The University of Maine
DigitalCommons@UMaine

General University of Maine Publications | University of Maine Publications

1970

University of Maine Catalog for 1971

University of Maine, Office of Student Records

Follow this and additional works at: https://digitalcommons.library.umaine.edu/univ_publications

Part of the Higher Education Commons, and the History Commons

Repository Citation
University of Maine, Office of Student Records, "University of Maine Catalog for 1971" (1970). *General University of Maine Publications*. 119.
https://digitalcommons.library.umaine.edu/univ_publications/119

This Monograph is brought to you for free and open access by DigitalCommons@UMaine. It has been accepted for inclusion in General University of Maine Publications by an authorized administrator of DigitalCommons@UMaine. For more information, please contact um.library.technical.services@maine.edu.

UNIVERSITY OF MAINE

Catalog for 1971

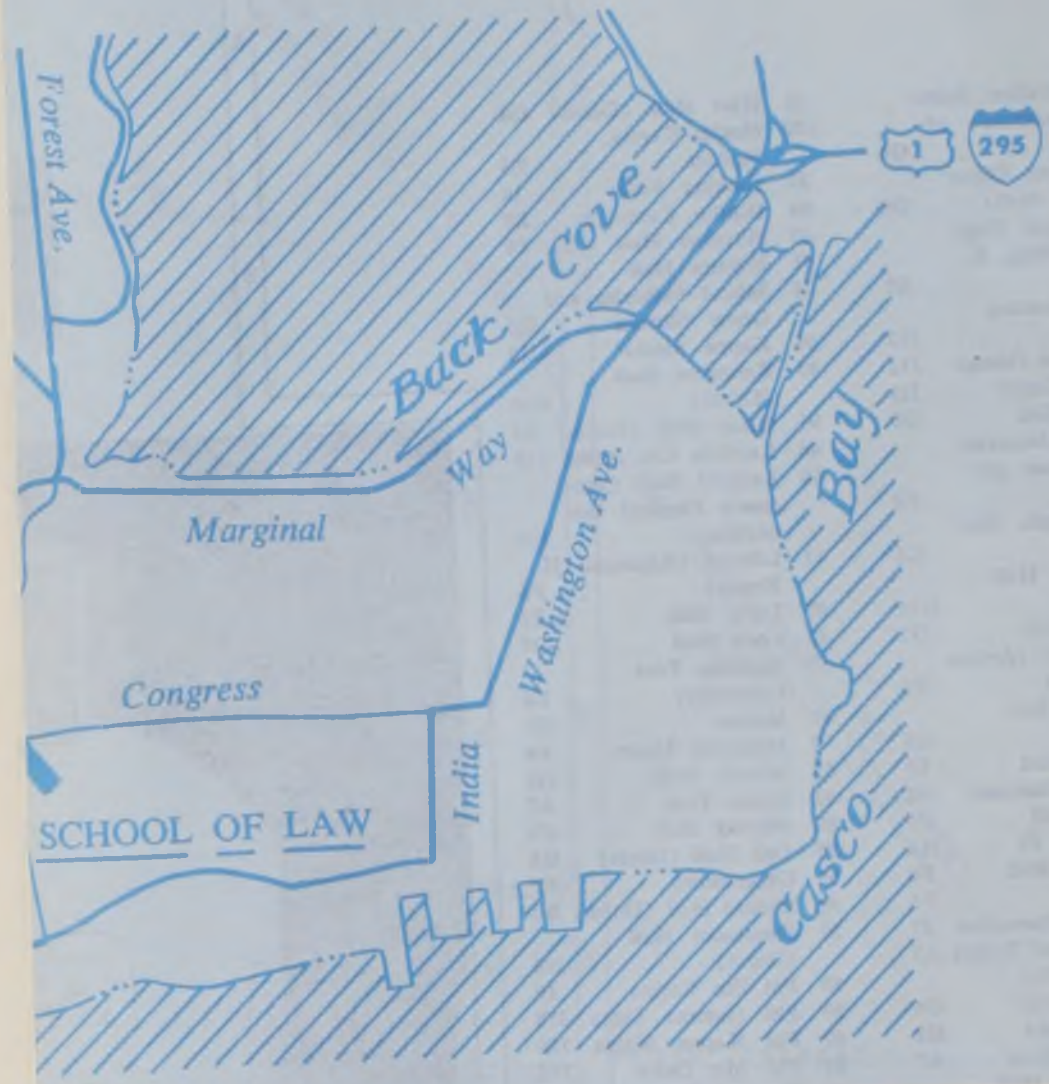
UNIVERSITY OF MAINE
BULLETIN
ORONO, MAINE 04473

'olume 73 August 15, 1970 Number 5

ublished by the University of Maine, Orono. Issued twice in August, September, November, lay; three times in July, October, December, January; four times in April; and five times in ebruary, March and June.

Second class postage paid at
Orono, Maine 04473

ITY OF MAINE
LAW — PORTLAND



F MAINE — AUGUSTA

ABBREVIATIONS AND SYMBOLS

ARE	Agricultural and Resource Economics
AE	Agricultural Engineering
AnV	Animal and Veterinary Sciences
As	Astronomy
At	Art
Ay	Anthropology
Ba	Business Administration
Bc	Biochemistry
Bio	Biology
Bt	Botany
Cd	Clothing and Design
Ce	Civil Engineering
Cf	Child Development and Family Relationships
Ch	Chemistry
ChE	Chemical Engineering
Cl	Classics
Cp	Comparative Literature
Ec	Economics
Ed	Education
Ee	Electrical Engineering
Eh	English
En	Entomology
Fn	Food and Nutrition
Fo	Folklore
Fr	French
Fs	Food Science
Fl	Foreign Languages
Fy	Forest Resources
Ge	General Engineering
Gk	Greek
Gm	German
Gy	Geological Sciences
He	Home Economics Education
Hm	Home Management and Housing
Hr	Honors
Hy	History
IS	Independent Study
It	Italian
Jr	Journalism
LSA	General Life Sciences and Agriculture
Lt	Latin
Ly	Library Service
Mb	Microbiology
Mc	Music
Me	Mechanical Engineering
Mhe	Man and his Environment
Ms	Mathematics
Mt	Military
My	Modern Society
Nu	Nursing
P	Plants
Pa	Pulp and Paper Technology
Pe	Physical Education
Pl	Philosophy
Ps	Physics
Pol	Political Science
Py	Psychology
Ru	Russian
S	Soils
Sh	Speech
SS	Special Seminar
Sp	Spanish
Sw	Social Work
Sy	Sociology
Zo	Zoology

† Courses offered during 1970-71 and alternate years.

‡ Courses offered during 1971-72 and alternate years.

INFORMATION IN THIS CATALOG COVERS 1970-71 ACADEMIC YEAR

The information contained in this catalog covers rules, regulations, curricula, and programs for the 1970-71 academic year. The Universiy reserves the right to make changes at any time.

CONTENTS

Calendar 4
Board of Trustees 5
Officers of Administration 6
Correspondence (sources of information) 9
General Information 13
Student Activities 37
Admission 41
Veterans Administration Information 43
Financial Information 49
Loan Funds 54
Scholarships 55
University of Maine Foundation Funds 59
Prizes 61
Environmental Studies 62
College of Arts and Sciences 70
  Nursing, School of 134
College of Business Administration 174
College of Education 184
College of Life Sciences and Agriculture 206
  Forest Resources, School of 227
  Human Development, School of 235
College of Technology 286
University of Maine at Augusta 327
University of Maine at Bangor 329
Graduate School 331
Military Science 333
Physical Education and Athletics 337
Continuing Education Division 340
Summer Session 341
Educational Television and Radio 342
Personnel 343
Summary of Student Enrollment 387
Index 391

APPROVED CALENDAR FOR 1970-71

ORONO CAMPUS

Fall 1970

		1970	
Registration of all students who have not previously completed it by mail	Sat. 8:00 A.M.-12:00 M 1:00 P.M.- 4:30	Sept.	12
Classes begin	Mon., 8:00 A.M.	Sept	14
Midsemester reports due (covering the first half semester to November 6)	Mon., 12:00 M	Nov.	9
Thanksgiving recess begins	Fri., 5:00 P.M.	Nov.	20
Classes resume	Mon., 8:00 A.M.	Nov.	30
Associate and baccalaureate degree requests for January commencement due in Registrar's Office	Mon., noon	Dec.	14
Christmas recess begins	Fri., 5:00 P.M.	Dec.	18
	1971		
Classes resume	Mon., 8:00 A.M.	Jan.	4
Graduate theses due	Fri., 4:30 P.M.	Jan.	8
Classes end	Fri., 5:00 P.M.	Jan.	15
Final examinations begin	Mon., 8:00 A.M.	Jan.	18
Registration for spring semester	Mon.-Sat.	Jan.	18-23
Final examinations end	Tuesday	Jan.	26
Commencement exercises	Sat., 7:45 P.M.	Jan.	23
Midyear recess begins	Tues., 6:30 P.M.	Jan.	26
Registration of all students who have not previously completed it	Sat., 8:00 A.M.-11 A.M.	Jan.	30

Spring 1971

		1971	
Classes begin	Mon., 8:00 A.M.	Feb.	1
Midsemester reports due (covering the first half semester to March 24)	Thurs., 12:00 M	Mar.	25
Spring recess begins	Fri., 5:00 P.M.	Mar.	26
Classes resume	Mon., 8:00 A.M.	Apr.	5
Associate and baccalaureate degree requests for June commencement due in Registrar's Office	Wed., noon	Apr.	14
Maine Day (tentative)	Wednesday	May	5
Graduate theses due	Fri., 4:30 P.M.	May	14
Classes end	Fri., 5:00 P.M.	May	21
Final examinations begin	Mon., 8:00 A.M.	May	24
Final examinations end	Tuesday	June	1
Class Day (tentative)	Wednesday	June	2
Commencement exercises (tentative)	Thursday	June	3

Summer Camp

Forestry (tentative)	Start— Mon., June 9	End—Sat., July 31

Summer Sessions

Three-week session (tentative)	Start—Mon., June 14	End—Fri., July 2
	Mon., July 5	Fri., July 23
	Mon., July 26	Fri., Aug. 13
	Mon., Aug 16	Fri., Sept. 3
Six-week sessions (tentative)	Start—Mon., June 14	End—Fri., July 23
	Mon., July 5	Fri., Aug. 13
	Mon., July 26	Fri., Sept. 3
Associate and baccalaureate degree requests for August commencement due in Registrar's Office	Wed., noon	July 14
Graduate theses due (tentative)	Fri., 4:30 P.M.	Aug. 6
Commencement exercises (tentative)	Fri., 7:45 P.M.	Aug. 13

70

S	M	T	W	Th	F	S
			JULY			
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	
			AUGUST			
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					
			SEPTEMBER			
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			
			OCTOBER			
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
			NOVEMBER			
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					
			DECEMBER			
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		
			JANUARY			
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						
			FEBRUARY			
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						
			MARCH			
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			
			APRIL			
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	
			MAY			
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					
			JUNE			
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

71

BOARD OF TRUSTEES

LAWRENCE MARK CULTER, Chairman — 31 Grove Street, Bangor 04401
Term expires May 26, 1975

JEAN SAMPSON (MRS. RICHARD W.), Vice Chairman — 45 Labbe Avenue, Lewiston 04242
Term expires May 26, 1975

HAYDEN L. V. ANDERSON — Pond Road, Gardiner 04345
Term expires May 26, 1969

ARTHUR HENRI BENOIT — Monument Square, Portland 04111
Term expires May 26, 1974

HERBERT R. BROWN — 32 College Street, Brunswick 04011
Term expires May 26, 1972

LUCIA M. CORMIER — 312 Fore Street, Portland 04111
Term expires May 26, 1970

VAUGHN CURRIER — School Street, Fort Kent 04743
Term expires May 26, 1973

RALPH H. CUTTING — Keyes Fibre Company, Waterville 04901
Term expires May 26, 1971

ROBERT NELSON HASKELL — 33 State Street, Bangor 04401
Term expires May 26, 1972

STEPHEN THOMAS HUGHES — Box 141A, West Auburn Road, Auburn 04210
Term expires May 26, 1976

WILLIAM T. LOGAN, JR. *ex officio* — State House, Augusta 04330

JAMES H. PAGE — 57 Sweden Street, Caribou 04736
Term expires May 26, 1974

CARLTON DAY REED — Day's Ferry, Woolrich 04579
Term expires May 26, 1977

W. GORDON ROBERTSON — 84 Harlow Street, Bangor 04401
Term expires May 26, 1973

NILS Y. WESSELL — 630 5th Avenue, Room 2550, New York, N. Y. 10020
Term expires May 26, 1971

CLERK OF THE BOARD: Joanne R. Magill

OFFICERS OF ADMINISTRATION*

OFFICERS OF THE UNIVERSITY

CHANCELLOR. Donald R. McNeil.

PRESIDENT. Winthrop Charles Libby, Alumni Hall.

VICE PRESIDENT FOR ACADEMIC AFFAIRS. James Milford Clark, Alumni Hall.

VICE PRESIDENT FOR STUDENT AFFAIRS. Arthur M. Kaplan, Fernald Hall.

VICE PRESIDENT FOR FINANCE AND ADMINISTRATION. John M. Blake, Alumni Hall.

BUSINESS MANAGER AND ASSISTANT TO THE TREASURER. Alden E. Stuart.

CONTROLLER AND BUDGET DIRECTOR. Prescott Hale Vose, Alumni Hall.

UNIVERSITY LIBRARIAN. James Curtis MacCampbell, Fogler Library.

REGISTRAR. George Howard Crosby, Wingate Hall.

DIRECTOR OF ADMISSIONS. James Arnold Harmon, Alumni Hall.

DIRECTOR OF CAREER PLANNING AND PLACEMENT. Philip Judd Brockway, 220 East Annex.

DIRECTOR OF CENTER FOR COUNSELING AND PSYCHOLOGICAL SERVICES. Charles O. Grant, Fernald.

DIRECTOR OF DEVELOPMENT. Harold L. Chute, Alumni Center.

DIRECTOR OF ENGINEERING SERVICES. Alan D. Lewis, 120 Service Building.

DIRECTOR OF INSTITUTIONAL RESEARCH. Paul C. Dunham, Alumni Hall.

DIRECTOR OF MEMORIAL UNION AND ARTHUR A. HAUCK AUDITORIUM. David M. Rand.

DIRECTOR OF OFFICE OF RESEARCH AND FEDERAL RELATIONS. (Vacant).

DIRECTOR OF PHYSICAL PLANT. Parker G. Cushman, 113 Service Building.

DIRECTOR OF PUBLIC INFORMATION AND CENTRAL SERVICES. Howard Arthur Keyo, PICS Building.

DIRECTOR OF PUBLIC SERVICES. Edwin Hill Bates, 101 Winslow Hall.

DIRECTOR OF PURCHASES. Murray R. Billington, Service Building.

DIRECTOR OF RESIDENCE AND DINING HALLS. William Carl Wells, West Commons.

DIRECTOR OF STUDENT AID. Robert Clifton Worrick, 107 East Annex.

DIRECTOR OF STUDENT HEALTH CENTER. Dr. Robert Alexander Graves, Infirmary.

EXECUTIVE DIRECTOR, GENERAL ALUMNI ASSOCIATION. Donald Stewart, Alumni Center.

* A complete list of teaching personnel is given in the back of this catalog.

OFFICERS OF DIVISIONS OF THE UNIVERSITY

College of Arts and Sciences. John Jacob Nolde, Dean, 100 Stevens Hall.

College of Business Administration. William Stanley Devino, Dean, Stevens Hall, South.

College of Education. Mark Richard Shibles, Dean, 151 College of Education Building.

College of Life Sciences and Agriculture. Bruce Robert Poulton, Dean, 16 Winslow Hall.

School of Forest Resources. Albert Deane Nutting, Director, Forest Resources Building.

School of Human Development. Margaret Elizabeth Thornbury, Director, 24 Merrill Hall.

College of Technology. Eldred Wilson Hough, Dean, 110 Boardman Hall.

Technical Institute Division. Robert Barlow Rhoads, Associate Director, 208 Boardman Hall.

Graduate School. Franklin Paul Eggert, Winslow Hall.

Summer Session. Edward W. Hackett, Jr., Director, Merrill Hall.

Continuing Education Division. Edward W. Hackett, Jr., Associate Director, Merrill Hall (Orono). Walter P. Fridinger, Associate Director, Portland.

Public Services Division and Cooperative Extension Service. Edwin Hill Bates, Director, 14 Winslow Hall.

Maine Agricultural Experiment Station. Bruce Robert Poulton, Director, 16 Winslow Hall.

Maine Technology Experiment Station. Horace Asa Pratt, Testing Engineer, 106 Boardman Hall.

Department of Industrial Cooperation. Richard Conrad Hill, Director, 110 Boardman Hall.

OFFICERS OF THE DEPARTMENTS

Agricultural Engineering. Professor Norman Smith, 2 Agricultural Engineering Building.

Agricultural and Resource Economics. Professor Homer Bastian Metzger, 36 Winslow Hall.

Animal and Veterinary Sciences. Professor Stanley D. Musgrave, Hitchner Hall.

Anthropology. Professor Richard Gibbs Emerick, 52 South Stevens.

UNIVERSITY OF MAINE

ART. Professor Vincent Andrew Hartgen, Carnegie Hall.

BIOCHEMISTRY. Professor Frederick Herbert Radke, 231 Hitchner Hall.

BOTANY AND PLANT PATHOLOGY. Associate Professor Gary Allen McIntyre, 315 Deering Hall.

CHEMICAL ENGINEERING. Professor Edward George Bobalek, 275 Aubert Hall.

CHEMISTRY. Professor James Langdon Wolfhagen, 261 Aubert Hall.

CIVIL ENGINEERING. Professor Wayne A. Hamilton, 101 Boardman Hall.

ECONOMICS. Professor John Donald Coupe, 12A South Stevens.

ELECTRICAL ENGINEERING. Professor Richard Cushing Gibson, 101 Barrows Hall.

ENGLISH. Professor Robert Hunting, Stevens Hall.

ENTOMOLOGY. Professor Geddes Wilson Simpson, 306 Deering Hall.

FOOD SCIENCE. Professor John Matthew Hogan, 102B Holmes Hall.

FOREIGN LANGUAGES AND CLASSICS. Professor George Tufford Moody, 201A Little Hall.

FOREST RESOURCES. Director Albert Nutting, Forest Resources Building.

GEOLOGICAL SCIENCES. Professor Philip Henry Osberg, 111 Boardman Hall.

GENERAL ENGINEERING. Professor Matthew McNeary, 122 East Annex.

HISTORY. Professor David White Trafford. (Acting Chairman), 170 Stevens Hall.

HUMAN DEVELOPMENT. Director Margaret Elizabeth Thornbury, 24 Merrill Hall.

INDUSTRIAL COOPERATION. Professor Richard Conrad Hill, 112 Boardman Hall.

JOURNALISM. Associate Professor Alan R. Miller, 101A Lord Hall.

MATHEMATICS. Professor John Carl Mairhuber, College of Education Building.

MECHANICAL ENGINEERING. Professor Francis Joseph Sullivan, 209 Boardman Hall.

MICROBIOLOGY. Professor Darrell Bradford Pratt, Hitchner Hall.

MILITARY SCIENCE. Lt. Col. George Fell, Armory.

MUSIC. Professor Robert Chandler Godwin, Lord Hall.

PHILOSOPHY. Associate Professor Robert Fertig Tredwell, The Maples.

PHYSICAL EDUCATION AND ATHLETICS. Professor Harold Scott Westerman, Memorial Gymnasium.

PHYSICS. Professor Paul Rice Camp, Clarence E. Bennett Hall.

PLANT AND SOIL SCIENCES. Professor Roland August Struchtemeyer, 114 Deering Hall.

POLITICAL SCIENCE. Professor Eugene Alberto Mawhinney, 11 Stevens Hall, North.

PSYCHOLOGY. Professor Stanley Stewart Pliskoff. 301A Little Hall.

SOCIOLOGY. Professor William Sezak, Stevens Hall, South.

SPEECH. Professor Wofford Gordon Gardner, 310 Stevens Hall.

ZOOLOGY. Professor Kenneth William Allen, Joseph Magee Murray Hall.

OFFICERS OF THE ADMINISTRATION

Augusta Campus

DIRECTOR. Lloyd Jay Jewett.
DIRECTOR OF CONTINUING EDUCATION DIVISION CENTER. William Robinson.
DIRECTOR OF ADMINISTRATIVE SERVICES. Clifford H. West.
DIRECTOR OF STUDENT AFFAIRS. Richard John Randall.
REGISTRAR. Mary Elizabeth Randall.
LIBRARIAN. Kathryn G. Wulff.

CORRESPONDENCE

Inquiries should be directed as indicated below:

General administrative matters.....President, Winthrop C. Libby
Scholarship records.....Registrar, George H. Crosby
Admission to the freshman class and to
advanced standing (Orono).....Director of Admissions, James A. Harmon
Financial affairs of students.....Business Manager, Alden E. Stuart
College of Arts and Sciences————————Dean of the College, John J. Nolde
College of Business Administration.....Dean of the College, William S. Devino
College of Education.....Dean of the College, Mark R. Shibles
College of Life Sciences and Agriculture.....Dean of the College, Bruce R. Poulton
College of Technology.....Dean of the College, Eldred W. Hough
University of Maine at Augusta:
Provost, Lloyd Jewett, 99 Western Avenue
Graduate School and Scholarships available for
graduate students.....Dean of Graduate School, Franklin P. Eggert
Summer Session for teachers and college students.....Director Edward W. Hackett, Jr., Merrill Hall.
Continuing Education Courses.....Center Directors

Edward W. Hackett, Jr.
University of Maine
14 Merrill Hall, Orono

Walter P. Fridinger
University of Maine, Portland
96 Falmouth St., Portland

William E. Robinson
University of Maine, Augusta
99 Western Avenue, Augusta

David W. Wheeler
University of Maine, Lewiston-Auburn
Room 405A, 145 Lisbon Street, Lewiston

George P. Milner
Aroostook State College, Presque Isle

UNIVERSITY OF MAINE

ART. Professor Vincent Andrew Hartgen, Carnegie Hall.

BIOCHEMISTRY. Professor Frederick Herbert Radke, 231 Hitchner Hall.

BOTANY AND PLANT PATHOLOGY. Associate Professor Gary Allen McIntyre, 315 Deering Hall.

CHEMICAL ENGINEERING. Professor Edward George Bobalek, 275 Aubert Hall.

CHEMISTRY. Professor James Langdon Wolfhagen, 261 Aubert Hall.

CIVIL ENGINEERING. Professor Wayne A. Hamilton, 101 Boardman Hall.

ECONOMICS. Professor John Donald Coupe, 12A South Stevens.

ELECTRICAL ENGINEERING. Professor Richard Cushing Gibson, 101 Barrows Hall.

ENGLISH. Professor Robert Hunting, Stevens Hall.

ENTOMOLOGY. Professor Geddes Wilson Simpson, 306 Deering Hall.

FOOD SCIENCE. Professor John Matthew Hogan, 102B Holmes Hall.

FOREIGN LANGUAGES AND CLASSICS. Professor George Tufford Moody, 201A Little Hall.

FOREST RESOURCES. Director Albert Nutting, Forest Resources Building.

GEOLOGICAL SCIENCES. Professor Philip Henry Osberg, 111 Boardman Hall.

GENERAL ENGINEERING. Professor Matthew McNeary, 122 East Annex.

HISTORY. Professor David White Trafford. (Acting Chairman), 170 Stevens Hall.

HUMAN DEVELOPMENT. Director Margaret Elizabeth Thornbury, 24 Merrill Hall.

INDUSTRIAL COOPERATION. Professor Richard Conrad Hill, 112 Boardman Hall.

JOURNALISM. Associate Professor Alan R. Miller, 101A Lord Hall.

MATHEMATICS. Professor John Carl Mairhuber, College of Education Building.

MECHANICAL ENGINEERING. Professor Francis Joseph Sullivan, 209 Boardman Hall.

MICROBIOLOGY. Professor Darrell Bradford Pratt, Hitchner Hall.

MILITARY SCIENCE. Lt. Col. George Fell, Armory.

MUSIC. Professor Robert Chandler Godwin, Lord Hall.

PHILOSOPHY. Associate Professor Robert Fertig Tredwell, The Maples.

PHYSICAL EDUCATION AND ATHLETICS. Professor Harold Scott Westerman, Memorial Gymnasium.

PHYSICS. Professor Paul Rice Camp, Clarence E. Bennett Hall.

PLANT AND SOIL SCIENCES. Professor Roland August Struchtemeyer, 114 Deering Hall.

POLITICAL SCIENCE. Professor Eugene Alberto Mawhinney, 11 Stevens Hall, North.

PSYCHOLOGY. Professor Stanley Stewart Pliskoff. 301A Little Hall.

SOCIOLOGY. Professor William Sezak, Stevens Hall, South.

SPEECH. Professor Wofford Gordon Gardner, 310 Stevens Hall.

ZOOLOGY. Professor Kenneth William Allen, Joseph Magee Murray Hall.

OFFICERS OF THE ADMINISTRATION

Augusta Campus

DIRECTOR. Lloyd Jay Jewett.
DIRECTOR OF CONTINUING EDUCATION DIVISION CENTER. William Robinson.
DIRECTOR OF ADMINISTRATIVE SERVICES. Clifford H. West.
DIRECTOR OF STUDENT AFFAIRS. Richard John Randall.
REGISTRAR. Mary Elizabeth Randall.
LIBRARIAN. Kathryn G. Wulff.

CORRESPONDENCE

Inquiries should be directed as indicated below:

General administrative matters.....President, Winthrop C. Libby
Scholarship records.....Registrar, George H. Crosby
Admission to the freshman class and to
advanced standing (Orono).....Director of Admissions, James A. Harmon
Financial affairs of students.....Business Manager, Alden E. Stuart
College of Arts and Sciences————————Dean of the College, John J. Nolde
College of Business Administration.....Dean of the College, William S. Devino
College of Education.....Dean of the College, Mark R. Shibles
College of Life Sciences and Agriculture.....Dean of the College, Bruce R. Poulton
College of Technology.....Dean of the College, Eldred W. Hough
University of Maine at Augusta:
Provost, Lloyd Jewett, 99 Western Avenue
Graduate School and Scholarships available for
graduate students.....Dean of Graduate School, Franklin P. Eggert
Summer Session for teachers and college students.....Director Edward W. Hackett, Jr., Merrill Hall.
Continuing Education Courses.....Center Directors

Edward W. Hackett, Jr.
University of Maine
14 Merrill Hall, Orono

Walter P. Fridinger
University of Maine, Portland
96 Falmouth St., Portland

William E. Robinson
University of Maine, Augusta
99 Western Avenue, Augusta

David W. Wheeler
University of Maine, Lewiston-Auburn
Room 405A, 145 Lisbon Street, Lewiston

George P. Milner
Aroostook State College, Presque Isle

UNIVERSITY OF MAINE

Senior and alumni placement.....Placement Director, Philip J. Brockway

Financial assistance.....Director of Student Aid, Robert C. Worrick

Dormitory rooms for women.....Manager, Women's Housing, Erna D. Wentworth

Dormitory rooms for men, rooms in private house, and apartments.....Manager, Men's and Family Housing, Vernon C. Elsemore

Foreign students.....Bryce W. Grindle, Adviser

Conferences and conventions.....Earsel E. Goode, Conference Coordinator

UNIVERSITY OF MAINE SYSTEM

The University of Maine is a state-wide system of public institutions of higher education. It is operated by a single Board of Trustees, which is appointed by the Governor. The chief academic and administrative officer for the system is the Chancellor, who is responsible to the Board of Trustees.

The system has university centers at Orono and Portland-Gorham, four-year colleges at Fort Kent, Presque Isle, Machias, and Farmington, and operates community colleges at Augusta and Bangor.

MUNSON ROAD

General Information

The information in this catalog pertains only to the activities and programs at Orono, Bangor, and Augusta.

The University of Maine at Orono is located about half way between Kittery, the most southerly town in the state, and Fort Kent on the northern boundary. It is on U. S. Route 2A, approximately eight miles from Bangor, the third largest city of the state. The University campus is about a mile from the business section of Orono, an attractive town of about 8,000 population, and borders the Stillwater River, a branch of the Penobscot.

History—The University at Orono was established originally as the State College of Agriculture and the Mechanic Arts under the provisions of the Morrill Act, approved by President Lincoln in 1862. The next year the State of Maine accepted the conditions of the Act and in 1865 created a corporation to administer the affairs of the college. The original name was changed to the University of Maine in 1897.

The institution opened September 21, 1868, with 12 students and two faculty members. Dr. Merritt Caldwell Fernald was appointed acting president. By 1871 curricula had been arranged in agriculture, civil engineering, mechanical engine-

ering, and elective. From these curricula the Colleges of Agriculture, Technology, and Arts and Sciences gradually developed. Women have been admitted since 1872. The School of Education was established in 1930 and became the College of Education in 1958. The University operated a College of Law from 1898 to 1920. After this unit was discontinued in 1920, the University did not offer law courses until 1961 when a School of Law, located in Portland, was added through a merger with Portland University.

Schools of Business Administration, Forestry, Home Economics, and Nursing were established in 1958. The School of Business Administration became the College of Business Administration in 1965.

The Maine Agricultural Experiment Station was established as a division of the University by act of the Legislature of 1887, as a result of the passage by Congress of the Hatch Act. It succeeded the Maine Fertilizer Control and Agricultural Experiment Station, which had been established in 1885.

Graduate instruction has been given by various departments for many years. The first master's degree was conferred in 1881 and the first doctor's degree in 1960. Since 1923 graduate work has been a separate division in the charge of a dean.

Beginning in 1895, a summer Session has usually been held each year. The former six-week program was extended to nine weeks in 1961 and to 12 weeks in 1962. This session is designed for teachers, school administrators, and for college students who desire to accelerate their work.

The institution has been served by the following presidents: The Rev. Charles Frederick Allen, Dr. Merritt Caldwell Fernald, Dr. Abram Winegardner Harris, Dr. George Emory Fellows, Dr. Robert Judson Aley, Dr. Clarence Cook Little, Dr. Harold Sherburne Boardman, Dr. Arthur Andrew Hauck, Dr. Lloyd H. Elliott and Dr. Edwin Young.

Organizations of the University—The University is controlled by a 15-member Board of Trustees. The Board of Trustees has supreme authority in all matters pertaining to the University, and all policies applying to the University as a whole must be approved by the board. Administrative units of the University of Maine at Orono include the Colleges of Arts and Sciences, Life Sciences and Agriculture, Business Administration, Education, and Technology; University of Maine at Bangor; University of Maine at Augusta; Graduate School, Summer Session, Public Services Division, Cooperative Extension Service, Maine Agricultural Experiment Station, Maine Technology Experiment Station, Continuing Education Division, and Department of Industrial Cooperation. Each division regulates those affairs which concern itself alone.

Policy Statement—The University of Maine fully 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 COLLEGE OF ARTS AND SCIENCES offers curricula in an approved field of concentration or in any of the following subjects: Anthropology, Art, Chemistry, Comparative Literature, Economics, English, French, Latin, Geological Sciences, German, Political Science, (option in Public Management) History, International Affairs, Journalism, Mathematics, Medical Technology, Music, Modern Lan-

guages, Nursing, Philosophy, Physics, Psychology, Romance Languages, Sociology, Spanish, Speech, Theatre, and Zoology.

THE COLLEGE OF BUSINESS ADMINISTRATION offers curriculum in Business Administration. The degree of bachelor of science is awarded to those who successfully complete the requirements with majors in accounting, finance, management, or marketing.

THE COLLEGE OF EDUCATION offers during the academic year professional training for prospective elementary and secondary school teachers, principals, guidance counselors, physical education instructors, and supervisors and teachers of art and music. The degree of bachelor of science in education is given to those who have successfully completed the requirements for the degree. Appropriate work taken through the Summer Session and Continuing Education Division may likewise be applied to the requirements for the degree.

THE COLLEGE OF LIFE SCIENCES AND AGRICULTURE offers programs leading to the bachelor of science degree in the following fields: Agricultural Resource Economics, Agricultural Engineering, (jointly with the College of Technology), Agricultural Mechanization, Animal and Veterinary Sciences, Bacteriology, Biochemistry, Biology, Botany, Entomology, Forestry, Home Economics, Natural Resource Management, Plant and Soil Sciences, and Wildlife Management. Options providing minor programs of study are available in Agricultural Education, International Agricultural Development, Food Science, and Journalism. It also offers two-year preprofessional programs in Agricultural Education, Veterinary Science, Dairy Manufacturing, and Food Processing. Two-year technical training programs leading to a degree of associate in science are offered in Resource and Business Management (with options in Food Industry Management, Agricultural Business Management, Horticultural Management, and Resource Management), Animal Technology, Animal Medical Technology, Merchandising, Food Service Management, and Forest Management.

THE COLLEGE OF TECHNOLOGY offers degree programs in Agricultural Engineering (jointly with the College of Life Sciences and Agriculture), Chemical Engineering, Pulp and Paper Technology, Chemistry, Civil Engineering, Electrical Engineering, Engineering Physics and Mechanical Engineering. Post baccalaureate programs leading to a certificate are available in Pulp and Paper Management. Two-year programs are also offered through the Technical Institute Division of the college in Civil Engineering Technology, Electrical Engineering Technology, Mechanical Engineering Technology, and Chemical Engineering Technology.

THE UNIVERSITY OF MAINE AT AUGUSTA provides students the opportunity to complete university requirements for associate degrees in Liberal Studies, General Education, and Administration (Business or Public major) programs. Students receive an Associate in Arts (Liberal Studies and General Education) or an Associate in Science (Administration) degree.

The Liberal Studies program is a University-parallel curriculum and a student may, at any time, transfer to appropriate University of Maine baccalaurate programs. A student must have a 2.8 grade point average to transfer to appropriate baccalaureate degree programs after completing the Administration or General Education program. An evaluation of the academic record will be made at the time of transfer to determine the number of credit hours that may be transferable.

A wide variety of courses at the undergraduate and graduate level is offered in the evening under the direction of the Continuing Education Division. A

Master of Public Administration degree is available through the Continuing Education Division. Also, this division offers many seminars and short-term courses and a varied selection of courses during the summer session.

Persons interested in more information about UMA may write for a catalog to *Director of Admisions, Alumni Hall, University of Maine, Orono, Maine 04473.*

THE GRADUATE SCHOOL offers programs of study leading to the degrees of master of arts, master of science, master of engineering, master of arts in teaching (foreign languages), master of education, master of arts in teaching, master of agricultural and resource economics, master of business administration, master of geological sciences, master of library service, master of mechanical engineering, master of public administration, doctor of philosophy and doctor of education. Programs leading to the Ph.D. degree are available in animal nutrition, chemical engineering, chemistry, civil engineering, forest resources, history, oceanography, general and experimental psychology, clinical psychology, physics, plant science and zoology. Doctor of education programs are available in guidance and counseling, in the language arts, in social studies education and in science education.

The Certificate of Advanced Study, designed for teachers and school administrators, is awarded for the completion of a planned program of 30 hours of work beyond the master's degree.

THE MAINE AGRICULTURAL EXPERIMENT STATION maintains its offices and principal laboratories at Orono. Experiment farms include Highmoor Farm at Monmouth, Aroostook Farm at Presque Isle, Chapman Farm at Chapman, and Blueberry Hill Farm at Jonesboro.

THE MAINE TECHNOLOGY EXPERIMENT STATION, established in 1915, makes investigations for various state and municipal departments, and on request furnishes scientific information to industries. The station maintains offices and laboratories in Boardman Hall and is under the control of the College of Technology.

THE OFFICE OF RESEARCH AND FEDERAL RELATIONS provides assistance to faculty and staff in developing proposals and seeking outside funding for research instruction, and service projects. The office, with headquarters in Winslow Hall, provides liaison with federal funding agencies and private foundations.

THE DEPARTMENT OF INDUSTRIAL COOPERATION (D.I.C.), a part of the Office of Research and Federal Relations, coodinates the work of the University in contract agreements with state and industrial organizations. The Department is located in Boardman Hall.

Division of Public Services—The Division of Public Services includes the following units that provide organized, full-time educational programs throughout the State: Bureau of Public Administration, Continuing Education Division and Summer Sessions, Bureau of Labor Education, Cooperative Extension Service, and Division of Special Programs (State Technical Services, Title I (Higher Education Act), Civil Defense Education, UM/New England Center of Continuing Education, and Open House). The functions of each are described briefly below.

THE BUREAU OF LABOR EDUCATION conducts programs for union and non-union employee groups covering most requested subjects, but focused on effective employee organization practices and community participation.

THE BUREAU OF PUBLIC ADMINISTRATION is part of the Department of Political

Science. It provides in-service training for Maine municipal and state government officials, does research in areas of interest to such officials and otherwise supplies information on these and related activities to persons engaged or interested in government.

THE CONTINUING EDUCATION DIVISION (C.E.D.) is a part of the Division of Public Services. It coordinates the part-time study of adults in various locations in Maine and provides programs within commuting distance of their homes. Major C.E.D. centers are maintained at Auburn, Lewiston, Orono, Portland, Presque Isle, and Augusta.

THE COOPERATIVE EXTENSION SERVICE is an educational agency representing the University of Maine and the U.S. Department of Agriculture. Educational and informational assistance in a broad range of subjects is provided to individuals, families and organized groups in rural and urban areas of the state.

County Extension Associations are the sponsoring organizations of the Extension program in each county. They function under the leadership of an executive committee with the assistance of local community leaders.

Extension Service personnel include state and area specialists, administrative staff, and Extension agents. The latter, who make up the major part of the staff, are located in each county, usually at the county seat, and carry out work with the assistance of specialists in agriculture, home economics, 4-H and other youth education, resource development, and public affairs education. Extension agents also provide general information about other programs and services of the University of Maine, the U.S. Department of Agriculture and other agencies serving the people of Maine.

THE SUMMER SESSION offers a wide variety of academic and educational courses on both the elementary and secondary level. College students by enrolling in selected subjects can accelerate graduation. For teachers and school administrators there are workshops in elementary and secondary education as well as numerous other courses and conferences especially designed for those engaged in the teaching profession.

The Special Programs Division is responsible for administering five programs within the Public Service Division; Maine Technical Services Program, Title I of the Higher Education Act of 1965, University of Maine/New England Center for Continuing Education, Civil Defense Education, and U of M, Orono Open House.

MAINE TECHNICAL SERVICES PROGRAM assists business and industry to acquire and use scientific and engineering information more effectively by making technical information more accessible and by direct technical assistance.

TITLE I HEA provides federal matching funds to encourage and support public and private universities, colleges, and junior colleges to use their facilities and personnel, through research and teaching, to help solve problems of community living with the accent on new concepts, approaches, and programs.

NEW ENGLAND CENTER FOR CONTINUING EDUCATION is a consortium of the six state universities established for the purpose of focusing the resources of institutions of higher education on common problems in the region. Workshops, institutes, conferences and other informal study programs—ranging from one day to several weeks—are sponsored throughout the year. The University of Maine has a special responsibility in the field of resource development.

CIVIL DEFENSE EDUCATION AND TRAINING. The University of Maine is one of 53 universities which have contracted with the federal government to make community disaster preparedness, education and training, as developed by the Office of Civil Defense, available at the local level.

UNIVERSITY OPEN HOUSE is an expansion of the traditional Farm and Home Week. In addition to the previously offered activities, the Open House program provides many new educational and cultural activities for Maine citizens.

Buildings—Orono Campus—The following are dormitories and dining facilities:

ANDROSCOGGIN HALL (1963), capacity 248. Named for the county having the sixth largest number of regular full-time students enrolled at the University at the time of its construction.

AROOSTOOK HALL (1963), capacity 179. Named for the county having the fifth largest number of regular full-time students enrolled at the University at the time of its construction.

BALENTINE HALL (1914-1916), capacity 107. Named in honor of the late Elizabeth Abbott Balentine, secretary and registrar of the University, 1894-1913.

CHADBOURNE HALL (1948), capacity 156. Named for Dr. Ava Harriet Chadbourne, professor emerita of education.

COLVIN HALL (1930), capacity 48. Named in honor of the late Caroline Colvin, professor emerita of history and government and the first dean of women at the University. It became a cooperative dormitory for women in 1961.

CORBETT HALL (1947), capacity 228. Named in honor of the late Lamert Seymour Corbett, formerly professor of animal industry and dean of men.

CUMBERLAND HALL (1961), capacity 260. Named for the county having the second largest number of regular full-time students enrolled at the University at the time of its construction.

DUNN HALL (1947), capacity 228. Named in honor of the late Charles John Dunn, formerly Chief Justice of the Supreme Judicial Court of Maine and treasurer of the University from 1909 to 1923.

EAST COMMONS (1963) is a dining hall having a capacity for serving 800 persons cafeteria style. This dining hall serves Androscoggin, Cumberland and Gannett Halls.

ESTABROOKE HALL (1940), capacity 172. Named in honor of the late Kate Clark Estabrooke, a former superintendent of the first women's dormitory, the Mount Vernon House.

GANNETT HALL (1959), capacity 260. Named in honor of James Adrian Gannett, registrar emeritus.

HANCOCK HALL (1965), capacity 265. Named for the county having the seventh largest number of regular full-time students enrolled at the University at the time of its construction.

HANNIBAL HAMLIN HALL (1911), capacity 89. Named for the late Hon. Hannibal Hamlin of Hampden and Bangor, the first president of the Board of Trustees.

HART HALL (1955), capacity 233. Named in honor of the late James Norris Hart of Orono, dean of the University and professor of mathematics and astronomy.

HILL TOP (1967-68) is a dining hall having the capacity to serve 900

persons cafeteria style. It also contains a small library and reading rooms. The dining hall serves Knox, Oxford and Somerset Halls.

KENNEBEC HALL (1961), capacity 180. Named for the county having the third largest number of regular full-time students enrolled at the University at the time of its construction.

KNOX HALL (1967), capacity 285. Named for the county having the tenth largest number of full-time students enrolled at the University at the time of its construction.

OAK HALL (1937), capacity 96. Named for the late Hon. Lyndon Oak of Garland, a long-time member and president of the Board of Trustees.

OXFORD HALL (1967), capacity 285. Named for the county having the eighth largest number of full-time students enrolled at the University at the time of its construction.

PENOBSCOT HALL (1960), capacity 180. Named for the county having the largest number of regular full-time students enrolled at the University at the time of its construction.

SOMERSET HALL (1967), capacity 285. Named for the county having the ninth largest number of full-time students enrolled at the University at the time of its construction.

STODDER HALL (1956), capacity 170. Named in honor of the late Mrs. Anne E. Stodder of Bangor, a benefactress of the University. Its dining hall serves 700 students.

THE UNIVERSITY CABINS (1945), capacity 42 men students. These are co-operative units.

UNIVERSITY PARK (1961) is a family housing development that provides apartments for 120 families (24 three-bedroom, 48 two-bedroom and 48 one-bedroom apartments).

WEST COMMONS (1958) is a dining hall having a capacity for serving 1500 persons cafeteria style. This dining hall serves Corbett, Dunn, Hannibal Hamlin, Hancock, Hart and Oak Halls.

YORK HALL (1962), capacity 260. Named for the county having the fourth largest number of regular full-time students enrolled at the University at the time of its construction. Its dining hall serves 700 students.

The following are used mainly for administration and instruction.

AGRICULTURAL ENGINEERING BUILDING (1938) houses the Agricultural Engineering Department and its laboratories for teaching and research.

ALUMNI HALL (1901) contains administrative offices and studios for Educational Television. It received its name because of contributions made by alumni to supply a part of the funds for its erection.

ALUMNI MEMORIAL, consisting of an Indoor Field, Armory, and Gymnasium, was erected as a memorial to the Maine men who died in the service of their country in the Spanish-American War and World War I and is a gift of alumni, students, faculty, and friends of the University. The Indoor Field (1926), one of the largest in the country, provides ample facilities for indoor track, winter baseball practice, and military drill. The Armory (1926) houses offices and classrooms of the military unit, including an indoor rifle range. The Gymnasium (1933) contains the offices of the Department of Physical Education and Athletics, equipment and rooms for handball, boxing, wrestling, and corrective exercise, shower

and locker rooms, and an auditorium with a seating capacity of approximately 3,000, used for basketball, lectures, student assemblies, banquets, and dances.

AUBERT HALL (1914) houses the Departments of Chemistry and Chemical Engineering, including the Pulp and Paper Division. It was named in honor of the late Alfred Bellamy Aubert, professor of chemistry from 1874 to 1909. A wing was added in 1940 to increase the facilities in Chemical Engineering and the Pulp and Paper Division. Two additional wings were added in 1958 to provide more facilities for Chemistry and Chemical Engineering, including the Pulp and Paper Division. The Gottesman Computer and Analysis Laboratory is located in this building.

BARROWS HALL (1963) contains offices, classrooms and laboratories for the Department of Electrical Engineering. It was named for the late William Edward Barrows, formerly professor and head of the Department of Electrical Engineering.

CLARENCE E. BENNETT HALL (1959) contains offices, classrooms, and laboratories of the Department of Physics.

BOARDMAN HALL (1949) houses the Department of Civil Engineering, including Sanitary Engineering, Department of Geological Sciences, Department of Mechanical Engineering, Technology Experiment Station laboratories, Department of Industrial Cooperation, office of Research Support and Federal Relations, and office of State Technical Services. It was named in honor of the late Dr. Harold Sherburne Boardman, Dean of Technology and President of the University from 1925 to 1934.

CARNEGIE HALL, the former library building erected in 1906 through the generosity of Andrew Carnegie, is now devoted to the Department of Art. It was named in horor of the original donor.

COBURN HALL (1888) houses offices of the School of Nursing as well as other miscellaneous offices. It was named for the late Hon. Abner Coburn, a former president of the Board of Trustees and benefactor of the University. Its future role is uncertain.

CROSBY LABORATORIES (1928) contains the laboratories of the Department of Mechanical Engineering. It was named for the late Hon. Oliver Crosby, Class of '76, who bequeathed $100,000 for its construction.

DEERING HALL (1949) contains the Departments of Agronomy, Botany, Entomology and Horticulture, also part of the facilities for the Agricultural Experiment Station and the Cooperative Extension Service. It was named in honor of the late Dr. Arthur L. Deering, dean of agriculture, who served the University from 1912-1957.

EAST ANNEX (1947) houses the Department of General Engineering, Student Placement Bureau Personnel Office, Offices of Student Aid, and provides classrooms and offices for the several colleges. The building, formerly a unit of the naval base at Sanford, was erected on the campus by the Bureau of Community Facilities of the Federal Works Agency.

COLLEGE OF EDUCATION BUILDING (1961) contains facilities for the College of Education and, on the top floor, for the Department of Mathematics of the College of Arts and Sciences. The Audio-Visual Service and laboratories for teacher training are located in this building.

FERNALD HALL (1870) the oldest building on the campus, contains offices of the personnel deans. It also houses a small snack bar operated by University Stores.

FOGLER LIBRARY (1941-47) was erected and furnished with the aid of a fund-raising campaign by alumni, faculty, students and friends of the University. The completion in 1950 of the main reading room has increased the seating capacity of the library to 570. The library was named in 1962 in honor of Dr. Raymond H. Fogler, a former president of the Board of Trustees.

FORESTRY BUILDING (1968) contains offices, laboratories and classrooms of the School of Forest Resources.

HAUCK AUDITORIUM (1963) was erected and furnished with the aid of a fund-raising campaign by alumni, faculty, students and friends of the University. It contains an auditorium providing seating for 600 persons, stage facilities and the University Store. It was named in honor of Dr. Arthur A. Hauck, president emeritus, who served the University as president from 1934 to 1958.

HITCHNER HALL (1959) contains offices, laboratories, and classrooms for the Departments of Bacteriology, Biochemistry, and Animal and Veterinary Sciences for programs in instruction, research and Extension. It was named for Dr. E. Reeve Hitchner, professor emeritus of bacteriology.

HOLMES HALL (1888) is used by the Maine Agricultural Experiment Station for its administrative offices, and Departments of Chemistry and Food Science. It received its name from the late Dr. Ezekiel Holmes, writer, editor, and pioneer in Maine agriculture.

LENGYEL HALL (1963) contains offices, classrooms and a gymnasium for the Department of Physical Education, women. It was named for Helen Anna Lengvel, professor emerita of women's physical education.

CLARENCE C. LITTLE HALL (1965) houses the Departments of Foreign Languages and Psychology. Contains four general purpose lecture rooms and offices for faculty of College of Arts and Sciences.

LORD HALL (1904) contains offices and laboratories for the Department of Music on the first and second floors of the east wing, and for the Department of Journalism, the Maine Campus newspaper, the Prism (yearbook), and the campus security offices in the west wing. It was named for the late Henry Lord, a former president of the Board of Trustees.

MEMORIAL UNION (1953) is a memorial to the University of Maine men who died, and a tribute to all who served, in World War II. It is the gift of alumni, students, non-alumni faculty, and friends. This union is the center of student activities and recreational programs on the campus. It has a Memorial Room, meeting rooms, lounges, offices, snack bar, game room, bowling alleys, offices for the director of religious affairs and for student organizations, faculty-alumni lounge and dining room which serve the University community. Additional meeting rooms were added in 1961.

MERRILL HALL (1931) is used for work in Home Economics. Also houses offices of Continuing Education Division. It was named for the late Dr. Leon S. Merrill, dean of the College of Agriculture from 1911 to 1933.

MURRAY HALL (1967) is used by the College of Arts and Sciences for its Department of Zoology. It contains offices, seminar rooms, undergraduate and graduate student laboratories. It was named in honor of Dr. Joseph Magee Murray, Dean of the College of Arts and Sciences from 1941 to 1966.

ROGERS HALL (1928) houses administrative offices of the Department of Animal Sciences and contains research laboratories in animal nutrition and related work. It was named in honor of Dr. Lore A. Rogers, Class of '96, chief of research laboratories (retired), Bureau of Dairy Industry, U.S. Department of Agriculture.

STEVENS HALL (1924), with two wings constructed in 1933, contains accommodations for the Colleges of Arts and Sciences and Business Administration. It was named in honor of the late Dr. James S. Stevens, for many years dean of the College of Arts and Sciences.

WINGATE HALL (1892) contains administrative offices, the office of the Registrar, Data Processing Center, the University Computing Center, and the University Planetarium. It was named for the late William P. Wingate, a former president of the Board of Trustees.

WINSLOW HALL (1909) is used by the College of Life Sciences and Agriculture, the Cooperative Extension Service, and houses the Graduate School office. It was named for the late Edward B. Winslow, a former president of the Board of Trustees.

Other buildings include the President's House, Horticultural Greenhouses, Dairy Barns and Milk House, Federel Office Building, Poultry Buildings, Stock Judging Pavilion, Machine Tool Laboratory, Maples, Agricultural Engineering Shop Building, Observatory, Student Health Center, Alumni Center, University Public Information and Press Building, the Central Heating Plant, Service Building, Entomology, several residences occupied by faculty members, and various farm buildings.

FRATERNITY HOUSES—The following fraternities have houses on or near the Orono campus: Beta Theta Pi, Delta Tau Delta, Kappa Sigma, Lambda Chi Alpha, Phi Kappa Sigma, Sigma Chi, Sigma Nu, Theta Chi, Phi Eta Kappa, Alpha Gamma Rho, Alpha Tau Omega, Phi Gamma Delta, Phi Mu Delta, Tau Epsilon Phi, Tau Kappa Epsilon, Sigma Alpha Epsilon, and Sigma Phi Epsilon.

RESIDENCE AND DINING HALLS—Five complexes of residence and dining halls serve the students. These consist, in general, of a dining hall around which are clustered residence halls for both men and women. At the far south end of campus, York dining hall serves York residence hall (women), Aroostook (men), Kennebec (women), and Estabrooke (graduate students). In south center, Stodder cafeteria serves the Stodder residence hall (men and women), Balentine (women), Chadbourne (men and women) and Penobscot (women). In the center of campus, West Commons serves Hart (women), and Corbett (men), Dunn (men), Hancock (women), Hannibal Hamlin (men) and Oak Hall (men). Two complexes are located in the northeast section where East Commons serves Gannett (men), Androscoggin (women), and Cumberland (men), and the newest complex, sometimes called Camelot by the students, is clustered around Hill Top Cafeteria. Here are located Knox (women), Oxford (men), and Somerset (women).

Colvin Hall is the cooperative women's residence where students prepare and serve their own meals and do the general house work in the unit, thus reducing their costs. The University Cabins, with accommodations for four male students each, provide housekeeping facilities.

The privilege of living in a University residence hall is granted to those undergraduate students who are registered for a minimum of twelve credit hours per semester. In special cases such as student teaching, second semester

seniors, etc., the Dean of Residence may grant permission for them to continue to reside in a residence hall if a student is carrying a minimum of ten credit hours.

Graduate students who are enrolled in full-time study for the academic year have the privilege of residing in the university facilities provided for them.

Residents of the dormitories are furnished meal tickets good for 21 meals per week. Non-residents may buy meals in any dining hall on a transient basis or may purchase a meal ticket.

At the University of Maine at Bangor, women in two-year courses are housed in Belfast Hall and transfer and readmission women live in Augusta Hall. Ellsworth, Rockland, and Lewiston Halls will be occupied by two-year and transfer and readmission men. As space becomes available in the Orono residence halls, transfers and readmission students will be reassigned in the order of their dates of admission. Meals for these students are served in Brewer Hall, the dining room in close proximity to the residence halls.

Freshman students under 20 who do not live at home are required to live in one of the residence halls, except that the Associate Dean of Residence Halls may authorize off-campus residence in exceptional cases.

Students are expected to reside within the system for a complete semester. If they leave, they are subject to a refund policy as set forth in the Residence Halls contract.

Residents of the dormitory system are furnished bed linen each week without extra charge. They furnish their own towels, pillows, blankets, and any decorative features such as rugs, bureau scarfs or drapes.

Temporary housing is furnished as a convenience to students who find it difficult or impossible to leave the campus for the Thanksgiving, mid-year, and spring recesses. No accommodations are available during the Christmas recess

Athletic Facilities—The University's facilities for athletics and physical education on the Orono campus include the Memorial Gymnasium, the Memorial Indoor Field House, the Helen A. Lengyel Gymnasium, numerous athletic fields, a new swimming pool, gymnastics and wrestling areas now under construction.

The athletic fields for men include 14 tennis courts, two baseball fields, a football stadium, three football practice fields (one of which is illuminated for evening practice), a quarter-mile cinder track, hammer and discus fields, fields for intramural sports, a four-mile cross country course, skiing facilities, and three soccer fields.

The Helen A. Lengyel Gymnasium has a gym floor and a large recreation room which are used by the department for intramural activities in team and individual sports, recreational games, and club activities, as well as for classes. The building includes an indoor archery range, a first aid room, and a remedial gymnasium, which is also used for folk, modern, and square dancing classes.

The women's athletic field is located at the south end of the campus near the women's residences. It has a hockey field, practice area and an archery range and 4 tennis courts. In season, the field is also used for soccer, speedball, and softball.

University Farms—The University farms include approximately 900 acres of land used primarily for a dairy operation. One farm adjoins the campus; others are located in the Stillwater section of Old Town.

The campus farm includes a modern dairy barn housing an outstanding herd of registered dairy cattle representative of the leading breeds. A sizable poultry

laying flock, and a flock of sheep are also maintained on the campus farm. A herd of registered beef cattle located off campus is also a part of the total farm operation.

The farms serve several purposes. They are utilized for student instruction, as laboratories for agricultural courses, and as demonstration projects for Extension programs. Research projects are continuously in progress in various segments of the operation. Milk and eggs produced on the farm are utilized by the University dormitory system.

University Forest—The University forest totaling 1,750 acres and located in the Stillwater-Old Town area, is administered by the School of Forestry for student instruction, project demonstration, and research. An additional two acres are operated as a forest nursery. Indian Township, a tract of 17,000 acres, is managed by the School of Forestry for summer instructional purposes. Headquarters for the summer training program is the Robert J. Ashman Forestry Camp on Long Lake, near Princeton.

Woodland Preserve—The Woodland Preserve, consisting of two tracts of woodland and marsh totalling approximately 33 acres in the southeast corner of the Orono campus, was established by action of the Board of Trustees in 1967 to provide the University community with a nearby area for the scientific study and observation of the ecology and natural evolution of forest and marsh.

Computing and Data Processing Services — The Computer Center supports the instructional, research, consulting and administrative needs of the University system. A course in digital computer programming is offered by the Department of Mathematics. The College of Business Administration and the Departments of Chemical Engineering and of General Engineering offer courses in programming as applied to their disciplines, the latter two including analog work. Non-credit courses and seminars are available to establish competencies necessary to make effective use of computing facilities. Packaged programs are available for most commonly used statistical work and consulting programmers are available to advise on computability.

University Facilities Include: The IBM 360 in Wingate Hall which supplies batch computing. Current configuration is a model/40 with 256K byte main memory, five 2314 disk drives and 2415 tape unit (with two 9-channel drives). The operating system is MORE POWER DOS (Power Spooling and Maine On-line Remote Entry).

Typewriter based terminals (2741) are installed at all locations of the University and additional units are available for short term use. Intermediate speed (2780) terminals are to be installed at Portland and Gorham by fall 1970.

The IBM 1800 in Aubert Hall is a part of the Gottesman Computation Center. It is particularly well adapted to process control work and to support interactive terminals. It is being used to monitor remote data acquisition. The facility includes a 16K work memory, two 2310 disk drives and an off-line printer. An EAI 231R analog computer can be operated independently or as an input to the 1800. The operating system is a modified TSX.

The IBM 1230 in the Education Building is a part of the Testing and Counseling Service. This equipment can be used to convert test and questionnaire responses into a medium for further analysis on any of the other facilities.

Problems not suited to the above equipment are handled on IBM 360/65's operating under a modified OS system. Arrangements have been made for 2741 and telephone line service and for on-site work.

The Ira C. Darling Center for Research, Teaching and Service—The Marine Laboratory of the University of Maine. Located on Wentworth Point on the Damariscotta River in Walpole, the Darling Center now has approximately 5,000 square feet of laboratory space available for faculty and graduate marine research. The dormitory accommodates 18. A pier completed in 1969 has 15 feet at low water. A 34-foot diesel work boat, a 34-foot research catamaran commissioned in the spring of 1970, and a number of outboard boats are used for field work. The Center's library contains several thousand volumes, an extensive reprint collection, and several thousand microforms. Laboratory space for visiting investigators is available by pre-arrangement. Summer courses in marine invertebrate zoology and ichtyology are offered. Courses in biological and geological oceanography and in ichthyology are given by Darling Center staff at the Orono campus.

The Libraries—The University Libraries serve the intellectual needs of the students and faculty and stimulate the use of books for research and recreational reading. The libraries contain more than 500,000 volumes and receive some 3,600 periodicals in three divisions. They are the regional depository for northern New England for U.S. Government publications and have a file of maps for the Army Map Service. They also are a selective depository for Canadian government publications. They extend these resources to other libraries through interlibrary loan service, to visiting scholars, and to citizens of the state whenever they can do so without interfering with local needs. Periodical articles and similar materials not available for lending may often be photocopied, subject to copyright regulations.

The University of Maine Art Collection—The University of Maine Art Collection in Carnegie Hall contains materials depicting the history of art through all ages. More than 10,000 photographs, color reproductions, and slides of art masterpieces are available, on occasion, to students and faculty for study and loan. Through generous gifts in recent years the collection has been augmented by some 1,000 original sculptures, paintings, and graphic arts by outstanding American and European artists: Inness, Homer, Hassam, Marin, Hartley, Spinchorn. Kienbusch, Wyeth, Pleissner, Kingman, Peirce, Picasso, Matisse, Rouault, Hamabe and others. Almost all of these works are hung in public areas throughout the campus.

The University of Maine Program of Exhibitions—Throughout the academic year and during the summer session the Department of Art presents each month eight different art exhibitions: four in Carnegie Hall and one each in the Oakes Room of the Fogler Library, the library Photo Salon, the lobby of the Memorial

Union Building, and the lobby of Alumni Hall. Special exhibits are arranged from time to time in the East and West Commons lounges, Hauck Auditorium lobby, library reference room, and the Maine Christian Association Building. All exhibits, open without charge, display only original art, with special preference given to professional artists and craftsmen living or working in Maine. As a service to the state each year, the Department of Art arranges and circulates 100 different exhibitions of original art throughout the schools and academies of Maine. There is no charge for these exhibitions, but reservations must be made before Sept. 30 for each academic year. All inquiries should be addressed to Professor Vincent A. Hartgen, Head, Department of Art.

Scientific Collections—The following collections are located on the Orono campus:

BOTANY—The herbarium in Deering Hall includes several collections, the most important of which is the one made by the late Rev. Joseph Blake and presented to the University by Mr. Jonathan G. Clark, of Bangor. The late Professor F.L. Harvey left to the herbarium the general collections accumulated during his connection with the University. Other important collections are Collin's Algae of the Maine Coast, Halsted's Lichens of New England, Halsted's Weeds, Ellis and Everhart's North American Fungi, Cook's Illustrative Fungi, Underwood's Hepaticae, Cummings and Seymour's North American Lichens, and Bartholomew's Fungi Columbiana.

The herbarium has been enriched recently by the personal collections of Mrs. Frank Hinckley, Helen Paine Scoullar, Charles Curtis, Henry Wilson Merrill, Maynard Quimby, Louise Coburn, Sue Gordon, Ralph C. Bean, George B. Rossbach, K.P. Jansson and Glen D. Chamberlain. Numerous centuries of Plantae Exsiccatae Grayanae are significant additions. Sixty-five thousand herbarium sheets are available.

Approximately three acres of land extending southward from the Heating Plant and between the Forest Nursery and the Stillwater River were assigned to the Department of Botany for the establishment of a Botanical Plantation in the autumn of 1934. The first three plantings were made in conjunction with Maine Day of 1935. At present, more than 300 species of trees and shrubs have been introduced. This area was recently named the Fay Hyland Botanical Plantation. Many species of ferns and flowering plants have also been included.

ENTOMOLOGY—A small area partly enclosed by trees of the Botanical Plantation and near the southern boundary of the Forest Nursery forms a site for a small University apiary. This apiary has approximately five colonies that are used for pollination studies.

The Edith M. Patch aphid collection, housed in Deering Hall, is one of the outstanding aphid collections in North America. It is a major portion of the insect collection maintained by the University for reference purposes in dealing with inquiries concerning insect pests sent in by citizens of Maine.

GEOLOGY—The geological collections of minerals, rocks, and fossils are housed in Boardman Hall.

ZOOLOGY—These collections in the new Zoology building, Murray Hall, consist of a working collection of bird skins, a display of bird mounts, and study collections of various other groups of both vertebrates and invertebrates. The Anson Allen Collection of Invertebrates and of Maine Birds, presented by Mrs.

Mattie Munson; the Eckstorm Collection of birds, presented by Mrs. Fannie H. and Mrs. P. F. Eckstorm; and the bird skin collection of the Portland Society of Natural History-Maine Audubon Society, one of the oldest of its kind in the country and consisting of 3844 study skins, form an important part of the whole.

