial cultures. Empirical and theoretical materials from hunting-gathering, pastoral and peasant peoples will be examined from the perspectives of anthropology and geography. *Prerequisites:* Anthropology 21 or Geography 11. Three hours. Mr. Gade (Geog) and Mr. Pastner (Anthropology).

193, 194 College Honors

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

201 HISTORICAL GEOGRAPHY OF THE UNITED STATES (Same as history 201) The physical setting of the American historical development, emphasizing the sequence of peoples and cultures which have occupied the land and their varied appreciation of its resource base. *Prerequisite:* a course in U.S. History plus three additional hours in geography, history, or other social sciences. Three hours. Mr. Miles.

202, 203 HISTORICAL GEOGRAPHY OF EUROPE (Geography 202 same as History 202) European geography within a framework of past times, the historical

203

GEOGRAPHY

development and distribution of settlement, economic and political patterns. *Prerequisite:* six hours in geography or history. Three hours. Mr. Barnum.

211 GEOGRAPHIC ANALYSIS OF VERMONT A course emphasizing field studies, using the state and local area as an outdoor laboratory to indicate lines of geographic inquiry and to demonstrate methods and techniques of investigation into the human use of the earth. *Prerequisite:* six hours in geography. Three hours. Staff.

216 BIOGEOGRAPHY Processes and patterns of distribution, domestication and human_utility_of_plant_and_animal_species_and communities_in_varying environmental and historical contexts. *Prerequisite:* nine hours in geography or biology. Three hours. Mr. Gade.

220 SEMINAR IN ENVIRONMENTAL GEOLOGY This course is identical with Geology 220.

221 SPECIAL TOPICS IN REGIONAL GEOGRAPHY Specialized study of a particular region or parts thereof. *Prerequisite:* twelve hours in the social sciences including three in geography, and departmental permission. Three hours. Staff. I, II

231 PHYSICAL AND RESOURCE GEOGRAPHY OF THE UNITED STATES Identification and analysis of the natural regions of the U.S. as they reflect the elements of the physical environment. Emphasis on distributional patterns and resource significance. *Prerequisite:* six hours in geography including Geography 12. Three hours. Mr. Meeks.

233 REGIONAL PLANNING This course is identical with Resource Economics 233.

241 ADVANCED PHYSICAL GEOGRAPHY Geographic patterns and processes in the linkages and interactions between the earth, atmosphere, hydrosphere and biosphere. The effects of human intervention in environmental systems. *Prerequisite:* Geography 12 or 151, and advanced courses in geography, geology, or biological sciences; or permission of the instructor. Three hours. Mr. Lind.

243 SPATIAL ANALYSIS The analysis of spatial structure and interaction in geography through quantitative and statistical models. An introduction to measurement, scaling, sampling, classification and geographic covariation within a spatial framework. *Prerequisite:* 6 hours in geography (preferably including Geography 14). Three hours. Mr. Leinbach.

244 ADVANCED ECONOMIC GEOGRAPHY Locational analysis of economic activity, transportation and spatial interaction. *Prerequisite:* Geography 14 and six additional hours in geography, economics, or other social sciences. Three hours. Mr. Leinbach.

246 URBAN GEOGRAPHY An analysis of the morphology and function of cities. Consideration of urban growth and development, methods of classification, distribution, and theories of location. *Prerequisite:* Geography 11 and three additional hours in the social sciences. Three hours. Mr. Barnum.

251 ADVANCED CLIMATOLOGY Analysis of regional and local climatic data with special reference to climatic controls: special laboratory projects. *Prerequisite*: Geography 151 and permission. Three hours. Mr. Lind.

257 POLITICAL GEOGRAPHY (Same as political science 257) The political unit

GEOLOGY

as a geographic area. Location, resources, and the distributional relationships of the variety of cultural and human factors as they have a bearing on the structure and functioning of the modern political unit. Relationship between geopolitics and political geography. *Prerequisite:* six hours in geography and political science. Three hours. Mr. Miles.

258 SELECTED TOPICS IN POLITICAL GEOGRAPHY Advanced studies in political geography focusing primarily on contemporary world politics from \tilde{a} geographical and geopolitical viewpoint. *Prerequisite:* Geography/Political Science 257 and permission. Three hours. II. Mr. Miles.

261 SPECIAL TOPICS IN REMOTE SENSING OF ENVIRONMENT (same as Geology 219). Advanced research projects in remote sensing involving use and application of multi-spectral data for environmental studies. *Prerequisite:* Geography 161, or permission of the instructor. Three hours. Mr. Lind.

262 CULTURAL GEOGRAPHY (Same as Anthropology 262) Concepts and theories of cultural ecology, culture area, culture history and the cultural landscape. *Prerequisites:* Geography 11 and six additional hours in geography, anthropology or other social sciences. Three hours. Mr. Gade.

263 MAN IN NATURE An inquiry into the changing conceptions of the earth as the home of man, and the conservative and destructive uses of the physical environment that have resulted from these attitudes. *Prerequisite:* Three hours of geography. Three hours. II. Mr. Gade.

271 ADVANCED CARTOGRAPHY The history and importance of cartography; contemporary developments; special laboratory projects. *Prerequisite:* Geography 171 and permission. Three hours. I, II. Mr. Barnum.

281 THE NATURE OF GEOGRAPHY The history, philosophy and structure of modern geography. *Prerequisite:* twelve hours in geography. Three hours. I. Staff.

Geology

COLLEGE OF ARTS AND SCIENCES

Professor Stanley (Chairman); Associate Professors Hunt and Wagner; Assistant Professors Bucke, Doolan, and Drake.

1 INTRODUCTORY GEOLOGY (3-2) Processes, agents, and their effects on materials, structure, and morphology of Earth's crust. Laboratory includes field trips, study and interpretation of rocks, minerals, and maps. Four hours. Mr. Bucke.

25 ELEMENTARY FIELD GEOLOGY (1-9) Introduction to problem oriented geologic mapping with emphasis on such environmental problems as water and mineral resources, land usage, and geologic hazards. *Prerequisite:* None. Four hours. Staff.

32 HISTORY OF THE EARTH (3-0) Origin of the earth and solar system; evolution of the earth's continents, oceans, and atmosphere; the effects of changing ancient environments. Three hours. Mr. Bucke, Mr. Hunt.

GEOLOGY

42 GEOLOGICAL OCEANOGRAPHY (3-0) Characteristics and development of oceans, their basins and shorelines. Continental drift and related investigations. *Prerequisite:* 1 or introductory science course. Three hours. Mr. Hunt, Mr. Doolan.

51 ENVIRONMENTAL GEOLOGY (3-0) Environmental topics to include water resources, waste disposal, pollution, land planning and development, highways, rivers, and shorelines. *Prerequisite:* 1 or introductory courses in science, engineering, or permission of instructor. Three hours. Mr. Wagner.

60 GEOLOGY OF MINERAL RESOURCES (2-3) The origins, forms, and classifications of mineral deposits. The world location, occurrence and production of major mineral products. Three hours. Mr. Drake.

110 EXTRATERRESTRIAL GEOLOGY (3-0) The geology of extraterrestrial bodies, with emphasis on lunar materials and meteorites. *Prerequisite:* 1. Three hours. Mr. Drake.

111 INTRODUCTORY MINERALOGY (2-6) Study of the chemical and physical properties of minerals with special regard to their mode of origin. Laboratory stresses identification of minerals in hand specimen. *Prerequisite:* 1, 42, or introductory courses in physics, or chemistry. Four hours. Mr. Drake.

121 GEOLOGIC HISTORY OF LIFE (3-0) Survey of the origin, preservation, and diversification of ancient life. The interaction of organisms with their environment and the effect that organisms have had on the evolution of the earth. *Prerequisite:* 1, 42, or Biology 1, or equivalent. Three hours. Mr. Hunt.

132 INTERMEDIATE ENVIRONMENTAL GEOLOGY (3-0) Mechanical, structural, and chemical aspects of rocks and their application to man's use of the earth. Emphasis on technical evaluation of earthquake hazards, mineral, petroleum, and groundwater resources, highway and dam construction, land development, etc. *Prerequisite:* 1, 51, or introductory courses in physics, chemistry, engineering, or permission of instructor. Three hours. Mr. Stanley.

145 OPTICAL MINERALOGY (1-6) The study of the optical properties of minerals by means of the polarizing microscope with emphasis on determinative techniques. *Prerequisite:* 111 (may be taken concurrently). Three hours. Mr. Doolan.

155 SEDIMENTARY PETROLOGY (1-6) Origin, identification, and basis for classification of sedimentary rocks, with emphasis on interpretation of depositional and post-depositional environments. *Prerequisite:* 111. Three hours. Mr. Bucke.

156 IGNEOUS AND METAMORPHIC PETROLOGY (2-3) The origin and analysis of igneous and metamorphic rocks. Laboratory stresses modern approaches to petrologic problems. *Prerequisite*: 145. Four hours. Mr. Doolan.

166 STRUCTURAL GEOLOGY (3-3) Rock deformation, description, and geometry of structural types, and the kinematic and dynamic interpretation of structural features of all sizes. *Prerequisite:* 1, or 42, 51, 132, or Physics 16, 25, r C.E. 100, 180. Four hours. Mr. Stanley.

180 SOIL MECHANICS (See Civil Engineering 180). Four hours. Mr. Olson.

193, 194 COLLEGE HONORS

195, 196 SPECIAL TOPICS

206

GEOLOGY

197, 198 RESEARCH IN GEOLOGY (0-2) Supervised research and readings in a selected field of geology. Students from the allied sciences, mathematics, and engineering may elect a research problem that combines their major field of study and geology. *Prerequisite:* Consultation with the staff. Three hours.

215 GEOMORPHOLOGY Examination of stream, wind, glacier, and wave mechanics and the resultant land forms. Emphasis is given to recent field and laboratory studies. *Prerequisite:* 51 or permission of instructor. Three hours. Mr. Wagner.

216 GLACIAL GEOLOGY (2-3) The Quaternary history of North America with emphasis on the origin, mechanics, and effects of past and present glaciations. *Prerequisite*: junior standing or above. Three hours. Mr. Wagner.

218 HYDROGEOLOGY (3-0) The origin, occurrence, movement, and character of ground water. *Prerequisite:* junior standing or above. Three hours. Mr. Wagner. Alternate years.

219 REMOTE SENSING OF THE ENVIRONMENT (See Geography 261). Three hours. Mr. Lind.

220 SEMINAR IN ENVIRONMENTAL GEOLOGY (2-3) Consideration of environmental problems in Vermont, New England, and elsewhere with emphasis on the geological role in the solution of these problems. *Prerequisite:* 51, 132, or permission of instructor. Three hours. Staff.

221 SOIL CLASSIFICATION AND LAND USE (See Plant and Soil Science 261). Three hours. Mr. Bartlett.

223 ENVIRONMENTAL GEOLOGY ACTION STUDIES Study of environmental problems. Emphasis is given to project selection, investigation methods, actual investigation, and constructive implementation of findings for maximum social benefit. *Prerequisite*; permission of instructor. Three hours. Mr. Wagner.

235 ADVANCED STRUCTURAL GEOLOGY (2-3) Dynamic and kinematic origin of earth structures with emphasis on field studies, rock mechanics and other laboratory experiments. *Prerequisite:* 166. Three hours. Mr. Stanley.

237 STRUCTURAL PETROLOGY (3-0) Modes of rock deformation. Dynamic and kinematic interpretation of strain features in minerals. Laboratory includes orientation and universal stage procedures, use of computers in the rotation of data, and methods of interpretation. *Prerequisite:* 66 and 145. Three hours. Mr. Stanley.

238 FIELD GEOLOGY (1-6) Field mapping in western Vermont. Methods of analysis of field data. Geological reports. Held in late May and early June. *Prerequisite*: 166 or departmental permission. Four hours. Mr. Stanley.

242 REGIONAL GEOLOGY (3-0) Comprehensive study of the geology and sequential development of selected regions of the earth's crust. *Prerequisite:* 155 or 156 (or concurrent enrollment), 166. Three hours. Mr. Stanley.

245 GEOLOGY OF NEW ENGLAND (3-0) Prerequisite: 166, or 155, 156, or 277. Three hours. Mr. Stanley.

250 ADVANCED MINERALOGY (2-3) Crystallographic, chemical, and physical properties of the common rock forming minerals. Laboratory stresses tech-

GEOLÓGY

niques of mineral identification and analysis of mineral assemblages. *Prerequisite:* 111. Three hours. Mr. Drake.

252 CLAY MINERALOGY The structure, composition, properties, occurrence, origin, distribution, and environmental significance of the various clay minerals. Laboratory techniques in identification of clay minerals and measurement of their physical and chemical parameters. *Prerequisite:* Permission of instructor. Three hours. Mr. Bucke.

253 PHASE EQUILIBRIUM IN MINERAL ASSEMBLAGES (2-3) The application of thermodynamics and graphical methods to analysis of multicomponent, polyphase systems of mineralogical interest. *Prerequisite:* 250, or 156, or permission of instructor. Three hours. Mr. Drake.

254 GEOCHEMISTRY (3-0) The application of basic concepts in chemistry to geological problems, including solution geochemistry, weathering, mineral paragenesis, and the effects of pressure and temperature. *Prerequisite:* 250, or 155, or 156, or permission of instructor. Three hours. Mr. Drake.

256 CRYSTAL CHEMISTRY (2-3) A discussion of crystal symmetry, polymorphism, order-disorder, cation distribution and chemical variation in mineral systems and the genetic significance thereof. *Prerequisite:* 111 and Chemistry 1-2 or permission of instructor. Three hours. Mr. Drake.

261 IGNEOUS GEOLOGY Paragenesis of igneous rocks; laboratory work on selected suites of specimens. *Prerequisite*: 145, 156. Three hours. Alternate years. Mr. Doolan.

264 METAMORPHIC GEOLOGY The origin of metamorphic rocks with emphasis on the concepts of metamorphic facies, analysis and interpretation of mineral assemblages, and the spacial relationship of metamorphism to tectogenesis. *Prerequisites:* 145, 156. Three hours. Alternate years. Mr. Doolan, Mr. Drake.

270 INVERTEBRATE PALEONTOLOGY (2-3) Classification, geological distribution, evolution, paleoecology, and morphology of major invertebrate fossil groups. *Prerequisite*: 121, or equivalent. Three hours. Mr. Hunt.

272 RECENT SEDIMENTATION (1-6) Investigation of recent sedimentary environments using geolimnological and oceanographic techniques. Group and individual projects. Field oriented with use of the University research boats. *Prerequisite:* 155 or 42 and permission of instructor. Three hours. Mr. Hunt.

277 STRATIGRAPHY (2-2) Study and interpretation of development and distribution of sedimentary rocks. *Prerequisite:* 155. Three hours. Mr. Bucke.

278 ADVANCED SEDIMENTARY PETROLOGY Origin and interpretation of sedimentary rocks. Topics include mechanics of transportation and deposition, recent depositional environments, interpretation of surface textures, methods of statistical analysis, theoretical aspects of rock classification, and sedimentary tectonics. Thin section study and individual projects. *Prerequisite:* 155. Three hours. Mr. Hunt.

291 SEMINAR in GEOLOGY Selected topics of current interest. *Prerequisite:* senior or graduate standing. One to three hours. Staff.

German

COLLEGE OF ARTS AND SCIENCES

Professor Webster (Chairman); Associate Professors Kahn, Paucker and Richel; Assistant Professors Allen and Mieder; Instructor Doane.

1-2 ELEMENTARY GERMAN Four hours. Staff.

11, 12 INTERMEDIATE GERMAN Literature and Discussion of selected prose with review of grammar. *Prerequisite:* 1-2 or equivalent for 11; 11 for 12. Three hours. Staff.

13, 14 INTERMEDIATE GERMAN Composition and Conversation. Guided conversation, discussion and written work leading to free composition and oral presentations. Grammar review. *Prerequisite:* 13 or 11 for 14. Three hours. Mr. Kahn.

15, 16 INTERMEDIATE GERMAN Introduction to Technical German. Reading technical expository prose of moderate difficulty. Emphasis on developing fluency in reading types of prose useful for graduate work and research in the humanities and sciences. *Prerequisite:* 1-2 or equivalent; 15 for 16. Three hours. Staff.

82 SCIENTIFIC GERMAN Prerequisite: 16 or equivalent. Three hours. Staff.

101, 102 INTRODUCTION TO GERMAN LITERATURE Survey of German literature from the beginnings to the twentieth century. *Prerequisite:* 12 or 14 or equivalent. Three hours. Mr. Webster.

121, 122 COMPOSITION AND CONVERSATION Emphasis on increasing oral and written command of the language. Free composition, oral reports, and translation into German. *Prerequisite:* 12 or 14 or equivalent and departmental permission. Three hours. Staff.

193, 194 College Honors

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

197, 198 READINGS AND RESEARCH.

201 PROSEMINAR: METHODS OF RESEARCH AND BIBLIOGRAPHY An introduction to tools and methods of research. *Prerequisite*: 101, 102 or equivalent. Three hours. Mr. Mieder.

203 DEVELOPMENT OF GERMAN INTELLECTUAL MOVEMENTS A comprehensive survey of the history of ideas as a framework for the study of German literature. *Prerequisite:* 101, 102 or equivalent. Three hours. Mr. Paucker.

204 COURTLY EPIC AND MINNESANG Cultural background and major works of medieval classicism. *Prerequisite:* 101, 102 or equivalent. Three hours. Mr. Paucker.

205, 206 GOETHE AND SCHILLER AND THEIR TIME Origin, development,

HEBREW

characteristics and criticism of German Classicism. *Prerequisite*: 101, 102 or equivalent. Three hours. Mr. Webster and Staff.

207 NINETEENTH-CENTURY PROSE Narrative prose of representative authors such as Mörike, Keller, Ludwig, Meyer, Stifter, Raabe, and the early Thomas Mann. *Prerequisite:* 101, 102 or the equivalent. Three hours. Staff. Alternate years, 1974-75.

208 NINETEENTH-CENTURY DRAMA Works by Kleist, Büchner, Grillparzer, Hebbel, Ludwig, Wagner and the early Hauptmann. *Prerequisite:* 101, 102 or the equivalent. Three hours. Staff. Alternate years, 1974-75.

209, 210 THE TWENTIETH CENTURY Selected works in poetry, prose and drama by Brecht, George, Hauptmann, Hofmannsthal, Kafka, Thomas Mann, Rilke and others. *Prerequisite:* 101, 102 or the equivalent. Three hours. Mr. Allen. Alternate years, 1973-74.

221, 222 ADVANCED COMPOSITION AND CONVERSATION Oral and written practice in German of advanced difficulty with emphasis on stylistics. *Prerequisite:* 121, 122 or equivalent. Three hours. Mr. Kahn.

232 HISTORY OF THE GERMAN LANGUAGE Historical linguistic development of the German language from earliest times to the present. No knowledge of the older stages of the language is presupposed or required. *Prerequisite:* 121, 122 or equivalent. Three hours. Mr. Mieder. Alternate years, 1973-74.

235 THE STRUCTURE OF GERMAN Linguistic analysis of the phonological, morphological, and syntactic structure of modern German with special attention to problems useful for teachers. *Prerequisite:* 121, 122 or the equivalent. Three hours. Staff.

281, 282 SENIOR SEMINAR Readings and research. Required of all senior concentrators. Three hours.

General Literature

61, 62 GERMAN LITERATURE IN TRANSLATION See course description under Extra-Departmental Courses, page 201.

Hebrew

COLLEGE OF ARTS AND SCIENCES

Associate Professor Kahn

1-2 ELEMENTARY HEBREW The spoken language of everyday use with oral, aural and written practice in speaking, reading, and comprehension. Four hours. Mr. Kahn. Alternate years, 1971-72.

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. 1972-73.

History College of Arts and Sciences

Professors Bliss, Daniels, Davison, Evans (Emeritus), Felt (Chairman),, Hand, Rollins, Schmokel, Schultz, Spinner and Stout; Associate Professors Hutton, Metcalfe, Muller, Overfield, Seybolt, and Steffens; Assistant Professors Andrea, Fackler, Stoler, True and Young.

Courses numbered 100 to 199 generally require sophomore standing, but may be open to freshmen by permission of the instructor. Courses numbered 200 to 299 require six hours of appropriate work in history.

1, 2 CONTEMPORARY PROBLEMS IN HISTORICAL PERSPECTIVE An introduction to historical thinking and literature focusing upon significant historical antecedents of such selected facets of contemporary civilization as urbanization, race, bureaucracy, revolution, science and technology. Three hours. Staff.

3 THE STUDY OF HISTORY An introduction to the methods of studying the past. Use of the works of major historians as a means of investigating the ways in which historians think about and write history. Three hours. Staff (I, II).

9 ANCIENT MEDITERRANEAN CIVILIZATION A detailed study of Athens in the 5th century B.C. continuing to the rise of Rome through the 1st century A.D. (Students who have already taken History 106 may not take History 9). Three hours, Miss Davison and Staff.

10 MEDIEVAL EUROPEAN CIVILIZATION Three hours. Mr. Andrea.

11 EUROPEAN CIVILIZATION TO 1815 An introduction to the political, social, and intellectual movements which have shaped the foundations of western civilization: from the Renaissance to the French Revolution. Three hours. Staff.

12 EUROPEAN CIVILIZATION, 1815 to 1945 A survey emphasizing the ideas and institutions which have helped shape western society and culture from the Napoleonic Era to the end of the Second World War. Three hours. Staff.

23, 24 HISTORY OF THE UNITED STATES Three hours. Staff.

51, 52 CONTEMPORARY HISTORY First semester, 1918-1945; second semester, 1945 to the present. Three hours. Mr. Spinner.

61, 62 HISTORY OF SCIENCE A survey of the history of the physical and biological sciences from antiquity to the present. The course will stress science as an intellectual activity, within the contemporary context of philosophy, religion and social organization. Three hours. Mr. Steffens.

73 TRADITIONAL EAST ASIAN CIVILIZATION A topical survey of Chinese and Japanese culture from ancient times to the coming of the west in the 19th century. Three hours. Mr. Seybolt.

74 EAST ASIA IN TRANSITION Domestic and foreign affairs in China, Japan and Southeast Asia from 1800 to the present. Three hours. Mr. Seybolt.

104 LATIN AMERICAN HISTORY An introduction to the history of modern Latin America. Three hours. Mr. True.

105 ARCHAEOLOGY AND HISTORY OF THE ANCIENT NEAR EAST Survey of the primary civilizations of Egypt and Mesopotamia and the secondary cultures of

HISTORY

Anatolia, Syria-Palestine, Assyria, and Iran, with major emphasis on the archaeological evidence. Three hours. Miss Davison.

106 HISTORY OF GREECE Survey of the history of ancient Greece from prehistoric times (with special emphasis on the Minoan and Mycenaean cultures) to the Hellenistic Age. Three hours. Miss Davison.

107 HISTORY OF ROME Survey of the history of ancient Italy from prehistoric times (with special emphasis on the Italic peoples, the Etruscans, and Greek colonization) to the age of Justinian. Three hours. Miss Davison.

115, 116 AFRICAN HISTORY Survey of the history of Africa south of the Sahara, from earliest times to independence. First semester: to 1880; second semester; 1880 to the present. Three hours. Mr. Schmokel.

123 AMERICAN HISTORY SINCE 1945 Three hours. Mr. Hand.

125 BLACK HISTORY Economic, social, political, and intellectual developments in U. S. history as they have affected and been affected by the Black American; emphasis on the period since 1865. Three hours. Staff.

140 BIOGRAPHY Readings in the history and criticism of biography, the role of the individual in history, and biographies of individuals. Three hours. Mr. Schultz.

153, 154 ENGLISH HISTORY Political and social history of England. First semester: Middle Ages and Tudor-Stuart; second semester, 1715 to the present. Three hours. Messrs. Metcalfe and Spinner. To be given in alternate years, beginning, 1971-1972.

181 U.S. MILITARY HISTORY The development of the American Military Establishment within the framework of American history from the Colonial era to the present. Three hours. Messrs. Stoler and Stout.

191 READINGS FOR DEPARTMENTAL HONORS For seniors concentrating in history only. (Candidates should consult the chairman of the Department at the time of spring enrollment. Students accepted will do their readings between November and March; official enrollment will be in the spring semester.) *Prerequisite:* an 80 average through the junior year and an 85 average in at least eighteen hours of history; completion of at least six hours of history numbered above 200. Three hours. Staff.

193, 194 College Honors

195, 196 SPECIAL TOPICS

197, 198 READINGS AND RESEARCH An individual instructor may prescribe prerequisites for History 197, 198.

200 PHILOSOPHY OF HISTORY An investigation of the theories of history from the perspectives of both historians and philosophers. Three hours. Staff.

201 HISTORICAL GEOGRAPHY OF THE U.S. Three hours. See geography 201.

202 HISTORICAL GEOGRAPHY OF EUROPE Three hours. See geography 202.

203 LATIN AMERICAN HISTORY The Spanish Empire in America including the Indian heritage, the conquest, economic, social and political trends within the empire, and the struggles for independence. Reading knowledge of Spanish strongly recommended. Three hours. Mr. True. (To be given in alternate years, spring semester.) 205 HISTORY OF MEXICO SINCE 1810 Reading knowledge of Spanish strongly recommended. Three hours. Mr. True. (To be given in alternate years, spring semester.)

207 THE EARLY MIDDLE AGES Western Europe from the late Roman Empire to the death of Otto III (A.D. 1002). Three hours. Mr. Andrea.

208 THE HIGH MIDDLE AGES Western Europe, 1000-1300. Three hours. Mr. Andrea.

211 THE RENAISSANCE European society from the fourteenth to early sixteenth century, emphasizing the transition from medieval to "modern" society and the roots of Renaissance Italy's cultural and artistic brilliance. Three hours. Mr. Overfield.

212 THE REFORMATION European society from the Renaissance to mid seventeenth century. Emphasis on the religious struggles growing out of the Protestant Reformation and their impact on the social, political, economic and cultural movements of the era. Three hours. Mr. Overfield.

213, 214 CANADIAN HISTORY Canadian development from the French exploration and settlement to the present; evolution of self-government and relations with the United States; historical foundations of the problems of biculturalism. Three hours. Messrs. Metcalfe and Young.

215, 216 FRENCH CANADA A history of the French experience in North America from 1608-1867 and 1867-1973. Ability to read in French a decided asset. Three hours. Mr. Young.

221 THE AMERICAN COLONIES 1607-1763 Three hours. Mr. Stout.

222 THE AMERICAN REVOLUTION 1763-1790 Three hours. Mr. Stout.

226 THE MIDDLE PERIOD OF U.S. HISTORY History of the U.S., 1815-1856. Three hours. Mr. Fackler.

231, 232 FRENCH HISTORY First semester: seventeenth century to 1799; second semester; 1799 to the present. Three hours. Mr. Hutton.

233, 234 GERMAN HISTORY First semester: seventeenth century to 1850; second semester: 1850 to the present. Three hours. Messrs. Overfield and Schmokel.

235, 236 INTELLECTUAL HISTORY OF MODERN EUROPE Emphasis upon ideas in their relation to major political and social movements. First semester: Humanism, the Scientific Revolution, and the Enlightenment (1500-1800); second semester: the Modern Era (1800-1960). Three hours. Messrs. Hutton and Overfield.

240 AMERICAN BIOGRAPHY Investigation and portrayal of personalities; the uses of biography in the study of American history. Subjects selected to represent a variety of vocations and aspects of history. Three hours. Mr. Schultz.

243 SOVIET RUSSIA The USSR from the Revolution of 1917 to the present. Three hours. Mr. Daniels.

244 TSARIST RUSSIA History of Russia from the Middle Ages to the revolutionary period. Three hours. Staff.

253 TUDOR-STUART ENGLAND England from 1485 to 1660, with particular

HISTORY

emphasis on the central period from the 1530's to the 1640's (the Henrician reformation to the Revolution). Three hours. Mr. Metcalfe. Offered 1972-1973 and alternate years.

254 VICTORIAN ENGLAND Selected topics in 19th century English history with emphasis on "industry and empire", changing class relationships, and the growth and development of political parties. Three hours. Mr. Spinner. Offered 1972-1973 and alternate years.

257, 258 AMERICAN STATESMEN Thought and practical politics of American statesmen. First semester: 1783-1865; second semester; since 1865. Three hours. Mr. Schuliz.

259 THE LINCOLN ERA A history of the United States, 1830-1865, with emphasis on the sectional conflict of the 1850's, the Civil War, and the life of Lincoln. Three hours. Mr. Schultz.

261 VERMONT HISTORY A survey of Vermont History from early times to the present. Three hours. Mr. Muller.

263, 264 SOCIAL HISTORY OF THE U. S. Selected topics in the history of American society, including social movements, rural history, or urban history. Three hours. Mr. Fackler.

265, 266 INTELLECTUAL HISTORY OF THE UNITED STATES Three hours. Mr. Felt.

267, 268 HISTORY OF U.S. FOREIGN RELATIONS FIRST semester: 1763-1900; second semester: 1900-present. Three hours. Mr. Stoler.

271, 272 HISTORY OF MODERN CHINA History of China in modern times, including the late Empire, the Western impact, the Revolutions of the 20th century, and the People's Republic of China. Three hours. Mr. Seybolt.

277 SOVIET POLITICS (Same as Political Science 277) An intensive historical and institutional study of the Soviet government and Communist Party, mainly treating the period since 1953. Application of sociological and biographical analysis and data-processing techniques. Comparative treatment of other Communist systems. *Prerequisites:* 6 hours of appropriate work in history, political science, or economics. Three hours. Mr. Daniels.

278 FOREIGN POLICY OF THE USSR (Same as political science 278).

280 SCIENCE AND CULTURE A study of science as an integral part of the culture of our age with emphasis on the published works of leading scientists, mathematicians and "humanists" of the 20th century. Three hours. Mr. Steffens.

281 SCIENTIFIC REVOLUTIONS AND SOCIETY An evaluation of the relationship between scientific activity and conditions of society during the "Scientific Revolution" of the 17th century, the rapid development of science and technology in the 19th century and the "new science" of the 20th century. Three hours. Mr. Steffens.

289 QUANTITATIVE METHODS IN HISTORICAL RESEARCH Applications of quantitative methods to the selection and analysis of historical source materials; emphasis on political and social data. Use of the University's Computation Center facilities and other data-processing equipment. *Prerequisite:* Math 110 or equivalent work in statistics. Three hours, Mr. Fackler.
Home Economics

SCHOOL OF HOME ECONOMICS

Professors Betsinger (Director), Brown, Grams, Morse, Williams; Associate Professors Caldwell, Knowles, Powell, Webster; Assistant Professors Atwood, J. Emanuel¹, Goldhaber, Jameson, Livak, Osborn, Prior, Shelton, Soule and Tyzbir; Instructors Buller², F. Emanuel², Lord², Reidel², Simon² and Thorndike; Teaching Associate Lawler; Technologist Hegyi; Adjunct Professor Spaven; Adjunct Assistant Professors Coffey, Strassburg; Affiliated Faculty: Assistant Professor Rathbone.

1 HOME ECONOMICS IN THE LAND-GRANT COLLEGE Teaching, research, and extension. Historical development of field, its common core of family and individual, professional opportunities which are available. I hour. Staff.

Program in Clothing, Textiles, and Design

15 DESIGN (1-4) Color and design in theory and practice. Work with various media for creative expression and understanding of art principles. Three hours. I, II. Misses Atwood and Caldwell.

16 SKETCHING FOR FASHION AND HOUSING DESIGN (1-4) Sketching the human figure in poses and in action. Orthographic and perspective drawing. Rendering in various media. *Prerequisite:* 15. Three hours. Miss Atwood.

20 TEXTILES AND CLOTHING FOR THE CONSUMER (3-0) Clothing: its impact on wearer and observer. Today's fibers, fabrics and finishes. Consumer problems and responsibilities in selection, use, care. Three hours. I, II. Miss Thorndike.

22 CLOTHING CONCEPTS AND TECHNIQUES I (1-4) Selection of clothing to meet individual needs in relation to design and appropriateness of dress. Development of clothing construction techniques. Three hours. Staff.

23 CLOTHING CONCEPTS AND TECHNIQUES II (1-4) The role of fashion and clothing in human behavior. Emphasis on pattern alteration and advanced construction techniques. *Prerequisite:* 22 or instructor approval based on a pretest. Three hours. Mrs. Lawler.

107 COSTUME DESIGN (1-4) Application of design fundamentals and principles to fashion planning. Techniques of fashion illustration. *Prerequisites*: 15, 16. Three hours. Miss Caldwell.

115. TEXTILE DESIGN (1-4) Application of design elements and principles to processes of textile design. The Shelburne Museum collection will provide resources for research. *Prerequisites:* 15, 20; or Art 10 and departmental permission. Three hours. Miss Atwood.

116 WEAVING (1-4) Practical application of design fundamentals in the creation of woven textiles. Shelburne Museum collection available for study. *Prerequisites*: 15, 20; or Art 10 and departmental permission. Three hours. Miss Atwood.

¹ On Sabbatical Leave ² Part-time

117 HISTORY OF COSTUME (2-2) History of costume stressing the background, philosophy and events of each period as reflected in dress. *Prerequisites:* Art 5, 6. Three hours. Miss Caldwell.

119 INTERIOR DESIGN I (1-4) Application of design fundamentals to the problems involved in furnishing the home. *Prerequisite:* 15 (and 16 for Design majors). Three hours. Miss Caldwell.

120 ADVANCED TEXTILES (3-3) Physical and chemical properties of fibers in relation to fabric characteristics. Technological developments in fabric formation, dves, finishes. Testing techniques. *Prerequisites:* H.E. 20, Chemistry 16. Four hours. Miss Thorndike.

122 PATTERN DESIGN (2-4) Techniques of designing and altering flat patterns. Advanced construction techniques, altering flat pattern and emphasis on original design. *Prerequisite:* 23. Three hours. I, II. Mrs. Webster.

123 TAILORING (2-4) Construction techniques with emphasis on tailoring problems. *Prerequisite*: 122. Three hours. Mrs. Webster.

217 AMERICAN TEXTILES AND FASHION: TWO CENTURIES—18th Century to 1910. Study of home production of textiles, needle art and clothing in collections at Shelburne Museum. Lectures, demonstrations and laboratory experience. *Prerequisite:* six hours in design and/or textiles, or permission of instructors. Three hours. Misses Atwood and Caldwell.

219 INTERIOR DESIGN II (1-4) Interior design; period furnishing, its present use and influence upon modern furnishing. *Prerequisite:* 119. Three hours. Miss Caldwell.

221 COSTUME DESIGN AND DRAPING (1-4) Draping techniques in creative fashion design. Handling of fabrics in relation to line in dress. Original proj ects. *Prerequisites*: 15, 122. Three hours. Mrs. Webster.

229 CLOTHING, TEXTILES AND RELATED ART SEMINAR Theory and research in Clothing, Textiles and Related Art, analysis of current problems; review and discussion of recent publications; individual studies. *Prerequisites:* 17, 219 or 221. Three hours. Staff.

231 ADVANCED CLOTHING WORKSHOP AND SEMINAR (2-4) Individual projects using all possible methods of clothing design. Independent laboratory work. Emphasis on management, planning, new techniques, production, evaluation. *Prerequisites*: 123, 221. Three hours. Mrs. Webster.

Program in Early Childhood and Human Development

61 HUMAN DEVELOPMENT IN CONTEMPORARY SOCIETY The impact of the family, community, and various agencies, systems and conditions within society upon the developing individual. Three hours. Mr. Grams.

62 ADOLESCENT DEVELOPMENT Physical growth, physiological, psychological, and social development in adolescence. Emphasis on interrelationships of these processes and the developing personality. *Prerequisites:* sophomore standing, psychology 1. Three hours. Mr. Shelton.

63 CHILD DEVELOPMENT The biological, psychological, and social growth and development of the child and his relationships with his family, peers and institutions. *Prerequisites:* sophomore standing and psychology 1. Three hours. Ms. Jameson, Mr. Shelton, and Goldhaber.

64 MATURING AND AGING Physical change, physiological, psychological, social development during the maturing years and older age. Interrelationships between these processes will be stressed. *Prerequisites:* sophomore standing, psychology 1. Three hours. Mr. Grams.

65 HUMAN RELATIONSHIPS AND SEXUALITY Sexual responsibility and the biological, social, psychological growth and development of human beings in terms of sex role identity. Three hours. Mr. Grams, Dr. Gray and Staff.

82 CREATIVE CURRICULUM ACTIVITIES FOR THE EARLY CHILDHOOD YEARS I Planning interdisciplinary program materials for children on an individual and group basis using movement, graphic, plastic, language arts. *Prerequisite:* Permission of instructor. Three hours. Ms. Jameson.

163 THE EMERGING FAMILY Development of parents and children in various stages of the family life cycle and various emerging family forms. *Prerequisite:* sophomore standing. Three hours. Ms. Jameson and Mr. Lord.

164 PARENT-CHILD RELATIONS Interpersonal relations of adults and children and the application of underlying principles in parent education and family consulting. *Prerequisite:* 63 or consent of instructor. Three hours. Mr. Grams.

169 HUMAN DEVELOPMENT PROGRAM SEMINAR An ongoing seminar for Human Development majors. Readings; study and discussion of current issues, research, publications and professional affairs. *Prerequisites:* sophomore standing, Human Development Major. A student may enroll for a maximum of twelve hours. Two hours. Staff.

182 CREATIVE CURRICULUM ACTIVITIES FOR THE EARLY CHILDHOOD YEARS II (2-2) Planning interdisciplinary program materials for children on an individual and group basis emphasizing mathematics, the natural ecology, and general sciences. *Prerequisites:* 63 and permission of instructor. Three hours. Ms. Jameson.

184 EARLY CHILDHOOD PROGRAMS (3-0) An active examination of present day early childhood programs in relationship to their historical development from early history. Three hours. Staff.

187 FIELD PRACTICUM Supervised teaching in accredited early childhood facilities licensed or approved by responsible boards. *Prerequisite:* permission of instructor. Eight hours. Ms. Jameson.

188 ADMINISTRATION SEMINAR FOR EARLY CHILDHOOD PROGRAM Administration and planning for an early childhood development center. *Prerequisite:* Early Childhood Major. One hour. Ms. Hegyi.

189 EARLY CHILDHOOD PRACTICES (1-5) Supervised planning and conducting the early childhood laboratory center. *Prerequisite:* Permission of instructor. Seven hours. Ms. Hegyi, Ms. Jameson.

261 INTERNATIONAL PROGRAMS IN EARLY CHILDHOOD DEVELOPMENT An examination of the practices and interrelated services in the field of early childhood in several countries. *Prerequisite:* 184, or equivalent. Three hours. Staff.

264 CHANGING ROLES OF MEN AND WOMEN Recent literature regarding the changing roles of men and women and the unique tasks they face in the contemporary world. *Prerequisites:* Junior standing, 9 hours in Human Development or consent of instructor. Three hours. Ms. Jameson and Mr. Shelton.

265 FAMILY LIFE AND SEX EDUCATION IN SCHOOL AND COMMUNITY Methods, materials and philosophy of family life and sex education in the schools.

Prerequisites: 65, Senior standing and consent of instructor. Three hours. Mr. Grams.

266 SEMINAR IN HUMAN DEVELOPMENT Intensive study of issues in human development and their application in a wide variety of professional areas. May be taken more than once up to a maximum of 12 credits. *Prerequisites:* Junior standing, 9 hours of Human Development or equivalent. Three hours. Staff.

Field Experience, Seminars, Special Topics and Research

290 INTRODUCTION TO RESEARCH Research procedures with lectures and discussions of problem selection, objectives, bibliographical techniques, and analysis of data. One hour. Miss Morse.

291 SPECIAL PROBLEMS Reading, discussion, and special field and/or laboratory investigations. *Prerequisite:* departmental permission. Students may enroll more than once for a maximum of twelve hours. One-Six hours. Staff.

295 SPECIAL TOPICS Lectures, laboratories, readings or projects relating to contemporary areas of study. Enrollment may be more than once; accumulation up to twelve hours. *Prerequisite:* Departmental permission.

296 FIELD EXPERIENCE Professionally oriented field experience under joint supervision by faculty and business or community representative, credit arranged up to fifteen hours. *Prerequisite:* Departmental permission.

Program in Home Economics Education

15 PARTICIPATION (See Education 15) Credit to be arranged. Staff.

71 INTRODUCTION TO HOME ECONOMICS EDUCATION Careers in home economics education, contemporary programs, professional and youth organizations, and resources. Independent study, field trips, experiences in teaching. *Prerequisite:* sophomore standing. Three hours. Miss Osborn.

171 METHODS OF TEACHING Methods of teaching home economics in junior-senior high schools, and administration of home economics departments in secondary schools. *Prerequisites*: 71; psychology 1. Three hours. Miss Brown.

172 STUDENT TEACHING Supervised observation and teaching in approved home economics programs in Vermont schools. *Prerequisite:* 171. Seven hours. Miss Brown and Miss Osborn.

173 COMMUNICATION METHODS (2-2) Presentation of information through the media of press, radio and television, and lecture-demonstration. *Prerequisite:* junior standing. Three hours. I. Miss Osborn and Mr. Spaven.

174 EXTENSION EXPERIENCE Seven weeks off campus supervised jointly by extension and resident faculty. *Prerequisite:* SW 51 and HEC 171 or Votec 156 or Votec 112. Seven hours. Staff.

175 SPECIAL PROBLEMS IN HOME ECONOMICS EDUCATION Individual investigation of a problem selected to meet special needs of students. Students may accumulate up to six hours. *Prerequisite:* 71 and permission of instructors. Two or three hours. Miss Brown and Miss Osborn.

272 TEACHING ADULTS Organization and teaching of classes in home economics to meet the needs of adults; supervised experience in teaching adults. *Prerequisite:* 171, or permission of instructor. Two hours. Miss Brown.

273 OCCUPATIONAL EDUCATION (2-3) Role of the home economics teacher in organizing and implementing wage earning educational units at the secondary school level. *Prerequisite:* 171, or experience in secondary home economics education. Three hours. Miss Osborn.

274 HOME ECONOMICS IN ELEMENTARY AND MIDDLE SCHOOLS Home Economics, an integral part of curriculum, grades one through eight. Observations of children in these grades. Participation in schools. *Prerequisites:* 63, 71. Three hours. Miss Osborn.

Program in Housing and Home Management

Housing

51 FAMILY HOUSING SELECTION A study of the problems involved in selecting living environments for families including site location, financing, structure and space design. Three hours. Miss Knowles.

52 SOCIO-ECONOMIC ASPECTS OF HOUSING The housing needs of families including low income, elderly, physically handicapped and minority groups; programs devised to aid housing problems. Three hours. Miss Knowles.

151 HOUSE PLANNING (1-4) An advanced study of housing design to meet family requirements, application of home management principles. *Prerequisite:* 51. Three hours. Miss Knowles.

152 HOUSING AND THE COMMUNITY (3-0) A humanistic study of the role housing plays in land-use planning. Neighborhood and community planning related to family life styles. *Prerequisites:* 51 or 52 or permission of instructor. Three hours. Staff.

154 HOUSEHOLD EQUIPMENT (2-2) Application of scientific principles to the selection, operation and care of household equipment. Three hours. Miss Knowles.

155 EXPERIMENTAL EQUIPMENT (1-4) Performance measurement and rating of household equipment. *Prerequisite:* 154. Three hours. Miss Knowles.

251 ADVANCED HOUSING Investigation of housing data and current problems including studies of environmental factors, technological developments and governmental programs. *Prerequisites:* 51; economics 12 and sociology 21. Three hours. Miss Knowles.

Home Management

56 PRINCIPLES OF HOME MANAGEMENT Family and individual management techniques. Application to use of time, energy, and money. Introduction to consumer economics. Three hours. Mrs. Reidel.

158 CONSUMER PROBLEMS The consumer in the economy: modern buyer/seller relationships, agencies providing consumer information and protection, lecture, readings, demonstration problems. *Prerequisite:* junior or senior standing. Three hours. Staff.

256 HOME MANAGEMENT PROBLEMS Application of economic and sociological principles to some problems of the home and family. *Prerequisites:* 56; economics 12; psychology 1. Three hours. Staff.

258 FAMILY ECONOMICS The American family as a socio-economic unit; acquiring resources, managing current consumption, planning for future consumption. *Prerequisites*: 56; economics 3 or 12. Three hours. Staff.

Program in Human Nutrition and Food

37 BASIC CONCEPTS OF FOODS (2-2) Basic principles of food purchasing and preparation presented through demonstration, lecture and laboratory participation. I, II. Three hours. Mrs. Soule.

40 BASIC CONCEPTS OF CONTEMPORARY NUTRITION (3-0) Basic concepts of nutrition with special emphasis on problem-solving as it relates to contemporary nutrition. Three hours. I, II. Mrs. Livak.

41 CLINICAL NUTRITION (3-0) Fundamental nutrition of information related to clinical settings in which health personnel may be expected to function on the technical level. Three hours. Mrs. Buller.

43 FUNDAMENTALS OF NUTRITION (See Animal Sciences 43) Three hours. Carew. Credit will not be given for both 43 and 141.

135 ADVANCED FOOD PREPARATION (2-4) Scientific principles and processes underlying food preparation and preservation. *Prerequisites:* 37 and a course in organic chemistry or equivalent. Four hours. I, II. Mrs. Livak.

137 MEAL MANAGEMENT (1-5) Principles and practice in planning, preparing and serving family meals. *Prerequisite:* 37 or equivalent. Three hours. I, II. Mrs. Soule.

138 QUANTITY FOOD PRODUCTION AND SERVICE (3-4) Application of principles and techniques of food production and service in different establishments including equipment, sanitation, and time-motion studies. *Prerequisite:* 137. Five hours. Mr. Emanuel.

139 INSTITUTIONAL PURCHASING AND FOOD COST CONTROL (3-0) Principles of institutional purchasing, accounting, food cost control, and menu planning. *Prerequisite:* 137. Three hours. Mr. Emanuel.

140 CHILD NUTRITION (3-0) Nutritional implications in growth and development, conception through adolescence, emphasizing interrelationships with social, cultural and economic factors. Designed for students in Human Development and Education. *Prerequisite:* sophomore standing. Three hours. Miss Williams.

141 NUTRITION AND HEALTH (3-0) Basic principles of nutrition. Nutrient content of foods. Practice in recording and evaluating dietary intake of individuals. *Prerequisites:* Chemistry 4, Zoology 6. Three hours. Misses Powell and Williams. Credit will not be given for both 43 and 141.

144 APPLIED NORMAL NUTRITION (2-2) Nutritional needs of individuals during the life cycle. Physiological and environmental factors which affect nutritional status. Designed for nutrition majors. *Prerequisites:* 43 or equivalent, chemistry 4 or 16 and physiology. Three hours. Miss Powell.

145, 146 DIET MODIFICATION IN DISEASE Modification of the diet in prevention and treatment of disease. Role of diet in nursing care. Integrated with Nursing 125, 126 and 176. *Prerequisite*: 141. Four hours. I, II. Miss Powell.

148 COMMUNITY INVOLVEMENT-PROBLEMS IN FOODS AND NUTRITION (3-0) Individual investigation of a specific problem relating to nutritional health of people. Focus on analysis and solutions of the problem. *Prerequisite:* college course in nutrition and departmental permission. Three hours. Mrs. Livak.

235 **RECENT ADVANCES IN FOODS AND NUTRITION** Interpretation, application and communication of trends in foods and nutrition as evidenced through literature and research. *Prerequisites:* 12 hours in foods and nutrition and related areas. Three hours. Staff.

JAPANESE

236 INTRODUCTION TO FOOD RESEARCH (1-4) Methods and techniques in experimental work in foods. Independent laboratory study of problems in food preparation. *Prerequisite*: 135. Three hours. Mrs. Livak, Miss Williams.

237 **READINGS IN FOODS** Critical survey of the literature on the recent developments in food research. *Prerequisites:* senior standing; 135. Two or three hours. Staff.

238 WORLD DIETARY PROBLEMS (3-0) A background for understanding the causes of under-nutrition, the magnitude of the problem, and the programs seeking workable solutions. *Prerequisites:* 6 credits in nutrition or departmental permission. Three hours. Miss Williams.

239 INSTITUTIONAL ORGANIZATION AND MANAGEMENT (3-0) Institutional organization and management; personnel policies; laws and regulations; promotion and advertising. *Prerequisites*: 138, 139, or equivalent. Three hours. Mr. Emanuel.

240 METHODS IN NUTRITION EDUCATION (3-0) Problems common to nutrition educators in schools, hospitals and community. Individual investigations selected to meet special needs. *Prerequisite:* college course in nutrition or departmental permission. Three hours. Staff.

244 **DIET THERAPY** (4-0) Adaptations of the normal diet in conditions affected by or affecting the utilization of food. *Prerequisites:* 246, biochemistry, physiology. Four hours. Miss Powell.

246 ADVANCED NUTRITION (3-0) A study of nutrients and their specific functions in metabolic processes. *Prerequisites:* 43 or equivalent, and a course in biochemistry and physiology. Three hours. Tyzbir.

248 **READINGS IN NUTRITION** Critical survey of the literature on recent developments in nutrition. *Prerequisite:* 246, or departmental permission. Two or three hours. Staff.

249 NUTRITION SEMINAR A review of recent developments in nutrition with special emphasis on nutritional problems on a worldwide basis. *Prerequisite:* a college course in principles of nutrition. Three hours. Miss Morse and Mr. Welch.

294 HISTORY OF NUTRITION Foremost investigators and methods involved in the development of present day nutritional knowledge. *Prerequisite:* three hours of nutrition. One hour. Miss Morse.



Mr. Andrews and Staff.

1-2 ELEMENTARY SPOKEN JAPANESE A study of the spoken language of everyday use through instruction by a native speaker and intensive use of language tapes. 6 hours. Mr. Andrews.

11, 12 INTERMEDIATE SPOKEN JAPANESE A continuation of Japanese 1-2 aiming toward an ability to freely converse in simple, everyday Japanese. *Prerequisite:* Japanese 1-2 or the equivalent. Three hours. Mr. Andrews.

21, 22 ELEMENTARY WRITTEN JAPANESE An introduction to some five hundred basic ideograms and the written style through tutorial study of easy written texts. *Prerequisite:* Japanese 11, 12, or the equivalent. Three hours. Mr. Andrews.

Mathematics¹

COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

Professors Schoonmaker (Chairman), Brock, Chamberlain, Izzo, Lighthall, Meserve, Moser and Riggs; Associate Professors Bee, Burgmeier, Cooke, Dwork, Sylwester and Wright; Assistant Professors Aggarwal and Lamborn; Instructors Dickson, Hatcher, Kost, Morency, Mosca, Puterbaugh and Williams.

l ELEMENTARY COLLEGE ALGEBRA Review of fundamental operations and a more extensive study of fractions, exponents, radicals, linear and quadratic equations. Additional topics to be discussed include ratio, proportion, variation, progressions and the binomial theorem. This course covers the topics normally included in intermediate algebra in high school. Students who have satisfactorily completed two years of high school algebra, or the equivalent, will receive no credit for this course. Offered only in Summer Session. Three hours. Staff.

2 PLANE TRIGONOMETRY A study of trigonometric functions, their graphs and other properties, logarithms, solution of triangles, trigonometric equations and identities, and inverse trigonometric functions. *Prerequisite:* 1 or 9. Three hours. Staff.

4 MATHEMATICS OF FINANCE Mathematical theory of finance applied to interest and investments, annuities, and life insurance. *Prerequisite:* 1 or 9. Three hours. Staff.

7, 8 FUNDAMENTALS OF MATHEMATICS To provide an understanding of basic logical and mathematical ideas (both ancient and modern) and some of their applications to other fields of knowledge. Emphasis is on fundamental concepts and logical methods of reasoning rather than on the development of techniques. Many topics of algebra, trigonometry and analytic geometry are considered in their relation to certain basic concepts pervading all mathematics. A course for students in the arts, social sciences and others whose programs do not require further study of mathematics. Credit will not be given for both mathematics 7 and 9. *Prerequisite:* one year each of secondary school algebra and geometry, 7 for 8. Three hours. Staff.

9 COLLEGE ALCEBRA A study of sets, relations, and functions with particular attention to properties of algebraic, exponential, and logarithmic functions, their graphs and applications. Students who have earned credit for any higher numbered course in mathematics may not enroll in this course for credit. Credit will not be given for both mathematics 7 and 9. *Prerequisite:* two years of secondary school algebra and one year of secondary school geometry. Three hours. Staff.

 For many mathematics courses it will be assumed that the enrolled student knows how to program the University computer and how to use the University computer facility. This knowledge can be acquired by attending an informal six hour session arranged by the director of the academic computer facility.