Planetarium—A Planetarium, operated under the supervision of the Department of Physics, is located in the second floor of Wingate Hall. The Planetarium is used in connection with courses in astronomy but is also open to the public. Groups may visit by making arrangements in advance through the Public Information Office.

The University of Maine Anthropology Museum—The Department of Anthropology has established an Anthropology Museum on the third floor of South Stevens Hall. The museum serves not only as a teaching aid for students in the department but also as an additional cultural facility for the campus and the community. Through the generosity of many interested persons the collection includes material relating to the American Indians, Africa, the Arctic and Oceania. There are also special teaching exhibits on weapon and tool development, fossil man and race, as well as special sections on Maine Indians and Maine prehistory. Loan collections from other institutions sometimes are exhibited. The museum is open to the public whenever the University is open. Regular hours are Monday through Friday, 8 a.m. to 4 p.m. The museum can be opened for groups at other times by appointment. Summer hours are Monday through Friday 9 a.m. to noon.

University Publications—The following are included in the various bulletins and reports regularly issued by the University:

University of Maine Bulletin is issued about 30 times a year to give information to students, faculty, alumni, and the general public.

University of Maine Studies are research works published under the direction of the Maine Studies Committee. A price list may be obtained from the Bulletin Room, Public Information Building. Orders and exchanges should be sent to the Bulletin Room.

Agriculture Experiment Station Publications include technical and popular bulletins and miscellaneous reports in which are contained the results of research studies; and Official Inspections which contain the results of inspections of feeding stuffs, fertilizers, agricultural seeds, fungicides and insecticides, and foods and drugs. A report of progress is issued quarterly as Research in The Life Sciences. A free copy of each publication is available upon request.

Cooperative Extension Service Bulletins and Circulars are issued by the Cooperative Extension Service on a wide variety of subjects relating to agriculture, home economics, youth education, resource development and public affairs. Maine residents may secure a list of available bulletins and circulars upon request to the Mail Room, PICS Building, U of M Orono.

The Maine Alumnus, an illustrated magazine of campus and alumni news published seven times during the college year, is sent to former students of the University who subscribe, and to those making donations to the Annual Alumni Fund.

THE UNIVERSITY OF MAINE LAW REVIEW is a continuation of the former *Maine Law Review* last published in 1920. It was revived as a student activity in 1962.

Student publications are described in a section of this catalog called "Student Activities."

The Coe Research Fund and the Weppler Fund—The University Trustees have set aside $100,000 to form a permanent fund known as The Coe Research Fund, and $143,000 to form a permanent fund known as the Weppler Fund, the income to be used by the faculty for carrying on research work. From time to time some additional funds are made available to the committee for the same purposes. Applications for grants from these funds should be addressed to the Secretary, Coe Research Fund Committee.

FACULTY SUMMER RESEARCH GRANTS. A program of support to enable a limited number of grants to underwrite faculty research projects during the summer. Recipients are selected on the basis of information supplied in a proposal which explains the research project to be conducted during the period for which the grant is made. The Coe Research Fund Committee serves as a screening committee to evaluate the proposals. Application information may be obtained from the Dean of the Graduate School.

Center for Counseling and Psychological Services—The Center for Counseling and Psychological Services provides assistance to students with academic, vocational, personal and emotional concerns.

Counseling and psychotherapy are the most frequently used services. Opportunities for psychological evaluation, psychiatric evaluation and consultation, and self improvement programs in such areas as interpersonal relationships and study skills also are available. The Center maintains an educational-occupational information library, including college and graduate school catalogs representative of many types of schools and geographical locations. Students may drop in to use these materials at any time. In order to help answer a student's questions about himself, his counselor may use interest inventories, aptitude tests and personal preference inventories. Tests for admission to graduate schools and for employment purposes are also administered by the Center.

All students, freshman through graduate, on the Orono and Bangor Campuses of the University are eligible for the services of the Center free of charge. Students are seen by appointment, which can be made by coming to the Center or by phone. All visits are confidential. The main office of the Center for Counseling and Psychological Services is at 101 Fernald Hall, (Tel. 7937), and most initial contacts will be made here. Psychological and psychiatric services are also provided at the Infirmary, (Tel. 7128).

Office of Career Planning and Placement—Through this office the University offers career planning and placement services to undergraduate and graduate students and alumni in both teaching and non-teaching fields. Established as the Placement Bureau in 1935 in cooperation with the General Alumni Association, the office offers the following services to registrants and employers:

1) Counsels and assists students and alumni in career planning.

2) Notifies registrants of suitable employment opportunities.
3) Assists candidates in preparing and presenting effective applications.
4) Cooperates with employers in their search for qualified personnel.
5) Develops career information for University men and women in both new and traditional fields of opportunity.

The office schedules for students each year an extensive and informative on-campus interviewing program with representatives from both teaching and non-teaching fields. Assistance is also given students in locating summer vacation employment.

The College Teacher Division serves candidates for master and doctoral degrees interested in employment in college and university positions.

Presently employed alumni teachers are offered assistance in maintaining continuous records of achievement to facilitate professional advancement by the Alumni Teacher Placement Division located in Coburn Hall.

No charge is made to students, alumni, or employers for the services of the Office.

Office of Student Aid—The Office of Student Aid receives applications for student aid including part-time employment, Work Study Program, scholarships, University loans, loans under the National Defense Education Act, and Educational Opportunity grants. Detailed information on student aid will be found on pages 36, 43 and 53. Information on loan funds and scholarships is contained in a special brochure, available on request.

Foreign Student Adviser—The University maintains an office for the information and assistance of all students who are not citizens of the United States. All foreign nationals are required to register with this office in the East Annex, Orono, at the beginning of each academic year.

The University wishes that each international student have the best possible educational and personal experience while he is in the United States and especially while at the University.

The Foreign Student Adviser's office assists the student to interpret in appropriate situations the administrative regulations of the institution; local, state, and national laws; accepted standards of conduct; and expectations and reactions of those he will encounter while in a new cultural community environment.

All International Students including those with "F" student or "J" exchange student status must report to the Foreign Student Adviser's office as soon as convenient after arrival on campus. Advice concerning immigration regulations, necessary forms, etc., are available so that international students may remain in the United States as long as properly necessary to achieve their educational goals.

Health Service—The Student Health Center is organized and operated for the benefit of students. Supervision of medical care and health needs afforded by a family physician is the goal of this program. Insofar as possible, all aspects of a personal doctor-patient relationship are preserved. The following services are offered at no charge to eligible students:

1. Twenty-four-hour emergency care, including weekends when the University is in session; emergency visits by the physician when necessary. (Medical services are not available during vacations.)

2. In-patient care in the Infirmary as needed, including physician visits, nursing care, medicines, and diagnostic tests.
3. Consultations with staff physicians and surgeons for diagnosis and treatment during regular clinic hours.
4. Limited dispensing of medicines on an out-patient basis.
5. Routine immunization, allergy injections, etc.
6. Limited diagnostic laboratory tests, x-rays, and physical therapy.
7. Follow-up examinations for various athletic activities, pre-employment physical examinations, and other routine physical examinations.
8. Coordination of the Health Insurance Program to insure maximum benefits to the students when illness requires hospital treatment or consultation with physicians not on the Health Center staff.
9. Supervision of the University environment to minimize exposure of students to health hazards.
10. The Center for Counseling and Psychological Services maintains offices at the Health Center. Emergency contact with CCPS staff can be made through contacting the Health Service. See full description of services provided under the heading for Center for Counseling and Psychological Services.

To meet these goals, a new Student Health Center was completed in 1968 consisting of out-patient clinics, laboratory, x-ray and physiotherapy facilities and 32-bed infirmary. The staff consists of four full-time physicians, two clinical psychologists, a surgical consultant, a psychiatric consultant, and adequate nursing and technical help.

No major steps in health care of individual students are undertaken without consultation with the student's parents except in extreme emergency cases when the parents cannot be located.

Religious Affairs—Subject to the approval of the president and the Board of Trustees, the Committee on Religious Affairs serves as the policy-making group in the area of religion at the University of Maine. It oversees the activities of the Student Religious Association and functions as the official body through which the faith groups are related to the administration of the University.

Six religious groups provide opportunities for worship, study, conversation, and witness: The Episcopal Church at the Maine campus for Episcopal students, Hillel Foundation for Jewish students, Maine Christian Association for Protestant students, and Our Lady of Wisdom Chapel and the Newman Apostolate for Roman Catholic students. The chaplains are available for counseling or instruction. The Intervarsity Christian Fellowship, an approved student organization, meets weekly in the Memorial Union. The Christian Science Organization meets for study and worship each week in the Drummond Chapel of the Union Building.

THE STUDENT RELIGIOUS ASSOCIATION, called SRA, is the coordinating agent of the recognized faith groups and religious activites of the campus and is governed by a cabinet of representatives from the student members of these groups.

LOCAL CHURCHES AND SYNAGOGUES—The churches and synagogues of Orono, Old Town, and Bangor always welcome the attendance of University students. A small meditation room, the Drummond Chapel, is in Memorial Union.

Activities concerned with religious affairs are coordinated through the Office of the Dean of Student Activities and Organizations.

Use of Laboratory Apparatus—Many laboratory courses involve instruction in and the use of various types of power equipment and laboratory apparatus. 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 caution. 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 and Accident Insurance is recommended.

Registration—Undergraduates at the Orono campus will register in accordance with the following:

FRESHMEN—All members of the incoming freshman class are required to attend, during the summer preceding the beginning of classes, any one of the several freshman orientation sessions at the Orono campus. The dates when these are held each year are furnished incoming freshmen and their parents. It is strongly urged that parents plan to attend the orientation program with their sons and daughters.

During the orientation period, registration is accomplished for the fall semester. Also, information is distributed concerning arrangements in connection with the beginning of classes, arrival at dormitories, etc., in September.

UPPERCLASSMEN—In the fall, upperclassmen will be required to register by mail prior to, or in person, on the day specified or to present written evidence that they have been allowed by their dean to register late. Upperclassmen must communicate in advance with the dean of their college giving their reason for wishing to register late, and have received from him written permission to do so. In the event of an unusual circumstance wholly beyond the control of the student, and occurring just before the opening of the fall term, the student may present his case in person to the dean upon his arrival at the University.

Academic advisers are assigned all students for help in planning their educational programs, to ensure their meeting graduation requirements, for counsel and guidance in academic work, and for advice about study or classwork problems. The final responsibility for fulfilling degree requirements, however, rests with each student.

Degrees—The University awards the following degrees:

Associate of Arts (A.A.) in ..... with the major field designated to those who complete the two-year curriculum at Bangor.

Associate of Arts (A.A.) in ..... with the major field designated to those who complete the two-year program at Augusta.

Associate of Science (A.S.) in ..... major field to those who complete the two-year curriculum in the College of Life Sciences and Agriculture or Technology at Bangor.

Associate of Science (A.S.) in Administration with option designated to those who complete the two-year curriculum at Augusta.

Associate of Science (A.S.) in ..... with major field designated to those who complete two-year program at Augusta.

Bachelor of Arts (B.A.) with specification of the major subject, to those who complete a four-year curriculum in the College of Arts and Sciences.

Bachelor of Music in Applied Music (B. Mus.) to those who complete the prescribed four years' work in the College of Arts and Sciences.

Bachelor of Science (B.S.) to those who complete the prescribed work of four years in the Colleges of Business Administration, Life Sciences and Agriculture, and Technology.

Bachelor of Science in Education (B.S. in Ed.) is conferred upon students who complete the prescribed work in the College of Education.

A minimum residence of one year is required for the attainment of any bachelor's degree. This regulation refers to the senior year.

The following advanced degrees are offered by the Graduate School:

Master of Arts (M.A.) and Master of Science (M.S.) with designation of the major subject or field.

Master of Agricultural and Resource Economics (M.A.R.E.).

Master of Arts in Teaching (M.A.T.).

Master of Business Administration (M.B.A.).

Master of Education (M.Ed.).

Master of Engineering (M.E.) with departmental designation.

Master of Library Service (M.L.S.).

Master of Mechanical Engineering (M.M.E.).

Master of Public Administration (M.P.A.).

The Certificate of Advanced Study (C.A.S.) with a planned program.

Doctor of Education (Ed.D.).

Doctor of Philosophy (Ph.D.) with designation of major field.

BACCALAUREATE DEGREES WITH DISTINCTION are conferred at commencement for the following attainments in rank.

Seniors having an average grade of 3.50 or above will be graduated with highest distinction, 3.25 to 3.49 with high distinction and 3.00 to 3.24 with distinction if they meet the criteria listed below.

The average grade is based on the work of the first three and one half years, which must include at the time of graduation three years of resident study at the University of Maine. Candidates must take their senior year at the University of Maine.

DEGREES WITH HONORS, WITH HIGH HONORS, OR WITH HIGHEST HONORS are awarded to seniors who successfully complete the Honors Program.

Grading System—Grades at the University are given in terms of letters as follows. (For purposes of comparison these letters carry the following arbitrary values for undergraduate students: A=4, B=3, C=2, D=1, E=0; for graduate students both D and E grade=0.)

Passing undergraduate grades: A, high honors; B, honors; C, satisfactory, successful, and respectable meeting of the course objectives; D, low level passing; Q, passed for degree credit on a *Pass-Fail* basis.

Passing graduate grades: A, high honors; B, honors; C, may be considered satisfactory by specific approval of student's advisory committee. *Acceptable*, applied to satisfactory theses only.

Failing grades: E, failed.
F, failed *Pass-Fail course.*
L, registered for course. Non-attendance reported, no withdrawal on file. Equivalent to an E.

Y, dropped with grade of E.

Progress grade: R, final grade deferred.

Grades held in abeyance: X, absent from final examination; Z, deficiency in course work; X and Z change to an E grade if not made up within periods stated in the Handbook.

Non-credit grades: H, audited course; P, passed non-credit course or, when noted, withdrew passing; W, dropped without penalty.

Each college sets its own graduation requirements in terms of grades or grade points.

A candidate for a bachelor's degree must: (a) receive passing grades in all courses required by his major department, except the Colleges of Arts and Sciences and Business Administration which require a 2.0 average in the major field; (b) accumulate the number of degree hours specified by the college in which he is registered; (c) achieve an accumulative average of not less than 1.80 except the Colleges of Arts and Sciences and Education which require an accumulative average of not less than 2.0.

The degree hours are the sum of the course credit hours of those courses which may be counted toward a degree, provided a passing grade has been received.

The accumulative average is the quotient of the grade points divided by the total hours, carried to two decimal places. The grade points are the product of the course credit hours and the numerical value of the letter grade: A=4, B=3, C=2, D=1, E=0. The total hours are the sum of the course credit hours from all courses.

Grade Reports are sent to the parents of all undergraduate students at the end of each semester. Progress reports are sent to the parents of freshmen at the middle of each semester.

Parents are notified whenever a student is placed on, continued on, or removed from probation. (This procedure is omitted in the case of veteran students who are legal age.)

Considerable care is taken to ensure that course registrations and grades entered on a student's permanent record are accurate. Any student who, upon receipt of a semester final grade report, suspects an error has been made should take the matter up immediately with the Registrar's Office. Records are assumed to be correct if a student does not so report to the Registrar's Office within six months of the completion of a course. At that time portions of the record are committed to microfilm, which cannot be emended.

Student Registrations—It is assumed that all students entering the University are willing to subscribe to the following: *A student is expected to show, both within and outside the University, respect for order, morality, and the rights of others, and such sense of personal honor as is demanded of good citizens.*

The University requires certain standards of academic performance and of general good character for admission; if these are not maintained, the University suspends or dismisses the student. Every effort is made to provide adequate academic and personal counseling for all students, with the aim of enabling them to successfully complete their courses of study.

Freshmen are not permitted to have or operate motor vehicles at the University of Maine. This regulation prohibits a freshman from keeping an automobile

on the campus or in Orono or vicinity. Students are expected to observe the spirit as well as the letter of the regulation and the cooperation of parents is solicited in the operation of the rule. Exceptions may be made by the Security Registrar in cases of freshmen who commute daily from their homes.

Upperclass students are allowed to have and to operate motor vehicles on the campus, but all such vehicles must be registered in the office of Mr. Edward McLaughlin, Security Registrar, Lord Hall, and bear an official University sticker. There is a registration fee of $1.00. In addition, evidence of automobile liability insurance must be shown.

Each student is expected to be present at every college exercise for which he is registered.

Dismissal and Suspension—Students may be dismissed or suspended from the University for unsatisfactory work (academic dismissal* or suspension), for misbehavior (disciplinary dismissal or suspension), or for mental or physical health problems (administrative disenrollment). Dismissed* students are ineligible to *apply* for readmission for one year from date of dismissal; suspended students may apply for readmission effective upon termination of suspension. Dismissed* students are ineligible to register for credit or non-credit in any division of the University for one year following dismissal; suspended students for the duration of the suspension.

Withdrawal—Students who desire to withdraw from the University for any reason must secure a withdrawal slip from the Registrar's Office and have it completed. Failure to do so may result in failing grades being recorded in all courses at the end of a semester. Additionally, withdrawal after the final date of the "withdrawal with penalty" period set by the University as detailed in student regulations, except for approved emergency reasons, will also result in failing grades.

Change of Campus (Orono-Augusta) A student wishing to change campuses should secure from his Dean's Office a *Change of Campus Request* form and follow carefully the instructions theron.

Physical Examination—The University requires that all entering students, freshmen, transfer, graduate, and special, have a physical examination, tuberculin skin test and also chest X-ray if the latter seems indicated. Physical examinations and tuberculin tests may also be required of students seeking readmission to the University.

Detailed information about the regulations affecting students is contained in a pamphlet entitled *The Maine Handbook* obtainable at the Office of the Dean of Students.

**Exception: First* (fall) *semester freshmen* dismissed in January for low grades (academic dismissal) may apply for readmission effective the end of the ensuing spring semester, at which time they may register otherwise, as well, without waiting for an entire year to elapse.

Responsibility for Personal Property—*The University does not under any circumstances assume responsibility for loss of or damage to personal property through fire, theft, or other causes. Persons desiring protection against possible loss or damage should purchase appropriate insurance unless it is found that parents already have desired coverage by means of a family policy.*

THE UNIVERSITY HONORS PROGRAM

General—The University Honors Program is open to all qualified undergraduate students in the University. Its purpose is twofold: (1) to introduce students of high scholastic potential to the major areas of knowledge—mathematics and science, social studies, literature, philosophy, and fine arts—through individual reading and small group discussion; and (2) to develop their skills to as high a degree as possible in the field in which they choose to concentrate.

The program in the freshman and sophomore years is the same for all colleges and is administered by the Honors Council. Its task is the orientation of the student to the broad perspectives of the academic world.

The programs for the junior and senior years vary somewhat from college to college and are administered by the Honors Committee of each college. Their task is to sharpen and focus the student's abilities in his own field of specialization.

Content—Students who are designated as Distinguished Maine Students, as well as a limited number of other highly qualified students (see page 36), may begin honors work in the fall semester of the freshman year in a seminar in which a limited number of books, chosen to cover the major intellectual disciplines, are discussed under the leadership of a faculty member. In the spring semester other qualified freshmen join the program. Honors work in that semester consists of a colloquium in which readings concerned with the seminal ideas of Western civilization are discussed by students with a faculty leader. The sections of the freshman seminar and colloquium are limited to 12 to 14 students each.

During the sophomore year, honors work is based on small group tutorials, each group consisting of three or four students. Each group meets weekly with a tutor for the discussion of books and ideas from the honors reading list. Every group does substantial reading in three or four major areas of thought each semester.

In the junior year the student begins his concentration in his major field. His work in honors may be a course of study under tutorial supervision designed to acquaint him with his major field, or, at the option of his college Honors Committee, he may take an interdisciplinary seminar in one semester of the year.

For the senior year, a thesis or research project, within or closely related to his field of primary interest, is the major part of his Honors Program. A final comprehensive examination before a faculty board tests the student's accomplishments in both objectives of the program: breadth of knowledge and depth of specialization within his major field.

Degree—The degree of honors awarded—Honors, High Honors, Highest Honors—depends upon three factors: the student's accumulative average over seven semesters; the quality of his senior thesis or project; his performance on the comprehensive examination. In order to receive a degree with Honors, a student must have a minimum of four semesters of work in the Honors Program, including both semesters of the senior year, and at least one semester of sophomore group tutorials.

UNIVERSITY OF MAINE

Entry—Normally, entry into the Honors Program except for Distinguished Maine Students and a few others, occurs at the start of the second semester in the freshman year. However, a substantial number of students are admitted at the beginning of the sophomore year, some at mid-years in the sophomore year, and a small number at the beginning of the junior year.

Admission—Students are recommended for the Honors Program by the Honors Committee of the college in which they are registered and admitted to the freshman and sophomore programs by the Honors Council. To be eligible for consideration for the Honors Program, a student should normally have a point average of 3.0 or better, have high C.E.E.B. test scores, and show curiosity, initiative, and intellectual flexibility in the work he has done. Students wishing to join the Honors Program should consult the secretary of their college Honors Committee: Life Sciences and Agriculture, Prof. R. J. Campana, 215 Deering Hall; Arts and Sciences, Professor R. B. Thomson, 15 North Stevens; Business, Associate Professor Jean Goodman, 20 South Stevens; Education, Professor G. H. Davis, 132 Education Building; Technology, Professor R. C. Hill, 112 Boardman Hall.

Council—The University Honors Council, consisting of the Vice President for Academic Affairs as chairman, Professors Hill, Davis, Campana and Thomson, and Associate Professor Goodman, administers the common program of the first two years and coordinates the work of the College Honors Committees. All questions in regard to the University Honors Program should be addressed to Professor Thomson, 15 North Stevens, Director of the University Honors Program.

Descriptions of honors courses will be found in the Arts and Sciences section of the catalog.

PRESIDENTIAL SCHOLARS

Each year 20 entering freshmen judged academically superior on the basis of their secondary school records, test scores, and recommendations are invited to become Presidential Scholars. Awards of $500 for 16 Maine students and $1,000 for four out-of-state students are granted for the freshman year. Presidential Scholars are invited to enter the University Honors Program as first-semester freshmen.

DISTINGUISHED MAINE STUDENTS PROGRAM

In 1963 the Board of Trustees approved a program aimed at recognizing outstanding graduates of Maine secondary schools who are admitted to the University of Maine as regular, full-time students. Such students are designated as "Distinguished Maine Students." Recipients of this honor are selected primarily on the basis of three criteria: (1) outstanding preparatory school records; (2) strong potential as indicated by test scores, and (3) excellent personal recommendations from secondary school officials.

Students who are selected receive certificates of recognition from the University which are sent prior to the date of secondary school commencement. The secondary school from which each Distinguished Maine Student graduates is also notified of the student's selection for this honor.

Distinguished Maine Students, along with a few other highly qualified students, may enroll in the first semester seminar of the University Honors Program. In this course students read a limited number of books, which are representative of the major fields of learning, and discuss them under the guidance of a faculty member. The seminar presents a unique opportunity for first-semester freshmen to participate in an unusual academic program.

A primary aim of the Distinguished Maine Students Program is to call attention to the academic accomplishments of talented Maine youth and to give these accomplishments suitable recognition. At the present time 50 students per year are selected for this honor. Recipients of the Distinguished Maine Student designation are selected by the Director of Admissions and the University Honors Council, acting jointly. Credentials of all applicants for regular admission are reviewed in the selection process; no special application is required or accepted.

STUDENT ACTIVITIES

Cooperative Government—The organizations through which cooperative government is effected are the following:

THE GENERAL STUDENT SENATE seeks to promote the general welfare of the student body and the best interests of the University. It is composed of representatives elected from campus living areas and off-campus. Two officers are elected at large in the spring of every year. The Senate is responsible for appointing student members to all committees, initiating services such as draft and drug counseling, making recommendations concerning student opinion to other governing bodies, and considering any business properly brought before it.

THE ASSOCIATED WOMEN STUDENTS, composed of all regularly enrolled undergraduate women, is the organization that promotes women's affairs on the campus; the administration of self-government in the dormitories; and the sponsorship of cultural, social, and educational programs for women. The AWS is a member of the Intercollegiate Association of Women Students.

THE MEMORIAL UNION, completed in 1953, is the community center for all members of the University family—students, faculty, administration, and guests. Expressed in its broadest terms, the purpose of the Union is synonymous with the goals of the University. Students today are taught to be questioners, skeptics, seekers of truth and critics of what they see and experience. The Union provides an out-of-class atmosphere for students to question and pursue truth.

Uniquely, the Union is for students and directed by students. The success of the Union in accomplishing its objectives is directly proportional to the quality of ideas contributed to the program by those students providing leadership. The Memorial Union Activities Board (MUAB) is the undergraduate organization that accepts the challenge of creating a varied and meaningful program. Program areas encompass social and recreational, cultural and intellectual. Students who are interested in membership in MUAB are encouraged to make their interest known at the MUAB offices on the second floor.

Facilities within the Union are meeting rooms, lounges, snack bar, dining facilities, and game rooms. Also, the Drummond Chapel gives students of all faiths an opportunity for spiritual meditation.

Scholastic Honor Societies—These groups recognize attainment and promise in the academic field by selecting for membership undergraduates whose accumulative point averages are not lower than 3.0 after completing five or more semesters of college work or 3.3 after completing less than five semesters. The date indicates when the chapter was established at the University.
PHI KAPPA PHI (1900)—All colleges
TAU BETA PI (1911)—Engineering
PHI BETA KAPPA (1923)—College of Arts and Sciences
NEAI MATHETAI (1925)—Freshman Women
OMICRON NU (1931)—Home Economics
KAPPA DELTA PI (1932)—College of Education
SIGMA XI (1948)—Scientific research

Student Organizations—A complete descriptive listing of departmental and professional honor societies, departmental clubs, and other student organizations appears in the student *Handbook*. Copies are available at the Dean of Student's office.

Musical Organizations—Students have many opportunities to continue their musicial training and experience, either through the degree programs in music (details of these programs are listed under the College of Arts and Sciences and the College of Education), or through participating in any of the several organizations either for credit or non-credit. There are also smaller instrumental ensembles for the more advanced musicians.

For a description and course numbers of the following musical organizations, see the music courses listed in the College of Arts and Sciences section of this catalog.

UNIVERSITY SINGERS—U of M's most select choral organization; 52 mixed voices selected from applicants who have had considerable singing experience. This group sings extensively on the campus and throughout the state during the school year. The literature it performs embraces all periods of music history—Renaissance through the most recent contemporary. Touring itinerary usually includes appearances outside the state. Future concert tours will become more extensive; a European tour is under consideration.

UNIVERSITY ORCHESTRA—Composed primarily of students for the purpose of preparing and performing standard orchestral repertoire. Augmented by members of the Bangor Symphony for presentation of choral works by the Oratorio Society.

ORATORIO SOCIETY—A choral organization of approximately 75 singers specializing in performing larger works with orchestra and soloists.

CONCERT BAND—A well-balanced unit of 75 students carefully selected from the Orono campus that performs the finest available band literature. Both music and non-music majors are invited to audition; there are three rehearsals per week. The regular activities of the Concert Band include formal winter and spring concerts, a state band clinic, and a spring concert tour.

Marching Hundred—U of M's elite marching band of 100 musicians plus majorettes, "Honeybears," and drum major. Personnel are chosen from the Concert Band, Varsity Band, and incoming freshmen. Rehearsals begin shortly before the opening of the fall term.

Chamber Singers—A small group of mixed voices specializing in vocal music especially written for this performing medium. Several appearances during the year, both on and off campus.

Varsity Band—Plays good band music on a more informal basis; a training group for the Concert Band. The Varsity Band provides music at home basketball games in addition to at least one off-campus game.

Varsity Women's Glee Club—Newly organized in the fall of 1969, specializes in music expressly written for this type of performing group. In addition to appearances on campus throughout the year the group has limited appearances throughout the state.

University Chorus—Primarily for the inexperienced singer who wishes to acquire sufficient background for participation in other choral organizations.

Ensembles: Brass, Woodwind, String—Limited participation by qualified students for study and performance of chamber music written especially for small ensembles.

Maine Masque Theatre—As the University Theatre, it is an integral part of the academic and co-curricular program of the Department of Speech. The theatre provides an opportunity for all students to participate in every aspect of theatrical production, including stage and house managing, lighting, costuming, acting, directing, publicity, scenery, properties, and makeup. As a contribution to the cultural growth of the University community, the theatre offers productions which cover the full range of dramatic expression. Membership in the Maine Masquers, a local theatre honor society, may be gained through participation in the theatre's program.

Debate and Forensics—The University forensic program provides opportunities for experience in debate, discussion, extemporaneous speaking, oral interpretation, and original oratory. The program, under the administration and supervision of the Department of Speech, is open to all undergraduate students. Representatives participate in extensive intercollegiate competition with major colleges and universities from the entire United States, as well as engaging in intramural programs on campus. Membership in the Maine Debating Council and Pi Kappa Delta may be obtained through participation in forensic activities.

Radio and Television—Students from the entire University have an opportunity, through working on stations WMEB-FM and WMEB-TV, to participate in all phases of radio and television broadcasting. With studios in 275 Stevens Hall, WMEB-FM is operated with a faculty and student staff as an integral part of the academic and co-curricular program of the Department of Speech. WMEB-TV, operated by the Maine Educational network, has studios in Alumni Hall. The varied program enables the student to gain valuable experiences in engineering, programming, announcing and writing.

Student Publications—The University's regular student publications are:

THE MAINE CAMPUS, a newspaper published weekly.

THE PRISM, an illustrated annual.

UBRIS, a literary magazine published semi-annually.

The Student Publication Committee, a joint faculty-student group, is the publishing board for all the University's student publications.

Social Fraternities and Sororities—The following fraternities and sororities have chapters at the University. The figures in parentheses are the dates they were established.

FRATERNITIES—National: Beta Theta Pi (1879), Kappa Sigma (1886), Alpha Tau Omega (1891), Phi Kappa Sigma (1898), Phi Gamma Delta (1899), Sigma Alpha Epsilon (1901), Sigma Chi (1902), Theta Chi (1907), Delta Tau Delta (1908), Lambda Chi Alpha (1913), Sigma Nu (1913), Phi Mu Delta (1923), Alpha Gamma Rho (1924), Tau Epsilon Phi (1929), Sigma Phi Epsilon (1948), Tau Kappa Epsilon (1948), Delta Upsilon (1970). Local: Phi Eta Kappa (1906).

SORORITIES—National: Alpha Omicron Pi (1908), Phi Mu (1912), Delta Delta Delta (1917), Pi Beta Phi (1920), Chi Omega (1921), Delta Zeta (1924), Alpha Chi Omega (1958), Alpha Phi (1963), Alpha Delta Pi (1968), Sigma Kappa (1968).

Admission

All correspondence concerning undergraduate admission and financial aid should be addressed to the Director of Admissions, Alumni Hall, University of Maine, Orono, Maine 04473. Maine students who plan to begin their programs at the Augusta campus, 99 Western Ave., Augusta, Maine 04330, should indicate this fact on their applications. All applications are filed at our Orono office. There are no dormitory facilities at the Augusta campus.

Applicants for admission to the Graduate Division should write directly to the Dean of the Graduate School, Winslow Hall, University of Maine, Orono, Maine 04473.

ADMISSION TO THE FRESHMAN CLASS

The approval of candidates for admission is on a selective basis. The University is interested in candidates whose preparatory program, scholastic achievement, aptitudes, interests, character, health, and established study habits give definite promise of success in a senior college program. The University admits men and women, both residents of Maine and non-residents; it reserves the right to terminate admissions whenever the capacity of the University to care properly for the students has been reached.

The candidate is required to submit a carefully answered questionnaire concerning favorite studies, school activities, community interests, hobbies, choice of college course and other matters bearing upon preparation for a college program. This information is required so that the University may better guide the student in selecting courses of study best suited to his individual abilities, aptitudes, and interests.

All four-year degree candidates are required to submit the scores on the College Entrance Examination Board Scholastic Aptitude Test (S.A.T.), and the scores on three C.E.E.B. Achievement Tests. (For details, see section concerning the C.E.E.B. which follows).

Candidates for admission to the freshman class should file their applications in the fall of the year prior to the date they plan to begin their studies.

The required application forms (which are revised each year) may be obtained by writing to the Director of Admissions. *A non-refundable application fee of $10 is required of all applicants.* Applicants must apply for admission prior to March 1 for equal consideration with other candidates. Applications received after this date will be marked "Late" and considered only as classroom and dormitory capacities allow.

Candidates for the freshman class normally are accepted for the opening of the academic year in September. (It is not our policy to admit transfer freshmen in the middle of the academic year.) The priority of the housing assignment is based primarily on the date of formal acceptance by the Committee on Admissions. *Certificates of admission issued prior to the completion of the current school year may be rescinded if the final report in June is unsatisfactory.*

SCHOLASTIC APTITUDE AND ACHIEVEMENT TESTS

All candidates for admission to four-year degree programs, the Associate Degree programs in Liberal Studies, Art, and Nursing at the Augusta campus, and the Associate Degree programs in Engineering Technology at the Orono Campus are required to take the Scholastic Aptitude Test (S.A.T.) and three Achievement Tests administered by the College Entrance Examination Board. Candidates are urged to take the November, December and/or the January tests. The Achievement Tests should include English composition, [Level I Mathematics is also required of all engineering candidates] and two other tests of the candidate's choice, or as recommended by the Director of Admissions.

Candidates for the two-year technical programs in the College of Life Sciences and Agriculture (Orono), and all other two-year programs at Augusta. (Administration, General Studies, and Law Enforcement), are required to take the Scholastic Aptitude Test only.

High school juniors are encouraged to take achievement tests in *non-continuing subjects* on the May or July testing dates. Guidance counselors should be consulted prior to registering for such tests.

Arrangements to take the C.E.E.B. Tests should be made by writing to the College Entrance Examination Board, P.O. Box 592, Princeton, New Jersey, for application forms and information. *Arrangements must be made at least one month before the testing date.*

The College Entrance Examination Board will administer tests on each of the following dates:

Saturday, November 7, 1970 (S.A.T. only)

Saturday, December 5, 1970 (S.A.T. and Ach's.)

Saturday, January 9, 1971 (S.A.T. and Ach's.)

Saturday, March 6, 1971 (S.A.T. and Ach's.)

Saturday, April 17, 1971 (S.A.T. only)

Saturday, May 1, 1971 (Ach's only)

Saturday, July 10, 1971 (S.A.T. and Ach's.)

ADVANCE PLACEMENT

In certain subjects, candidates who have completed advanced work in secondary schools may apply for advanced placement and credit at the University of Maine. Candidates interested in advanced placement and credit must take the Advanced Placement Test, or Tests, administered by the College Entrance Examination Board. Each case will be considered individually on its own merits.

Candidates who have completed advanced work in certain subjects or who have had training and/or experience in certain professional or semi-professional fields may apply for advanced placement and credit at the University of Maine. Candidates interested in advanced placement and credit may take either appropriate standardized tests, such as those prepared by the College Entrance Examination Board, or examinations especially developed by the academic unit concerned.

VETERANS ADMINISTRATION INFORMATION

Mrs. Alice F. Harkins is prepared to help veterans and children of disabled and deceased veterans. Requests for information concerning Veterans Administration educational benefits should be forwarded to the Registrar's Office, Wingate Hall, University of Maine, Orono, Maine 04473.

Former students of the University as well as prospective students should submit their applications for admission to the University to the Director of Admissions. Applications for a Candidate of Eligibility should be made at a Regional V.A. Office.

SPECIAL LIVING ARRANGEMENTS (ORONO CAMPUS)

Applications for residence in Colvin Hall, women's cooperative dormitory, and the University Cabins for men, should be included with the application for admission. The necessary forms (financial aid) may be obtained from the Director of Admissions or from the Director of Student Aid, East Annex, Orono.

Unmarried freshman students shall live in one of the University housing units unless they can live at home. Exceptions to this rule are seldom considered by the University. Students requesting such exceptions must indicate this fact on the application card. In addition, the student must write a separate letter (to be sent along with the application) explaining in detail his housing plans, the reason for requesting an exception to the rule and the name of the person with whom he wishes to live.

FINANCIAL AID AND SCHOLARSHIPS

Applications for financial grants, loans under the National Defense Education Loan Plan, for participation in the Work-Study Program under the Economic Opportunity Act of 1964, and assistance under the Higher Education Act of 1965 may be obtained from the Director of Admissions. Parents or legal guardians of all applicants for financial aid are required to file a Parents' Confidential Statement with the College Scholarship Service. Forms and information are available in each local high school. Requests for aid will be reviewed by the committee after the applicant has been formally notified of acceptance by the Director of Admissions. The University financial aid form should be filed before March 1, and preferably at the time the admission application is filed.

The University participates in the College Scholarship Service (CSS) of the College Entrance Examination Board. Participants in CSS subscribe to the principle that the amount of financial aid granted a student should be based upon financial need. The CSS assists colleges and universities and other agencies in determining the student's need for financial assistance. Entering students seeking financial assistance are required to submit a copy of the Parents' Confidential Statement (PCS) form to the College Scholarship Service, designating the University of Maine as one of the recipients. The PCS form may be obtained from a secondary school or the College Scholarship Service, P.O. Box 176, Princeton, New Jersey 08540 or P.O. Box 1025, Berkeley, California 94704. This form should be completed by January 1.

Upperclass students may apply annually during designated periods for all types of financial assistance. Applications and PCS forms are available at the Office of Student Aid.

Part-time work opportunities, both on-campus and off-campus, are available to students. From applications filed each year, the Office of Student Aid refers students to suitable job openings as they are received. A satisfactory academic standing must be maintained during the working period. Freshman students are not encouraged to undertake part-time jobs that require an excessive amount of time.

A specially prepared brochure entitled Financial Aid is available from the Director of Student Aid upon request. Detailed descriptions of all types of financial aid programs are included.

REQUIREMENTS FOR ADMISSION

COLLEGE OF ARTS AND SCIENCES

English	4 units
Foreign Language	2 units in one language
Algebra	2 units
Plane Geometry	1 unit
History or Social Science	1 unit
Electives†	6 units
Total	16 units

† Chemistry is recommended as an elective for Science, Medical Technology and similar curricula, and required for the Nursing program.
† ½ unit in Trigonometry is recommended for students who plan to major in Mathematics or Science.

COLLEGE OF BUSINESS ADMINISTRATION

English	4 units
Algebra	2 units
Plane Geometry	1 unit
History or Social Science	1 unit
Electives	8 units
Total	16 units

COLLEGE OF EDUCATION

(Includes curriculum in Physical Education)

English	4 units
Three units from one and two units from another of the following:	
Foreign Languages Mathematics Natural Sciences Social Studies	5 units
Electives	7 units
Total	16 units

United States History, Natural Sciences, and two units of Mathematics are recommended. Algebra I and II and Plane Geometry are required of those students who wish to prepare for teaching mathematics or science.

COLLEGE OF LIFE SCIENCES AND AGRICULTURE

I. Animal Sciences, Plant and Soil Sciences, Agricultural and Resource Economics, Agricultural Engineering, Agricultural Mechanization, Biological Sciences, School of Forest Resources.

English	4 units
Algebra	2 units
Plane Geometry	1 unit
Trigonometry (Agric. Engineering only)	½ unit or its equivalent
Science	2 units (one of which must be chemistry or physics)
History or Social Science	1 unit
Electives	5½-6 units
Total	16 units

II. School of Human Development

English	4 units
Mathematics	2 units (at least 1 yr. of algebra)
Science	1 unit (chemistry recommended)
History or Social Sciences	1 unit
Electives	8 units
Total	16 units

III. Two-Year Technical Division (Orono campus only):
Candidates for admission to the Two-Year Technical Programs in Life Sciences and Agriculture must have graduated from high school and must complete the C.E.E.B. Scholastic Aptitude Test. (C.E.E.B. Achievement Tests

are not required). A student should have two units of high school mathematics, one of which must be algebra. Students who contemplate transfer to the regular four-year curriculum must satisfy requirements for the College of Life Sciences and Agriculture.

COLLEGE OF TECHNOLOGY

I. English	4 units
Foreign Languages	— —(Two or more units in one language recommended but not required)
Algebra	2 units
Trigonometry	½ unit or its equivalent (not required for two-year engineering technology programs—See below)
Plane Geometry	1 unit
Chemistry or Physics	1 unit
History or Social Science	1 unit
Electives	6½-7 units
Total	16 units

In addition to these course requirements, applicants must further qualify themselves by satisfactory performance on the Level I Mathematics Achievement Test administered by the College Entrance Examination Board.

II. Two-Year Engineering Technology Division (Orono campus only): Candidates for admission to one of the Two-Year Engineering Technology Programs must have completed the same courses as required of the four-year degree candidates with the exception of trigonometry. Also, candidates are required to complete the C.E.E.B. Scholastic Aptitude Test and three Achievement Tests (English Composition, Level-I-Math., and Physics or Chemistry).

UNIVERSITY OF MAINE AT AUGUSTA

I. Two-Year Associate Degree Program in Liberal Studies—This is a University parallel (transfer) program. All candidates must meet the same entrance requirements as those students admitted to the Orono campus in regular, four-year degree programs. The C.E.E.B. Scholastic Aptitude Test and three Achievement Tests are required.

II. Two-Year Associate Degree Program in Administration (Business or Public) —A terminal program. Candidates must have graduated from high school and must complete the C.E.E.B. Scholastic Aptitude Test.

III. Two-Year Associate Degree Program in General Studies—A terminal program. Candidates must meet the same requirements as for II above.

IV. Two-Year Associate Degree Program in Nursing—Chemistry and two units of mathematics required, in addition to the general requirements for I above.

V. Two-Year Associate Degree Program in Art—Candidates must have graduated from high school, and must meet the basic admission requirements for programs I, III or IV. In special cases, applicants may present a portfolio, in lieu of certain other requirements, for admission consideration.
VI. Two-Year Associate Degree Program in Law Enforcement—A terminal program. Candidates must meet the same requirements as for II.

UNIVERSITY OF MAINE AT BANGOR

I. Two-Year Associate Degree Program in General Studies—Candidates must have graduated from high school and must complete the CEEB Scholastic Aptitude Test.
II. Law Enforcement—A Two-Year, Terminal, Associate Degree Program—Candidates must meet the same requirements as for I above.

ADMISSION OF SPECIAL AND SHORT COURSE STUDENTS

In exceptional cases, and when space permits, a mature person who presents satisfactory evidence of ability to benefit from work of a special college program may be admitted to the University as a special student. Such students are not candidates for degrees but will be registered in the college where the principal courses in their program are taught. Application forms may be obtained from the Director of Admissions.

ADMISSION TO THE CONTINUING EDUCATION COURSES ADMINISTERED BY THE DIVISION OF PUBLIC SERVICES

The University of Maine has undertaken a broadened program of adult education at various locations throughout Maine. This program includes credit courses, non-credit courses, short courses, and conferences as appropriate.

The categories of admission under the programs in Continuing Education are:

1. Degree Program Admission—Regular admission requirements are in effect for both undergraduate and graduate degree applicants. Applications should be filed with the Director of Admissions (undergraduate degree status) or with the Dean of the Graduate Division.
2. Deferred Degree Program—An undergraduate-trial program with a specific 30-hour program planned to give a candidate an opportunity to prove his capabilities to continue as a degree candidate.
3. Special Student Admission—For students who are not candidates for degree credit, but who are qualified, according to University standards and regulations, to enroll in selected courses.

Information and application forms may be obtained by writing the Director, Continuing Education, Merrill Hall, University of Maine, Orono, Maine 04473.

FORMER STUDENTS

Former students who desire to return to the University must file an early application (at least six weeks prior to the opening of classes) for re-admission with the Director of Admissions. The applicant must arrange for official transcripts

and catalogs to be forwarded to the Director of Admissions from all schools and colleges attended since leaving the University of Maine. A re-admission application form may be obtained from the Director of Admissions.

The request for re-admission by a former student is reviewed and acted upon by the Committee on Academic Standing.

ADMISSION BY TRANSFER

The admission of transfer students is necessarily carefully controlled. Admission is on a selective basis.

A student desiring to transfer to the University of Maine from another college of recognized standing must file an early application with the Director of Admissions—at least five months prior to the semester he plans to enter. This request must include a statement of the name and address of all schools and colleges attended as well as information indicating the desired curriculum.

The applicant must arrange for official transcripts and catalogs to be forwarded from all previously attended junior colleges, colleges, and universities to the Director of Admissions, Alumni Hall, University of Maine, Orono, Maine 04473. Students who have been dismissed from another college for any reason are not eligible for consideration for one year.

The evaluation of transcripts of academic work completed at institutions previously attended must be accepted as final at the time of enrollment.

NEW ENGLAND REGIONAL COOPERATION

New England's six state universities are working together to increase the number and variety of educational opportunities for the young people of the region. Under this new cooperative program, qualified New England residents are given preferential admission at other state universities in certain specialized programs not available at their own state university. Students accepted in these programs are also granted the benefit of in-state or resident tuition and fees which are considerably lower than those usually charged out-of-state students. This plan makes available to the residents of the region a wider variety of programs at low cost—without additional funds being spent to duplicate specialized staff and expensive facilities in each state.

Each university has designated which of its programs are to be offered on a regional basis and maintains control over its own courses and programs. The undergraduate programs begin at the freshman level. Other regional programs are available at the graduate level or for certain professional curricula.

Information may be obtained from high school guidance officials, from the New England Board of Higher Education, 20 Walnut St., Wellesley, Mass., 02181; or by writing to the directors of admission at the six New England state universities.

The New England Association of Colleges and Secondary Schools accredits schools and colleges in the six New England states. Membership in one of the six regional accrediting associations in the United States indicates that the school or college has been carefully evaluated and found to meet standards agreed upon by qualified educators. Colleges support the efforts of public school and community officials to have their secondary school meet the standards of membership.

Financial Information

STUDENT EXPENSES

The student expenses outlined in the following paragraphs are the anticipated charges for the academic year 1970-71. Changing costs may require an adjustment of these charges.

Tuition and Fees for the Academic Year*

Regular Students	Residents of Maine	Non-Residents of Maine
Tuition	$450.00	$1350.00

Estimate of Student Expenses

A partial list of necessary expenses for a semester is indicated below. It includes only items which are fairly uniform for all students.

Rates for One Semester	Residents of Maine	Non-Residents of Maine
Tuition	$225.00	$675.00
Board and Room (University Dormitories)	500.00	500.00
	$725.00	$1175.00

Textbooks, personal laboratory equipment, etc., are not furnished by the University and are estimated to cost from $90 to $160 per year.

A *student fee* for the support of student governmental organizations is now levied by the University and is incorporated in the semester bills.

The University provides a student health and accident insurance plan on a compulsory basis for a premium of $30 for 12 months following fall registration. The insurance is charged to every fully enrolled student on the fall semester bill.

Matriculation Fee—This fee of $25 is required of all students registering for the first time who are candidates for a degree. It must be paid as part of the first term bill.

Payment of Bills—All University bills, including those for rooms and board in University buildings, are due and payable on or before registration day for each semester. An academic year consists of two semesters, fall and spring.

Installment Plan—Students and parents who prefer to pay their educational costs on an installment basis may do so. The University has made arrangements with Education Funds Inc. for the following plan which may be used by both student and parents. An application for the installment plan must be obtained from the Business Office, Alumni Hall. The application and a $10 application fee (non-refundable) is to be mailed to EFI-Fund Management, 36 South Wabash Street, Chicago, Illinois, 60603, on or before June 1, 1971. EFI-Fund manage-

* Please see catalog of the University of Maine at Augusta for charges at that campus.

ment will bill the parent or student in ten (10) equal installments for the total yearly cost of education at the University. The total cost of this plan is $20 per year, the $10 application fee and a $10 service charge added to the first installment. There are no other costs.

The Plan for 1970-71 is as follows, using the major approximate costs.

	Maine Resident	Non-Resident
Tuition	$450.00	$1,350.00
Insurance	30.00	30.00
Student Fee	12.00	12.00
Yearbook	8.00	8.00
Total for off-campus students	500.00	1,400.00
Room and Board	1,000.00	1,000.00
Total for students living on campus	1,500.00	2,400.00

Women Dormitory Students add $28.00 security fee.

Sample payments for a Maine resident living in a dormitory

June 10, 1970—Application Fee	10.00
July 1, 1970 (Inc. service chg.)	160.00
Aug. 1, 1970	150.00
Sept. 1, 1970	150.00
Oct. 1, 1970	150.00
Nov. 1, 1970	150.00
Dec. 1, 1970	150.00
Jan. 1, 1971	150.00
Feb. 1, 1971	150.00
Mar. 1, 1971	150.00
Apr. 1, 1971	150.00

Sample payments for a non-resident living in a dormitory

June 10, 1970—Application Fee	10.00
July 1, 1970 (Includes service charge.)	250.00
Aug. 1, 1970	240.00
Sept. 1, 1970	240.00
Oct. 1, 1970	240.00
Nov. 1, 1970	240.00
Dec. 1, 1970	240.00
Jan. 1, 1971	240.00
Feb. 1, 1971	240.00
Mar. 1, 1971	240.00
Apr. 1, 1971	240.00

All incidental and additional charges must be paid directly to the University. Any refunds will be paid by the University directly to the parent or student.

Additional information may be obtained by writing the University of Maine, Business Manager, Alumni Hall, Orono, Maine.

Freshman Charges—The following table shows the fixed charges for the fall semester for freshmen:

	Residents of Maine	Non-Residents of Maine
Tuition	$225.00	$675.00
Room and Board (University Dormitories)*	500.00	500.00
Freshman Orientation Period**	22.00	22.00
Matriculation Fee	25.00	25.00
Insurance	30.00	30.00
	$802.00	$1252.00

For freshmen who do not room and board in University dormitories, the charge is $302 for residents of Maine and $752 for non-residents.

For the students classified as "special," and for those registered for less than a normal program, the rate will be $22 ($67.50 for non-residents) per semester hour up to 10 semester hours. *Full tuition is charged all students registered for 10 or more semester hours.*

All fully-enrolled students may avail themselves of the services provided by the University Health Service. Students registered for 10 or more semester hours are admitted without charge to athletic events and the Concerts Series. Generally students registered for less than 10 hours may purchase tickets for these events.

Room and Board—Due to the difficulty of estimating the cost of food, fuel, and services, it is impossible to guarantee the exact cost of room and board. The charge for room and board in the permanent dormitories for the fall semester, 1970, is $500. The charge for room and board in Hannibal Hamlin Hall for the fall semester, 1970 is $450.

In the cooperative dormitories for women, the charge for room and board is based upon student effort in management and operation, and is at less than regular rates.

A women's dormitory fee of $14 per semester is charged to all women students living in University dormitories (except Colvin Hall). This is necessitated by the higher cost of security measures resulting from a vote by women students for new curfew rules.

All University dormitories are closed to students during scheduled vacation periods.

Miscellaneous—A fee of $10 is charged a student who registers after the prescribed day of registration.

The prescribed gymnasium uniform for women costs approximately $25. Information regarding the uniform and where it may be purchased will be sent to incoming students during the summer.

Tuition fees for work taken in the Continuing Education Division are at the rate of $22 per credit hour, except as indicated otherwise in the Continuing Education bulletin.

* See statement under Room and Board.
** Maximum (may vary according to room and board provided)

The fees for students registered in Applied Courses in Music are indicated in the catalog section on Music.

Deposits—A deposit of $25 is due when the applicant is notified of acceptance by the Director of Admissions. If a dormitory room is required, an additional $25 is due. These deposits will be applied toward the student's account when he registers. (They should not be confused with the matriculation fee of $25, which is a non-refundable charge.)

If a freshman, transfer, or readmission applicant notifies the Director of Admissions of withdrawal prior to June 1, the deposits will be refunded. *The deposits are forfeited in case of withdrawal after June 1.*

All upperclassmen desiring to live in a dormitory must pay a room deposit of $25 during the spring in order to assure that rooms will be reserved for them in the fall. This deposit will be deducted from the fall semester bill. If it is found that dormitory accommodations are not desired the deposit will be refunded if the Housing Office is notified by August 1. If notice is not given by that date the deposit will be forfeited.

Locks for gymnasium lockers may be secured from the Physical Education Department and must be returned at the end of the spring semester. No deposit is required, but a charge of $2.50 is made if the lock is not returned at the end of the year.

Refunds—Students leaving the University before the end of a semester will receive refunds. Tuition payment refunds will be paid as follows:

Fall Semester

Withdrawal	before October	1 — ½ of semester charge
	before November	1 — ⅓ of semester charge
	before December	1 — ⅙ of semester charge

Spring Semester

Withdrawal	before March	1 — ½ of semester charge
	before April	1 — ⅓ of semester charge
	before May	1 — ⅙ of semester charge

A room and board refund, approximately the cost of raw food, will be made for each day remaining in the semester.

Summer Forestry Camp—The charges for Summer Forestry Camp (near Princeton, Maine) described in the catalog section on Forestry are:

Registration Fee	$5.00
Tuition	$176.00

Room and board and course fee for Fy 19 S are assessed in addition to the above charges.

Rules Governing Residence

A student is classified as a resident or a non-resident for tuition purposes at the time he is admitted to the University. The decision, to be made by the treasurer, is based upon information furnished by the student and any other relevant information. In general, in order to be considered eligible to register as a resident a student must have established a bona fide year-round residence in the State of Maine with the intention of continuing to maintain it indefinitely. The tuition status as determined at the time of enrollment normally prevails as long as the student remains in attendance. Members of the Armed Forces and their dependents are normally granted in-state tuition rates during the period when they are on active duty within the State of Maine.

Subject to the provisions of the preceding paragraph, the residence of an unmarried minor follows that of the parents or legally appointed guardian. The bona fide year-round residence of the father, if living, otherwise that of the mother, is the residence of such a minor; but if the father and the mother have separate places of residence, the minor takes the residence of the parent with whom he lives or to whom he has been assigned by court order. If neither of the parents is living the unmarried minor takes the residence of his legally appointed guardian.

Subject to the provisions of the first paragraph above, an adult student, defined for purposes of these rules as one who is either married or 21 years of age or older, will be classified as a resident of Maine if (1) his parents are residents of Maine and he has not acquired residence in another state; or (2) being at least 20 years old, he has resided in Maine for at least six consecutive months immediately preceding his initial admission to the program of his choice.

The residence of a wife follows that of her husband; however, a woman student who already has a resident status by reason of the residence of her parents, or by reason of her own residence where she is at least 21 years old, may continue as a resident student although she marries a non-resident.

In all cases the University reserves the right to make the final decision as to resident status for tuition purposes.

Communications

Communications with reference to financial affairs of students should be addressed to the Business Manager of the University of Maine. Matters concerning all types of financial assistance should be referred to the Director of Student Aid.

STUDENT AID

The Student Aid Program is designed to help students with financial problems who have shown themselves willing to help themselves, who have done creditable academic work, who are of good character, and who can be expected to be a credit to themselves and their University.

The Student Aid Program for all campuses of the University is administered through the Office of Student Aid and includes the following activities: 1) part-time employment; 2) student loans; 3) scholarships; 4) special living arrangements (University Cabins and Colvin Hall); 5) the Work-Study Program of the

Economic Opportunity Act; 6) and Educational Opportunity grants of the Higher Education Act of 1965.

A complete description of the many facets of the program of financial assistance to students at the University has been published in a separate bulletin, entitled Financial Aid. Entering students may obtain a copy by writing to the Director of Admissions, Alumni Hall. Students currently in attendance at any of the University campuses, or interested parents, may obtain a copy by writing to the Office of Student Aid. The publication also presents the latest available information on the federal student assistance programs participated in by the University. All programs of financial assistance are equally applicable to each campus of the University if the student is approved and registered in a degree-type program.

The University administers and/or holds the following loan, scholarship and prize funds. A complete description of each fund is given in the special Financial Aid bulletin. Scholarship funds for the Graduate School are listed in the Graduate School Catalog.

LOAN FUNDS

The American Association of University Women Loan Fund
The Jacob Agger Loan Fund
The American Institute of Electrical Engineers Loan Fund
Anonymous Loan Fund
The William E. Barrows Loan Fund
Law Student Loan Fund
The O. Merrill Bixby Loan Fund
The Boston Alumnae Fund
Katherine M. and Walter H. Bragg Fund*
The Carleton Orchard Fund
The Gordon L. Chapman Loan Fund
The Class of 1907 Loan Fund
The Class of 1913 Loan Fund
The Class of 1914 Loan Fund
The Class of 1931 Loan Fund
The Class of 1932 Loan Fund
The Class of 1933 Loan Fund
The Class of 1935 Loan Fund
The Class of 1936 Loan Fund
The Class of 1939 Loan Fund
The Class of 1944 Loan Fund
The Frederick W. Conlogue Loan Fund
The Cumberland County Alumni Association Student Loan Fund
The Charles D. Darling, Jr. Memorial Fund
The George P. Davenport Student Loan Fund
The Delta Chi Alpha Loan Fund
The Delta Delta Delta Loan Fund
The Robert W. DeWolfe Fund*
The Drummond Fund
The Esther Eayres Chapter, Daughters of American Revolution Loan Fund
Harry A. Emery (Maine 1906) Fund*
The Thomas G. Feltman-John E. Field, Jr. Loan Fund
The John Fils Memorial Fund
The Ralph E. Fraser Loan Fund
The General Loan Fund
The Henry Fairfield Hamilton Loan Fund
The J. Dudley Harrington Loan Fund
The Maynard A. Hincks Memorial Fund
The Chester A. Jenkins Loan Fund
The Kappa Psi Loan Fund
The John Fitzgerald Kennedy Memorial Loan Fund
The Francis Gregory King Memorial Loan Fund
The Kitterdge Fund
The H. Walter Leavitt Loan Fund

A.D.T. Libby Loan Fund
The Philip W. Lown Loan Fund
The Maine Alumni Association of Boston Loan Fund
The Maine Alumni Teachers Association Loan Fund
The Maine Association of Engineers Loan Fund
The Maine Campus Fund
The Maine State Florists Association Loan Fund
The Mrs. Maine Club Loan Fund
The Ralph Packard Loan Fund
The Charles H. Payson Loan Fund
The Phi Eta Kappa Loan Fund
The Pulp and Paper Foundation Loan Fund
The Schiro Family Loan Fund
The Senior Skull Loan Fund
The Sigma Chi Loan Fund
The Mary S. Snow Memorial Loan Fund
The Southern New Hampshire Alumni Loan Fund
The Bertha Joy Thompson Loan Fund
The George W. Treat Fund
The Ernest A. Turner Loan Fund
The Diong Diek Uong Loan Fund
The Wheelden-Bassett Fund
The Frances D. Young Loan Fund
(*–In University of Maine Foundation)

SCHOLARSHIPS

Trustee Undergraduate Tuition Scholarships

The Merritt Caldwell Fernald Scholarship
The James Stacy Stevens Scholarship
The Harold Sherburne Boardman Scholarship
The Leon Stephen Merrill Scholarship
The Charles Davidson Scholarship
The College of Business Administration Scholarship
The John Homer Huddilston Scholarship
The Rising Lake Morrow Scholarship
The Maine State Colleges Scholarships
The University Indian Scholarships
The University Scholarships
The Foreign Student Scholarships
The Science Scholarship

Endowed Scholarships

The American Welding Society (Maine Section) Scholarship Fund
Albert E. Anderson Class of 1909 (Law) Fund
The Appreciation Scholarship Fund
The Robert I. Ashman Fund
The Bancroft and Martin Scholarship Fund
The Bangor Business and Professional Women's Scholarship Fund
The Bangor Daily News Scholarship Fund
Lewis O. Barrows Scholarship Fund
The Harold H. Beverage Award Fund
Myra Baker Bickford Scholarship Fund
William Bingham, 2nd, Scholarships
William Bingham, 2nd, Scholarships in Honor of Payson Smith
The William H. Boardman Scholarship Fund
James H. Boody Scholarship Fund
The William E. Bowler Scholarship Fund
The Geraldine Brewster Scholarship Endowment Fund
The Edgar W. Brigham Scholarship Fund
The Adelaide G. Bunker Educational Fund
Lillian Abbott Butterfield Citizenship Fund
Harold M. Carr Scholarship Fund
The Class of 1905 Scholarship

The Class of 1940 Student Emergency Fund
The Class of 1926 Scholarship Fund
The Class of 1941 Memorial Scholarship Fund
The Class of 1943 Student Aid Fund
The Class of 1954 Scholarship
The Class of 1957 Scholarship
The Class of 1961 Scholarship
The Class of 1962 Scholarship
The Class of 1968 David R. Rittenhouse Scholarship Fund
The Albert D. Conley Fund
The Donald P. and Franceila D. Corbett Fund
Merton C. Corson Memorial Fund
The Walter Joseph Creamer Fund
The Oliver Crosby Scholarship Fund
The Harold R. Cummings Scholarship Fund
The Frank Conant Day Fund
The C. Walton Deckelman Memorial Fund
The Arthur Lowell Deering Fund
The Delta Delta Delta-Frances Kent Murray Scholarship
The Charles Alexius Dickinson Scholarship Fund
Richard C. Dolloff Scholarship Fund
The Charles Leslie and Helen H. Eastman Scholarship Fund
E. Perrin Edmunds Scholarship Fund
The Lloyd H. and Evelyn E. Elliott Scholarship Fund
The Joseph and Mollie Emple Scholarship Fund
The Rachel W. Engel Scholarship Fund
The Harry H. and Ida E. Epstein Scholarship Fund
The Fred S. N. Erskine Scholarship Fund
The Joseph Rider Farrington Scholarship
The Edward Files Scholarship Fund
The John P. Fitch Scholarship Fund
The Deacon Ephraim Flint Scholarship Fund
The Fort Kent Future Farmers Scholarship Fund
The Ella Somerville Foster Scholarship
The Louis J. Freedman Forest Management Award
The Harold F. French Fund
The Salomie and Eulalia Gardner Fund
The Mary French Geyer Scholarship Fund
The Fred H. and Alice V. Gould Scholarship Fund
The Henry L. Griffin Scholarship Fund
The Gushee Scholarship Fund
The Eugene Hale Scholarship Fund
Allen Crosby Hardison Scholarship Fund
The Helen C. Hardison Scholarship Fund
The Alonzo J. Harriman Scholarship Fund
The Elise R. Hatch Memorial Fund
The Philip R. Hathorne Scholarship
The Helen B. Hemingway Memorial Fund
The Lillie C. Hemphill Scholarship Fund
The Benjamin Higer Memorial Scholarship Fund
The Frederick W. and Marianne Hill Scholarships
The Linnie P. Hills Fund
The Kenneth W. Hodgdon Fund
The David Dunlap Holmes Scholarship Fund
The Hovey Memorial Scholarships
The Will R. Howard Scholarship Fund
Mary L. Hoyt Mathematics Memorial Fund
The Carol C. Jones Scholarship

The Max Kagan Family Foundation Scholarship Fund
The Kidder Scholarship
The Spoffard H. Kimball Scholarship Fund
The Charles E. Knowlton Fund
The Mac and Lillian Lacritz Scholarship Fund
The Fred L. Lamoreau Scholarship Fund
The Ralph W. Leavitt, Sr., Scholarship Fund
The Lucien P. Libby Scholarship Fund
The Limestone Future Farmers Scholarship Fund
The Maine Extension Association Scholarship Fund
The Thomas G. Mangan Scholarship Fund
The John L. McCobb Scholarship Fund
The Marguerite E. McQuaide Scholarship Fund
The Rebecca and Benjamin Mendelson Memorial Scholarship Fund
The Marion Farrington Merritt Memorial Fund
The Alma Taylor Milne Fund
The Calvin H. Nealley Scholarships
Timothy P. O'Connor, '24, Memorial Fund
The Gilbert Crosby Paine Scholarship
The Edward E. Palmer Scholarship
The Perley Burnham Palmer Scholarship Fund
The William Emery Parker Scholarship
The Clifford Spruance Patch Scholarship Fund
The Jean Spruance Patch Fund
The William N. Patten Scholarship Fund
The Charles H. Payson Scholarships
The Ralph H. Pearson Fund
The Stanley Plummer Scholarship
The Frank P. Preti Scholarship Fund
The Frederick G. Quincy Scholarship Fund
The Henri Raffy Memorial Fund
Round Tap Farms Scholarship Fund
The Samuel and Pauline Rudman Scholarship Fund
The Herbert Sargent Student Aid Fund
The Arthur E. Silver Scholarship Fund
The Leroy C. Smith Scholarship Fund
J. Robert Smyth Scholarship Fund
The Mary S. Snow Memorial Fund
The Frank Elwyn Southard Fund
The Adelbert W. and Irene K. Sprague Scholarship Fund
The Dean John E. Stewart Memorial Scholarship Fund
The Anne E. Stodder Scholarship Fund
The James and Sarah Striar Scholarship Fund
Richard F. Talbot Scholarship Fund
The Bertha Joy Thompson Scholarship Fund
The James E. Totman Fund
The Nathan Pratt Towne Scholarship Fund
The University Store Company Scholarship Fund
The Mary Maxfield Valentine Memorial Scholarship
The Sergeant Walter McClymonds Wales Scholarship Fund
The Kenneth Craig Ward Memorial Scholarship
The Donald S. Walker Scholarship Fund
The Charles P. Weston Scholarship Fund
The James F. White Scholarship Fund
The Mott F. Wilson Scholarship Fund
The Gerald E. Wing Scholarship Fund

The Julia E. Winslow Scholarship Fund
The Charles F. Woodman Fund

Annual Scholarships

The Agricultural Club Scholarship
The Alcoa Foundation Scholarship Award
All-Maine Women Scholarship
The American Agriculturist Foundation Scholarship
The American Can Company Foundation Scholarship
American Association of University Women, Augusta Branch Scholarship Award
The Army ROTC Scholarships
The Associated Women Students Scholarship
The Elizabeth Abbott Balentine Scholarships
Bath Iron Works Corporation Scholarships
The Boston Paper Trade Association Scholarships
The Louis Calder Foundation Scholarships
The Class of 1960 Scholarship
The Charles M. Cox Trust Fund
Distinguished Maine Student Scholarship Award
The Walter O. Frost Scholarship Fund
The Geigy Dyestuffs Scholarship
The General Foods Fund Scholarships
The General Motors Scholarship
D. S. and R. H. Gottesman Foundation Scholarship (Spanish)
The Graduate "M" Club Scholarships
The Stanley D. Gray Scholarship Fund
The Great Atlantic and Pacific Tea Company Scholarship
The Martin Hagopian Scholarship
The Homelite Forestry Scholarship
The Charles H. Hood Dairy Foundation Scholarships
The Martin Luther King Scholarship Program
The Knox County Fish and Game Association Scholarship
The Knox-Lincoln County Women of Extension Scholarship
The Maine Bridge Association Scholarship Fund
Maine Chapter, American Public Works Association Scholarship
The Maine Consumer Finance Association Tuition Scholarship
The Maine Life Scholarship
The Maine Managers' Scholarship
The Maine Section IEEE Award
The Maine Vegetable Growers' Association Scholarship
The National Plant Food Institute Scholarship
The New England Farm and Garden Association Scholarships
New York Mercantile Exchange Scholarship
The Northeastern Division Paper Industry Management Association Scholarship
School of Nursing Scholarship Fund
The Ober Award
The Velma K. Oliver Phi Kappa Phi Scholarship
The Paper Trade Journal Scholarship
The Penick and Ford Scholarship in Pulp and Paper Technology
The Pennsylvania, New Jersey, and Delaware Division of the Paper Industry Management Association Annual Scholarship Award
The Barbara Bosworth Scholarship of Phi Mu
The Pi Beta Phi Scholarship
The PIMA Award
The Ralston Purina Scholarship
The Retail Lumber Dealers Association of Maine Scholarship
The Rice and Miller Company Scholarship Fund

The Harrison L. Richardson Scholarship
Sears Roebuck Agricultural Foundation Scholarship Awards
Lila and Vernon Segal Scholarship
The Senior Alumni Association Scholarships
The Senior Skull Scholarship
The Carl R. and Laura Smith Scholarship
The Sophomore Eagles Scholarship Awards
The Sophomore Owl Scholarship
The Dean John E. Stewart Scholarship
The TAPPI-Maine, New Hampshire Section Annual Award
Oscar E. and Dorcas D. Taylor Annual Scholarship Fund
The Charles Irwin Travelli Scholarship Fund
The Marcus L. Orann Fund
The Joel J. and Annie H. Walker Scholarships
The Stanley M. Wallace Scholarship
A Western Electric Company Scholarship
The Beatrice Batchelder Wright Scholarship
The York County Poultry Improvement Association Scholarship
The Zonta Club of Bangor Scholarship

Alumni Association Scholarships

The Androscoggin Valley Alumnae Scholarship
The Black Bear Club of Rhode Island Scholarship
The Massachusetts North Shore Alumni Association Scholarship
The Northern Connecticut Alumni Association Scholarship
The Portland Alumnae Association Scholarship
The Southern Connecticut Alumni Association Scholarship
The Southern Kennebec Maine Alumni Association Scholarship
The Southern Penobscot Alumnae Association Scholarship
The Western Pennsylvania Alumni Association Scholarship
The Worcester County, Massachusetts, Alumni Association Scholarship

UNIVERSITY OF MAINE FOUNDATION FUNDS

The Archie A. Adams Scholarship Fund
The Edwin Wentworth Adams Scholarship Fund
The Maria S. Appleton Fund
The Hazen H. Ayer Scholarship Fund
The Dr. Tibor Jalsoviczky Bebek Memorial Fund
The Hosea B. Buck Memorial Fund
Buxton-Hollis Community Hospital Fund, Inc.
The Ava H. Chadbourne Fund
The Elwood I. and Hazel P. Clapp Scholarship Fund
The James W. Clarkson Fund
Class of 1906 Fund
Class of 1909 Fund
Class of 1910 Trust Fund
Class of 1911 Scholarship Fund
Class of 1912 Fund
Class of 1915 Student Aid Fund
Class of 1916 Scholarship Fund
Class of 1917 Scholarship Fund
Class of 1918 Fund
Class of 1919 Fund
Class of 1920 Fund
Class of 1920 Scholarship Fund
Class of 1921 Fund
Class of 1922 Fund
Class of 1923 Fund
Class of 1924 Fund
Class of 1925 Fund
Class of 1927 Fund

Class of 1928 Fund
Class of 1929 Student Aid Fund
Class of 1930 Fund
Class of 1937 Fund
Class of 1938 Students Aid Fund
Class of 1942 Fund
Class of 1945 Fund
Class of 1946 Fund
Class of 1947 Fund
Class of 1948 Fund
Class of 1949 Scholarship Fund
Class of 1950 Fund
Class of 1951 Fund
Class of 1952 Fund
Class of 1953 Grant-in-Aid Fund
Class of 1955 Fund
Class of 1956 Fund
Class of 1958 Scholarship
Class of 1959 Fund
Class of 1962 Sterritt Fund
Class of 1963 Fund
Arthur C. Clayton Horticultural Scholarship Fund
Charles E. Crossland Fund
C. Parker Crowell Fund
Eugene Danforth Scholarship Fund
The Robert W. DeWolfe Fund
Emma Jane Eaton Fund
James Adrian Gannett Scholarship Fund
Charles E. Gilbert Scholarship
George P. Gould & Antoinette G. Torrey Fund
Pearl R. Graffam Scholarship Fund
Greater New York Alumni Association Scholarship Fund
Lucy F. Griffin Fund
George E. Hamblen Fund
Robert C. Hamlet Fund
George O. Hamlin Fund
James Norris Hart Scholarship
Arthur A. Hauck Fund
President Hauck Scholarship Fund
Thelma L. Kellogg Fund
Benjamin C. Kent Fund
Harriet S. Kilby Scholarship
Harland A. Ladd Scholarship Fund
Nathan Levitan Scholarship Fund
Alfred B. Lingley Scholarship Fund
George E. Lord Scholarship Fund
Harold P. Marsh Fund
The Elsie C. Moody Scholarship Fund
Frank P. Morison Scholarship Fund
William A. Murray Fund
Penobscot Valley Alumni Association Scholarship
Thomas Allen Perkins Medical Fund
Harold M. Pierce Fund
Wesley C. Plumer Fund
James E. Poulin Fund
John Reed '89 Scholarship Fund
Rhode Island Alumni Association Scholarship
The William F. Scamman Scholarship Fund
Senior Alumni Scholarship Fund
Ben Sklar Scholarship Fund
Anna Strickland Fund
William Jordan Sweetser Fund
The Helen White Tobey Scholarship Fund
Christine Blaisdell Urann Fund
Viles Family Scholarship
Alburney E. Webber, Jr., Scholarship Fund
Ralph Whittier Fund
Dorothy H. and Arthur O. Willey Fund

University of Maine Pulp and Paper Foundation Funds

The Warren B. Beckler, Jr. Fund
The Joseph A. Benedetto Fund
Philip S. Bolton Scholarship Fund
The James A. Cameron Fund
The Knud Dahl Scholarship Fund
The Samuel Dauman Scholarship Fund
The Frederick H. Frost Fund
The Abel Arthur Greep and Adelaide Scott Greep Fund
The Paul Hodgdon Scholarship Fund
The Everett P. Ingalls Fund
The Manuel C. McDonald Scholarship Fund

The David C. Murchison Fund
The J. Larcom Ober Scholarship Fund
The George Olmsted Scholarship Fund
The Margaret Murchie Riegel Fund
The Benjamin L. Sheldon Fund
The Elvah L. Soderberg Scholarship Fund
The Ralph A. Wilkins Scholarship Fund

PRIZES

Endowed Prizes and Awards

Frank B. Bickford and Charles S. Bickford Memorial Prize Fund
The Prize of the Class of 1873
The Milton Ellis Prize
The Claude Dewing Graton Prize
The Henry L. Griffin Prize in English Composition
The Maine Hardwood Association Award
The John M. Oak Scholarship Prizes
The John Ferdinand Steinmetz Memorial Award
The Technology Honors Book Fund

Annual Prizes and Awards

The Chi Omega Prize
The Dorothy Stone Clark Memorial Prize
The Frank H. Dalton Award in Bacteriology
The Delta Zeta Prize in English
The Freshman Algebra Prizes
The Helen A. Lengyel Award
The Maine Association of Engineers Honor Award
The Carl Whitcomb Meinecke Award
The James Gordon Selwood Scholarships

The Panhellenic Scholarship Award
The Sigma Chi Foundation Scholarship Cup
The Interfraternity Singing Contest Trophy
The Charles Rice Cup
The Intramural Plaques

The Washington Alumni Association Watch
The Portland Alumnae Award for Scholastic Achievement

Environmental Studies

A Center for Environmental Studies at the University of Maine at Orono has been created as a result of studies and discussions extending over more than two years. To give direction to his effort, Professor Harold Borns has been appointed as Special Assistant to the President for Environmental Studies. This assignment is a temporary one, going through the fall semester 1970.

Professor Borns' responsibilities, while not fixed, encompass certain specific assignments within the general context of encouraging and promoting University interest and interdisciplinary cooperation in environmental research, teaching and public service—including physical, biological, and social aspects.

The following courses are representative of the University's present academic effort in understanding and bettering the environment of man, including the physical, biological, and social aspects. Complete descriptions of these courses are found under the departmental offerings.

Many of the subject areas indicated in the following course listings may be pursued to greater depth by taking additional courses as indicated in the offerings of the respective departments.

General

Env 100 Topics in Modern Environments

COLLEGE OF ARTS AND SCIENCES

Anthropology

Ay 1,2 Introduction to Anthropology
101 Physical Anthropology
141 People and Cultures of the Pacific Islands
150 Hunters and Food Gatherers
151 North American Indian Ethnology
155 Peoples and Cultures of Africa
160 Peoples and Cultures of the Circumpolar Area
161 Ethnological Theory
165 Political Anthropology
166 Economic Anthropology
167 Peasant Societies

Folklore

Fo 1, 2 Introduction to Folklore

Art

At 5, 6 Art Appreciation and History
19, 20 History of Architecture

Comparative Literature

Cp 11, 12 The Western Tradition in Literature
41, 42 The Drama of the Western World

Economics

Ec 1, 2 Principles of Economics
37 Comparative Economic Systems
138 Economic Development
168 Social Control of Business
172 State and Local Government Finance

English

Eh 9, 10 Modern Literature
21-25 English Literature
43, 44 Survey of American Literature

	45	Twentieth Century American Prose and Poetry
	46	Writers of Maine
	270	The American Drama
	292	Literature of Maine and the Atlantic Provinces

Foreign Languages

Fl	201	Introduction to General Linguistics

Geological Sciences

Gy	1(a), 2(2a)	Aspects of the Natural Environment
	6	Geology for Engineers
	140	Seminar in Quaternary Studies
	218	Low Temperature-Pressure Geochemistry
	241	Glacial Geology
	242	Quaternary Environments and Climatic Change
	257	Genesis of Ore Deposits
	258	Ore Deposits Exploration

History

Hy	10	History of Maine
	170	America Since 1938
	172	Economic History of the United States
	199	Contemporary History Problems
	261	Urban History of the United States
	276	Social and Intellectual History of the U.S.
	285	New England History

Journalism

Jr	22	Survey of Journalism
	25	History of American Journalism
	26	The Press and Society

Modern Society

My	1, 2	Modern Society

Music

McH	123	Music of the Twentieth Century
McL	1	Understanding Music

Philosophy

Pl	1, 2	Philosophy of Modern Life
	70	Perspectives in Culture
	111	Ethics
	113	Aesthetics
	123	Philosophical Anthropology
	131, 132	Logic

Physics and Astronomy

Ps	3	Descriptive Physics
	9	Climatology
	10	Meteorology
	161	Advanced Meteorology
As	9	Descriptive Astronomy

Political Science

Pol	1	Introduction to Government
	3	State Government
	133	The American City
	134	Municipal Administration
	151	Public Administration
	158	Public Opinion
	200	City and Regional Planning

Psychology

Py	1, 2	General Psychology
	130	Social Psychology

Sociology

Sy	24	Sociology of Rural Life
	110	Social Organization
	113	Deviant Behavior
	114	Social Change
	125	Industrial Sociology
	126	Sociology of Urban Life
	129	The Individual and the Community
	134	Population
	135	Human Ecology
	140	Social Control
	169	Collective Behavior and Social Movements

	180	The Science of Social Man
	310	Seminar in Social Organization
	313	Seminar in Social Disorganization
	326	Seminar in Formal Organization
	329	Seminar in Community Studies
	368-369	Manpower Research Seminar

Speech

Sh	1	Introduction to Oral Communication
	170	Broadcasting and Government
	176	Broadcast Programming
	202	20th Century Public Address
	204	Persuasion
	263	American Theatre

Zoology

Zo	156	Animal Ecology
	168	Limnology
	170	Introductory Oceanography
	357	Population Dynamics
	362	Estuarine Ecology
	369	Biological Oceanography

COLLEGE OF BUSINESS ADMINISTRATION

Ba	125	Business Logistics
	150	Financial Institutions
	165	Advertising
	313	Business Cycles and Forecasting
	321	Human Relations in Industry

COLLEGE OF EDUCATION

Ed B	2	The American School
	3	Growth-Learning Process
	4	The Teaching Process
Ed C	142 or 143	Field Course in the Earth Sciences
	144	Basic Field Ecology
	146 or 147	Natural Science Education—Coastal
	148 or 149	Natural Science Education—Inland
Ed X	163 or 173	Workshop in Conservation Education

COLLEGE OF LIFE SCIENCES AND AGRICULTURE

General

Mhe	50	Man and His Environment

Agricultural and Resource Economics

ARE	48	Principles of Agricultural Economics
	171	Land Resource Economics
	186	World Policies for Agriculture
	24	Sociology of Rural Life
	42	World Population Resources
	129	The Individual and the Community

Agricultural Engineering

AE	35	Soil Water Control
	37	Agricultural Engineering for Developing Countries
	164	Instrumentation and Control Systems
	165	Soil and Water Engineering

Animal and Veterinary Sciences

AnV	43	Tropical Agriculture
	45	Animal Science
	218	Population Genetics

Bacteriology

By	21	Introduction to Bacteriology
	30	Fundamentals of Public Health
	122	Microbiology and Man

Botany and Plant Pathology

Bt	1	General Botany
	2	The Plant Kingdom
	130	Plant Ecology
	262	Plant Geography

Entomology

En	26	Introductory Entomology
	211	Insect Ecology
	312	Biological Control of Insects

Food Science

Fs	101	Food Processing Industry, Principles and Problems
	202	Food Industry Quality Control

School of Forest Resources

Fy	1, 2	Introduction to Forest Resources
	19	Ecology
	48	Natural Resources
	53	Forest Recreation Management
	128	Game Management

School of Human Development

Cf	2	Patterns of Interpersonal Behavior
	111	Family Relationship
Fm	41	Introduction to Food and Nutrition
HM	81	Home Management Principles and Theory

Plant and Soil Sciences

S	2	Soil Science
	50	Soil and Water Conservation
	154	Soil-Plant Relationships
P	1	Horticulture
	21	Crop Science

COLLEGE OF TECHNOLOGY

Chemistry

Ch	11, 12	General Chemistry

Civil Engineering

Ce	28	Highway Engineering Fundamentals
	30	Transportation Engineering
	31	Introduction to Sanitary Engineering
	61	Engineering Relations
	65	Soil Mechanics
	155	Hydrology
	175	Contemporary Environmental Pollution
	200	City and Regional Planning
	205	Traffic Operations and Geometric Design
	230	Water Resources Engineering
	322	Sewage Treatment Theory

Electrical Engineering

Ee	31	Elements of Communication
	191	Illuminating Engineering
	196	Electro-acoustics
	198A	Noise Control

General Engineering

Ge	1,2	Introduction to Engineering Design
	7	Computer Programming for Engineers
	12	Forestry Drawing
	14	Architectural Drawing

Mechanical Engineering

Me	21	Materials Engineering and Science
	84	Industrial Management
	124	Mechanical Design I
	160	Heat Transfer
	167	Direct Energy Conversion
	181	Turbomachinery
	186	Power Plants
	187	Mechanical Design II
	191	Heating and Ventilating System Design
	193	Internal Combustion Engines
	196	Refrigeration and Air Conditioning

UNIVERSITY OF MAINE

The following courses sample the various aspects of the environment and may be elected by any student. These courses carrry no or minimal prerequisites.

General

Ce	175	Contemporary Environmental Pollution
Env	100	Topics in Modern Environments
Fy	48	Natural Resources
Mhe	50	Man and His Environment

Physical

Gy	1(1a)	Aspects of the Natural Environment
Ps	9	Climatology
Ps	10	Meteorology
S	2	Soil Science

Biological

Bt	130	Plant Ecology
Fy	19	Ecology

Social

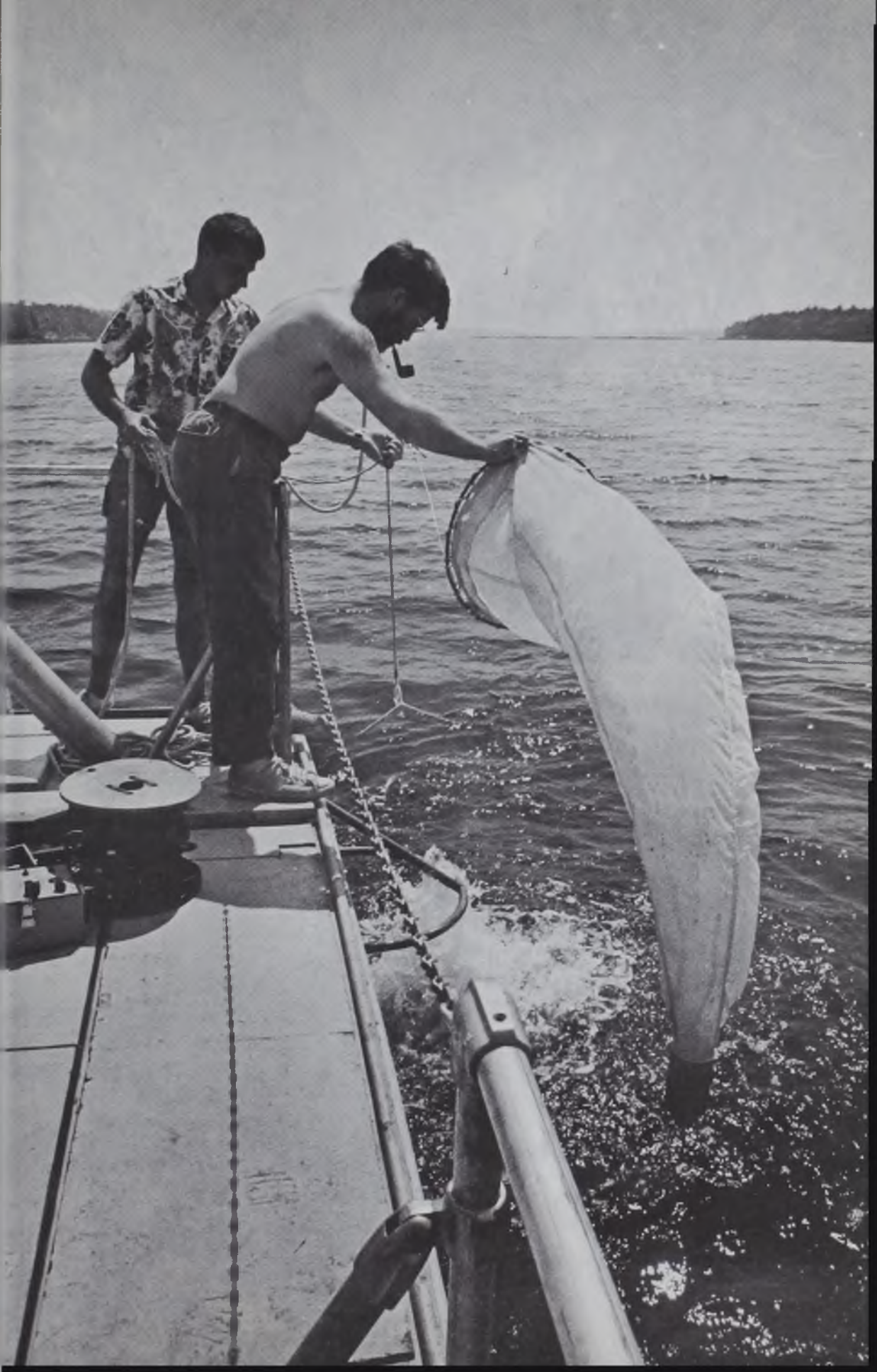
ARE	42	World Population Dynamics
At	5	Art Appreciation and History
Ay	1	Introduction to Anthropology
Ec	1	Principles of Economics
Jr	22	Survey of Journalism
McH	1	History of Western Music
Pl	1	Philosophy and Modern Life
Pol	1	Introduction to Government
Sh	21	Introduction to Broadcasting and Film
Sy	135	Human Ecology

The following courses sample the various areas of ecology and may be elected by any student having completed the required prerequisites.

Bt	130	Plant Ecology
En	143	Forest Insect Ecology
En	211	Insect Ecology
Fy	19	Ecology
Sy	135	Human Ecology
Zo	156	Animal Ecology
Zo	168	Limnology
Zo	362	Estuarine Ecology
Zo	369	Biological Oceanography

Additional information on environmental matters may be obtained by contacting:

Dr. Harold W. Borns, Jr., Temporary Director
Center for Environmental Studies
6 Winslow Hall



COLLEGE OF ARTS AND SCIENCES

JOHN J. NOLDE, DEAN

College of Arts and Sciences

The College of Arts and Sciences provides opportunities for students to acquire knowledge and skill in a variety of fields wherein a cultural emphasis is prominent.

The college is divided into 18 departments and a School of Nursing. All students are required to take work in several of these departments; but, in general, the degree of specialization can vary widely to fit the needs of individuals. Some students may desire to pursue studies in only a few of the major departments, while others may prefer to take work of greater subject-matter range. The college has prepared, for those who desire them, specific programs of study in many pre-professional and vocational fields (see the section on Specimen Curricula). Considerable flexibility is permitted the student within all these programs.

The college's major objective is to furnish its students with a general cultural background. Within the framework of this background the student will also find much that is of utilitarian value. The college seeks to train men and women in critical intelligence, broad and sympathetic understanding of human needs, and determination of purpose.

Arts and Sciences students who are interested in taking subjects offered in one of the other colleges of the University may do so provided they have fulfilled the necessary prerequisites. In collaboration with the College of Education, this college offers specialized training to prospective teachers.

GENERAL INFORMATION

Admission—The specific requirements for admission are given in full elsewhere in the catalog (see page 41). All deficiencies in entrance requirements must be made up before registering for the junior year. Students who transfer from other colleges with advanced standing must satisfy all admission requirements within a year.

Transfer Credit—No transfer credit will be allowed for courses taken at another institution in which grades below C have been received. Evaluation of courses taken at another accredited institution for which transfer credit is asked rests with the Director of Admissions and the Dean.

Graduation Requirements—The work of the College of Arts and Sciences leads to the degree of bachelor of arts (B.A.) and bachelor of science (B.S.). The latter degree is awarded in the School of Nursing. All students are required to complete a minimum of 120 degree hours.

In addition, each student must accumulate a total of "grade points" equal to 1.8 times (with the Class of 1973, 2.0 times) the number of credit hours in which he receives grades. In computing grade points, each credit hour of A is multiplied by 4, B by 3, C by 2, D by 1, and E by 0.

Specific course requirements are listed in the section, The First Two Years.

Satisfactory work in written English is required throughout the college course.

Students who transfer to this college from another college of the University will be required to do two full years' work in the College of Arts and Sciences and satisfy all specific requirements before receiving the bachelor of arts degree, with the exception that students from the College of Technology may transfer after the junior year and be graduated after one year's work as majors in the Departments of Physics, Chemistry, or Mathematics; and students from the College of Life Sciences and Agriculture may similarly transfer and be graduated as majors in the Department of Zoology.

The First Two Years—The emphasis in the first two years of the student's college course is on basic courses in varied fields. The objective is twofold: first, to enable the student to acquire wide knowledge; and second, to prepare him for advanced study in a major subject or field.

To meet these objectives, the college has established specific course requirements for the first two years. With the consent of the adviser and the dean, not more than two of these requirements may be postponed until the junior year by any student whose interests are best served by variation from the usual program. Also, the student may be able to satisfy certain of these requirements by passing qualifying tests. Permission of the department concerned must be obtained by the student before he attempts the test.

The course requirements follow:

I. SPEECH. All freshmen are required to complete Sh 1, Public Speaking.

II. FOREIGN LANGUAGE. All students except those in the School of Nursing are required to complete Intermediate French, German, Russian, Spanish, Greek, or Latin, or to pass a qualifying test in one of these languages. The intermediate course will normally be taken in the freshman year by those students who continue a language taken for at least three years in high school. Students who begin a language in college would normally take the intermediate course in the sophomore year.

III. SOCIAL SCIENCE. A minimum of four courses in social science is required of all students. Students who have not completed a basic one-year high school course in American history are required to take United States History (Hy 3, 4). During the first two years, students who have completed such a course in high school should select 12 hours (four courses) from the following: Hy 3. 4, United States History; Hy 5. 6, History of Western Europe; My 1/2, Modern Society; Ec 10, Principles of Economics and a second additional semester in Economics; Pol 1/2, Introduction to Government; Ay 1. 2, Introduction to Anthropology; Sy 3/4, Introduction to Sociology or Py 1, General Psychology, and a second additional semester in Psychology. Not more than six hours (two courses) from the same department may be used to satisfy this requirement.

IV. NATURAL SCIENCE AND MATHEMATICS. A minimum of two years of work in science is required of all students. One year of this work must be a basic year-course in laboratory science or mathematics, and work of the second year must be taken in a different subject matter area. Two of the semester courses in descriptive science may be used to satisfy one year of this requirement. With the approval of the dean certain other combinations may be allowed to fulfill the descriptive science combinations.

a. Basic year courses:
As 15/16, General Astronomy
Bt 1, General Botany, and Bt 2, The Plant Kingdom
Bt 1, General Botany and Mb 127 with Mb 21a
General Microbiology with Laboratory
Ch 11/12, General Chemistry, or Ch 13/14,
Chemical Principles
Gy 1/2, Physical and Historical Geology
Ms 4, Algebra and Trigonometry and Ms 12, Analytical
Geometry and Calculus
Ms 5/6, Elements of College Mathematics
Ps 1/2, or Ps 1a/2a, General Physics
Zo 3/4, Animal Biology
Zo 3, B 1, Animal Biology and Botany
Zo 3, Animal Biology and Mb 127 with Mb 21a
General Microbiology with Laboratory

b. Semester courses in descriptive science:
As 9, Descriptive Astronomy
Gy 1a, Descriptive Geology, Physical
Gy 2a, Descriptive Geology, Historical
Mb 127, General Microbiology
Ms 19, Principles of Statistical Inference
Ps 3, Descriptive Physics
Zo 1, Principles of Biology

V. HUMANITIES. The humanities requirement may be met by taking two semesters in *one* of these fields: American, English, French, German, or Spanish literature; comparative literature; philosophy; or by taking one of these year-courses: Cl 1. 2; Hy 1. 2; Hy 7. 8; Hr 47. 48.

VI. PHYSICAL EDUCATION. All students, except veterans, are required to take and pass one year of physical education.

Students may register for five courses (normally 14-17 hours), excluding Mt 1, 2, 3, or 4. Dean's List students may register for six courses (normally 18 hours).

Normally not more than six hours may be taken in one subject in either semester of the sophomore year.

The Last Two Years—On the completion of 53 degree hours, the student, in conference with his adviser and with the approval of the dean, selects his major subject. The department in which the major subject chiefly falls becomes for administrative purposes the student's major department, and the head of that

department is responsible for the student before the faculty and must approve the student's registration.

The major curriculum is the nucleus of related courses selected by the student as representing his chief field of interest or major subject. Normally much of the work will fall in one department. The minimum number of credit hours acceptable for a major is set by the department. The maximum number of hours a student may count for degree credit from any one department is 48, including the credit derived from the introductory course in that department. (Not applicable in B.S. program).

Selected students may take advanced courses in Military Science and Tactics during their junior and senior years, for which a maximum of 10 credit hours may be received.

Foreign Study—The college encourages students in good academic standing to spend a year (preferably the junior year) in study at selected foreign universities. Depending on the foreign institution attended and the type of courses taken, academic credit for such study will be determined by the dean and the head of the student's major department upon completion of the program. While evidence of satisfactory performance in the form of grades, certificates, etc., is required to obtain degree credit, such grades will not be used in computing the student's accumulative average at the University of Maine.

Honors Program—These tutorial courses encourage exceptional ability by affording special opportunities for its exercise and to reward high achievement with appropriate recognition. The program stimulates originality, intellectual curiosity, and resourcefulness, and demands a large measure of self-reliance. The student does his work under the supervision of a tutor, whom he meets in conference at regular intervals for informal discussion and advice. The formal recognition, the highest offered in the College of Arts and Sciences, is conferred following a successful completion of the honors program, in the form of graduation honors of three grades: honors, high honors, highest honors.

Pass-Fail Option—Students enrolled in the College of Arts and Sciences who have achieved sophomore standing and who have an accumulative grade point average of 2.0 or better are eligible to take *one* course a semester on a Pass-Fail basis. However, courses which are required by the college and courses taken in one's major field or closely related fields may not be taken on a Pass-Fail basis.

Normally only the Registrar and the student's adviser will know which course the student is taking under the option. A student will be required to take all examinations and fulfill all other course requirements. The instructor submits a letter grade to the Registrar who converts the grade to either a Pass or Fail and enters it on the student's record.

A grade of D or better is graded as a Pass. Although Pass grades are not used in computing grade point averages, the credit thus earned is counted for degree credit.

Professional Certificates for Teachers—Certification for secondary school teaching may be earned by students registered in the College of Arts and Sciences. Eighteen hours of basic work (Ed B2, Ed B3, Ed B4, one methods course and student teaching) meets the professional subject requirements for the General

Secondary Provisional Certificate, which must be renewed after five years. Student teaching is required for full certification.

In addition to the 18 hours in professional courses, completion of a teaching major of 30 hours in one academic subject commonly taught in secondary schools is required. Candidates for a certificate are also expected to complete at least 18 hours in a second teaching field.

An alternate route to certification is possible by having 50 hours in a teaching area where at least three related academic subjects are represented.

Among the combinations of subject fields expected of prospective teachers are mathematics and science, English and history, English and French, English and Latin, history and Latin, history and French, French and Latin, English and speech, and history and speech.

Medical Technology—This course has been developed in cooperation with the Eastern Maine Medical Center, Bangor, the Central Maine General Hospital, Lewiston, and the Maine Medical Center, Portland. Students electing the program spend three or more years at the University of Maine following which they undergo a period of 12 months in training at one of the above hospitals. Students receive the degree of bachelor of arts when they have satisfactorily completed the program (see page 75) and the certificate in Medical technology when they have passed a special examination. The work at the University also meets the entrance requirements of schools of medical technology which are not affiliated with the University.

Public Management Curriculum—This program is designed to train men and women for governmental service in towns and cities.

Bangor Theological Seminary—Regularly enrolled students in the College of Arts and Sciences may register for courses at the Bangor Theological Seminary, not to exceed five credit hours per semester, without payment of additional fees. The College of Arts and Sciences extends a like privilege to students regularly enrolled at the Bangor Theological Seminary. Such registrations must have the approval of the academic deans of both institutions and the instructors involved. Credit for courses so taken will be considered a part of the student's program at the institution where he is enrolled.

While enrolled at the Bangor Theological Seminary a student may, with the approval of his dean and the admissions officer of the University, also register as a special student in the College of Arts and Sciences on the established fee basis for such courses. Work so taken, if it does not substitute for or duplicate courses taken in the seminary program, may be counted as advanced standing credit toward the degree in the event a student later registers for a degree program at the University.

Summer Session—Before students of the College of Arts and Sciences pursue Summer Session courses in any institution other than the University, they must secure the approval of the dean if they expect degree credit for such work. A marked bulletin of the institution should be left at the dean's office with a note requesting such credit for the courses selected.

Premedical and Predental Options—Medical and dental colleges in general desire students who are not only well prepared in the sciences and mathematics

but who are also broadly educated. To the first point they require certain courses in biology, chemistry, mathematics and physics; to the second they recommend a liberal background in the humanities and the social sciences.

Although most premedical and predental students major in a science, they may major in any of the non-science departments according to their interests. The student would be advised, however, to take a program during the first two years that will allow the greatest possible freedom of choice in later selecting an undergraduate major. The freshman year specimen curricula given for majors in chemistry, physics or zoology will leave many options open. Those who major in a non-science department and meet only the minimum science and mathematics requirements should achieve superior grades in order to demonstrate their proficiency in these critical subjects.

In order to achieve a uniformly strong program, all premedical and predental students are advised to take the following courses, regardless of their major:

		Subject	Credit Hours
Eh1	and Eh9	Freshman Composition and Modern Literature	6
Ch	13/14	Chemical Principles	8
Ch	140	Quantitative Analysis	4
*Ch	151/152	Organic Chemistry Lecture	6
*Ch	161/162	Organic Chemistry Laboratory	4
Bc	161	Physiological Chemistry	4
*Ms	4	Algebra and Trigonometry	4
*Ms	12	Analytic Geometry and Calculus	4
*Ps	1a/2a (or Ps 1/2)	General Physics	8
*Zo	3/4	Animal Biology	8
Zo	133	Comparative Anatomy	4
Zo	136	Developmental Biology	4
Zo	162	Principles of Genetics	3

* Required essentially by all medical schools.

Students should take speech, two years of a foreign language, preferably German, and psychology. They must also meet the special requirements of the college and the department in which they major.

SPECIMEN CURRICULUM FOR MEDICAL TECHNOLOGY

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
†Ch	13	Chemical Principles	4	†Ch	14	Chemical Principles	4
†Ms	4	Algebra and Trigonometry	4	Pe	2	Physical Education	0
Pe	1	Physical Education	0	†Ps	3	Descriptive Physics	3
†Zo	3	Animal Biology	4	Sh	1	Public Speaking	3
		Modern Language	3	†Zo	4	Animal Biology	4
						Modern Language	3
			15				17

Sophomore Year

			Hours				Hours
†Ch	140	Quantitative Analysis	4	†Mb	152	Pathogenic Bacteriology and Serology	4
†Mb	127	General Microbiology	5	Py	2	General Psychology	3
Py	1	General Psychology	3	†Zo	158	Animal Parasitology	4
		Modern Language or Social Science	3			Modern Language or Social Science	3
						Elective	3
			15				17

Junior Year

			Hours				Hours
†Bc	21	Organic Chemistry	4	†Bc	122	Biochemistry	4
Cp	11	Comparative Literature	3	Cp	12	Comparative Literature	3
Zo	151	Histology	4	Zo	152	Animal Microtechnique	2
		Social Science or Elective	3			Social Science or Elective	3-6
			14				12-15

*Senior Year

Twelve months in either the Eastern Maine Medical Center, Bangor, Maine; the Central Maine General Hospital, Lewiston, Maine; or the Maine Medical Center, Portland, Maine.

	Weeks	No. of credits
†Microbiology (Bacteriology, Parasitology, Mycology)	12	7
†Clinical Biochemistry	12	7
†Clinical Microscopy (urine, feces, spinal fluid)	4	3
†Hematology	11	6
†Blood Bank Procedures	4	3
†Serology	4	3
†Histologic Technique	4	3
†Electrocardiography	1	0
Total	51	32

* Students desiring to spend their senior year at the University of Maine may do so by electing the proper advanced courses along with a departmental major other than medical technology. Such students are candidates for the bachelor's degree in the major fields of their choice. They are eligible for the certificate of M.T. only upon completion of a fifth year of training, this to be obtained at a hospital laboratory.

† These courses, or their equivalents, are required for the major in medical technology.

SPECIMEN CURRICULUM IN PUBLIC MANAGEMENT

Leading to

Degree of B.A. in Public Management

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	1	Freshman Composition or Eh 9, Modern Literature	3	Eh	1	Freshman Composition or Eh 9, Modern Literature	3
Ms	5	Elements of College Math	3	Ms	6	Elements of College Math	3
Pe	1	Physical Education	0	Pe	2	Physical Education	0
Pol	1	Intro. to Government	3	Pol	2	Intro. to Government	3
Sy	3	Intro. to Sociology	3	Sh	1	Public Speaking	3
		Language	3	Sy	4	Intro. to Sociology	3
						Language	3
			15				15

Sophomore Year

			Hours				Hours
Sh	1	Public Speaking	3	Ec	10	Principles of Economics	3
Pol	3	State Government	3	Pol	158	Public Opinion	3
		Humanities	3			Humanities	3
		Language	3			Language	3
		Science	3			Science	3
			15				15

Junior Year

(Common to Federal-State and Local Options)

			Hours				Hours
Ba	9	Prin. of Accounting I	3	Ba	10	Prin. of Accounting II	3
Ba	161	Personnel Management	3	Ms	19	Prin. of Stat. Inference	3
Pol	151	Public Administration	3	Ms	169	Computer Programming	3
Ec	171	Public Finance and Fiscal Policy		Pol	152	Administrative Law	3
or				Ec	172	State and Local Government Finance	
Sw	150	Social Welfare	3	or			
		Elective	3	Sw	151	Social Welfare	3
			15				15

Summer between Junior and Senior Years

Pol 195 Internship in Municipal, Regional, State or Federal Agency 3

Senior Year—Federal-State Option

			Hours				Hours
Pol	159	Problems of American Government	3	-or-			
Pol	183	Constitutional Law	3	Pol	160	Problems of State Government	3
Pol	297	Seminar	3	Pol	184	Constitutional Law	3
		Electives	6	Pol	201	State Administration	3
				Pol	298	Seminar	3
						Elective	3
			15				15

Senior Year—Local Option

			Hours				Hours
Pol	133	The American City	3	Pol	134	Municipal Administration	3
Pol	297	Seminar	3	Pol	200	City & Regional Planning	3
		Electives	9	Pol	298	Seminar	3
						Electives	6
			15				15

Recommended Electives

			Hours				Hours
Ec	171	Public Finance and Fiscal Policy		Ec	172	State and Local Government Finance	
or				or			
Sw	150	Social Welfare	3	Sw	151	Social Welfare	3
Pol	7	Maine Government	1	Sy	126	Sociol. of Urban Life	3
Pol	183	Constitutional Law	3	Pol	8	Maine Government	1
Eg	1	Technical Drawing	2	Pol	184	Constitutional Law	3
Ce	5	Surveying	3	Ce	10	Curves & Earthwork	2
Ce	29	Intro. to Highway Eng.	3	Ce	30	Transportation Engineering	3
Ce	31	Intro. to Sanitary Eng.	3	Ce	32	Sanitary Eng. Design	3

SPECIMEN CURRICULUM FOR ZOOLOGY, PREMEDICAL, AND PREDENTAL MAJORS

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	1	Freshman Composition or Eh 9, Modern Literature	3	Eh	1	Freshman Composition or Eh 9, Modern Literature	3
Ms	4	Algebra & Trig.	3	Ms	12	Anal. Geometry and Calculus	4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
Zo	3	Animal Biology	4	Zo	4	Animal Biology	4
		*Modern Foreign Lang.	3			Modern Foreign Language	3
		Social Science	3			Social Science	3
			16				17

Sophomore Year

			Hours				Hours
Ch	13	Chemical Principles	4	Ch	14	Chemical Principles	4
Sh	1	Public Speaking	3	Zo	136	Development Biology	4
Zo	133	Comparative Anatomy	4	Ms	19	Statistics	3
		Modern Foreign Lang.	3			Modern Foreign Language	4
			14				14

Junior Year

			Hours				Hours
Ch	151	Organic Chemistry	3	Ch	152	Organic Chemistry	3
Ch	161	Organic Chemistry Lab	2	Ch	162	Organic Chemistry Lab	2
Ps	1a	General Physics	4	Ps	2a	General Physics	4
Zo	177	Animal Physiology	4	Zo	162	Prin. of Genetics	3
		Humanities	3			Elective	2
						Humanities	3
			16				17

Senior Year

			Hours				Hours
Ch	140	Quantitative Analysis	4	Zo	178	General Physiology	4
Zo	151	Histology	4			Zoology Elective	4
		Social Science	3			Social Science	3
		Zoology Elective	4				
			15				11

* The equivalent of two years of collegiate modern foreign language, preferably German, is usually required for medical school admission. Candidates should be familiar with the specific requirements of several schools before planning their first-year program. Those who have a special interest in chemistry should take Ch 13/14, Chemical Principles, with or without Animal Biology in the freshman year.

COURSES OF INSTRUCTION

Courses numbered 1 to 99 are undergraduate courses. They are open to graduate students but credit earned in these courses may not be used to satisfy advanced degree requirements. Courses numbered 100 to 199 are upperclass undergraduate courses which may be used for graduate degree credit by graduate students if given prior approval by the graduate students' advisory committee. Courses numered 200 to 299 are graduate courses which may be elected by undergraduate honor students, or those undergraduates whose advancement in the field will permit their taking a graduate level course among graduate students without disadvantage to themselves. Courses numbered 300 to 399 are graduate level courses which may be taken only by students admitted to the Graduate School.

One number is used for a course which is given both fall and spring.

When a dash is used between the two numbers (e.g., 1-2), both semesters must be taken to obtain credit; when a slant is used (e.g., 1/2), the first semester may be taken by itself, but the second cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit.

ANTHROPOLOGY (Ay)

PROFESSORS EMERICK (Chairman) IVES; ASSISTANT PROFESSORS ACHESON AND WELSH

The Department of Anthropology presents a program of study designed to expand the student's awareness and understanding of the biocultural nature of man, the variousness of his behavior and the structure and function of his institutions. It is also designed to acquaint the student with the fundamental concepts and principles as well as the basic research skills of the disciplines for which the department is responsible—anthropology (cultural, physical, linguistics, social anthropology, archaeology) and folklore.

The undergraduate major in the department may select and develop, in consultation with his adviser, a basic curriculum (or a series of courses) which will

give him an opportunity to develop his interests and provde him with the background necessary for his future needs. In addition to the following, students in the department must meet the general requirements of the College of Arts and Sciences.

Specific requirements for majors:

When a student declares anthropology as his major he is assigned to an adviser within the department. If the student already has a particular interest in some area for which the department is responsible—such as Archaeology, Social Anthropology, or Folklore—he will be assigned, whenever possible, to an adviser who is most closely identified with such a field. The design of the student's major program for his junior and senior years will, in large part, grow out of this adviser-advisee relationship. It is generally expected, however. that a major's program will take shape within the following guidelines:

Majors should expect to take Introductory Anthropology (Ay 1. 2), Anthropological Theory (Ay 161), one methods course: Archaeological (Ay 170), Ethnographic (Ay 120), or Folklore (Fo 107), and 6 hours to be chosen from Mathematics, Logic, Computer Science or Statistics. These 6 hours may count as major credit.

The Department will consider upon consultation with the student through his adviser the granting of up to 6 hours of major credit for courses in collateral areas in other departments.

Majors are urged to take at least one course from each of the following general areas in the department:

a. Archaeology
b. Physical Anthropology
c. Folklore and Linguistics
d. General Cultural—Social Anthropology

1. A world area course, area ethnography, i.e., People and Cultures of the Pacific Islands, North American Indian Ethnology, etc.
2. A functional area course (Hunters and Gatherers, Peasants, Culture and Personality, Social Anthropology, Political Anthropology, Economic Anthropology, etc.

Recommended laboratory science courses for anthropology majors are Principles of Geology (Gy 1/2), or Animal Biology (Zo 3/4). For those students who have not taken Gy 1/2 as a lab science, Descriptive Geology (Gy 1a/2a) is recommended to meet the Arts and Sciences descriptive science requirements. Other recommended electives are General Psychology (Py 1/2), Social Psychology (Py 130), Comparative Anatomy (Zo 133), Glacial Geology, (Gy 152), and Pleistocene Epoch (Gy 342).

The introductory course, Ay 1.2, should be taken during the freshman or sophomore year. Fo 1 and Fo 2 may be taken during the freshman or sophomore years. Any two of the following Fo courses may be counted toward an English major: Fo 1, Fo 2, Fo 134, and Fo 179.

Students who wish to explore the requirements for graduate study or the professional or career aspects of any of the areas for which this department is responsible should consult with their departmental advisers.

Anthropology (Ay)

1. 2. Introduction to Anthropology—The development of man as a biocultural phenomenon. Special emphasis on human paleontology and race formation as well as on the nature of culture and such human institutions as social organization, marriage, religion, economics, etc., among primitive people, with some application of derived principles to Western civilization. Required of majors. *Cr* 3. MR. EMERICK

****101. Physical Anthropology***—A lecture course which provides an introduction to methods and findings related to human evolution, primate behavior, Fossil Man and racial differences. Prerequisite: AY 1.2 or permission of instructor. *Cr* 3. STAFF

120. Ethnographic Method—A study of methods and techniques in ethnography, including a survey of the issues involving in planning and carrying out field studies. Emphasis is on the anthropologist's way of looking at and making a record of human behavior, with practical exercises to reinforce the student's theoretical understanding. Prerequisite: Minimum of 9 hours in Anthropology beyond AY 1.2, or permission of instructor. *Cr* 3. MISS WELSH

****139. Culture and Personality***—A study of how culture influences the development of personality. Major emphasis is on the different ways in which human societies socialize the child and on the relationships between cultural systems and personality systems. Prerequisite: AY 1/2 or permission of instructor. *Cr* 3. MR. EMERICK

140. Seminar in Quaternary Studies—A multidisciplinary seminar that is concerned with selected areas of study—physical, biological and anthropological—related to the Quaternary Period. The subject areas of the seminar will vary each semester and it can be taken more than once for credit. Course same as Gy, S, and Zo 140. Prerequisite: Consent of instructor. *Rec.* 2, *Cr* 2.
STAFF, MR. DENTON, MR. LOTSEY, MR. DEARBORN

141. People and Cultures of the Pacific Islands—The problem of migration to and the peopling of the Pacific world will be examined. The development of distinct cultural traditions traced in Australia, Melanesia, Micronesia, and Polynesia. The possibility of trans-Pacific contact with pre-Columbian America will be discussed, as well as the special problems of these Oceanic people in the modern world. Prerequisite: AY 1/2, or permission of instructor. *Cr* 3.
MR. EMERICK

****143. Peoples and Cultures of South Asia***—A descriptive and analytical survey of both the island cultures and the mainland cultures of South Asia. Selected representative groups from India, Ceylon, Assam, Burma, Thailand, Laos, Cambodia, and Viet Nam will be considered and discussed as well as those from Indonesia, Maylasia, and the Philippine Islands. Attention will be focused on traditional cultural characteristics but their relationship to current problems will also be considered. Ay 1/2 or permission of instructor. *Cr* 3. STAFF

****144. Cultures and Societies of North and East Asia***—A description and analysis of the people and cultural behavior of North and East Asia with special emphasis on China, Japan, and Korea. Particular attention will be given to cultural geography and population as well as to such topics as kinship and family, values and religion, political organization, economics, and stratification of society. Trends

* Not offered 1970-1971

in the contemporary life of these areas will be referred to, but current problems will be subordinated to insight into basic cultural patterns. Ay 1/2 or permission of instructor. *Cr* 3. STAFF

150. *Hunters and Food Gatherers—A survey of the vanishing people whose subsistence economy has remained at the hunting and gathering level. Attention will be focused on selected groups in all major geographical and culture areas. Both unique and common problems of these people will be dealt with and special emphasis will be placed on ethnohistorical, environmental, and acculturation factors. Prerequisite: Ay 1/, or permission of instructor. *Cr* 3. MR. EMERICK

151. *North American Indian Ethnology—An ethnological survey of American Indian cultures north of Mexico, but excluding the Eskimo. Emphasis upon cross-cultural comparison through the use of selected ethnographic studies. The formulation of generalizations of geographical and temporal significance, including a consideration of modern developments and problems. Prerequisite: Minimum of 9 hours in Anthropology beyond Ay 1.2, or permission of instructor. *Cr* 3. MISS WELSH

152. *South American Indian Ethnology—A survey of the ethnology of South American Indian cultures including the West Indies. Designed as a sequence course to Ay 151 and using a similar approach. Prerequisite: Ay 1.2, or permission of the instructor. *Cr* 3. MISS WELSH

153. *People and Cultures of Mesoamerica — Study of contemporary peasant societies of Mexico and Guatemala. Short history of these communities since the Spanish Conquest. Comparison of Mestizo and Indian communities; relations between folk societies and urban areas. Special emphasis on current theory concerning Middle American societies. Prerequisite: Ay 2 or permission of the instructor. *Cr* 3. MR. ACHESON

154. *Cultures and Societies of the Middle East—A study of the cultures and societies of the Middle East with emphasis on the Arab World, Turkey, Iran and Afghanistan. Particular emphasis will be given to religious organization, kinship, political organization, and economics. Special attention on contemporary life and the current problems in the ethnography. Ay 1/2 or permission of instructor. *Cr* 3. MR. ACHESON

155. *Peoples and Cultures of Sub-Saharan Africa—Study of selected societies of Africa. The culture areas of Africa. Emphasis will be placed on an intensive study of societies in differing areas which exhibit important structural principles. Prerequisite: Ay 2 or permission of the instructor. *Cr* 3. MR. ACHESON

156. *Islamic Africa*—A study of the Muslim peoples and cultures of the Northern and Western parts of Africa. Contrast and comparison of the tribes of the Atlas, the coastal Arabs, the tribes of the Sahara, and tribes of West Africa dominated by Islam. Relationships between Islamic and pagan peoples. The city, village and tribe. Ay 1/2 or permission. *Cr* 3. MR. ACHESON

160. *Peoples and Cultures of the Circumpolar Area*—The development of northern cultures in both the Old and the New Worlds will be traced from prehistoric times to the present. Problems of economics, social structure, and cultural organization will be emphasized. Prerequisite: Ay 1/2, or permission of instructor. *Cr* 3. MR. EMERICK

161. *Anthropological Theory*—A consideration of the major theoretical ideas in anthropology (evolutionary, historical, functional, linguistic) as they have

* Not offered 1970-1971

developed to the present time. Using illustrations drawn from the literature, attention will particularly be given to current issues in anthropological theory and their historical roots. Prerequisite: At least 9 hours in Anthropology beyond Ay 1.2, or permission of instructor. *Cr* 3. MISS WELSH

163. Social Anthropology—Basic concepts, principles and problems of modern social anthropology will be presented through the reading of certain key monographs. Prerequisite: Ay 2 or permission of the instructor. Cr 3. MR. ACHESON

****165. Political Anthropology***—Examination of leadership patterns for social control in selected non-Western and/or tribal societies. Prerequisite: Ay 2 or permission of the instructor. *Cr* 3. MR. ACHESON

166. Economic Anthropology—Comparative study of production, consumption and exchange in selected non-Western societies. Emphasis will be placed on factors influencing economic decisions in a variety of social and cultural settings. Prerequisite: Ay 2 or permission of the instructor. *Cr* 3. MR. ACHESON

167. Peasant Societies—Peasants, neither primitive nor modern, are the majority of humanity. Study of the similarities and differences among and between peasant societies in various parts of the world. A critical examination of the body of anthropological theory concerning peasantry. Prerequisite: Ay 2 or permission of the instructor. *Cr* 3. MR. ACHESON

170. Archaeological Theory and Method—An introduction to the methods of archaeological research. Techniques of excavation and analysis; theoretical basis of methods and fundamental principles; application to specific case studies; interpretation of findings; the use of geological, biological, geographical and other tools in archaeological research. Prerequisite: Ay 1/2 or permission of the instructor. *Cr* 3. STAFF

****171. Old World Prehistory***—The prehistory of man in the eastern hemisphere from the beginnings of culture through the development of agriculture and urbanism. The development and elaboration of human society as inferred from material remains. Prerequisite: Ay 1/, or permission of the instructor. *Cr* 3. STAFF

172. North American Prehistory—The prehistory of man in North America from his arrival to European contact. A survey of major developments such as the spread of agriculture. Emphasis upon late and post-glacial adaptations to environment. Prerequisite: Ay 1/2, or permission of the instructor. *Cr* 3. STAFF

173. Mesoamerican Prehistory—The prehistory of man in Mesoamerica, covering the area from northern Mexico to the Isthmus of Panama. The development of agriculture and urbanism with reference to parallel developments in the Old World. The emergence of civilization leading up to European contact. Prerequisite: Ay 1/2, or permission of the instructor. *Cr* 3. STAFF

177. Field Research in Archaeology—Introduction to archaeological field technics by excavation of prehistoric sites in Maine. Intensive training in site survey excavation technics, recording, analysis and preliminary interpretation of archaeological materials. Prerequisites: Ay 1 and 2 (or equivalent) and permission of instructor. *Cr* 3-6. (Summer only). STAFF

180. Anthropological Linguistics—The study of the structure and function of language as an aspect of culture, including considerations of the bi-

* Not offered 1970-1971

ology of language, patterning in language and culture, and problems of evolution and historical development. Emphasis on non-Western languages and on providing the tools and definitions necessary for an understanding of linguistic anthropology. Prerequisite: At least 9 hours in Anthropology beyond Ay 1.2, or permission of instructor. *Cr* 3. MISS WELSH

181. Language and Culture—Designed as a sequence course to AY 180, this course includes an introduction to the writings of key figures in the field and goes on to explore their broader implications in such areas as non-linguistic communication, semantics, and general problems in 'Cognitive Anthropology'. Prerequisite: Ay 180 or permission of instructor. *Cr* 3. MISS WELSH

197. 198. Department Projects—For the advanced student. Minimum of 15 hours of department courses as a prerequisite. Apply directly to the Department Chairman before registration. Cr 2 or 3.

Folklore (Fo)

1. Introduction to Folksong—A survey of the various forms of music and poetry as they exist in folk tradition: epics, ballads, lyrics, work-songs, dance and play-party songs, blues, religious songs, etc. Emphasis will be on listening to field recordings. *Cr* 3, *Lec* 2, *Lab* 2. MR. IVES

2. Introduction to Folklore—Survey of the different genres of folklore, with emphasis on belief, custom, and legend. *Cr* 3, *Lec* 3. MR. IVES

****106. North American Indian Mythology***—Myths, tales, and legends of selected representative American Indian groups of the United States and Canada, with special emphasis on the Northeast. Prerequisite: Fo 2 or permission of the instructor. *Cr* 3, *Lec* 3. MR. IVES

107. Field Work in Folklore—Principles and methods of collecting songs, ballads, tales, beliefs, proverbs, oral history, and other data relevant to the study of folklore. Problem statement, advance preparation, interviewing techniques, the use of questionnaires, documentation, transcription, legal and ethical aspects, etc. Special attention given to the proper use of recording equipment. Readings, lectures, and practical field experience. Prerequisite: 3 credits of folklore or permission of instructor. *Cr* 3. MR. IVES

****108. Poet and Performer in a Folk Culture***—A study of the creation, performance, transmission, and function of poetry and other works of art in folk culture. Tradition and individual creativity: their limits, conflict, and resolution in a number of specific cultures. The theories of such men as Gummere, Boas Barry, Herzog, Merriam, and Parry and Lord. The general emphasis will be on the place of art and the artist in society. Prerequisite: 3 credits of folklore or permission of instructor. *Cr* 3. MR. IVES

****134. Folksong in America***—Types and traditions of folksong in America, especially the ballad; English, Scottish, Irish, Spanish, French, and Negro materials. Prerequisite: Fo 1 or permission. *Cr* 3, *Lec* 2, *Lab* 2. MR. IVES

179. Folk Narratives—A study of the folktale *(Marchen)* and such allied forms as jests, tall tales, and various types of hero cycles found in both the Old and the New World. Prerequisite: Fo 2 or permission of the instructor. *Cr* 3. MR. IVES

197. 198. Projects in Folklore—Individual supervised projects particularly

* Not offered 1970-1971

the field of collecting folk materials. Prerequisite: 6 credits of folklore and permission of the instructor. *Cr* 2 or 3. MR. IVES

ART (At)

PROFESSOR HARTGEN, Chairman; ASSISTANT PROFESSORS DECKER, GHIZ, LEWIS, BROWN; INSTRUCTOR GREENWALD

As a division of the College of Arts and Sciences, the curriculum in Art is basically liberal arts, with required courses in the sciences, social studies, languages and humanities dispersed within the student's courses in art appreciation, history, aesthetics and studio. The art program offers a balance between creative studio experience in drawing, painting, graphics and design on the one hand, and lecture and seminar classes in history, criticism and appreciation on the other. Both directions of study may subsequently lead the student toward specialized work in the fine arts, industrial design, advertising, illustration, etc.; or to an advanced degree in research, history, or criticism. No advanced degrees in art are offered at this time. The department designates a minimum of 38 hours and a maximum of 48 hours within its program for the bachelor of arts degree.

The Department of Art, in Carnegie Hall, is adequately equipped with facilities for studio involvement in painting, drawing, printmaking, and sculpture. There is a large collection of slides, reproductions, artifacts and original works of art, all of which are available to the art student. Also, some seven or eight exhibitions of original art, in all media, styles and periods, are brought to the campus each month and displayed in the University's several art galleries. These shows offer the art major a first-hand opportunity to study and evaluate important masterpieces.

Majors in art education follow a curriculum developed in cooperation with the College of Education, leading to the bachelor of science degree in education. Preparation for elementary and secondary level teaching of art is offered here. Registration is in the College of Education.

SPECIMEN CURRICULUM FOR ART

Freshman Year

Eh	1	Freshman Comp. or Eh. 9, Modern Literature	3
		Descriptive Science or Sh. 1, Fundamentals of Public Speaking	3-4
		Foreign Language 1	3
At	5	*Appreciation & History of Art	3
Pe	1	(1W) Phys. Ed.	0
Hy	5	History of Western Europe or Social Science	3
			15-16

Eh	1	Freshman Comp. or Eh. 10, Modern Literature	3
		Descriptive Science or Sh. 1, Fundamentals of Public Speaking	3-4
		Foreign Language 2	3
At	6	*Appreciation & History of Art	3
Pe	2	(2W) Phys. Ed.	0
Hy	6	History of Western Europe or Social Science	3
			15-16

Sophomore Year

		Foreign Language 3	3		Foreign Language 4	3
		Social Science 1	3		Social Science 2	3
At	1	*Basic Drawing	2	At	2 *Basic Drawing	2
		Laboratory Science	3-4		Laboratory Science	3-4
At	7	*Basic Design	2	At	8 *Basic Design	2
		Electives	2-3		Electives	2-3
			15-17			15-17

Junior Year

		Humanities requirement 1	3		Humanities requirement 2	3
At	11	*Advanced Drawing	2	At	12 *Advanced Drawing	2
At	9	*Advanced Design	2	At	10 *Advanced Design	2
At	25	*Renaissance Art in Italy or At. 27 North. Renaissance Art	2	At	26 *Renaissance Art in Italy or At. 28 Northern Renaissance Art	2
At	21	*Amer. Art or At. 23 Cont. Art Forms	2	At	22 *American Art or At 24 Cont. Art Forms	2
		Electives	3-4		Electives	3-4
			14-15			14-15

Senior Year

At	15	*Painting & Rendering	2	At	16 *Painting & Rendering	2
At	23	*Cont. Art Forms or At 21 *American Art	2	At	24 *Contemporary Art Forms or At 22 *American Art	2
At	19	Art in the Community or At 31, Masterpieces of Graphic Arts	2	At	20 Art in the Community or At 32, Masterpieces of Graphic Arts	2
At	97	Problems in Art	2-3	At	30 Art Materials & Techniques	3
		Electives	6	At	98 Problems in Art	2-3
					Elective	3
			14-15			14-15

* Minimum required art courses for degree. Note: 38-hour minimum in art.

1/2. Basic Drawing—Fundamentals of drawing. Principles of perspective, shades and shadows, and composition. Pencil, charcoal, graphite, and crayon. *Lab* 4, *Cr* 2. STAFF

3. 4. Principles of Art—The basic principles of art—its substance, nature, and classification. An analysis of architectural, sculptural, and pictorial forms. Not a historic study of art, although masterpieces are studied. *Rec* 2, *Cr* 2. STAFF

5. 6. Art Appreciation and History—Techniques and trends in architecture, sculpture, and painting as related to the history of art from the earliest times to the present day. Lectures, text, slides, and prints. *Rec* 3, *Cr* 3. MR. HARTGEN

7. Basic 2-D Design and Color—Fundamentals of 2-D design through studio experience. Emphasis on pure design. Analysis of design elements, their relationships and organization and basic perceptual and aesthetic aspects of color explored. *Lab* 4, *Cr* 2. STAFF

8. Basic 3-D Design—Study of basic 3-D design elements. Learning fundamentals through studio experience and manipulation of materials. *Lab* 4, *Cr* 2. MR. DECKER

9. Introduction to Graphic Arts—Fundamentals of printmaking through experiences with relief printing, silk screen and etching. Prerequisite: At 1/2 and At 7/8. *Lab* 4, *Cr* 2. MR. DECKER

10. Introduction to Sculpture—Study of sculptural form and expression through clay, plastics, wood, stone, metal. Prerequisite: At 1/2 and At 7/8. *Lab* 4, *Cr* 2.