11¹ ANALYTIC GEOMETRY AND CALCULUS I A few topics from College Algebra and an introduction to plane analytic geometry and calculus. This course prepares students for mathematics 12. Credit will not be given for more than one of the courses 11, 13, 25. *Prerequisite:* 9 and 2 or sufficiently strong background in secondary school algebra and trigonometry. Five hours. Staff.

12 ANALYTIC GEOMETRY AND CALCULUS II A continuation of the study of plane analytic geometry, differential and integral calculus and their applications, vectors, and solid analytic geometry. *Prerequisite:* 11. Five hours. Staff.

13¹ ENGINEERING MATHEMATICS I Some plane analytic geometry and calculus of algebraic functions with applications. This course is intended primarily for engineering students. Credit will not be given for more than one of the courses 11, 13, 25. *Prerequisite:* 9 and 2 or sufficiently strong background in secondary school algebra and trigonometry. Four hours. Staff.

14 ENGINEERING MATHEMATICS II A continuation of mathematics 13 including transcendental functions, techniques of integration, applications of the calculus and solid analytic geometry. *Prerequisite:* 13. Four hours. Staff.

25, 26 FUNDAMENTALS OF CALCULUS I, II Differential and integral calculus with analytic geometry, and an introduction to linear algebra are presented with applications from both social and physical sciences. Not accepted as prerequisite to advanced mathematics courses. A student who completes Mathematics 26 may be admitted to Mathematics 12 upon the recommendation of his Mathematics 26 instructor. Students interested in intensive use of mathematics should take Mathematics 11 and 12. Credit will not be given for more than one of the courses 11, 13, 25. *Prerequisite:* 9 and 2 or sufficiently strong background in secondary school algebra and trigonometry; 25 for 26. Three hours. Staff.

31 INTRODUCTION TO COMPUTER SCIENCE Structure of a digital computer. Introduction to flow charting and machine oriented languages. Programming and coding in a commonly used language. Practical experience with the solution of various types of problems on a university computer (presently system 360/44). *Prerequisite:* 9 or the equivalent. Two hours. Staff.

33 FINITE MATHEMATICS Review of set algebra, semigroups and groups, directed and undirected graphs. Boolean algebra and propositional logic. *Prerequisite:* two years of secondary school algebra and one year of secondary school geometry. Three hours. Staff.

102 FUNDAMENTAL CONCEPTS OF MATHEMATICAL ANALYSIS Sets, relations, functions, the Schroeder-Bernstein theorem, cardinal numbers, ordinal numbers, well-ordering, the Axiom of Choice, Zorn's lemma, rational numbers, fundamental sequences, real numbers, complex numbers, elementary topology of the reals and complexes. *Prerequisite:* credit or concurrent enrollment in mathematics 121. Three hours. Staff.

110 ELEMENTARY STATISTICS Frequency distributions, measures of central tendency, measures of variation, probability, expectation, binomial and normal distributions, sampling, estimation, tests of hypotheses, regression and correlation. Not open to mathematics majors. *Prerequisite:* 9 or the equivalent. Three hours. Staff.

^{1.} Those who are deficient in high school mathematics for their chosen curriculum are urged to attend summer school prior to their first semester in college.

115 INTRODUCTION TO COMPUTING I (2-2) A survey of Computer organization, languages, logic and applications. Computer solutions of numerical and non-numerical problems using one or more programming languages. The laboratory component uses a disciplinary approach so that the student applies his computer knowledge to his areas of interest. *Prerequisite:* 9 or equivalent. Three hours. Staff.

116 INTRODUCTION TO COMPUTING II Computer structure, further machine language development, instruction execution, addressing techniques and digital representation of data. Symbolic coding and assembling systems, macros, linkage. Systems and utility programs. *Prerequisite*: 115. Three hours. Staff.

117 INTRODUCTION TO OPERATIONS ANALYSIS Problem definition, criteria, decision making; emphasis on modeling and simulation. Computerized simulations are accentuated. Prerequisite: 115 and either 11 or 13 or 25. Three hours. Mr. Brock.

121 CALCULUS III Partial differentiation, multiple integrals, infinite series, and elementary differential equations. *Prerequisite*: 12. Three hours. Staff.

123 ENGINEERING MATHEMATICS III A continuation of mathematics 14 including vectors, partial derivatives, multiple integrals, infinite series, complex numbers and elementary differential equations. *Prerequisite:* 14. Four hours. Staff.

124 LINEAR ALGEBRA A study of matrices, linear dependence, vector spaces, linear transformations and characteristic equations. *Prerequisite:* 11 or 13 or 25. Three hours. Staff.

125, 126 FUNDAMENTAL CONCEPTS OF ELEMENTARY SCHOOL MATHEMATICS Discussion of natural numbers, integers, fractions, decimals, and real numbers together with the fundamental operations and fundamental principles involving them. Number bases, sets, measurement and approximation, ratio, proportion, percentage, and selected topics from algebra which are a natural extension of arithmetic. Open only to students in elementary education. *Prerequisite:* sophomore standing; 125 for 126. Three hours. Staff.

179 TEACHING SECONDARY SCHOOL MATHEMATICS Contemporary secondary school mathematics curricula, their content from an advanced standpoint, unifying mathematical concepts and their implications at various levels, and the introduction of selected mathematical topics. Intended only for students with an interest in teaching secondary school mathematics. Not acceptable as part of any mathematics requirement for a degree. *Prerequisite:* Ed. 178, acceptance in teacher education, or permission of instructor. Three hours. Mr. Meserve.

200 STATISTICAL METHODOLOGY I Fundamental ideas and techniques of statistics, including randomization, confidence intervals, hypothesis testing, and estimation. Emphasis on applications to current problems of interest to the student requires acquaintance with another discipline to serve as source of data for problems (e.g., education, biology, economics, psychology, agricultural and civil engineering). No graduate credit for mathematics majors. This course is much more demanding than 110. *Prerequisite*: 9. Three hours. Staff.

201 STATISTICAL METHODOLOGY II Techniques of regression, analysis of variance and covariance, multiple comparisons. Heavy emphasis on application requires knowledge of another discipline to serve as source of current problems and data. *Prerequisites:* 200 or 204. Three hours. Staff.

202 SAMPLING METHODS Constructing and analyzing designs for investigations involving sampling techniques. Descriptive surveys including simple random, stratified, and multistage designs. Estimation in finite populations including ratio and regression estimators. *Prerequisite:* 201. Three hours. Staff.

203 ELEMENTS OF PROBABILITY Basic concepts, techniques and applications of probability, random variables, moment generating functions, laws of large numbers and central limit theorems. Techniques and applications include permutations and combinations, binomial and normal distributions, the Poisson process, reliability theory and quality control. No graduate credit for mathematics or electrical engineering majors. *Prerequisite:* 12. Three hours. Staff.

204 MATHEMATICAL STATISTICS I Theory and application of classical statistical methods. Sampling distributions, estimation procedures, tests of hypothesis and confidence intervals. *Prerequisite:* 102, 124, 203. Three hours. Miss Lamborn.

205 MATHEMATICAL STATISTICS II Theory and application of modern statistical procedures. Non-parametric methods, multivariate techniques, decision theory, sequential procedures. *Prerequisite:* 204. Three hours. Miss Lamborn.

206 EXPERIMENTAL DESIGNS Analysis of variance including subsamples and disproportionate subclass numbers, estimation of variance components, incomplete block designs, compounding of factorial effects, fractional replication, multiple comparison techniques, principles of split plots, and pooling of experiments. *Prerequisite*: 201. Three hours. Mr. Bee.

207 PROBABILITY THEORY Basic non-measure-theoretic course in probability theory with some applications. Axioms of probability, random variables, moment generating functions, laws of large numbers and central limit theorems, introduction to stochastic processes. Students will need a strong working knowledge of calculus including infinite series, partial differentiation and multiple integration. *Prerequisites:* 33 or 102; 124. Three hours. Mr. Sylwester.

210 APPLIED STOCHASTIC PROCESSES Random walk models, Markov chains, Poisson process, Brownian motion, probability generating functions, discrete branching processes, homogeneous birth and death processes, and diffusion processes. *Prerequisites*: 207. Three hours. Mr. Sylwester.

211 MULTIVARIATE METHODS Multivariate normal theory, tests of hypotheses. Multivariate analysis of variance and covariance, principle components and factor analysis. *Prerequisites*: 201 and 205, or permission of instructor. Three hours. Staff.

215 SOFTWARE FUNDAMENTALS Review of assembly language coding. Batch processing systems programs. IOCS buffer pool management, supervisors, loaders, utilities. Parallel processors, Interrupt handling, spooling. Introduction to multi-programming and time sharing. No graduate credit for mathematics majors. *Prerequisite*: 116. Three hours. Staff.

216 SYSTEMS PROGRAMMING Batch processing system programs. Parallel processing of Input-Output. Multiprogramming systems. Time sharing systems. *Prerequisites:* 223, 224 and credit or concurrent enrollment in 226. Three hours. Staff.

217 SWITCHING THEORY Lattices and Boolean algebras, Boolean functions, minimization theory, Quine's algorithm, combinational and sequential logic nets, state assignment problems, Hartmanis' theorems, closure operators, Paull-Unger problems. *Prerequisite:* 33. Three hours. Staff.

218 AUTOMATA THEORY Finite state automata, nondeterministic and twoway automata, theorems of Rabin-Scott, Myhill and Kleene. Regular expressions, homomorphisms, the lattice of automata, free automata, isomorphism theorems. *Prerequisite:* 251. Three hours. Mr. Aggarwal.

219, 220 MATHEMATICAL LOGIC Truth tables, axiomatic propositional calculus, independence, first order quantification theory, completeness theorems, prenex normal forms, decidability. Formal number theory, recursive functions, Gödel numbers, recursive undecidability, axiomatic set theory, ordinal numbers, the axiom of choice, effective computability, undecidable problems. *Prerequisites:* 102 or consent of instructor; 219 for 220. Three hours. Mr. Aggarwal.

221 DETERMINISTIC MODELS IN OPERATIONS RESEARCH Techniques of linear and dynamic programming and game theory. Graphs and tree models. Classical problems are discussed, and problem formulation stressed. *Prerequisites:* 124; 121 desirable. Three hours. Mr. Aggarwal.

222 STOCHASTIC MODELS IN OPERATIONS RESEARCH Stochastic processes and their use in analysis of industrial problems. Markov chains, queueing theory, linear and dynamic programming under uncertainty. *Prerequisites:* 203, or 207; 221. Three hours. Mr. Sylwester.

223 PROGRAMMING LANGUAGES Formal definition of programming languages including specification of syntax and semantics. Global properties of algorithmic languages. List processing, string manipulation and simulation languages. No graduate credit for mathematics majors. *Prerequisite:* 116. Three hours. Staff.

224 DATA STRUCTURES Lists, strings, arrays. Trees and graphs. Storage systems and structures. Storage allocation and garbage collection. Searching and sorting techniques. Generalized data management systems. No graduate credit for mathematics majors. *Prerequisites:* 33, 116, and credit or concurrent enrollment in 124. Three hours. Staff.

225 COMPILER CONSTRUCTION Organization of a compiler including compile and run time symbols tables, lexical scan, syntax scan and object code generation. *Prerequisite*: 216. Three hours. Staff.

226 COMPUTER ORGANIZATION Organization, logic design and components of a digital computer. Features needed for multi-programming, multi-processing time-sharing and real time systems. No graduate credit for mathematics majors. *Prerequisites*: 33, 116, 124. Three hours. Staff.

228 ADVANCED SYSTEMS PROGRAMMING Advanced study and research in a selected area of systems programming. *Prerequisite:* 216. Three hours. Staff.

229 COMPUTER FACILITY MANAGEMENT Non-mathematical content, problems of technical administration, budget considerations, open-closed shop, equipment proliferation, interorganizational relationships. *Prerequisites:* 116 or permission of instructor. Two hours. Mr. Brock.

230 ORDINARY DIFFERENTIAL EQUATIONS Solutions of linear ordinary differential equations, the Laplace transformation, and series solutions of differential equations. *Prerequisites*: 121, 124. Three hours. Staff.

231, 232 FUNCTION OF A COMPLEX VARIABLE Differention 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:* 242; 231 for 232. Three hours. Staff.

233, 234 THEORY OF FUNCTIONS OF REAL VARIABLES Functions of real variables, including: point sets and measure, transfinite numbers, Riemann and Lebesgue integrals, and sequences of functions. Considerable outside reading is assigned. *Prerequisite:* 242; 233 for 234. Three hours. Staff.

235 PARTIAL DIFFERENTIAL EQUATIONS First order equations, classification of second order equations, standard problems of Laplace and Cauchy. *Prerequisites*: 230, 242. Three hours. Staff.

236 CALCULUS OF VARIATIONS Necessary conditions of Euler, Legendre, Weierstrass and Jacoby for minimizing integrals. Sufficiency proofs. Variation and eigenvalue problems. Hamilton-Jacoby equations. *Prerequisite:* 230. Three hours. Staff.

237 NUMERICAL METHODS I Concept of error, polynomial approximation, summation techniques, solution of equations, linear systems, eigenvalues. *Prerequisites*: 121 and 124. Three hours. Staff.

238 NUMERICAL METHODS II Finite differences, differentiation and integration, ordinary and partial differential equations, linear programming. *Prerequisite*: 237. Three hours. Staff.

239 INTEGRAL TRANSFORMS The theory of Fourier, Laplace, Hankel and Mellin transforms with applications to fluid dynamics, elasticity, physics. *Prerequisite*: 231. Three hours. Mr. Burgmeier.

240 OPERATIONAL MATHEMATICS Orthogonal functions, transforms and boundary value problems. *Prerequisite:* 230 or 271. Three hours. Staff.

241 ADVANCED CALCULUS I Calculus of several variables, Euclidean spaces, open and closed sets, limits, continuity, differentiation (emphasizing the linearity), maxima and minima, Lagrange multipliers and integration of functions of several variables. *Prerequisite:* 121 and 124. Three hours. Staff.

242 ADVANCED CALCULUS II Jacobians, change of variables in a multiple integral, line and surface integrals, Green's, Gauss', and Stokes' Theorems, Fourier Series, Fourier and Laplace transforms. *Prerequisite:* 241. Three hours. Staff.

251 MODERN HIGHER ALGEBRA Fundamental concepts of Abstract Algebra. Sets, mappings, groups, rings, integral domains, fields, homomorphisms and isomorphisms. *Prerequisite:* 12; 102 highly desirable. Three hours. Staff.

252 ADVANCED LINEAR ALGEBRA Linear transformations and vector spaces, including Jordan forms. Symmetric, Hermitian, orthogonal and unitary matrices, and quadratic forms. *Prerequisite*: 124; 251 desirable. Three hours. Staff.

253, 254 TOPOLOGY The elements of point set topology: closed sets and open sets in metric spaces, continuous mappings, connection, Peano curves, separation theorems and homotopy. *Prerequisites:* 102, 253 for 254. Three hours. Staff.

255 ELEMENTARY NUMBER THEORY Divisibility, prime numbers, Diophantine equations, congruence of numbers, and methods of solving congruences. *Prerequisite*: 121. Three hours. Staff.

256 ANALYTIC NUMBER THEORY Prime numbers, prime number theorem, interchange of summations, Euler phi function, Mobius function, Riemann zeta function. *Prerequisite:* 232. Three hours. Mr. Brock.

257 THEORY OF GROUPS The study of the various kinds and structures of groups. *Prerequisite*: 251. Three hours. Staff.

258 GALOIS THEORY The study of Galois theory leading to the insolvability of general quintic equations by radicals and theorems on constructions with straightedge and compass. *Prerequisite:* 257. Three hours. Staff.

260 FOUNDATIONS OF GEOMETRY Geometry as an axiomatic science; various non-Euclidean geometries; relationships existing between Euclidean plane geometry and other geometries; invariant properties. *Prerequisite:* 12. Three hours. Messrs. Izzo, Meserve and Riggs.

261 THE DEVELOPMENT OF MATHEMATICS Besides considering important contributions of outstanding mathematicians of the past, and classical problems of mathematics, the historical development of the concepts of modern mathematics is presented. Three hours. Mr. Meserve.

262 GEOMETRY FOR ELEMENTARY SCHOOL TEACHERS Informal Euclidean geometry, classical constructions, coordinate geometry, inductive and deductive reasoning, convexity, and an introduction to topology. Not open to mathematics majors. *Prerequisite*: 126. Three hours. Mr. Izzo and Mr. Meserve.

263 PROJECTIVE AND AFFINE GEOMETRIES The principle of duality, perspectivity, projectivity, harmonic sets, cross ratio, the theorems of Pascal and Brianchon, poles and polars. *Prerequisite:* 124. Three hours. Staff.

264 VECTOR ANALYSIS Introduction to general vector methods including the elements of vector algebra and vector calculus with applications to physics and mechanics. *Prerequisite*: 121. Three hours. Staff.

265 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, geodesic curves. *Prerequisite*: 121. Three hours. Staff.

266 MATHEMATICS OF DIGITAL COMPUTATION FOR TEACHERS Mathematical theory underlying digital computing machines including assigned problems on a University computer, including programming in computer system language. A portion of the course is devoted to elementary numerical analysis. *Prerequisites:* 121, 124 highly desirable. Three hours. Staff.

271 APPLIED MATHEMATICS FOR ENGINEERS AND SCIENTISTS I Matrix Theory, Vector Analysis, Linear Ordinary Differential Equations. Emphasis on methods of solution, including numerical methods. No credit for mathematics majors. For a mathematics concentration, a sequence beginning with 230 is advised. *Prerequisites:* 123 and knowledge of computer system programming. Three hours. Staff.

272 APPLIED MATHEMATICS FOR ENGINEERS AND SCIENTISTS II Partial Differential Equations of Mathematical Physics, Calculus of Variations, Functions of a Complex Variable, Cauchy's Theorem, integral formula. conformal mapping. *Prerequisite*: 271. Three hours. Staff. 273 INTRODUCTION TO COMBINATORICS Combinatorial relations, elementary problems of existence, enumerative combinatorics; generating functions and graphs. Applications to problems in probability, mathematics of computers, graph theory and number theory. No graduate credit for mathematics majors. *Prerequisite:* 33 or 102. Three hours. Staff.

279, 280 SENIOR PROBLEM Investigation of some area or problem, under the direction of an assigned staff member, culminating in a report. This course is available only to candidates for the Bachelor of Science degree in Mathematics. *Prerequisite:* departmental permission. Three hours. Staff.

281, 283, 285, 287, 289, 291, 293 SPECIAL TOPICS For advanced students in the indicated fields. Lectures, reports and directed readings on advanced topics. *Prerequisite:* Consent of instructor. Credit as arranged. Offered as occasion warrants. Staff.

281 Special Topics in Applied Mathematics

283 SPECIAL TOPICS IN COMPUTER SCIENCE

285 SPECIAL TOPICS IN STATISTICS

287 SPECIAL TOPICS IN ALGEBRA

289 SPECIAL TOPICS IN TOPOLOGY

- 291 SPECIAL TOPICS IN GEOMETRY
- 293 SPECIAL TOPICS IN ANALYSIS

Other Courses in Mathematics

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

		Creun
Number	Title	Hours
A15	Plane Analytic Geometry	3
A16	Differential Calculus	3
A17	Integral Calculus	3
A18	Intermediate Calculus	3
A19	Differential Equations	3
S45	Coordinate Geometry and Vectors	3
S46	Elementary Functions	3
S47	Calculus I	3
S48	Calculus II	3
S142	Fundamental Concepts of Algebra	3
S144	Statistics and Probability	3

Medical Technology

SCHOOL OF ALLIED HEALTH SCIENCES

Professor Coon; Associate Professor Breen (Acting Chairman, Department of Medical Technology); Assistant Professors Jones, Kleiler; Instructors Clark, Czerniawski, Grearson, Monaco, Reed, Russell, Sullivan; Clinical Instructors Albarelli, Coble, Cote, Hodnett, Isham, Letourneau, Merrill, Rapsinski, Thomas, Wilbur, Wyllie.

Cradia

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

3 MEDICAL TECHNOLOGY Medical Terminology. Terminology related to medical science and Hospital services. Required of all students in the Department of Medical Technology, open to other Health Science students by permission of departmental chairman. One hour. Staff.

11 LABORATORY SCIENCE Designed to introduce students to some of the more basic concepts of science as they relate to the field of laboratory science. Units of study include basic electricity, genetics, zoology, laboratory safety, body fluid dynamics, biological rhythms. Required of all students in the Associate Degree Program. Offered in the Spring semester. Three hours. Staff.

20 CLINICAL CHEMISTRY Laboratory exercises include manual chemistry procedures as well as instrumentation in the analysis of body constituents. Practicum in Rowell Student Laboratory and the Mary Fletcher Unit Chemistry Laboratory. Required of all students in the Medical Laboratory Technician Program. Fall and spring semesters. Six hours. Ms. Clark, Sullivan, Wilbur.

21 HEMATOLOGY Techniques of basic laboratory procedures in hematology. Rotating assignment in the clinical laboratory provided by the Medical Center Hospital of Vermont. Required of second year students in Medical Technology. Fall and spring semesters. Four hours. Ms. Monaco, Mr. Letourneau and Ms. Wyllie.

22 CLINICAL IMMUNOHEMATOLOGY Introduction to human blood groups, compatibility testing, and identification of blood group antibodies. Includes lectures, student laboratory exercises and clinical practicum. *Prerequisite:* Senior MLT standing or permission of the instructor. Ms. Kleiler, Isham.

23 CLINICAL MICROBIOLOGY A course required for second year Medical Technology students which builds on the fundamentals of Microbiology 55 to include the isolation and identification of clinically significant pathogenic bacteria, from all types of clinical specimens. Includes didactic instruction and practicum in both clinical and student laboratories. *Prerequisite:* Microbiology 55; four hours; fall and spring semesters. Ms. Grearson, Ms. Rapsinski, Ms. Thomas.

101 MEDICAL TECHNOLOGY Principles, procedures and special techniques. Includes serology, parasitology, urinalysis, spinal fluids, and coagulation. Required of all third year students in Medical Technology. Spring semester. Four hours. Ms. Grearson, Monaco, Sullivan.

103 MEDICAL TECHNOLOGY AND INDIVIDUAL RESEARCH Lectures on special problems. Spring semester. One hour. Ms. Breen, Russell.

110 CLINICAL CHEMISTRY Principles and techniques currently employed in the laboratory are explored. Facets covered include: pathological conditions which are relevant, the source, preservation and handling of the sample, the chemical manipulation, the instrumental method, and the significance of the result. Required of all students in the Medical Technology program. Fall and spring semesters. Six hours. Ms. Clark, Sullivan, Wilbur.

111 HEMATOLOGY Comprehensive study of principles, procedures, special techniques and disease states in hematology. Rotating assignments in the clinical laboratory provided by the Medical Center Hospital of Vermont. Required of fourth year students in Medical Technology. Fall and spring semesters. Four hours. Ms. Monaco, Mr. Letourneau, and Ms. Wyllie.

112 CLINICAL IMMUNOHEMATOLOGY Advanced study of human blood groups. Emphasis is on problem solving, advanced theory and special laboratory exercises, and clinical practicum. *Prerequisite:* Senior MT standing or permission of the instructor. Ms. Kleiler, Isham.

113 CLINICAL MICROBIOLOGY A course designed to give fourth year MT students the fundamentals of isolation and identification of clinically significant pathogenic microorganisms in routine and special Bacteriology. Planned to correlate with Microbiology 120, taken concurrently. Course includes clinical practicum, didactic instruction and student laboratory experiences. *Prerequisite:* Microbiology 55 and Spring semesters; four hours; Mr. Cote, Ms. Grearson, Ms. Rapsinski and Ms. Thomas.

197-198 MEDICAL TECHNOLOGY Assigned readings and special topics. Fall and spring semesters. Three credits.

201 MEDICAL TECHNOLOGY, ADVANCED Individual research in the field of medical technology. *Prerequisite:* departmental permission. Credit as arranged. Fall and spring semesters. Doctor Coon.

Microbiology and Biochemistry

COLLEGES OF AGRICULTURE

Professors Little and Racusen (Chairman); Associate Professors Foote, Sjogren, and Weller; Teaching Associate Husted.

55 INTRODUCTORY MICROBIOLOGY (2-4) The study of microorganisms, especially bacteria, their structure, development and activities. *Prerequisite:* eight hours of chemistry. Four hours. Mr. Sjogren. Also offered each speing. The fall term is reserved for Allied Health Science students except by permission of instructor.

197, 198 UNDERGRADUATE RESEARCH Prerequisite: Departmental permission. One to three hours. Staff.

201 GENERAL BIOCHEMISTRY (3-3) Broad coverage of biochemistry including principles of analytical biochemistry. *Prerequisite:* Chemistry 16 or 131. Four hours. Mr. Foote. Also offered each spring by Mr. Little.

202 ADVANCED BIOCHEMISTRY (3-3) A study of metabolic cycles with emphasis on research methods involving radioisotopes and chromatography. *Prerequisite:* 201 or 203 or permission of the instructor. Four hours. Mr. Racusen.

203 MOLECULAR BIOLOGY (3-3) The structure and biological function of nucleic acids, proteins, and enzymes. Emphasis is on optical, electrophoretic, and ultracentrifugal methods. *Prerequisite:* Chemistry 140 or 142 or permission of instructor. Four hours. Mr. Weller.

220 ENVIRONMENTAL MICROBIOLOGY (2-3) The activities of microorganisms, primarily bacteria, in air, soil, and water. *Prerequisite:* a previous course in microbiology. Three hours. Mr. Sjogren. Alternate years, 1973-74.

254 MICROBIAL BIOCHEMISTRY (2-4) The chemical composition and metabolism of microbial cells. *Prerequisite*: 55, 201, or permission of instructor. Four hours. Mr. Sjogren. Alternate years, 1974-75.

Military Studies

Lieutenant Colonel Haponski (Chairman); Majors Barber and McCune; Captains Jones, Segura and Walz.

Note: MS 1, 2, 11, 12, 211, 212 are designed not just for ROTC cadets, but all University students interested in the part military forces play in national and international affairs. Laboratories are required only for ROTC cadets. Total allowable credit for Military Studies varies by College; check with Department of Military Studies.

1 INTRODUCTION TO MILITARY STUDIES (2-1) An overview of several aspects of war: warfare as seen by some notable military thinkers, impacts of war on civilization, principles of war, components of military power, and contemporary issues involving the use of military force in today's world. Fall. Two hours. Captain Jones, Captain Walz.