11. Intermediate Drawing—Advanced studies in form, space, composition. Experimentation with range of media. Prerequisite: At 1/2. *Lab* 4, *Cr* 2. STAFF

12. Figure Drawing—Creative drawing based on the human figure. Study of understanding human structure and form and representation of grace and fluidity of human figure machine. Prerequisite At 11. *Lab* 4, *Cr* 2. MR. LEWIS

13. 14. Fundamentals of Painting—Basic introductions to the painting art. Exercises in color, technique and composition. Studio and outdoor subjects. All media. Prerequisite: At 1/2 or permission. (Not open to art majors) *Lab* 4, *Cr* 2. STAFF

15/16. Basic Painting—Exploration of painting through study of various painting techniques—oils, acrylics, water media; stress on composition, color and technical mastery of painting medium. Prerequisite: At 11/12. *Lab* 4, *Cr* 2. STAFF

19/20. History of Modern Architecture and Design—A study of European-American architecture and design from 19th century to present. Basic styles and concepts in residential, school, church and civic structures. Special emphasis on urban planning and the need for environmental design today. Second semester: Packaging, industrial design, advertising and related subjects. *Rec* 2, *Cr* 2. MR. DECKER

21. 22. American Art — American painting, architecture and sculpture; styles, trends and schools. First semester, from beginning to 20th century; second semester, the 20th century. *Rec* 2, *Cr* 2. MR. DECKER

23. 24. Contemporary Art Forms—An examination of all modern European and American trends in architecture, sculpture, painting, and the graphic arts. A comparison of the modern "isms." At 5 and 6 are recommended but not required. *Rec* 2, *Cr* 2. MR. GHIZ

25. 26. Renaissance Art in Italy—The architecture, sculpture and painting of the Italian Renaissance from the 13th to 18th century. First semester: Rome and Florence; the second: Bologna, Venice, and Milan. At 5 and 6 recommended or permission. *Rec* 2, *Cr* 2. STAFF

27. 28. The Northern Renaissance—Architecture, sculpture and painting in Flanders, France, Germany, Spain, Holland, England from the 14th to 18th century. At 5 and 6 recommended or permission. *Rec* 2, *Cr* 2. MR. GHIZ

30. Art Materials and Techniques—Materials, methods, and techniques for the professional artist-craftsman. Examination, comparison, and testing of materials and processes of painting, graphics, sculpture, etc. Prerequisite: At 1/2 or permission. *Rec* 2, *Lab* 1, *Cr* 3. MR. DECKER

31. 32. Masterpieces of Graphic Arts—Drawings and prints, their techniques and classifications. Collecting, marketing and exhibiting. Masterpieces of all ages and countries. Study of original examples from the collection. *Rec* 2, *Cr* 2. STAFF

33/34. Primitiive Art—A study of the function of art in primitive societies and the relationship between art and society. African, Oceanic, American

Indian and the art of Mexico and Central and South American cultures are covered. At 5/6 recommended or permission. *Rec* 2, *Cr* 2. STAFF

35/36. Asian Art—A general and comparative survey of the main periods of the art of Asia. The art of China, Korea, Japan and Islam will be covered. At 5/6 recommended or permission. *Rec* 2, *Cr* 2. STAFF

41/42. Commercial Art and Publications Design—The design of booklets, catalogs, magazines, newspapers, posters, etc. Exercises in lettering and layout. Prerequisite: At 1/2 or permission. *Lab* 4, *Cr* 2. (Given on sufficient demand.) MR. GHIZ

65. 66. Methods and Curricula in Art Education—Contemporary objectives in the teaching of art in the elementary and secondary schools. Selection and planning of materials, techniques, and curricula. Fall: elementary; spring: secondary. *Rev* 2, *Lab* 1, *Cr* 3. Permission of instructor. MISS BROWN

69. The Teaching of Art—Current methods and materials for the teaching of art in the elementary grades. Theory and actual experience with various two and three dimensional art projects. *Lec and Lab* 3, *Cr* 2. MISS BRJWN

80/81. Introduction to Filmmaking—Study of film through studio experiences and viewing of films of historical and artistic merit. Filmmaking as an art medium. Introduction to basic photographic techniques in shooting film, editing, lighting, animation, sound, etc. Permission of instructor. *Lab* 4. MR. LEWIS

97. 98. Problems in Art—Advanced projects for student research and presentation. Undergraduate thesis or exhibition. *Cr Ar*. Permission of head of the department. STAFF

151. Art Education Workshop and Laboratory—Plan of study, projects and credit arranged. STAFF

CHEMISTRY (Ch)

PROFESSORS WOLFHAGEN (Chairman), BEAMESDERFER, DUNLAP, GOODFRIEND; ASSOCIATE PROFESSORS GEORGITIS, GREEN; ASSISTANT PROFESSORS BENTLEY, PATIN, PATTERSON, RASAIAH, RUSS, ZOLLWEG; RESEARCH ASSOCIATE HILL; MRS. WHITNEY, MRS. WOLFHAGEN

The student majoring in chemistry in the College of Arts and Sciences is able to complete all requirements for certification to the American Chemical Society Committee on Professional Training. Chemistry majors who intend to enter medicine or other related fields are permitted to take fewer chemistry courses in order to have a wider choice of electives. Some variation in the order of electives as described below is possible in special situations.

Although the specimen curriculum below suggests beginning with Ms 4, the Department of Chemistry strongly recommends sufficient high school preparation in mathematics so that Ms 12 may be taken during the first semester of the freshman year. Further, a course in computer programming is recommended.

Courses in the Department of Chemistry are described under the College of Technology.

RECOMMENDED SPECIMEN CURRICULUM IN CHEMISTRY FOR STUDENTS IN THE COLLEGE OF ARTS AND SCIENCES

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Ch	13	Chemical Principles	4	Ch	14	Chemical Principles	4
Eh	1	Freshman Composition or		Eh	1	Freshman Composition or	
Eh	9	Modern Literature	3	Eh	9	Modern Literature	3
Ms	4	Algebra and Trigonometry	3	Ms	12	Anal. Geometry and Calculus	4
Ps 1 or 1a		General Physics	4	Ps 2 or 2a		General Physics	4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
			15				15

Sophomore Year

			Hours				Hours
Ch	140	Quantitative Analysis	4	Ch	152	Organic Chemistry Lecture	3
Ch	151	Organic Chemistry Lecture	3	Ch	162	Organic Chemistry Laboratory	2
Ch	161	Organic Chemistry Laboratory	2	Gm	2	Elementary German	3
Gm	1	Elementary German	3	Ms	28	Anal. Geometry and Calculus	4
Ms	27	Anal. Geometry and Calculus	4	Sh	1	Public Speaking	3
			16				15

Junior Year

			Hours				Hours
Ch	171	Physical Chemistry	5	Ch	172	Physical Chemistry	5
Gm	13	Inter. Scientific German	3	*Ch	190	Intermediate Organic Chemistry Laboratory	3
*Ms	29	Differential Equations	4	Gm	14	Readings in Scientific German (Intermediate)	3
		Humanities or Social Science Elective	3			Humanities or Social Science Elective	3
		Free Elective	3			Free Elective	3
			18				17

Senior Year

			Hours				Hours
Ch	154	Adv. Inorganic Chemistry	3	*Ch	164	Instrumental Analysis	4
*Ch	185	Chemical Literature	2			Social Science or Humanities Electives	6
		Social Science or Humanities Electives	6			Free Electives	6
		Free Elective	3-6				
			14-17				16

* For American Chemical Society Certification

Indian and the art of Mexico and Central and South American cultures are covered. At 5/6 recommended or permission. *Rec* 2, *Cr* 2. STAFF

35/36. Asian Art—A general and comparative survey of the main periods of the art of Asia. The art of China, Korea, Japan and Islam will be covered. At 5/6 recommended or permission. *Rec* 2, *Cr* 2. STAFF

41/42. Commercial Art and Publications Design—The design of booklets, catalogs, magazines, newspapers, posters, etc. Exercises in lettering and layout. Prerequisite: At 1/2 or permission. *Lab* 4, *Cr* 2. (Given on sufficient demand.) MR. GHIZ

65. 66. Methods and Curricula in Art Education—Contemporary objectives in the teaching of art in the elementary and secondary schools. Selection and planning of materials, techniques, and curricula. Fall: elementary; spring: secondary. *Rev* 2, *Lab* 1, *Cr* 3. Permission of instructor. MISS BROWN

69. The Teaching of Art—Current methods and materials for the teaching of art in the elementary grades. Theory and actual experience with various two and three dimensional art projects. *Lec and Lab* 3, *Cr* 2. MISS BRJWN

80/81. Introduction to Filmmaking—Study of film through studio experiences and viewing of films of historical and artistic merit. Filmmaking as an art medium. Introduction to basic photographic techniques in shooting film, editing, lighting, animation, sound, etc. Permission of instructor. *Lab* 4. MR. LEWIS

97. 98. Problems in Art—Advanced projects for student research and presentation. Undergraduate thesis or exhibition. *Cr Ar*. Permission of head of the department. STAFF

151. Art Education Workshop and Laboratory—Plan of study, projects and credit arranged. STAFF

CHEMISTRY (Ch)

PROFESSORS WOLFHAGEN (Chairman), BEAMESDERFER, DUNLAP, GOODFRIEND; ASSOCIATE PROFESSORS GEORGITIS, GREEN; ASSISTANT PROFESSORS BENTLEY, PATIN, PATTERSON, RASAIAH, RUSS, ZOLLWEG; RESEARCH ASSOCIATE HILL; MRS. WHITNEY, MRS. WOLFHAGEN

The student majoring in chemistry in the College of Arts and Sciences is able to complete all requirements for certification to the American Chemical Society Committee on Professional Training. Chemistry majors who intend to enter medicine or other related fields are permitted to take fewer chemistry courses in order to have a wider choice of electives. Some variation in the order of electives as described below is possible in special situations.

Although the specimen curriculum below suggests beginning with Ms 4, the Department of Chemistry strongly recommends sufficient high school preparation in mathematics so that Ms 12 may be taken during the first semester of the freshman year. Further, a course in computer programming is recommended.

Courses in the Department of Chemistry are described under the College of Technology.

RECOMMENDED SPECIMEN CURRICULUM IN CHEMISTRY FOR STUDENTS IN THE COLLEGE OF ARTS AND SCIENCES

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Ch	13	Chemical Principles	4	Ch	14	Chemical Principles	4
Eh	1	Freshman Composition or		Eh	1	Freshman Composition or	
Eh	9	Modern Literature	3	Eh	9	Modern Literature	3
Ms	4	Algebra and Trigonometry	3	Ms	12	Anal. Geometry and Calculus	4
Ps 1 or 1a		General Physics	4	Ps 2 or 2a		General Physics	4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
			15				15

Sophomore Year

			Hours				Hours
Ch	140	Quantitative Analysis	4	Ch	152	Organic Chemistry Lecture	3
Ch	151	Organic Chemistry Lecture	3	Ch	162	Organic Chemistry Laboratory	2
Ch	161	Organic Chemistry Laboratory	2	Gm	2	Elementary German	3
Gm	1	Elementary German	3	Ms	28	Anal. Geometry and Calculus	4
Ms	27	Anal. Geometry and Calculus	4	Sh	1	Public Speaking	3
			16				15

Junior Year

			Hours				Hours
Ch	171	Physical Chemistry	5	Ch	172	Physical Chemistry	5
Gm	13	Inter. Scientific German	3	*Ch	190	Intermediate Organic Chemistry Laboratory	3
*Ms	29	Differential Equations	4	Gm	14	Readings in Scientific German (Intermediate)	3
		Humanities or Social Science Elective	3			Humanities or Social Science Elective	3
		Free Elective	3			Free Elective	3
			18				17

Senior Year

			Hours				Hours
Ch	154	Adv. Inorganic Chemistry	3	*Ch	164	Instrumental Analysis	4
*Ch	185	Chemical Literature	2			Social Science or Humanities Electives	6
		Social Science or Humanities Electives	6			Free Electives	6
		Free Elective	3-6				
			14-17				16

* For American Chemical Society Certification

COMPARATIVE LITERATURE (Cp)

PROFESSORS TERRELL, HUNTING, MOODY, AND O'NEILL; ASSOCIATE PROFESSORS COLBATH, JACOBS, ROGGENBAUER, TATEM, AND TREDWELL

The college provides an interdisciplinary major in Comparative Literature, with offerings in the Departments of Art, English, Foreign Languages and Classics, History, Music, Philosophy, and Speech. Students with special interests in the cultural movements of Western civilization are invited to elect this major. The humanities requirement may be satisfied by two semesters taken seriatim from Eh 21, 22, 23, 24. Other requirements are: 1) at least 24 hours of Comparative Literature courses, and 2) 24 hours of related courses in the cooperating departments. During the senior year, majors must pass final examinations in 1) the history, 2) literature, and 3) either the philosophies or the arts (painting, sculpture, music, theatre) of one of the following periods of European civilization:

1. Greek and Roman Classicism (beginnings to 500 A.D.)
2. Medievalism (500-1300)
3. The Renaissance and Reformation (1300-1650)
4. Neoclassicism and the Enlightenment (1650-1785)
5. European Romanticism (1785-1850)
6. The Later Nineteenth Century (1850-1914)
7. The Twentieth Century (1914-present)

Information may be obtained from the Comparative Literature Office, 225 Stevens Hall.

Undergraduate Courses in Comparative Literature (Cp)

11. 12. The Western Tradition in Literature—A general survey of the major writers in the Western literary tradition, with particular attention to the development of our cultural heritage and the evolution of major literary forms. First semester: Homer to the Renaissance. Second semester: the 17th, 18th, and 19th centuries. *Cr* 3. MR. MANLOVE, Chairman

41. 42. The Drama of the Western World—A rapid survey from the beginnings to the present. Primary emphasis on literary forms and aesthetic values. Aeschylus to Ibsen the first semester; Ibsen to the present the second. *Cr* 3.

173. Earlier Criticism—From Plato to Coleridge. Includes readings of selected classics and practice in criticizing works of literature. *Cr* 3. MR. SPRAGUE

174. Modern Literature Criticism—From Coleridge to the present. Modern trends in criticism. *Cr* 3. MR. ANDERSEN

175. 176. European Literature—Continental European literature in translation. From Homer to the Renaissance in the first semester. Continuing to the present in the second semester. Prerequisite: Cp 11. 12 or equivalent. *Cr* 3.

185. Earlier Biography—Great biographies of the world, from Plutarch to Boswell. *Cr* 3. MR. RANDEL

186. Modern Biography—Great biographies of the world, from Boswell to the present. *Cr* 3. MR. RANDEL

189. 190. Novel of Western Europe—A survey of the novel in France, Germany, Italy, and Spain. First semester from the beginnings to 1900. Second semester from 1900 to the present. *Cr* 3. MR. TERRELL

191. Early 20th Century Drama of the Western World—A study of such major dramatists as Ibsen, Strindberg, Pirandello, Shaw, O'Neill and Maxwell Anderson. *Cr* 3. MR. TERRELL

192. Later 20th Century Drama of the Western World—A study of such major dramatists as Brecht, Anouilh, Giraudoux, Williams, Miller, and Albee, and the Theatre of the Absurd, with Beckett, Ionesco, Genet, Pinter, etc. *Cr* 3. MR. TERRELL

193. 194. Novel of Eastern and Northern Europe—A survey of the Russian, Scandinavian, and Central European novel. First semester from the beginnings to Tolstoy; second semester from Tolstoy to Pasternak. *Cr* 3. MR. TERRELL

Graduate Courses

230. Oriental Masterpieces: The Near East—*Cr* 3.
231. Oriental Masterpieces: The Far East—*Cr* 3.
240. Neoclassic Drama in Europe—*Cr* 3.
241. European Drama of the 18th Century—*Cr* 3.
242. European Drama from the Revolution to 1850—*Cr* 3.
251. Epic Masterpieces of the Middle Ages—*Cr* 3.
253. Neoclassicism in Europe—*Cr* 3.
299. Seminar in European Literature—*Cr* 3.
300. 301. Introduction to and Problems in Comparative Literature—*Cr* 3. MR. WICKS
350. Independent Reading in Comparative Literature—*Cr* 3.

ECONOMICS (Ec)

PROFESSORS COUPE (Chairman), DEVINO, HUQ; ASSOCIATE PROFESSORS BURKE, CLARK*, DUCHESNEAU*, SAVAGE, TALLEY*; ASSISTANT PROFESSORS DOANE, LUTZ, WIHRY, WILSON; GRADUATE ASSISTANTS GAGNON, GHORY, KALISS, PETERS

The student majoring in economics in the College of Arts and Sciences must fulfill all the requirements of the College and also complete the following curriculum:

1. Core Requirements
   Ec 10 — Principles of Economics
   Ec 132 — Macroeconomics
   Ec 173 — Price Theory
   Ms 13/14 — Mathematics for Social Sciences
   Ms 19 — Principles of Statistical Inference

   Note: (a) It is strongly recommended that majors take Ec 132 and Ec 173 immediately after Ec 10.
   (b) A new course Ms 15/16, Statistics for the Social Sciences, will be implemented in 1971-1972 and will replace Ms 19 as the statistics requirement.
   (c) Ba 9, Principles of Accounting is recommended for majors.

2. Completion of at least 21 additional hours in economics (Ec) courses.

The maximum number of hours in economics courses counting for degree credit—42 hours. The maximum number of hours permitted for degree credit in any other discipline is 18 hours.

Courses in Economics

10. Principles of Economics—Analysis of the fundamental characteristics and institutions of modern economic society. Problems analyzed include: inflation, unemployment, poverty, resource allocation, international economic inter-relationships, economic growth and development. *Cr* 3. STAFF

21. Current Economic Problems—The application of economic reasoning to contemporary domestic and world problems. Problems and possible solutions are analyzed in terms of basic economic principles. Prerequisite: Ec 10. *Cr* 3. STAFF

132. Macroeconomics—An analysis of the basic forces that cause fluctuations in economic activity. The effects on employment, investment, and business firms are thoroughly treated. Stabilization proposals are examined and evaluated. Prerequisite: Ec 2 or Ec 10. *Cr* 3. MR. SAVAGE

133. Labor Economics—A discussion of labor in an industrial society; origins and structure of the labor movement; theories of the labor movement, wages and labor's income; the process of collective bargaining in industrial relations and the development of labor legislation and social security laws. Prerequisite: Ec 2 or Ec 10. *Cr* 3. MR. LUTZ

135. History of Economic Thought—A survey of the development of basic economic principles and theories from preindustrial times to the present. Major emphasis is on the Classical School (Smith, Ricardo, and Malthus) and its critics, the development of the Austrian School, the synthesis of Neo-Classicism, and the emergence of marcoeconomics. Prerequisite: Ec 2 or Ec 10. *Cr* 3. MR. HUQ

137. Comparative Economic Systems—The structures and operating principles of the major contemporary economic systems are examined and compared. Prerequisite: Ec 2 or Ec 10. *Cr* 3. MR. LUTZ

138. Economic Development—The theories and practices of interregional and international economic development. Special attention is given to development problems of emerging nations. Prerequisite: Ec 2 or Ec 10. *Cr* 3. MR. BURKE, MR. WILSON

139. International Trade and Commercial Policy—The principles and practices of international trade and finance are thoroughly treated. Special emphasis is given to current trends in the international economy and to United States commercial policy. Prerequisite: Ec 2 or Ec 10. *Cr* 3. MR. BURKE, MR. WILSON

145. Regional Economics—An analysis of a region (country, state, county, city, etc.) as an economic unit. The economics of location, agglomeration, and interregional trade will be studied. Emphasis will be placed upon introducing the student to empirical tools such as cost—benefit analysis, base studies, input-output tables, and regional accounts. Prerequisite: Ec 2 or Ec 10. *Cr* 3. Not offered 70-71.

153. Money and Banking—An examination of the American banking and financial system, a study of the monetary theory and policy, and a detailed study of selected subjects in money and banking. Prerequisite: Ec 2 or Ec 10. *Cr* 3. MR. SAVAGE

168. Social Control of Business—A study of the nature and structure of American industry with particular emphasis upon government regulation of competition and monopoly. Prerequisite: Ec 2 or Ec 10. *Cr* 3. MR. LUTZ

171. Public Finance and Fiscal Policy—Public expenditure theory; principles of taxation; the federal budget and alternative budget policies; federal tax policy; fiscal policy for stabilization; federal debt. Prerequisite: Ec 2 or Ec 10. *Cr* 3. MR. WIHRY

172. State and Local Government Finance—Development of the federal system; fiscal performance; intergovernmental fiscal relations; state and local revenue systems; budgetary practices; state and local debt. Prerequisite: Ec 2 or Ec 10. Cr 3. MR. WIHRY

173. Price Theory—The theory of consumer behavior, markets, the firm, and distribution are treated. Prerequisite: Ec 2 or Ec 10. *Cr* 3.
MR. HUQ, MR. DOANE

174. Economic Policy—Current economic problems on national and international levels. Prerequisite: Ec 173. *Cr* 3. MR. HUQ

175. Industrial Organization—Emphasis is on determining the relationship between market structure, conduct and performance. Also, the development of a general analytical framework to permit an assessment of performance in existing markets. Current public policy in this area is evaluated in the framework of the above analysis. Prerequisite: Ec 173. *Cr* 3. Not offered 70-71.

180. Introduction to Mathematical Economics—Mathematics is used as a language in presenting concepts of economic theory. Prerequisite: Ec 132, 173; Ms 6 or 12. *Cr* 3. MR. COUPE

Graduate Courses

210. Micro-economic Theory—*Cr* 3.

211. Macro-economic Theory—*Cr* 3.

212. 213. Economics Research Seminar—*Cr* 3.

215. Economics of Human Capital and Education—*Cr* 3.

220. Monetary Theory and Policy—*Cr* 3.

221. Public Finance and Fiscal Policy—*Cr* 3.

222. International Economic Theory and Policy—*Cr* 3.

223. Seminar in Labor Economics—*Cr* 3

225. Mathematical Economics—*Cr* 3.

229. Readings in Economics—*Cr* 3.

230. Econometrics—*Cr* 3.

235. Modern Economic Thought—*Cr* 3.

238. Economic Development—*Cr* 3.

275. Industrial Organization—*Cr* 3.

368. 369. Manpower Research Seminar—*Cr* 3.

399. Graduate Thesis—*Cr* 6.

ENGLISH (Eh)

PROFESSORS HUNTING (Chairman), BENNETT, HOLMES, MANLOVE, RANDEL, REYNOLDS, SPRAGUE, TERRELL, WENCE; ASSOCIATE PROFESSOR HERBOLD, ASSISTANT PROFESSORS ANDERSON, BAUSCHATZ, BROGUNIER, CARLSON, HATLEN, JAMES, LEMELIN, RICHARDS, WICKS, WILSON; INSTRUCTORS ADAMS, BAILEY, BISHOP, BUNKER, CHAPMAN, CSUPECZ, DULLEA, KENDA, MCCORMICK, RENAUD; GRADUATE ASSISTANTS COOK, DANIELSON, DONAHUE, ERICKSON, HAYNES, HOLLENBERG, KARLSRUHER, MCLEMORE, MILLS, OGIER, PROVENCHER, ROY, SERAFY, SPEARIN, THIBODEAU, TRACY, WAGNER, WENTWORTH, H. WILLIAMS, S. WILLIAMS

There are six requirements for a major in English:

(1) Eh 21. 22. 23. These courses should if possible be taken in the order listed, and the student should begin the sequence in the first semester of his sophomore year.

(2) Eh 7 or Eh 8. One of these courses should be taken in the sophomore year, if possible.

(3) Eh 43.

(4) Eh 157 or Eh 158.

(5) Eh 153 or Eh 164.

(6) A minimum of 36 hours credit in the Department of English.

Among electives, English majors are strongly urged to choose as many as possible of the following courses: History of England (Hy 155. 156); History of Philosophy (Pl 101, 102. 103. 104); Modern Grammars (Eh 121) or the History of the English Language (Eh 167); English Literature (Eh 24); American Literature (Eh 44).

There are somewhat different requirements for an English major who seeks a *Concentration in Creative Writing.* Specifically:

Eh 21. 22. 23.
Eh 43
Eh 157 or Eh 158
Eh 153 or Eh 164
Twelve credit hours from among:
Eh 8; Eh 77a, Eh 78a (poery); Eh 77b, Eh 78b (prose); Eh 101, Eh 102.

(Students who are not majors in English will be particularly interested in Eh1, 5, 6, 17, 9, CP 11, CP 12, Eh 46).

By the end of the first eight weeks of his final semester, the student is to submit as part of his work a book-length manuscript prepared as if for publication. Preparation and writing of this manuscript may be part or all of the student's work in Eh 101 or Eh 102.

Also: six additional hours in English.

Other courses strongly recommended: Pl 113; Sp 256, Sp 266; Eh 174, Eh 175; Cp 174, Cp 189, Cp 190; Hy 169, Hy 170; a course in the history of American art; and a course in intellectual history.

The department offers the Master of Arts degree in English, normally requiring 24 hours of course credits (12 of which must be numbered above 200;

no more than nine of which may be in the Continuing Education Division) and the writing of a satisfactory thesis.

The department cooperates with the College of Education in its M.A.T. (Master of Arts in Teaching) program.

Courses in Writing

1. College Composition—Intensive practice in expository writing, with reading of illustrative material. Required normally of freshmen. Elective in the College of Arts and Sciences and open to upper classmen as well as freshmen. *Cr* 3. MRS. CARLSON, Chairman

7. 8. Advanced Composition—A course for those who wish to develop greater skill in writing, either for their own pleasure or for professional use. *Not* a remedial course. First semester, the writing of formal and informal expository essays; second semester, descriptive and narrative writing. *Cr* 3.
MR. HOLMES, Chairman

17. Advanced Professional Exposition—Supervised practice in clear expository writing of formal reports, professional correspondence, and related materials. Open to students in any college, but not open to English majors in the College of Arts and Sciences. *Cr* 3. MRS. MCCORMICK, Chairman

77. 78. Creative Writing—An advanced course for students of demonstrated ability. Prerequisite: Eh 7 or 8 and permission of instructor. *Cr* 3.
MR. HOLMES, MR. KENDA

101. 102. Directed Writing—Writing in such forms as the novel, drama, short story, poetry, essay, or literary criticism. Individual projects for students with demonstrated ability in writing. Students must have consent of instructor before they register for this course. *Cr* 1, 2, or 3, dependent on amount of writing, agreed upon in advance with the instructor. MR. HOLMES

285. The Theory of Composition—*Cr* 3. MRS. CARLSON

Undergraduate Courses in Literature

5. Introduction to Poetry—A systematic progression through the various kinds of poetry (lyric, narrative, elegiac, occasional; the sonnet, the ode, the epic; etc.) and an examination of the techniques (rhythm, pattern, sound, tone, imagery, metaphor, allusion, for example) used by poets of note. *Cr* 3. MR. ANDERSEN, STAFF

6. Introduction to Fiction—A close reading of six or seven masterpieces of fiction (novel-length) and a selection from the great short stories of our time. *Cr* 3. MR. WICKS, STAFF

9. Modern Literature—Readings in significant literature of the last half-century. Freshmen only. *Cr* 3. MR. SPRAGUE, Chairman

15. 16. (See Cp 11. 12 which has replaced Eh 15. 16.)

21. 22. 23. 24. English Literature Survey—*Cr* 3. MR. WENCE, Chairman

21. English Literature from Beowulf to Spenser—*Cr* 3.

22. English Literature from Spenser to Johnson—*Cr* 3.

23. English Literature from Johnson to the Victorians—*Cr* 3.

24. English Literature from the PreRaphaelites to the Present—*Cr* 3.

25. Twentieth Century British Prose and Poetry—*Cr* 3.
MR. TERRELL, Chairman

43. 44. American Literature—Semester 1: American Literature from

Colonial times to the American Renaissance. Semester II: American Literature from the Rise of Realism to the present. *Cr* 3. MR. LEMELIN, Chairman

45. Twentieth Century American Literature—Cr 3.
MR. TERRELL, Chairman

46. Writers of Maine—The Maine scene and Maine people as presented by Sarah Orne Jewett, E. A. Robinson, Edna St. Vincent Millay, Mary Ellen Chase, R. P. T. Coffin, Kenneth Roberts, E. B. White, and others. *Cr* 2. MR. DULLEA

90. Topics in Literature—Seminars in the relationship between literature and other fields of study, or in special areas of language or of English and American literature not covered in regular academic courses. *Cr* 3. STAFF

Advanced Undergraduate Courses in Literature

(Graduate students are reminded that courses numbered 100 to 199 may be used for graduate credit only if prior approval has been given by the graduate student's advisory committee.)

153. Chaucer—Selections from *The Canterbury Tales* and the Minor Poems, stressing the reading of Chaucer's poetry, literary range and qualities, and picture of his times. *Cr* 3. MR. BENNETT

155. Spenser—A study of the major works of Edmund Spenser. Special attention given to *The Faerie Queene*. *Cr* 3. MR. HERBOLD, Chairman; MR. BAILEY

157. 158. Shakespeare—A survey of the comedies, history plays and tragedies. Comedies and histories in the first semester; tragedies in the second semester. *Cr* 3. MR. HERBOLD, Chairman; MR. BAILEY, MR. HATLEN

159. Elizabethan and Seventeenth-Century Lyric Poetry—Readings from Wyatt through Marvel, with special emphasis on Johnson and Donne. Cr 3.
MR. SPRAGUE

160. Seventeenth Century English Prose—Readings from Hooker through Bunyan, with special emphasis on the prose of Donne, Bacon, and Browne. *Cr* 3.
MR. SPRAGUE

161. 162. British Drama—Fall Semester: Shakespeare's contemporaries, with some attention to the drama before and after Shakespeare. Spring semester: a survey from the Restoration (1660) to 1900. *Cr* 3. MR. SPRAGUE

164. Milton—The poetry and prose with attention to the literary and historical background. *Cr* 3.

165. Dryden and the Literature of the Restoration Period—Major works in Restoration literature. *Cr* 3. MR. MANLOVE

166. Age of Swift and Pope—*Cr* 3. MR. HUNTING

168. Johnson and His Circle—A study of the major works of Samuel Johnson and his contemporaries: Boswell, Goldsmith, Gibbon, Reynolds, Burke, Garrick, Mrs. Thrale, and Fanny Burney. Some attention given to the beginnings of Romanticism. *Cr* 3. MR. MANLOVE

169. 170. Poetry of the Romantic Movement—The first semester: Wordsworth, Coleridge, and their contemporaries, against the background of their times. The second semester: Byron, Shelley, Keats, and their contemporaries. *Cr* 3.
MR. RICHARDS

171. Victorian Poetry—Browning, Tennyson, Arnold, the PreRaphaelites, and their contemporaries. *Cr* 3. MR. WILSON

172. The American Renaissance—The great authors of the United States in the mid-19th century—their works, personalities and social background. *Cr* 3.
MR. LEMELIN

174. 175. The American Novel—Semester I: the novel from Brown to James; semester II, from Crane to the present. *Cr* 3. MR. RANDEL

179. The American Short Story—Selected short stories from Hawthorne and Poe to the present. *Cr* 3. MRS. CARLSON

181. The Earlier English Novel—The principal novelists from the beginnings to Jane Austen. *Cr* 3. MR. HUNTING, MR. WENCE

182. The Later English Novel—The principal novelists from Scott to Hardy. *Cr* 3. MR. HUNTING, MR. WENCE

183. English Prose Stylists of the Nineteenth Century—Not including fiction. The major essayist from Lamb to Stevenson. Studies of content and literary style. *Cr* 3. MR. JAMES

190. Topics in English or American Literature—Not offered 1970-71. *Cr* 3. STAFF

199. Distinguished Lecturer Seminar—This course, like Eh 190, is intended to supplement, and allow occasional experiments within, the existing curriculum. Not offered 1970-71. Cr 3.

Graduate Courses in Literature

243. Old English—*Cr* 3. MR. BENNETT

244. Beowulf—*Cr* 3. MR. BENNETT

245. Studies in Middle English: I—*Cr* 3. MR. BAUSCHATZ, MR. BENNETT

246. Studies in Middle English: II—*Cr* 3. MR. BAUSCHATZ, MR. BENNETT

254. Pre-Shakespearean Drama—*Cr* 3. MR. HERBOLD, MR. SPRAGUE

255. Sixteenth Century Prose and Verse—*Cr* 3. MR. SPRAGUE

256. Special Studies in Shakespearean Tragedy—*Cr* 3. MR. HERBOLD

257. Special Studies in Shakespearean History Plays—Prerequisite: Eh 157.158 or its equivalent. *Cr* 3. MR. HERBOLD

258. Special Studies in Shakespearean Comedy—Prerequisite: Eh 157. 158 or its equivalent. *Cr* 3. MR. HERBOLD

259. Shakespeare's Contemporaries and Followers—*Cr* 3. MR. SPRAGUE, MR. HERBOLD

260. Restoration Drama—*Cr* 3. MR. SPRAGUE

270. The American Drama—*Cr* 3. MR. LEMELIN

271. Early American Literature—Offered on request. *Cr* 3. MR. LEMELIN

273. The Rise of Realism in America—*Cr* 3. MR. BROGUNIER

274. 275. Modern British and American Literature—*Cr* 3.

292. Literature of Maine and the Atlantic Provinces— *Cr* 3.

325. Bibliography and Methods of Research—Required of all graduate students in English. *Cr* 1. MR. SPRAGUE

343. Seminar in American Romanticism—*Cr* 3. MR. RANDEL

344. Seminar in American Realism—*Cr* 3. MR. RANDEL

350. Independent Reading—Prerequisite: 9 hours of graduate work. *Cr* 1, 2, or 3. STAFF

390. Seminar in the Literature of Medieval England—*Cr* 3. MR. BENNETT

391. Sixteenth Century Topics—*Cr* 3. MR. HERBOLD, MR. SPRAGUE

392. Seventeenth Century Topics—*Cr* 3. MR. SPRAGUE

393. Eighteenth Century Topics—*Cr* 3. MR. HUNTING, MR. MANLOVE

394. Nineteenth Century Topics—*Cr* 3. MR. LEMELIN, MR. RICHARDS

395. Twentieth Century Topics—*Cr* 3. MR. ANDERSEN, MR. TERRELL
399. Graduate Thesis—*Cr Ar.* THE STAFF

Courses in Linguistics and in the History of the English Language

121. Modern Grammars—Traditional, structural, and generative grammars, with particular implications for prospective teachers of English and others interested in the basic theories of grammar. Attention is given to problems of usage. *Cr* 3. MR. BAUSCHATZ, MR. BENNETT

167. History of the English Language—Main aspects of the development of Modern English from Old and Middle English; words and their backgrounds; changes in sound, form, and meaning. *Cr* 3. MR. BAUSCHATZ, MR. BENNETT

241. General Linguistics—*Cr* 3. MR. BAUSCHATZ, MR. BENNETT

250. Special Problems in Linguistics—Prerequisite: Eh 241 or its equivalent. *Cr* 3. MR. BENNETT

396. Seminar in Linguistics and Semantics—*Cr* 3. MR. BENNETT

Courses in the Teaching of English

184. Teaching English in the Secondary School—A discussion of principles and practices in the teaching of literature, language, and composition, with exercises in theme correction. *Cr* 3. MRS. CHAPMAN, MR HOLMES

185. Workshop for Secondary School Teachers of English—Lectures by staff and eminent specialists in reading, composition, language, and literature. Designed for experienced secondary school English teachers who want to enrich their backgrounds in their subject matter. Enrollment limited to 25 students. Course given in Summer Session only. *Cr* 3. MRS. CHAPMAN, MR. HOLMES

285. The Theory of Composition—*Cr* 3. MRS. CARLSON

384. Teaching College English—Required of all graduate assistants in English. *Cr* 1. MRS. CARLSON

FOREIGN LANGUAGES AND CLASSICS

PROFESSORS MOODY (Chairman), GROSS, MILES, O'NEILL, RIOUX, ROGGENBAUER, RUSSELL; ASSOCIATE PROFESSORS GUTMAN, W. R. LUSZCZYNSKI, REID, TATEM; LECTURER MRS. GROSS; ASSISTANT PROFESSORS BRIMMER, DAVID CARROLL, ROBERT CARROLL, DELPHENDAHL, FITZPATRICK*, GALBIS, HALL, HAYES, HERLAN, LOPEZ, MUÑOZ, MURRAY, PYLES, WALLACE*; INSTRUCTORS MR. DOCKERY, MISS FRENCH, MR. HATHAWAY, MR. KAHN, MRS. LUSZCZYNSKI, MR. MICHAUD, MRS. SINGERMAN, MR. SINGERMAN, MR. ZOLLITSCH; GRADUATE ASSISTANTS MR. CHABOT, MISS EISBERT, MISS GAVETT, MR. GILBERT, MISS HENDERSON, MR. IBARGUEN, MR. LABBE, MISS LANIGAN, MR. LIBERTSON, MISS MAHAN, MISS MOORE, MISS PAGE, MISS SNYDER

Students may major in the following subject fields: French, German, Spanish, Romance Languages, Modern Languages, Latin, and International Affairs, in accordance with the requirements listed below.

French, German, and Spanish—A minimum of 30 hours in the subject field is required beyond the intermediate level, at least 18 hours of which must be

* On leave of absence 1970-71

in literature courses in the 100 series, including 6 hours of the appropriate survey course (Fr 109.110, Gm 109.110, Sp 109.110). Students are also required to take Fr 7/8, Gm 7/8, or Sp 7/8, as appropriate. These should be taken in the junior year, or earlier if possible.

Romance Languages—Majors in Romance Languages are required to take at least 30 hours in literature and related courses in French and Spanish beyond the intermediate level, at least 24 hours of which must be in 100 series literature courses; 12 of these must be in survey courses (Fr 109.110, Sp 109.110) in the two languages. Students will also be required to take either Fr 7/8 or Sp 7/8.

Modern Languages—Majors in Modern Languages are required to take at least 30 hours in literature and related courses in German and Russian, or in one of the Romance Languages and German, or Russian, beyond the intermediate level, of which at least 24 hours must be in 100 series literature courses; 12 of these must be in survey courses in the languages chosen (Fr 109.110, Sp 109.110, Gm 109.110, Ru 9.10). Students will also be required to take either Fr 7/8, Gm 7/8, Sp 7/8, or Ru 7/8.

Latin—Students electing to major in Latin will be required to take 24 hours of the subject matter field beyond the intermediate level. Lt 47.48 should be taken in the junior year or earlier.

Comparative Literature—The department participates in an interdepartmental major in Comparative Literature. Interested students should see page 90 of this catalog.

International Affairs—Students electing to major in International Affairs with a foreign language emphasis should see page 120 of this catalog.

Study Abroad—Students majoring in a foreign language may spend a summer session, a semester, or an academic year at a foreign university as part of their major program. Consult the chairman of the department regarding these possibilities.

Hy 5/6 is required for students whose main concentration is French or German; Hy 5/6, or Hy 147.148 is required for Spanish majors; and Hy 101.102 for Latin majors. Hy 222 is also recommended for French majors.

Teacher Certification—Courses required or recommended for students planning to obtain certification for teaching French, are: Fr 7/8, Fr 9.10, Fr 57.58, Fr 99 or Fr 120, Fr 109.110, Fl 166, and four semesters of advanced literature courses. For teaching German, the following courses are recommended: Gm 7/8, Gm 57.58, Gm 109.110, Fl 166, and four semesters of advanced literature courses. For teaching Spanish, the following courses are recommended: Sp 7/8, Sp 9.10, Sp 57.58, Sp 109.110, Fl 166, and four semesters of advanced literature courses. To obtain certification for teaching Latin, Lt 9.10, Lt 47.48, Fl 166, plus 12 credit hours in advanced courses, are recommended.

Humanities Requirement—Two semesters' work in French, German, or Spanish literature, or Classical literature in translation may be taken to satisfy the humanities requirement.

Graduate Study—The department also offers work leading to the master's degree in French, Spanish, and German. See the Graduate School catalog, as well as the Summer Session catalog for special aspects involved when the degree is sought through attendance at summer sessions.

FOREIGN LANGUAGES (Fl)

166. The Teaching of Foreign Languages—Principles and practices of teaching foreign languages. Analysis of current trends and methods. Application of language-learning principles to classroom procedures. Theory and practice of language methodologies at different learning levels. For seniors seeking certification in foreign language teaching. *Cr* 3. MR. O'NEILL, MR. HALL

†***201. Introduction to General Linguistics***—Grammatical structure; phonology; morphology, and syntax. The course will include discussion of language families; linguistic history; language and culture. *Cr* 3. MR. GUTMAN

‡***221. 222. Seminar in Literary Research Methods***—Literary topics transcending national boundaries will be chosen to provide training in the methods and techniques of literary research for students of French, German, and Spanish literature. *Cr* 3. STAFF

FRENCH (Fr)

1-2. Elementary French—Development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no French or less than two years of high school French. *Cr* 3. STAFF

3/4. Intermediate French—For students who have completed Fr 1-2 or two or more years of high school French. Laboratory practice. Review of grammatical structures. Students will be assigned to this course, or to Fr 5/6, on the basis of their achievement in previous French courses or of their scores on a language proficiency test. Completion of this course fullfills the language generalization requirement. *Cr* 3. STAFF

5/6. Advanced Intermediate French—Should be elected in place of Fr. 3/4 by students who have achieved a high level of performance in Fr 1-2 or in equivalent high school French courses. Laboratory practice, grammatical review, free composition, readings. Completion of this course fulfills the language generalization requirement. *Cr* 3. STAFF

7/8. Practical French—Systematic training in correct pronunciation and usage, and in vocabulary building, with written and oral practice, phonetics and work in the laboratory. Prerequisite: Fr 4, Fr 6, or the equivalent. This course, which is required for majors, should be taken in the junior year or earlier, if possible. *Cr* 3. STAFF

9. 10. Oral French—Fluency, grammatical and idiomatic expression, and acceptable pronunciation are the main objectives of the course. The techniques used may include dialogues, skits, speeches, discussions, and other forms of practice. Prerequisite: Fr 7.8 or permission. With permission this course may be presented in lieu of Fr 7.8 to meet the requirements of the major. *Cr* 3. STAFF

11. 12. Readings in French Literature—For students who wish further practice in reading before beginning advanced literature courses. Discussion and analysis in French. Prerequisite: Fr 4, Fr 6, or equivalent. *Cr* 3.
MR. O'NEILL, MR. DOCKERY

57. 58. French Civilization—Readings, discussions, lectures, oral and written reports on varied aspects of France, its people, institutions, and culture to provide the background essential to an understanding of French literature, thought, and artistic expression. Open to students, including freshmen and sophomores, who have completed Fr 4, Fr 6, or the equivalent. *Cr* 3. STAFF

99. Applied French Linguistics—The French sound system, spoken grammar, basic concepts of descriptive linguistics. This course should be taken by students preparing for teacher certification. *Cr* 3. MR. GUTMAN

109. 110. Introduction to French Literature—A survey of the important works of French literature from the Middle Ages to the French Revolution. Prerequisite: Fr 4, Fr 6, or the equivalent. This course, which is required for majors in French, should be taken in the junior year or earlier, if possible. This course satisfies the humanities requirement of the College of Arts and Sciences. *Cr* 3. STAFF

120. French Phonetics—A formal study of the French sound system and an initiation into phonetic transcription with practical and remedial work in pronunciation. Prerequisite: Fr 4, Fr 6, or the equivalent. *Cr* 3. MR. GUTMAN

153. The French Novel Between the World Wars—Readings from Gide, Proust, Camus, and others. Prerequisite: Fr 110, or permission. *Cr* 3. MR. LUSZCZYNSKI

154. The French Novel from World War II to the Present—Contemporary trends in the novel; with some attention also to the short story. The post-war works of Camus, Sartre; the anti-novel, as well as the works of Claude Simon, Hervé Bazin, Pierre Gascar, and others. Prerequisite: Fr 110, or permission. Cr 3. MR. LUSZCZYNSKI

‡***156. The Twentieth Century French Theatre***—Representative plays of Claudel, Giraudoux, Anouilh, Montherlant, and including the "Theatre of the Absurd" of Genêt, Beckett, and Ionesco. Prerequisite: Fr 110, or permission. Cr 3.

167. Advanced French Grammar—Designed to provide an adequate foundation in French grammar and syntax for prospective teachers. *Cr* 3. MR. RIOUX

168. Advanced Composition and Stylistics—Designed to develop an adequate proficiency in written French. Prerequisite: Fr 167, or permission. *Cr* 3. MR. RIOUX

171. 172. French Literature of the Seventeenth Century—Literary trends in French classicism: Descartes, Pascal, Corneille, Racine, Molière, La Fontaine. Prerequisite: Fr 110, or permission. *Cr* 3. MRS. RUSSELL

173. 174. French Literature of the Eighteenth Century—Lectures and readings of the works of leading writers, including Voltaire, Montesquieu, Diderot, and Rousseau. Prerequisite: Fr 110, or permission. *Cr* 3. MR. MURRAY

175. French Romantic Prose and Poetry—Lectures, readings, and discussions of representative writers of the Romantic movement, from its 18th century origins to the middle of the 19th century. Prerequisite: Fr 110, or permission. *Cr* 3. MR. O'NEILL

‡***176. French Drama of the Nineteenth Century***—Lectures, readings, and discussions of representative dramatists of the last century. (Fall semester). Prerequisite: Fr 110, or permission. *Cr* 3.

177. 178. The Nineteenth Century French Novel—Representative novels of Balzac, Stendhal, Barbey d'Aurevilly, Flaubert, Maupassant, Zola, Villiers de l'Isle-Adam, Alain-Fournier and others, with some attention also to the short story. Prerequisite: Fr 110, or permission. *Cr* 3. MR. CARROLL

‡***179. The Age of Enlightenment***—Readings in English translation of the political, social, and philosophical writings of Montesquieu, Voltaire, Diderot, Rousseau, and other French writers of the 18th century. May be elected by juniors, seniors, and sophomores with permission. (This course may not be used to meet the requirements of a major or the M.A. degree in French.) *Cr* 3.

‡***181. French Literature of the Medieval Period***—Idealistic and popular developments, *La chanson de Roland*, theatre, the chroniclers, Villon. Prerequisite: Fr 110, or permission. *Cr* 3. MR. RIOUX

‡***183. 184. French Literature of the Renaissance***—Representative works by such important figures as Marot, Rabelais, Calvin, Du Bellay, Ronsard, d'Aubigné, Montaigne, Marguérite d'Angoulême. Prerequisite: Fr 110 or permission. *Cr* 3. MR. RIOUX

Graduate Courses

200. Advanced French Phonetics—*Cr* 3.
207. 208. Old French Language and Literature—*Cr* 3.
210. French Linguistics for Graduate Students—*Cr* 3.
291. 292. Individual Authors—*Cr* 3.
296. Seminar in French-Canadian Literature and Language—*Cr* 3.
297. 298. Projects in French—*Cr* 3.
310. Seminar in French Renaissance Literature—*Cr* 3.
320. Seminar in French Classicism—*Cr* 3.
330. Seminar in Literature of the Eighteenth Century—*Cr* 3.
340. Seminar in the Novel—*Cr* 3.
350. Seminar in Romanticism—*Cr* 3.
360. Seminar in Poetry—*Cr* 3.
370. Seminar in the Theatre—*Cr* 3.
399. Graduate Thesis—*Cr* 6.

GERMAN (Gm)

1-2. Elementary German—Emphasis on development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no German or less than two years of high school German. *Cr* 3. STAFF

3/4. Intermediate German—Continuation of 1-2. Laboratory practice. For students who have completed German 1-2 or have completed two or three

years of high school German. Completion of this course fulfills the language generalization requirement. *Cr* 3. STAFF

5/6. Advanced Intermediate German—Should be elected in place of Gm 3/4 by students who have achieved a high level of performance in Gm 1-2 or in equivalent high school courses. Laboratory practice. Completion of this course fulfills the language generalization requirement. *Cr* 3. STAFF

7/8. Practical German—Systematic training in correct pronunciation and usage, and in vocabulary building, with written and oral practice, and work in the laboratory. Prerequisite: Gm 4, Gm 6, or the equivalent. This course, which is required for majors in German, should be taken in the junior year or earlier, if possible. *Cr* 3. MR. ROGGENBAUER

13. Intermediate Scientific German—For students who have completed Gm 1-2 or have completed two or three years of high school German. Intended for students who wish to become acquainted with the techniques of translating scientific German. *Cr* 3. MR. ROGGENBAUER

14. Readings in Scientific German—Specialized reading for comprehension; individual projects and reports. Recommended as preparation for meeting graduate school language requirements. Cr 3. MR. ROGGENBAUER

16. German Play Production—Participation in reading, selection, acting and production of plays in the German language. Prerequisite: permission of the instructor. *Cr* 3. MR. HALL

†***57. 58. German Civilization***—Readings, discussions, lectures, and oral and written reports on Germany, its people, institutions and culture for the purpose of providing the background essential to an understanding of German literature, thought, and artistic expression. Open to students, including freshmen and sophomores, who have completed Gm 4, Gm 6, or the equivalent. *Cr* 3.

MR. ROGGENBAUER

109. 110. Introduction to German Literature—A survey of the important periods in German literature with readings of representative works. Prerequisite: Gm 4 or the equivalent. This course, which is required of students majoring in German, should be taken in the junior year or earlier if possible. This course satisfies the humanities requirement of the College of Arts and Sciences. *Cr* 3.

MR. HAYES

‡***151. Enlightenment and "Storm and Stress"***—A survey of representative works with lectures in German. *Cr* 3. MR. ROGGENBAUER

‡***152. The Romantic School***—A survey of representative authors; as well as selected works by Kleist. *Cr* 3. MR. ROGGENBAUER

†***155. Goethe***—Readings and discussion of works by Goethe, with primary emphasis on Faust. *Cr* 3. MR. MILES

†***156. Schiller***—Readings and discussion of works by Schiller, including *Wilhelm Tell* and *Maria Stuart*. *Cr* 3. MR. MILES

‡***157. 158. German Literature from 1832 to the Turn of the Century***—

Important literary figures and movements with particular attention to the drama and novelle. *Cr* 3. MR. MILES

†***159. 160. German Literature of the Twentieth Century***—Prose, poetry, and drama by representative writers. *Cr* 3. MR. ROGGENBAUER

‡***167. Advanced German Grammar and Composition***—Designed to provide an adequate foundation in German grammar, syntax, and composition for prospective teachers. *Cr* 3.

Graduate Courses

207. Middle High German—*Cr* 3.

208. Medieval German Literature—*Cr* 3.

212. The Age of Baroque—*Cr* 3.

290. Seminar in Literary Genres—*Cr* 3.

291. 292. Individual Authors—*Cr* 3.

297. 298. Projects in German—*Cr* 3.

399. Graduate Thesis—*Cr* 6.

GREEK (Gk)

‡***1-2. Elementary Greek***—Fundamentals of the Greek language. In the second semester, selections from Euripides' *Alcestis*. For students who have had little or no preparation in Greek. *Cr* 4. MR. TATEM

†***3/4. Intermediate Greek***—In the first semester, Plato's *Apology, Crito* and selections from the *Phaedo*. In the second semester, selected books from Homer's *Iliad*. *Cr* 3. MR. TATEM

ITALIAN (It)

‡***1-2. Elementary Italian***—Development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no Italian or less than two years of high school Italian. *Cr* 3. MISS LANIGAN

†***3/4. Intermediate Italian***—For students who have completed Italian 1-2 or two or more years of high school Italian. Laboratory practice. Review of grammatical structures. Completion of this course fulfills the language generalization requirement. *Cr* 3. MISS LANIGAN

LATIN (Lt)

1-2. Elementary Latin—Fundamentals of the Latin language. *Cr* 3. MRS. DELPHENDAHL

3/4. Intermediate Latin—Selected reading from masters of Latin prose and poetry. For students who have had Latin 1-2 or at least two years of high school Latin. Completion of this course fulfills the language generalization requirement. *Cr* 3. MRS. DELPHENDAHL

9. 10. Readings in Latin Literature—Selections from Latin prose and poetry with emphasis upon literary values. *Cr* 3. MR. TATEM

‡47. 48. Latin Prose Composition and Stylistics—Review of grammar and syntax, with particular attention to Cicero and Tacitus. The writing of prose, especially in the style of Cicero. This course, which is required for majors, should be taken in the junior year or earlier, if possible. *Cr* 3. MR. TATEM

151. Roman Comedy; Plautus and Terence—One play of each dramatist will be read. The sources of Roman comedy, its literary features, and influence upon later literature. Given every three years; offered in 1972-73. *Cr* 3. MR. TATEM

152. Roman Philosophical Thought—Selections from Lucretius, *De Rerum Natura*, and Cicero's philosophical essays. The three major philosophical schools: Academic, Stoic, Epicurean, and their influence on Roman thought. Given every three years; offered in 1972-73. *Cr* 3. MR. TATEM

153. Poetry of the Republic and Early Empire—The lyric poetry of Catullus. The *Odes* of Horace. The origin and development of satire, with selections from the satires of Horace and Juvenal. Given every three years; next offered in 1971-72. *Cr* 3. MR. TATEM

154. Prose of the Republic and Early Empire—Selections from Cicero's letters, Pliny's letters, and Tacitus' *Annals*. Given every three years; next offered in 1971-72. *Cr* 3. MR. TATEM

181. Virgil: The Eclogues, Georgics, Aeneid — The poet's background, achievement, and influence upon later literature. Given every three years; next offered in 1970-71. *Cr* 3. MR. TATEM

182. Survey of Latin Literature—A rapid survey from the Archaic Age to Medieval Latin. Lectures, discussions, reports, and assigned readings. Given every three years; next offered in 1970-71. *Cr* 3. MR. TATEM

197. 198. Projects in Latin—Individual work on a project of the student's selection. Prerequisite: permission of the department head. *Cr Ar.* (maximum: 3 hrs.) STAFF

RUSSIAN (Ru)

1-2. Elementary Russian — Development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no Russian or less than two years of high school Russian. *Cr* 3. MR. PYLES

3/4. Intermediate Russian—Continuation of 1-2. Laboratory practice. For students who have completed Russian 1-2, or have completed two or three years of high school Russian. Completion of this course fulfills the language generalization requirement. *Cr* 3. MR. PYLES

‡7/8. Practical Russian—Systematic training in correct pronunciation and usage, and in vocabulary building, with written and oral practice, and work in the laboratory. Prerequisite: Ru 4, or permission. Well qualified students who have not taken Ru 7 may with permission elect Ru 8. *Cr* 3. MR. PYLES

†***9. 10. Introduction to Russian Literature***—Russian 9 is a systematic presentation of selected works of the most important writers from Pushkin through Chekhov. Russian 10 is a systematic presentation of selected works of the most important writers from the Modernist Movement through the present. Prerequisite: Ru 4, or permission. *Cr* 3. MR. PYLES

SPANISH (Sp)

1-2. Elementary Spanish — Development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no Spanish or less than two years of high school Spanish. *Cr* 3. STAFF

3/4. Intermediate Spanish—Continuation of 1-2. Laboratory practice. For students who have completed Spanish 1-2 or who have completed two or three years of high school Spanish. Completion of this course fulfills the language generalization requirement. *Cr* 3. STAFF

5/6. Advanced Intermediate Spanish — Should be elected in place of Spanish 3/4 by students who have achieved a high level of performance in Spanish 1-2 or in equivalent high school Spanish courses. Laboratory practice. Completion of this course fulfills the language generalization requirement. *Cr* 3. MRS. GROSS

7/8. Practical Spanish—Systematic training in correct pronunciation and usage, and in vocabulary building, with written and oral practice, phonetics and work in the laboratory. Prerequisite: Sp 4, Sp 6, or equivalent. This course, which is required for majors, should be taken in the junior year or earlier, if possible. *Cr* 3. MRS. LUSZCZYNSKI

9. 10. Oral Spanish—Fluency, grammatical and idiomatic expression, and acceptable pronunciation are the main objectives of the course. Techniques used may include dialogues: skits, plays, speeches, discussions, and other forms of practice. Prerequisite: Sp 7.8 or permission. With permission this course may be presented in lieu of Sp 7. 8 to meet the requirements of the major. *Cr* 3. MRS. LUSZCZYNSKI

11. 12. Readings in Spanish Literature—For students who wish further practice in reading before beginning advanced literature courses. Discussion and analysis in Spanish. Prerequisite: Sp 4, Sp 6, or equivalent. *Cr* 3. MR. MUÑOZ

†***57. 58. Hispanic Civilization*** — Readings, discussions, lectures, oral and written reports on varied aspects of Hispanic civilization to provide the background needed for an intelligent understanding of Hispanic literature, thought, and artistic expression. Open to students, including freshmen and sophomores, who have completed Sp 4, Sp 6, or the equivalent. *Cr* 3. MR. LOPEZ MUÑOZ, MR. GALBIS

109. 110. Introduction to Spanish Literature—A survey of the important periods and trends in Spanish literature with reading of representative works. Prerequisite: Sp 4, or the equivalent. This course, which is required of students majoring in Spanish, should be taken in the junior year or earlier, if possible. This course satisfies the humanities requirement of the College of Arts and Sciences. *Cr* 3. MR. GALBIS

†*149. 150. Spanish Literature of the Eighteenth and Nineteenth Centuries*—Important examples of classicism, romanticism, regionalism, and realism will be studied. There will be special attention in the spring semester to such writers as Galdós and Benavente. *Cr* 3. MR. LÓPEZ MUÑOZ

‡*151. 152. Spanish Literature of the Twentieth Century*—Fall semester: The Generation of 1898. Spring semester: Tremendismo from the Civil War to the present. *Cr* 3. MR. LÓPEZ MUÑOZ

†*153. 154. The Modern Latin-American Novel*—Fall semester: From the late nineteenth century to World War II. Spring semester: The contemporary period with attention to the literary renaissance in Mexico, Argentina and Peru. *Cr* 3. MR. GROSS

‡*155. 156. Latin-American Literature from the Colonial Period to the Late Nineteenth Century*—A survey of the important trends, periods, and works. *Cr* 3. MRS. LUSZCZYNSKI

‡*167. Advanced Spanish Grammar and Composition*—Designed to provide an adequate foundation in Spanish grammar, syntax, and composition for prospective teachers. *Cr* 3. MR. GALBIS

Graduate Courses

207. 208. Old Spanish Language and Literature—*Cr* 3.

259. 260. Cervantes and the Writers of the Golden Age—*Cr* 3.

291. 292. Individual Authors—*Cr* 3.

297. 298. Projects in Spanish—*Cr* 3.

399. Graduate Thesis—*Cr* 6.

CLASSICS (Cl)

1. 2. Greek and Latin Literature in English Translation — The first semester is devoted to Greek literature; the second semester to Latin literature. No knowledge of either language is necessary. This course satisfies the humanities requirement of the College of Arts and Sciences. *Cr* 3. MR. TATEM

GEOLOGICAL SCIENCES (Gy)

PROFESSORS OSBERG (Chairman), BORNS; ASSOCIATE PROFESSORS DENTON, HALL, HOWD; ASSISTANT PROFESSORS FINK, MYER, NORTON, SCHNITKER

The geological sciences are concerned with the physical and chemical characteristics of minerals and rocks, with their occurrence, arrangement, and surface expression, and with the history of the earth and its organic inhabitants. The curriculum provides for a basic understanding of the geological sciences and is sufficiently flexible to allow students with interests in geochemistry, geophysics, paleontology, and oceanography to pursue additional courses in appropriate ancillary sciences.

A geology major is prepared to enter directly into industry or survey work, or to enter graduate school in geology. In addition, if Zo 3/4, Ch 151/152, and Ch 161/162 are taken the requirements for medical or dental school, or programs in medical technology are fulfilled.

The requirements for the major include: Gy 111; Gy 113; Gy 114; Gy 116; Gy 118; Gy 155; Gy 157; Gy 158; Ch 13-14; Ps 1a/2a; Ms 12; Ms 19; Ms 27; Ms 28 and Ms 169.

The specimen curriculum is somewhat flexible and may be altered for individuals with previous geological training. Special interdisciplinary programs may be arranged after consultation with the departmental undergraduate advisor.

GEOLOGY SPECIMEN CURRICULUM

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	1	English Composition or Eh 9, Modern Literature	3	Eh	1	Freshman Composition or Eh 10, Modern Literature	3
Ch	13	Chemical Principles	4	Ms	4	Algebra and Trigonometry	3
		Language	4	Ch	14	Chemical Principles	4
		Social Science	3			Language	4
Sh	1	Speech	3			Social Science	3
			17				15

Sophomore Year

			Hours				Hours
Ms	19	Prin. of Statistical Inference	3	Ms	12	Analytical Geom. & Calculus	4
Gy	111	Field Geology I	3	Gy	116	Social Science	3
		Language	3	Gy	114	Mineralogy	4
		Social Science	3	Ms	169	Computer Programming	3
		Humanities	3			Language	3
			15				17

Junior Year

			Hours				Hours
Ms	27	Analytical Geom. & Calculus	4	Ms	28	Analytical Geom. & Calculus	4
Ps	1a	General Physics	4	Ps	2a	General Physics	4
Gy	113	Field Geology II	3	Gy	118	Field Geology III	3
Gy	155	Instrumental Methods in Determinative Mineralogy	4	Gy	116	Invertebrate Paleontology	3
				*Gy	160	Seminar	2
			15				16

Senior Year

		Hours			Hours
Gy 157	Thermodynamic Basis of Mineral Associations	4	Gy 158	Petrology of Metamorphic & Igneous Rocks	5
	Humanities	3	*Gy 160	Seminar	2
	Electives	8		Electives	8
		15			15

* Offered in alternate years.

Courses for Undergraduate Students

1 (1a). Aspects of the Natural Environment—A study of earth materials and processes including: the structure of matter, the formation of igneous rocks, radioactive age-dating, chemical and mechanical destruction of rocks, formation of sedimentary rocks, evolution of mountain belts, and the formation of metamorphic rocks. Laboratory work includes a consideration of earth materials in preparation for two compulsory one-day weekend field trips. Gy 1: *Lec* 3, *Lab and field trips, Cr* 4; Gy 1A: *Lec* 3, *Cr* 3.

2 (2a). Aspects of the Natural Environment—An examination of the structure and composition of the interior of the earth, mountain building processes; the origin and use of paleomagnetic data in the continental drift question; the origin and evolution of the atmosphere, the hydrosphere, and life; mechanisms and patterns of biological evolution. The course ends with a survey of man's place in and utilization of his environment. Laboratory work includes preparation for one compulsory two-day field trip in May. Prerequisite: Gy 1-1a. Gy 2: *Lec* 3, *Lab and field trip, Cr* 4; Gy 2a: *Lec* 3, *Cr* 3.

6. Geology for Engineers—A study of geology as related to civil engineering practice. *Rec* 2, *Lab* 3, *Cr* 3.

21. 22. Geologic Problems—The study of and report upon some original investigation. Time to be arranged. Prerequisite: consent of instructor. Cr 1 and 2. May be taken more than once.

Courses Primarily for Undergraduate Students but Open to Graduate Students

111. Field Geology I—An introduction in the field to basic observations, concepts and techniques of stratigraphy and simple structural geology. Use of the Brunton compass and plane table and alidade. Three one-day field trips, three weekend field trips. Prerequisite: consent of instructor. *Rec* 2, *Lab* 4, *Cr* 3.

113. Field Geology II—Field methods of structural and stratigraphic analysis and synthesis of rocks having undergone multiple deformation. Use of the Schmidt net in mapping and solving structural problems. Four weekend and one afternoon field projects. Prerequisite: Gy 111 and consent of instructor. *Rec* 2, *Lab* 4, *Cr* 3.

114. Mineralogy—An introduction to crystallography and the crystal chemistry of minerals. Identification of the common minerals by their physical properties. Prerequisite: Ch 13/14 and consent of instructor. *Rec* 3, *Lab* 3, *Cr* 4.

116. Invertebrate Paleontology—Classification and evaluation of the major phyla of fossil invertebrates and their use in stratigraphic interpretation. Prerequisite: consent of instructor. *Lec* 2, *Lab* 2, *Cr* 3.

118. Field Geology III—Introduction to geologic mapping, including an introduction to photogeology and altimetry. Completion of a mapping project and preparation of a report. Prerequisite: Gy 113 and consent of instructor. *Rec* 1, *Lab* 5, *Cr* 3.

†***140. Seminar in Quaternary Studies***—A multidisciplinary seminar concerned with selected areas of study, physical, biological and anthropological, related to the Quaternary Period. Subject areas will vary each semester; may be taken more than once for credit. Course same as Ay, S, Zo 140. Prerequisite: consent of instructor. *Rec* 2, *Cr* 2. MR. DENTON, STAFF, MR. LOTSE, MR. DEARBORN

155. Instrumental Methods in Determinative Mineralogy—Elementary theory and practice in the use of the polarizing microscope, the x-ray diffractometer, the electron probe microanalyzer, the colorimeter, the atomic absorption spectrophotometer and methods of density measurement in mineralogy. Prerequisite: Gy 114. *Lec* 2, *Lab* 8, *Cr* 5.

157. Thermodynamic Basis of Mineral Associations—Thermodynamic study of heterogeneous systems with particular attention to open systems. Relationships between chemical composition, mineralogical content, and external parameters in rocks. Prerequisite: Gy 114, Ms 28. *Lec* 3, *Rec* 1, *Cr* 4.

158. Petrology of Igneous and Metamorphic Rocks—Mode of occurrence and characteristics of igneous and metamorphic rocks with an intensive investigation of the important phase relationships attributable to them. Laboratory problems involve work with the polarizing microscope and instrumental chemical analysis. Three one-day field trips. Prerequisite: Gy 155, Gy 157 and Ms 19. *Lec* 2, *Lab* 8, *Cr* 5.

‡***160. Seminar in Geology***—Preparation and presentation of reports covering geological topics of interest. *Rec* 2, *Cr* 2.

Courses Primarily for Graduate Students but Open to Undergraduate Students

212. X-ray Analysis in Mineralogy—*Lec* 3, *Lab* 3, *Cr* 4.

218. Low Temperature-Pressure Geochemistry—*Lec* 3, *Cr* 3.

221. Sedimentology—*Lec* 2, *Lab* 3, *Cr* 3.

226. Micropaleontology—*Lec* 3, *Lab* 2, *Cr* 4. (offered 1970 and every other year)

241. Glacial Geology—*Lec* 2, *Lab* 2, *Cr* 3.

242. Quaternary Environments and Climatic Change—*Lec* 2, *Lab* 2, *Cr* 3.

257. Genesis of Ore Deposits—*Lec* 3, *Lab* 3, *Cr* 4.

258. Ore Deposits Exploration—*Lec* 3, *Cr* 3.

‡***260. Marine Geology***—*Lec* 3, *Cr* 3.

†***264. Structure and Teconics of the Seafloor***—*Lec* 3, *Cr* 3.

† Offered alternate years—offered 1971

‡ Offered alternate years—offered 1972

Courses for Graduate Students Only

301. Directed Study in Geology

399. Graduate Thesis

HISTORY (Hy)

PROFESSORS ALBION, JEFFREY, A. M. JOHNSON, W. H. PEASE, SEAGER, STEWART, TRAFFORD (Acting Chairman); ASSOCIATE PROFESSORS BANKS, DOTY, HAKOLA, REYNOLDS, SMITH; ASSISTANT PROFESSORS BAKER, BATTICK, BEITZELL, BLANKE, CASEY, MCANDREW, NADELHAFT, J. H. PEASE, ROBERTSON, SCHRIVER; INSTRUCTOR MORGAN; GRADUATE ASSISTANTS ALLIN, CASS, CHURCHILL, IRELAND, L. JOHNSON, KELLY, LAWRENCE, MAHLMAN, METZ, MOORE, MORRISON, MUNDY, NOBLE, PHILIE, SIMANO, TAMMARO

The history major must complete Hy 3.4, Hy 5.6, and at least 24 hours of advanced history courses approved by his adviser.

So that the major will receive an adequate background in related disciplines, he must also take a minimum of 12 hours work in two of the following areas: (1) Political Science; (2) Economics; (3) Sociology, Psychology, or Anthropology; (4) Philosophy; (5) English, Foreign Literature, or Classics; (6) Art or Music. Introductory courses in these fields will count toward the satisfaction of the 12-hour minimum requirements.

Superior majors are strongly advised to take in addition at least one 200-level history course in each semester of their senior year. Other majors may be admitted to these 200-level courses by special permission.

The department offers the M.A. degree in history, with specialities in most areas of history. The Ph.D. degree is offered in United States history, Canadian-American Studies; and in the history of Great Britain and the Commonwealth. Within these fields, special emphasis may be placed on military and maritime history. Further details may be found in the Graduate School Bulletin.

1. 2. Classical and Medieval Civilization—The social and cultural development of the ancient Greeks and Romans is treated in the first semester. The second semester deals with the social and cultural development of Western Europe in the Middle Ages. Particular attention is given to the great achievements in literature, philosophy, religion, and art. This course satisfies the humanities requirement of the College of Arts and Sciences. *Cr* 3. MR. ROBERTSON

3. 4. United States History—From 1789 to recent years. The development of democracy, growth of the West, slavery and sectionalism, the Civil War, Reconstruction, the making of modern America, industrialization, imperialism, and other topics. *Cr* 3. MR. HAKOLA, CHAIRMAN

5. 6. History of Western Europe—Europe and its civilization from the decline of the Roman Empire to the present. The emphasis is upon the development of those political, economic, and social institutions which help to explain our present-day civilization. *Cr* 3. MR. TRAFFORD, CHAIRMAN

7. 8. Asian Civilization—A survey of the highlights of Asia's civilization from the ancient period to the present. The backgrounds of the present-day civilizations of India, China, Korea, and Japan will be considered. *Cr* 3.

MR. CASEY

10. History of Maine—A survey of Maine's social, economic, and political life, from primitive times to the present. After a brief study of Indian life preceding white settlement, the periods of colonial, provincial, and state history are covered. *Cr* 3. MR. SCHRIVER

101. 102. Ancient History—The political, social, and economic history of the civilizations of the ancient Mediterranean world. Egypt, the Near East, and Greece will be studied in the first semester; Rome will be covered in the second semester. *Cr* 3. MR. ROBERTSON

103. 104. The Middle Ages—Europe from late antiquity through the Renaissance. Special emphasis will be placed on the Carolingian Empire, the origin, development and structure of feudalism, the medieval church and state, medieval theology and philosophy, and the coming of the Renaissance. Prerequisite: Hy 5 or permission. *Cr* 3. MR. ROBERTSON

107. The Renaissance and Reformation—The political, social, economic and cultural achievements of Europe in the period 1300-1650. The Protestant revolt, the Catholic reform, and the wars of religion will be evaluated. Prerequisite: Hy 5.6 or permission. *Cr* 3. MR. BATTICK

108. Europe in the 17th Century—The major political and intellectual developments of the period will be emphasized. The special histories of each European state will be subordinated to the general problems of state-building, the growth of capitalism and political absolutism, and the diplomacy and wars of Europe as a whole. Prerequisite: Hy 5.6 or permission. *Cr* 3. MR. BATTICK

109. Europe in the 18th Century—The history of the Continent from 1715 through the Congress of Vienna with emphasis on the Enlightenment, the Enlightened Despots and the origins of the French Revolution. The impact and spread of French revolutionary thought throughout Europe, and the influence of the personality and military campaigns of Napoleon on the Continent will be treated. Prerequisite: Hy 5.6 or permission. *Cr* 3. MR. BEITZELL

110. Europe in the 19th Century—The history of the Continent from 1815 through the Franco-Prussian war. Liberalism and nationalism, reaction and revolution, socialism and imperialism will be considered. The impact of the unification of Germany and Italy on the politics and diplomacy of the Continent will also be covered. Prerequisite: Hy 5.6 or permission. *Cr* 3.

MR. BEITZELL, MR. DOTY

111. 112. Europe Since 1870—The effect of industrialization, the emergence of the masses, the rise and fall of colonial empire and the impact of two world wars will be considered. Irrationalist philosophies on the creation of fascism and communism, the recasting of democracy, the development of the European state system and the economic integration of the continent will also be treated. Prerequisite: Hy 5.6 or permission. *Cr* 3. MR. DOTY, MR. BLANKE

123. 124. History of Russia—Russian history from the earliest times to the present. The first semester of the course will treat the political, social, economic and intellectual development of Tsarist Russia to the end of the Crimean War. Late 19th century Russia, the decay of the Tsardom, the Bolshevik Revolution, and the subsequent internal development and expansion of the Soviet Union will

occupy the attention of the second semester. Prerequisite: Hy 5.6 or permission. *Cr* 3. To alternate with Hy 125.126. MR. BLANKE

125. 126. History of Modern Germany—The decline of the Holy Roman Empire, the rise of Prussia, the Napoleonic impact, and the period to 1848 will be covered in the first semester; the second semester will deal with the unification of Germany, the Weimar and National Socialist periods, and the Federal Republic. Stress will be placed upon political, social, economic and intellectual developments. Prerequisite: Hy 6 or permission. *Cr* 3. MR. BLANKE

135. 136. History of China—The fall semester will be concerned with the history and culture of the Chinese people from earliest times to the 19th century. The spring semester will treat the Western penetration of China, the coming of the missionaries and the gunboats, the impact of Western ideas, and the resulting nationalist and revolutionary movements. Prerequisite: Hy 7.8 or six hours of history, or permission. *Cr* 3. MR. CASEY

137. History of Modern Japan—The history of Japan during the past century with major focus on the Western penetration, the influence of Western ideas on traditional Japanese culture, the emergence of the modern Japanese industrial state, and the rise and defeat of the Japanese empire. Prerequisite: Hy 7.8 or six hours of history, or permission. *Cr* 3. MR. CASEY

138. Problems of Southeast Asia—An analysis of European imperialist rivalries in the area together with a consideration of the special problems of the new nations recently emerged from colonialism. The background of the French and the American presence in Vietnam will also be treated. Prerequisite: Hy 7.8 or six hours of history, or permission. *Cr* 3. MR. CASEY

139. 140. History of South Asia—A survey history of the Indian sub-continent since 1500 with emphasis on the rise of the Mughal dynasty, Anglo-French rivalries in India and the expansion of British influence. The second semester will treat the period of Crown Rule, the emergence of Indian nationalism, the role of Ghandi, and the problems of Muslin separatism. Prerequisite: Hy 7.8 or six hours of history, or permission. *Cr* 3. MR. CASEY

147. 148. Hispanic America—The Spanish and Portuguese colonial empires in America from their establishment to their achievement of independence in the early 19th century. The second semester will mainly concern the national period of Hispanic America and an analysis of the contemporary problems and tensions of the area. Prerequisite: No freshmen. *Cr* 3. MR. JEFFREY

149. Argentina, Brazil, and Chile — A history of the major countries of South America from their independence in 1823 to the present with primary emphasis on their social structures, political developments, and international relations. Prerequisite: Hy 148 or permission. *Cr* 3. MR. JEFFREY

150. Mexico—A history of Mexico from early times to the present. Emphasis will be placed on the social and political structure of Mexico, the Mexican wars of independence, and the revolutionary movements of the 20th century. Prerequisite: Hy 148 or permission. *Cr* 3. MR. JEFFREY

152. Problems of Latin America—An analysis and evaluation of contemporary Latin American problems. The internal tensions and international relations of the several countries will be considered, together with the rise, spread and development of Castroism in the area. Prerequisite: six hours of history or permission. *Cr* 3. MR. JEFFREY

155. 156. History of England—A general survey of the political, social,

economic and constitutional aspects of English history. Special attention will center on trial by jury, the evolution of Parliament, the Protestant revolt, the commercial and industrial revolutions, and the growth of political and economic democracy. Prerequisite: Hy 5. 6 or six hours of history. *Cr* 3.

MR. BAKER, MR. TRAFFORD

159. 160. History of Canada—Canada's history from the earliest settlements in New France to the present. Emphasis will center on the evolution of Canada within the British Empire-Commonwealth, relations with the United States, and on the background of contemporary constitutional, economic and cultural problems. Prerequisite: Hy 3. 4 or Hy 5. 6, or sophomore standing, or permission. *Cr* 3. MISS STEWART, MR. MCANDREW

161. American Colonial History to 1740—English colonial policy and the founding of the British colonies in America. The political, social and economic development of the American colonies in the 17th and early 18th centuries will be considered, as will the remote causes of the American Revolution. Prerequisite: Hy 3 or permission. *Cr* 3. MR. NADELHAFT

162. Revolution and Confederation, 1740-1789—A study of the origins of the American Revolution. The Revolutionary War will be evaluated with special attention to the attendant internal social and political revolution. Emphasis will also be given the problems of the Confederaton period, the diplomacy of the new nation, and the background and events of the Constitutional Convention. Prerequisite: Hy 3 or permission. *Cr* 3. MR. NADELHAFT

165. Hamilton and Jefferson, 1789-1824—An analysis of the social and economic problems of the new nation with special attention to the Hamilton-Jefferson intellectual dichotomy, the foreign policy and constitutional development of the infant United States, and the emergence of political parties. The initial territorial and commercial expansion of the nation will also be considered. Prerequisite: Hy 3 or permission. MR. PEASE

166. The Age of Jackson, 1824-1850—A consideration of American political, cultural, social and economic development in the first half of the 19th century. Specific topics will include the controversies surrounding Jacksonian democracy, the Bank of the United States, internal improvements, the tariff, "Manifest Destiny," and the sectional-slavery issue. Prerequisite: Hy 3 or permission. *Cr* 3.

MR. PEASE

167. Civil War and Reconstruction, 1850-1877—The period of national disruption and reunification with emphasis on the collapse and reconstruction of America's political, constitutional and social fabric, the acceleration of economic change, the emergence of the new industrialism, and the development of the new sectionalism. Prerequisite: Hy 4 or permission. *Cr* 3. MRS. PEASE

168. The Gilded Age and Progressive Era, 1877-1914—The industrialization and transformation of the United States from a predominantly rural to a predominantly urban society. Emphasis will be given such topics as population movements, business and financial enterprise, labor organizations, religious and reform protests, imperialism, racism, populism, progressivism, and intellectual and social change. Prerequisite: Hy 4 or permission. *Cr* 3. MRS. PEASE

169. Early 20th Century America, 1914-1938—The Wilson era of reform and intervention in World War I, the return to isolation, the age of business in prosperity and depression, and the New Deal period of Franklin D. Roosevelt. Also

stressed will be the changes in American politics, economics, organized labor, the judiciary, and the arts. Prerequisite: Hy 4 or permission. *Cr* 3.

MR. SMITH, MR. REYNOLDS

170. America Since 1938—The rise of contemporary American society will be examined through the coming of World War II, the Cold War and the nuclear age, the emergence of the affluent society and the concurrent civil rights and student movements. Special attention will be paid the problems of increased federal centralization, the reform governments of the 1960's, the appearance of the military-industrial-aerospace complex, and resulting social reactions. Prerequisite: Hy 4 or permission. MR. SMITH, MR. REYNOLDS

171. 172. Economic History of the United States—A survey of American economic history with special attention to such areas as early patterns of trade and commerce, the American industrial revolution, the expansion of the railroads and other common carriers, the growth of heavy industry, changing concepts of business enterprise, the centralization of finance capital, and the adjustment of the United States to the world market. Prerequisite: Hy 3. 4 or permission. *Cr* 3.

MR. HAKOLA, MR. JOHNSON

173. 174. American Diplomatic History—American diplomatic history from the revolution to the present, with emphasis on the formation and application of America's major foreign policies. To alternate with Hy 273. 274. Prerequisite: Hy 3. 4 or permission. *Cr* 3. MR. SEAGER

175. The Negro in American History—The contribution of the Negro in the making of American history. The development of the slave trade, slavery as a system and its abolition, the decline of the rural South, and the growth of the urban ghettos will be discussed. Such special topics as the contributions of black people to the cultural life of the nation will also be treated. Prerequisite: Hy 3. 4. *Cr* 3.

MRS. PEASE

180. Naval History—The influence of sea power on history with major emphasis on the Anglo-American naval tradition since 1950. Naval strategy, tactics, operations and administration will be evaluated during the period of naval growth (1775-1900) and the subsequent era of the battleship and the fast carrier attack force. Anglo-American naval operations in World War I, World War II, Korean and Vietnam will be specially considered. Prerequisite: Hy 3.4 or permission. *Cr* 3. MR. REYNOLDS, MR. SEAGER

183. Maritime History—Ships and trade from colonial days to the present. Emphasis will be placed on famous ships and shipbuilders, the evolution of ships from sail and wood to steam and steel, the effect of the Civil War and two world wars on the American merchant marine, and the relationship between the United States Navy and the merchant service. Prerequisite: Hy 3.4 or permission. *Cr* 3. MR. ALBION

199. Contemporary Problems in History—An analysis in depth of a selected controversial and contemporary historical problem. The topic to be studied and the method of approaching it will be chosen jointly by interested students and the staff. Prerequisite: permission. *Cr* 3. MR. DOTY AND STAFF

213. Expansion of Europe—Studies of the overseas expansion of Europe from 1450 to 1815. Areas for investigation will include the age of exploration, the foundation of colonial empires, the economic and political ramifications of colonial expansion within and among European states, and the impact of expansion upon non-European peoples. Lectures, readings, class reports, and re-

search papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. ALBION, MR. BATTICK

217. Early Modern England—A consideration and analysis of selected problems, ideas, and institutions of the Tudor-Stuart period of British history. Topics of study will be drawn from such general areas as the growth of parliamentary power, political theory, colonial policy, maritime and naval developments, social and economic changes, and foreign affairs. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. BATTICK

219. Modern England—An evaluation of selected problems in English history since 1815. Among the areas to be treated are the gradual democratization of the British government, the continuing industrial revolution, and the impact of two world wars on English social, cultural and political life. Lectures, readings, class reports, research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. BAKER

220. The British Empire and Commonwealth Since 1815—Studies in selected problems of British imperial expansion. Areas of investigation will include changing theories of imperial administration, the transplantation of British institutions and culture to the empire, and the conversion of the empire to the Commonwealth. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MISS STEWART, MR. MCANDREW

221. Canadian External Relations—Selected topics in Canadian foreign policy emphasizing relations with the United States. Canada's developing interrelations with other nations, including those of the Commonwealth, will also be studied. Lectures, readings, class reports, and research papers. Prerequisite: Hy 159. 160 or permission. *Cr* 3. MR. MCANDREW

222. Modern France—An evaluation of selected topics in French history from the Bourbon Restoration to the present. Internal political challenges from the Left and the Right in the failure of three monarchies and three republics, the rise and decline of the French empire, economic growth and lag, and French leadership of intellectual movements from Romanticism to Existentialism will be among the subjects investigated. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. DOTY

223. 224. Central European History—An analysis of selected topics in German, Habsburg and Polish history. The first semester will treat various economic, intellectual, political and social movements in the 1648-1848 period. The second semester will be concerned with some of the problems of nationalism, imperialism, revolution and war since 1848 with particular attention to Germany, Poland and the successor states. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. BLANKE

225. Modern Germany—A consideration of selected aspects of German history since Unification. The emergence of Germany as a great power, the German defeat in two world wars, the problems of the Weimar Republic, the rise and fall of Adolph Hitler and National Socialism, and the recovery of West Germany after World War II will be areas of interest and concentration. Lectures,

readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. BLANKE

226. European Social and Intellectual History—An examination of selected topics in the social, intellectual, literary, and cultural development of Europe since the seventeenth century. Particular attention will be paid to the changing views of European intellectuals toward man, his political organization, property relationships and religion. Lectures, readings, class reports, and research papers. Prerequisite: graduate students: senior history majors and others by permission. *Cr* 3. MR. DOTY

229. 230. Economic History of Europe—An evaluation of selected aspects of the European agricultural revolution, feudalism, the rise of towns and guilds, mercantilism, capitalism, and industrialism. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. HAKOLA

233. 234. European Diplomatic History—Specialized studies in the diplomatic history of modern Europe emphasizing the foreign policies of selected major powers and the changing concepts of international relations. The relationship of national power and military power to foreign policy formulation will also be stressed. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. BEITZELL

History 237: Political Science 237. The Evolution and Development of Canadian Government and Politics—An examination of the theoretical structure and the historical development of government and politics in Canada. Prerequisite: Pol. Sci. 135, or History 160, or by permission. *Cr* 3.

MR. MCANDREW AND MR. HORAN

240. Social and Intellectual History of South Asia—An examination of political, cultural, philosophical, and literary developments in India and Pakistan in the 19th and 20th centuries. Special attention will be given to such subjects as the impact of the British presence on Indian society, theories of nationalism, the literary influence of Tagore, and the influence of Gandhian philosophy in India and the West. Prerequisite: Hy 7. 8, or 139. 140, or by permission. *Cr* 3. MR. CASEY

251. Latin America and the United States—Studies in United States participation and intervention in Latin American affairs from the early 19th century to the Bay of Pigs. Special attention will focus on the development of the Monroe Doctrine, the evolution of the Good Neighbor policy, and the American response to contemporary Latin American revolutionary movements. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. JEFFREY

260. Agricultural History of the United States—An analysis of rural life in America. Selected studies in agricultural techniques, inventions, capitalization, and the rise of agriculture as a business will be undertaken. The relationship of government and agriculture will also be treated. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. SMITH

261. Urban History of the United States—An evaluation of special topics in the rise of the city in America and the development of urban patterns of life. Attention will focus on such subjects as the population shift to the cities, the development of slums and ghettos, the growth of municipal institutions and

services, and the relationship of government with city dwellers. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. SMITH

270. Government-Business Relations in American History—Case studies in such problems as the adoption of a central banking system, federal regulation of railroads, antitrust policy, and the federal government as entrepreneur and as manager of the economy with particular emphasis on the Progressive Era and the New Deal. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. JOHNSON

273. 274. American Diplomatic History—Studies in special aspects of American foreign policy since 1775. Emphasis will center on America's roads to war and peace, the problems of maritime neutral rights, territorial and commercial expansion, and the role of military and naval power in foreign policy formulation and execution. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. SEAGER

275. 276. Social and Intellectual History of the United States—A consideration and evaluation of some of the major ideas in American intellectual and cultural history, including such topics as transcendentalism, pragmatism, mission, progress, and revolution. Particular analysis will be given to the interrelationships between ideas and their social environment. Readings, lectures, reports, research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. PEASE

277/278. War and Society—Special studies in the impact of war on civilization. Emphasis will center on such topics as the philosophy and psychology of war, as well as on the causes, consequences, preparation, and prosecution of war. The techniques of land, sea and air warfare, the relationship of science and technology to war, the literature of war, and the problems of averting war will also be treated. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. REYNOLDS

281. History of the West—A selective analysis of the factors involved in the movement of population westward. Special subjects of study will include the evolution of agricultural and pioneering techniques, the formation and migration of capital on the several frontiers, frontier life and culture, and the influences of territorial and agricultural expansion on American history. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. HAKOLA

285. New England History—Studies in the region as a distinct and unique section of the country. Particular attention will be paid to such transitional movements as the decline and shift in agriculture, lumbering and fishing, the growth of industries, population movement, and the impact of those changes on the political, social and economic structure of the region. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. SCHRIVER

286. The South, Old and New, 1820-1900—Studies in selected aspects of the economic, political, and cultural life of the region. Emphasis will be given to the problems of slavery and race, economic development and stagnation, the

relationship of sectional politics to national politics, and the myth and reality of Southern culture and literature. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3 MRS. PEASE

[300-level courses are listed in the Graduate School Bulletin]

HONORS PROGRAM (Hr)

DEAN NOLDE, Chairman; PROFESSORS THOMSON (SECRETARY), MILES, BISCOE, FLYNN, GLANVILLE, HARTGEN, HOLMES, C. J. REYNOLDS, SWINFORD, J. BENNETT, SPRAGUE; ASSOCIATE PROFESSORS BANKS, REID; ASSISTANT PROFESSORS LEMELIN, SCHRIVER; MR. MACDONALD; MRS. HAKOLA

Freshmen of marked academic ability enrolled in all colleges are invited to apply to the secretary for admission to the sequence of honors courses described below. The work of the freshman and sophomore years, under the direction of staff drawn from all colleges of the University, provides the stimulus and the guidance which should enable a superior student to begin building for himself a perspective view of the liberal arts and sciences and to lay a foundation for the more specialized work which is to come. The Honors Program reaches its climax in a thesis which is written during the senior year and treats some limited problem falling in the student's major field. In exceptional cases, students may be admitted at any stage of the Honors Program up to the opening of the junior year. Of the courses listed below, Hr 41, 45, 47, and 48, are taken in common with students from other colleges within the University.

41. Distinguished Freshman Seminar—Students are selected by the Honors Committee. Discussions and demonstrations displaying the range and nature of the Liberal Arts and Sciences. *Cr* 3. MR. REYNOLDS

45. Honors Colloquium—Readings and discussion on the basic concepts of Western civilization. Normally taken in the freshman year. *Cr* 3. MR. BANKS

46. Honors Summer Readings: Basic—Optional for those who have taken course 45. An individually arranged program of readings is independently pursued in the summer. *Cr* 1. MR. REYNOLDS

47. 48. Honors Group Tutorial—Oral and written reports under tutorial direction, upon a planned sequence of books representative of the various fields of liberal education. Hr 47. 48 fulfills the sophomore humanities requirement for those students registered in the Honors Program. *Cr* 3. MR. THOMSON, Chairman

49. Honors Summer Readings: Intermediate—Guided summer readings and reports, individually adapted to the student's program. Primarily for students who have had only one semester from Hr 47. 48. *Cr* 1, MR. SPRAGUE

50. Honors Seminar—Discussion groups in such fields as the arts philosophy and history of science, aspects of the study of society. Content varies from year to year. Normally taken in the junior year. *Cr* 3.

51. 52. Honors: Specialized Studies—A tutorially conducted study of the student's major field, issuing in the choice of an approved thesis topic. *Cr* 3.

53. 54. Honors Thesis—The planning and completion of an honors thesis or research projects. *Cr* 3.

INTERNATIONAL AFFAIRS (Ia)

A major in international affairs may be followed in economics, foreign languages, or political science. A suggested curriculum for the first two years is outlined below. Detailed programs covering the last two years of study in each discipline may be secured from the Committee on International Affairs, 33 North Stevens, University of Maine, Orono, Maine 04473.

To enter the junior year of the program a student must have a minimum point average of 2.0 or permission from the Committee on International Affairs. Normally a student would take four years of a modern language or its equivalent. He would study in each of the three disciplines.

SPECIMEN CURRICULUM IN INTERNATIONAL AFFAIRS

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
		English Composition	3			English Composition	3
Hy	5	Hist. of Western Europe	3	Pol	22	Current World Problems	2
Ms	5	Elements of College Math. or a Laboratory Science	3-4	Hy	6	Hist. of Western Europe	3
				Ms	6	Elements of College Math. or a Laboratory Science	3-4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
Sh	1	Funds. of Public Speaking	3			Foreign Language	3
		Foreign Language	3				
			14-15				14-15

Sophomore Year

Ec	10	Principles of Economics	3	Py	1	General Psychology	3
Pol	1	Introduction to Government	3	Pol	2	Introduction to Government	3
		Descriptive Science	3			Descriptive Science	3
		Foreign Language	3			Foreign Language	3
		Humanities	3			Humanities	3
			15				15

JOURNALISM (Jr)

PROFESSOR HAMILTON; ASSOCIATE PROFESSOR MILLER (Chairman)
ASSISTANT PROFESSOR HALBE; PART-TIME INSTRUCTOR KRALL

The department offers a broad, interdisciplinary liberal arts and pre-professional program for students interested in careers in journalism. Its courses are also available and appropriate for any students in the University interested in improving their writing skills or in the study of mass communications as a part of society.

Laboratory facilities are provided so students may obtain a variety of experience. Three student publications (a weekly newspaper, a magazine and a yearbook), and a daily television news broadcast aired on the state's public broadcasting network are used as journalism laboratories. Students also have access

to a radio station, the University printing plant, daily Associated Press wire service, photographic darkroom, and a journalism library. Part-time work during the year and summer work are sometimes available.

Major students are required to complete Jr 22, Survey of Mass Communications; 31.32, News Writing; 85, Law of Publications; 93.94, Advanced Journalism; and 95.96, News Editing. Course 95.96 represents the required one year of laboratory experience, which the student may elect to fulfill in newspaper work, magazine work, broadcasting, or a combination. The major student will round out his program according to one of the options below, designed to provide added understanding of the political, economic and sociological forces operating around him as he pursues a subsequent professional career. Many will elect to continue their training on the graduate level.

Public Affairs Option—For the student preparing for news work in mass communications in the United States, or related activities such as public relations or industrial editing. Required courses: Ec 10, Principles of Economics, and Pol 158, Public Opinion. The student must also elect 12 additional hours from a list of appropriate advanced social science courses the student's adviser will furnish.

Foreign Affairs Option—For the student preparing for work abroad in mass communications or related activities. The student must complete work in at least one language (French, German, Russian or Spanish) up to at least the 7/8 course level. Other required courses: Pol 135.136, Democratic Government of Europe, and Communist Governments; Ec 137, Comparative Economic Systems. The student must also elect 12 additional hours from a list of advanced courses to be furnished by the adviser appropriate for a background in international affairs.

Art, Literature and Humanities Option—For the student interested in this broader background as preparation for a writing or broadcasting career. Students must elect 18 hours from courses in Art, Folklore, Music, Theatre, English and American Literature and Comparative Literature. With the help of his adviser, the student may also select from a few other appropriate course areas.

Social Welfare Option—For the student preparing for a journalism career with an interest in social welfare, or in the increasing emphasis on sociological research in mass communications. Students will need to take the introductory courses in psychology and sociology, preferably by the end of the sophomore year, and will then elect a plan of advanced courses in either sociology or social welfare.

Science Writing Option—Designed to combine liberal arts and a strong science background with journalism training for those interested in this specialized field. Prospective majors should elect Ms 12, Analytic Geometry and Calculus, for their freshman science requirement. The student will be required to complete about 24 hours in a science and the necessary requirements or prerequisites in related sciences.

Courses in Journalism

22. Survey of Mass Communications—A beginner's course in the structure and operation of modern news media. May include visits to a modern newspaper plant and television studio. Open to all freshmen and sophomores. *Cr* 3. STAFF

25. History of American Journalism—A review of the newspaper's role

in American history, and the development of modern mass communications. Open to all sophomores, juniors and seniors. *Cr* 3. MR. MILLER

26. The Press and Society—Not given every year.

31. 32. News Writing—A course in writing and reporting procedures. For the student interested in communicative writing skill generally or as part of a vocational interest. Not open to freshmen. *Cr* 3. STAFF

42. The Foreign Press—Survey of the world press; its role in political, economic and cultural development. Includes annual trip to United Nations to meet in seminar with UN correspondents, visit to Overseas Press Club, N.Y. Times and other publishing houses. MR. MILLER

51. Management of Publications—Analysis of the business, advertising, distribution and editorial processes and policies of various journalistic publications. Prerequisite: Ec 10. *Cr* 3.

56. Introduction to Advertising—Social and economic roles of advertising; rate structures, agency practices, effective use of media, advertising laws, analyzed and discussed from the media point of view. Prerequisite: Jr 51. *Cr* 3.

61. Introduction to Photojournalism—For students desiring an understanding of photography as an effective medium of communications. Classroom and darkroom instruction. Basic principles of processing, composition, and the uses of photography in various media. *Cr* 3.

85. Law of Publications—A study of the various legal systems affecting the publishing and broadcasting worlds. Topics include libel, privacy, contempt, copyright, obscenity, censorship, prejudicial pre-trial publicity, and others as they develop within the society. *Cr* 3. MR. HAMILTON

91. Staff Training—On-the-job training during the summer between the junior and senior years under the direction of a local editor. Cr 3.

93. 94. Advanced Journalism—Intensified writing training; readings and discussions in the ethics and law of journalism. Prerequisite: Jr 31.32. *Cr* 3. MR. HAMILTON

95. 96. News Editing—A laboratory course designed to acquaint the student with the problems of news selection, copy-editing and so on in the process of publication or broadcasting news and public affairs. Six hours of class work a week. Prerequisite: 31. *Cr* 3. MR. HAMILTON

MATHEMATICS (Ms)

PROFESSORS MAIRHUBER (Chairman), EVES*, WOOTTON, SWINFORD; ASSOCIATE PROFESSORS NORTHAM, HAMM, TOOLE, CUNNINGHAM, HARPER, DODGE, GREEN, HANNULA, MESTECKY,* MURPHY, LANGFORD, POGORZELSKI, GEIGER, HOOPER; ASSISTANT PROFESSORS PERRY, STEARNS, SOULE, DUBE, LOCKE, MORSE, FUENTES, MERRIMAN, BRESINSKY, WOHLGEMUTH, BYTHER, BALAKRISHNAN, CHEN, FEICHTINGER, FERGUSON, HAGGARD, SOBEL; INSTRUCTORS HEATH, TAYLOR; GRADUATE ASSISTANTS MR. FINN, MR. MCCRUM, MR. MERCIER, MR. SMITH, MISS SULLIVAN, MISS BLANCHETTE, MISS COOK, MR. GAGNON, MISS KURDICK, MISS MCDONALD, MR. OSTROSKI, MR. RAND, MR. TURNER, MR. WONG

Students who plan to major in mathematics will normally complete the following courses in their freshman and sophomore years: Ms 12, 27, 28, 122, and 124.

To satisfy departmental requirements, a student must complete at least 39 hours of mathematics, including Ms 12, 27, 28, 122, 124, 171, and 173, at least one of Ms 29, 103, 130, and 187, and at least one of Ms 161, 165, 175, and 197. With the exception of Ms 12, courses numbered below 20 cannot be counted as part of the 39 hours. It is possible to obtain advanced placement, or to be excused from elementary courses by passing proficiency examinations for the department.

The student's program of elective courses for the junior and senior years will depend upon his vocational plans. In selecting upper level courses, the mathematics major will be assisted by a Mathematics Department member assigned by the department as his adviser. The core of required courses demanded of all mathematics majors has been selected as being necessary for work in any branch of mathematics.

The general requirements for the master of arts degree are given in the Graduate Catalog. Candidates for this degree in mathematics are expected to have substantial undergraduate training in his subject.

4. Algebra and Trigonometry—The trigonometric functions, their properties and applications. Basic topics in algebra for further work in mathematics. Prerequisite: 2 units H.S. Algebra, 1 unit H.S. Geometry. *Rec* 5, *Cr* 4.

5, 6. Elements of College Mathematics—Ms 5 consists of modern viewpoint on certain basic mathematical material. Content may vary with the instructor. Ms 6 consists of an introduction to the differential and integral calculus. Students who have received credit for Ms 12 may not take Ms 6 for credit. Intended primarily for non-mathematics majors. *Cr* 3.

7/8. The Structure of Arithmetic—A development of the real number system beginning with the sub-system of natural numbers and generalizing through the systems of integers, rational numbers, and real numbers. Properties of numbers, relations, and operations. Details of numeration systems. Primarily for the elementary school teacher. *Cr* 3.

9. Informal Geometry—Sets, points, lines, planes, and other configurations of one, two, and three dimensional geometry. Congruences, measurement,

* Leave of absence, 1970-71

and constructions. Primarily for the elementary school teacher. Prerequisite: consent of the instructor or teaching experience in an elementary or junior high school. *Cr* 3.

10. Basic Algebra—An introductory treatment of mathematical operations on set symbols including procedures for solving simple equations and inequities. Primarily for the elementary school teacher. Not given every year. Prerequisite: consent of the instructor or teaching experience in an elementary or junior high school. *Cr* 3.

12. Analytic Geometry and Calculus—Equations and graphs, differentiation and integration of polynomials, applications. Prerequisite: trigonometry and the equivalent of Ms 3. *Cr* 4.

13/14. Mathematics for the Social Sciences—An introduction to elementary mathematical analysis and the calculus, with applications to business and economics. Mathematical models, elementary functions, systems of equations and inequalities, linear programming, matrix algebra, topics from the calculus, probability. Prerequisite: 3 years H.S. Math. Cr 3.

17. Mathematical Theory of Investment—Interest, annuities, and their applications. *Cr* 3.

19. Principles of Statistical Inference—An introductory course including such topics as distributions sampling variability, estimation, hypothesis testing and regression. *Cr* 3.

27. Analytic Geometry and Calculus—Conic sections; differentiation and integration of algebraic, trigonometric, logarithmic and exponential functions; applications. Prerequisite: Ms 12 or consent of the department. *Cr* 4.

28. Analytic Geometry and Calculus—Polar coordinates, geometry of three dimensions, infinite series, partial derivatives; multiple integrals; applications. Prerequisite: Ms 27. *Cr* 4.

29. Differential Equations—An introduction to ordinary differential equations; applications. A brief introduction to partial differential equations and Fourier series. Prerequisite: Ms 28. *Cr* 4.

29a. Differential Equations—An introduction to ordinary differential equations; applications. Prerequisite: Ms 28. *Cr* 3.

41. Introduction to Mathematical Logic and the Nature of Proof—An introductory course designed specifically to view logic and the nature of mathematics. Proof with concepts and symbolism as used throughout modern mathematics. The notions and symbolic logic will be developed with a decidedly set-theoretic background. Prerequisite: Ms 21 and Ms 27 or Ms 122. *Cr* 2.

103. Linear Programming I—Formulation of the general linear programming problem, homogeneous and non-homogeneous linear equalities, the simplex method for non-degenerate cases, simplex computational procedure and check concluding slack, surplus and artificial variables, revised simplex procedures, degeneracy and cycling. Prerequisite: Ms 124 or Ms 172, or permission. *Cr* 3.

104. Linear Programming II—Duality theory, primal-dual algorithm transportation and transhipment problems, network flows, game theory, optimal strategies, operations research, decision theory, machine assignment, optimal product mix, refinery applications, linear programming and the firm, economic theory applications, closed and dynamic Leontief models. Prerequisite: Ms 103. *Cr* 3.

122. The Structure of the Real Number System—Development of the arithmetic and order properties of the integers, rational, and real numbers. Division

algorithm, well-ordering, mathematical induction, fundamental theorem of arithmetic, sequences and series, and consequences of the completeness property of the real numbers. Prerequisite: Ms 27. *Cr* 3.

123. Theory of Equations—Techniques for finding and approximating roots of polynomial equations, synthetic division, factorization of polynomials, solution of linear systems of equations, elementary theory of finite fields. Prerequisite: Ms 122, or permission. *Cr* 3.

124. Linear Algebra—An introduction to the theory of vector spaces and linear transformations. Prerequisite: Ms 28. *Cr* 4.

124a. Linear Algebra—An introduction to the theory of vector spaces and linear transformations. Primarily for graduate students. Prerequisite: Ms 28. *Cr* 3.

130. Mathematical Statistics I—Probability and principles of inference. Particular emphasis is given to the normal distribution and related sampling distributions. Prerequisite: Ms 28. *Cr* 3.

131/132. Mathematical Statistics II and III—A continuation of Ms 130 including topics such as decision functions, non parametric methods and an introduction to analysis of variance. Prerequisite: Ms 130 or permission. *Cr* 3.

133. Probability—A brief review of the elements of probability followed by material on random walk, Markov chains and more general stochastic processes. Prerequisite: Ms 130. *Cr* 3.

149. Mathematics for Teachers—A modern approach to selected topics in mathematics with methods of presentation to secondary school students. Prerequisite: Ms 28 or consent of the department. *Cr* 3.

151. Introduction to Vector Analysis and Matrices—The algebra and calculus of vectors. Matrices and systems of linear equations, eigenvalues and eigenvectors, bilinear and other forms. Prerequisite: Ms 28. *Cr* 3.

152. Introduction to Complex Variables—Analytic functions, integration, series, and mapping. Prerequisite: Ms 28. *Cr* 3.

153/154. Partial Differential Equations—An introduction to the general properties of partial differential equations follows by solutions of specific equations. The techniques include eigenfunction expansions, operational methods, and conformal mapping. Prerequisite: Ms 29. *Cr* 3.

161. History of Mathematics—The development of elementary mathematics from ancient to modern times. Prerequisite: Ms 12. *Cr* 3.

165. Theory of Numbers—Elementary properties of the integers. Prerequisite: Ms 122. *Cr* 3.

166. Introduction to Sampling Methods—Basic sampling schemes: simple random, stratified, cluster, and multi-stage. Biases and errors. Ratio and regression estimation. Prerequisite: Ms 19 or Ms 130. Not given every year. *Rec* 2, *Lab* 2, *Cr* 3.

167. Statistical Methods in Research—Analysis of variance, factorials, planned comparisons, analysis of covariance, and multiple regression, viewed as tools for research in all fields. Prerequisite: Ms 19 or 130 or permission. *Rec* 2, *Lab* 2, *Cr* 3.

168. Design of Experiments—Randomization analysis, blocking, and orthogonality; split-plot, factorial, and incomplete-block designs. Examples will be chosen from a variety of fields. Not given every year. Prerequisite: Ms 167. *Rec* 2, *Lab* 2, *Cr* 3.

169. Computer Programming—Programming logic and techniques. Con-

centrates on the IBM Fortran language. Student programs will be run on the University's IBM 360 computer. Prerequisite: one year of college mathematics or consent of the instructor. *Cr* 3.

171. Introduction to Abstract Algebra—Algebraic structures, such as groups, rings, integral domains and fields. The theory of groups is emphasized. Prerequisite: Ms 122 and Ms 124. *Cr* 3.

172. Topics in Linear Algebra and Matrix Theory—Advanced topics in the theory of linear algebra and matrix theory. Content varied depending on instructor. Prerequisite: Ms 124 or permission. *Cr* 3.

173/174. Advanced Calculus—Functions of real variables, limits, infinite series, partial differentiation, and other topics. Prerequisite: Ms 122. *Cr* 3.

175/176. Higher Geometry—An introduction to various geometrics, such as projective and non-Euclidean. Prerequisite: Ms 28. *Cr* 3.

179. Finite Groups—Theory of groups, including Sylow's theorems and Abelian groups. Prerequisite: Ms 122 or consent of the department. *Cr* 3.

185. Mathematical Logic—Church's two basic formulations of non-quantified propositional calculus and the elements of quantified propositional calculus. Normal forms. Axiom schemata. Boolean rings and Boolean algebras in logic. Not given every year. Prerequisite: Ms 28. *Cr* 3.

187. Numerical Analysis—Computational methods for electronic computers with exercises on the IBM 360 for interpolation, simultaneous linear algebraic equations, non-linear and polynomial equations, numerical integration, and ordinary and partial differential equations. Prerequisite: Ms 28 and Ms 169. *Cr* 3.

191/192. Differential Geometry—Applications of calculus to the study of space curves and surfaces. Not given every year. Prerequisite: Ms 28. *Cr* 3.

193. Non-Linear Programming—Introduction to non-linear programming problems, mathematical background review of pertinent linear algebra, convex set theory, linear programming techniques, classical optimization techniques, properties of convex functions, approximations methods for solution of problems involving separable functions, stochastic programming, Kuhn-Tucker theory, and quadratic programming. Prerequisite: Ms 28 and Ms 103. Recommended: Ms 104, Ms 169, Ms 187, linear algebra and permission. *Cr* 3.

194. Non-Linear Programming II—Integer linear programming including sequencing problems, project planning, manpower scheduling, and capital budgeting; gradient methods, Arrow-Hurwicz gradient method for concave programming, dynamic programming including manpower loading and inventory problems, dynamic formulation of transportation problems, equipment replacement problems, combined production scheduling and inventory control problems, Markov processes, optimal pure strategies, and recent developments. Prerequisite: Ms 193. *Cr* 3.

196. Selected Topics in Mathematics—Advanced topics in mathematics not regularly covered in other courses. The content is not fixed but can be varied to suit current needs. The course may, with permission of the department, be taken more than once. Prerequisite: consent of the department. *Cr* 2 or 3.

197. 198. Foundations of Mathematics—Fundamental concepts and methods of mathematics; viewpoints on the foundation of mathematics. Prerequisite: Ms 28 or permission. *Cr* 3.

200. Seminar in Mathematics Education—Oral and written reports on

topics in mathematics which have relevance for experimental and new programs in the secondary schools. Restricted to teachers or supervisors. Prerequisite: permission of the instructor. Not given every year. *Cr* 3.

225/226. Analysis for High School Teachers—A thorough development of the calculus for functions of a single variable. The course is designed to give an experienced high school teacher a proper background in the principles of mathematical analysis. Prerequisite: Ms 122. *Cr* 3.

255/256. Theory of Ordinary Differential Equations—Existence and uniqueness of solutions, nth-order linear equations, linear and non-linear systems, stability, perturbation theory, series solutions, eigenvalue problems and expansion theory. Sturm comparison and oscillation theory, Poincare-Bendixson theory. Prerequisites: Ms 124 and Ms 173 or permission. *Cr* 3.

271/272. Abstract Algebra—The basic structure theorems for groups, rings, fields, and modules. Prerequisite: Two courses from among Ms 124, Ms 171, Ms 172, Ms 179. *Cr* 3.

277/278. Topology—An introduction to fundamental concepts in topology. Topological spaces, continuity, filters, product and quotient spaces, metrization, and other basic concepts are developed. Ms 278 is a continuation of Ms 277 with topics in homotopy theory and fiber spaces added. Prerequisites: Ms 173, Ms 174 or consent of the instructor. *Cr* 3.

‡279/280. Functions of a Complex Variable—Elementary properties of holmorphic functions including the classification of isolated singularities, Laurent expansion and infinite product representations. Also an introduction to conformal mapping and the Reimann Mapping theorem. Prerequisite: Ms 174 or consent of department. Cr 3.

†283/284. Functions of a Real Variable—Lebesque integration and the elementary properties of Hilbert and Banach spaces. Prerequisite: Ms 174 or consent of department. *Cr* 3.

296. Advanced Topics in Mathematics—Topics not regularly covered in other course work. May be taken more than once with departmental permission. Prerequisite: consent of department. *Cr* 2 or 3.

399. Graduate Thesis—*Cr Ar.*

MODERN SOCIETY (My)

ASSOCIATE PROFESSOR SCONTRAS (Chairman); INSTRUCTOR MACDONALD

Modern Society (My 1/2) is an introductory course in social science, designed to acquaint the student with the meaning and use of the scientific method in the study of human relations. It introduces the student to major concepts in the fields of anthropology, social psychology, sociology, economics, and political science. Some attention is given to basic literature and problems in each field.

Modern Society is open to any student who has not had a minimum of two years of social science at the college level. Three Credits.

MUSIC (Mc)

PROFESSOR GODWIN (Chairman); ASSOCIATE PROFESSORS CAZDEN, COLLINS, JACOBS; ASSISTANT PROFESSORS FOLEY, HALLMAN, MAGNUSON, NESBIT, OPHEIM, OSTROW; INSTRUCTOR MEYER; MRS. COLLINS, MRS. MUMMÉ, MR. NOWICK

The curricula of the Department of Music lead to baccalaureate degrees as follows:

1. ***Bachelor of Arts Degree*** with a major in music

   This program is designed for the study of music within a strong liberal arts curriculum. It offers a broad coverage of the field of music with emphasis upon the study of the history and theory of music. It furnishes an appropriate background for prospective candidates for advanced degrees who are preparing for such careers as musicologists, composers, music librarians, and teachers at the college level. It does not qualify the graduate for certification as a public school music teacher. Candidates for the degree are expected to attain a level of performing ability equivalent to that required at the completion of the sophomore year in the Bachelor of Music program. A senior project is required in lieu of a senior recital.

   Total number of required semester hours in music: 48

Music Theory	20
Music History	10
Performance Emphasis	7
Senior Project	1
Music Organization	4
Music Electives (theory or history)	6
	48

2. ***Bachelor of Science in Music Education***

   This is a four-year professional degree for students in the College of Education who intend to make music a career either as a public school teacher or supervisor of music. Majors in music education will register in the College of Education and follow the curriculum outlined there. The specific requirements for the degree may be obtained from the Department of Music. The degree provides for many professional opportunities and serves also as preparation for graduate study in music education. Upon satisfactory completion of the music education course of study the student is certified to teach both elementary and secondary music. A half-hour recital is required in the junior or senior year.

   Total number of required semester hours in music: 66

Music Theory	22
Music History	10
Major performance area	12
Music Organization	7
Instrumental concentration or Vocal-keyboard concentration	15
	66

3. Bachelor of Music in Applied Music

This degree is designed to assist the gifted music student to prepare for a career in music performance. Emphasis is placed on performance, music theory, music history, and studies in the liberal arts. The degree is granted in the following applied music areas: *Strings*, *Woodwinds*, *Brass*, *Piano*, *Voice*, and *Pipe Organ*. Graduation requirements include appropriate proficiency in playing or singing, excellent memory and substantial repertoire, and musicianship of a high order. A half-hour recital is required in the junior year, and a full recital in the senior year.

Total number of required semester hours in music: 83

Music Theory	28
Music History	16
Performance Major	16
Performance Minor	4
Music Organization	8
Conducting, Literature	4
Elective in Music	7
	83

A proficiency examination in piano must be passed by all degree students in music. See the music adviser for details.

Applied Music Fees

1. For the Music Major:
   No fees will be charged for *required* private instruction.
2. For the non-music major and for instruction *not* required of music majors:
   A fee of $30 per semester will be charged for one 1/2-hour lesson per week; a fee of $60 per semester will be charged for one 1-hour lesson per week. Private instruction for the non-music major and instruction not required for the music major is contingent upon the availability of time of the instructor. Arrangements for such instruction must be made through the office of the Music Department.

Practice facilities are provided in the music building. The University provides, so far as possible, practice opportunities for students who desire to take applied music without credit.

After being accepted by a teacher, the student should report immediately to the music office for a fee statement. The lesson fee must be paid to the Treasurer's Office before lessons can begin.

Courses in Music Performance

The Department of Music provides private instruction in various instruments and voice. The student should enroll under one of the following numbers:

	Performance Minor B.A. (major in music) candidates, all others	Performance Major B. Mus., B.S. in Mus. Educ. candidates
*First level	Mc 1-2 Cr 1	Mc 10-20 Cr 2
Second level	Mc 3-4 Cr 1	Mc 30-40 Cr 2

Third level	Mc 5-6	Cr 1	Mc 50-60	Cr 2
Fourth level	Mc 7-8	Cr 1	Mc 70-80	Cr 2

* The level is roughly the equivalent of the year, but the student who does not meet the requirements for the level at the end of each year as determined by the jury examination will continue on the previous level until the requirements are met. Students will be reviewed at the end of their sophomore year by a jury composed of the faculty of the Department of Music to determine whether they should be advanced to upper level standing in applied music.

Instruction is provided in the following areas. When enrolling, add the appropriate division noted below after the course number to indicate the instrument or voice.

Example: Mc 10— 1 (voice)

Voice,	1	Viola,	5	Oboe,	9	Trumpet,	13
Piano,	2	Cello,	6	Clarinet,	10	Baritone Horn,	14
Organ,	3	Bass,	7	Bassoon,	11	Trombone,	15
Violin,	4	Flute,	8	French Horn,	12	Tuba,	16

Candidates for B. Mus., B.S. in Mus. Ed. enroll for two hours credit for the major instrument or voice, one hour for the second instrument or voice. B.A. (major in music) candidates, *all other students* enroll for one hour credit.

Courses in applied music and music performance may be repeated for credit.

Each student taking instruction in an applied area must take an examination before a jury of the faculty of music at the end of each semester. Attendance at the Tuesday afternoon student recital is required. Prerequisite: qualifying test; see the Chairman of the Department of Music.

Senior Project—A research paper, or original composition, or a lecture-recital presented in lieu of a recital. Required of all music majors in the Bachelor of Arts degree program. Accomplished under the guidance of an assigned faculty member during the senior year. *Cr* 1.

Musical Organizations and Ensembles (Mc O)

1. 2. University Singers—Rehearsal and performance of choral concert repertoire. Membership through audition requires sight reading ability. Extended concert tours. Four hours of rehearsal a week. Attendance at all rehearsals and public performances required. May be repeated for credit. *Lab* 4, *Cr* 1.

3. 4. Oratorio Society — Rehearsal and performance of major choral works. Membership through audition. Attendance at all rehearsals and public performances required. May be repeated for credit. *Lab* 2, *Cr* 1.

5. 6. Varsity Women's Glee Club—Rehearsal and performance of choral music written expressly for this performing medium. Membership through audition. Attendance at all rehearsals and public performances required. A limited touring organization. May be repeated for credit *Lab* 2, *Cr* 1.

7. 8. Varsity Men's Glee Club—Rehearsal and performance of choral music written expressly for this performing medium. Membership through auditon. Attendance at all rehearsals and public performances required. A limited touring organization. May be repeated for credit. *Lab* 2, *Cr* 1.

9. 10. University Chorus—Rehearsal and performance of choral music

appropriate for choral singers with limited background and training. No audition required. Open to all students. Attendance at all rehearsals and public performances required. May be repeated for credit. *Lab* 3, *Cr* 1.

11. Band—During football season the band functions as a marching unit; the remainder of the semester is spent in the rehearsal and performance of concert band repertoire. Membership through audition. Attendance at all rehearsals and public performances required. May be repeated for credit. (Fall semester only.) *Lab* 4, *Cr* 1

12. Concert Band—Rehearsal and performance of standard band repertoire. Membership through audition, or previous participation in Marching Band. Attendance at all rehearsals and public performances required. Extended concert tours. May be repeated for credit. (Spring semester only.) *Lab* 4, *Cr* 1.

13. Varsity Band—Organized each fall following football season from members of the University Band who are not selected for the Concert Band. *Lab* 2, *Cr* 1.

21. 22. University Orchestra—Rehearsal and performance of standard orchestral repertoire. Membership through audition. Attendance at all rehearsals and public performances required. May be repeated for credit. *Lab* 4, *Cr* 1.

31. 32. Chamber Choir—The study and performance of chamber music for the voice. May be repeated for credit. *Lab* 2, *Cr* 1.

41. 42. Brass Ensemble—The study and performance of chamber music for brass instruments. May be repeated for credit. *Lab* 2, *Cr* 1.

45. 46. Woodwind Ensemble—The study and performance of chamber music for woodwind instruments. May be repeated for credit. *Lab* 2, *Cr* 1.

49. 50. String Ensemble—The study and performance of chamber music for string instruments. May be repeated for credit. *Lab* 2, *Cr* 1.

Courses in Music Education (Mc E)

1. Music Methods for the Elementary Teacher—A functional course covering the methods, content, and materials of the elementary music program. Prerequisite: MC T 14 A, and Mc L 22. *Cr* 3.

3. Teaching and Supervision of Public School Music—Methods, materials, organization and administration of the music curriculum in the public schools. Prerequisite: MC T 14 A and MC L 22. *Cr* 3.

5-6. Music for the Elementary Classroom Teacher—Basic musicianship and approaches to the musical training of the elementary school child. Emphasis is placed upon the achievement and utilization of elemental performance skills in the areas of singing, rhythmic movement, aural analysis, composition, improvisation and instrumental techniques. *Lec* 1, *Lab* 2, *Cr* 2. Required of all elementary education majors.

21. Teaching of General Music—Organization and teaching of general music classes in the junior high school. Prerequisite: MC E 3, or equivalent. *Cr* 3.

Courses in Performance Techniques (Mc P)

1/2. Voice Class—The systematic development of the principles of good singing through class method approach. Prerequisite: MC T 1 or equivalent. *Lab* 2, *Cr* 1.

5/6. Piano Class—Designed to give a basic command of the keyboard. Recommended especially for students preparing to take the proficiency examination in secondary piano. May be taken as an introduction to piano performance for the beginning student. Prerequisite: MC T 1 or equivalent. *Lab* 2, *Cr* 1.

†9/10. String Class—Basic skills pertaining to each of the four string instruments. First semester, study of all instruments; second semester, concentrated work on one instrument. Prerequisite: Mc T 1 or equivalent. First semester: *Lab* 4, *Cr* 2. Second semester: *Lab* 2, *Cr* 1.

‡13. Woodwind Class—Basic skills pertaining to the woodwind instruments. Prerequisite: MC T 1, or equivalent. *Lab* 4, *Cr* 2.

‡17. Brass Class—Basic skills pertaining to the brass instruments. Prerequisite: MC T 1, or equivalent. *Lab* 4, Cr 2.

†21. Percussion Class—Basic skills pertaining to the percussion instruments. Prerequisite: MC T 1, or equivalent. *Lab* 2, *Cr* 1.

41. Choral Conducting and Literature — Basic choral conducting, and study of problems in the organization and training of choral groups. Prerequisite: MC H 2. *Lec* 2, *Lab* 3, *Cr* 3.

45. Instrumental Conducting and Literature—Basic instrumental conducting, and study of problems in the organization and training of bands and orchestras. Prerequisite: MC H 2. *Lec* 2, *Lab* 3, *Cr* 3.

51. 52. Accompanying—A course designed for music majors whose concentration is voice-keyboard. Prerequisite: MC 2B or C. *Lab* 2, *Cr* 1.

Courses in Music History (Mc H)

1/2. History of Western Music—The history of music from antiquity to the present day with a technical study of the significant musical trends. Prerequisite: For the major, MC L 22, or sophomore standing. For the general student, permission of the instructor. *Cr* 3.

117. Music of the Baroque Period—A study of music in the 17th and first half of the 18th centuries; from Monteverdi and Schütz to Bach and Handel. Prerequisite: MC H 2, or permission of the instructor. *Cr* 3.

119. Music of the Classical Period—The changing style in form and content as evolved by Haydn, Mozart and Beethoven viewed against the background of social and political conditions of the time. Prerequisite: MC H 2, or permission of the instructor. *Cr* 3.

121. Music of the Romantic Period—Study of musical expression during the 19th century with emphasis on the intellectual foundations of the romantic movement. Study and detailed analysis of represenative works from Beethoven through Debussy. Prerequisite. MC H 2, or permission of instructor. *Cr* 3.

123. Music of the Twentieth Century—Trends in contemporary music and their relationship to the cultural and political life of our time. Prerequisite: MC H 2, or permission of the instructor. *Cr* 3.

Courses in Music Literature (Mc L)

1. Understanding Music—A study of the basic elements of music necessary for intelligent listening, with emphasis on the various historical movements, together with a study of the great composers and their contrasting styles as

exemplified by their most important compositions. For the general student. Cr 3.

3. Vocal Literature—A survey through discussion and performance of vocal literature from the 18th century to the present day to include classic Italian songs, German Lieder, French art songs, and contemporary American and British songs. *Cr* 1.

5. Woodwind Literature—A survey through discussion and performance of woodwind literature to familiarize the student with the standard repertory. *Cr* 1.

7. Brass Literature—A survey through discussion and performance of brass literature to familiarize the student with the standard repertory. *Cr* 1.

9. String Literature—A survey through discussion and performance of string literature to familiarize the student with the standard repertory to include that composed for string quartet. *Cr* 1.

11. Piano Literature—A survey through performance and discussion of standard literature for piano. *Cr* 1.

13. Organ Literature—A survey through discussion and performance of standard literature for organ. *Cr* 1.

21/22. Survey of Music Literature—A comparative study of styles, characteristic, forms, and performing mediums of music from the Renaissance to the present. Primarily for music majors. *Cr* 2.

Courses in Music Theory (Mc T)

1. Fundamentals of Music—Notation and terminology, scales and intervals, chords, ear training, elementary rhythmic and melodic dictation, sight-singing. Open to all students. *Cr* 3.

11A/12A. Elementary Harmony — Four-part harmony in diatonic relationships. To be taken concurrently with MC T 11B/12B. Primarily for music majors. *Cr* 3.

11B/12B. Elementary Sight Singing and Ear Training—Sight singing, ear training, dictation, and keyboard work. To be taken concurrently with MC T 11A/12A. *Lab* 2, *Cr* 1.

13A/14A. Advanced Harmony — A continuation of MC T 11A/12A. Function and use of the seventh, ninth, eleventh and thirteenth chords, chromatic harmony, and advanced modulation. To be taken concurrently with MC T 13B/14B. Prerequisite: MC T 12A. *Cr* 3.

13B/14B. Advanced Sight Singing and Ear Training—A continuation of MC T 11B; 12B. To be taken concurrently with MC T 13 A/14 A. *Lab* 2, *Cr* 1.

15/16. Form and Aanlysis—Harmonic and structural analysis of musical forms from the smallest to the largest. Prerequisite: MC T 12A or the equivalent. *Cr* 2.

21. Modal Counterpoint—Contrapuntal techniques as practiced by composers of the 16th and 17th centuries. Written exercises and analysis. Prerequisite: MC T 12A, or permission of instructor. *Cr* 2.

22. Tonal Counterpoint—Contrapuntal techniques as practiced by composers of the 18th and 19th centuries. Written exercises and analysis. Prerequisite: MC T 12A. *Cr* 2.

55/56. Canon and Fugue—Analysis of masterpieces in forms, with particular concentration on the canons and fugues of Bach. Composition projects in these polyphonic types. Prerequisite: MC T 14B, and MC T 22, or its equivalent. *Cr* 2.

151. Instrumentation and Arranging—Study of the ranges, tonal possibilities, technical limitations, and transpositions of all orchestral and band instruments; scoring of short pieces for band, orchestra and ensembles. Prerequisite: MC T 12A. *Cr* 2.

161. Composition I (Small Forms)—Creative writing in the smaller forms including harmonic textures and use of contrapuntal devices. Prerequisite: A working knowledge of harmony and counterpoint and permission of the instructor. May be repeated for credit. *Cr* 2.

163. Composition II (Large Forms)—Continuation of MC T 161. Creative writing for voice and instruments in the large forms. Prerequisite: MC T 161. May be repeated for credit. *Cr* 2.