2 U.S. DEFENSE ESTABLISHMENT (2-1) Evolution of the Establishment from Revolution to present. National security structure: President, National Security Council, Department of State, Congress, intelligence community, defense industries. The Department of Defense: Secretary, Joint Chiefs of Staff, Armed Forces, Defense agencies. Case study of Cuban missile crisis. Spring. Two hours. Captain Jones.

11 (HIST 181) U.S. MILITARY HISTORY (3-1) Development of American Military Establishment within framework of American History from Colonial Era to the present. Taught by History Department. Required of ROTC cadets. Spring. Three hours. Professor Stout.

12 CONTEMPORARY WORLD MILITARY SCENE (2-1) Seminar on current international uses of military forces, viewed against a background of long range national concerns, especially of the U.S., Western European countries, U.S.S.R., China. Fall. Two hours. Captain Walz.

101 LEADERSHIP AND MANAGEMENT I (2-1) Military cartography; fundamentals of educational psychology applicable to instruction; techniques used in planning, presenting, and evaluating instruction. The role of the various branches of the Army. Fall. Two hours. Captain Segura.

102 LEADERSHIP AND MANAGEMENT II (3-1) The psychological, physiological and sociological factors which affect human behavior; individual and group solution of leadership problems common to small units. Analysis of the leader's role in directing and coordinating the efforts of individuals and small units in the execution of tactical missions. Spring. Three hours. Captain Segura.

111 LEADERSHIP AND MANAGEMENT III (3-1) Study of combat operations and the various military teams; the coordination and planning necessary between the elements of the team. Special attention will be given to the development of leadership potential through practical exercises. Fall. Three hours. Major Barber.

112 LEADERSHIP AND MANAGEMENT IV (2-1) Analysis of selected leadership and management problems involved in unit administration, military justice, and the Army Readiness Program and determination of appropriate solutions. Obligations and responsibilities of an officer on active duty. Officer-enlisted relationships. Spring. Two hours. Major Barber. 211 SPECIAL STUDIES In depth analysis of military topic proposed by student. Guided research. *Prerequisite:* MS 1, 2, 11 and 12 or equivalent by permission of Chairman. Credit to be arranged. Staff.

212 CONTINUATION OF 211 Staff.

Music

COLLEGE OF ARTS AND SCIENCES

(Acting Chairman) William Metcalf; Professors Lidral and Pappoutsakis; Associate Professors Chapman, D. Kinsey, Read, and Schultz; Assistant Professors Weinrich and Wigness; Instructors J. Ambrose, Dahl, Dorsam, Fleming, F. Kinsey, Lederer, E. Metcalfe, Powell and M. Vogelmann; Lecturer Bemis.

Students in all music courses are required to attend a designated portion of major ensemble concerts, faculty recitals, and formal student recitals as part of the course requirements.

Theory and Composition

5-6 THEORY I (2-3) Melodic and rhythmic dictation, sight singing, and elementary harmony. Three hours. Mr. Lidral and Miss Fleming.

9 INTRODUCTORY MUSIC—THEORY Fundamentals of music: major and minor scales, intervals, transposition, rudiments of harmony, rhythm, terminology, the conventions of musical notation. Three hours.¹ Messrs. Pappoutsakis and Weinrich.

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

203, 204 ORCHESTRATION First semester: characteristics of instruments, arranging for orchestra; second semester: advanced exercises in orchestral scoring. *Prerequisite*: 105-106; 203 for 204. Three hours. Mr. Pappoutsakis. 204 in alternate years, 1972-73.

205, 206 COUNTERPOINT First semester: tonal counterpoint; second semester: canon and fugue. *Prerequisite:* 105-106; 205 for 206. Three hours. Mr. Kinsey. 206 in alternate years, 1973-74.

207 PEDAGOGY OF THEORY Objectives, viewpoints, content and specific approach to the organization and teaching of theory courses. *Prerequisite:* eighteen hours in theory. Three hours. Mr. Lidral.

208 FORM AND ANALYSIS Creative approach to aural and sight analysis of musical construction. *Prerequisite:* 105-106; 205 recommended. Three hours. Mr. Kinsey.

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. May be repeated for credit. Mr. Read.

1. Enrollment in 5 will cancel credit for 9.

MUSIC

History and Literature

1,2 SURVEY OF MUSICAL LITERATURE First semester: the Classical and Romantic eras in songs and piano pieces, program music, and the symphony and the concerto. Second semester: Gregorian chant to Handel and Bach, opera, postromanticism, modern music, and American music. Three hours. Messrs. Kinsey and Wigness; Mrs. Ambrose.

10 INTRODUCTORY MUSIC—LISTENING A study, from the listener's point of view, of music from the Baroque through the Classical and Romantic to the twentieth century contemporary periods. Stylistic, structural, and orchestral developments. Three hours.² Messrs. Pappoutsakis and Weinrich.

13 CONTEMPORARY MUSIC Development and stylistic characteristics of twentieth century music from the late Romanticists to the experimentalists. Both European and American composers will be presented. *Prerequisite:* 1, 2, or 10. Three hours. Mr. Read.

14 JAZZ LITERATURE The history of jazz music: African and American backgrounds; transition to jazz, growth, early jazz, further developments in the decades from the teens to the present. *Prerequisite:* Music 1, 2, or 10. Three hours. Mr. Bemis.

193, 194 College Honors

195, 196 Special Topics

197, 198 READING AND RESEARCH

221, 222 HISTORY OF MUSIC Changes in musical structure and style in relation to contemporaneous artistic, literary, religious, and social movements. First semester: Gregorian chant to the Baroque era. Second semester: Baroque to Modern. *Prerequisite*: 1, 2 and 5-6. Three hours. Mr. Chapman.

223 through 228 MUSIC LITERATURE Advanced studies in the literature of music. *Prerequisite:* 105-106 and 221, 222. Three hours. Mr. Chapman.

245, 246 CHAMBER MUSIC LITERATURE Study through analysis and performance of masterworks for small groups leading to public performance. *Prerequisite:* twelve hours or the equivalent in performance field and departmental permission. One hour. Staff.

281 through 284 INDEPENDENT STUDY Studies in theory, composition, history, or literature under the direction of an assigned staff member for advanced students and candidates for honors. Credit as arranged.

For Music Education, see page 99.

Performance

For the fees for instruction, see page 234.

A senior recital in the performance major field is required of all music majors. Regular appearances in informal recitals are required of all performance students. Appearance in one formal departmental recital a semester is required of all music majors. At the end of each semester jury examinations are given in applied music.

All music majors on any curriculum are required to pass a FUNCTIONAL

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

PIANO FACILITY examination before certification for graduation. This will include:

- a. Ability to sight-read songs of the type found in a community song book.
- b. Ability to harmonize at sight; to improvise a simple piano accompaniment for songs requiring the use of I, IV, and V chords and some simple modulations; to transpose the songs and harmonizations to other keys.
- c. Ability to sight-read fairly fluently simple accompaniments, vocal or instrumental, and simple piano compositions of the type used for school rhythmic activities.

41, 42 MAJOR ENSEMBLES (0-3) University Band, Choir, Choral Union, and Orchestra. Attendance at all rehearsals and public performances required. *Prerequisite:* departmental permission. One hour.¹ Messrs. Chapman, Lidral, Schultz, and Weinrich.

45, 46 CHAMBER MUSIC (0-2) Study and performance of masterworks for small groups. Attendance at all rehearsals and public performances required. Outside practice required. *Prerequisite:* departmental permission. One hour.¹ Staff.

51, 52 PERFORMANCE STUDY Individual instruction in piano, organ, harpsichord, voice, strings, woodwinds, brass, percussion, and harp. One to four hours.¹ Staff.

Letter code for performance study and advanced performance study:

A.	Piano (harpsichord)	G.	Clarinet (saxophone)	М.	Percussion
В.	Voice	H.	Bassoon	N.	Violin
С.	Organ	I.	Horn	О.	Viola
D.	Harp (guitar)	J.	Trumpet	Р.	Violoncello
E.	Flute	К.	Trombone (euphonium)	Q.	Bass
F.	Oboe	L.	Tuba	R.	Recital

71, 72 CLASS STUDY (0-2) Required of music education students, elective to others to limit of facilities and equipment. Class study in performance fields of voice, strings, woodwinds, brass, and percussion. One hour.¹ Staff.

74 INSTRUMENT REPAIR CLASS (0-2) A laboratory for music education students in minor repair and adjustment of string, woodwind, brass, and percussion instruments. *Prerequisite:* string, woodwind, brass, and percussion classes or concurrent enrollment and departmental permission. One hour. Mr. Schultz.

111 MUSIC for ELEMENTARY TEACHERS The development of musical skills, understandings, and attitudes pertinent to the teaching of music in the elementary classroom. *Prerequisite:* Sophomore standing. Three hours. Mr. Wigness.

112 ELEMENTARY MUSIC METHODS A course to aid the elementary classroom teacher in developing the potential musicality of students to the highest level through the practical application of musical skills and understandings already acquired by the teacher. *Prerequisite:* 111. Three hours. Mr. Wigness.

 Indicated courses in performance may be repeated for credit. Each hour of credit in performance study requires one hour's practice per day, and credit will be given only on condition that the instruction be accompanied or preceded by a three-credit course in music and participation in ensemble, unless excused from the latter by the chairman. 211, 212 CONDUCTING (2-2) First semester: technique of the baton, score reading, laboratory practice; second semester: preparation and performance of selected scores, including rehearsal procedures. Selected students may conduct University major ensembles. *Prerequisite:* 5-6, 211 for 212. Three hours. Mr. Pappoutsakis. 212 in alternate years, 1973-74.

271, 272 PERFORMANCE PEDAGOGY Methods of teaching voice, strings, woodwinds, brass, percussion, or keyboard instruments including repertoire suitable for use at various levels of ability. Significant literature of all historical periods in the major field. *Prerequisite:* Senior standing in performance and consent of instructor. Three hours. Staff.

Natural Resources

SCHOOL OF NATURAL RESOURCES

Professors Christensen, Oppenlander, Reidel, Sargent, Whitmore, and Wilm; Associate Professors Dawson, Fay, Hannah, and McCormack; Assistant Professors Armstrong, Donnelly, Downer, Eldred, Gilbert, Hoekstra, Lindsay, and Olson; Lecturer Turner; Adjunct Professors Foulds, Kiley, and Knight; Adjunct Assistant Professors Bevins, Fuller, Harold, Malcolm and Stearns.

Forestry

1 INTRODUCTION TO FORESTRY Introduction to forestry and conservation sciences. Two hours. Mr. Donnelly.

2 FRESHMAN SEMINAR Guest lecturers and student seminars on selected topics in forest resources management. One hour. Mr. Donnelly.

5 DENDROLOGY (3-4) Classification and silvical characteristics of native and exotic forest trees. Twig identification. *Prerequisite:* biology 1 or botany 4. Four hours. Mr. Hannah.

100 FOREST BIOECOLOGY Structure, dynamics, and manipulation of selected forest communities. *Prerequisite:* forestry 5. Four weeks in summer camp. Four hours. Mr. Donnelly, Mr. Fuller, and Mr. McCormack.

105 MAN AND THE FOREST ENVIRONMENT (3-0) Forest resources of North America, their uses and their influences on the environment. Three hours. Mr. McCormack.

107 FOREST ENTOMOLOGY (See P & SS 107.) Three hours. Mr. Parker.

112 FOREST PATHOLOGY (See Botany 112.) Three hours. Staff.

122 SILVICS Environmental factors and their influence upon the development, distribution, and succession of forest trees. *Prerequisite:* 5. Three hours. Mr. Donnelly.

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

126 URBAN FORESTRY Value of trees in the urban environment; selecting, planting and maintaining trees, diagnosing tree problems and discussion of spe-

NATURAL RESOURCES

cific problems with emphasis on non-parisitic injuries. *Prerequisites*: a course in tree identification and permission. Three hours. Mr. Donnelly.

132 FOREST FIRE CONTROL Forest fire ecology and behavior; causes and effects; danger measurements; prevention and control of fires; use of fire in forest management. *Prerequisite:* Sophomore standing and one forestry course. Two hours. Mr. Whitmore.

134 INTRODUCTION TO OUTDOOR RECREATION (3-0) Current outdoor recreation resource problems, policies, and needs at national and state levels. Three hours. Mr. Lindsay.

135 FOREST RECREATION PLANNING (2-3) Outdoor recreation site analysis, design, and development in the forest environment; forest recreation area management. *Prerequisites:* junior or senior standing and permission. Three hours. Mr. Lindsay.

136 FOREST MANAGEMENT (2-2) Organization of forests for continued multiple-use production, regulation of cut for sustained yields. *Prerequisites:* 123 and 144. Three hours. Mr. Armstrong.

140 FOREST BIOMETRY II Boundary and topographic survey methods in forest management. Principles of forest biometry in forest-data collection. *Prerequisites:* C.E. 12, forestry 5, and forestry 144. Four weeks in summer camp. Four hours. Mr. Turner.

142 FOREST PHOTOGRAMMETRY (2-3) Identification, interpretation, measurement, and mapping of forest resources from aerial photographs. *Prerequisite:* 144. Three hours. Mr. Lindsay.

144 FOREST BIOMETRY I (2-4) Introductory concepts in forest biometry, measurement of trees and forest products, forest sampling and inventory with applications in multiple-use management. *Prerequisite:* Mathematics 110 or concurrent enrollment. Three hours. Staff.

151 FOREST ECONOMICS The economic principles and problems in the management and utilization of forest resources; taxation of forest lands; marketing of forest products. *Prerequisite:* economics 12. Three hours. Mr. Armstrong.

153 FOREST POLICY AND ADMINISTRATION Analysis of public and private forest policies and their administration in relation to other natural resources and to the people. *Prerequisite:* Junior standing in forestry. Three hours. Mr. Wilm.

162 WOOD TECHNOLOGY (2-3) Properties, uses and identification of commercial woods of the United States. *Prerequisite:* Biology 1. Three hours. Mr. Whitmore.

163 TIMBER HARVESTING (2-3) Methods and costs of harvesting timber under different forest conditions and silvicultural treatments; organization and costs of logging operations. *Prerequisite:* 5. Three hours. Mr. Harold.

165 FOREST PRODUCTS (2-3) Wood products manufacture and distribution including lumber, veneer and plywood, pulp and paper. Wood preservation; naval stores; maple products. *Prerequisite:* 162. Three hours. Mr. Whitmore.

170 WILDLIFE BIOMETRICS Instrumentation, specimen collectionpreservation, sexing, aging, food habit analysis, capturing and marking wildlife; habitat analysis and evaluation; wildlife census. Required of wildlife management majors in four week summer term of the junior year. *Prerequisites:* Forestry 174 and 144. Four hours. Mr. Hoekstra.

NATURAL RESOURCES

174 PRINCIPLES OF WILDLIFE MANAGEMENT (2-2) Properties of game populations and their habitat in relation to the mechanisms and practices of game management. *Prerequisite:* biology 2. Three hours. Mr. Fuller.

175 GAME MAMMALS (3-3) Behavioral, ecological, physical, and taxonomic characteristics of the class Mammalia emphasizing game species of North America. *Prerequisite:* Biology 1, 2 and permission. Four hours. Mr. Hoekstra.

185 SPECIAL TOPICS Readings, investigations, lectures or work-study projects in selected forest resource areas. *Prerequisites*: junior standing and permission. One to three hours. Staff.

197, 198 SENIOR RESEARCH Work on a research problem under the direction of a staff member. Findings submitted in written form as prescribed by the department. *Prerequisites:* senior standing and permission. Three hours. Staff.

205 MINERAL NUTRITION OF PLANTS (See plant and soil science 205.) Three hours. Mr. Bartlett and botany and forestry staff. Alternate years, 1973-74.

207 WATER RELATIONS OF PLANTS Soil-plant water relations. Terminology and measurement of soil moisture. Absorption, transport, and transpiration by plants. Effects of water excesses and deficits. *Prerequisite:* permission. Three hours. Mr. Donnelly and botany and plant and soil science staff. Alternate years, 1974-75.

221 SITE RELATIONS AND PRODUCTION DYNAMICS IN FORESTS (2-4) Theory of site relations; total site concepts; and dynamics of dry matter production. *Pre-requisite:* permission. Three hours. Mr. Hannah. Alternate years, 1973-74.

222 ADVANCED SILVICULTURE Scientific bases for silvicultural practices for specific forest types. *Prerequisite*: permission. Three hours. Mr. McCormack.

242 ADVANCED FOREST BIOMETRY Advanced principles of electronic data processing and biometry for forest land management. Current developments in the science of forest biometry. *Prerequisite:* 144 or permission. Three hours. Staff.

252 FOREST VALUATION Principles of valuation of forest growing stock, land and other forest resoures. *Prerequisites:* 151 and 136 or concurrent enrollment. Two hours. Mr. Armstrong.

253 FOREST MANAGEMENT DECISION THEORY (3-0) Operations research procedures in forest management including wildlife, fire control, insect control, construction projects, and management of conservation programs. *Prerequisite:* Calculus. Three hours. Mr. Armstrong.

271 WILDLIFE MANAGEMENT (3-3) Integration of principles and techniques of wildlife management with contemporary land use; emphasis on development and maintenance of habitat requirements; population regulation. Field trips. *Prerequisites:* Forestry 123, 170. Four hours. Mr. Fuller and Mr. Hoekstra.

282 FORESTRY SEMINAR Review and discussion of current problems and controversies in natural-resource management. Required of forestry and wildlife seniors and graduate students. One hour. Mr. Wilm.

Resource Economics

75 PARTICIPATION IN RECREATION Management (see page 239)

121 RESOURCE ECONOMICS An evaluation of the economic forces affecting resource allocation, tools of economic analysis, and economic implications of

NURSING

current resource utilization practices. *Prerequisite:* economics 11 or resource economics 61. Three hours. Mr. Gilbert.

222 ADVANCED Resource Economics A critical investigation of current research, allocation procedures, and methods of analysis in natural resource economics with emphasis on the public sector. *Prerequisite:* resource economics 121. Three hours. Mr. Gilbert.

223 REGIONAL PLANNING Delineation of regional boundaries, determination of public goals, tools of planning, quality environment planning and the legal and political process of planning. *Prerequisite:* senior standing and economics 11, 12, or equivalent. Three hours. Mr. Sargent.

224 ENVIRONMENTAL POLICY The economic history, objectives, criteria, implementation, politics, and implications of natural resource policy. *Prerequisite:* junior standing and resource economics 121, or permission of the instructor. Three hours. Mr. Sargent.

225 ECONOMICS OF OUTDOOR RECREATION (see page 239).

235 PLANNING AND ZONING LAW An examination of Vermont planning and zoning law with comparisons with other states. Cases in planning and zoning and land use controls. *Prerequisite:* senior standing or consent of instructor. Three hours. Messrs. Sargent and Ewing.

Recreation Resource Management

75 PARTICIPATION IN RECREATION MANAGEMENT Supervised field experience in national, state, urban or private park and recreation operations. *Prerequisites:* Sophomore standing and permission of recreation management committee. Three hours. I, II. Mr. Fuller, Mr. Gilbert, Mr. Lindsay, Mr. Greig and Mr. Schmidt.

134 INTRODUCTION TO OUTDOOR RECREATION (3-0) (see page 237).

135 FOREST RECREATION PLANNING (2-3) (see page 237).

225 ECONOMICS OF OUTDOOR RECREATION An economic analysis of demand and supply of natural resources for outdoor recreation. Emphasis on current policy issues and management of recreational business firms. *Prerequisite:* economics 11, 12, or resource economics 61. Three hours. Mr. Bevins.

Nursing DIVISION OF HEALTH SCIENCES

Professor Woodruff (Director).

Professional Nursing: Professors Woodruff (Chairman) and Milligan; Associate Professors Cronin, Demers, Emerson, Forgione, Palmer, Powell, Sawyer, Schwalb; Assistant Professors Barrett, Calvi, Deck, Magee, Murray, Scranton, and Ure; Instructors Brearton, Burroughs; Teaching Associates Barry and Lalumiere.

Technical Nursing: Associate Professors Allen (Chairman) and Phillips; Assis-

NURSING

tant Professors Foreman, Gray and Rule; Instructors Clark, Foster, Kranich, and Spurlock; Teaching Associate Hall and Wright.

Professional Nursing

102 CONCEPTS OF HEALTH Study and discussion of health as a concept, health care as a science and an art, roles of providers and consumers of health care and the role of health care in society. Lectures, multimedia sessions and seminars. Opportunity for observational experiences and self directed study. Three hours, Mrs. Deck and Miss Emerson.

104 INTRODUCTION TO NURSING SKILLS Identification and application of basic skills necessary to provide health care for a person in his environment. Opportunity for self-paced classroom learning and supervised experience in clinical settings. Three hours. Mrs. Lalumiere and Mrs. Murray.

125-126 NURSING I AND II Development of knowledge and skills needed to assess and maintain the physical and psychosocial integrity of individuals of all ages and their families during health and illness; knowledge and skills needed for nursing those with uncomplicated problems which are the result of deviations from usual physical, psychological, or physiological functions. Laboratory experiences in homes, ambulatory care facilities, and institutional settings such as hospitals, nursing homes, and other protective environments. Nine hours. Staff.

145 NURSING III Development of knowledge and skills needed for nursing individuals of all ages with complex problems involving pathophysical and psychosocial functions; implications of illness for the family will be emphasized. Development of knowledge and skills necessary in giving nursing care to families and groups with emphasis on the interrelatedness of the family and group to the environment. Laboratory experiences in homes, ambulatory care facilities, and institutional settings. Nine hours.

146 NURSING IV Development of knowledge and skills needed to assume leadership in providing nursing care for groups with emphasis on the effect of the roles of leadership, collaboration, and coordination on the interrelatedness of these groups; implications of the health team approach will be emphasized. Laboratory experiences in a variety of community settings. Nine hours.

151 NURSING RESEARCH An introduction to research in nursing. Each student will design and carry out a study of a nursing problem. Three hours.

152 NURSING ELECTIVE Each student will undertake an approved nursing experience in a setting which meets specific needs and/or reflects particular area of interest. Six hours.

156 **PSYCHIATRIC NURSING (4-8)** Principles of nursing care of patients with psychiatric problems in hospitals and other settings. The emphasis will be on the development of therapeutic relationships with selected patients and upon the nurses's role with patients in various treatment situations. Six hours. Miss Magee and Mrs. Ure.

164 ADVANCED NURSING (3-12) Opportunity is provided to develop understanding of the concepts and skills necessary to provide direct nursing care to the critically ill patient and the patient in the emergency situation and to develop leadership competencies through experience in directing care for groups of patients. Six hours. Sister Barrett, r.h.s.j. and Mrs. Palmer.

176 COMMUNITY HEALTH NURSING (4-8) Study and discussion of the

240

PATHOLOGY

development, functions and trends in official and voluntary health organizations with emphasis on the role of the nurse at the local, state, national and international level. Laboratory study provided in the community. Six hours. Misses Brearton, Emerson and Mrs. Cronin.

186 SURVEY OF CONTEMPORARY NURSING Influence of contemporary social, educational, political and economic developments on nursing; problems and issues in the profession today; professional organizations in nursing and responsibilities of the professional nurse. Three hours, Miss Milligan.

195 INDEPENDENT STUDY Independent study in nursing as indicated by student's interest. *Prerequisite:* departmental permission. One to three hours.

TECHNICAL NURSING

11-12 FUNDAMENTALS OF NURSING (3-6) A basic course in the principles of nursing care. The entire sequence focuses on nursing interventions to meet the physiological, safety, and individuality needs of all persons. Within each course, specific needs of man are presented in depth with learning opportunities to develop related skills and to adapt these skills to specific age levels. Microbiology content taught in collaboration with the Department of Microbiology in the College of Medicine is included. Concurrent experiences are planned in hospitals and community agencies. Five hours. Miss Foreman, Mrs. Hall, Rule, and Spurlock.

14 (four weeks summer session) *Prerequisite:* nursing 11-12, Anatomy 9, Physiology 10. Four hours. Staff.

27-28 NURSING CARE OF CHILDREN AND ADULTS (5-15), (5-15) These courses focus on nursing interventions necessary to meet changing needs of children and adults in various stages of the wellness—illness continum. Within each course, content is presented within a framework of broad psychosocial and path-ophysiological concepts in which principles of nursing care are emphasized. Clinical learning experiences focus on the adaptation and application of nursing principles to individual patient situations, including maternal and infant care and care of children and adults with varying alterations in physiological and/or psychological functioning. *Prerequisite:* Nursing 14. 27, ten hours; 28, ten hours. Mrs. Clarke, Mrs. Wright, Misses Foster, Gray and Kranich.

30 NURSING SEMINAR This course is designed to increase the student's understanding of the role of the technical nurse within the profession of nursing. Past and current trends in nursing are reviewed in relation to future goals. *Prerequisite:* Nursing 27. Two hours. Miss Allen.

Pathology

COLLEGE OF MEDICINE

Professors Coon (Chairman), Craighead, Korson, Kusserow; Associate Professors Clemmons, Duffell, Picoff, Rice, Stark, Taylor, Trainer; Assistant Professors Harris, Howard, Kanich, Kaye, Tihen.

PHARMACOLOGY

101 INTRODUCTION TO HUMAN DISEASE (2-3) This is an elementary course in human pathology designed for Allied Health students. The first portion will deal with general mechanisms of disease, to be followed by disorders of specific organs. *Prerequisite:* 1 year college level general biology or equivalent and permission of departmental chairman. Three hours. Dr. Taylor and Staff.

201 HISTOCHEMISTRY A survey of techniques used for chemical identification of cellular and tissue components, including discussion of underlying theories. *Prerequisite:* an acceptable course in cell structure (e.g., Anatomy 311, Botany 256); Chemistry 131-132; permission of the department. A course in biochemistry is strongly recommended. Credit as arranged. Not offered each year. Dr. Korson.

Pharmacology

COLLEGE OF MEDICINE

Professors Gans, Jaffe, and Smith (Chairman); Associate Professors Doremus, Gray, McCormack, Reit, Robinson; Visiting Professor Maxwell.

190 PHARMACOLOGY FOR PHYSICAL THERAPY Basic pharmacology and classes of drugs which may alter the responsiveness of patients to physical therapy. Last six weeks of second semester. 2 hours. Staff.

290 INTRODUCTION TO PHARMACOLOGY Consideration of the factors which determine the efficacy and safety of drugs with emphasis on representative agents used in medicine. A broad range of systemic pharmacology will be considered: Neuropharmacology, cardiovascular, endocrine and metabolic pharmacology and chemotherapy. *Prerequisites:* Introductory course in organic chemistry (Chem. 4, 16 or 131-132) and background in biology or health sciences. 3 hours. Staff.