School of Nursing

DR. MARY ANN EELLS, Director; PROFESSOR MACLEAN; ASSOCIATE PROFESSORS COTTON, EELLS, IVANISIN, ROSCOE; ASSISTANT PROFESSORS FURLONG, JENSEN, MADDOX, TRYON; INSTRUCTORS M. J. EDWARDS, M. S. EDWARDS, FISH, HAMMOND, STONE, TALBOT

The School of Nursing offers a program of four years and one summer session which leads to the degree of bachelor of science with a major in nursing. One hundred and twenty hours are required for graduation with a minimum grade of C in all clinical nursing courses. Graduates are eligible to take the State Board Examination for licensure as registered nurses.

The program is accredited by the Maine State Board of Nursing. The School is a member of the National League for Nursing Council of Baccalaureate and Higher Degree Programs.

Students may be admitted to either the Portland or Orono campus or transfer from other campuses.

In addition to the usual University fees and expenses, nursing students must purchase uniforms (approximately $90) during the sophomore year and provide themselves with a car during the senior clinical course in Community Health Nursing.

Objectives of the Program

In order to prepare the student for nursing in today's world and for the future, the program at the University of Maine School of Nursing is designed to prepare a nurse who can: 1) make relevant, effective responses to the needs of people in providing direct care; 2) demonstrate an ability to work effectively to coordinate care in various settings; 3) identify her role as a professional nurse in the community.

Philosophy

The faculty believes that nursing is an art and a developing science which began with the simple acts of caring and curing. The essence of nursing is captured in the word "response." Nursing begins with the initial response of recognizing

the biological, social and psychological needs of the client, makes a priority assessment of such needs and utilizes feasible modes of nursing intervention. It is this set of sensitive and crucial responses which comprise excellence in nursing care.

The faculty further believes that adequate professional nursing preparation occurs within the climate of higher education. The practice of nursing stems from a theoretical base that concerns man in his biological, social and cultural environment, and the utilization of this knowledge in nursing science.

The Program

Because of the changing curriculum and the desire to individualize instruction the prospective student is urged to seek the adviser's assistance early in her academic career in order to plan her program of study.

a) The minimum requirement of the nursing major is 59 hours which must include the following:

Nu 01	The Role of the Nurse
Nu 02	Fundamentals of Nursing
Nu 100/Nu 101	Nursing of Adults
Nu 102/Nu 103	Nursing of Mothers and Children
Nu 104	Community Health
Nu 105	Community Health Nursing
Nu 106	Psychiatric Nursing
Nu 107	Comprehensive Nursing
Nu 108	Seminar in Nursing

b) In addition to the general education requirements of the University of Maine at Portland, the following courses are required and prerequisite to the clinical nursing courses:

Zo 3	Animal Biology
Sy 3	Introduction to Sociology
Py 1	General Psychology
A second course in Psychology	
Fn 152	Human Nutrition
One mathematics course Ms 19	Principles of Statistical Inference is recommended

One semester course from Group A

Sy 4	Introduction to Sociology
Ay 1	Introduction to Anthropology
Ay 2	Introduction to Anthropology
Pol 1	Introduction to Government
Pol 2	Introduction to Government

Eight hours from Group B

Ch 11/12	General Chemistry
or Ch 13/14	Chemical Principles
or Bc 7	Fundamentals of Chemistry
Bc 8	Elementary Physiological Chemistry

Four hours from Group C

Zo 8		Anatomy and Physiology
Zo 10		Anatomy and Physiology
Zo 177		Animal Physiology

Two semester courses from Group D

By 127		General Bacteriology
By 128	*and*	Laboratory for General Bacteriology
or By 127		General Bacteriology
By 21A	*and*	Elementary Microbiology Laboratory

Course Descriptions

Nu 01. The Role of the Nurse—A survey of the current and expanding roles of the nurse. *Cr* 3. EELLS, MACLEAN

Nu 02. Fundamentals of Nursing—Serves as a foundation for subsequent courses. The emphasis is on learning fundamental concepts and skills needed to provide professional nursing care for selected patients. Prerequisite: junior status or consent of instructor. *Cr* 3. STONE AND STAFF

Nu 100/Nu 101. Nursing of Adults (undergraduate only)—Basic nursing intervention required to meet the major health needs of adults. Emphasis on scientific principles underlying nursing action. Prerequisite: Nu 02. *Cr* 6, 6. TALBOT AND STAFF

Nu 102/Nu 103. Nursing of Mothers and Children (undergraduate only) Family centered approach to nursing needs of parents and children with guided experiences in the field of maternal, infant and child care in the hospital and community. *Cr* 6, 6. TRYON AND STAFF

Nu 104. Community Health (undergraduate only)—Concepts and principles basic to the development and maintenance of community health. Includes theories of ecology, biostatistics, epidemiology and the organization and delivery of health services to the community. *Cr* 3. ROSCOE AND STAFF

Nu 105. Community Health Nursing (undergraduate only)—Concepts and selected field experiences essential to the understanding of the role of the nurse in the community. Prerequisite: Nu 100/Nu 101 and Nu 102/Nu 103. *Cr* 6. ROSCOE AND STAFF

Nu 106. Psychiatric Nursing (undergraduate only)—Guided experience in the application of psychodynamic concepts to the nursing care of selected patients. Prerequisite: Nu 100/Nu 101 and Nu 102/Nu 103. *Cr* 6. COTTON AND STAFF

Nu 107. Comprehensive Nursing (undergraduate only)—Designed to increase the student's competency in providing complex nursing care and to assist her in applying administrative concepts in a leadership role. Prerequisite: Nu 100/Nu 101 and Nu 102/Nu 103. *Cr* 12. STONE AND STAFF

Nu 108. Seminar in Nursing (undergraduate only)—Current problems of the profession. Prerequisite: Nu 100/Nu 101 and Nu 102/Nu 103. *Cr* 2. IVANISIN

Nu 199. Reading Course (undergraduate only)—Individual study in an area of nursing with the permission of the instructor. *Cr* 2-3. STAFF

PHILOSOPHY (Pl)

PROFESSORS HJELM, VIRTUE; ASSOCIATE PROFESSORS SKORPEN,* TREDWELL (Chairman); ASSISTANT PROFESSORS WARNE, WEBER; INSTRUCTOR MRS. FARTHING; LECTURER DR. WEISZ

Philosophy, man's search for basic understanding of himself, his culture, and his world, has always been both a generous critic and a dissatisfied goal-maker for liberal education. As a critic, it offers insight into intellectual method and the procedures of judgment and evaluation; as a goal-maker, it seeks the union of theory and practice through immediate participation in cultural processes themselves.

The Humanities Requirement

You may meet the Arts and Sciences humanities requirement by taking any six hours in Philosophy. Pl 1.2, Philosophy and Modern Life, is *reserved for freshmen and sophomores.* It may not be taken by upperclassmen, except that upperclassmen who have already had Pl 2 under the old requirement may take Pl 1 to complete their requirement. Freshmen and sophomores are also eligible for other courses in the department.

Philosophy courses that are open without prerequisite are: Pl 103, Early Modern Philosophy; Pl 104, 19th and 20th Century Philosophy, Pl 111, Ethics; Pl 121, Existentialism; Pl 161, Biblical Thought; and Pl 163, Religions of the East. Any of these courses may be used as an introduction to philosophy and as the first step in meeting the humanities requirement. Other courses in the department carry prerequisites—usually, satisfactory completion of one 100-level philosophy course. Examine the individual course listings in this catalog or in the University time schedule for details.

1. 2. Philosophy and Modern Life—An introduction to philosophical thinking through an examination of contemporary spokesmen on ethics, religion, education, and politics and a critical comparison of their ideas with those of major philosophers of the Western tradition. Representative topics are: classic and contemporary views of social justice; egoism and unselfishness; tradition and the formation of the present. Restricted to freshmen and sophomores. First semester, MR. HJELM AND MR. WEBER; Second semester, MR. TREDWELL AND MRS. FARTHING. *Cr* 3.

70. Perspectives in Culture—The interrelations of the sciences and the arts in contemporary culture. For seniors in practice teaching only. Not offered in 1970-71.

100. Readings in Philosophy—Individual study of a selected topic, agreed upon by the student and instructor. *Cr* 1-3. STAFF

History of Philosophy

‡***101. History of Ancient Philosophy***—From the earliest Greeks through the Romans, with central emphasis on Plato and Aristotle, and including the Epicureans and Stoics.

‡***102. History of Mediaeval Philosophy***—The development of thought from

* on leave 1970-71

the confluence of Greco-Roman philosophy with the Judaic, Christian, and Islamic traditions to the philosophies of the High Middle Ages. Next offered in 1971-72. *Cr* 3.

†***103. Early Modern Philosophy***—The emergence of rationalism and empiricism on the continent and in the British Isles. A study of representative chief thinkers from Descartes and Bacon to Hume. *Cr* 3. MR. TREDWELL

†***104. Late Modern Philosophy***—The philosophy of Kant and later idealism and other representative philosophers such as Comte, Mill, and Spencer in the 19th century. *Cr* 3. MR. TREDWELL

107. American Philosophy—A brief examination of colonial and early 19th century American contributions to the development of present-day philosophy. Particular emphasis will be given to the philosophical views of Royce, Pierce, James, Dewey and Santayana. Prerequisite: one course in philosophy. *Cr* 3. MRS. FARTHING

108. Philosophical Classics—An intensive study of the works of a major philosopher or school. This course is conducted in seminar style, and ordinarily treats intensively a philosopher or school of the period considered by the history of philosophy course in the preceding term. Prerequisite: one course in philosophy or consent of the instructor. First semester: Peirce, MRS. FARTHING. Second semester: St. Thomas Aquinas, MR. WEBER. *Cr* 3.

Value Theory

111. Ethics—An introductory inquiry into problems of the good life and of right and wrong action. Classical moral theories, such as those of Aristotle, Hume, Kant, and Kierkegaard, are examined and discussed in the light of contemporary ethical and meta-ethical issues. *Cr* 3. MR. TREDWELL

113. Aesthetics—Analysis of aesthetic experience and value. Various theories and interpretations, classical and contemporary, of the nature of beauty, feeling, and the arts are studied. Prerequisite: one course in philosophy or consent of the instructor. *Cr* 3. MR. WARNE

Philosophy of Man

121. Existentialism—Subject matter of the course is viewed in historical perspective to the perennial philosophical questions of human identity, individual purpose, existential courage, etc. Concepts of despair, alienation, tragic heroism, bad faith, authenticity, shipwreck and recovery are explored in the writings of such men as Kierkegaard, Nietzsche, Camus, Sartre, Heidegger, and Jaspers. *Cr* 3. MR. WEBER

123. Philosophical Anthropology—Speculation about human nature has led Western philosophers to draw wide-ranging conclusions for ethics, aesthetics, political philosophy and philosophy of education. This course examines these views in detail, treating such writers as Plato, Aquinas, Dewey, Cassirer and Sartre. Prerequisite: one course in philosophy or consent of the instructor. *Cr* 3. MR. WEBER

Logic and Formal Studies

131. Logic I—An introductory course in modern symbolic logic. Techniques of deductive inference, including decision procedures and axiomatization, are

studied in developing the propositional and predicative logics. Some attention, as time permits, is given to metalogic and the philosophy of logic. *Cr* 3. MR. WARNE

132. Logic II—A course in advanced topics in symbolic logic. Topic for second semester, 1970-71: modal logic—an investigation of the semantical and syntactical features of modal logic and their relationship to issues in ethics, epistemology, and religion. Prerequisite: Pl 131 or consent of the instructor. *Cr* 3.
MR. WARNE

Philosophy of Science

141. Philosophical Problems in the Natural Sciences—A critical examination of the conceptual and experimental procedures scientists employ in formulating and evaluating their theories. Readings from scientists' writings and from contemporary philosophers of science. Not offered in 1970-71. *Cr* 3.

142. Philosophical Problems in the Social Sciences—A critical discussion of the theories and procedures of the social scientists. Designed to elucidate the philosophic presuppositions of social sciences and the philosophical ramifications of their findings. Prerequisite: a major in social sciences and junior standing. *Cr* 3. MR. WEBER

Topics in Philosophy

153. Philosophy of History—A critical examination of the problem of historical knowledge, and of major speculative contributions to the interpretation of history. Readings will include Hegel, Marx, Spengler, and Toynbee. Prerequisite: one course in philosophy or consent of the instructor. Not offered in 1970-71. *Cr* 3.

154. Epistemology—Concentrating on the theory of knowledge since Kant, this course examines such topics as: the sense-data theory of the origin of knowledge; the relation of language to theories; and the methods by which claims to know are supported or dismissed. Prerequisite: one course in philosophy. Not offered in 1970-71. *Cr* 3.

155. Metaphysics—A study of traditional and contemporary views on the nature of reality. Historical treatment of representative metaphysicians of the past forms the basis for an examination of the categories and tenets of present-day metaphysicians. Prerequisite: one course in philosophy or consent of the instructor. *Cr* 3. MRS. FARTHING

156. Philosophy of Religion — A philosophical study of religion, with emphasis on such topics as revelation and reason, religious language and the Divine existence as they have been dealt with in classical and contemporary thought. Prerequisite: one course in philosophy or consent of the instructor. Second semester. *Cr* 3. MR. WARNE

159. Topics in Philosophy—Individual and small group study of problems or systems of philosophical concern. The course is conducted in seminar style, and, relying on careful use of major philosophical resources, attempts fresh exploration of fundamental topics. Topic for first semester, 1970-71: Analytic Philosophy. MR. WARNE. Second semester: Spinoza, MR. TREDWELL. *Cr* 3.

Religious Thought

161. Introduction to Biblical Thought—An introduction to the historical, literary and theological development of the Biblical tradition from the time of the Hebraic origins to the period of the emergence and expansion of the Christian community. *Cr* 3. MR. HJELM

163. Religions of the East—A study of the principal living religions of India, the Far East and the Middle East in their historical development with special emphasis on theological, literary and cultic characteristics. *Cr* 3. MR. HJELM

164. Western Religious Thought—An examination of the main developments of the Judeo-Christian tradition from the first to the 17th century. Special emphasis is given to the reading of primary sources from the Christian tradition. *Cr* 3. MR. HJELM

165. Religious Thought of the 18th and 19th Centuries—An analysis of the significant developments of religious thought from the Enlightenment to World War I. Special emphasis will be placed on the reading of representative primary sources from Hume to Barth. Prerequisite: one other course in the history of religious thought, or Pl 103, or Pl 104. *Cr* 3. MR. HJELM

169. Topics in Religion—Individual and small-group study of problems and issues in religious thought. Conducted in seminar style, this course undertakes detailed examination of topics of present interest to students of religion. Since its content varies from term to term, Pl 169 may be repeated for credit. Not offered in 1970-71. *Cr* 3.

PHYSICS AND ASTRONOMY

PROFESSORS CAMP (Chairman), BISCOE, CARR, KRUEGER; ASSOCIATE PROFESSORS BROWNSTEIN, COFFIN, CSARINSZKY, EDGERTON, HARMON, MORROW; ASSISTANT PROFESSORS CLARK, HESS, SMITH, TARR, VIETTI; INSTRUCTORS, MR. R. H. LITTLEFIELD, MR. R. G. LITTLEFIELD; TEACHING ASSOCIATE MR. BURKE

ASTRONOMY (As)

9. Descriptive Astronomy—An elementary course emphasizing the principles of this natural science. Lectures are supplemented by demonstrations in the planetarium and the observatory. *Cr* 3.

14. Navigation—The compass, piloting, dead reckoning, the sailings, celestial navigation. Prerequisite: trigonometry. Not given every year. *Cr* 3.

15/16. General Astronomy—A more complete treatment of the subject than is possible in As 9. Prerequisite: one year of college mathematics. *Cr* 3.

59/60. Advanced Astronomy—Spherical trigonometry; determination of time, latitude, longitude; celestial mechanics, artificial satellites, interplanetary flight; eclipses; stellar parallax, motions, strucuture; binary stars, sizes and masses. Prerequisite: Ms 28 or permission. Not given every year. *Cr* 3.

PHYSICS (Ps)

The department offers major work leading to the degree of bachelor of arts in physics in the College of Arts and Sciences, and also major work leading to the degree of bachelor of science in engineering physics in the College of Technology.

The following courses should be taken by all candidates for the B.A. degree: Ps 1/2 (or 1a/2a), 17, 18, 36, 153, 155, 172, 176, along with Ms 12, 27/28, 29.

A minimum of 35 credit hours in physics is required although in special cases a course in another department may be substituted for a physics course. In addition, Ch 13/14 and further courses in mathematics are recommended. Any program of study must be approved by the department.

Prospective physics majors should take Ms 12 and Ms 27 and, if possible, Ps 1/2 (or Ps 1a/2a) in the freshman year. If not prepared for Ms 12, a student should elect Ms 4 and, if taking physics concurrently, should take Ps 1a/2a.

The following courses of the more descriptive variety are open to all students and have no prerequisite: Ps 3, 9, 10, 31.

1/2. General Physics—The fundamentals of mechanics, matter, sound, heat, electricity magnetism, light, and modern physics. The course meets the needs of engineering and science students. Calculus will be used. *Lec* with *Dem* 2. *Rec* 1, *Lab* 3, *Cr* 4. MR. BROWNSTEIN AND STAFF

1a/2a. General Physics—The fundamentals of mechanics, sound, heat, electricity, magnetism, light, and modern physics. Similar to Ps 1/2 but with less emphasis on computations and more emphasis on discussion and graphical methods. Calculus is not used. *Meets the needs of predental and premedical students. Lec* with *Dem* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. BISCOE AND STAFF

3. Descriptive Physics—For the non-science student. A treatment in non-mathematical language of the more important topics in physics. Designed to develop an appreciation for the concepts, vocabulary, and methods of the science. *Lec* with *Dem* 3, *Cr* 3.

6. Essentials of Physics—A one-semester general physics course designed primarily for students from the College of Life Sciences and Agriculture. A condensation of Ps 1/2 accompanied by a careful selection of the topics treated. *Lec* with *Dem* 3, *Lab* with Discussion 4. *Cr* 5.

9. Climatology—An introduction to general climatology, treating the elements and controls of climate, climate classification, and various relationships between climate and other natural phenomena and human activities. No prerequisite. *Rec* 3, *Cr* 3. MR. VIETTI

10. Meteorology—The earth's atmosphere, composition, and movements. Atmospheric conditions accompanying changes in weather, and weather predictions. Air-mass analysis. The course may be followed by Course 161. *Rec* 3, *Cr* 3. MR. VIETTI

17. 18. Intermediate Physics—A more rigorous treatment with the calculus of general physics to supplement. Courses 1/2 or 1a/2a, either of which is a prerequisite, to complete suitable preparation for advanced courses in the department. *Lec* 2, *Comp* 2, *Cr* 3. MR. COFFIN AND OTHERS

19. 20. Sophomore Laboratory-Physics—Normally taken concurrently with Ps 17. 18, but may be taken separately by permission. Students enrolled in Ps 36 may take Ps 19, and students enrolled in Ps 172 may take s 20. *Lab* 2, *Cr* 1. MR. COFFIN AND STAFF

31. Photography—Fundamental theories and techniques. For the scientist and the amateur. Characteristics and use of various types of cameras, lenses, exposure and exposure meters, emulsions, filters, artificial lighting and copying contact and projection printing, dark-room practice. *Rec* 2, *Lab* 2, *Cr* 3. MR. KRUEGER

36. Introductory Modern Physics for Engineers—Selected topics in

molecular, atomic, electronic, and nuclear physics, intended to meet the needs of the present-day engineering student. College physics, calculus, and some chemistry are prerequisite. *Lec* 2, *Rec* 1, *Cr* 3. MR. HARMON

153. Electrical Measurements—A third-year laboratory course covering theories and practices in the measurement of electrical and magnetic quantities. *Lab* 4, *Cr* 2. MR. TARR

155. Electricity and Magnetism—An advanced treatment of the fundamental aspect of electrostatics, magnetism, electromagnetic phenomena, direct and alternating currents. Prerequisite: Ps 18 or permission. *Rec* 3, *Cr* 3. MR. BISCOE

161. Advanced Meteorology—A more theoretical treatment than Course 10, combined with which the meterology requirement for government service is satisfied. Not given every year. *Rec* 3, *Cr* 3. MR. VIETTI

162. Heat and Thermodynamics—The laws of thermodynamics. Thermodynamic description of the properties of matter. *Rec* 3, *Cr* 3. MR. BISCOE

163. Statstical and Thermal Physics—Emphasizes the principles and methods of statistical mechanics as a foundation for classical thermodynamics. Elementary statistical mechanics applied to systems of current interest. Quantum statistics and non-equilibrium theory considered as time permits. Prerequisites: Ps 17, 18, 36. Not given every year. *Rec* 3, *Cr* 3.

166. Physical Electronics—Electronic ballistics, electronic emission, high-vacuum, solid state, and gaseous electronics. Not given every year. *Rec* 3, *Cr* 3.

169. Atomic Physics—Atomic and molecular physics. Includes atomic structure, X-rays, quantum concepts and spectroscopy. Prerequisite: Ps 36 or permission. *Rec* 3, *Cr* 3. MR. TARR

170. Nuclear Physics—Basic concepts, radioactivity, nuclear reactions, alpha-beta and gamma-decay. A more specialized course than Ps 169. *Rec* 2, *Cr* 3, *if taken with laboratory or Cr* 2 *if taken without laboratory*. MR. HESS

172. Optics—An introductory study of geometric and physical optics. *Rec* 3, *Cr* 3. MR. EDGERTON

176. Physical Measurements—A third-year laboratory course in which experiments are selected from various branches of physics. *Lab* 4, *Cr* 2. MR. TARR

181. 182. Advanced Laboratory Physics—Selected projects for senior students. Opportunity is given to develop original ideas and to design and construct novel apparatus. Departmental approval required. *Lab* 6, *Cr* 3. STAFF

186. Introduction to Quantum Mechanics—Concepts of quantum theory. The Schrodinger equation and its solution for simple physical systems. Perturbation theory. Prerequisite: Ps 169, and differential equations. *Rec* 2, *Cr* 2. MR. CARR

191. 192. Mathematical Physics—An advanced theoretical course which deals with the mathematical aspects of physics. Mathematics is treated as a tool in the analysis of physical problems. Analytical mechanics is emphasized the first semester; topics are selected from the whole field of physics in the second semester. *Rec* 3, *Cr* 3.

193. Topics in Physics—A course primarily for undergraduates dealing with selected topics in areas not already covered by regular course offerings in the department. Given on demand. *Cr Ar*. STAFF

196. Physics of Materials—Relates the commonly observed macroscopic properties of materials to the microscopic process from which they result. Electrical, magnetic, optical, and mechanical properties will be discussed. Prerequisites: Ps 36, Ps 155 and Ms 29. *Rec* 3, *Cr* 3. MR. SMITH

198a/198b. Physics Seminar—Oral and written reports on approved topics. Primarily for seniors. 198a No Credit, 198b *Cr* 1. MR. SMITH

199. Problems in Physics—A thesis project primarily for undergraduates and ordinarily of an experimental nature. *Cr Ar.* (1-3). STAFF

Graduate Courses

201. Mechanics—Prerequisite: Ps 191 or equivalent. *Rec* 3, *Cr* 3. MR. EDGERTON

205. Modern Physics—Prerequisite: an undergraduate course in Modern Physics or its equivalent, and mathematics through ordinary and partial differential equations and vector analysis. *Rec* 3, *Cr* 3. MR. CARR

210. 211. Graduate Laboratory — An advanced treatment which stresses sophisticated techniques and attempts to acquaint the student with the state of the art in several different areas of experimental physics. For graduate students in physics and for scientists and engineers in neighboring disciplines and industry. Prerequisites: graduate standing in physics, chemistry, electrical engineering, or permission of the instructor. Hours and credits arranged to fit individual needs. Coordinator MR. CLARK.

212. Electrodynamics I—Prerequisite: Ps 192 or its equivalent, and mathematics through partial differential equations, vector analysis and elementary complex variable theory. *Rec* 3, *Cr* 3. MR. KRUEGER

218. 219. Methods of Theoretical Physics—The level is that of *Methods of Theoretical Physics* by Morse and Feshbach. Prerequisite: Ps 192 or equivalent. *Rec* 3, *Cr* 3.

220. Quantum Mechanics I—Prerequisite: Ps 205. *Rec* 3, *Cr* 3. MR. BROWNSTEIN

230. Statistical Mechanics—Prerequisite: Ps 162 or its equivalent, and mathematics through differential equations. *Rec* 3, *Cr* 3. MR. HARMON

234. X-Rays—Not offered every year. *Rec* 3, *Cr* 3. MR. BISCOE

291. Special Topics in Theoretical or Experimental Physics—Given on demand. *Cr Ar.* STAFF

300. Graduate Seminar—*Cr Ar.*

307. Nuclear Physics—Ps 205 is prerequisite. Not offered every year. *Rec* 3, *Cr* 3. MR. HESS

313. Electrodynamics II—Prerequisite: Ps 212. Not offered every year. *Rec* 3, *Cr* 3. MR. KRUEGER

315. Spectroscopy at Microwave and Radio Frequencies—Prerequisite: Ps 205, Ps 192, or equivalent. *Rec* 3, *Cr* 3. MR. CARR

321. Quantum Mechanics II—Prerequisite: Ps 220. MR. BROWNSTEIN

324. Solid State Physics I—Prerequisite: Ps 205. *Rec* 3, *Cr* 3. MR. CAMP

325. Solid State Physics II—Prerequisite: Ps 324 or equivalent. *Rec* 3, *Cr* 3. MR. CAMP

328. Plasma Physics—Prerequisite: Ps 212 and Ps 230 or equivalent. *Rec* 3, *Cr* 3. MR. HARMON

399. Graduate Thesis—*Cr Ar.* GRADUATE STAFF

GRADUATE WORK IN PHYSICS

The degrees of master of science and doctor of philosophy are offered in physics. See secion on Graduate Study for detailed requirements.

SPECIMEN CURRICULUM IN PHYSICS[1]

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Ps	1,	or 1a General Physics	4	Ps	2,	or 2a General Physics	4
Ms	12	Anal. Geometry and Calculus	4	Ms	27	Anal. Geometry and Calculus	4
Eh	1	Freshman Composition	3	Eh	10	Modern Literature	3
		Foreign Language	3			Foreign Language	3
Pe	1	Physical Education	0	Pe	2	Physical Education	0
			14				14

Sophomore Year

			Hours				Hours
Ps	17	Intermediate Physics	3	Ps	18	Intermediate Physics	3
Ps	19	Soph. Laboratory Physics	1	Ps	20	Soph. Laboratory Physics	1
Ps	36	Introd. Mod. Physics	3	Ps	172	Optics	3
Ms	28	Calculus	4	Ms	29	Differential Equations	4
Ge	7	Computer Programming	2			Foreign Language	3
		Foreign Language	3	Sh	1	Fund. Pub. Speaking	3
			16				17

Junior Year

			Hours				Hours
Ch	13	Chemical Principles	4	Ch	14	Chemical Principles	4
Ps	153	Electrical Measurements	3	Ps	169	Atomic Physics	3
Ps	155	Electricity and Magnetism	2	Ps	176	Physical Measurements	2
Ms	153	Part. Diff. Equations	3	Ms	154	Part. Diff. Equations	3
		Humanity or Social Science	3			Humanity or Social Science	3
			15				15

Senior Year

	Hours		Hours
Electives[2]	9	Electives[2]	9
Social Science or Humanity	3	Social Science or Humanity	3
Social Science	3	Social Science	3
	15		15

1. This curriculum is intended to be suggestive of a typical program. Modifications are possible.

2. One physics course should be included.

POLITICAL SCIENCE (Pol)

PROFESSORS MAWHINNEY (Chairman), COLLINS, SCHOENBERGER, THOMSON
ASSOCIATE PROFESSORS CLARK, HAYES, PALMER; ASSISTANT PROFESSORS
CARSTARPHEN, HENDERSON, HORAN, REID, SHIN, WENDZEL, WIKSTROM;
INSTRUCTOR HELMKE; MR. BAGGETT, MR. MARSTERS, MR. HAAG,
MRS. GODWIN; MR. BRALEY, MR. FLYNN, MR. JORDAN,
MR. LATESSA

Students may major in the following fields: (1) political science, (2) international affairs, or (3) public management.

Specific requirements for majors:

1. Political Science: A minimum of 36 hours of work in the department excluding Pol 7. 8 and Pol 21. 22 Required courses: Pol 1/2, Pol 183/184 or 189. 190, and for all seniors Pol 197. In addition a student is required to select one of the following alternatives. (1) Related Areas—General: 18 hours from the following courses: Ay 1. 2, Ec 10, Hy 3. 4 or 5. 6, Pl 1. 2, Py 1, or Sy 3/4; or (2) Related Areas—Specific: 18 hours, including the foundation course, in one of the following fields: economics, history, psychology, sociology or anthropology.
2. International Affairs: See page 120.
3. Public Management: See page 77.

The department offers M.A. degrees in political science and public management and a master of public administration degree. Students desiring to concentrate in international affairs may do so within the M.A. in political science.

Bureau of Public Administration

Created within the Department of Political Science by the 102nd Maine Legislature, the Bureau of Public Administration is engaged in governmental research and publication and in programs of career development over the state. Political science students are encouraged to use its collections of governmental materials.

Courses in Geography (Geo)

1. Physical Geography—Basic knowledge of the world's physical environments, organized under five topics; maps, weather and climate, landforms, soils, and vegetation. Prerequisite: sophomore standing. *Cr* 3.

2. World Regional Geography—A study of world regions and their human occupants. Special attention will be given to those regions which are the focus of world attention. Prerequisite: sophomore standing. *Cr* 3.

26. Economic Geography—The geographical aspects of world resources, production, and trade. Prerequisite: sophomore standing. *Cr* 3.

101. Historical Geography of North America—The growth of the American economy studied in its spatial aspect as reflected by urban and rural settlement patterns. Particular attention given to three historical "cross-sections": 1760, 1860, and 1910. Prerequisite: junior standing. *Cr* 3.

102. Urban Geography—Techniques of regional geographic analysis as applicable to urban study. Emphasis on spatial patterns which transport facilities and associated commercial, residential, and governmental land uses assume in the American city. Prerequisite: junior standing. *Cr* 3.

123/124. Political Geography—The geographic and demographic factors that condition national and international politics. Emphasis will be placed on the relationships of the major nations to their areas and to the world, on examination of the strategic necessities, and on historical reviews of ther resultant foreign policies. *Cr* 3. MR. SCHOENBERGER

150. The Geography of Canada—The analysis of the physical and human elements and their part in producing the distributional patterns of present day Canada. Regional case studies focusing on current problems and future potentialities. *Cr* 3.

Courses in Political Science (Pol)

1/2. Introduction to Government—An introduction to the discipline of political science, with emphasis on United States government and politics. Political systems, cultures, and ideologies are discussed; political institutions and processes in the United States are studied and compared with those of other Western and non-Western states. *Cr* 3. MR. HORAN, Chairman

3. State Government—State constitutions, structure and functions of state government, relations with federal, state and local governments. Prerequisite: sophomore standing. *Cr* 3. MR. PALMER

7. 8. Maine Government—Practical operations and current problems of state and local government in Maine. One lecture each week by an official, followed by a discussion period. Open to all students. *Cr* 1.
MR. PALMER AND GUEST LECTURERS

7a. 8a. Maine Government—Designed for prospective teachers and others who wish more material on Maine government than is given in Pol 7. 8. No person may receive credit for both Pol 7 and 7a or for both Pol 8 and 8a. *Cr* 2.

21. 22. Current World Problems—A study of contemporary national and international affairs based on area studies of the United States, the Soviet Union, Europe the Middle East, the Far East, and Southeast Asia. Open to all students. *Cr* 2. MR. SCHOENBERGER

55. Congressional Internship—A first-hand study of the national legislative process and the function of the legislator. The student will be assigned to the staff of a Congressman or Senator in Washington, D. C., from about February 1 to the end of June. Readings and reports are required in addition to the staff work. Open to juniors on a competitive basis. Rules announced publicly each fall semester. *Cr* 6. MR. PALMER

131. Introduction to Comparative Politics—A systematic study of the nature, dimensions, and issues in the discipline of comparative politics. The course will emphasize relevant theories and approaches, basic conceptual tools, analytical skills, spatial and chronological surveys of various political systems, and the processes of political development. Prerequisite: Pol 1/2. MR. HENDERSON

133. The American City—The process of government in urban America, including concepts of local self-government, forms and procedures in urban governing, and developments in intergovernmental relations and metropolitan areas. Prerequisite: Pol ½. *Cr* 3. MR. WIKSTROM

134. Municipal Administration—The management, financial control and administration of modern American cities; emphasis on personnel and finance administration, the city plan, and line functions: public safety, transportation, health and welfare, housing. Prerequisite: Pol 133. *Cr* 3. MR. WIKSTROM

135. Democratic Governments of Europe—The political traditions, parties, governmental structures, and special political problems of Great Britain, France and West Germany. Prerequisite: Pol 1/2. *Cr* 3. MR. HORAN

136. Communist Governments—Marxism-Leninism and the contemporary Communist party, state, economy and society of the Soviet Union. Survey of the satellites. Prerequisite: Pol 1/2. *Cr* 3. MR. HORAN

144. Public Relations—Principles of public relations and a study of their application through cases and problems. National, international, community and educational public relations with press, consumers, taxpayers, and other groups. *Cr* 2.

151. Public Administration—The dynamics of governmental administration including administrative principles, decision-making, communication, leadership organizational models and technical, political and personal factors of administration. Prerequisite: Pol 1/2. *Cr* 3. MISS CARSTARPHEN

152. Administrative Law—Primarily case studies of the legal adjustment of administrative authority and individual liberty, including: judicial control over administration, personal liability of officers, scope and limits of administrative powers and the due process measurement of administrative procedure. Prerequisite: Pol 151. *Cr* 3. MISS CARSTARPHEN

156. Political Parties—Development and present organization and operation of the American party system. Nature and function of major and minor parties, sectionalism, nominating systems, presidential and congressional elections, the electorate, finance, interest groups. Prerequisite: Pol 1/2. *Cr* 3. MR. HAYES

158. Public Opinion—The role of public opinion in American democracy; definition and measurement; sociological and psychological influences; mass media; linkage to government. Prerequisite Pol 1/2. *Cr* 3. MR. HAYES

159. Problems of American Government—An examination of basic problems of American national government. Case studies in such areas as federalism, the nature of the presidency, congressional organization, civil rights and liberties, the role of the judiciary, and foreign affairs. Prerequisite: Pol 1/2. *Cr* 3. MISS CARSTARPHEN

160. Problems of State Government—An examination of basic problems of American state government. Case studies in such areas as the role of the states in the federal system, the office of the governor, lawmaking, administrative organization, the nature of the judiciary, and the future of state government. Prerequisite: Pol 1/2. *Cr* 3. MR. PALMER

165. Governments of South Asia—The governments and politics of selected countries of South and Southeast Asia. Emphasis on common problems of emergent nations of the area. *Cr* 3. MR. HENDERSON

166. Governments of East Asia—A study of the contemporary political systems of China and Japan. *Cr* 3. MR. HENDERSON

167. Emerging Africa—The transition of Ghana, the Congo and other selected areas from colonial to independent states. Attention to political and economic organization and the native culture's impact on government. Prerequisite: Pol 1/2. *Cr* 3. MR. TROMSON

168. Government in Latin America—Concentration on "political styles," the contemporary struggle between tradition and revolution, political elites, economic and political problems. Selected case studies, not necessarily the same each year. Prerequisite: Pol 1/2. *Cr* 3. MR. HENDERSON

173. 174. International Relations—In the first semester an analysis of the international system of states; the impact of nationalism; the restraints imposed on the unilateral actions of governments; and the possibility of peace resulting from war, disarmament, functionalism, and diplomacy. In the second semester an analysis of the administration and implementation of United States foreign policy. Prerequisite: Pol 1/2 or six hours of history. *Cr* 3. MR. SCHOENBERGER, MR. HORAN

182. Introduction to Law—The focus of the course is on the nature and functions of law in the modern world; on law as part of the study of society. Not a technical course in law. Prerequisite: junior or senior standing. *Cr* 3.
MR. THOMSON

183/184. Constitutional Law—The political, social and economic development of the Constitution through Supreme Court decisions. Court procedures. First semester: decisions on the nature of the federal system and commerce, taxation and war powers. Second semester: decisions in civil liberties; Bill of Rights and Fourteenth Amendment. Prerequisite: Pol 1/2. *Cr* 3. MR. MAWHINNEY

187. International Law—Historical treatment and analysis. Includes development of international law, recognition of states, nationality, law of treaties, responsibilities of states, and legal regulation of the use of force. *Cr* 3.
MR. COLLINS

188. International Organization—The forms, functions and development of international organization. Conferences, international administration and adjudication, international federation, world government. United Nations and specialized agencies—organization and administrative procedures. *Cr* 3.
MR. COLLINS, MR. HELMKE

189. 190. Political and Social Thought—A survey of political theories from ancient Greece to the French Revolution. The basic approach is historical, and seeks to relate theories of politics to the environments in which they developed. Prerequisite: junior or senior standing. *Cr* 3. MR. REID, MR. THOMSON

191. American Political Ideas—The development of political ideas in America from 1620 to the present. *Cr* 3. MR. THOMSON

192. Modern Political and Social Thought—From the French Revolution to the present. Liberalism, utilitarianism, socialism, fascism, communism. *Cr* 3.
MR. THOMSON

194. Asian Political Ideas—The traditional pattern of Asian thought on man, society and politics: Chinese, Indian (Hindu), Muslin. Seminar style, one two-hour meeting per week. Prerequisite: junior standing. *Cr* 3.

195. Municipal or State Internship—Professional experience in either a local government unit or a department or agency of state government. Open to selected students. Reports and readings required. State government option available under the Maine State Government Internship Program enacted by the 103rd Legislature; Municipal Government option required for the B.A. or M.A. degree in Public Management. *Cr* 3 or 6 hrs. Students may not receive more than 6 credit hours for internships within the department. MR. WIKSTROM, MR. PALMER

196. International Affairs Internship—Study during the summer in a government agency, an international organization, or a business with overseas operations. Readings, reports, and on-the-job training required. Open to junior or senior International Affairs majors. *Cr* 3. MR. SCHOENBERGER

197. Scope of Political Science—The scope and nature of the study of politics: power and society; basic descriptive political theory and the role of

political institutions. Prerequisite: Pol 1/2. Open to senior Political Science majors or with permission. *Cr* 3. MR. THOMSON

199. Theory and Methodology of International Relations—An analysis of traditional and current theories of international politics and the application of such theories to specific situations. Particular emphasis will be given to such approaches as systems analysis, game theory, decision-making, simulation, and the development of theoretical models. Prerequisite: Pol 173, *Cr* 3. MR. SCHOENBERGER

Graduate Courses

200. City and Regional Planning—*Cr* 3.

201. State Administration—*Cr* 3.

205. Political Man and His Milieu—*Cr* 3.

212. Electronic Data Processing in Public Administration—*Cr* 3.

217. Comparative Administrative Systems—*Cr* 3.

231. Topics in Comparative Politics—*Cr* 3.

237. The Evolution and Development of Canadian Government and Politics—*Cr* 3.

249. Seminar in American Politics—*Cr* 3.

273. Problems in International Politics—*Cr* 3.

283. 284. American Constitutional Development—*Cr* 3.

287. Problems in International Law—*Cr* 3.

289. Topics in the History of Political Philosophy—*Cr* 3.

294. Topics in Political Theory—*Cr* 3.

295. Methods of Political Science—*Cr* 3.

297. 298. Seminar—*Cr* 3.

302. Topics in Public Administration—*Cr Ar.*

303. Topics in International Relations—*Cr Ar.*

310. Administrative Theory—*Cr* 3.

311. Program Analysis and Evaluation—*Cr* 3.

320. Urban Regional Government—*Cr* 3.

325. Planning and Organization for Economic and Social Development—*Cr* 3.

327. Intergovernmental Relations—*Cr* 3.

331. Seminar in Comparative Politics—*Cr* 3.

333. Community Political Power Structures—*Cr* 3.

350. Independent Readings—*Cr Ar.*

397. Method Seminar in Public Administration—*Cr* 3.

398. Project Seminar in Public Administration—*Cr* 3.

399. Graduate Thesis—*Cr Ar.*

PROJECTS-IN-LEARNING

Projects-in-Learning consists of two component programs which are experimental in nature, and designed to offer to qualified students an opportunity to explore in depth subjects not normally dealt with in the curriculum.

One program, Independent Study, is available to students with an accumulative point average of 2.5 or better and sophomore standing or above. Independent Study projects are arranged between instructor and student. An instructor helps the student shape a project and is available for guidance at all times; however,

emphasis is on the word *independent* and the student is encouraged to work on his own. Independent study projects can be used to satisfy major requirements with the prior approval of the department head.

The second component is the Special Seminar Program. Each semester seminars dealing with topics not covered in depth in regular courses are offered to students who have an accumulative point average of 2.0 or better and have sophomore standing or above. Emphasis is placed on topics of concern to interested students and faculty and range from those dealing with contemporary social problems to those designed to explore the unusual and provocative. Examples of seminars recently offered are: "The Brain and the Computer" and "Contemporary Poetry." Special seminars do not satisfy any university, college or departmental requirements.

The Projects-in-Learning Program is directed by a supervisory committee which must approve all projects work. Students, faculty and administrators are encouraged to formulate and submit imaginative proposals to the committee which consists of four faculty members and four students.

Eligible students may take up to four "projects" in their last three years but no more than one each semester. All projects work is graded Pass or Fail.

Information regarding this program may be obtained from advisers and from the Dean's Office, 100 Stevens Hall.

PSYCHOLOGY (Py)

PROFESSORS ANTONITIS, GLANVILLE, KAPLAN, NICHOLS, PLISKOFF (Chairman), SAPER; ASSOCIATE PROFESSORS ABELSON, FREY, HAMMER, G. KULBERG, MAGARO, STONE, WADE; ASSISTANT PROFESSORS CHERULNIK, FARTHING, GERSHMAN, GOLD, J. KULBERG, MARTINDALE, RYCKMAN, STUBBS, VITRO; LECTURERS GRANT, SANDERS

The instruction offered by the Department of Psychology is designed to acquaint the student with psychology as a biological science and as a social science. The department provides the student with training in psychological theory and methodology as well as in the applications of psychology.

The minimum requirement for a major in the department is 27 hours, which must include Py 1, Py 45, Py 141, and Py 171. Additional courses to complete the major requirement will be chosen in conjunction with a departmental advisor, who may recommend additional courses outside the department.

Py 1—General Psychology, is a prerequisite for all advanced courses in the department.

1. General Psychology—A survey of psychology as the science of behavior. Lecture discussions of basic psychological processes including conditioning, perception, motivation and emotion, higher mental processes, individual differences and personality, and additional selected topics. To provide depth to the student's experience, participation in research to a maximum of two hours is expected. *Cr* 3.
STAFF

5. Applied Psychology for Nurses—An introductory course for three-year nurses. Not acceptable for credit towards the B.S. degree in the School of Nursing, University of Maine. *Cr* 2. STAFF

Unless other prerequisites are stated, Course 1 or the equivalent is prerequisite for the following advanced courses.

20. 21. Child Study Laboratory—Observation and study of a group of pre-school children. Individual projects, supplemented by reading and class discussions. Opportunity to assist in guiding the children's activities. *Rec* 2, *Lab* 3, *Cr* 3. MR. NICHOLS, MRS. GERSHMAN

45. Principles of Psychological Research—Techniques of psychological research. Applications of general methodology and specific techniques to major problem areas in behavioral research. Prerequisite: Py 141 (may be taken concurrently). *Cr* 3. MR. FARTHING, MR. STUBBS

74. Seminar in Issues in Contemporary Psychology—A review of some of the current theoretical issues and research findings in the general areas of psychology. *Cr* 3. MR. MAGARO

90. Problems in Psychology—Opportunity to carry out a particular research problem under supervision. *Per. Cr. Arr.*

103. Applications of Behavior Principles—Methods employed in the experimental analysis of behavior; principles of respondent (classical) and operant (instrumental) conditioning; applications of principles to the understanding and control of behavior in everyday life situations. *Cr* 3. MR. ANTONITIS

111. Business and Industrial Psychology—Applications of psychological principles, facts, and research methods to problems of trait and proficiency measurement, selection, efficiency, training, accidents, motivation, and adjustment in business and industry. *Cr* 3. MR. WADE

117. Educational Psychology — The underlying psychological principles useful to the educator: understanding individual differences in development, personality, intelligence; principles of effective learning; interpretation of standardized tests. *Cr* 3. MRS. GERSHMAN, MRS. KULBERG, MR. VITRO

123. Psychology of Childhood—A systematic study of the child's behavior and psychological development. Emphasis upon principles underlying development, methods of child study, and practical implications. *Cr* 3.
MRS. GERSHMAN, MRS. KULBERG

124. Psychology of Adolescence—Adolescent development in the physical, intellectual, emotional, and social spheres. Adolescent personality and problems of adjustment in relation to the family, the school and the community, and the world of work. Delinquency and abnormality in adolescents. *Cr* 3.
MRS. GERSHMAN

126. Psychology of the Retarded Child — Description and analysis of various types and levels of retardation and study of causative factors. Consideration of psychological principles and techniques applicable to the identification, care, and training of retarded children. Prerequisite: Py 123. *Cr* 3. MR. NICHOLS

127. Psychology of the Superior Child—Identification development, and behavioral characteristics of superior children. Discussion of social and psychological problems associated with the superior child. *Cr* 3. (Not offered 70-71)

128. Psychology of the Exceptional Child—A consideration of the development and behavior of the exceptional child. Special emphasis on the practical

problems related to the management of children with intellectual, emotional, orthopedic, sensory, and academic handicaps. Prerequisite: Py 123. *Cr* 3.
MR. NICHOLS

130. Social Psychology—An introduction to the study of social behavior from a psychological perspective. Representative topics include culture and personality, attitude formation and change, conformity, leadership and prejudice. *Cr* 3.
MR. CHERULNIK, MR. RYCKMAN, MR. STONE

132. Mental Hygiene—A consideration of the fundamental factors in human adjustment with emphasis upon the prevention of inadequate adjustments and upon the processes by which maladjusted individuals may be restored to normal living. Family and educational situations will be emphasized. *Cr* 3. MR. HAMMER

133. Abnormal Psychology—The origin, development, and manifestations of the psychoneuroses and major psychoses with a view to better understanding of deviant behavior in our society. Emphasis of the biological, social, and psychological determinants of deviant behavior. *Cr* 3. MR. KULBERG, MR. MAGARO

138. Theories of Personality—A survey of the chief contemporary approaches to the study of personality. Critical issues in personality. Consideration of assessment techniques and research methods. *Cr* 3. MR. MARTINDALE

141. Statistics in Psychology—A survey of techniques used to obtain, display, analyze, and interpret data in psychology. *Cr* 3. MR. ABELSON, MR. GOLD

147. 148. Experimental Psychology—*First semester:* Techniques and objective approach to the study of human perception, learning, psychophysics, etc. Training in writing psychological research reports. *Second semester:* Basic principles in programming and use of operant conditioning procedures with animal subjects. Planning and conducting an original investigation by the student. *Rec* 2, *Lab* 4, *Cr* 4. Prerequisite or concurrently: Py 141. MR. GLANVILLE

151. Psychology of Motivation—A survey of theory, research methodology and experimentally obtained facts related to the activation and direction of behavior. *Cr* 3. MR. MARTINDALE

154. Learning and Motivation—An examination of fundamental principles of classical conditioning and instrumental learning, including interrelations between learning and motivation. Research data will be discussed in relation to various theories of learning. Laboratory work will emphasize demonstrations of fundamental learning phenomena in animal subjects. *Lec* 3, *Lab* 2, *Cr* 4.
MR. FARTHING

155. Psychology of Learning—Basic principles that underlie the discovery, fixation, and retention of new modes of human behavior. Conditioned response learning, serial learning, memory and forgetting, transfer of training, thinking and problem solving, insight and concept formation, individual differences in learning. *Cr* 3. MR. ANTONITIS

157. Learning in the Classroom—An examination of the basic phenomena and principles involved in understanding and managing the learning process in the classroom from subprimary through the college level. Prerequisite: Py 117 or equivalent. *Cr* 3. MRS. KULBERG

161. Sensation and Perception—A systematic examination of selected sensory and perceptual processes. Emphasis on the experimental method, research findings and theoretical interpretations. *Cr* 3. MR. STUBBS

165. Physiological Psychology—Physiological bases of behavior with emphasis upon the development and function of the nervous system and the sense

organs; the relation between psychological processes and physiological activity. Prerequisite: a basic course in Zoology. *Cr* 3. MR. ABELSON

167. Animal Behavior—An examination of several topics in comparative animal psychology, including learning, motivation, sensory processes, behavior genetics, innate behavior, social behavior, and the development of behavior. Various methods of investigating and classifying animal behavior are critically evaluated. Prerequisites: Py 1 and Zo 3 or consent of instructor. *Cr* 3. (Not offered 70-71)

171. History and Systems of Psychology—An historical account of the development of psychology; the development of psychological concepts and points of view prior to Wundt; a consideration of the major modern systems and schools of psychology. *Cr* 3. MR. GLANVILLE

Graduate Courses

222. Advanced Child Psychology—*Cr* 3. MR. NICHOLS
223. Identification of Emotionally Disturbed Children—*Cr* 3. MR. SAUNDERS
224. Experimental Child Psychology—*Cr* 4. MR. NICHOLS
234. Advanced Psychopathology—*Cr* 3. MR. KULBERG
242. Psychological Methodology—*Cr* 3. MR. WADE
243. Correlation Techniques—*Cr* 3. MR. GOLD
244. Psychological Test Theory—*Cr* 3. MR. GOLD
245. Nonparametric Techniques in Psychology—*Cr* 3. (Not offered 70-71)
247. Introduction to Factor Analysis—*Cr* 3. (Not offered 70-71)
251. Advanced Physiological Psychology—*Cr* 4. MR. ABELSON
256. Theories of Learning—*Cr* 3. MR. PLISKOFF
261. Advanced Social Psychology—*Cr* 3. MR. RYCKMAN
263. Group Processes—*Cr* 3. MR. CHERULNIK
265. Attitudes and Opinions—*Cr* 3. MR. RYCKMAN
303. Ethics and Professional Problems—*Cr* 1. MR. GRANT
311. Scientific Inquiry in Psychology—*Cr* 3. MR. ANTONITIS
312. Advanced Experimental Psychology—*Cr* 3. MR. WADE
315. Advanced Experimental Design—*Cr* 3. (Not offered 70-71)
317. Experimental Social Psychology—*Cr* 3.
321. Individual Psychological Testing—*Cr* 4. MR. VITRO
325. Basic Methods in Assessment—*Cr* 3. MR. KULBERG, MR. SAUNDERS
326. Advanced Clinical Assessment—*Cr* 3. MR. HAMMER
327. Clinical Interviewing—*Cr* 3. MR. KULBERG
328. Consultation—*Cr* 3. MR. SAPER
330. Practicum (activity)—*Cr Ar.*
341. Personality—*Cr* 3. MR. RYCKMAN
342. Theories of Psychopathology—*Cr* 3. MR. MARTINDALE
343. Seminar in Clinical Psychology—*Cr* 3. MR. KULBERG
347. Seminar in School Psychology—*Cr* 3. (Not offered 70-71)
351. Child Psychopathology—*Cr* 3. (Not offered 70-71)
355. Seminar in Psychotherapy—*Cr* 3. MR. HAMMER
357. Case Studies in Psychotherapy—*Cr* 3. MR. HAMMER
358. Seminar in Behavior Therapy—*Cr* 3. MR. SAPER

361. Seminar in History and Systems of Psychology—*Cr* 3. (Not offered 70-71)

362. Seminar in Physiological Psychology—*Cr* 3. (Not offered 70-71)

363. Seminar in Learning—*Cr* 3. MR. STUBBS

364. Seminar in Motivation—*Cr* 3. (Not offered 70-71)

365. Seminar in Perception—*Cr* 3. (Not offered 70-71)

366. Seminar in Social Psychology—*Cr* 3.

368. 369. Manpower Research Seminar—*Cr* 3.
MR. CHERULNIK, MR. BOLARIA, MR. CLARK, MR, FORSGREN

371. Topics in Child Psychology—*Cr* 3. (Not offered 70-71)

372. Topics in Comparative Animal Behavior—*Cr* 3. MR. FARTHING

373. Topics in Physiological Psychology—*Cr* 3. (Not offered 70-71)

374. Topics in Learning—*Cr* 3. MR. PLISKOFF

375. Topics in Sensation and Perception—*Cr* 3. (Not offered 70-71)

376. Topics in Quantitative Methods in Psychology—*Cr* 3. (Not offered 70-71)

377. Topics in Clinical Psychology—*Cr* 3. MR. MAGARO

390. Directed Research: (area)—*Cr* not to exceed 6. STAFF

392. Directed Reading: (area)—*Cr* not to exceed 6. STAFF

399. Graduate Thesis—*Cr Ar.*

SOCIOLOGY (Sy)

PROFESSOR MACCOBY (Chairman); PROFESSOR SEZAK; ASSOCIATE PROFESSORS GUPTILL, MEAD, WASS; ASSISTANT PROFESSORS BOLARIA, DEWITT; COOPERATING MEMBERS: PROFESSOR PLOCH; ASSISTANT PROFESSOR HYATT; GRADUATE ASSISTANTS BRYAN, NYBERG, RICH, SACKS

The Department of Sociology presents a program of study designed to further the student's perception and understanding of social interaction and group processes, and to provide fundamental concepts and basic research skills in the disciplines for which the department is responsible—sociology and social welfare.

The undergraduate major in the department may select and develop, in consultation with his adviser, a basic curriculum (or a series of courses) which will give him an opportunity to develop his interests and provide him with the background necessary for his future needs.

Students in the department major in sociology, which includes those who concentrate in (a) sociology or (b) social welfare. All students must meet the general requirements of the College of Arts and Sciences, and one of the following:

Specific Requirements for Sociology Majors:

Sociology Option: Introduction to Anthropology (Ay 1), Introduction to Sociology (Sy 3/4), Statistical Methods for Sociological Research (Sy 119), Methods of Social Research (Sy 120) and Sociological Theory (Sy 160).

Non-departmental electives recommended are General Psychology (Py 1/2), Social Psychology (Py 130), Principles of Economics (Ec 1/2), and Introduction to Government (Pol 1/2).

Social Welfare Option: Introduction to Anthropology (Ay 1), Introduction to Sociology (Sy 3/4), Statistical Methods for Sociological Research (Sy 119), Sociological Theory (Sy 160), Social Welfare (Sw 150/151) and Social Work as a Profession (Sw 152/153). In addition, Field Experience in Social Welfare (Sw 154/155) is available as an elective. These required Sw courses meet the current recommendations of the Council on Social Work Education, of which this department is a constituent member.

The two introductory courses, Ay 1 and Sy 3/4, should be taken during the freshman or the sophomore year. The Introductory Anthropology and Sociology courses may be taken concurrently. A minimum of 36 hours of departmental course work must be taken; the maximum number of hours permitted within the department is 48.

Students who wish to explore the requirements for graduate study or the professional or career aspects of the disciplines (sociology, social welfare) should consult with their departmental adviser.

Sociology of Education (Sy 5ed), Sociology for Nurses (Sy 6n), and Marriage (Sy 7) do not carry credit toward the department major.

A specimen curriculum for the freshman-sophomore years is provided in the appropriate College of Arts and Sciences section of this catalog.

The department offers a program of study leading to the master of arts degree in sociology. The general requirements are described in the Graduate School Catalog.

SPECIMEN CURRICULUM IN SOCIOLOGY

The sociology major is required to take Introduction to Anthropology (Ay 1), Introduction to Sociology (Sy ¾), Statistical Methods for Sociological Research (Sy 119), Methods of Social Research (Sy 120) and Sociological Theory (Sy 160). The sociology major who elects the Social Welfare option is required to take Introduction to Anthropology (Ay 1), Introduction to Sociology (Sy ¾), Statistical Methods for Sociological Research (Sy 119), Sociological Theory (Sy 160), Social Welfare (Sw 150/151) and Social Work as a Profession (Sw 152/153).

Freshman Year

Ay	1	Introduction to Anthropology
Sy	3	Introduction to Sociology
Eh	1	Freshman Composition or Eh 9, Modern Literature
Fr	3	(or Gm 3) Intermediate French or Intermediate German
Pe	1	Physical Education
Zo	3	Animal Biology, or Ms 5, Elements of College Mathematics
Sy	4	Introduction to Sociology
Eh	1	Freshman Composition or Eh 10, Modern Literature
Fr	4	(or Gm 4) Intermediate French or Intermediate German
Pe	2	Physical Education
Sh	1	Funds. Public Speaking
Zo	4	Animal Biology, or Ms 6, Elements of College Mathematics

Sophomore Year

Py	1	Geneal Psychology	Ay	2	Introduction to Anthropology or Sy 4, Introduction to Sociology
Ay	1	Introduction to Anthropology or Sy 3, Introduction to Sociology			Foreign Language, if not completed in freshman year
		Foreign Language, if not completed in freshman year			Humanities course
		Humanities course			

Sociology recommended electives: Py 1, General Psychology; Ec 10, Principles of Economics; Pol 1/2, Introduction to Government. Social Welfare recommended electives: Pol 1/2, Introduction to Government.

Students who major in the Department of Sociology will establish, in consultation with their major adviser, the program for their junior and senior years. Consult this catalog for specific courses in the program areas offered by the department —sociology, and social welfare, and for department requirements concerning advanced courses.

Sociology (Sy)

3/4. Introduction to Sociology—The fundamental concepts, principles, and methods of sociology; analyzes the influence of social and cultural factors upon human behavior; evaluates effect of group processes, social classes, stratification, and basic institutions on contemporary society. The first semester (Sy 3) concentrates on concepts and principles; the second semester (Sy 4) on application of these to various social problem areas. *Cr* 3. STAFF

5ed. Sociology of Education—The major principles of sociology; the culture concept and its use in perceiving and understanding the diversity of the social system in relation to the school and education; discussion of school-community relationships, social groups, and pattern of social behavior. Offered concurrently with Mhe 50 and Py 70. Credits are not accepted toward the department major. *Cr* 3. MR. SEZAK

6n. Sociology for Nurses—An introductory semester course which presents the fundamentals of sociology; description and analysis of the structure and dynamics of human society; social norms, intergroup relations, social change, stratification and institutions. Discussion of hospital-community relationships. A course for nurses at Eastern Maine Medical Center. Credits are not accepted toward the department major or B.S. in Nursing. *Cr* 2. MR. DEWITT

7. Marriage—A study of the factors involved in success and failure in marriage. Research in the social, psychological and biological sciences is applied to common personal problems of courtship, marriage and parenthood. Open to all students in the University. No prerequisite. Credits are not accepted toward the department major. *Cr* 2. STAFF

24. Sociology of Rural Life—Significance of rural society in American culture. The impact of forces of change, including population movement. The significance of changes in the institution of family, religion, education, and stratification. The course is the same as Ab 24. *Cr* 3. MR. PLOCH

110. Social Organization—An examination of selected institutions in modern society, analysis of social roles, processes and structures within typical organized groups, such as industrial, military, religious and fraternal organizations; discussion of bureaucracy, decision making, social conflict; the implication of

cultural and technological change. Prerequisite: Sy 3 or permission of instructor. *Cr* 3. MR. BOLARIA

113. Deviant Behavior—The origins and causes of socially disapproved behavior; ways in which society interprets and copes with the deviant. Study of the major forms of social disorganization; specific social problems are considered, such as suicide, crime, drug addiction, alcoholism, prostitution, mental illness, divorce, group conflict. Prerequisite: Sy 3 or permission of the instructor. *Cr* 3. MR. DEWITT

114. Social Change—Analysis of sociocultural factors related to social change and the dynamics of the change process. Sy 3 or permission of the instructor. Cr 3. MR. DEWITT

115. Sociology of Adolescence—Attention is given to the social behavior of adolescents, the development of adolescent culture and the involvment of adolescents in the various social systems and the class structure of society. Prerequisite: Sy 3 or permission of instructor. *Cr* 3. STAFF

118. Sociology of the Family—A sociological approach to the study of the family, including the structure of social relationships, the modern American family as a social institution, the cultural background of the family, and the impact of social change. Prerequisite: Sy 3 or permission of the instructor. *Cr* 3. MR. SEZAK

119. Statistical Methods for Sociological Research—Emphasis on the uses of statistics in the organization, interpretation and presentation of sociological research data. Prerequisite: Ms 13/14 or permission of the instructor. *Cr* 3. MR. GUPTILL

120. Methods of Social Research—An introductory research course. Nature of scientific social inquiry; problem formulation; sources of data; basic methods and techniques; use of specific tools in social research; theoretical relation between data collection and findings. Field studies. Prerequisite: Sy 3, Sy 119, or permission of instructor. *Cr* 3. MR. GUPTILL

121. Juvenile Delinquency—The problem of adolescence in modern society. Discontinuities of teenage roles; influence of various subcultures on patterns of behavior; problems of the adolescent in his social environment; delinquency as a social problem; theories of delinquency causation; issues, programs. Prerequisite: Sy 3, or permission of instructor. *Cr* 3. MR. MEAD

122. Criminology: The Adult Offender—Social and cultural factors in the causation of crime among adults; organized crime as a social phenomenon in American life; specific types of criminal careers; legal and judicial aspects of crime. Prerequisite: Sy 3, or permission of instructor. *Cr* 3. MR. MEAD

123. Social Stratification—Systematic analysis of social differentiation and evaluation. Theories of, and research in, the structure and function of class, caste, and ethnic stratification. Descriptive materials will be drawn from studies of American and other societies. Prerequisite: Sy 3, or permission of instructor. *Cr* 3. MR. GUPTILL

125. Industrial Sociology—Social factors involved in the development of industries; social consequences of technological change; social organization within industry; problems encountered within the social structure(s) of industry. Prerequisite: Sy 3, or permission of instructor. *Cr* 3. MR. BOLARIA

126. Sociology of Urban Life—A descriptive and analytical approach to the study of city life. Emphasis is placed on environment, social organization,

the ecological processes, population, areas, housing, and maladjustments. No freshmen. Prerequisite: Sy 3, or permission of the instructor. *Cr* 3.

MR. SEZAK, MR. MEAD

129. The Individual and the Community—Analysis of the functioning and structure of the community. Emphasis on ways in which individuals and groups are affected by community dynamics. Group processes, leadership, program planning and development are stressed. Community project. Prerequisite: Ab/Sy 24 or Sy 26 or permission. Course same as Ab 129. *Cr* 3. MR. PLOCH

134. Population—Theories of population. Demography; analysis of birth, death, and migration trends. Problems and policies. Prerequisite: Sy 3/4 or permission of instructor. *Cr* 3. STAFF

135. Human Ecology—Spatial distribution of human beings and related activities and social processes. Prerequisite: Sy 3 or permission of instructor. *Cr* 3.

STAFF

138. Race and Culture Conflict—Analysis of factors involved in group conflict, with emphasis on minority groups in culture contact situations. Prerequisite: Sy 3 or permission. *Cr* 3. STAFF

140. Social Control—Examination and comparison of major control mechanisms used in sacred and secular societies. Emphasis on various institutions of social control and their role in establishing and maintaining social order. Sy 3 or permission of the instructor. *Cr* 3. STAFF

160. Sociological Theory—A critical examination of the sociological theories of Marx, Max Weber, Durkheim, and contemporary theorists such as Parsons and Robert Merton. Study of developments in sociological theory as related to methodology, social issues, and current trends in contemporary sociology. Prerequisite: Sy 3 and two other courses in sociology, or permission of the instructor. *Cr* 3.

161. History of Sociology—Trends and leading figures in the history of sociology. Survey of current approaches and established principles in the field. Prerequisite: Sy 3 and two other courses in sociology, or permission. Seniors only. *Cr* 3.

169. Collective Behavior and Social Movements—Behavior of groups such as mobs, crowds, and riots which involve little cultural direction. Relatively unstructured mass behavior and broad society-wide movements are analyzed. Sy 3 or permission of the instructor. *Cr* 2.

170. Small Group Analysis—Communication and interaction patterns within small groups are identified and analyzed. Course involves participation in and observation of such interaction. Prerequisite: Sy 3 or permission of instructor. *Cr* 3.

171. Sociology of Medicine—Attention is given to the relationship between sociocultural factors and the occurrence of disease and the social systems which are developed in the treatment and prevention thereof. Prerequisite: Sy 3/4 or permission of instructor. *Cr* 3. MR. BOLARIA

180. The Science of Social Man—The course will review and seek to integrate to the extent possible, basic concepts, theoretical systems and methodological issues in the behavioral sciences. It will be inter-disciplinary in nature and help the student understand the degree to which a unified science of man has been approached, as well as the problems yet to be resolved. It will also consider the implications of outstanding recent contributions. It will be jointly taught

by members of this department as well as by other faculty who may be invited to participate. Prerequisite: senior sociology majors or permission of instructors. *Cr* 3. STAFF

182. Sociology of Religion—An objective study of religion as a social institution. Attention is given to the social correlations of religion and the functions of religion in society. Prerequisite: Sy 3 or permission of instructor. *Cr* 3. MR. DEWITT

184. Sociology of the Military—An analysis of the military viewed as a social system. An examination is made of professional and conscript military roles, professional ideology and decision-making processes, and other social organizational aspects of the armed forces. Prerequisite: Sy 3 or permission of the instructor. *Cr* 3.

197/198. Department Projects—For the advanced student. Minimum of 15 hours of department courses as a prerequisite. Apply directly to Professor Sezak before registration. *Cr* 2 or 3.

Graduate Courses

219. Intermediate Quantitative Methods in Sociology— *Cr* 3.
240. Seminar on Action Sociology—Cr 3.
297. Directed Research *Cr Ar.*
298. Directed Readings *Cr Ar.*
305. Advanced Sociology of Education—*Cr* 3. MR. SEZAK
310. Seminar in Social Organization—*Cr* 3. MR. BOLARIA
313. Seminar in Social Disorganization—*Cr* 3. MR. DEWITT
318. Advanced Sociology of the Family—*Cr* 3. MR. SEZAK
320. Seminar in Research Methods—*Cr* 3.
326. Seminar in Formal Organization—*Cr.* 3. MR. BOLARIA
329. Seminar in Community Studies—*Cr* 3. STAFF
368. 369. Manpower Research Seminar—*Cr* 3.
MR. HUG, MR. FORSGREN, MR. BOLARIA, MR. STONE
371. Seminar in Medical Sociology— MR. BOLARIA
382. Advanced Sociology of Religion—*Cr* 3. MR. DEWITT
399. Graduate Thesis—*Cr* 6.

Social Work (Sw)

150/151. Social Welfare—Study of social welfare as a social institution. An examination of social welfare programs, their philosophy and methods, within a social and cultural context. Prerequisite: Ay 1 or Sy 3. *Cr* 3. MR. WASS

152/153. Social Work as a Profession—Study of the ideology and methods of the social work profession. An examination of the role of the social worker in modern society, and the relationship of social work to other helping professions: psychology, psychiatry, medicine, and the ministry. Prerequisite: Sy 150/151, seniors, or permission of instructor. *Cr* 3. MR. WASS

154/155. Field Experience in Social Work—Field observation and experience in community agencies to enable students to apply social science and social welfare knowledge and to test their motivation and capacity for the field of social work. Prerequisite: seniors and permission of instructor. *Cr* 3. MR. WASS

SPEECH (Sh)

PROFESSOR GARDNER (Chairman); ASSOCIATE PROFESSORS BOST, COLBATH, DOPHEIDE, GILLESPIE, PETTIT, SCHER; ASSISTANT PROFESSORS W. BURNS, E. CYRUS, HARTMAN, RICE, VAN RHEENEN, WILKINSON; INSTRUCTORS MR. F. BURNS, MR. DEVINE, MR. DOUGLASS; PART-TIME INSTRUCTORS MRS. MOWER, MRS. PICKERING; GRADUATE ASSISTANTS MR. BOWERS, MISS DENITHORNE, MR. GEAGHAN, MRS. KALLOCH, MR. LONGTIN, MR. PIETROSKI, MISS SALSBURY

The major studies may lead to either a B.A. degree in speech or a B.A. degree in theatre. In addition, the major in speech permits the student, by meeting special requirements, to concentrate in one of the following areas: broadcasting; oral communication (general speech, rhetoric and public address, and speech education); or speech pathology and audiology. Specific requirements for each are available at the departmental office, including suggestions for preferred courses in meeting college requirements.

All majors in the department are required to complete six hours in one or more of the areas of the department, outside of the particular area of concentration or major.

All majors are expected to take advantage of the laboratory opportunities offered by the department through University Forensics, the Maine Masque Theatre, WMEB-FM and WMEB-TV, and the Speech and Hearing Center.

The department offers programs leading to the master of arts degree. Further details may be found in the Graduate School Catalog.

Courses in Oral Communication (Sh)

The University forensic program offers practical experience in debate, discussion, oratory, extemporaneous speaking, and oral interpretation through competition with other colleges and universities. All undergraduate students in the University may participate in the program.

1. Introduction to Oral Communication—An analysis of the basic elements of interpersonal oral communication in modern society. Experience in the preparation, presentation, and analysis of representative speaking experiences. *Cr* 3.
MR. W. BURNS, Chairman

4. Introduction to Discussion and Debate—Principles and methods used by individuals and groups in discovering and supporting intelligent decisions on controversial issues. Emphasis on the interrelationship of thought, speech, and social action in classroom experiences. *Cr* 3. MR. DOUGLASS, MRS. HARTMAN

9. Parliamentary Procedure—The principles and methods by which groups organize themselves and transact business with efficiency and fairness. *Cr* 1.
MR. GARDNER

41. Fundamentals of Interpretation—An introduction to the art of interpretation in order to stimulate an understanding and responsiveness to literature and to develop the ability to convey to others, through oral reading, an appreciation of that literature. *Cr* 3. MRS. RICE, Chairman

51. 52. Debate Laboratory—Practical application of the principles and procedures of debate through the University of Maine Forensic Program. Prerequisite: Sh 4 or permission. *Lab* 2, *Cr* 1. STAFF

101. Advanced Public Speaking—An examination of the problems and principles of the types of speech common to contemporary life. Classroom experience in the preparation and presentation of speeches. Prerequisite: Sh 1 or 4. *Cr* 3.
MR. VAN RHEENEN

103. Speech Analysis and Criticism—Study of the nature, significance, and influence of public speech with emphasis on the problems and methods in description, analysis, and evaluation of the speech situation. Prerequisite: Sh 1 or 4. *Cr* 3. MR. DOUGLASS

105. Group Discussion—The theory and methods of group procedures in problem-solving. Emphasis on current theories in group methods and participation in group discussions. Prerequisite: Sh 4. *Cr* 3. MRS. HARTMAN

107. Argumentation—Concepts, principles, and procedures of reasoned discourse, with emphasis on the process of critical decision-making through debate and persuasion. Prerequisite: Sh 4. *Cr* 3. MR. GARDNER

155. American Public Address—Consideration of representative American speakers from colonial times to the present. A critical analysis of the materials, structure, and style of selected speeches. Prerequisite: Sh 1 or 4. Sh 103 is recommended. *Cr* 3. MR. W. BURNS

158. Directing the Forensic Program—An analysis of the duties, responsibilities, and opportunities of the director or coach of extemporaneous speaking, oratory, discussion, and debate, with attention to the training procedures in these areas. Limited to juniors and seniors. Prerequisite: Sh 4 or permission. *Cr* 3.
MRS. HARTMAN

190. Ensemble Interpretation—Application of the basic principles of oral reading to the problems of group interpretation of literature. Emphasis on methods, materials, and actual participation in group reading. Prerequisite: Sh 41 and permission. *Cr* 3. MRS. RICE

192. Advanced Oral Interpretation—Consideration of the particular problems involved in the oral reading of the following: (1) prose, (2) poetry, and (3) drama. Limited to juniors and seniors. Prerequisite: Sh 41 or permission. *Cr* 3.
MRS. RICE

‡***197. Teaching of Speech***—Problems, methods, and materials related to the teaching of speech. Particular attention to the co-curricular speech program. Prerequisite: permission. *Cr* 3. MRS. HARTMAN

Courses in Theatre (Sh)

The Maine Masque Theatre presents four major productions each year, in addition to other laboratory or studio programs, and serves as a practical training ground in theatre. All students in the University are eligible to read for plays to be produced and may participate in the other areas of the theatre.

11. Introduction to Theatre—A study of the nature of the theatre medium, its basic elements and techniques. Emphasis on the principles that underlie theatre practice and the process by which plays are translated into theatrical expression. For the general student as well as prospective theatre majors. *Cr* 3.
MR. WILKINSON, Chairman

14, 15. Stagecraft—An introduction to technical production in the areas of scene design, lighting, costumes, properties, and makeup. Projects and laboratory work associated with theatre productions will be required. *Fall semester*:

scene design and lighting; *Spring semester*: costumes, properties and makeup. Sh 11 recommended. *Lec* 2, *Lab* 2, *Cr* 3. MR. CYRUS

16. Play Production—An introduction to the responsibilities of the director and to the basic principles of stage directing, including choosing and analyzing plays, scheduling rehearsals, blocking action, and determining stage business. Backstage work on major and laboratory theatre productions is recommended. *Lec* 2, *Lab* 2, *Cr* 3. MR. COLBATH, MR. WILKINSON

17. Fundamentals of Acting—The basic skills of acting, including the actor's internal preparation for playing a role and the development of his external techniques for projecting the role to his audience. *Lec* 2, *Lab* 2, *Cr* 3. MR. WILKINSON

68. Theatre Practicum—Supervised experience in Maine Masque Theatre productions in such areas as: acting, stage managing, publicity, scenery, lighting, and costume. Prerequisite: six hours of theatre courses and permission. May be repeated for a maximum of three hours. *Cr* 1. STAFF

161. 162. Theatre History—A study of the development of the drama, physical theatre, and modes of production. *Fall semester*: Greek theatre through the Renaissance. *Spring semester*: Restoration to the present day. Limited to juniors and seniors. *Cr* 3. MR. BOST

†***163. Scene Designing***—Principles, methods, and materials used in scene designing. Laboratory projects in preparing the complete design for a particular production, including drawings and plans. Prerequisite: Sh 14. *Cr* 3. MR. CYRUS

‡***164. Stage Lighting***—Principles, methods, and materials used in stage lighting, including their artistic and technical applications. Projects will include problems in lighting particular productions. Prerequisite: Sh 14. *Cr* 3. MR. CYRUS

165. Stage Costuming — An introduction to aspects of stage costuming including history, aesthetic principles, and practical application to actual productions. Prerequisite: Sh 15. (Not offered every year.) *Cr* 3.

166. Stage Directing—The translation of all aspects of the theatre production into an artistic unity. Emphasis on theatre aesthetics. Practice in the directing of short plays, with particular attention to the director's work with the actor. Prerequisite: Sh 16. Limited to juniors and seniors. *Lec* 2, *Lab* 2, *Cr* 3. MR. COLBATH

167. Advanced Acting—Development of the individual actor's versatility, with emphasis on the actor's exploration of himself as an instrument. Practice in broadening basic acting skills, role interpretation, and characterization. Limited to juniors and seniors. Prerequisite: Sh 17. *Lec* 2, *Lab* 2, *Cr* 3. MR. WILKINSON

Courses in Broadcasting and Film (Sh)

Radio Station WMEB-FM provides practical experience in broadcasting. All students have the opportunity to work for staff positions and program assignments. Certain opportunities are available on University television station WMEB-TV.

21. Introduction to Broadcasting and Film—Survey of the nature of the mass communications media of radio, television, and film in America, developmental history, social and economic influence, philosophy, and systems of content and dissemination. *Cr* 3. MR. SCHER

22. Basic Audio Techniques—The role of sound in radio, television, and

film. Basic considerations of equipment, audio patterns, and voice requirements. Emphasis on the role of the announcer and narrator. *Lec* 1. *Lab* 4. *Cr* 3.

MR. DEVINE

23. Radio Laboratory—Practicum in the functions of radio programming and production. Students will be assigned specific responsibilities in the operation of WMEB-FM. Prerequisite: three hours of broadcasting courses and permission. May be repeated for a maximum of three hours. *Cr* 1. MR. DEVINE

170. Broadcasting and Government—A study of the relationship between station operation and governmental policy or regulation. Special emphasis on the licensee's public service responsibilities as established by legislative and judicial precedents. Prerequisite: Sh 21 or permission. *Cr* 3. MR. SCHER

171. Writing for Broadcasting—An analysis of the problems in writing for radio and television. The preparation of different forms of continuity copy and the creation of various types of programs. Prerequisite: Sh 21 or 22 or permission. *Cr* 3. MR. SCHER

172. Advanced Audio Techniques—Production of audio patterns for the mass media. Emphasis on the art of the radio production and the television or film soundtrack as an aesthetically composite whole. Prerequisite: Sh 22 or permission. *Cr* 3. MR. DEVINE

173. Basic Television Production—An introduction to the theory and processes of television production. Emphasis on the use of television equipment, its potentials and limitations. Prerequisite: Limited to juniors and seniors or by permission. *Lec* 2, *Lab* 2, *Cr* 3. MR. DEVINE

174. Advanced Television Production—An analysis of the problems involved in the creation, production, and direction of the television program. Emphasis on the total production as an aesthetic whole. Prerequisite: Sh 173 or equivalent. *Lec* 1, *Lab* 4, *Cr* 3. MR. DEVINE

175. Film in Television—Basic film techniques as they relate to television. Analysis of the problems in planning, producing, and editing. Prerequisite: Sh 22 or permission. *Lec* 2, *Lab* 2. (Not offered every year). *Cr* 3.

176. Broadcast Programming—The problems in planning, preparing, and scheduling programs for radio and television. Major consideration to the interrelationships of audience analysis, station policy, advertising needs, and industry or federal guidelines. Prerequisite: Sh 21 or permission. *Cr* 3. MR. SCHER

177. Using Television in the Classroom—The values and potentials of utilizing radio and television in education, with particular emphasis on current use of the media in elementary and secondary schools, colleges and universities, and adult education. *This is not a course in producing the instructional program.* Limited to juniors and seniors. (Not offered every year). *Cr* 3.

178. Television Laboratory—Students will serve as crew members at a television studio. Crew functions will include camera operation, technical direction, announcing, and various other production duties. Prerequisite: Sh 173. *Cr* 3. STAFF

Courses in Speech Pathology and Audiology (Sh)

The Speech and Hearing Center is available for both diagnosis and therapy for all who can benefit from its services. It also provides training opportunities for those who are preparing to become speech therapists.

31. Voice and Diction—Designed to establish good speech habits through

an understanding of the vocal mechanism and instruction in the development, care, and use of the speaking voice. *Cr* 3. MR. GILLESPIE, Chairman

32. Phonetics—A study of the formation, auditory recognition, and phonetic (IPA) transcription of the sounds of the English language, with an examination of the interrelationship of such sounds in connected speech. *Cr* 3.
MR. GILLESPIE

180. Language and Speech Development—An examination of the psychological and sociological foundations of language development and the sequential aspects of speech development. The interrelationships of the natural and behavioral sciences in understanding the speech and language processes. Limited to juniors and seniors or by permission. *Cr* 3. MR. GILLESPIE

181. Introduction to Speech Pathology—A survey of the major disorders of speech with attention to their recognition and the principles of their treatment. *Recommended for all teachers.* Limited to juniors and seniors or by permission. *Cr* 3. STAFF

182. Fundamentals of Speech Pathology—A professional orientation to the diagnosis and treatment of speech disorders presented by school age children. Emphasis on the interpersonal therapeutic experience and basic clinical procedures. Supervised observations of therapy will constitute a portion of the course. Prerequisite: Sh 181. *Lec* 2, *Lab* 2, *Cr* 3. MR. DOPHEIDE

183. Anatomy and Physiology of the Speech Mechanism—Study of the structures, the muscular system, and the nervous system underlying breathing, phonation, articulation, and language. While emphasis is placed on normal neurophysiological function, attention is directed to organic pathologies affecting speech and language. Limited to juniors and seniors. *Cr* 3. MR. DOPHEIDE

184. Basic Research in Speech and Hearing Science—An introduction to research findings on the importance of acoustical, physiological, and perceptual factors in speech production and reception. Methodology and instrumentation employed in such research are surveyed. Limited to juniors and seniors. *Cr* 3.
MR. PETTIT

185. 186. Clinical Practicum I—Supervised experience with selected clients in the University of Maine Speech and Hearing Center. Three hours weekly participation, plus weekly conference. Prerequisite: Sh 182 and permission. *Cr* 1.
STAFF

187. Language Disorders—A study of the etiological factors, diagnostic procedures, and therapeutic methodology relevant to the clinical management of language disorders of both adults and children, such as adult aphasia, delayed language development, and language disability associated with mental retardation. Prerequisite: six hours in speech pathology. *Cr* 3. MR. PETTIT

188. Hearing Impairment—An introduction to normal auditory function as a basis for understanding disorders of hearing. A survey of procedures for hearing assessment and rehabilitation methods used with the hearing-impaired person. Limited to juniors and seniors or permission. *Cr* 3. MR. F. BURNS

189. Introduction to Audiology—The field and profession of audiology. A study of the methods of hearing assessment, including their administration and interpretation. Audiometric identification of hearing loss and rehabilitation of the hearing-impaired person. Prerequisite: Sh 188. *Cr* 3. MR. F. BURNS

General Courses (Sh)

195. 196. Problems in Speech—For the advanced student desiring to study a particular problem under the guidance of a member of the staff. Prerequisite: permission of the department chairman. *Cr* 1-3. STAFF

198. Seminar in Speech—Investigation of special problems and significant topics in the field of speech. Oral and written reports. Prerequisite: permission. *Cr* 3. MR. GARDNER

Graduate Courses (Sh)

202. 20th Century Public Address—*Cr* 3.
204. Persuasion—*Cr* 3.
206. Survey of Rhetorical Theory—*Cr* 3.
208. Communication Theory—*Cr* 3.
260. Production of Pre-Modern Drama—*Cr* 3.
261. Production of Modern Drama—*Cr* 3.
263. American Theatre—*Cr* 3.
265. 266. Dramatic Theory—*Cr* 3.
267. Drama Colloquium—*Cr* 3.
272. Comparative Systems of Broadcasting and Film—*Cr* 3.
281. Articulation Disorders—*Cr* 3.
282. Voice Disorders—*Cr* 3.
283. Stuttering—*Cr* 3.
286. Current Issues in Clinical Practice—*Cr* 3.
288. Aural Rehabilitation—*Cr* 3.
301. Seminar in Research Methods—*Cr* 3.
302. Teaching Speech in College—*Cr* 1.
369. Theatre Laboratory—*Cr* 3.
386. Clinical Practicum II—*Cr* 1-2.
390. 391. Directed Research—*Cr* 1-3.
399. Graduate Thesis—*Cr Ar.*

ZOOLOGY (Zo)

PROFESSORS ALLEN (Chairman), SPEICHER, MEYER, FLYNN, BARDEN, DEAN, PRATT, MUN; ASSOCIATE PROFESSORS HATCH, MAJOR, SASS, COOK*, VALLEAU, ROBERTS, DEARBORN, HAYNES; ASSISTANT PROFESSORS MCALICE, MCCLEAVE, VADAS, DEWITT, GREGORY; LECTURERS PORTER, RODERICK, WADSWORTH, RIDGWAY, KANDUTSCH, STEVENS, FELL, BAILEY, CHERRY, POTTS, RUSSELL; TEACHING ASSOCIATE BLAKE; PART-TIME INSTRUCTORS WEATHERBEE, MAJOR; GRADUATE ASSISTANTS KAISER, TURNER, CORMIER, FELL, GOW, MANEN, MOBRAATEN, SCOTT, SERAFY, SNOW, SPEIRS

Zoology, or animal biology, includes the study of every aspect of animal life: the structure of animals, their development, functions, heredity, and interactions with other organisms and their environment. The department's introductory course, Zo 3/4, Animal Biology, fulfills one year of the college requirement of a basic year course in laboratory science or mathematics. This course, or a combination

* On leave of absence 1970-71.

of Zo 3 and Bt 1, General Botany, is a prerequisite to all advanced courses in the department.

A zoology major is prepared for graduate training in biology, for entrance into medical or dental school, or for medical technology. Specimen curricula for several of these fields are given in this catalog and should be carefully considered by the student in planning a program. Other curricula can be worked out in consultation with the department head.

Upon graduation a zoology major may also enter various fields: business, education, industry, government agencies, and research laboratories. Among the positions held by zoology majors the following may be mentioned: museum curator, research assistant, teacher, hospital administrator, librarian, biological aide, aquatic biologist, ranger-naturalist, biological supply house employee, book publisher's representative, medical and biological illustrator, and science writer.

FISHERY SCIENCE

A zoology major may elect a sequence of courses introducing the basic skills necessary for careers in fishery management and biological oceanography. Graduates of this sequence are eligible for Civil Service examinations for positions at the technician level in federal and state agencies concerned with management of aquatic resources. More advanced positions in these fields generally require graduate preparation. Undergraduates anticipating graduate study are urged to secure a broad base in the biological and physical science. The zoology major requirements are ideally suited to such preparation.

A graduate program in Fishery Science leading to the degrees of master of science and doctor of philosophy is offered in the Department of Zoology. Opportunities for research in fresh water and estuarine environments are available through the cooperation of state and federal agencies. Research assistantships are usually available for graduate students.

The Maine Department of Inland Fisheries and Game has maintained close liaison with the University fishery science program for 25 years. Natural populations of warm water and cold water game fish abound in the state, providing unlimited opportunity for field study. Two fish cultural stations nearby provide facilities for controlled studies on large groups of fish.

The Maine Cooperative Fishery Unit, the second such unit established in the nation, provides opportunities for training and research in the field of fishery science. The unit is operated under a cooperative program by the U. S. Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife, the Maine Department of Inland Fisheries and Game, and the University. The unit offers advanced training in modern fishery management and research techniques, conducts a program of fishery research, and participates in extension programs.

Preparation for the Zoology Major

In addition to the general requirements of the college, the department requires the following courses for the B.A. degree in zoology:

Zo 3/4, Animal Biology

Ch 13/14, General Chemistry

Ch 151/152, 161/162, Organic Chemistry (with lab), or Bc 21. Organic Chemistry and Bc 122, Biochemistry

Ms 12, Calculus; Ms 19, Principles of Statistical Inference
Ps 1a/2a, General Physics

Requirements for the Zoology Major

Twenty-two hours of advanced work in zoology are required. The following courses must be included in the advanced work in zoology:

Zo 133, Comparative Anatomy or Zo 136, Developmental Biology
Zo 162, Genetics
Zo 177, Animal Physiology

Courses in Zoology (Zo)

1. Principles of Biology—A non-laboratory treatment of the basic principles of biology, including such topics as ecology, evolution, genetics, and cell theory. Particular emphasis on the application of biological principles to problems of modern society. *Lec* 3, *Cr* 3. MR. ALLEN

3/4. Animal Biology—A basic two-semester course. The first semester deals with principles of life, including properties of cells, heredity, ecology, and evolution. The second semester is an introduction to vertebrate structure and function, with emphasis placed on basic physiological principles. *Lec* 2, *Lab* 4, *Cr* 4. MR. HAYNES, MR. VALLEAU

5. Anatomy and Physiology for Nurses—The general principles of animal life, emphasizing the structure and functions of the human body. Restricted to three-year student nurses. *Lec* 3, *Lab* 3, *Cr* 5. MR. SASS

7. Man's Ocean—An introduction to the ocean currents, changes in the ocean floor, productivity, and man's relation to the sea. This course is especially designed for the high school teacher and will be taught at The Darling Center only. *Lec* 3, *Lab* 4, *Cr* 4. MR. GRAHAM

8. Anatomy and Physiology—The general principles of animal life, with emphasis on the structure and functions of the human body. Prerequisite: Zo 3 or chemistry. Students who have had Zo 3/4 should take Zo 133 rather than Zo 8. *Lec* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. SASS

10. Anatomy and Physiology—Similar to Zo 8, with additional time for laboratory. For students in the School of Nursing. Prerequisite: Zo 3. *Lec* 2, *Rec* 1, *Lab* 4, *Cr* 5.

12. Organic Evolution—The biological development of higher forms of life from the simpler, the evidence which support this fact and the processes which bring it about. Open to all non-majors above freshman standing. Not given every year. *Lec* 2, *Cr* 2.

131. Vertebrate Biology—An introduction to the classes of vertebrates: their characteristics, evolution, ecology, and systematics. Emphasis in laboratory is on taxonomy of regional fauna. (Lab optional.) Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 3, *Lab* 2, *Cr* 3 or 4. MR. MCCLEAVE

133. Comparative Anatomy—The structure, origin, and history of the vertebrate organ-systems. Prerequisite: Zo 3/4, or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. FLYNN

134. Biological Ultrastructure—A study of the ultrastructure of the cells of multicellular organisms, protozoa, bacteria and viruses. Prerequisitie: Zo 151 and Biochemistry. *Lec* 3, *Cr* 3. MR. HAYNES

136. Developmental Biology—The transformation of the fertilized egg into a new adult individual: the concepts of growth and development of organisms. Prerequisite: Zo 3/4. *Lec* 2, *Lab* 4, *Cr* 4. MR. MUN

137. Comparative Embryology—A comprehensive approach to the early embryological phases of selected invertebrate and vertebrate forms, with emphasis on living development and embryological techniques. Prerequisite: two years of zoology. *Lec* 2, *Lab* 4, *Cr* 4. MR. HAYNES

139. Mammalogy—The characteristics of mammals, their life histories and economic importance. Lectures supplemented by laboratory study of skins and mounted specimens. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 3, *Cr* 3. MR. BARDEN

140. Seminar in Quaternary Studies—A multidisciplinary seminar that is concerned with selected areas of study—physical, biological and anthropological—related to the Quaternary Period. The subject areas of the seminar will vary each semester and it can be taken more than once for credit. Prerequisite: consent of instructor. *Rec* 2, *Cr* 2.

151. Histology—Microscopic anatomy of animal tissues and methods of preparing microscopic slides. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 4, *Cr* 4. MR. ROBERTS

152. Animal Microtechnique—Histological and histochemical techniques in the preparation of animal tissues for microscopic study. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lab* 4, *Cr* 2. MR. ROBERTS

153. Invertebrate Zoology — The morphology, physiology, life histories, phylogenetic relationship, and economic importance of invertebrates exclusive of insects. (Lab optional.) Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 4, *Cr* 2 or 4. MR. MEYER

156. Animal Ecology—The interrelationships between animals and their physical and biotic environment. Topics include essentials of existence, ecosystem concepts, energy relationships, populations, communities, distribution, adaptations and applications. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 4, *Cr* 4, several required field trips. MR. DEARBORN

158. Animal Parasitology—The life histories, economic importance, methods of control, host necropsy and the preparation of parasites. (Lab optional.) Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 4, *Cr* 2 or 4. MR. MEYER

160. Ornithology—The characteristics of birds, their life histories and economic importance. Lectures, laboratory study of skins and mounted specimens, and field identifications. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 4, *Cr* 4. MR. BARDEN

161. Human Genetics — The inheritance of human traits, genetic and chromosomal. The genetics of human populations of races and of inbreeding. Those seeking a basic course in genetics are advised to take Zo 162. Prerequisite: Zo 3 and junior standing. *Lec* 2, *Cr* 2. MR. SPEICHER

162. Principles of Genetics—The nature of hereditary factors and the mechanisms by which they are transmitted and expressed. Prerequisite: Zo 3 and junior standing. *Lec* 3, *Cr* 3. MR. SPEICHER

164. Genetics Laboratory — Practical experience in the rearing of some genetically important laboratory species, and analysis of the resulting data. Prerequisite: Zo 162 or concurrently. *Lab* 4, *Cr* 2. MR. SPEICHER

168. Limnology—The ecology of inland waters, with primary emphasis on the physical, chemical and biological factors controlling productivity. (Lab optional.) Prerequisite: first-year courses in zoology and chemistry. Zoology 153, and Entomology are recommended. *Lec* 2, *Lab* 4, *Cr* 2 or 4. MR. HATCH

170. Introduction to Oceanograhy—Basic concepts in physical, geological, chemical, and biological oceanography. Prerequisite: one year each of mathematics, physics, chemistry, and biology, or permission of instructor. *Rec* 3, *Cr* 3. STAFF

171. Fishery Biology—An introduction to the theory and practice of contemporary fishery biology including ecology, zoogeography, population estimation and sampling, fish production and disease, as a basis for fishery management practices. (Lab optional.) Prerequisite: Zo 131; Zo 156 or Fy 19. *Rec* 3, *Lab* 2, *Cr* 3 or 4. MR. GREGORY

177. Animal Physiology—Physiological processes in vertebrates with emphasis on the integration of organ systems. Prerequisite: one year of chemistry, Zo 3/4. *Lec* 2, *Lab* 4, *Cr* 4. MR. MAJOR

178. General Physiology—The vital phenomena common to all organisms. The effects of pressure, and temperature in biological systems. Membrane structure is treated in detail. Laboratory is a general methods laboratory. Prerequisite: Organic Chemistry and year of physics. *Lec* 2, *Lab* 4, *Cr* 2 or 4. (Lab optional but recommended for students who have not taken Biochemistry.) MR. MAJOR

187. 188. Problems in Zoology—Open to juniors and seniors who have special interest and qualifications in some branch of zoology. Admission by permission of the head of the department. *Cr Ar.* STAFF

GRADUATE STUDY IN ZOOLOGY

The department offers work leading to the degree of master of science and doctor of philosophy, the general requirements for which are listed under Graduate Study.

A reading knowledge of French or German, preferably the latter, is a requirement for the advanced degree. In the major field, all courses numbered 200 or over are given primarily for graduate credit. All courses numbered 100 to 199 may be taken for graduate credit, with the prior approval of the student's advisory committee. Students may be required to take, without graduate credit, certain undergraduate courses which they lack.

Specific fields of interest for thesis subjects include cytology ecology, experimental embryology, fishery biology, general physiology, genetics, invertebrate zoology, and parasitology.

Graduate Courses in Zoology

208. Anatomy and Classification of Fishes—An introduction to the classification of fishes, including fossil forms, and a discussion of those aspects of fish anatomy of most value in systematics. Summers only, at The Darling Center. Prerequisite: Zo 133 and/or 136, or premission of instructor. *Lec & Lab, Cr* 5. MR. DEWITT

210. Marine Invertebrate Zoology—The morphology, functional anatomy, systematics and phylogenetic relationships of free-living marine invertebrates,

excluding protozoans, with laboratory emphasis on studies of living material from the local fauna. Numerous field trips required. Summers only, at The Darling Center. Prerequisite: Zo 153 or equivalent. *Lec* 2, *Lab* 6, *Cr* 5. STAFF

232. Ichthyology—The characteristics, functional anatomy, life history, and ecology of fishes. Lectures, laboratory study, and field trips. Prerequisite: Zo 131, or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. MCCLEAVE

270. Advanced Topics in Aquatic Biology — A seminar-type course designed to acquaint the student with current research in biological oceanography and fishery science. May be repeated for credit. Prerequisite: permission of the instructor. *Cr Ar.* STAFF

279. Experimental Endocrinology—A comprehensive survey of the vertebrate endocrine glands and their functional relationships. The experimental and comparative approach is emphasized. Prerequisite: Zo 177, and Organic Chemistry. *Lec* 2, *Lab* 4, *Cr* 4. MR. VALLEAU

280. Cell Mechanisms — A physico-chemical analysis of cell metabolism. Emphasis on mechanisms controlling growth and division. Prerequisite: Zo 3/4, Organic Chemistry or Biochemistry. *Lec* 3, *Lab* 4, *Cr* 4. MR. COOK

292. Functional Anatomy of Marine Invertebrates—Detailed studies of the functional anatomy of selected groups of marine invertebrates. Feeding and reproductive biology will be emphasized. Laboratory work will deal exclusively with live material. Prerequisite: Zo 153 or equivalent. *Rec* 1, *Lab* 4, *Cr* 3. MR. DEARBORN

‡337. Experimental Embryology—*Rec* 2, *Lab* 4, *Cr* 4. MR. MUN

†352. Cytology and Cytogenetics—*Rec* 2, *Lab* 4, *Cr* 4. MR. SPEICHER

354. Advanced Genetics—*Rec* 3, *Cr* 3. MR. ROBERTS

‡355. Faunistic Zoology—*Rec* 2, *Lab* 4, *Cr* 4. MR. MEYER

†357. Population Dynamics—*Rec* 2, *Cr* 2. MR. HATCH

‡362. Estuarine Ecology—*Rec* 2, *Lab* 4, *Cr* 4. STAFF

†369. Biological Oceanography—*Rec* 2, *Lab* 4, *Cr* 4. STAFF

380. Comparative Physiology—*Rec* 2, *Lab* 4, *Cr* 4. MR. MAJOR

‡381. Experimental Physiology—*Lab* 4, *Cr* 3. MR. MAJOR

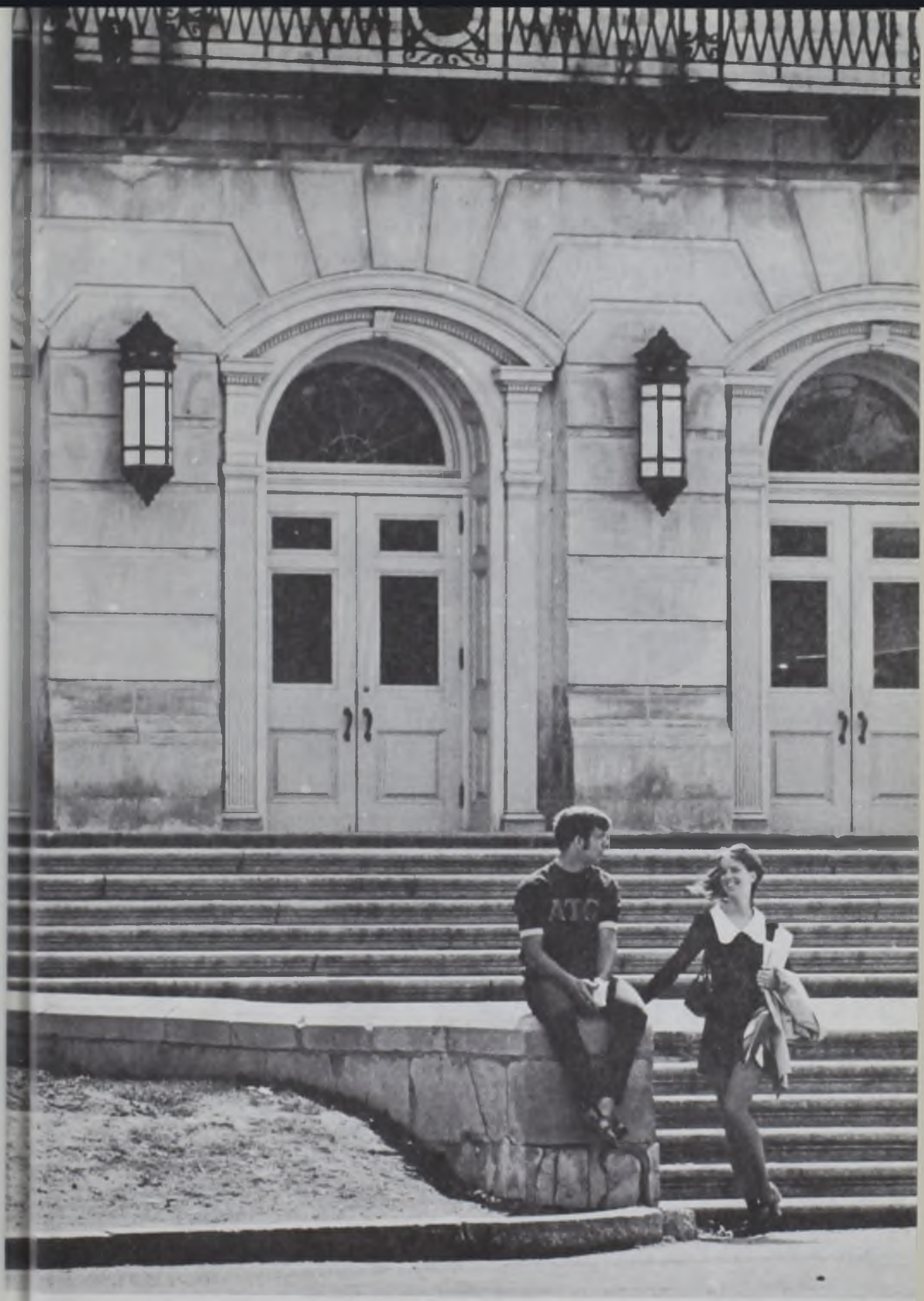
†384. Advanced Cell Physiology—*Rec* 2, *Cr* 2. MR. COOK

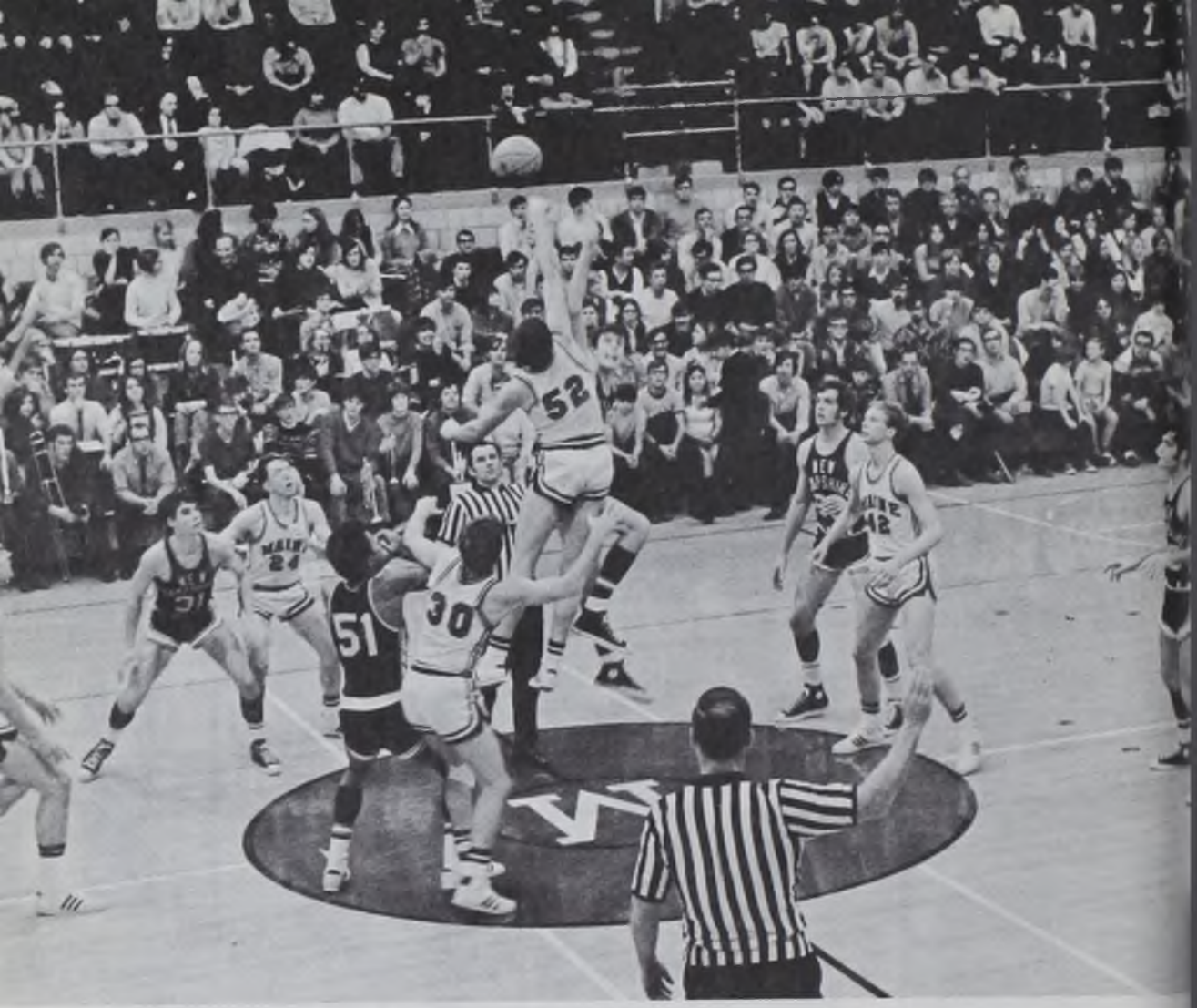
‡385. Comparative Endocrinology—*Rec* 3, *Cr* 3. MR. VALLEAU

391. 392. Problems in Zoology—*Cr Ar.* STAFF

393. 394. Problems in Biological Oceanography—*Cr Ar.* STAFF

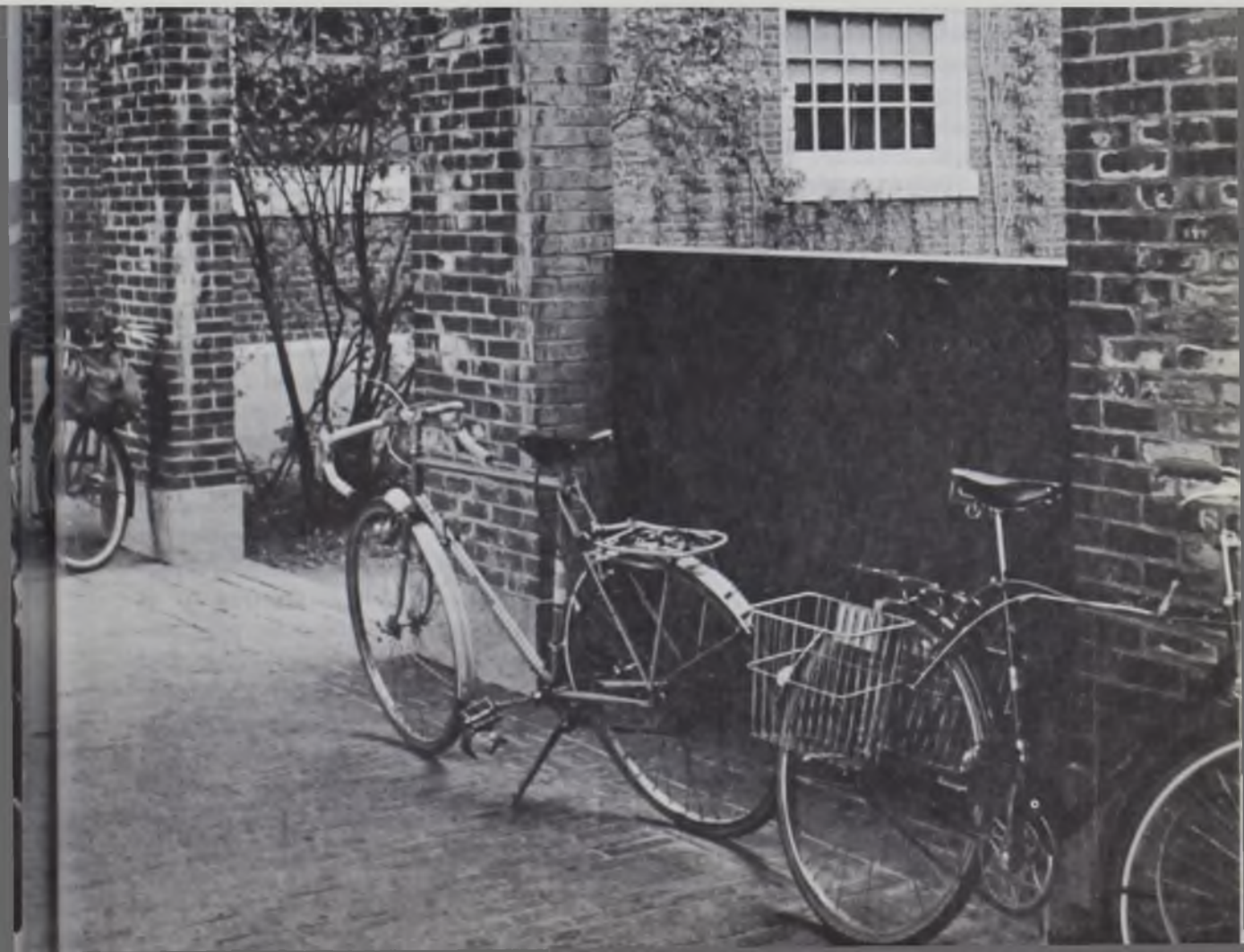
399. Graduate Thesis—*Cr Ar.* STAFF


ATG


52
51
30
24
42

COLLEGE OF BUSINESS ADMINISTRATION

W. STANLEY DEVINO, DEAN



College of Business Administration

The College of Business Administration offers a four-year program in the major area of business administration. Upon successful completion of the prescribed curriculum the student is awarded the bachelor of science degree.

The college also provides a graduate program leading to the degree of master of business administration. The graduate offerings of the College of Business Administration are described in the Graduate School Catalog.

UNDERGRADUATE PROGRAMS

The primary objective of the undergraduate program in business administration is to develop the student's abilities to assume the responsibilities of business management. The program is aimed at providing the broad training necessary for successful business management in a rapidly changing economy. No attempt is made to provide detailed specialized training in particular business tasks. The program aims, rather, at developing skills and attitudes of mind that will enable the student to cope successfully with the changing problems of business management in the years ahead. Implementation of this program takes place in three general phases: First, the student acquires broad training in the liberal arts and sciences for the necessary foundation upon which his future education will build. Second, the student pursues a program of study designed to provide him with an understanding of the major functional areas common to most business operations and with a knowledge of certain fields which are particularly relevant to the study of business management. This is referred to as the "core" program and includes basic courses in accounting, computer programming, economics, finance, the legal environment of business, marketing, and general management. Third, the student undertakes to acquire a deeper knowledge of the major field which he has selected. This is done largely during the senior year and is accomplished by taking 18 credit hours of work beyond the introductory course in the chosen field. The four major fields of concentration in which advanced work may be done are accounting, finance, marketing, and management.

GENERAL INFORMATION

Admission—Students are usually admitted to the College of Business Administration as first-year students in the University. The specific requirements for admission are given on page 44 of this catalog. All deficiencies in entrance requirements must be removed before registering for the sophomore year. Students who transfer from other colleges with advanced standing must satisfy all basic entrance requirements within one year.

Transfer Credit—No transfer credit is granted for courses completed at another accredited institution in which grades below C have been received. Responsibility for evaluating course work for which transfer credit is requested rests with the Director of Admissions and the Dean of the College.

Students in other colleges of the University of Maine who wish to transfer to the College of Business Administration must present an academic record which meets at least the minimum standards of quality established by the University. Also, they are required to complete at least one full year of academic work as students in the College of Business Administration.

Graduation Requirements—Completion of the required work of the College of Business Administration leads to the degree of bachelor of science. All students are required to complete 120 degree hours, exclusive of credit for basic military training.

In addition, each student must accumulate a total of "grade points" equal to 1.8 times the number of credit hours in which he receives grades. This grade point average is computed by multiplying each credit hour of the letter grade by a factor in the following manner: A hours by 4, B hours by 3, C hours by 2, D hours by 1, and E hours by 0.

All course work taken in Business (Ba) and Economics (Ec) must be completed with a 2.0 (C) average for a student to be eligible for a degree.

The required course work for the B.S. in Business Administration is given below:

I. B.S. IN BUSINESS ADMINISTRATION PROGRAM

A. General Foundation Subjects—54 credits

1. Humanities and Fine Arts (21 credits)

   Eh 1—Freshman Composition
   Eh 17—Advanced Professional Writing
   Sh 1—Introduction to Oral Communication
   At least three of the remaining 12 credit hours must have an Eh designation. The remainder may be selected in such fields as: art, the classics, English composition, foreign languages, journalism, literature, music, philosophy, speech, and theatre.

2. Social Sciences (21 credits)

   Ec 10—Principles of Economics
   At least three of the remaining 18 credit hours must have an Ec designation. The remaining credits may be taken in such fields as: anthropology, economics, government, history, modern society, psychology, and sociology.

3. Mathematics and Computer Science (12 credits)

Ms 13/14—Mathematics for the Social Sciences*
Ms 15—Statistics for the Social Sciences**
Ms 169—Computer Programming

* Ms 12 and Ms 27 may be substituted for Ms 13/14.
** Ms 130 may be substituted for Ms 15.

B. Core Requirements in Business—24 credits

Ba 9—Principles of Accounting I
Ba 10—Principles of Accounting II
Ba 23—Elements of Industrial Management
Ba 63—Marketing
Ba 130—The Legal Environment of Business
Ba 147—Business Data Processing
Ba 151—Business Finance
Ba 159—Business Management and Policy (Seniors Only)

C. Major Field—18 credits

The major field to be composed of 18 credit hours to be required by each functional area subject to approval of the faculty. All courses must carry a Ba or Ec designation.

1. Accounting (18 credits)

Required:
Ba 41—Intermediate Accounting
Ba 42—Intermediate Accounting
Ba 143—Advanced Accounting I
Ba 145—Cost Accounting I
Ba 148—Auditing

and *either* of the following:
Ba 144—Advanced Accounting II
Ba 146—Cost Accounting II

2. Finance (18 credits)

Required:
Ba 150—Financial Institutions
Ba 158—Corporate Treasury Dynamics

and *four** of the following:
Ba 41—Intermediate Accounting
Ba 145—Cost Accounting I
Ba 156—Investment Strategy
Ba 157—Forward Planning and Capital Decisions
Ba 195—Financial Research Seminar
Ec 139—International Trade and Commercial Policy
Ec 153—Money and Banking
Ec 171—Public Finance and Fiscal Policy
Ec 172—State and Local Government Finance
Ec 175—Industrial Organization

* At least two of the four must have a Ba designation.

3. Management (18 credits)

Required:
Ba 149—Business Economics
Ba 161—Personnel Management
Ba 164—Dynamics of Organization and Behavior
Ba 168—Seminar in Contemporary Management Problems

and any *two* of the following:
Ba 90—Problems of Small Business
Ba 125—Business Logistics
Ba 162—Industrial Relations
Ec 133—Labor Economics
Ec 139—International Trade and Commercial Policy
Ec 173—Economic Analysis

4. Marketing (18 credits)

Required:
Ba 125—Business Logistics
Ba 165—Advertising
Ba 167—Sales Management
Ba 170—Managerial Marketing

and any *two* of the following:
Ba 90—Problems of Small Business
Ba 150—Financial Institutions
Ba 161—Personnel Management
Ba 164—Dynamics of Organization and Behavior
Ba 168—Seminar in Contemporary Management Problems
Ba 169—Marketing Research

D. Free Electives—24 credits

THE FRESHMAN YEAR

Students admitted to a degree program in the College of Business Administration should pursue the following program during the freshman year:

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
Ec	10	Principles of Economics	3	Ec		Economics elective	3
Eh	1	Freshman Composition	3	Ms	14	Math for Social Sciences	3
Ms	13	Math for Social Sciences	3	Sh	1	Intro to Oral Communication	3
		Social Science elective	3			English elective	3
		Humanities elective	3			Social Science elective	3
Pe	1	Physical Education	0	Pe	2	Physical Education	0
			15				15

COURSES OF INSTRUCTION

PROFESSORS DEVINO, JENSEN, JOHNSON; ASSOCIATE PROFESSORS ALPANDER*, BARTLETT, FORSGREN, GOODMAN, AND MCCLURE**; ASSISTANT PROFESSORS BAILEY, BURNHAM, KAKALIK, UYAR, VANGERMEERSCH, WEBSTER, AND ZIEGENBEIN; LECTURER FREY; INSTRUCTORS (PART-TIME) COHEN AND LAWRENCE; GRADUATE ASSISTANTS FOSTER, GEMME, NEWELL AND RAYMOND

Courses numbered 1 to 99 are undergraduate courses. They are open to graduate students but credit earned in these courses may not be used to satisfy advanced degree requirements. Courses numbered 100 to 199 are upperclass undergraduate courses which may be used by the graduate student's advisory committee. Courses numbered 200 to 299 are graduate courses which may be elected by undergraduate honor students, or those undergraduates whose advancement in the field will permit their taking a graduate level course among graduate students without disadvantage to themselves. Courses numbered 300 to 399 are graduate level courses which may be taken only by students admitted to the Graduate School.

One number is used for a course which is given both the fall and spring.

When a dash is used between the two numbers (e.g., 1-2), both semesters must be taken to obtain credit; when a slant is used (e.g.,1/2), the first semester may be taken by itself, but the second semester cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit.

Courses in Business Administration (Ba)

9. Principles of Accounting I—An introductory course in accounting with emphasis on the basic accounting cycles, management use of accounting data, construction and analysis of financial statements, asset valuation, and elementary cost analysis. *Cr* 3. STAFF

10. Principles of Accounting II—Books of original entry, analysis of assets and liabilities, negotiable instruments, and an introduction to partnership and corporate accounting. Prerequisite: Ba 9. *Cr* 3. STAFF

23. Elements of Industrial Management—A comprehensive survey of all phases of the management of industrial and business enterprises. The influence of industrial relations is interspersed with the treatment of management's technical problems. Prerequisite: Ec 1/2 or Ec 10. *Cr* 3. MR. UYAR

41/42. Intermediate Accounting—Principles regarding the valuation and recording of working capital items and noncurrent items; capital stock and surplus; statement analysis. Prerequisite: Ba 9, 10. *Cr* 3. MR. VANGERMEERSCH

63. Marketing—Problems of distribution for representative industrial and consumer goods, including merchandising policies, selection of distribution channels, price policies, and advertising and sales promotion methods. Prerequisite: Ba 9, Ec 1/2 or Ec 10. *Cr* 3. MR. KAKALIK

76. Federal Tax Reporting—Federal tax laws as they affect individuals,

* On leave of absence 1970-71.
** On leave of absence fall 1970.

partnerships, corporations, and estates. An opportunity is given the student to become familiar with tax forms. Prerequisite: Ba 9, 10. *Cr* 3. MR. LAWRENCE

90. Problems of Small Business—A consideration of those aspects of management that are uniquely important to small firms, in the interest of developing an understanding of the economic and social environment in which the small concern functions. Course will afford the student practice in decision-making on the same types of problems that small businessmen face. Directed toward students who wish to explore opportunities for operating their own small businesses, and to those who expect to have small businesses as customers or suppliers. Problems relevant to small business operations in Maine will be stressed. Prerequisite: Ba 9. STAFF

125. Business Logistics—An introduction to the elements of the logistical system includes consideration of transportation modes, plant and warehouse location, inventory size determination, etc. Cases and problems are utilized to sharpen analytical techniques. Final attention turns to the total cost approach to logistical system analysis and decision-making. Prerequsite: Ba 23, 63. *Cr* 3. MR. KAKALIK

130. The Legal Environment of Business—An examination of fundamental legal concepts and their application to the business community. Among the topics discussed are the evolution of law and its underlying conceptual framework from which legal rules and principles of business develop. Selected legal cases will be critically analyzed and discussed. (Juniors and seniors only). *Cr* 3. MR. COHEN

143. Advanced Accounting I—Principles, theory, and procedures of parent and subsidiary accounting. A comprehensive study of consolidated statements, affiliation structures, and consolidations and mergers. Also includes home office and branch accounting. Prerequisite: Ba 41/42. *Cr* 3. MR. MCCLURE

144. Advanced Accounting **II**—The application of accounting principles to accounting problems arising in connection with: Partnerships, joint ventures, insurance, consignments, installment sales, statement of affairs, receiverships, estates and trusts, statement of realization and liquidation, foreign exchange, and governmental and institutional accounting. Prerequisite: Ba 41/42. *Cr* 3. MR. MCCLURE

145. Cost Accounting I—The principles and methods of job order costs, including inventory control and pricing, labor and analysis and allocation of factory overhead. Principles and practices of process cost accounting. Prerequisite: Ba 9, 10. *Cr* 3. MRS. GOODMAN

146. Cost Accounting II—A comprehensive study of joint and by-product costs, estimated and standard costs, distribution and differential costs. Budgeting. Analysis of cost structure and management use of standards. Prerequisite: Ba 145. *Cr* 3. MRS. GOODMAN

147. Business Data Processing—The purpose of this course is to introduce the student to applications of the computer to business decision making. Fundamentals of FORTRAN Programming are discussed and then are applied to financing, inventory, simulation, and other types of systems models in business. Prerequisite: Ms 19. *Cr* 3. MR. JENSEN

148. Auditing—The systematic verification of financial statements including a study of the responsibilities, liabilities and ethics of the independent public accountant. Prerequisite: Ba 9, 10, 41. *Cr* 3. MR. BAILEY

149. Business Economics—Application of economic analysis to concrete business situations. Emphasis on developing the student's ability to apply economic analysis to the solution of problems faced by business management. Prerequisite: Ec 1/2 or Ec 10, Ba 9. *Cr* 3. MR. UYAR

150. Financial Institutions—A survey of the operations and economic roles of financial institutions: commercial banks, investment houses, and investment markets; savings and insurance institutions; and governmental agencies. An institutional introducton to the fields of private and public finance. Prerequisite: Ec 1/2 or Ec 10, or permission. *Cr* 3. MR. WEBSTER

151. Business Finance—This course deals with the promotion, organization, and financing of the single proprietorship, partnership, and corporation. It also utilizes advanced cases and problems related to the above topics. Prerequisite: Ec 1/2 or Ec 10, Ba 9. *Cr* 3. MR. ZIEGENBEIN

156. Investment Strategy—Emphasis is on analysis and selection of stocks and bonds as part of the investor's approach to financial security. The relationships between the securities markets, the total money market and the general economy are examined. Prerequisite: Ba 151. *Cr* 3. MR. WEBSTER

157. Forward Planning and Capital Decisions—Basic financial forecasting and risk evaluation are combined with profit-volume-cost analysis as essentials in fully evaluating capital expenditure proposals. Cost of capital and other tools are developed for use in the decision-making process. Prerequisite: Ba 151. *Cr* 3. MR. WEBSTER

158. Corporate Treasury Dynamics—The counterflows of cash between the corporate unit and the money market due to seasonal, cyclical, and secular demands are first analyzed. Numerous approaches to debt limit determination are then presented. The student finally turns to the total problem of making optimal financing decisions in specific corporate settings. Prerequisite: Ba 151. *Cr* 3. MR. ZIEGENBEIN

159. Business Management and Policy—Administrative practice at the higher levels of business management through case analysis and discussion. The course attempts to coordinate the background of business majors in the formulation and administration of sound business policy. Seniors only. *Cr* 3. MR. BURNHAM

161. Personnel Management—The selection, training, and management of personnel in private and public business. Designed for the student interested in adminstration, office management, or personnel work in education, business engineering, public service, and other fields. Prerequisite: Ec 1/2 or Ec 10. *Cr* 3. MR. BURNHAM

162. Industrial Relations—A study of industrial relations patterns in the U. S. Major focus is on the relationship between management and organized labor, and the bargaining, administration and interpretation of contracts. The problem of disputes settlement and a comparison of methods used in the U. S. and abroad. Attention is also given to industrial relations in unorganized firms and in the civil service. Prerequisite: Ec 133. *Cr* 3. MR. ALPANDER

164. Dynamics of Organizations and Behavior—An analysis of business organization and the problems of administrators in an interpersonal setting. Primary emphasis is on the findings of behavioral sciences which are particularly relevant to the management of economic enterprises. Also an examination of interdisciplinary approaches to human relations and adjustment problems in modern organizations. Motivation, leadership, and organization theory as related to work

and productivity, and associated topics are also covered. Prerequisite: Ba 23. *Cr* 3.
MR. BURNHAM

165. Advertising—The place of advertising in the marketing program. Business cases are analyzed to determine those situations in which advertising may be profitably employed to stimulate primary and selective demand for industrial and consumer goods and services. Prerequisite: Ba 63. *Cr* 3. MR. FREY

167. Sales Management—An analysis of the problems facing marketing management in formulating sales policy and in managing the sales organization. Prerequisite: Ba 63. *Cr* 3. MR. BARTLETT

168. Seminar in Contemporary Management Problems—Seminar in developments in the behavioral and management sciences, the development of management thought, and critical issues in organizational theory, with special reference to industrial application. In addition, students will conduct library research, or field work of considerable depth, in select managerial topics. Prerequisites: Ba 149, 164. *Cr* 3. MR. UYAR

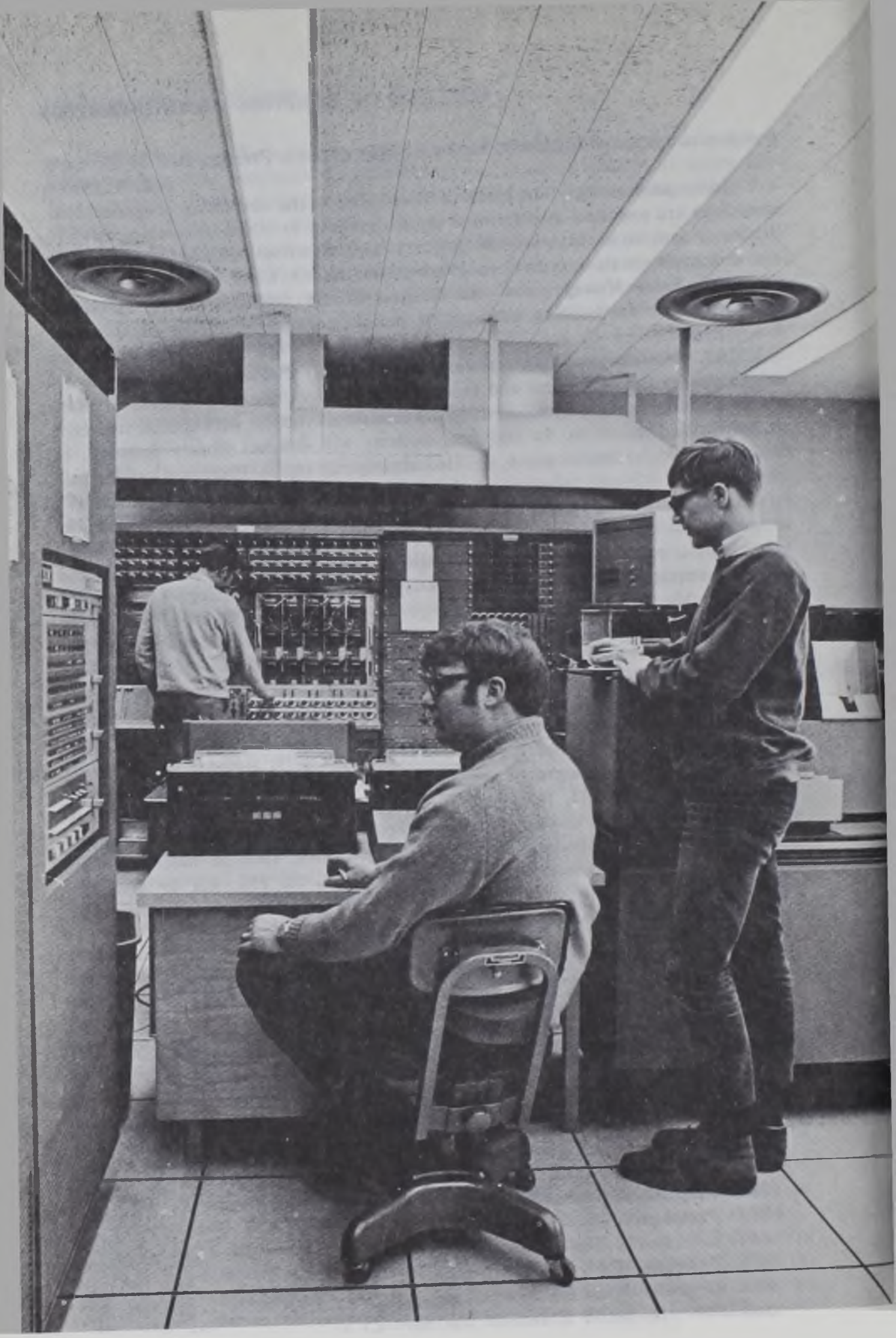
169. Marketing Research—A consideration of marketing research as a tool in solving problems of production and distribution. Emphasis is upon problem formulation, exploratory research, research design, basic observational and sampling requirements, data analysis, interpretation, and sampling. Prerequisite: Ba 63 and Ms 19. *Cr* 3. STAFF

170. Managerial Marketing—A managerial approach emphasizing the integration of marketing, as an organic activity, with other activities of the business firm. Study is directed toward recognition and appreciation of the problems encountered by top marketing executives in modern business, with a consideration of the policies and procedures that may be followed in their solution. By case analysis and consideration of current marketing literature, students are provided opportunities for development of abilities in solving marketing management problems. Prerequisite: Ba 125, 165 and 167. MR. KAKALIK

195. Financial Research Seminar—Techniques of research and analysis are introduced and applied to topical areas in finance, such as money, credit, banking and debt instruments. Prerequisite: Ba 151, Ec 153, Ms 19 and permission. *Cr* 3. MR. JOHNSON

Graduate Courses

310. Management Policy—*Cr* 3. MR. BURNHAM
311. Managerial Economics—*Cr* 3. MR. WEBSTER
312. Managerial Accounting—*Cr* 3. MR. BAILEY
313. Business Cycles and Forecasting—*Cr* 3. MR. JOHNSON
314. Financial Management—*Cr* 3. MR. ZIEGENBEIN
315. Marketing Management—*Cr* 3. MR. FREY
316. Industrial Relations and Personnel Management—*Cr* 3. MR. FORSGREN
320. Market Research and Analysis—*Cr* 3. MR. KAKALIK
321. Human Relations in Industry—*Cr* 3. MR. UYAR
322. Operations Research—*Cr* 3. MR. JENSEN
323. Production Management—*Cr* 3. MR. JENSEN
324. Investment Management—*Cr* 3. MR. JOHNSON
325. Collective Bargaining—*Cr* 3. MR. DEVINO
326. Organizational Behavior in Business—*Cr* 3. MR. DEVINO
368. 369. Manpower Research Seminar—*Cr* 3. MR. FORSGREN



COLLEGE OF EDUCATION

MARK R. SHIBLES, DEAN

College of Education

The College of Education offers four-year programs designed to prepare elementary, junior and senior high school teachers and teachers of physical education, athletics, health recreation, music and art. Within the four-year undergraduate program a student may start his preparation for such positions as a specialist in reading, guidance counselor, principal, supervisor, and school administrator. These programs are usually completed during a period of graduate study.