Philosophy

COLLEGE OF ARTS AND SCIENCES

Philosophy Faculty: Professors Cahn (Chairman), Dykhuizen (emeritus) and Hall; Associate Professor Moneta; Assistant Professors Beckett, Miller, Paskow and Rice; Instructors Anderson, Corcoran, Sugerman and Swanson.

Philosophy

3 LOGIC Principles and conditions of correct thinking with emphasis on the detection of fallacies of thought. Three hours. Messrs. Beckett and Miller and Ms. Moneta.

4 ETHICS Examinations of the ideas underlying man's moral behaviour to develop an acceptable and coherent theory of conduct. Three hours. Staff.

5 INTRODUCTION TO PHILOSOPHICAL PROBLEMS An introduction to philosophy and its methods through certain general problems; knowledge and

PHILOSOPHY

experience, God, religion, the self, moral and aesthetic values, freedom and determinism. Three hours. Staff.

21, 22 INTRODUCTION TO PHILOSOPHY A systematic analysis of the thought of such leading philosophers as Plato, Aristotle, Descartes, Spinoza, Hume and Kant on such topics as Theory of Knowledge, Ethics, Political Philosophy, and Theory of Art. Three hours. Staff.

23 ORIENTAL PHILOSOPHY An examination of the main schools of Chinese and Indian philosophy including Confucianism, Taoism, Buddhism, Neo-Confucianism, and Maoism. Three hours. Mr. Swanson.

101, 102, 103 HISTORY OF PHILOSOPHY First semester: ancient philosophy; second semester: early modern philosophy through Kant; third semester: late modern philosophy (Kant through Nietzsche). *Prerequisite for 101:* one introductory course in philosophy; *prerequisite for 102:* philosophy 101; *prerequisite for 103:* philosophy 102. Three hours. Messrs. Corcoran, Miller, Paskow, and Rice.

151 PHILOSOPHY AND LITERATURE Selected philosophical works and the literary works they have influenced. *Prerequisite*: one course in philosophy. Three hours. Mr. Hall.

152 PHILOSOPHY OF THE ARTS An analysis of some principal theories of art as exemplified in music, literature and painting. *Prerequisite:* one introductory course in philosophy. Three hours. Mr. Hall.

153 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. Emphasis on current attempts at their solution. *Prerequisite:* a course in philosophy or science. Three hours. Mr. Beckett.

154 **PHILOSOPHY OF RELIGION** A critical analysis of the basic concepts and values which have emerged from man's religious experience. *Prerequisite*; one introductory course in philosophy, or religion 21 or 22. Three hours. Mr. Hall.

155 INTRODUCTION TO PHENOMENOLOGY A systematic study of fundamental principles of the phenomenological method such as: intentionality of consciousness, phenomenological reflection, phenomenological reduction, concept of constitution, and inner time consciousness. *Prerequisite*: philosophy 102. three hours. Ms. Moneta.

175 CHINESE RELIGION AND THOUGHT Three hours. Mr. Andrews. See Religion 175.

193, 194 COLLEGE HONORS

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

200 PHILOSOPHY OF HISTORY An investigation of theories of history from the perspectives of both historians and philosophers. *Prerequisites:* either two advanced courses in philosophy or six hours in history. Three hours. Staff.

202 ANALYTIC PHILOSOPHY The significant problems of philosophy from the standpoint of the predominant contemporary philosophic movement in England and the United States. *Prerequisites:* philosophy 101 and 102. Three hours. Mr. Beckett.

PHILOSOPHY

204 THEORY OF KNOWLEDGE A study of basic concepts and problems involved in explaining the possibility of human knowledge. Topics such as sense perception, memory, truth, necessity, knowledge and belief, and the possibility and limit of human knowledge will be considered. *Prerequisites:* philosophy 101 and 102. Three hours. Mr. Rice.

206 SOCIAL PHILOSOPHY The meaning and values inherent in social life. *Prerequisites:* philosophy 101 and 102. Three hours. Mr. Anderson.

207 METAPHYSICS Current and traditional metaphysical problems such as the concept of change, the existence and nature of God, the self, and the world. *Prerequisites:* philosophy 101 and 102. Three hours. Ms. Moneta.

208 THEORY OF VALUE An analysis of the nature of value and the nature of experience of the various realms of value. *Prerequisites:* philosophy 101 and 102. Three hours. Mr. Corcoran.

209 AMERICAN PHILOSOPHY The thought of such leading American philosophers as Peirce, James, Royce, Santayana, Dewey and Whitehead. *Prerequisites*: philosophy 101 and 102. Three hours. Mr. Miller.

210 PHENOMENOLOGICAL THINKERS A critical and intensive investigation of the thought of a major twentieth century phenomenologist, e.g., Husserl, Heidegger, or Merleau-Ponty. *Prerequisites:* philosophy 155 or 101 and 102. Three hours. Ms. Moneta and Mr. Paskow.

211 NINETEENTH-CENTURY PHILOSOPHY A systematic analysis of the contributions to philosophical thought of such thinkers as Fichte, Schelling, Hegel, Schopenhauer, Nietzsche, Mill, Kierkegaard, Dilthey, and Marx. *Prerequisites:* philosophy 101 and 102. Three hours. Staff.

212 EXISTENTIALISM Existentialism, its sources and its relation to literature and to the arts. *Prerequisites:* philosophy 101 and 102. Three hours. Staff.

213 PHILOSOPHY OF MIND An investigation of the mutually exclusive theories of psycho-physical interactionism, logical behaviorism, neural identity materialism, and double aspect theory. *Prerequisites:* philosophy 101 and 102. Three hours. Mr. Paskow.

214 INTELLECTUAL BACKGROUNDS OF MODERN LIFE Intellectual movements which have influenced the thought and life of today. *Prerequisites:* philosophy 101 and 102. Three hours. Mr. Rice.

221 TAO TE CHING A systematic study of one of the most important texts of Taoism and of the English translation of the text. *Prerequisites:* philosophy 23, 101 and 102. Three hours. Mr. Swanson.

222 I CHING OR BOOK OF CHANGES A systematic study of one of the most difficult and most important texts in the Oriental tradition. *Prerequisites:* philosophy 23, 101 and 102. Three hours. Mr. Swanson.

281, 282 SEMINAR Selected topics in philosophy, determined according to the interest of students and instructor. *Prerequisites:* philosophy 101 and 102. Three hours. Staff.

297, 298 READINGS AND RESEARCH Independent study with an instructor on a philosopher or philosophical problem of the student's choice. *Prerequisites:* philosophy 101 and 102. Three hours. Staff.

For economic philosophy, see economics 295; for political philosophy, see political science 211, 212; and for mathematical logic, see mathematics 259, 260.



(see college of education, page 178).

Physical Therapy

SCHOOL OF ALLIED HEALTH SCIENCES

Associate Professor Feitelberg (Chairman, Department of Physical Therapy); Associate Professor Page; Assistant Professors Anderson and Moffroid; Instructors Piasetski, Sampson; Clinical Assistant Professors Clawson, Corbin, DeAngelis, Parry, Smith; Clinical Instructors, Kane, Main, Marshall, Parry, Smith, Sulima, Tandy.

21 PHYSICAL THERAPY I History and current trends of the profession with emphasis on the medical-ethical-legal aspects of practice. The role of the therapist in treatment, the health care environment and as a team member. Supervised observation in approved clinical centers. (2 hours) Mr. Feitelberg and faculty.

111 KINESIOLOGY The study of normal posture and movement, from infancy through adulthood as a basis for analysis of abnormal function. Biomechanical principles of the musculoskeletal and nervous systems are studied in relation to pathomechanics. Lecture, laboratory. (3 hours) Mrs. Moffroid.

121-122 PHYSICAL THERAPY II, III The study of the evaluation process in physical therapy utilizing testing and measurement methods and devices. Patient management and treatment through medical, nursing and physical therapy techniques. Theory and application of principles in massage, electrotherapy, hydrotherapy and therapeutic exercise for the treatment of disease and disability. Lecture, laboratory, patient demonstration and clinical experience. (II 4 hours) (III 5 hours) Miss Anderson, Miss Corbin, Mr. Feitelberg, Miss Page and clinical faculty.

123 SCIENTIFIC INQUIRY I Introduction to clinical inquiry, including mathematical analysis. Basic statistics of central tendency, dispersion, correlation and one way analysis of variance are learned and their applications are discussed. Current literature provides a framework for discussion. (2 hours) Mrs. Moffroid.

131-132-133 CLINICAL MEDICINE Management of disease processes in the major medical specialties such as General Medicine, Orthopaedics, Neurology, Pediatrics and Rehabilitation Medicine. Utilization of the problem oriented medical record as a basis for understanding the concept of comprehensive care. Lecture and clinical presentations. A continuum of three semesters. (131: 1 hour; 132: 2 hours; 133: 1 hour) Faculty, College of Medicine.

142 HEALTH CARE SYSTEMS Consideration of the social science aspects of health care, community health services, manpower needs and emerging patterns

for health care systems. Small group participation in problem-solving projects. (3 hours) Mr. Feitelberg and Faculty.

144 INDEPENDENT STUDY The selection and development of a topic for investigation using an assigned faculty member as a preceptor. Seminar sessions for guidance and problem solving on related issues. (2 hours) Faculty.

151-152 PHYSICAL THERAPY IV, V Continued studies in the advanced evaluation process. Theory and application of therapeutic exercise utilizing neuromuscular facilitation techniques. In depth study of ambulation techniques, activities of daily living, assistive devices, prosthetic and orthotics and related allied health disciplines. Emphasis on goal determination, treatment design and modification. Analysis and synthesis of clinical education experiences. Investigation of more complex medical problems and their management. Lecture, laboratory and clinical presentation. (IV 6 hours) (V 3 hours) Miss Anderson, Miss Page and clinical faculty.

153 NEUROSCIENCES FOR PHYSICAL THERAPY A study of the concepts in Neuroanatomy and Neurophysiology that contribute to physical therapy. Lectures and clinical presentations. (2 hours) Mrs. Moffroid, Miss Anderson and faculty.

161 PSYCHOLOGICAL ASPECTS OF PHYSICAL DISABILITY Consideration of the reactions to illness and disability and associated emotional and personality changes. Emphasis on developing methods to modify behavior for effective treatment and teaching of the disabled and the family. (2 hours) TBA

172 PRINCIPLES OF ORGANIZATION AND ADMINISTRATION Analysis of current designs and methods used in existing physical therapy facilities. Opportunity to investigate concepts for projecting new patterns to meet the needs of future health care systems. Study of communication theories fundamental to the process of change. Group activity to design alternate models based on problem solving. (2 hours) Mr. Feitelberg and clinical faculty.

174 PRINCIPLES OF EDUCATION Introduction to procedures and methods of instruction in various teaching situations. Opportunity to design and participate in a teaching activity. Introduction to the preparation and use of instructional aids. (2 hours) Faculty.

176 SCIENTIFIC INQUIRY II Prerequisite: P.T. 123 or a statistics course. Clinical inquiry is presented as a methodology. Two way analysis of variance is learned. The student plans an experimental design and completes it with mock data. The administrative planning of clinical inquiry is explored and methods are discussed for disseminating information. (2 hours) Mrs. Moffroid.

128 CLINICAL EDUCATION I Students are assigned to a variety of approved clinical centers for supervised observation and participation. Learning experiences are designed in cooperation with the clinical faculty in keeping with the level of competency acquired. (3 hours) (Full time, 5 week period, May-June) Mr. Feitelberg and clinical faculty.

178 CLINICAL EDUCATION II A continuation of Clinical Education I. At this level students fully participate in the evaluation and treatment of patients according to the objectives of the facility. A wide variety of opportunities are planned within the facility and community. Students are assigned full time to two facilities during this period. (5 hours) Full time 10 week period, January-March) Mr. Feitelberg and clinical faculty.

Physics

COLLEGE OF ARTS AND SCIENCES

Professors Crowell (Chairman), Detenbeck, Juenker, Krizan, Nyborg and Scarfone; Associate Professors Brown and Cohen; Assistant Professors Nagy and Sachs.

Physics 1 CELESTIAL PHYSICS: ASTRONOMY AND SPACE-TIME. Description of various historical models of the observable universe. Nature of light and description of optical instruments, especially telescope and camera. Concept of space and time, Einstein's Relativity. Three hours. Mr. Crowell.

Physics 3 INTRODUCTORY PHYSICS (3-2) A one-semester laboratory course in basic physics, designed particularly to meet the needs of students in the program in the agricultural and health sciences. Four hours. Mr. Nagy.

11,12 ELEMENTARY PHYSICS (3-2) A survey of the principles of classical and modern physics. Recommended for students not concentrating in science, mathematics or premedical programs. *Prerequisite:* 3 or 11 for 12, secondary school algebra and trigonometry. Four hours. Staff.

15, 16 GENERAL PHYSICS (3-2) Introduction to the principles of physics for students concentrating in the natural sciences. Recommended for students in pre medical programs. *Prerequisite:* 15 for 16; credit in mathematics 26 or concurrent enrollment or credit in Mathematics 11 or 13 for 15. Four hours. Staff.

24, 25 FUNDAMENTALS OF PHYSICS (3, 2, 3-2) For students concentrating in engineering or a physical science. *Prerequisite:* for 24, Mathematics 11 or 13 and credit or concurrent enrollment in Mathematics 12 or 14; for 25, 24 or 18 and credit or concurrent enrollment in Mathematics 121 or 123. Four and four hours. Staff.

128 INTRODUCTORY MODERN PHYSICS (3-2) An introduction to the theory of relativity and to modern descriptions of radiation, the electron, the atom, the atomic nucleus, and elementary particles. *Prerequisite:* 16 or 25 and credit or concurrent enrollment in mathematics 121 or 123. Four hours. Staff.

193, 194 College Honors

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

Physics 201, 202 EXPERIMENTAL PHYSICS (1-3) Experiments in classical and modern physics. Each student selects laboratory experiments appropriate to his background and interests. The course may be entered at the beginning of either semester and repeated for credit up to a maximum of four semesters. *Prerequisite*: 16 or 25 and mathematics 121 or 123. Three hours. Staff.

211 MECHANICS (3-0) Newtonian dynamics of particles and systems of particles, with applications to problems of special importance, such as driven and coupled harmonic oscillators and central field trajectories. *Prerequisite:* 16 or 25, mathematics 121 or 123. Three hours. Mr. Brown.

PHYSICS

213 ELECTRICITY AND MAGNETISM (3-0) Fundamental principles of electricity and magnetism; electrostatic fields, and magnetic fields of steady currents. Electrical and magnetic properties of matter and electromagnetic energy relationships. *Prerequisite:* 16 or 25, mathematics 121 or 123. Three hours. Mr. Nagy.

214 ELECTROMAGNETISM AND RELATIVITY An introduction to time dependent electromagnetic fields. Maxwell's equations in space and matter. Electromagnetism as a relativistic phenomenon. Special relativity including an introduction to four-vectors. *Prerequisite:* 213. Three hours. Mr. Nyborg.

216 INTRODUCTION TO MATHEMATICAL PHYSICS Introduction to basic mathematical methods of theoretical physics. Particular emphasis on partial differential equations, especially the wave equation. *Prerequisite:* 211 or 213. Three hours. Mr. Depatie.

220 BIOLOGICAL PHYSICS (3-2) Physical laws, concepts and methods discussed with respect to their reference to biology. *Prerequisite:* 12 or 16, chemistry 2, mathematics 12. Four hours. Mr. Nyborg. Alternate years.

222 ADVANCED BIOLOGICAL PHYSICS (3-2) Sound and electromagnetic waves; ionizing particles and radiation. Interaction of these physical agents with biological systems. Physical properties of macromolecules and their aggregates. *Prerequisite:* chemistry 2; mathematics 121; and experience in applying differential equations. Departmental permission required. Four hours. Mr. Nyborg. Alternate years.

225, 226, 227 SPECIAL TOPICS IN BIOLOGICAL PHYSICS For research students in the field of biological physics. *Prerequisite:* 220 or 222, mathematics 121 and departmental permission. Credit as arranged. Mr. Nyborg. Offered as occasion warrants.

231, 232, 233 SPECIAL TOPICS IN ACOUSTICS For research students in the field of acoustics. *Prerequisite:* 211 and departmental permission. Credit as arranged. Messrs. Nyborg and Sachs. Offered as occasion warrants.

251, 252, 253 SPECIAL TOPICS IN THE PHYSICS OF SURFACES For research students in the field of surface chemistry and physics. *Prerequisite:* 265, or chemistry 142, mathematics 121 and departmental permission. Credit as arranged. Messrs. Crowell and Juenker. Offered as occasion warrants.

265 THERMAL PHYSICS (3-0) Basic concepts of thermodynamics and introduction to kinetic theory and statistical mechanics. *Prerequisite*; 128 and mathematics 121. Three hours. Mr. Juenker.

273 INTRODUCTORY QUANTUM MECHANICS Introduction to non-relativistic quantum mechanics. Schroedinger equation and applications to simple systems. *Prerequisites*: 211 and 216. Three hours. Mr. Detenbeck.

274 ATOMIC AND NUCLEAR PHYSICS Phenomenological study of electronic structure of atoms. Development of quantum theory. Structure of the nucleus and properties of elementary particles. *Prerequisites:* 273. Three hours. Mr. Detenheck.

Physiology and Biophysics

COLLEGE OF MEDICINE

Professors Alpert (Chairman), Chambers, McCrorey, Parsons; Associate Professor Webb; Assistant Professors Halpern, Hamrell, Gibbons, Whitehorn; Instructors MacDonald.

10 INTRODUCTION TO HUMAN PHYSIOLOGY A Systems Approach to Biology. This course will provide a physical-chemical basis for an understanding of modern human physiology. Specific emphasis will be placed on the functioning of the various organ systems and the interrelationships among these systems. Time will be spent in discussing how the intact organism uses the systems for maintaining its own integrity and for withstanding the stresses of the environment. There will be a focus on the skeletal-neuro-muscular system; cardiovascular system; respiratory system; gastrointestinal system; endocrine system; nervous system, and the renal system and body fluids. Three hours. Staff.

100 PHYSIOLOGY AND BIOPHYSICS (4-2) This course is taught as a science to physical therapy students in the first and second semesters, with emphasis placed on the broad physical, chemical and biological principles underlying the function of the main organ, tissue and subcellular systems. Special stress is placed on those phases which are the scientific basis of clinical physical therapy. The course consisting of 140 hours is made up of lectures, demonstrations and conferences. Five hours. Staff.

101-102 PHYSIOLOGY AND BIOPHYSICS (5-5) The scientific basis of mammalian (especially human) physiology and biophysics is presented for Allied Health Baccalaureate as well as other undergraduate and graduate students requiring an indepth working knowledge of structure and function. Emphasis is placed on the broad physical, chemical and biological principles underlying the performance of the subcellular components, cells, tissues, organs and multi-organ systems. Time will be spent in discussing how the intact organism maintains its own integrity despite the environmental stresses to which it is subjected. The laboratory will supplement all of these areas including experiments using human volunteer subjects for studying the detailed interaction of the pulmonary, renal, and cardiovascular systems during a variety of stresses. Prerequisites or concurrent courses: Chemistry 3 and 16, Physics 5 and 6, and one semester of mathematics or permission of instructor. Two semesters, 5 hours per semester. Staff.

Plant and Soil Science

COLLEGE OF AGRICULTURE

Professors Wiggans (Chairman), Bartlett, and MacCollom; Associate Professors Boyce, Flanagan, McIntosh, Parker, Pellett, and Wood; Assistant Professors Evert, and Magdoff; Lecturers Flinn and Whipkey; Adjunct Professor Calahan; Adjunct Associate Professor Benoit; Teaching Associate Bruckel. 10 HOME AND GARDEN HORTICULTURE Planning, selecting, and maintaining shrubs, trees, flowers, lawns, fruits, and vegetables around the home. Designed primarily for non-agricultural students. Three hours. Mr. Wiggans and staff.

11 PRINCIPLES OF PLANT SCIENCE Principles and practices involved in the culture, management, and utilization of economically important horticultural and agronomic crops. Three hours. Mr. Boyce.

14 SCIENTIFIC PHOTOGRAPHY Introduction to scientific still photography for the student and researcher in the plant sciences. Two hours. Mr. Wood.

51 THEORY OF LANDSCAPE DESIGN (3-0) An introduction to the theory of landscape design and its relationship to man, man-made structures, and the natural environment. Three hours. Mr. Flinn.

61. INTRODUCTORY SOIL SCIENCE Introductory study of the nature and properties of soils and how they serve as a media for plant growth. *Prerequisite:* sophomore standing. Three hours. Mr. Magdoff.

102 NATURAL RESOURCE CONSERVATION Systematic appraisal of the nation's resources; including soil, water, atmosphere, forest, wildlife, and mineral. *Prerequisite*: junior standing. Three hours. Mr. Flanagan.

106 ECONOMIC ENTOMOLOGY (3-2) Survey of the major insect orders, and methods for controlling injurious species. *Prerequisite:* 11. Four hours. Mr. MacCollom. Alternate years, 1974-75.

107 FOREST ENTOMOLOGY (2-2) Ecology and population dynamics of insects affecting forests and forest products. Insect control by silvicultural, biotic and chemical means. *Prerequisite:* junior standing in forestry or departmental permission. Three hours. Mr. MacCollom.

110 AGRICULTURAL HYDROLOGY A descriptive treatment of applied hydrology specifically concerned with the occurrence, distribution, and movement of water in the agricultural environment. *Prerequisites:* Plant and Soil Science 11, 61; Math 2 or 9; or departmental consent. Three hours. Mr. Whipkey.

111 WORLD CROPS Effect of environment, nutrition, and management on crop growth, distribution and production of world food supplies. *Prerequisite*: 11 or Bot 4. Three hours. Mr. Wood. Alternate years, 1974-75.

122 SMALL FRUIT CROPS (2-3) Principles of small fruit production, including propagation, culture, management, and harvesting. *Prerequisite:* 11. Three hours. Mr. Boyce. Alternate years 1973-74.

125 ORNAMENTAL HORTICULTURE (2-3) Identification, climatic requirements, cultural management, and use of ornamental plant materials in landscape plantings. *Prerequisite:* 11. Three hours. Mr. Bruckel. 1973-74.

138 PLANT PROPAGATION (2-4) Principles and practices involved in propagating herbaceous and woody plants by seeds, division, layering, cuttings, budding, grafting, and tissue culture. *Prerequisite:* 11 or consent of the instructor. Three hours. Mr. Evert.

145 TURFGRASSES (2-3) Establishment, maintenance and utilization of turf for lawns, parks, athletic fields, airports, cemetaries, roadsides, golf courses, and ski slopes. *Prerequisite:* 11. Three hours. Mr. Wood. Alternate years 1973-74.

250
152 BASIC LANDSCAPE DESIGN (3-3) Application of landscape design theory to a wide range of land use and environmental problems. *Prerequisite:* 51 or permission. Four hours. Mr. Flinn.

162 SOIL FERTILITY AND MANAGEMENT Principles of soil management including soil testing methods and interpretations, fertilizer manufacture, usage, and management practices. *Prerequisite*: 61. Three hours. Mr. Magdoff.

191 UNDERGRADUATE SPECIAL TOPICS Lectures, laboratories, readings, field projects, surveys or research designed to provide specialized experience in horticulture, agronomy, soils, or plant environment. *Prerequisite:* permission. One to three hours. Staff.

201 MICROMETEOROLOGY Theoretical and practical considerations of the micrometeorological factors that affect plant growth and agricultural practices. *Prerequisite:* 11. Three hours. Mr. Benoit. Alternate years, 1973-74.

204 PLANT RESEARCH TECHNIQUES (2-3) Methods of conducting research with plants including the organizing and planning of experiments. *Prerequisite:* 11. Three hours. Mr. Wiggans. Alternate years, 1973-74.

205 MINERAL NUTRITION OF PLANTS Role of essential elements for plant growth including classical and modern approaches to the study of ion availability and transport. *Prerequisite:* botany 104. Three hours. Mr. Bartlett and botany, forestry, and plant and soil science staff. Alternate years, 1973-74.

207 WATER RELATIONS OF PLANTS (See forestry 207) Three hours. Mr. Donnelly and botany and plant and soil science staff. Alternate years, 1974-75.

222 ADVANCED TREE FRUIT CULTURE (2-3) Theory and practice of modern commercial fruit science. Nutrition and cultural responses to various management practices. *Prerequisite:* 11. Three hours. Mr. Calahan. Alternate years, 1974-75.

261 SOIL CLASSIFICATION AND LAND USE Classification of soils throughout the world as they relate to soil development and land use. Three Saturday field trips. *Prerequisite:* 61 or a total of six hours in ecology, geography, or geology. Three hours. Mr. Bartlett. Alternate years, 1974-75.

264 SOIL CHEMISTRY (2-3) Chemistry and biology of soils affecting plant growth including the properties of clays and organic matter. *Prerequisites:* 61, chemistry 1, 2 or 3, 4. Three hours. Mr. Bartlett. Alternate years, 1973-74.

266 SOIL PHYSICS (2-3) Mathematical and physical principles of the soilwater-plant interaction and its relationship to production and management. *Prerequisites:* 61, physics 5, 6, chemistry 1, 2 or 3, 4. Three hours. Mr. Benoit. Alternate years, 1974-75.

281 SEMINAR Presentation and discussion of papers on selected topics of current interest by students and staff. *Prerequisite:* senior standing. One hour. Staff.

Political Science

COLLEGE OF ARTS AND SCIENCES

Professors Dellin, Gould, Haugen, Hilberg (Chairman), G. T. Little, and Staron; Associate Professors Pacy, Simon, Warner, and Wertheimer; Assistant Professors Flannery, Kinnard, Nelson, and Rosenbloom; Adjunct Assistant Professor Eastman; Instructors Brewer and Diamond.

11, 12 INTRODUCTION TO POLITICAL SCIENCE First semester: elements of political science. Second semester: comparative governmental institutions. Three hours. Staff.

13 INTRODUCTION TO POLITICAL THEORY An introduction to empirical theories of politics, the purpose of normative theory, and the analysis of basic political concepts. Three hours. Mr. Wertheimer.

21 AMERICAN POLITICAL SYSTEMS Institutions, processes, and problems of American government. Three hours. Mr. Warner and staff.

51 INTERNATIONAL RELATIONS The state as actor in international relations. Global divisions and problems. Three hours. Messrs. Flannery, Hilberg and Kinnard.

71 COMPARATIVE POLITICAL SYSTEMS Introduction to the method and theories of Comparative Politics focusing upon selected contrasting political systems. Three hours. Mr. Flannery.

81 POLITICAL BEHAVIOR An analysis of how people react to political situations and the ways in which their behavior may be understood. Three hours. Messrs. Brewer and Nelson.

96 SEMINAR Selected topics in Political Science. Three hours. Staff.

171 WESTERN EUROPEAN POLITICAL SYSTEMS An examination of the British, German, and French political systems. Three hours. Mr. Staron.

172 RUSSIAN AND EASTERN EUROPEAN POLITICAL SYSTEMS An examination of the Russian and some other Eastern European Communist political systems. Three hours. Mr. Staron.

173 CANADIAN AND COMMONWEALTH GOVERNMENTS Emphasis on Canada and Commonwealth cooperation. Three hours. Mr. Haugen.

174 LATIN AMERICAN POLITICAL SYSTEMS Analysis of the formal and informal political structure of Latin American states with emphasis upon contemporary developments. Three hours. Mr. Gould.

175, 176 ASIAN POLITICAL SYSTEMS The development of political institutions and processes in the 20th century with brief historical introductions. First semester: East Asia. Second semester: South and Southeast Asia. Three hours. Mr. Little. Not offered in 1973-74.

193, 194 College Honors

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

211, 212 HISTORY OF POLITICAL THOUGHT First semester. development of political thought from Plato to Burke. Second semester: recent political ideologies. *Prerequisite:* six hours in political science. Three hours. Mr. Staron.

213 CONTEMPORARY POLITICAL THOUGHT A discussion of the writings of several twentieth-century political thinkers, including writings in related fields such as psychology and economics. *Prerequisite:* six hours in political science. Three hours. Mr. Wertheimer.

216 AMERICAN POLITICAL THOUGHT American political thought from the colonial period to recent times. *Prerequisite:* six hours in political science. Three hours. Mr. Simon.

221, 222 CONSTITUTIONAL LAW First semester: judicial review, federalism, citizenship and suffrage, taxing power, commerce power. Second semester: Bill of Rights, Due Process, Equal Protection. *Prerequisite:* six hours in political science. Three hours. Mr. Gould.

227, 228 INTERNATIONAL LAW Principles and applications of public international law. *Prerequisite:* six hours in political science. Three hours. Mr. Little. Not offered in 1973-74.

231 THE LEGISLATIVE PROCESS Congressional and parliamentary organization and procedure. *Prerequisite:* six hours in political science. Three hours. Mr. Haugen.

232 LAWMAKING AND PUBLIC POLICY Influence of the executive and problems of congressional and parliamentary control. *Prerequisite:* six hours in political science. Three hours. Mr. Haugen.

233 THE NATIONAL EXECUTIVE Analysis of the functions and organization of the Presidency and the bureaucracy in American national government. *Prerequisite:* six hours in political science. Three hours. Mr. Warner.

235 DEFENSE POLICY Constitutional and historical framework; intelligence, R D, procurement, manpower and deployment; U.S.-Soviet discrepancies, developments, and dilemmas. *Prerequisite:* six hours in political science. Three hours. Mr. Kinnard.

239 AMERICAN POLITICS An examination of the politics of decision-making in the American political system. *Prerequisite:* six hours in political science. Three hours. Mr. Simon.

241 PUBLIC ADMINISTRATION The Federal government in action. *Prerequisite:* twelve hours in political science, or six hours in political science and one sophomore course in social science; junior standing. Three hours. Mr. Nuquist.

242 **PROBLEMS** OF **PUBLIC MANAGEMENT** Analysis of policy and administrative issues of current domestic programs. *Prerequisite:* six hours in political science. Three hours. Mr. Warner.

250 THE CRAFT OF DIPLOMACY Emphasis on experiences and reflections of diplomatic personalities, supplemented by studies of specialists. *Prerequisite:* six hours in political science. Three hours. Mr. Pacy. Not offered in 1973-74.

PSYCHOLOGY

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:* six hours of political science. Three hours. Messrs. Kinnard and Hilberg.

256 INTERNATIONAL ORGANIZATION Theory and practice in supranational institutions. *Prerequisite:* six hours in political science. Three hours. Mr. Pacy. Not offered in 1973-74.

257 POLITICAL GEOGRAPHY See Geography 257. Three hours. Mr. Miles.

258 PROBLEMS OF COMMUNISM See Economics 258. Three hours. Mr. Dellin.

261 URBAN GOVERNMENT AND POLITICS An analysis of metropolitan areas in terms of their governments, problems and roles. *Prerequisite:* six hours of political science. Three hours. Ms. Diamond.

264 STATE ADMINISTRATION Problems in planning, policy development, and program coordination. *Prerequisite:* six hours in political science. Three hours. Mr. Haugen.

265 INTERGOVERNMENTAL RELATIONS Problems of the Federal system. National-state-local cooperative administration of selected public functions. *Prerequisite:* six hours in political science. Three hours. Mr. Haugen.

277 Soviet Politics See History 277. Three hours. Mr. Daniels.

278 FOREIGN POLICY OF THE USSR Emphasizing post 1960 developments. *Prerequisite:* junior standing or consent of instructor. Three hours. Mr. Flannery.

281 POLITICAL PARTIES Analysis of political parties with special emphasis upon voting behavior and campaign techniques. *Prerequisite:* six hours in political science. Three hours. Mr. Nelson.

283 SCOPE AND METHODS OF POLITICAL SCIENCE Approaches, sources of information, research methods and systematization in the study of political phenomena. Open to senior majors and graduate students only. Three hours. Mr. Wertheimer.

291 through 293 READING AND RESEARCH For advanced undergraduates and graduate students. Three hours. Staff.

295, 296 SEMINAR Selected topics in Political Science. Prerequisite: six hours in political science. Three hours. Mr. Rosenbloom.

Psychology

COLLEGE OF ARTS AND SCIENCES

Professors Albee, Ansbacher, Forgays, Leitenberg and Perrine; Associate Professors Burchard (Acting Chairman), S. Goldstein, Howell, Joffe, Lawson, Musty and Patterson; Assistant Professors Dietzel, Does, Gordon, Hasazi, Kapp, Kessler, Leff and Rolf; Instructor Rodd; Adjunct Professor Grams; Adjunct Associate Professor McKenzie; Adjunct Assistant Professors Conquest, J. Goldstein, Huntley, McDowell and Thomson.

Note: All courses numbered 200 or above have 1, 109, 110, 111, 112, and 119 as prerequisites.

1 GENERAL PSYCHOLOGY Introduction to the entire field, emphasizing the normal adult human being. Three hours. Messrs. Albee and Forgays.

5 PSYCHOLOGICAL STATISTICS Statistical technique and research design pertinent to the behavioral scientist. A calculation laboratory is provided. *Prerequisite:* 1. Three hours. Messrs. Gordon and Howell.

100 BEHAVIOR MODIFICATION A survey of techniques for the manipulation and control of human behavior, and evaluation of their effectiveness. *Prerequisite:* 1. Three hours. Messrs. Leitenberg and Burchard.

109, 110 PRINCIPLES OF PSYCHOLOGICAL METHODOLOGY AND RESEARCH (2-4) This course prepares students to understand and to do competent research in a variety of areas of psychology. The focus is upon designs, methodologies, and statistical procedures essential for psychological research. Laboratory experiences are included. *Prerequisite:* 1. Four hours. Messrs. Gordon, Howell, Joffe, and Musty.

111, 112 **PRINCIPLES OF BEHAVIOR** This course reviews the principles of behavior in depth, including perception, ethology, conditioning and learning, motivation and emotion. Emphasis is placed on integrating classical findings with current research and applications of these topic areas. *Prerequisite:* 110. Three hours. Messrs. Musty and Rolf.

119 SYSTEMATIC PSYCHOLOGY A comparative study of the leading contemporary schools of psychological thought. *Prerequisite:* 1 sophomore standing. Three hours. Ms. Rodd.

121 BIOPSYCHOLOGY Principles of the biological bases of behavior are introduced through classical and contemporary issues in field, including an introduction to the nervous system, physiological and behavioral effects of drugs, chemical bases of behavioral disorders, hormonal control of behavior, intercerebral disorders of behavior, voluntary control of bodily functions, and possible physiological bases of extrasensory perception. *Prerequisite:* 1. Three hours. Messrs. Kapp and Musty.

130 SOCIAL PSYCHOLOGY A psychological approach to social phenomena with emphasis on the concepts and methods used in the study of the behavior of individuals in various social situations. *Prerequisite*: 1. Three hours. Mr. Leff.

150 PERSONALITY Individual and life problems from the field-theoretical and phenomenological approach with emphasis on Alfred Adler's viewpoint. *Prerequisite:* 1. Three hours. Mr. Ansbacher.

151 CHILD PSYCHOLOGY Behavioral development of the child from conception to adolescence. Emphasis is on basic learning processes and their relationship to selected aspects of development. *Prerequisite:* 1. Three hours. Mr. Hasazi.

152 ABNORMAL PSYCHOLOGY The more unusual mental processes; methods of observing them and interpreting them; their bearing on our understanding of the normal mind. *Prerequisite:* 1. Three hours. Mr. Kessler.

193, 194 College Honors

195,196 Special Topics

PSYCHOLOGY

197, 198 RESEARCH Individual research under staff direction. *Prerequisite:* Departmental permission. Three or six hours. Staff.

200 ADVANCED BEHAVIOR MODIFICATION Application of technique for the manipulation and control of human behavior in a variety of educational and social situations involving the collection and analysis of behavioral data. *Pre-requisite:* 100. Three hours. Messrs. Burchard and Leitenberg.

205 LEARNING Basic laws of the learning process as revealed by controlled experiments. Laboratory experiences are-provided and students may undertake original experiments. Three hours. Mr. Howell.

206 MOTIVATION AND EMOTION Nature and development of motives, emotions and their relation to other psychological processes. Three hours, Mr. Joffe.

210 SENSORY PERCEPTION An introduction to the sensory basis of perception. Emphasis is on methodology and research literature; development of an original experiment. Three hours. Mr. Lawson.

220 COMPARATIVE PSYCHOLOGY Behavior of animals under controlled experimental conditions and in their natural environments. Consideration of behavior similarities and differences at various levels of the phyletic scale. Three hours. Mr. Joffe.

221 PHYSIOLOGICAL PSYCHOLOGY I The structure and function of the mammalian nervous system, with emphasis upon neurological correlates of behavior and receptor mechanisms. Individual laboratory experience. Four hours. Mr. Musty.

222 PHYSIOLOGICAL PSYCHOLOGY II The study of the role of central nervous system mechanisms in the determination of innate behavior, arousal, internal inhibition, and learning. Individual laboratory experience. *Prerequisite*: 221. Four hours. Mr. Kapp.

230 EXPERIMENTAL SOCIAL PSYCHOLOGY Advanced survey covering current research in various fields of social psychology. Three hours. Staff.

231 SOCIAL PERCEPTION Experimental and theoretical study of the phenomena of the human perceptual process, with emphasis on the role of social, motivational, and learning factors. Students may undertake original experiments. Three hours. Mr. Perrine.

236 THINKING A critical review of the experimental investigation of thought processes. Three hours. Messrs. Gordon and Howell.

239 THE SOCIAL USE AND ABUSE OF ALCOHOL An intensive and critical analysis of the research literature concerning both the normative and deviant use of alcohol. Emphasis will be placed upon methodological aspects of original studies and upon psychological-biographical correlates of drinking patterns, injury on and off the highway, alcoholism, and feasible counter-measures. Three hours. Mr. Perrine.

251 BEHAVIOR DISORDERS OF CHILDHOOD Covers a wide range of topics from brain damage to childhood psychoses and nightmares. Each problem behavior will be considered in the context of normal child development. Three hours. Mr Rolf.

252 INTRODUCTION TO CLINICAL PSYCHOLOGY This course is a study of the basic principles of interviewing, testing, assessment from life situations, and re-

RADIOLOGIC TECHNOLOGY

port writing. There is an examination of the most common approaches to psychotherapy, such as the client-centered, habit change, cognitive change, emotional change, interpersonal relations, and group therapy approaches. Three hours. Mr. Kessler.

281-282 SEMINAR Review and discussion of current psychological research. One hour. Staff.

295, 296 CONTEMPORARY TOPICS Three hours. Staff.

Radiologic Technology

SCHOOL OF ALLIED HEALTH SCIENCES

Professor VanBuskirk; Assistant Professor Izzo (Chairman, Department of Radiologic Technology); Instructors Falby, Marschke; Adjunct Instructors Lacasse, Cunningham.

1, 2 CLINICAL ORIENTATION (1-6) Observation and participation in the clinical setting of the Medical Center Hospital of Vermont combined with discussion groups, laboratories, and independent study. *Prerequisite:* enrollment in the Radiologic Technology Program. Three credits each. Staff.

12 INTRODUCTORY RADIOLOGIC SCIENCE (3-0) Introduction to basic principles of ionizing radiation, and protection methods for personnel and patients. *Prerequisites:* Physics 3 and Math 9. Three credits. Mr. Izzo.

14 RADIOPATHOLOGY (3-0) Study of osteology, visceral anatomy and pathology relative to diagnostic and therapeutic applications of radiations. *Prerequisite:* RT 1 and ANAT 9. Three credits. Dr. VanBuskirk, Mr. Falby.

31 RADIOGRAPHIC, SCIENCE (2-2) Study of principles and methods of obtaining optimum radiographs, including topics of x-ray film and processing, intensifying screens, image formation, tomography. *Prerequisite:* RT 12. Three credits. Mr. Falby.

33, 34 RADIOGRAPHIC TECHNIQUES (2-2) Lecture, demonstration, and independent study of techniques for accurate patient positioning to obtain optimum radiographic visualization. Includes special procedures and assignments in the Emergency Room at the Mary Fletcher Unit. *Prerequisite:* PSL 10 and RT 2 for 33; RT 33 for 34. Three credits each. Mr. Falby.

41; 42, 44 NUCLEAR MEDICINE TECHNOLOGY I, II, III (2-2) Study of radiopharmaceuticals, instrumentation, and clinical techniques for determination of pathology related to body structure and function. *Prerequisite:* RT 12 for 41, ANAT 9 and PSL 10 for 42, RT 42 for 44. Three credits each. Mr. Izzo.

51, 52, 54 RADIATION THERAPY TECHNOLOGY (2-2) Study of physical principles and clinical techniques involved in the therapeutic use of ionizing radiation for malignant disease; including treatment planning, computer techniques and dosimetry. *Prerequisite:* RT 12 for 51. RT 51 and PSL 10 for 52, RT 52 for 54. Three credits each. Dr. VanBuskirk, Mr. Marschke.

RELIGION

71, 72 SENIOR CLINICAL PRACTICUM (0-12) Continuation of RT 1, 2 in field of specialization. Three hours each. Staff.

91, 92 SPECIAL RADIOLOGIC PROBLEMS Independent projects under the direction of faculty members. Variable hours. Staff.

Religion

COLLEGE OF ARTS AND SCIENCES

Religion Faculty: Assistant Professors Andrews, Gussner, Martin, Paden (Chairman) and Yarian; Instructors Anderson and Brenneman.

Religion

21 INTRODUCTION to the STUDY OF RELIGION: ASIAN TRADITIONS Introduction to the Hindu, Buddhist, and East Asian religious traditions as expressed in their basic symbolisms, writings, practices, and cultural forms. Three hours. Staff.

22 INTRODUCTION TO THE STUDY OF RELIGION: WESTERN TRADITIONS Study of the basic motifs, mythic patterns, and historical transformations in the religious life of man from the Ancient Near East to the modern West.

71 THE INTERPRETATION OF RELIGION Examination of major theories and methods used in studying and interpreting religious phenomena. *Prerequisite:* religion 21 or 22. Three hours. Staff.

101 RELIGIOUS INSTITUTIONS AND COMMUNITIES A comparative study of the basic types of religious community and religious institution, within various cultural settings. *Prerequisite:* three hours in religion or sociology 22; sophomore standing. Three hours. Staff.

112 MYSTICISM, SHAMANISM, AND POSSESSION A comparative study of the ways in which the inward dimension of the religious life finds expression. *Prerequisite:* three hours in religion; sophomore standing. Three hours. Staff.

122 MYTH, SYMBOL, AND RITUAL Study of the meaning and varieties of myth and ritual in cross-cultural perspective, with reference to contemporary theories of symbol and language. *Prerequisite:* three hours in religion; sophomore standing. Three hours. Staff.

129 PHILOSOPHY OF RELIGION Three hours. Mr. Hall. See Philosophy 154.

141 HEBREW SCRIPTURES Study of the history and writings of the Hebraic-Judaic religion to the first century B.C. *Prerequisite:* six hours in religion; sophomore standing. Three hours. Messrs. Martin and Kahn.

142 POST-BIBLICAL JUDAISM A study of the formation of post-biblical Judaism with special attention to the Rabbinic period, 70-500 A.D. *Prerequisite:* six hours in religion; sophomore standing. Three hours. Mr. Kahn.

RELIGION

145 **PRIMITIVE** CHRISTIANITY The origin and nature of early Christianity with emphasis on the New Testament writings. *Prerequisite:* six hours in religion; sophomore standing. Three hours. Mr. Martin.

148 HELLENISTIC RELIGION A study of religion in the Mediterranean area during the period from the second century B.C. through the second century A.D. *Prerequisite:* six hours in religion; sophomore standing. Three hours. Mr. Martin.

151 MODES OF CHRISTIAN EXPRESSION I A study of the teaching, rites, art and piety of Eastern Orthodox and Roman Catholic Christianity. *Prerequisite:* six hours in religion. Three hours. Mr. Yarian.

152 MODES OF CHRISTIAN EXPRESSION II A study of Protestant Christianity focusing on its orientation to the Word and its responses to developments formative of modern Western culture. *Prerequisite:* six hours in religion. Three hours. Mr. Yarian.

156 RELIGION IN AMERICA A study of the relationship between religion, the cultural ethos, and individual self-understanding in America. *Prerequisite:* six hours in religion, including Religion 22. Three hours. Mr. Martin.

161 STUDIES IN THE HINDU TRADITION Selected writings, rituals, and developments in the Hindu tradition with reference to cultural assumptions of India. *Prerequisite:* Religion 21; sophomore standing. Three hours. Mr. Gussner.

166 STUDIES IN THE BUDDHIST TRADITION Selected texts, disciplines, and doctrinal developments in Indian, Tibetan, and Chinese Buddhism. *Prerequisite:* six hours in religion, including Religion 21; sophomore standing. Three hours. Messrs. Gussner and Andrews.

171, 172 JAPANESE RELIGION The religion of shrine and temple, of Shinto and Buddhism, and their interaction with the rich folk traditions of Japan. *Prerequisite:* six hours in religion, including Religion 21; sophomore standing. Three hours. Mr. Andrews.

175 CHINESE RELIGION AND THOUGHT A survey of the religious and philosophical traditions and movements of premodern China. *Prerequisite:* six hours in religion or philosophy, including Religion 21 or Phil. 21; sophomore standing. Three hours. Mr. Andrews.

181 'PRIMITIVE' RELIGIONS A study of the religiousness of man in smallscale hunting and planting societies, and its external expressions, with reference to anthropological, sociological, and psychological contributions to the subject. *Prerequisite:* six hours in religion, or three hours in religion and three in anthropology; sophomore standing. Three hours. Mr. Gussner.

182 STUDIES IN FOLK RELIGION A study of folk tales, fairy tales, folk cults and festivals, folk deities, ogres, demons and "little people," in various cultures, and their relationship to the great traditions. *Prerequisite:* six hours in religion; sophomore standing. Three hours. Mr. Brenneman.

187 RELIGION AND SECULAR CULTURE The effects of modern culture on religion, and the emergence of new forms of religious life and expression. *Prerequisite:* six hours in religion; junior standing. Three hours. Mr. Paden.

193, 194 College Honors

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

201 SENIOR SEMINAR: CREATIVE HERMENEUTICS Workshop in theory and method incorporating current developments in the field. *Prerequisites:* twelve hours in religion including religion 71; senior standing. Three hours. Staff

281, 282 PROBLEMS IN THE HISTORY AND PHENOMENOLOGY OF RELIGION Topics of current concern to historians of religions. *Prerequisite:* nine hours in religion; junior standing. Three hours. Staff.

297, 298 INTERDISCIPLINARY SEMINAR Student-faculty workshop on a topic of current interest, employing resources from various disciplines. *Prerequisite:* nine hours in religion; junior standing, and permission of the instructor. Three hours. Staff.

Resource Economics

COLLEGE OF AGRICULTURE

Professors Sinclair (Acting Chairman), Sargent, Tremblay, and Webster; Associate Professor Fife; Assistant Professors Gilbert, and Schmidt; Adjunct Professor Houghaboom; Adjunct Associate Professor Eddy; and Adjunct Assistant Professors Bevins and Bigalow.

2 WORLD FOOD AND POPULATION Agricultural development with emphasis on natural and economic phenomena and the effect of food supplies on population trends and policies. Three hours. Mr. Tremblay.

51 AGRICULTURAL FINANCE Capital requirements of agriculture, financial problems of farmers, types and sources of credit, policies and practices of lending institutions. Alternate years, 1974-75. Three hours. Mr. Sinclair.

61 PRINCIPLES OF AGRICULTURAL AND RESOURCE ECONOMICS Introduction to principles of economics through the analysis of problems of agricultural production and resource development. Three hours. Mr. Sinclair. hours. Mr. Sinclair.

75 PARTICIPATION IN RECREATION MANAGEMENT (see page 239).

121 RESOURCE ECONOMICS (see page 238).

166 SMALL BUSINESS MANAGEMENT Theoretical and practical considerations in organizing and operating small businesses. Emphasis on financing, accounting, budgeting, investment analysis, and tax management. *Prerequisite:* sophomore standing. Three hours. Mr. Fife.

197, 198 SENIOR RESEARCH Work on a research problem under the direction of a staff member. Findings submitted in written form as prescribed by the department. *Prerequisite:* senior standing. Three hours. Staff.

201 FARM BUSINESS MANAGEMENT Organization and operation of successful farm businesses with emphasis on resource allocation, production efficiency, and marginal analysis. Field trips required. *Prerequisites:* economics 11, 12, or resource economics 61; junior standing. Three hours. Mr. Tremblay.

205 RURAL COMMUNITIES AND MODERN SOCIETY

207 MARKETS, FOOD, AND CONSUMERS Market structure, prices, and economic forces involved in the movement of farm products from producers to consumers. *Prerequisite:* economics 11, 12, or resource economics 61. Three hours. Mr. Webster.

208 AGRICULTURAL POLICY History and institutional development of agricultural policy. Price and income problems of American agriculture and alternative solutions. *Prerequisite:* economics 11, 12, or resource economics 61. Alternate years, 1974-75. Three hours. Mr. Sinclair.

218 COMMUNITY ORGANIZATION AND DEVELOPMENT

222 NATURAL RESOURCE EVALUATION

224 Environmental Policy (see page 239).

225 ECONOMICS OF OUTDOOR RECREATION (see page 239).

233 REGIONAL PLANNING (see page 239).

235 LEGAL ASPECTS OF PLANNING AND ZONING

254 ADVANCED AGRICULTURAL ECONOMICS Theories of supply and demand analysis, price determination, market structure, and income distribution in competitive and imperfectly competitive markets. *Prerequisites:* twelve hours in resource economics and/or economics, and permission of instructor. Three hours. Mr. Sinclair.

255, 256 SPECIAL TOPICS IN RESOURCE ECONOMICS Readings and discussion of selected topics in economics at an advanced level. *Prerequisite:* departmental permission. Credit as arranged. Staff.

266 ECONOMICS OF MANAGERIAL DECISIONS Applying economic concepts to problems of capital budgeting, tax planning, pricing, demand analysis, and discounting cash flows. Cases. *Prerequisite:* economics 11, 12, or equivalent. Three hours. Mr. Fife.

Romance Languages

COLLEGE OF ARTS AND SCIENCES

Professor Weiger; Associate Professors Kohler, Julow (Chairman), and Ugalde; Assistant Professors Rivard, Wesseling, Whatley, Whitebook, Wiley and Zarate; Instructors Carrard, Crichfield, Geno, Murad, Nunez-de-Cela.

French and Spanish language and literature courses are listed separately below by title' and number. The language sequences are designed specifically to train students in the four skills of speaking, comprehension, reading, and writing. The total sequence in each language represents a continuum into which a student with previous experience in the language will be placed according to his level of achievement, regardless of how many or how few years he may have studied it. For placement in advanced language courses (100 or above), first-year students should consult with this department. Those who have already taken courses here should simply follow the levels represented by the number sequences, 1-99, 100-199, etc. For convenience, we offer the following guidelines for placement in elementary

and intermediate; in all cases of doubt students should seek the advice of this department:

ELEMENTARY LANGUAGE: no previous study or less than two years of high school language.

INTERMEDIATE GRAMMAR: two to three years.

INTERMEDIATE READING AND CONVERSATION: three or more years.

Course titles and numbers:

French Language

1-2 ELEMENTARY Eight hours.

19 INTERMEDIATE GRAMMAR Four hours.

51, 52 INTERMEDIATE READING AND CONVERSATION Three hours (each course).

119 ADVANCED GRAMMAR Three hours.

121, 122 COMPOSITION AND CONVERSATION Three hours (each course).

223, 224 Advanced Composition and Conversation Three hours (each course).

233, 234 EXPLICATION DE TEXTES, STYLISTICS Three hours (each course).

Spanish Language

1-2 ELEMENTARY Eighthours.

19 INTERMEDIATE GRAMMAR Four hours.

51, 52 INTERMEDIATE READING AND CONVERSATION Three hours. (each course)

119 Advanced Grammar Three hours.

121, 122 COMPOSITION AND CONVERSATION Three hours. (each course)

223, 224 Advanced Composition and Conversation Three hours. (each course)

Literature Courses in French and Spanish

As the language courses offer a continuum for the learning of the four skills, the literature courses provide a sequential study of the development of French and Spanish literatures from the Middle Ages to the present. In addition, they offer both practice and continued training in the four language skills. While the literature courses are divided into centuries, with subcategories of genres, themes, and individual authors, it is not essential to adhere strictly to chronological order. In general, a one-hundred level literature course or its equivalent is the pre-requisite for all other literature courses; exceptions are regularly made with the approval of the department. Questions about the precise content of any literature course should be referred to the instructor listed for the course or to the department chairman.

Course titles and numbers:

ROMANCE LANGUAGES

French Literature

151, 152 MASTERWORKS Prerequisite: Intermediate French or equivalent. Three hours. (each course). Mr. Daggett and Staff.

193, 194 College Honors

195, 196 SPECIAL TOPICS

197, 198 READINGS AND RESEARCH

251 MEDIEVAL Three hours. Mrs. Whitebook. Alternate years, 1974-75.

256 16th CENTURY Three hours. Miss Wiley. Alternate years, 1974-75.

261 THE BAROQUE AGE 1600-1650. Three hours. Staff. Alternate years, 1974-75.

262 17th CENTURY 1650-1700. Three hours. Mr. Julow. Alternate years, 1974-75.

267, 268 18th CENTURY Three hours. (each course). Mrs. Whatley. Alternate years, 1973-74.

271, 272 19th CENTURY POETRY Three hours. (each course). Mr. Crichfield and Staff. Alternate years, 1973-74.

273, 274 19th CENTURY NOVEL Three hours. (each course). Mr. Crichfield, Mr. Julow. Alternate years, 1973-74.

275 19th CENTURY THEATER Three hours. Staff. Alternate years, 1973-74.

281 20th CENTURY POETRY Three hours. Mr. Carrard. Alternate years, 1974-75.

283, 284 20th CENTURY NOVEL Three hours. (each course). Mr. Rivard.

285, 286 20th CENTURY THEATER Three hours. (each course). Mr. Geno and Staff. Alternate years, 1974-75.

287, 288 FRENCH-CANADIAN LITERATURE Three hours. (each course). Mr. Rivard.

291 SENIOR SEMINAR Special readings and research. Required of all senior majors. Two hours. Staff.

Spanish Literature

151, 152 MASTERWORKS OF SPAIN *Prerequisite:* Intermediate Spanish or equivalent. Three hours. (each course). Mr. Wesseling. Alternate years 1974-75.

161 READINGS IN SPANISH AMERICAN LITERATURE: 19th CENTURY Prerequisite: Intermediate Spanish or equivalent. Three hours. Mr. Zárate. Alternate years, 1973-74.

162 READINGS IN SPANISH AMERICAN LITERATURE: 20th CENTURY Prerequisite: Intermediate Spanish or equivalent. Three hours. Mr. Zárate.

193, 194 College Honors

195, 196 Special Topics.

197, 198 READINGS AND REASEARCH

261, 262 GOLDEN AGE Three hours. (each course). Mr. Núñez-de-Cela. Alternate years, 1974-75.

263, 264 CERVANTES Three hours, (each course). Mr. Núñez-de-Cela. Alternate years, 1973-74.

271, 272 SPANISH-AMERICAN LITERATURE OF SOCIAL PROTEST Three hours. (each course). Mr. Zárate. Alternate years, 1974-75.

281 19th CENTURY Three hours. Mr. Ugalde. Alternate years, 1973-74.

282 20th CENTURY Three hours. Mr. Ugalde. Alternate years, 1973-74.

291 SENIOR SEMINAR Special readings and research. Required of all senior majors. Two hours. Staff.

The following extra-departmental course may be taken for credit toward a

major in the Department of Romance Languages: LINGUISTICS 101, 102 An introductory course designed to acquaint the student with the methods and theory of systematic observation and explanation of

language phenomena (linguistics.) *Prerequisite:* 101 for 102. Three hours.

FOR GRADUATE COURSES (300 LEVEL), PLEASE SEE GRADUATE COLLEGE BULLETIN.

Russian and Serbo-Croatian

COLLEGE OF ARTS AND SCIENCES

Professor Paganuzzi; Assistant Professor Nalibow

1-2 ELEMENTARY RUSSIAN Four hours each course. Staff.

11, 12 INTERMEDIATE RUSSIAN Prerequisite: 1-2. Three hours each course. Staff.

101, 102 INTRODUCTION TO RUSSIAN LITERATURE Outstanding authors of the 19th and 20th centuries from Pushkin to Pasternak and Solzhenitsyn. Oral discussion of readings, written practice. *Prerequisite:* 11, 12. Three hours each course. Paganuzzi.

103, 104 ADVANCED RUSSIAN Introduction to the history of Russian culture including Russian secular and ecclesiastical painting, architecture and music from the earliest periods to the present. *Prerequisite:* 101, 102. Three hours each course. Paganuzzi.

193, 194 College Honors

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

271, 272 SEMINAR IN SLAVIC LINGUISTICS Course 271, the linguistic prehistory of Slavic and the study of Old Church Slavic. Course 272, history of the Russian language. Three hours each course. Nalibow.

281, 282 SENIOR SEMINAR Required of all senior concentrators. Three hours each course. Paganuzzi.

Serbo-Croation

1-2 ELEMENTARY SERBO-CROATIAN Three hours each course. Staff.

11, 12 INTERMEDIATE SERBO-CROATIAN *Prerequisite:* Serbo-Croatian 1-2. Three hours each course. Staff.

General Literature

81 RUSSIAN LITERATURE IN TRANSLATION Nalibow. (See Extra-departmental Courses)

82 SOVIET LITERATURE IN TRANSLATION Nalibow. (See Extra-departmental Courses)

Professors Lewis, Mabry (Community Medicine), Sampson (Chairman); Associate Professors Finney, Folta, Stanfield, Steffenhagen; Assistant Professors Deck (Nursing), Nixon, Schmidt; Instructors Bradshaw, Fishman, Godfrey. Polich. Courses numbered 100 to 199 generally require either Sociology 10 or sopho-

Sociology

LLEGE OF ARTS AND SCIENCES

more standing, but may be open to freshmen by permission of the instructor. Courses numbered 200 to 299 generally require six hours of sociology. Sociology 100 will be required as a prerequisite for 200 level courses effective in the spring semester of 1975.

10 INTRODUCTION TO SOCIOLOGY Fundamental principles and problems in the sociological analysis of the structure and dynamics of modern society. Three hours. Staff.

100 FUNDAMENTALS OF SOCIAL RESEARCH Introduction to theory and research methods in sociology. Includes examination of basic problems in research design, measurement, data collection, data analysis and the presentation and interpretation of research findings. *Prerequisite:* Three hours of sociology. Three hours. Mr. Polich.

101 SOCIAL PROBLEMS Analysis of a selected number of major social problems in contemporary society. Three hours. Staff.

102 POPULATION, ENVIRONMENT AND SOCIETY Analysis of the consequences of the varying relationships among population size, social organization, technology and resource base. *Prerequisite:* three hours of sociology. Three hours. Mr. Godfrey.

105 THE COMMUNITY Analysis of the structure and dynamics of communities. Emphasis on American communities. *Prerequisite:* 10. Three hours. Mr. Lewis, Mr. Mabry amd Mr. Schmidt.

109 THE SELF AND SOCIAL INTERACTION Analysis of the social nature of human personality. Special emphasis will be given to the roles of social interaction and language in the formation and structure of the self, socialization as a continuous process throughout the life-cycle, and the impact on individual atti-

tudes and behavior of social stimulus situations. Three hours. Ms. Deck and Ms. Folta. Alternate years, 1974-75.

114 DEVIANCE AND SOCIAL CONTROL Analysis of social behavior that violates norms and the range of reactions to such behavior. Special attention will be given to the examination of the causes and consequences of deviance in social organization, the process of becoming a deviant, the structure of the deviant's world, and the forms of deviance control. Three hours. Ms. Fishman, Ms. Folta and Mr. Stanfield.

119 MINORITY GROUPS Analysis of the causes and consequences of the subordination of ethnic, racial, and religious groups in society. Special attention will be given to an examination of group prejudice and discrimination, minority group member's worlds and their relationships with dominant groups and the institutions of society. Three hours. Ms. Fishman and Mr. Polich.

122 WOMEN AND SOCIETY Analysis of the changing roles of women in modern society. Special attention will be given to changes in sex role differentiation and dedifferentiation, female socialization and opportunity and their consequences for major institutions in modern society. Three hours. Ms. Deck, Ms. Folta, Ms. Fishman and Mr. Lewis.

125 ALIENATION OF MAN IN MODERN SOCIETY An examination of the nature and sources of social alienation of man in modern industrial society. Special attention will be given to the effects of the social organization of work, bureaucracy, urbanization and mass culture in the United States. Three hours. Mr. Bradshaw and Mr. Steffenhagen.

129 THE FAMILY Analysis of the family as a social institution. Emphasis on the forms of the American family in crosscultural perspective. *Prerequisite*: 10. Three hours. Mr. Lewis and Mr. Mabry.

132 AFFLUENCE AND POVERTY IN MODERN SOCIRTY An examination of the structure of social inequality in contemporary America. Special attention will be given to the distribution of wealth in the United States and its association with power, prestige and opportunity. Three hours. Mr. Finney, Mr. Mabry, Mr. Nixon and Mr. Schmidt. Alternate years, 1974-75.

144 SOCIOLOGY OF EDUCATION Analysis of the social organization of educational roles and associations in modern society. Special attention will be given to an examination of the changing structure of the educational institution and its relationship to other institutions in society. Three hours. Mr. Bradshaw and Mr. Nixon.

151 RELIGIOUS DEVIANCE, MAGIC AND THE OCCULT Analysis of the social and cultural organization of groups professing spiritual, occult, mystical and/or magical beliefs and their relationship to the major social institutions of society. Three hours. Mr. Steffenhagen. Alternate years. 1973-74.

154 SOCIAL ORGANIZATION OF DEATH AND DYING Comparative examination of the nature of cultural and social adaptations to mortality in society. Special attention will be given to the ways in which family, medical, legal, religious and economic institutions respond to the fatally ill and dead in contemporary society. Three hours. Ms. Folta.

157 DRUGS AND SOCIETY Analysis of the nature of drug use and abuse in society. Special attention will be given to an examination of the social, cultural, psychological, legal amd medical aspects of drug taking and its causes and con-

sequences in contemporary society. Three hours. Ms. Fishman and Mr. Steffenhagen.

161 SOCIOLOGY OF LEISURE Analysis of the types and social organization of non-work activity in society. Special attention will be given to the examination of the relationships of life style, social class factors, education and work to recreation and leisure use patterns in modern society. Three hours. Mr. Bradshaw.

163 SOCIOLOGY OF SPORT Analysis of the types and social organization of amateur and professional athletics in society. Special attention will be given to the social origins of athletes, the structure and dynamics of athletic groups and their fans, and the relationship of sports to the major institutions of modern society. Three hours. Mr. Nixon.

165 THE SOCIAL STRUCTURE OF THE UNITED STATES I Examination of the major institutional structures and processes of contemporary American society. Special attention will be given to the analysis of the changing ecological and demographic bases, age and sex roles, and the kinship, stratification and economic institutions in the United States. May be taken independently of 166. Three hours. Mr. Sampson and Mr. Schmidt. Alternate years, 1973-74.

166 THE SOCIAL STRUCTURE OF THE UNITED STATES II Examination of the major institutional structures and processes of contemporary American society. Special attention will be given to the changing role of bureaucracy; the political, educational, scientific, religious and medical institutions; ethnic and race relations; and socio-cultural modes of integration, conflict and deviation and change in the United States. May be taken independently of 165. Three hours. Mr. Sampson and Mr. Schmidt. Alternate years, 1973-74.

193, 194 COLLEGE HONORS

195, 196 Special Topics

197, 198 READINGS AND RESEARCH

202 POPULATION DYNAMICS Analysis of the factors affecting human population growth and distribution, migration patterns, and the relationship between economic activity and population trends. *Prerequisite:* six hours of sociology or 10 and an introductory in biology, economics, geography or zoology. Three hours. Mr. Godfrey.

203 HUMAN ECOLOGY Analysis of the relationships between forms of social organization and their environments. Special attention will be given to the causes and consequences of the differential location of socio-economic, racial and cultural groups and the major institutional facilities of society in contemporary urban communities. Three hours. Mr. Godfrey and Mr. Mabry.

205 RURAL COMMUNITIES IN MODERN SOCIETY The changing structure and dynamics of rural social organization in the context of modernization, and urbanization. Emphasis on rural communities in America. Three hours. Mr. Finney amd Mr. Schmidt.

206 URBAN COMMUNITIES IN MODERN SOCIETY The changing structure and dynamics of urban social organization in the context of modernization and urbanization. Emphasis upon cities and metropolitan areas in America. Three hours. Mr. Godfrey and Mr. Lewis.

207 COMMUNITY ORGANIZATION AND DEVELOPMENT Community as a changing complex of organization within modern society. Special attention will

be given to problems of the formulation and implementation of alternative change strategies. Three hours. Mr. Schmidt.

209 SMALL GROUPS An examination of the structure and dynamics of interpersonal relations and informal interactions in small groups. Three hours. Ms. Deck, Mr. Nixon and Mr. Steffenhagen.

210 COLLECTIVE BEHAVIOR Analysis of the nature and types of emergent, non-institutional behavior, especially responses to shared stressful or crisis situations. Includes the examination, social origins, development and consequences of crowd, riot, disaster and craze behavior. Three hours. Mr. Finney and Mr. Stanfield. Alternate years, 1974-75.

211 SOCIAL MOVEMENTS Analysis of the nature and types of relatively organized collective action to promote social or cultural change. Special attention will be given to the genesis, structure and social consequences of political and religious movements. Three hours. Mr. Finney, Ms. Folta and Mr. Stanfield.

212 CULTURE AND PERSONALITY The cross-cultural comparison of personality development; the problem of delineating modal personality types. *Prerequisite:* 10, Anthropology 21 and one 100 level course in sociology or anthropology. Three hours. Mr. Mabry, Mr. Magnarella (Anthropology), and Mr. Steffenhagen. (Cross-listed in anthropology).

214 DELINQUENCY Analysis of the nature and types of juvenile behavior that violates law, the mechanisms for defining such behavior as delinquent, and the relationships between delinquency and the social situations of juvenile offenders. Three hours. Ms. Fishman.

215 CRIME Analysis of the nature and types of adult behavior that violates law, the mechanism for defining such behavior as criminal, and the relationships between crime and the social situation of adult offenders. Three hours. Ms. Fishman, Ms. Folta and Mr. Stanfield.

216 CRIMINAL JUSTICE Analysis of the social structures and processes involved in the specification of behavior as being legally deviant and the labeling of individuals as delinquent or criminal offenders. Criminal law, its enforcement and the courts. Three hours. Ms. Folta and Mr. Stanfield.

217 CORRECTIONS Analysis of the social structures and processes involved in dealing with individuals who have been designated as offenders of criminal law. Probation, prison, parole, programs of prevention and rehabilitation. Three hours. Ms. Fishman and Mr. Stanfield.

219 RACE RELATIONS Examination of racial subordination in social and historical context. Special attention will be given to the analysis of the forms of interracial contact, racial sub-cultures and social structures, social psychological and protest responses to racial prejudice and discrimination. Emphasis on American experience. Three hours, Ms. Fishman.

225 COMPLEX ORGANIZATIONS Analysis of the structure and dynamics of large, formal organizations. Special attention will be given to the analysis of the forms of complex organization and their external relationships, and the role of bureaucracy in contemporary society. Three hours. Mr. Finney, Mr. Nixon and Mr. Sampson.

226 SMALL GROUPS IN COMPLEX ORGANIZATION Analysis of the emergence, structure and consequences of informal interaction in large, formal organizations. Special attention will be given to the reciprocal effects of small groups

and their complex organizational environments. Three hours. Mr. Nixon and Mr. Steffenhagen. Alternate years, 1974-75.

230 SOCIAL VALUE PATTERNS IN AMERICAN FAMILY LIFE A detailed examination of both the similarities and differences in social value patterns characteristic of the different segments of American family life and the relation of each to the larger American society. Attention will be given to both continuity and change in value patterns, including radical alternatives, and their significance for future developments in the family and society. Three hours. Mr. Lewis. Alternate years, 1974-75.

232 SOCIAL STRATIFICATION Comparative analysis of the social causes, structures and consequences of the differential ranking of individuals and groups in society. Special attention will be given to the criteria for social ranking, their measurement and association and intergenerational social mobility. Three hours. Mr. Finney, Mr. Lewis, Mr. Nixon and Mr. Schmidt.

237 OCCUPATIONS AND PROFESSIONS Analysis of the social organization of economic roles and associations in industrial society. Special attention will be given to an examination of the impact of the structure of work on the individual and the relationship of occupations and professions to other institutions in society. Three hours. Mr. Bradshaw and Mr. Mabry. Alternate years, 1974-75.

239 COOPERATIVES AND COOPERATIVE COMMUNITIES Analysis of the structure and dynamics of cooperatives as a distinctive form of complex organization in society. Special emphasis will be given to the analysis of problems associated with the development, organization and maintenance of cooperatives among the poor in developed and underdeveloped societies. Three hours. Mr. Finney.

240 POLITICAL SOCIOLOGY Analysis of the social organization of political roles and associations in modern society. Special attention will be given to an examination of the changing structure of the political institution and its relationship to other institutions in society. Three hours. Mr. Nixon and Mr. Polich.

241 PUBLIC OPINION Analysis of the factors affecting social attitude formation and change. Special attention will be given to political and social ideology. Three hours. Mr. Polich. Alternate years, 1974-75.

246 BUREAUCRACY IN EDUCATION Analysis of the formal organizational aspects of educational institutions. Special attention is given to the structure and dynamics of schools and colleges as organizations, their authority systems and relationships to other organizations and institutions of society. Three hours. Mr. Bradshaw.

249 SOCIOLOGY OF KNOWLEDGE Reviews the development and present state of sociological theory and research on the emergence and role of belief and normative systems in society. Special attention will be given to systematic attempts to understand the causes and consequences of shared constructions of social reality. Three hours. Mr. Sampson. Alternate years, 1974-75.

251 SOCIOLOGY OF RELIGION Analysis of the social organization of religious roles and associations in modern society. Special attention will be given to the changing structure of the religious institution and its relationship to other institutions in society. Three hours. Mr. Sampson. Alternate years, 1974-75.

254 SOCIOLOGY OF HEALTH AND MEDICINE The socio-cultural environment

of physical well-being and illness. Special attention will be given to the role of socio-cultural factors in the etiology, identification, definition and treatment of illness in society. Three hours. Ms. Deck, Ms. Folta, Mr. Mabry and Mr. Steffenhagen. Alternate years, 1973-74.

255 SOCIOLOGY OF MENTAL HEALTH The socio-cultural environment of mental well-being and illness. Special attention will be given to the role of socio-cultural factors in the etiology, identification, definition and treatment of mental illness in society. Three hours. Ms. Deck, Ms. Folta, Mr. Mabry and Mr. Steffenhagen. Alternate years, 1973-74.

258 SOCIOLOGY OF LAW Analysis of the social organization of legal roles and associations in modern society. Special attention will be given to the changing structure of the legal institution and its relationship to other institutions in society. Three hours. Mr. Stanfield. Alternate years, 1974-75.

273 METHODOLOGY OF SOCIAL RESEARCH Basic issues in the construction and empirical testing of sociological descriptions, predictions and explanations. Consideration will be given to the philosophy and logic of social research and the socio-cultural nature of scientific inquiry; theoretical frames of reference; concept formation, measurement and validation; socio-cultural causation and measures of association; models, theories and verification; and the formalization of theories. Three hours. Mr. Godfrey, Mr. Polich and Mr. Sampson. Alternate years, 1973-74.

274 METHODS OF DATA GATHERING IN SOCIAL RESEARCH An examination of the methods available for studying social phenomena including laboratory and field experiments, observational techniques, social surveys, content analysis, cross-cultural comparisons and others. Basic problems in research design, sampling methods, and measurement and scaling will be investigated. Three hours. Mr. Mabry, Mr. Polich and Mr. Schmidt. Alternate years, 1974-75.

275 METHODS OF DATA ANALYSIS IN SOCIAL RESEARCH An examination of approaches to the quantitative analysis of sociological data, including table analysis, regression and path analysis, scaling and factor analysis, and the analysis of variance with emphasis on the multivariate techniques. Three hours. Mr. Polich.

278 THE DEVELOPMENT OF SOCIOLOGICAL THEORY An examination of the major classical traditions in social theory and their contemporary research relevance. Detailed critical attention will be given, but not necessarily confined to, the theoretical and methodological contributions of Marx, Durkheim and Weber. Three hours. Mr. Sampson and Mr. Schmidt.

279 CONTEMPORARY SOCIOLOGICAL THEORY A detailed examination of selected major theoretical approaches and issues in modern sociology. Three hours. Mr. Sampson, Mr. Schmidt and Mr. Stanfield.

281, 282 SEMINAR Presentation and discussion of advanced problems in contemporary sociological analysis. *Prerequisite:* twelve hours in sociology and permission of the department. Three hours. Staff.

288, 289 SEMINAR: RESEARCH AND METHODS OF TEACHING SOCIOLOGY The development and evaluation of teaching strategies in sociology. Open only to graduate students and advanced undergraduate sociology majors who are serving concurrently as teaching assistants in the Department. *Prerequisite:* twelve hours in sociology and permission of the department. Three hours. Staff.

295, 296 SPECIAL TOPICS297, 298 READINGS AND RESEARCH

Technology

COLLEGE OF ENGINEERING, MATHEMATICS AND BUSINESS ADMINISTRATION

The College of Engineering, Mathematics and Business Administration offers the following courses on a non-departmental basis.

1 ENGINEERING DESIGN CONCEPTS (4-0) See course description under Extra-Departmental Courses, page 201.

2 ENGINEERING DESIGN COMMUNICATION (1-6) See course description under Extra-Departmental Courses, page 202.

7 MAN'S PLACE IN THE UNIVERSE (1-0) Philosophy has been, over the years, mainly concerned with the problems of understanding man; his activities, his beliefs, his relationship to his fellows and his significance in the larger universe. This course endeavors to integrate and interpret existing scientific data to make comprehensible these areas of human concern. The guiding principle is that all life must conform to the requirements of Darwin's Theory of Natural Selection and be consistent with the world's known evolutionary history. Topics include: theories of the development of the universe, nature's technique of design-bychance, a scientific critique of religion and philosophy, the evolutionary basis of human and animal psychology and behavior, the genetic code and double-helix, the survival benefits of the religious impulse. The course will be presented in nontechnical language for persons interested in practical philosophy. One hour. Mr. Rush.

51 TECHNOLOGY AND SOCIETY (3-0) An examination of the effects of modern technology on society. Non-technological views as well as those of engineers and scientists are presented. Readings from the current literature. Group study projects. *Prerequisite:* Sophomore standing. Three hours.

52 TECHNOLOGY AND THE ENVIRONMENT (3-0) Practical information on solving environmental problems with emphasis on pollution. Inter-relationships and control of land, air, and water environments. Lectures supplemented by discussion and field trips. *Prerequisite:* One semester of college chemistry or permission of the instructor. Three hours.

53 ENERGY AND THE ENVIRONMENT (3-0) Physical principles underlying various energy conversion devices for the generation of electricity. Hydroelectric, fossil fuel and atomic power plants. Direct energy conversion: photoelectric, fuel cell, and magnetohydrodynamic devices. Present and future availability of fuels, their costs, and the environmental impact of various sources of power. Three hours.

54 OUR ELECTRONIC WORLD (3-0) Fundamentals of common electronic systems including telephone, radio, television, phonograph, magnetic tape recorder, and controls. Qualitative discussion of theory and practice and live demonstrations of basic principles. *Prerequisite:* High School Algebra. Three hours. Mr. Roth.

251 TECHNOLOGY AND SOCIETY SEMINAR (3-0) Current views on the influence of technology on society through extensive study of contemporary writings and involvement in seminars, discussion and project assignments. *Prerequisite:* Either Tech 51 or permission of the instructor and Senior or Graduate standing. Three hours.

Vocational Education and Technology

COLLEGE OF AGRICULTURE

Professor Schneider; Professor Fuller (Chairman); Associate Professor Kelly; Assistant Professor Bloom; Instructor Hull. Adjunct Faculty: Associate Professor Bornstein; Assistant Professors Halloran, Kisko, Moore; Instructor Kumble.

General

5 INTRODUCTORY AGRICULTURAL ENGINEERING (2-2) Introduction to building, wiring, water supply, sewage disposal, soil and water engineering, mechanical principles, and engines for residential, recreational and farm use with environmental considerations. Not for credit for B.S.A.E. degree candidates. Three hours. Mr. Schneider.

102 GENERAL SHOP (0-6) Wood and metal working by hand and machine, sheet metal, welding, rope, and tool fitting. Shop layout, selection of equipment. *Prerequisite:* sophomore standing. Three hours. Mr. Schneider.

104 LEADERSHIP PREPARATION Group and independent study and practice of methods for teachers, officers, administrators and group members to increase their leadership ability. *Prerequisite*: Junior standing or departmental permission. Three hours. Alternate years, 1974-75.

106 UNDERSTANDING THE MENTALLY RETARDED Survey of nature and needs of the mentally retarded. Field trips to, and discussions with personnel from, agencies and institutions serving the handicapped. Variable credit: 1 hour for field trips, 2 hours for lectures and discussions, 3 hours for combination. Mr. Hull.

112 EXTENSION AND COMMUNITY EDUCATION Introduction to community educational programs and techniques. Includes field trips and independent study. *Prerequisite:* sophomore standing. Two hours. Mr. Kelly.

152 INTRODUCTION TO CAREER ORIENTED EDUCATION Orientation to career education, and principles and philosophy of occupational and practical arts education. Includes field trips and independent study. *Prerequisite:* sophomore standing. Three hours. Mr. Fuller.

156 DEVELOPING INSTRUCTIONAL MATERIALS FOR TEACHING For students who will have educational program responsibilities in business, government, or schools. Materials will be prepared for auto-tutorial devices, audio-visual presentations, and other teaching techniques. *Prerequisite:* sophomore standing. Three hours. Mr. Kelly.

253 TEACHING ADULTS Problems related to organizing and planning adult education programs for schools, community organizations, government agencies or business. Techniques for teaching adults will be analyzed. *Prerequisite:* senior standing. Three hours. Mr. Kelly. 273 TECHNICAL REPORTING Communication of information through research and technical reports and professional articles for scientists, engineers and economists. Three hours. Mrs. Kumble, Mr. Spaven.

Applied Technology and Agricultural Engineering

121 SOIL AND WATER MANAGEMENT (2-2) Analysis of agricultural, recreational, and other rural soil and water problems; design and application of conservation practices for environmental protection. *Prerequisite:* plant and soil science 61; civil engineering 12 desirable. Three hours. Mr. Bornstein.

131 RESIDENTIAL, RECREATIONAL AND AGRICULTURAL BUILDINGS (2-2) Site planning, building planning, material selection. Functional and structural considerations including heating, ventilation and insulation. Consideration of environmental relationships. *Prerequisite:* sophomore standing. Three hours. Alternate years, 1973-74. Mr. Moore.

140 POWER AND MACHINERY FOR AGRICULTURE (2-2) The principles of operation and maintenance of engines, tractors and agricultural field and farmstead machinery. *Prerequisite:* physics 6. Three hours. Alternate years, 1973-74. Staff.

145 SOIL AND WATER ENGINEERING (2-2) Hydrologic, hydraulic, and agronomic principles; design and installation of drainage and irrigation systems, erosion control facilities, farm and small watershed flood control reservoirs, and other rural environmental protection practices. *Prerequisites:* plant and soil science 61, civil engineering 12. Three hours. Mr. Bornstein. Alternate years, 1975-76.

162 ELECTRICITY, WATER SYSTEMS, AND SEWAGE DISPOSAL IN RESIDENTIAL, RECREATIONAL AND AGRICULTURAL USE Wiring systems and applications of electricity, water sources and systems, sewage disposal for agriculture, residences, recreation, and rural development with environmental considerations. *Prerequisite:* sophomore standing. Three hours. Alternate years, 1974-75. Mr. Moore.

Occupational and Extension Education

150 TECHNICAL INTERNSHIP Planned, supervised, off-campus educational internship during summers and/or junior year. Technical theory plus practical application in field experiences. A student may enroll more than one time and accumulate up to 30 hours credit. *Prerequisite:* Departmental permission. Credit as arranged. Staff. I, II.

153-154 TEACHING INTERNSHIP IN OCCUPATIONAL EDUCATION Seminars for newly employed teachers of occupationally oriented subjects plus two consecutive semesters of supervised teaching. *Prerequisites:* Employment as a teacher, a teaching methods course or concurrent enrollment, and departmental permission. Four hours each. Staff.

155 TEACHING PRACTICUM IN OCCUPATIONAL EDUCATION Ten full weeks of supervised teaching in a high school or junior college; including two weeks during opening of school year. *Prerequisites:* 152, concurrent enrollment in 251; acceptance into teacher education program. Eight hours. Staff.

157 ORGANIZING AND MANAGING OCCUPATIONAL EDUCATION LABORATORIES Study of the vocational-technical laboratory as a teaching and learning environment. Includes: purchasing, inventory control, equipment placement, maintenance, and safety. Three hours. Mr. Kisko.

158 EVALUATING ACHIEVEMENT IN OCCUPATIONALLY ORIENTED EDUCATION Introduction to evaluation techniques for occupational and technical subjects. Includes: test construction, teacher-made tests, and statistical analysis of scores. *Prerequisite:* A teaching methods course or concurrent enrollment, or departmental permission. Three hours. Mr. Bloom.

159 DEVELOPING COURSES FOR OCCUPATIONAL EDUCATION Systematic development of course materials used in teaching occupationally oriented subjects. Includes: occupational analysis, performance objectives, course content, and supplementary instructional materials. *Prerequisite:* A teaching methods course or concurrent enrollment, or departmental permission. Three hours. Mr. Bloom.

251 METHODS FOR TEACHING OCCUPATIONALLY ORIENTED SUBJECTS Advanced teaching techniques combined with micro-teaching. Emphasis placed upon teaching and program management at high school or junior college level. *Prerequisite:* Concurrent enrollment in 153 or 155, or departmental permission. Three hours. Mr. Fuller, Mr. Bloom, Mr. Kisko.

282 SEMINAR Follow-up of teaching practicum. Required for all students completing 155, *Prerequisite*: 155, One hour, Staff.

Independent Study and Research

197 SPECIAL PROBLEMS Individual investigation of a problem selected to meet special needs of students. Students may enroll more than one time and accumulate up to six hours. *Prerequisite:* Departmental permission. Credit as arranged. Staff. I, II.

295 SPECIAL TOPICS Lectures, laboratories and/or readings and reports to provide background and specialized knowledge relating to contemporary areas of study. Students may enroll more than one time and accumulate up to nine hours. *Prerequisites:* senior standing, departmental premission. Credit as arranged. Staff. I, II.

Zoology

COLLEGE OF ARTS AND SCIENCES

Professors Glade (Chairman), Bell, Henson, Lochhead, Moody, Potash and Rothstein; Associate Professors Davison and Stevens; Assistant Professors Brammer, Keen, Landesman, and Woods.

Biology

1, 2 PRINCIPLES OF BIOLOGY (3-3) Introduction to the structure, functions, and evolution of animals and plants. Emphasis on concepts important for advanced study in a Life Science and for understanding the biological world of which man is a part. *Prerequisite:* 1 for 2. Four hours. Botany and Zoology staffs.

3 BIOLOGY AND MAN An introduction for nonscience majors. Selected biological processes relevant to man and his world, problems resulting from man's interaction with his environment such as overpopulation and environmental pollution, biological principles and concepts necessary for an understanding of these problems. *No prerequisite:* Three hours. Botany and Zoology staffs.¹

101 GENETICS Structural basis of inheritance; gene mutations; chromosomal aberrations; genes and enzymes; gene action in differentiation; genetics of populations; nonchromosomal inheritance. *Prerequisite:* 1, 2. Three hours. Staff.

102 ENVIRONMENTAL BIOLOGY (3-3) An ecological approach to the structure, dynamics, energetics, behavior, and evolution of organisms, populations, communities, and ecosystems. *Prerequisite:* 1, 2. Four hours. Mr. Keen.

103 CELL STRUCTURE AND FUNCTION (3-3) Structure and physiology of cells, with emphasis on basic features common to all forms of life. *Prerequisite:* 1, 2. Four hours. Mr. Landesman.

105 GENETICS LABORATORY (0-3) Illustration of concepts presented in Biology 101. *Prerequisites:* 101 or concurrent enrollment and permission of the instructor. One hour. Staff.

Zoology

5-6 HUMAN ANATOMY AND PHYSIOLOGY (2-2) Dissection of the cat, plus various vertebrate organs, with direct comparisons to corresponding structure in the human body; physiological experiments; microscopic study of tissues. Three hours. Mr. Brammer.²

104 COMPARATIVE STRUCTURE AND FUNCTION Anatomy and physiology of organs and organ systems in animals with emphasis on basic physiology common to all forms. *Prerequisite:* Biology 103. Four hours. Mr. Stevens.

193, 194 College Honors

195, 196 Special Topics

197, 198 UNDERGRADUATE RESEARCH Individual laboratory research under the guidance of a faculty member. Undergraduates who meet the academic requirements may enroll concurrently in College Honors. *Prerequisite:* junior or senior standing and departmental permission. Three hours or six hours.

201 CONTROL OF GROWTH AND DIFFERENTIATION Three hours. *Prerequisites:* Biology 101, 211, and Chemistry 131, 132. Mr. Davison. Alternate years, 1973-74.

203 POPULATION ECOLOGY Analysis of growth, regulation, and interrelations of biological populations in theoretical, laboratory, and natural systems. *Prerequisite:* Biology 102. Three hours. Mr. Keen.

- 1. Credit will not be given for both Biology 1 and Botany 4. Credit will not be given for both Biology 1, 2 and Biology 3. Botany and Zoology majors will not receive credit for Biology 3.
- 2. May be taken for credit in the College of Arts and Sciences but does not satisfy the requirement of a course in biology for premedical and predental students. Students will not receive credit for both this course and zoology 104.

ZOOLOGY

205 NATURAL HISTORY OF BIRDS AND MAMMALS (2-4) History, identification, evolution, ecology, behavior, zoogeography, conservation and aesthetics. *Prerequisite:* Biology 102 or 104. Four hours. Mr. Woods. Alternate years, 1974-75.

207 NATURAL HISTORY OF THE LOWER VERTEBRATES (3-3) Classification, ecology, behavior, evolution, and distribution of fish, amphibians, and reptiles. *Prerequisite:* 104. Four hours. Mr. Bell. Alternate years, 1974-75.

--208--GENERAL ENTOMOLOGY (2-4) --Morphology, physiology, and evolution of insects. *Prerequisite:* Biology 102 or Biology 103. Four hours. Mr. Bell. Alternate years, 1973-74.

209 FIELD ZOOLOGY (2-4) Collection and identification; study of local habitats, their nature, and adaptations to them; factors governing distribution methods of preparing study specimens. *Prerequisite:* Biology 102 or Biology 103. Four hours. Mr. Bell.

211 EMBRYOLOGY (2-4) Principles exemplified by typical invertebrate and vertebrate embryos. *Prerequisite*: 104. Four hours. Mr. Glade.

212 COMPARATIVE HISTOLOGY (2-4) Anatomy of tissues, chiefly vertebrate. Tissue similarities and specializations of organs among the various groups of animals in relation to function. *Prerequisite*: 104. Four hours. Mr. Glade.

216 HUMAN GENETICS Inheritance; population genetics; interaction of heredity and environment; application to human problems. *Prerequisite:* Biology 101. Three hours. Mr. Moody.

219 COMPARATIVE VERTEBRATE ANATOMY (2-4) Structure, function, and phylogeny; survey of evolutionary and functional trends; investigation of the structure of all chordate groups. *Prerequisite:* 104. Four hours. Mr. Woods.

220 MECHANISMS OF CELL DIVISION Fine structure and physiology of normal and abnormal cell division; emphasis on mechanisms. *Prerequisite:* Biology 103, a course in biochemistry, and the consent of the instructor. Three hours. Mr. Stevens. Alternate years, 1974-75.

222 EXPERIMENTAL EMBRYOLOGY (2-6) Theoretical approach based on research in embryology, genetics, physiology, bacteriology, and related fields. *Prerequisite:* 211 and departmental permission. Four hours. Mr. Glade. Alternate years, 1973-74.

223 BIOCHEMICAL EMBRYOLOGY Biochemical and structural differentiation of cells and tissues during oogenesis and embryogenesis. *Prerequisite:* 101, 211. A course in biochemistry is recommended. Three hours. Mr. Landesman. Alternate years, 1974-75.

225 ENVIRONMENTAL PHYSIOLOGY (2-4) Processes by which animals cope with moderate, changing, and extreme environments. *Prerequisite:* Biology 102 and 104. Four hours. Mr. Woods. Alternate years, 1973-74.

231 CELL PHYSIOLOGY (2-4) Experimental techniques used to elucidate chemical and physical mechanisms within living cells. *Prerequisite:* Biology 103, chemistry 131, 132, and departmental permission. Four hours. Mr. Rothstein.

236 LIMNOLOGY (2-4) The ecology of standing waters: the biota of lakes as related to the geological, physical, and chemical conditions of lakes. *Prerequisite:* Biology 102, Inorganic Chemistry, and junior standing. Four hours. Mr. Henson.

ZOOLOGY

237 ECOLOGY of RUNNING WATERS (2-4) Stream and river environments, adaptations of organisms to varying physical, chemical, and biotic conditions. *Prerequisite:* Biology 102, Inorganic Chemistry, and junior standing. Four hours. Mr. Potash.

240 INVERTEBRATE ECOLOGY OF THE MOUNTAINS An intensive study of the invertebrate fauna of Camel's Hump and vicinity. *Prerequisite:* Biology 102 or a course in invertebrate or insect taxonomy. Four hours. Mr. Bell.

250 INVERTEBRATE ZOOLOGY (2-4) Anatomy, physiology, and life histories of representatives of the more important phyla. *Prerequisite:* 104. Four hours. Mr. Lochhead.

251 INSECT STRUCTURE AND FUNCTION (3-3) Anatomy and physiology with emphasis upon growth, reproduction, and sensory physiology. *Prerequisite:* 104 or consent of instructor. Four hours. Mr. Brammer. Alternate years, 1974-75.

255 COMPARATIVE ANIMAL PHYSIOLOGY (2-6) General principles of function in invertebrates and vertebrates. *Prerequisite:* 104, departmental permission and Chemistry 131, 132. Four hours. II. Mr. Rothstein.

267 GENETICS OF DEVELOPMENT (2-4) Differentiation and morphogenesis from the viewpoint of gene action and biosynthesis; influence of hereditary material during ontogeny. *Prerequisite:* Biology 101, 104, and departmental permission. Four hours. Staff. Alternate years, 1974-75.

270 MODERN EVOLUTIONARY THEORY Contributions of modern research in genetics, systematics, distribution, experimental embryology, serology, and related fields to problems of evolutionary change. *Prerequisite:* Biology 101, (Biology 102 recommended). Three hours. Mr. Moody. Alternate years, 1973-74.

271 ADVANCED LIMNOLOGY Analyses of current concepts and problems. *Prerequisite*: 236. Four hours. Mr. Henson. Not offered 1973-74.

• 281 through 283 SEMINAR Review and discussion of current zoological research. Graduate students and seniors in zoological research programs are expected to enroll each semester. Without credit. Staff.

General Index

Absence from Semester Final Exams, 70 Academic Advisors, 70 Academic Calendar, 281 Academic Discipline, 62 Accounting, 107 Accreditation, 2 Admission, 51 Advanced Placement and Advanced Credit, 53 Agricultural Economics, 79 Agricultural Engineering and Applied Technology, 81 Agriculture, College of, 72 Allied Health, 144 Allied Health Sciences, School of, 121 Anatomy, 144 Animal Pathology, 74, 145 Animal Sciences, 75, 145 Animal Technology, 76 Anthropology, 147 Architectural Barrier Control, Applied Technology and Agricultural Engineering, 81 Area and International Studies, 149 Art. 150 Art Education, 95, 176 Arts and Sciences, College of, 82 Asian Studies Associates, List of, 24 Athletics, Recreation and Intramural Programs, 47 Attendance, 70 Auditing Courses, 67

Billings Center, 46 Biochemestry, 78, 153 Biological Science, 76 Biological Science, Core, 73 Biology, 154 Board Charges, 59 Board of Trustees, 4 Botany, 77, 153 Business Administration, 105, 156

Calendar, 282 Canadian Studies, 203 Carter Planning & Placement Service, 41 Center for Area Studies, 90 Chemistry, 107, 159, 201 Chinese Studies, 162 Civil Engineering, 110, 183 Class Organizations, 50 Classics, 162 Clothing, Textiles, and Design, 131, 215 College Entrance Examinations, 53 College Level Exam Program, 54 Communication and Theatre, 164 Computer Science, 188 Conferences and Institutes, 40, 142 Continuing Education, 141 Correspondence, 2 Counseling, 41 County Agents, 34 Courses of Instruction, 143-277 See entries by departments Credit by Examination, 54 Credit for Military Service, 55

Dairy Technology, 25 Dean's List, 68 Debating, 49 Degree Requirements, 69 Degree Student, 52 Dental Hygiene, 121, 168 Division of Health Sciences, 119 Doctoral Programs, 140 Dormitories, see Residence Halls Drama, 49

Early Childhood and Human Development, 131, 216 Economics, 169 Education, 171 Education, College of, 93 Educational Television, 40 Electrical Engineering, 111, 188 Elementary Education, 96, 175 Emeriti, 5 Engineering, 108, 201 Engineering Experiment Station Staff, 33 Engineering, Mathematics and Business Administration, College of, 104 English, 197 Enrollment, 52, 66 Entrance Examinations, 53 Environmental Quality, 201 Environmental Program, 136 Environmental Studies, 77, 135, 200 **Evening Division**, 141 Expenses, 56-60 Experimental Program in Arts & Sciences, 92

Experiment Station Staff, 32 Extension Service Staff, 33 Extra-Departmental Courses, 201

Faculty, List of, 6 Finance, 106 Finance, 106, 42, 60 Fifth Year Certificate, 102 Fleming Museum, 38 Forestry, 133, 236 Forestry Summer Program, 57, 134 Fraternities, 48 French, 262

General Information, 61 General Literature, 201 Geography, 202 Geology, 114, 205 German, 209 Government, See Political Science Government Research Center, 91 Grades and Reports, 68 Graduate College, 138 Greek, 162 Gym Bond Fee, 58

Handicapped, Accommodations for, 2 Health Insurance, 66 Health Services, 42, 58 Hebrew, 210 History, 211 Home Economics, School of, 131, 215 Home Economics Education, 131, 218 Honorary Societics, 46 Honors, 67 Horticultural Science, See Plant and Soil Science Housing, 43 Housing and Home Management, 131, 219 Human Nutrition and Food, 132, 220 Human Nitrition and Social Studies, 118

Industrial Management, 107 Infirmary, 43 Intercollege Transfers, 70 International Education Field Study, 102 Inter-Residence Association, 46 Intramural Sports, 47 Introduction, 36

Japanese Studies, 221 Journalism, 92

Lane Artists Series, 39 Latin, 163 Latin American Studies, 203 Law, 92 Liberal Arts Curriculum, 82 Library Bond Fee, 59 Linguistics, 201 Locker Towel Fee, 59

Manufacturing and Management Engineering, 113 Marketing, 107 Master's Degree Programs, 138

Mathematics, 115, 222 Mechanical Engineering, 112, 193 Medical Student Fee, 59 Medical Technology, 123, 229 Medicine, College of, 119 Meteorology, 201 Microbiology and Biochemistry, 78, 231 Military Studies, 232 Museum, 38 Music, 233 **Musical Activities**, 48 Music Education, 99, 177 Music, Performance, 234 Natural Resources, School of, 133, 236 Non-Degree Student, 52, 142 Nursing, School of, 127, 239 Occupational and Extension Education, 79 Office of Volunteer Programs, 48 Officers of Administration, 26 of Instruction, 5 Orientation Program, 55 Pass-No Pass Option, 54, 69 Pathology, 241 Payment of Bills, 57 Penalties for Low Scholarship, 68 Pharmacology, 202, 242 Philosophy, 242 Physical Education, 66, 177 Physical Education, Professional, 160, 178 Physical Therapy, 124, 245 Physics, 117, 247 Physiology and Biophysics, 249 Placement, 41 Plant and Soil Science, 78, 249 Policy on Campus Dissent and Disruption, 63 Policy on Discrimination, 65 Political Science, 252 Poultry Science, See Animal Science Preprofessional Preparation, 87 Preveterinary, 74 Priority of University Exercises, 70 Professional Nursing, 127, 240 Psychology, 254 Radio Station, 49 Radiologic Technology, 125, 257 Reading Center, 42 Recreation Resource Management, 135 Refunds, 58 **Recognition Societies**, 47 Regional Cooperation, 37 Related Services Staff, 33 Religion, 258 **Religious Life, 45** Repeated Courses, 69 Resource Economics, 79, 135, 238, 260

Right of Appeal, 71 Romance Languages, 261

Room and Board, 59

Russian and Serbo-Croatian Studies, 264

ROTC, 65

INDEX

Secondary Education, 97, 176 Social Welfare, 100, 181 Sociology, 265 Sororities, 48 Spanish, 262 Special Exam Fee, 54 Special Students, See Non-matriculated Speech and Hearing Center, 42 Speech Pathology-Audiology, 166 Statistics, Student Activities, 45 Student Activity Fee, 58 Student Association, 46 Student Health Insurance, 66 Student Health Service Fee, 58 Student Life, 41 Student Personnel Services, 41 Student Publications, 50 Student Teaching, 98 Study Abroad, 91 Summer Session, 141

Tardiness, 71

Technical Nursing Summer Program, 57, 241 Technical Nursing, 128, 241 Technology, 202, 271 Television, 49 Theatre, 167 Theology, 92 Transfer Students, 58 Tuition, 56

University Libraries, 38 University Responsibility, 66 Use of English, 65

Vermont Public Interest Research Group, 59 Vermont Resident Defined, 61 Veterans Administration Benefits, 42 Vocational Education and Technology, 79, 272

Wildlife Ecology, 134 Withdrawal, 70 WRUV, 49

Zoology, 274

Academic Calendar

CALENDARS RECOMMENDED BY THE ACADEMIC AFFAIRS COMMITTEE

FALL SEMESTER

1973-1974

Registration Labor Day Holiday Classes Begin Enrollment Thanksgiving Recess Classes End Exams Begin Exams End Aug. 30-31, Thurs.-Fri. Sept. 3, Mon. Sept. 4, Tues. Oct. 29-Nov. 2, Mon.-Fri. Nov. 21-24, Wed.-Sat. Dec. 11, Tues. Dec. 13, Thurs. Dec. 19, Wed.

SPRING SEMESTER

Registration Classes Begin Town Meeting Holidays Enrollment Spring Recess Begins Classes Resume Honors Day Classes End Exams Begin Exams End Commencement Jan. 14-15, Mon.-Tues. Jan. 16, Wed.

March 4-5, Mon.-Tues. March 18-22, Mon.-Fri. March 25, Mon. April 1, Mon. April 17, Wed. May 2, Thurs. May 6, Mon. May 11, Fri. May 18-19, Sat.-Sun.

1974-1975

Aug. 29-30, Thurs.-Fri. Sept. 2, Mon. Sept. 3, Tues. Oct. 28-Nov. 1, Mon.-Fri. Nov. 27-30, Wed.- Sat. Dec. 10, Tues. Dec. 12, Thurs. Dec. 18, Wed.

Jan. 13-14, Mon.-Tues. Jan. 15, Wed.

March 3-4, Mon.-Tues. March 17-21, Mon.-Fri. March 24, Mon. March 31, Mon. April 16, Wed. May 1, Thurs. May 5, Mon. May 9, Fri. May 17-18, Sat.-Sun.

CALENDAR 1973

FEBRUARY

JANUARY						
s	М	т	w	т	F	s
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	••	••	• •
			001			
		~	r m	-		
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	• •	••	••	••	••
		.11	II Y	,		
	~	~		-	~	-
	2	3	4	5	ь	
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	••	••	• •	••

OCTOBER

• •	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	••		••
• •	• •	••	••			

JANUARY							
s	MTWTF						
••	• •	1	2	3	4	5	
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	31	• •	••	
••	••	••	••	• •	••	••	
		Δ	PRI	1			
	1	2	3	- <u>_</u>	5	6	
		2	10		10	10	
	. 0	9	10		12	13	
14	15	16	17	18	19	20	
21	22	23	24	25	26	27	
28	29	30	••	• •	• •	••	

s	м	т	w	т	F	S			
•••	•••	•••		1	2	3			
4	5	6	7	8	9	10			
11	12	13	14	15	16	17			
18	19	20	21	22	23	24			
25	26	27	28		• •	••			
-	MAY								
		1	2	3	4	5			
6	7	8	9	10	11	12			
13	14	15	16	17	18	19			
20	21	22	23	24	25	26			
27	28	29	30	31		• •			
		AL	GU	ѕт					
			1	2	2	4			

•••	••	••	1	- 2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	
۰.	• •			• •		• •

NOV	EM	BF	R
1101		-	••

• •				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	• •
• •	••	• •	• •		• •	••

1974

	1071								
FEBRUARY									
s	м	Т	W	т	F	s			
		• •	•••	••	1	2			
з	4	5	6	7	8	9			
10	11	12	13	14	15	16			
17	18	19	20	21	22	23			
24	25	26	27	28	• •	۰.			
••	• •	••	••	••	••	••			
		r	۸A۱	(
• •			1	2	3	4			
5	6	7	8	9	10	11			
12	13	14	15	16	17	18			
10	20	21	22	72	24	25			

26 27 28 29 30 31

۰.

.

. .

..

. . ..

MARCH								
S	\$	М	т	W	Т	F	S	
					1	2	3	
	4	5	6	7	8	9	10	
1	1	12	13	14	15	16	17	
1	8	19	20	21	22	23	24	
2	5	26	27	28	29	30	31	
•			J	UNE				
						1	2	
;	3	4	5	6	7	8	9	
1	0	11	12	13	14	15	16	
1	7	18	19	20	21	22	23	
2	4	25	26	27	28	29	30	
SEPTEMBER								
							1	

• •	• •	••	• •	••	••	
2	з	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	••	••	• •	• •	••	••

DECEMBER

· .	• •	• •	••	••		1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	•••	••	••	• •	••

MARCH								
S	М	Т	W	т	F	S		
• •	••	••	•••	• •	1	2		
з	4	5	6	7	8	9		
10	11	12	13	14	15	16		
17	18	19	20	21	22	23		
24	25	26	27	28	29	30		
31	••	۰.	••	• •		••		
		ť	UNI	Ξ				
	••	••			••	1		
2	3	4	5	6	7	8		
9	10	11	12	13	14	15		

9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	••	••	••	••		








versial matter which has no relation to his subject. Limitations of academic freedom because of religious or other aims of the institution should be clearly stated in writing at the time of the appointment.

"The teacher is a citizen, a member of a learned profession and an officer of this institution. When he speaks or writes as a citizen he should be free from institutional censorship or discipline, but his special position in the community imposes special obligations. As a man of learning and an educational officer he should remember that the public may judge his profession and his institution by his utterances. Hence he should at all times be accurate, should exercise appropriate restraint, should show respect for the opinions of others, and should make every effort to indicate that he is not an institutional spokesman."

In additon there are recognized qualifications which must be attained and maintained before the privilege of being a member of the academic profession can be considered a permanent one: satisfactory performance as a teacher, scholarship, and high moral standards.

Responsibility of the Institution to the Faculty. The University must defend tenaciously the right of its members to think and express their thoughts freely and to make those choices within the law guaranteed to every citizen. This includes the right of dissent since any democratic institution ceases to merit the name democratic when this fundamen-

Continued on back cover ->

tal right is denied. Never is this duty more imperative than in those unhappy times when the public opinion of the community would restrain or curtail the free play of ideas. The universities, whose roots extend back into the centuries, have a tradition and a duty to maintain an independence of judgment in the face of public emotion.

While the universities must be sensitive to the needs of the community and nation, they need not and should not abrogate their position of leadership. This duty of the institution has never been so well stated as by Thomas Jefferson in his letter to prospective faculty members at the University of Virginia: "For here we are not afraid to follow truth wherever it may lead, nor tolerate error so long as reason is free to combat it."

Academic Freedom and Tenure. Tenure is an indispensable precondition for academic freedom. It is, in fact, a guarantee that the institution subscribes to the principle of academic freedom, and that its members may not be dismissed without adequate cause. Termination of tenure should occur only in cases of bona fide financial exigency in the University or when it has been demonstrated that the teacher lacks professional or moral fitness or competence as a teacher.

In the interpretation and the application of these principles we shall expect the University authorities to be quick to protect its heritage of academic freedom, in doubtful cases remembering that an excess of freedom is always less dangerous than an excess of constraint.

The statement on academic freedom reprinted on our covers was adopted by the University of Vermont Faculty Senate September 23, 1954.