The College of Education also provides instruction, on a service basis, in the professional subjects essential to the preparation for teaching, to undergraduate students from other divisions of the University, and also for students registered with the Faculty of Graduate Study.

GENERAL INFORMATION

The College of Education concerns itself only with those students who are planning for a career in the field of education. All of its undergraduate programs are designed so that each student will include a substantial amount of college work in the humanities, a concentration of academic work closely related to the area of special teaching interest, and basic professional work in education and psychology. No undergraduate student in the College of Education will be recommended for a degree until he has fulfilled these requirements.

ADMISSION

Students ordinarily are admitted to the College of Education as first-year students in the four-year program. The specific admission requirements are given on page 45 of this catalog. Any deficiencies in these requirements must be made up during the student's first two years. A student admitted with advanced standing must satisfy all basic entrance requirements during his first year in the College of Education.

DESCRIPTION OF THE FOUR-YEAR PROGRAM

The booklet, "Four-Year Programs in the College of Education," describing in detail the special requirements in general education, the courses needed for the

development of various teaching fields, and the required work in professional education, has been prepared for students who desire to enter education.

A copy of this booklet may be obtained by writing to the Director of Admissions or the Dean of the College of Education.

ADMISSION WITH ADVANCED STANDING

Students from other institutions who have already completed a portion of college work, or who desire to change their professional plans and enter education, are invited to apply for admission by transfer. Each case will be considered on its own merits. When such students are accepted, they will be given advanced standing in the College of Education for work already completed which meets the established standards of quality and the specific course requirements of the program to which they are seeking admission.

Summer Session and Continuing Education Students—Students whose only work in the College of Education has been or will be in the Summer Session or Continuing Education Division program are strongly urged to apply for admission to the University exactly as they would if they expected to apply for resident work during the regular school year. This recommendation applies both to students who expect to work for a degree in the various colleges of the University and also those who have not yet fully decided on the matter.

Among the advantages of being admitted to the University are: immediate assignment of a major adviser to counsel on registration, requirements, etc.; and eligibility for guidance and counseling service. Students who expect their work to be in the Summer Session should apply before their first registration; students whose first work is to be by continuing education class should apply during their first course.

Application for admission should be made directly to the Director of Admissions, University of Maine. (See sections immediately above.)

GRADUATION REQUIREMENTS

The completion of the required work of the College of Education leads to the degree of bachelor of science in education (B.S. in Ed.).

A total of 120 degree hours of required college work, exclusive of credit for basic military training (if elected), is required for graduation. In addition, each student must accumulate a total number of "grade points" equal to twice the number of hours in which he receives grades. Grade points are computed by multiplying each hour of the letter grade by the factor as follows: A by 4, B by 3, C by 2, and D by 1.

Included in the 120 semester hours required for graduation for those who follow the *elementary teacher* program are a minimum of 55 degree hours in general education, 30 degree hours of courses in professional subjects, 7 hours of course work offered by affiliated departments, and 24 hours in an academic field of concentration. Special work in appropriate fields (such as art, music and health and physical education) also is required.

All courses taken in the student's academic teaching field and in his professional work must be completed with a 2.0 (C) average to be eligible for a degree. In addition, a student must likewise acquire a 2.0 (C) average in all work taken before the degree may be awarded.

Those who follow the *secondary teacher* program are required to complete a minimum of 38 degree hours in general education, 18 degree hours in professional education, and 51 to 62 degree hours in the field of concentration (depending upon field of concentration), plus electives.

Students who expect to qualify to teach in a *specialized field,* such as physical education, music education, or art education, will use the work in these special areas as their field of concentration. In addition, students who follow the physical education program will be required to complete a 30-hour academic teaching major. Those who follow the music or art education program are required to complete no less than a 24-hour academic specialization.

Students who follow the *elementary teacher* program are required to complete a 24-hour academic specialization in addition to other specialized subjects such as music and art. Details will be found in the folder outlining the complete program, which may be obtained by writing to the Dean of the College of Education.

General Education Subjects Required—Information concerning the specific courses required in general education is available from the Office of the Dean. The subjects are:

English
Speech
Social Studies
Science
General Psychology
Cultural Perspectives
Man and His Environment
Educational Sociology
Electives in the above areas to total 50 credit hours

In addition to their regular subjects, teachers generally participate in the direction of student activities such as music, debating, dramatics clubs, and games. Each student in the College of Education should develop some proficiency in at least one of these fields.

Professional Subjects Required—The professional subjects required for a degree from the College of Education also meet the current state requirements for a teaching certificate. Students who desire to qualify for general teaching in the junior and senior high school only are required to complete 18 credit hours in professional education in addition to courses in general psychology. Students who desire to qualify for general teaching in the elementary school are required to complete 30 credit hours in professional education and 7 hours of course work offered by affiliated departments plus general psychology.

The required professional subjects are designed to acquaint the student with the general aims of education and the techniques and principles of teaching. These courses are arranged so that they culminate in the course Observation and Supervised Student Teaching. There are two student-teaching plans. In one, the student spends a half-day for one semester in regular college work and the other half-day as a student teacher in a local school; under the second plan, the student spends full days in regular college work for one half of the semester, and full days as a student teacher in the public schools for the other half semester.

RESIDENCE REQUIREMENTS

A minimum of 30 semester hours of credit must be earned as a student in the College of Education to qualify a candidate for a degree. This requirement may be met by one academic year of residence, or by attending Summer Sessions; however, regularly enrolled students in the University who wish to transfer to the college may be expected to complete two full years, or the equivalent, to meet degree requirements. For students enrolled in Continuing Education Division and Summer Session courses, the 30 hours of residence credit may be obtained over an extended period of time and need not be continuous; however, such candidates must enroll for the last 6 hours of credit on the campus. Work taken in the C.E.D. is considered resident credit for undergraduate students in the College of Education. Off-campus students, before enrolling for a course, should ascertain from the Dean of the College of Education the amount of such work that is allowed toward fulfilling the requirements for the degree.

Exceptions to these rules will not be permitted except by a vote of the faculty.

EDUCATION COURSES IN THE SUMMER SESSION AND BY EXTENSION IN THE CONTINUING EDUCATION PROGRAM

Numerous education courses are offered during the Summer Session and by class extension through the Continuing Education Division. Detailed information regarding the Summer Session may be obtained by communicating with the director, Edward Hackett, Merrill Hall, Orono, Maine 04473. Information concerning extension programs in the C.E.D. program may likewise be obtained by writing Mr. Edward Hackett, Associate Director C.E.D. Division, University of Maine, Orono, Maine 04473.

BUREAU OF EDUCATIONAL RESEARCH AND SERVICE

Organized as an integral part of the College of Education, the Bureau of Educational Research and Service offers specialized service in connection with testing programs, surveys, and counseling on campus and to the schools of the state. Information concerning these services, including appointments and fees, may be obtained from the director.

In addition to being available for consultation on special problems, the bureau maintains the regular services listed below.

Testing Service on the University Campus—An IBM test scoring machine is available for campus use with either standardized or informal tests. Sample tests and catalogs of tests publishers are available for study by the University faculty. Answer sheets, scoring keys, special pencils, and other materials, as well as information booklets on the construction of informal tests for machine scoring, are carried in stock.

Scoring and reporting the results of freshman placement tests also are carried on by the bureau.

Testing Service Off-Campus—The bureau is available for consultation with school officials of the state in planning testing programs. Arrangements may be made for scoring tests used in such programs. Basic materials for use with the IBM scoring machine can be rented from the bureau.

AUDIO-VISUAL CENTER

The Audio-Visual Center, under the auspices of the College of Education, maintains a rental library of educational motion pictures, and assists in their selection and use. These materials and services are available to Maine schools, civic groups, student organizations, and campus classes at the University.

A small rental or service fee is charged for these materials when they are sent off campus; no fee is charged for the educational use on the campus. In addition, projection equipment and a staff of student operators are available for campus use. A projection room is provided in the College of Education Building for use when suitable classroom space is unavailable.

To assist in the selection and use of audio-visual teaching aids, interested persons are invited to inspect these materials, catalogs and descriptive publications of the manufacturers. The office will be glad to arrange previews of any of its material.

Details of this service are contained in a separate bulletin which is available on request. For this bulletin, or other information, address the office of the Director of Audio-Visual Center, College of Education Building.

THE HONORS PROGRAM

With the cooperation of the other divisions, the College of Education participates in the University Honors Program. Twice during their freshman year, students of high academic standing and exceptional promise are considered for enrollment in honors courses. Students who do not enter the program during the spring semester of their freshman year may, if qualified, be selected to begin honors study the following fall. Although as a rule students are invited to become candidates for the program by a selection committee, a student himself may initiate his candidacy by requesting a written endorsement from his academic adviser addressed to the committee. Information about this program may be obtained from Prof. G. T. Davis, 132 Education Building.

A more detailed statement of the University Honors Program begins on page 119 of this catalog. Honors (Hr) courses are as follows:

41. Distinguished Freshman Seminar—Limited to Distinguished Maine Students and to a limited number of other students, by invitation. Discussions and demonstrations displaying the range and nature and the Liberal Arts and Sciences. *Cr* 3. MR. SIMPSON, Chairman

45. Honors Colloquium—Readings and discussions on the basic concepts of Western civilization. *Cr* 3.

47. 48. Honors Group Tutorial—Oral and written reports under tutorial direction, upon a planned sequence of books representative of the various fields of liberal education. Hr 47.48 fulfills the sophomore humanities requirement for those students interested in the Honors Program. *Cr* 3. MR. THOMSON, Chairman

51. 52. Honors: Specialized Studies—A tutorially conducted survey of the student's major field, issuing in the choice of an approved thesis topic. *Cr* 3.

53. 54. Honors Thesis—The planning and completion of an honors thesis or research project. *Cr* 3.

TEACHER EDUCATION PROGRAM

Teacher education is a function and responsibility of the entire University. A Universitywide Advisory Council on Education oversees the admission of students to the Teacher Education Program. Regardless of a student's college or department affiliation, the student must enroll as a teacher candidate if he desires to receive the University's approval for certification as a public school teacher. Application forms may be obtained at the Information Desk, College of Education Building. The Advisory Council screens applications submitted usually at the end of the sophomore year.

Students admitted to the University Teacher Education Program who make satisfactory records in student teaching, and who meet the graduation requirements of their college, will be recommended by the University for the provisional teaching certificate.

CERTIFICATES FOR TEACHERS

It should be clearly understood that the State Department of Education has sole authority to issue certificates for teaching. The office of the Dean of the College of Education, however, is in a position to advise prospective teachers concerning certificates.

To provide for the many types of school positions, the State Department issues several types of certificates. However, upon successful completion of his program, the undergraduate student in the College of Education will generally be eligible for the provisional teaching certificates at either the elementary or secondary school level, whichever is applicable. The graduation requirements of the College of Education are established so that all students graduated from the college will meet or exceed the requirements for the provisional certificate.

In addition to furnishing courses for its own students, the College of Education acts as a service agency to provide professional training for students from other teaching units of the University who wish to qualify for a teaching certificate. Such students are enrolled in the same classes with students from the College of Education.

Pattern A

For students in colleges other than the College of Education (1) a minimum of 30 semester credit hours in a subject field together with (2) a minimum of 18 semester credit hours in a second subject field is required unless pattern B is followed.

Pattern B

A minimum of 50 semester credit hours of exclusive special methods within an area of specialization (i.e., social studies, English, science and mathematics, the sciences).

Requirements for certificates in the areas of physical education, music education, and art education differ from the above. Information may be obtained at the office of the College of Education.

PLACEMENT FOR TEACHERS

The University of Maine Placement Bureau includes among its services assistance to prospective teachers in finding teaching positions and in facilitating promotion of teachers in service. Information regarding this service may be obtained from the University of Maine Placement Bureau, East Annex, University of Maine, Orono, Maine 04473.

COURSES OF INSTRUCTION

PROFESSORS CAUGHRAN, DAVIS, FREEMAN, PORTER-SHIRLEY, PRESCOTT, SANFORD, SUPPLE, TRUBOV, ZINK; ASSOCIATE PROFESSORS BISHOP, CHIAPPONE, DRUMMOND, GRAY, HAAS, LEPLEY, LINDLOF, LOWELL, MURO, MYERS, NICHOLS, D., ROBERTS, RYAN, WORK; ASSISTANT PROFESSORS BUTZOW, COBB, CROXFORD, DAVIS, W., DUPLISEA, HART, JARDINE, JOHNSON, JUDD, MILLER, SAUNDERS, SKAGGS, VITRO, VROOMAN, WHITE, WHITMAN, YVON; LECTURERS FOBES, FRISBIE, PUFFER; COOPERATING STAFF MEMBERS, BROWN, ART; CHAPMAN, ENGLISH; NESBIT, MUSIC; WOOTTON, MATHEMATICS; O'NEIL, FOREIGN LANGUAGES

Courses numbered 1 to 99 are undergraduate courses. They are open to graduate students but credit earned in these courses may not be used to satisfy advanced degree requirements. Courses numbered 100 to 199 are upperclass graduate courses which may be used for graduate degree credit by graduate students if given prior approval by the graduate student's advisory committee. Courses numbered 200 to 299 are graduate courses which may be elected by undergraduate honor students, or those undergraduates whose advancement in the field will permit their taking a graduate level course among graduate students without disadvantage to themselves. Courses numbered 300 to 399 are graduate level courses which may be taken only by students admitted to the Graduate School.

One number is used for a course which is given both fall and spring.

When a dash is used between the two numbers (e.g., 1-2), both semesters must be taken to obtain credit; when a slant is used (e.g., 1/2), the first semester may be taken by itself, but the second semester cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit.

The following courses may be offered during the regular academic year, through the Continuing Education Division, or the Summer Session.

Appraisal—Pupil Adjustment and Personnel Practices (Ed A)

120. Evaluating Pupil Achievement—Philosophy, principles and techniques of evaluation in the schools (K-12). Methods of measuring pupil achievement will be emphasized. Practice in the construction of teacher-made tests and the interpretation of standardized tests will be provided. Prerequisite: Ed B2 and Ed B3, or their equivalents. *Cr* 3. MR. PRESCOTT, MR. DRUMMOND

150. Guidance and the Teacher—Role of the classroom teacher in studying individual pupils and utilizing accumulative records; resources available to the teachers for help in studying individual pupils; teacher's function in homeroom activities. For either elementary or secondary school classroom teachers. This course is particularly designed for the certified classroom teacher. *Cr* 3.

MR. SANFORD, MR. MURO, MR. JOHNSON

Basic Professional Courses (Ed B)

2. The American School—Examines the nature, role, purposes, and curriculum of elementary and secondary schools with special attention to the place and function of the teacher within this social institution. This is one of the courses prerequisite to student teachings in all regular undergraduate programs. *Cr* 3. MR. TRUBOV, MR. VROOMAN, MR. MYERS, MR. GRAY

3. Growth-Learning Process—The pupil and his learning processes, including learning theories, pupil growth patterns, and selected techniques for the study of pupil development. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. Not open to freshmen or sophomores. *Cr* 3. MR. SAUNDERS, MR. WILLIAM DAVIS, MR. VITRO

4. The Teaching Process—The procedures of instructional planning, including such items as improved use of small groups, classroom space, and appropriate teaching materials; measurements, evaluation, and reporting of pupil learning. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. Not open to freshmen or sophomores. *Cr* 3.

MR. LINDLOF, MR. HART, MR. MILLER, MR. JUDD, MR. THOMAS

Curriculum and Instructional Materials (Ed C)

117. Children's Literature—An overview of literature written for children between the ages of four and twelve. Emphasis will be placed on developing means of evaluating various types of books and selecting of individual children. Prerequisite: Ed M 13 and junior standing. (May be taken concurrently with Ed M 13) *Cr* 3. MRS. WHITE

120. Principles of Team Teaching—The theory and practice of instructional teams. Emphasis on cooperative planning, pupil groupings, and curriculum innovation. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or their equivalents. *Cr* 3.

MR. NICHOLS

132. Student Activities in Secondary Schools—The place, organization and direction of student activities in the modern secondary school. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or their equivalents. *Cr* 3. MR. MYERS, MR. CROXFORD

133. Instructional Media—Basic course in the improvement of learning and teaching through the effective use of instructional media and related materials. Learning principles in relation to visual communications media; nature and applications of media and instructional materials; evaluation and selection of media and instructional materials. *Cr* 3. MR. JUDD

134. Teacher-Made Instructional Material—Planning and producing inexpensive instructional materials for both elementary and secondary school subjects; selection and use of media such as posters, charts, tape, etc. *Cr* 3.

MR. TRUBOV

140. Studies in Physical Science—An introductory study of selected topics in physical science for elementary and junior high school teachers. Studies include mechanics, magnetism, electricity, heat, light, atoms, elements, compounds, ionization, etc. *Cr* 3. MR. BUTZOW

141. Study in the Physical Sciences—II—The course is laboratory-centered and includes investigations in such areas as bonding in crystals, electric charges, atomic models, ions, molecules, non-ionic substances. Prerequisite: Ed C 140 and permission of instructor. *Cr* 3. MR. BUTZOW

142. Studies in the Earth Science (Elementary)—A science content course for elementary school teachers Course work will involve a series of elementary laboratory and field studies in astronomy and the earth sciences of geology, meteorology and soils. Topics selected will be those that can be explored through direct observation and study. Discussions, films and library assignments will be scheduled to supplement the work in laboratory and field. *Cr* 3. MR. DAVIS

143. Field Course in the Earth Sciences (Secondary)—The studies included in this course are intended for elementary and secondary school teachers who need some introductory information in the earth sciences of geology, meteorology and soils. Where possible, the studies will be undertaken in a natural setting using equipment and materials appropriate to the learning tasks. Lectures, films and library assignments will be scheduled to supplement the field work. *Cr* 3. MR. DAVIS

144. Basic Field Ecology—This course is designed for secondary school science teachers with a broad background in the natural sciences and for qualified elementary school teachers who desire studies beyond those ordinarily included in introductory natural history courses. The course involves accumulating, interpreting and applying data acquired primarily from the natural environment. The unique facilities offered at the Bryant Pond Campus and surrounding areas make possible biotic studies ranging from the lower inland elevations to subalpine environments. This program is intended to serve the needs of teachers conducting studies in the Green Version of BSCS biology. *Cr* 3. MR. DAVIS

146. Natural Science Education—Coastal—Primarily for elementary school teachers. Field studies of plants, animals, rocks, minerals, stars and weather, with special attention to marine life of the Maine coast. Areas to be studied are selected with the needs of the elementary school teacher in mind. Lectures and library work will supplement the field studies; offered only in Summer Session, at Goose Cove, Maine. *Cr* 3.

147. Natural Science Education—Coastal—Primarily for secondary school teachers. See general description under Ed C 146. *Cr* 3.

148. Natural Science Education—Inland—(Elementary)—Lectures, library work and field studies in the natural history of inland Maine, with special attention to the Bryant Pond area. Such areas as general ecology, geology, weather and climate will be studied. Opportunity will be given to study various types of habitats found in Maine. This course is directed to the needs of the elementary school teacher. Given only in the Summer Session at the Freeman-Waterhouse Campus, Bryant Pond, Maine. *Cr* 3.

149. Natural Science Education—Inland—(Secondary)—Primarily for general science and biology teachers in the secondary school. See general description under Ed C 148. *Cr* 3.

History and Philosophy (Ed H)

2. History of Education—A study of educational thought in its historical bearings with particular emphasis on current modes of thought relative to the values, objectives, purposes, and outcomes of American education. *Cr* 3.
MR. DUPLISSEA

History and Philosophy (Ed H)

100. Trends in Adult Education—Need for and purpose of adult education programs. Consideration of learning program development, organization, and administration of programs. Emphasis on adult education through the public schools, Cooperative Extension Service, and community agencies. *Cr* 3. MR. AXFORD

130. Trends in Education—Discussion of issues in American education as they relate to current and emerging practices in organization curriculum and teaching in the schools. *Cr* 3. MR. SHIBLES, MISS JARDINE, MR. GRAY

151. Education for Intercultural Understanding—Forces of international, racial and religious conflict in contemporary community life; ways in which schools teach understanding of and adjustment to such cultural conflicts. *Cr* 3.
MR. EMERICK

School Leadership (Ed L)

151. Organization and Administration of Adult Education—The organization, financing, staffing, promotion, and evaluation of programs of adult education. Teaching resources and the role of the adult education administrator are given major emphasis. Prerequisite: senior standing or permission of instructor. *Cr* 3.

Methods (Ed M)

13. Teaching of Reading in the Elementary School—General background for teaching reading in the elementary school; reading readiness, comprehension, word analysis skills, directed reading lessons, recreational reading, and evaluation. An introductory course. Prerequisite: Py 1; open to juniors and seniors. *Cr* 3. MISS JARDINE, MR. LOWELL, MR. THOMAS

18. Teaching Language Arts in the Elementary School—Current methods and materials in teaching handwriting, spelling, oral and written composition; analysis and correction of basic difficulties. Prerequisite: Py 1; open to juniors and seniors. *Cr* 3. MR. CAUGHRAN, MR. ROBERTS, MR. LOWELL

114. Teaching Arithmetic in the Elementary School—The arithmetic curriculum in the elementary school; methods and the techniques in teaching arithmetic; the arithmetic readiness program; instructional and evaluation material. An introductory course. Prerequisite: Py 1, Ms 7. *Cr* 3. MR. YVON

115. Teachnig Social Studies in the Elementary School—Methods and materials for social studies in the elementary school; ways of relating the work of the social studies class to the understanding of practical problems of the community. Prerequisite: Py 1, and sophomore standing. *Cr* 3. MR. SUPPLE

116. Teaching Science in the Elementary School—Materials, methods, devices, and activities appropriate to the program of science in the elementary school. Prerequisite: Py 1, junior or senior standing. *Cr* 3.
MR. DAVIS, MR. BUTZOW

120. Teaching Geography in the Elementary School—Materials, methods, devices, activities, and appropriate background information to the program of teaching geography in the school. Prerequisite: Py 1. *Cr* 3. MR. SUPPLE

130. Education of the Trainable—The contents of this course are family, social, and educational implications of the trainable mentally retarded child with emphasis being placed on the latter. Teaching methodology appropriate to the needs of the trainable child, as well as curriculum, goals, etc., are also included. Prerequisite: Ed B 2, Ed B 3, Ed B 4, or their equivalents. *Cr* 3.
MR. CHIAPPONE, MR. WILLIAM DAVIS

140. Teaching Reading in the Secondary School—Appraisal of reading achievements and needs; teaching reading and study skills in the content areas: survey of reading programs in the junior-senior high school. Prerequisite: Py 1, junior or senior standing. *Cr* 3. MR. ROBERTS

141. Teaching Social Studies in the Secondary School—Current practices in teaching social studies; selection and use of instructional materials; modern trends in curriculum construction for social studies in the secondary school. Prerequisite: Py 1, junior or senior standing. *Cr* 3. MR. MILLER

142. Teaching Science in the Secondary School—Methods and materials in teaching of science; development of the science curriculum, and equipment, supplies, and supplementary materials for science teaching in the secondary schools. Prerequisite: Py 1, junior or senior standing. *Cr* 3.
MR. DAVIS, MR. BUTZOW

143. Teaching Geograhy in the Secondary School—Materials, methods, devices, activities, and appropriate background information to the program of teaching geography in the school. Prerequisite: Py 1. *Cr* 3. MR. SUPPLE

150. Newer Practices in Reading—Objectives, materials, and procedures for the improvement of the teaching of reading; methods and materials used in evaluating the reading program; comparison of current practices in reading instruction. Prerequisite: Ed M 13 or Ed M 140, or their equivalents. *Cr* 3.
MR. CAUGHRAN, MR. ROBERTS, MR. LOWELL

165. Methods of Teaching the Superior Child—Methods, materials and techniques for teaching the gifted child. Prerequisite: Ed B 2, B 3, B 4 or their equivalents. *Cr* 3.

170. Methods of Teaching the Retarded Child—Methods, materials, and techniques in teaching retarded children at the special class level. *Cr* 3.
MR. CHIAPPONE, MR. WILLIAM DAVIS

172. Education of the Exceptional Child—The characteristics, identifications, educational provisions, adjustment, and guidance of exceptional students. Prerequisite: Ed B 2, Ed B 3, Ed B 4, or their equivalents. Cr 3.
MR. CHIAPPONE, MR. W. DAVIS

180. Teaching in Adult Education—This is a course in methods for teaching adults and makes a critical examination of major problems in teaching and learning in adult education. Emphasis is given to factors which affect learning ability, achievement, motivation to learn through the adult life-cycle. Prerequisite: senior standing, graduate standing, or permission of the instructor. *Cr* 3.
MR. AXFORD

OBSERVATION AND STUDENT TEACHING

The University's arrangement for Observation and Student Teaching is generally made a year in advance and based upon the need of students. The demand for this course has increased to the point where it has become necessary to make application with the Director of Student Teaching, Room 144. This application must be approved well in advance of actual registration for the course.

190. Full-Day Student Teaching (Elementary)—A full-day, off-campus internship program in a selected school for one half of the semester; a full-day, on-campus program of college courses is provided for the other half of the semester. Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4 or their equivalents, methods course, and senior standing. *Cr* 6.
MR. NICHOLS AND STAFF

191. Full-Day Student Teaching (Secondary)—A full-day, off-campus internship program in a selected school for one half of the semester; a full-day, on-campus program of college courses is provided for the other half of the semester. Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4, or their equivalents, methods course, and senior standing. *Cr* 6.
MR. NICHOLS AND STAFF

192. Half-Day Student Teaching (Elementary)—A half-day program of observation and student teaching in a selected school in the University area. The same four consecutive periods must be free daily in order to schedule this course. Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4, or their equivalents, methods course, and senior standing. *Cr* 6.
MR. NICHOLS AND STAFF

193. Half-Day Student Teaching (Secondary)—A half-day program of observation and student teaching in a selected school in the University area. The same four consecutive periods must be free daily in order to schedule this course. Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4, or their equivalents, methods course, and senior standing. *Cr* 6.
MR. NICHOLS AND STAFF

194. Student Teaching, K-12 (Music or Art Education)—A program of observation and student teaching in selected elementary and secondary schools. Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4, or their equivalents, methods course, and senior standing. *Cr* 6.
MR. LEWIS, MR. NESBIT

General (Ed X)

51. Basic Driver Education—A short, basic, intensive course in driver education for teachers has been arranged in cooperation with the American Automobile Association. This training is designed specifically to aid high schools in establishing plans for a course in driver education, not for the purpose of teaching an individual how to drive. *Cr* 3.

52. Driver and Traffic Safety Education—An intensive course in driver and traffic safety education for teachers who have completed the basic course in driver education, Ed X 51, and have had a minimum of one year's teaching experience in this area of education. Deals with problems experienced by teachers in teaching driver education and highway safety. Prerequisite: Ed X 51. *Cr* 3.

53. Driver Education Simulation—This course is devised to provide driver education teachers with the necessary knowledge and skills to effectually utilize driver education simulation as part of the total driver education program. *Cr* 3.

110. Workshop for Cooperative School Personnel (Activity)—A workshop concerning the nature and scope of the activities of the supervisor, resource teacher, team leader, critic teacher, aids with other school personnel. Attention will be given to the literature, research, practices and materials relating to effective utilization of cooperating school personnel as indicated. *Cr* 3.

MRS. BOYCE, MR. CROXFORD, MR. NICHOLS, MR. GRAY, MISS JARDINE

162. Workshop in Elementary Education (Activity)—A workshop designed to increase the competence of the elementary school teacher, supervisor, curriculum director, administrator, and other school personnel related to the school program. Attention will be given to the literature, research and materials concerned with a special aspect of elementary education. *Cr* 3-6. STAFF

163. Workshop in Conservation Education—Most of this elementary school teacher workshop program relates to the mineral, soil, water, forest, fish, wildlife, and recreational resources of Maine. Field studies are empahsized. *Cr* 3.

172. Workshop in Secondary Education (Activity)—A workshop designed to increase the competence of the director, administrator, and other school personnel related to the school program. Attention will be given to the literature, research and materials concerned with a special aspect of secondary education. *Cr* 3-6. STAFF

173. Workshop in Conservation Education—Same as course 163 except for secondary teachers. *Cr* 3.

181. Educational Travel (Area)—A summer session study tour designed to provide an insight in the social, economic, historical, and geographic aspects of the locale visited with special consideration to those areas which have made major contributions to our cultural heritage. Tours currently conducted to Europe, United States, Maritime Provinces and Quebec. *Cr* 3-6. MR. PORTER-SHIRLEY

198. Problems in Education—Individual work on a problem of the student's own selection. Primarily for majors in education. *Cr Ar.*

MR. BISHOP, MR. FOBES

DIVISION OF MUSIC EDUCATION

The College of Education offers a program in music education for students who intend to make music a career either as a teacher, and/or a supervisor of music. Majors in these programs will register in the College of Education. Upon satisfactory completion of the course of study, the student will graduate with the bachelor of science in education degree and will be certified to teach music in the public schools. Students who are interested in this program should obtain a special folder from the College of Education concerning this program.

DIVISION OF ART EDUCATION

A program in art education is offered by the College of Education. It is designed for those who plan to teach art or become supervisors of art in the public schools. Students who are interested in this program should obtain a special folder from the College of Education concerning this program.

DIVISION OF PHYSICAL EDUCATION

The professional curriculum in physical education is designed to prepare qualified students to teach health and physical education, to coach athletic teams and to direct recreational programs. It provides for a major in health, physical education and recreation and a second major in an academic teaching area. A bachelor of science degree in education is awarded graduates of this program.

Definite evidence of intellectual capacity, positive qualities of character and personality, good health, and competent proficiency in motor skills are the factors determining admission. Applicants who lack any of these qualities, which are considered essential for professional success in health, physical education, and recreation will be advised to enter some other field of study. Applicants are urged to present at least one unit in a laboratory science.

COURSES OF INSTRUCTION (Pe)

PROFESSORS WESTERMAN, WOODBURY, AND SEZAK; ASSOCIATE PROFESSORS HAAS, BROWN, CASSIDY, BUTTERFIELD, LEPLEY, STYRNA, WALKUP; ASSISTANT PROFESSORS ABBOTT, ANDERSON, CARVILLE, COBB, JORDAN, PHILBRICK, PICKETT, WALLACE; INSTRUCTORS AMES, BALANGER, CHAPPELLE, CREIGHTON, DEVARNEY, FOLGER, HADLEY, JORDAN, MACKINNON, STOYELL

(M-men students only; W-women students only)

9m. Team Sports Skills—To develop skills, techniques, and understandings for competency in basketball, football, and volleyball. *Cr* 1. STAFF

10m. Sport Skills—To develop skills, techniques, and understandings for competency in baseball, track and tennis. *Cr* 1.

10w. Sports Skills—To develop skills, techniques, and understandings for competency in volleyball, golf, and tennis. *Cr* 1. STAFF

11m. Team Sports Skills—To develop skills, techniques, and understandings for competency in soccer, speedball, and wrestling. *Cr* 1. STAFF

11w. Team Sports Skills—To develop skills, techniques, and understandings for competency in soccer, speedball, hockey, and basketball. *Cr* 1.

12m. Individual and Dual Sports—To develop skills, techniques, and understandings for competency in golf, archery, badminton, fencing, handball and squash. *Cr* 1. STAFF

12w. Individual and Dual Sports—To develop skills, techniques, and understandings for competency in skiing, swimming, track-field, and archery. *Cr* 1.

13m. Physical Conditioning—To develop skills, techniques, and understandings for competency in mass exercise, floor work. *Cr* 1.

13w. Sports Skills—To develop skills, techniques and understandings for competency in badminton, fencing, softball, and lacrosse. *Cr* 1.

14m. Rhythmic Activities—To develop skills, techniques, and understandings for competency in rhythms, folk dance, and square dance. *Cr* 1. MISS CASSIDY

14w. Rhythmic Activities—To develop skills, techniques, and understandings for competency in rhythms, folk dance, and square dance. *Cr* 1.

15m. Gymnastics—To develop skills, techniques, and understandings for competency in conditioning exercises, tumbling, apparatus, and free exercise. *Cr* 1.
MR. WALLACE

15w. Gymnastics—To develop skills, techniques, and understandings for competency in conditioning exercises, tumbling, apparatus, and free exercise. *Cr* 1.
STAFF

16w. Techniques in Modern Dance—To develop skills, techniques, and understandings for competency in modern dance. *Cr* 1. MISS CASSIDY

50. Camp Leadership—Designed for the training of camp counselors, with emphasis on participation in the varied activities of camping. In addition to the regular two hours per week in the classroom, field trips will be arranged. *Cr* 2.
MR. SEZAK

6. Physical Education in the Elementary School—Designed to give organizational procedures for curriculum construction, contributions of current research, and selection of content for the elementary school program. Activity participation in the specific areas of dance, gymnastics, sports and games, and aquatics. *Cr* 2. MISS HAAS

61m. Methods of Team Sports—Emphasis on appropriate techniques used in teaching team sports and lead-up activities. Includes laboratory experiences, the use of teaching aids, organizational procedures, and evaluative processes. *Cr* 2. MR. WOODBURY

61w. Methods of Team Sports—Emphasis on appropriate techniques used in teaching team sports and lead-up activities. Includes laboratory experiences, the use of teaching aids, organizational procedures, and evaluative processes. *Cr* 2.
MISS HAAS

62m. Methods of Individual and Dual Sports—A continuation of Pe 61m, with emphasis on individual and dual sports. *Cr* 2. MR. WOODBURY

62w. Methods of Individual and Dual Sports—A continuation of Pe 61w, with emphasis on individual and dual sports. *Cr* 2. MISS WALKUP

63m. Coaching Techniques—Practical instruction in football and basketball for men preparing to enter the coaching profession. *Rec* 2, *Cr* 2. MR. ABBOTT

63w. Methods in Modern Dance—An intensive study of modern dance, with special emphasis on teaching techniques, theory, and principles of composition. Prerequisite: Pe 14w. *Rec* 3, *Cr* 2. MISS CASSIDY

64m. Coaching Techniques—Devoted to a study of the mechanics of running, jumping, and weight throwing, with discussions of different styles involved in track and field activities; also a study of approved methods in coaching baseball in all its phases. *Rec* 2, *Cr* 2. MR. STYRNA, MR. BUTTERFIELD

65m. Coaching Techniques—Practical instruction in wrestling and soccer for men preparing to enter the coaching profession. *Rec* 2, *Cr* 2.
MR. MACKINNON, MR. LIVESEY

69. Foundations of Recreation—Fundamental concepts, principles, and practices in the field of recreation, with emphasis on historical and philosophical backgrounds. *Cr* 2. STAFF

73. Athletic Training—Prevention and care of injuries in athletic activities; the use of proper personal and field equipment, support methods, conditioning exercises, the medical examination, and therapeutic aids. *Rec* 1, *Lab* 2, *Cr* 2.
MR. JORDAN

78. Health Education—Stress is placed on elements of services, facilities, and instruction at elementary and secondary school levels as they influence habits of positive health. *Cr* 2-3 MR. LEPLEY

145. Community Centers and Playgrounds—Covers various aspects of organization, administration, management, facilities, equipment, and activities of building-centered programs and community playgrounds. *Cr* 3. STAFF

148. Field Experience—Supervised experience in conducting recreation programs in camp, community, social agency or institution situations. Enrollment by permission. *Cr* 3-6. STAFF

165. Leadership Organization in the Intra-Extramural Programs—Principles and philosophy, administration, organization, and supervision of intra-extramural activities in the physical education program in elementary, junior, and senior high schools. *Cr* 3. MR. LEPLEY

168. Protective Practices and Safety in Physical Education and Athletics—Designed to acquaint teachers and athletic coaches with modern principles and practices in prevention, treatment, rehabilitation, and safety in physical education and athletics. *Cr* 3. MR. WOODBURY, MR. COBB

171. History and Philosophy of Physical Education—Designed to develop an appreciation of the place and function of physical education during the course of civilization and to assist in the formation of a constructive approach to present day problems in this area. *Cr* 2-3. MR. LEPLEY

172. Tests and Measurements in Physical Education—Techniques and devices for the evaluation of physical education programs. Includes the selection and administration of traditional physical performance tests, the construction of teacher-made tests specific to instructional programs in physical education and the knowledges and understandings basic to interpretations of test scores. *Cr* 3. MISS WALKUP

176. Kinesiology—Introduction to the analysis of movement patterns based on precepts necessary for the application of basic mechanics and kinesiological principles to the teaching of motor skills. *Cr* 3. MISS WALKUP

180. Health, Physical Education, and Recreation Programs in the Elementary School—Study of skills, progressions in rhythms, sports, and gymnastics. Health programs including curriculum planning, and methods of presentation. Organization and administration of elementary school recreation programs. For elementary classroom teachers. *Cr* 3. MISS ANDERSON

183. Planning the Health Education Curriculum—Designed to assist the student in more thoroughly understanding health education in relation to the total school curriculum. Concepts of curriculum development, national considerations, and current research related to curriculum constructions are examined and evaluated. *Cr* 3. MR. LEPLEY, MR. COBB

184. Practicum in Physical Education—Leadership experiences under staff supervision in the service program. Consult either Dr. Haas or Mr. Woodbury before registering. *Cr* 1-3. STAFF

185. Program Planning in Recreation and Camp Organization—Skills and practical experiences essential to the development and organization of an effective recreation and camp program. *Cr* 3. MR. SEZAK

198. Problems (Activity)—Individual work on a problem in the area of health, physical education and recreation. *Cr* 1-3. STAFF

GRADUATE COURSES

Appraisal—Pupil Adjustment and Personnel Practices (Ed A)

220. Test Construction—Cr 2.
251. Introduction to School Guidance Services—Cr 3.
252. Guidance in Groups—Cr 3.
253. Guidance in the Elementary School—Cr 3.
254. Introduction to Counseling the Young Child—Cr 3.
255. Introduction to Counseling—Cr 3.
261. Student Personnel Services in Higher Education—Cr 3.
290. Nature and Needs of the Retarded—Cr 3.
320. Educational Measurement—Cr 3.
321. Statistical Methods in Education—Cr 3.
322. Organization and Administration of School Testing Programs—Cr 3.
351. Vocational Developmental Theory—Cr 3.
352. Group Procedures in Counseling—Cr 3.
353. Occupational and Educational Information—Cr 3.
354. Organization and Administration of School Guidance Services—Cr 3.
355. Advanced Counseling—Cr 3.

Curriculum and Instructional Materials (Ed C)

210. Planning the Curriculum for the Retarded Child—Cr 3.
211. Planning the Elementary School Curriculum—Cr 3.
221. Planning the Secondary School Curriculum—Cr 3.
224. Planning the Junior High School Curriculum—Cr 3.
233. The Dynamics of the Curriculum—Cr 3.
236. Campus, Culture and Student Activities in Higher Education—Cr 3.
237. New Media in Education—Cr 3.
312. Principles of Curriculum Construction (Elementary)—Cr 3.
322. Principles of Curriculum Construction (Secondary)—Cr 3.

Seminars, Research and the Thesis (Ed G)

300. Seminar: Education in the United States—Cr 3.
301. Seminar in Reading—Cr 3.
302. Seminar in Arithmetic—Cr 3.
303. Seminar in Social Studies (Elementary)—Cr 3.
304. Seminar in Science (Elementary)—Cr 3.
305. Seminar: Special Education (Exceptional Children)—Cr 3.
306. Seminar in Higher Education in the U. S.—Cr 3.
307. Seminar in Language Arts—Cr 3.
308. Seminar in Student Personnel Problems—Cr 3.
309. Seminar in College Teaching—Cr. 3.
315. Seminar in Methods of Teaching—Cr 3.
316. Seminar in Audio-Visual Aids—Cr 3.
321. Seminar in Social Studies (Secondary)—Cr 3.
322. Seminar in Science (Secondary)—Cr 3.
331. Seminar in Elementary School Curriculum—Cr 3.

332. Seminar in Secondary School Curriculum—Cr 3.
341. Seminar in Supervision—Cr 3.
342. Seminar in School Administration—Cr 3.
343. Seminar—The Superintendent—Cr 3.
351. Seminar in Measurement and Evaluation—Cr 3.
361. Seminar in Guidance—Cr 3.
362. Advanced Seminar in Counseling, Guidance, and Student Personnel Administration—Cr 3.
373. Seminar in Business Education (Administration and Supervision)—Cr 3.
375. Advanced Seminar in Science Education—Cr 3.
376. Advanced Seminar in Social Studies Education—Cr 3.
391. Graduate Apprenticeship—Cr 2-6.
393. Educational Internship—Cr 3.
395. Educational Research—Cr 3.
396. Doctoral Seminar in Education—No credit.
397. Advanced Educational Research I—Cr 6.
398. Advanced Educational Research II—Cr 2-6
399. Graduate Thesis—Cr 6.

History and Philosophy (Ed H)

261. Comparative Education—Cr 3.
362. Philosophy of Education—Cr 3.

School Leadership (Ed L)

210. School Administration and Supervision—Cr 3.
211. Educational Supervision—Cr 3.
220. Coordinating Service in Special Education—Cr 3.
230. Public Relations—Cr 3.
231. School Law—Cr 3.
251. Theories of Administration—Cr 3.
311. The Elementary School Principalship—Cr 3.
321. The Secondary School Principalship—Cr 3.
330. School Finance and Business Management—Cr 3.
340. Housing the School Program—Cr 3.
350. School Personnel Management—Cr 3.
352. The Governance of Education—Cr 3.
360. Educational Surveys of the School System—Cr 3.

Methods (Ed M)

200. Field Observation (Activity)—Cr 2.
215. Newer Practices in Social Studies in the Elementary School—Cr 3.
216. Advanced Studies in Science Education (Elementary)—Cr 6.
230. Advanced Study in Language Arts—Cr 3.
232. Methods of Teaching the Emotionally Disturbed—Cr 3.
241. Newer Practices in Social Studies in the Secondary School—Cr 3.
242. Advanced Studies in Science Education (Secondary)—Cr 3.

251. Newer Practices in Arithmetic—Cr 3.

253. Remedial Reading—Cr 3.

269. Clinical Practices in Reading—Cr 6.

271. Observation and Practice in Special Class Education—Cr 3.

280. Educational Institute (Activity)—Cr 3-6.

301. Diagnosis in Reading—Cr 3.

310. Learning Disability and the Handicapped—Cr 3.

311. Learning Disability—Cr 3.

320. Theories of Teaching—Cr 3.

357. Education Practicum (Activity)—Cr 3.

Vocational (Ed V)

271. Improvement of Instruction in the Vocational Business Subjects—Cr 3.

272. Improvement of Instruction in the Non-vocational Business Subjects—Cr 3.

275. Business Education Curriculum—Cr 3.

General (Ed X)

286. Workshop in Special Education (Activity)—Cr 3-6.

398. Individual Study in Education (field of specialization)—Cr 3-6.

Physical Education (Pe)

270. Interpretation of Health, Physical Education, and Recreation—Cr 3.

272. Planning the Physical Education Curriculum—Cr 3.

275. Current Studies in Health, Physical Education, and Recreation—Cr 3.

276. Physiology of Activity—Cr 3.

277. Organization and Administration of Health, Physical Education and Recreation—Cr 3.

280. Mechanical Analysis of Human Movement—Cr 3.

282. Physical Education for the Exceptional—Cr 3.

284. Evaluative Procedures in Health, Physical Education, and Recreation—Cr 3.

310. Seminar in Health, Physical Education, and Recreation—Cr 3.

COURSES TO BE OFFERED PERIODICALLY

(All courses are 3 credit hours except as noted by figure in parenthesis following course title.)

Curriculum Instructional Materials (Ed C)

113. Principles of Curriculum Construction (Conservation) for Elementary School Teachers.

123. Principles of Curriculum Construction (Conservation) for secondary School Teachers.

Seminars, Research and the Thesis (Ed G)

365. Seminar in Self-Actualization.

Methods (Ed M)

273. Problems in Teaching the Slow Learning Child.

Physical Education (Pe)

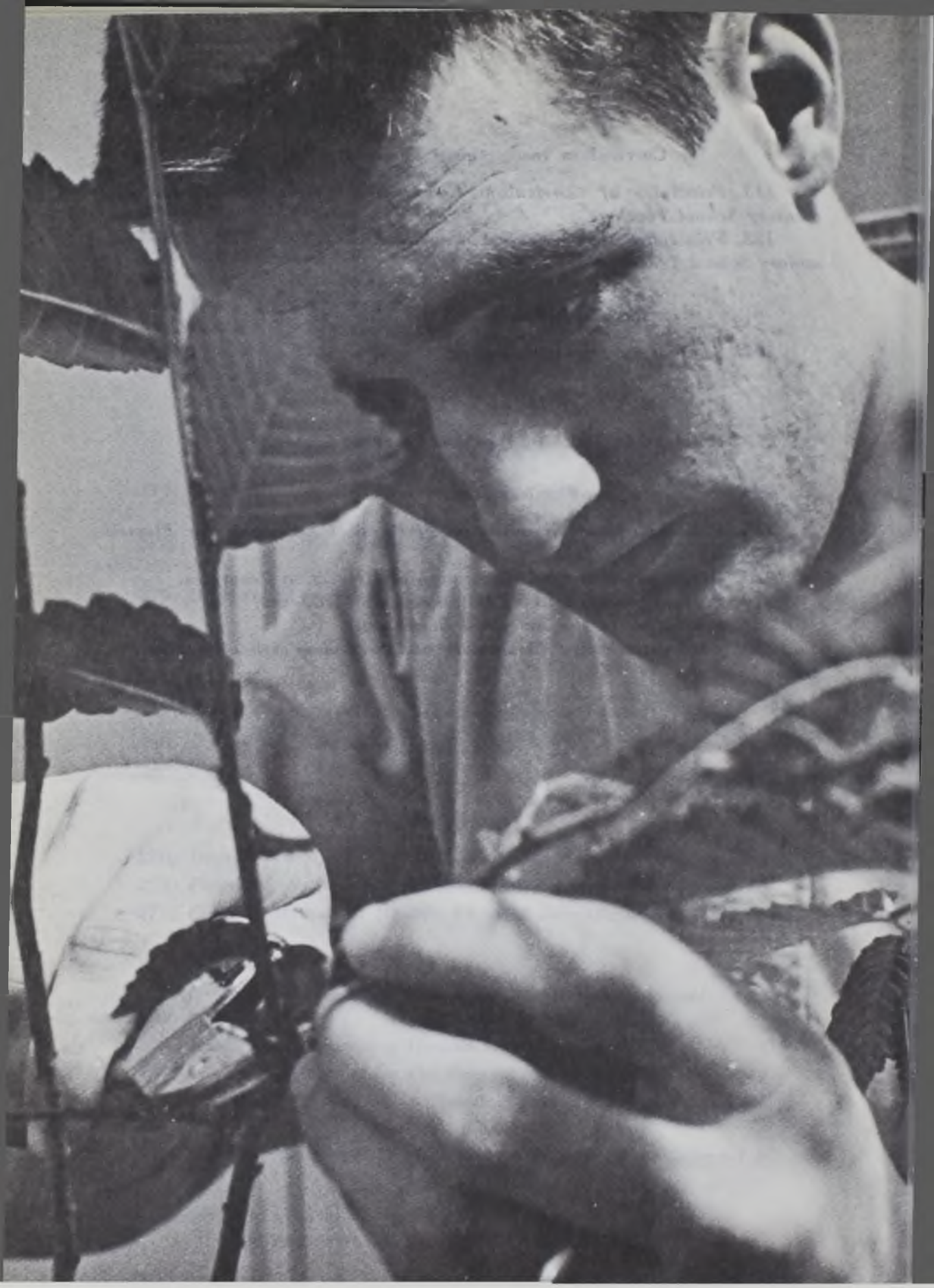
155. Philosophy and Organization of Physical Education for Elementary Schools.

274. Organization and Administration of Recreation Programs.

279. Current Studies in the Administration of Athletics.

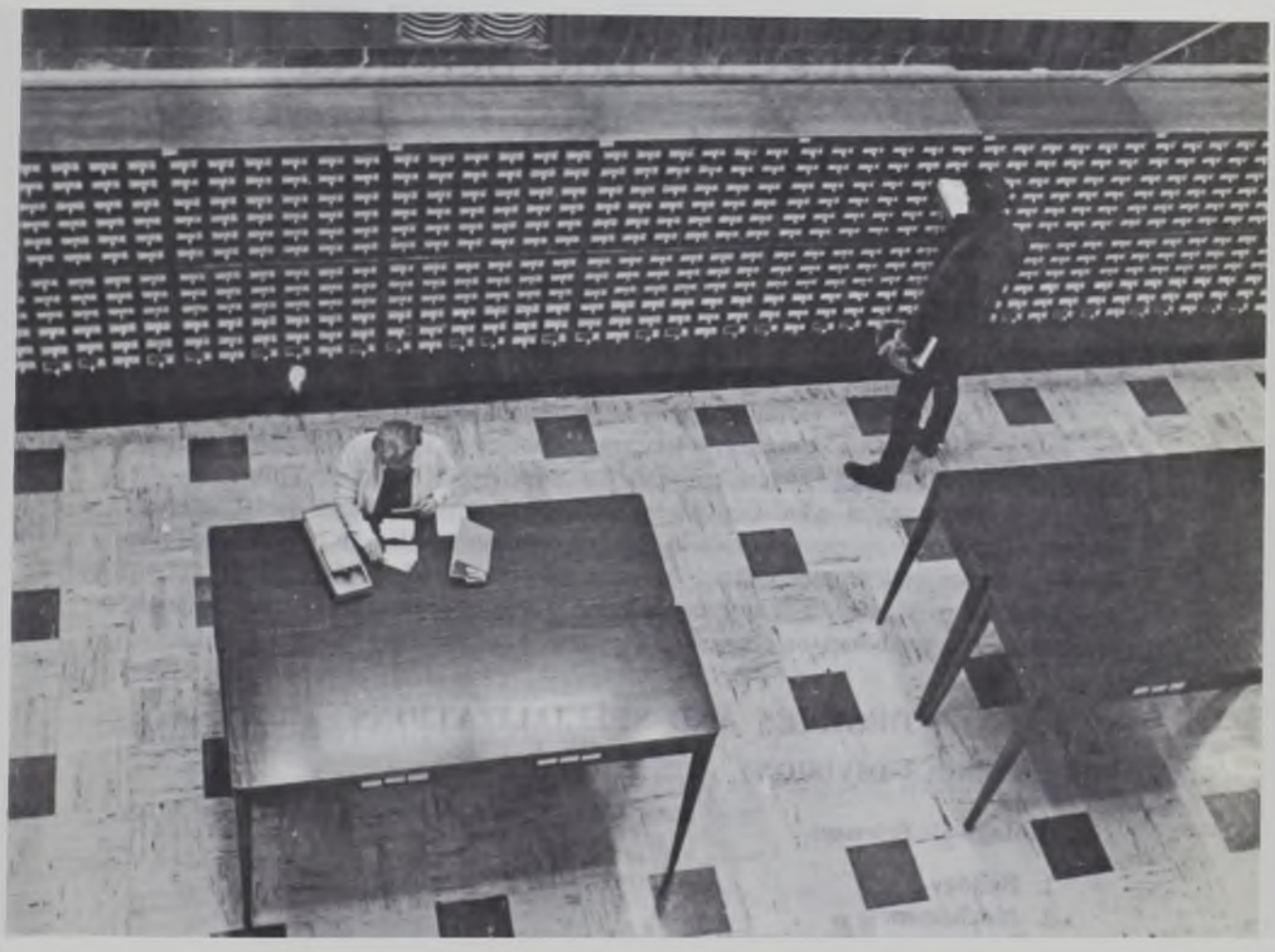
281. Recreation in the American Community.

283. Administration of Elementary and Secondary School Health Program.



COLLEGE OF LIFE SCIENCES AND AGRICULTURE

BRUCE R. POULTON, DEAN



College of Life Sciences and Agriculture

The College of Life Sciences and Agriculture is composed of the School of Forest Resources, the School of Human Development, and the Departments of Agricultural and Resource Economics, Agricultural Engineering, Animal and Veterinary Science, Microbiology, Biochemistry, Botany and Plant Pathology, Entomology, Food Science, and Plant and Soil Sciences.

While considerable variation exists in program requirements among units of the college, all have as common objectives: proficiency in a professional subject-matter field and broad, liberal training for effective citizenship. This gives the student a fundamental education in the biological, physical, and social sciences and an opportunity to elect courses in the arts and humanities. In addition, specific applied science courses are offered in each major area of specialization.

Students may select a major upon entering the college or they may do so at the end of the freshman or sophomore year.

DEGREES AND SPECIALIZATIONS

LIFE SCIENCES DIVISION*

Biological Sciences

1. Biology
2. Biochemistry
3. Botany and Plant Pathology
4. Entomology
5. Microbiology

Forest Resources

6. Forestry
7. Wildlife Management

Human Development

8. Human Development, with specialization in:
   —Food and Nutrition
   —Child Development Education
   —Home Economics Education
   —Social Service
   —General Home Economics
9. Health and Family Life Education

Natural Resource Management

10. Natural Resource Management, with options in:
    —Conservation Engineering
    —Forest Resources
    —Resource Economics
    —Soil and Water Conservation

AGRICULTURAL SCIENCE DIVISION*

11. Agricultural Engineering
12. Agricultural Mechanization
13. Agricultural and Resource Economics, with an option in:
    —Rural Sociology
14. Animal and Veterinary Science
15. Plant and Soil Science

* Minor areas of emphasis in baccalaureate degree programs: Agricultural Education, Biology Education, Food Science, International Agricultural Development, and Journalism

In addition, special pre-professional programs in Agricultural Education, Dairy Manufacture, and Food Processing are offered as a part of the New England Board of Higher Education plan for regional cooperation. This agreement permits students to complete two-year preparatory programs at the University of Maine at Orono, and to transfer to other specified New England universities for the final two years of professional training. A Pre-Veterinary curriculum is provided for those who wish to qualify for entrance into a regular college of veterinary medicine.

TECHNICAL INSTITUTE DIVISION

The college has technical programs of study of two years' duration that lead to an associate of science degree. The programs are:

1. Animal Technology
2. Animal Medical Technology
3. Forest Management
4. Food Service Management
5. Merchandising
6. Resource and Business Management, with specialization in:
   — Agricultural Business Management
   — Food Industry Management
   — Horticultural Management
   — Resource Management

GRADUATION REQUIREMENTS

Bachelor of Science Degree Candidates

Completion of course work required in the various programs of the College of Life Sciences and Agriculture leads to a degree of bachelor of science. All students are required to complete a minimum of 120 degree hours, exclusive of credit for basic military training. Exceptions are the School of Forest Resources that requires 132 credit hours plus 8 credit hours of summer camp and a one-hour spring trip in the Forestry and Wildlife programs, and Agricultural Engineering that requires a 129 credit hours.

In addition, each student must accumulate a minimum grade point average of 1.8 and receive a passing grade in all required courses in the program of study.

General subject matter requirements of all degree candidates are:

		cr. hrs.
Communications:		8
Eh 1 Freshman Composition*	3	
Eh 7, 8 or 17 Composition	3	
Sh 1 Speech or Senior Seminar	2(3)	
*Humanities and Social Sciences:***		15
Minimum of two courses in each		
Physical Education:		0
Minimum of two semesters		

* Students with high level of proficiency or selected for freshman honors are excused.

** *Humanities:* Courses in Literature, Philosophy Pl 1, 2, History Hy 1, 2; Foreign Languages; Music; Art.

Social Sciences: Courses in Anthropology, Philosophy, Modern Society, Economics, History, Political Science, Sociology, Psychology, Agricultural and Resource Economics.

Associate of Science Degree Candidates

For the degree of associate of science, students must complete satisfactorily a prescribed technical curriculum with a minimum of 64 credit hours earned at an accumulative grade point average of at least 1.8.

COURSES OF INSTRUCTION

Courses numbered 1 to 99 are undergraduate courses. They are open to graduate students but credit earned in these courses may not be used to satisfy advanced degree requirements. Courses numbered 100 to 199 are upperclass undergraduate courses which may be used for graduate degree credit by graduate students if given prior approval by the graduate student's advisory committee. Courses numbered 200 to 299 are graduate courses which may be elected by undergraduate honor students, or those undergraduates whose advancement in the field will permit their taking a graduate level course among graduate stu-

dents without disadvantage to themselves. Courses numbered 300 to 399 are graduate level courses which may be taken only by students admitted to the Graduate School.

Courses credited towards the baccalaureate and higher degrees are listed with the departmental abbreviation first, followed by the course number, e.g., Bc 21—Organic Chemistry; courses credited towards the two-year associate degrees are listed with the course number first and the departmental designator second, e.g., 2 Bc—Food Chemistry.

One number is used for a course which is given both fall and spring.

When a dash is used between the two numbers (e.g., 1-2), both semesters must be taken to obtain credit; when a slant is used (e.g., 1/2), the first semester may be taken by itself, but the second semester cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit.

Courses offered in 1971-72 and alternate years are indicated by the sign (‡) placed before the number of the course; courses offered in 1970-71 and alternate years are indicated by the sign (†) placed before the number of the course.

FRESHMAN PROGRAMS

Students admitted to degree programs of the College of Life Sciences and Agriculture enroll in one of the following freshman programs.

Agricultural and Resource Economics

FALL SEMESTER				SPRING SEMESTER			
		Subject	Credit Hours			Subject	Credit Hours
LSA	1	University Life	0	ARE	24	Sociology of Rural Life	3
Ec	10	Prin. of Economics	3	Ba	9	Principles of Accounting	3
Eh	1	Freshman Composition	3	Ms*	6	Elements of College Math.	3
Ms*	5	Elements of College Math.	3	Pe	2	Physical Education	0
Pe	1	Physical Education	0			Electives	6
		Electives	6				
			15				15

* Ms 4 and 12 may be substituted

Agricultural Engineering

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
LSA	1	University Life	0	Ch	14	Chemistry Principles	4
Ch	13	Chemistry Principles	4	Eh	1	Freshman Composition	3
Ge	1	Introduction to Engrg. Design	2	Ge	2	Introduction to Engrg. Design	2
Ge	5	Engineering Orientation	0	Ge	6	Engineering Orientation	0
Ms	12	Anal. Geom. and Calculus	4	Ms	27	Anal. Geom. and Calculus	4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
Ps	1	General Physics	4	Ps	2	General Physics	4
			14				17

Agricultural Mechanization

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
LSA	1	University Life	0	Bt	1	General Botany	4
Ec	10	Prin. of Economics	3	Ge	2	Introduction to Engineering Design	2
Ge	1	Introduction to Engineering Design	2	Ps	2a	General Physics	4
Eh	1	English Composition	3	Pe	2	Physical Education	0
Ms	4	Algebra and Trigonometry	4			Electives	5
Ps	1a	General Physics	4				
Pe	1	Physical Education	0				
			16				15

Animal and Veterinary Sciences—Plant and Soil Sciences

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
LSA	1	University Life	0	Ch	12 or 14	Chemistry	4
Ch	11 or 13	Chemistry	4	Pe	2	Physical Education	0
Eh	1	Freshman Composition	3	S or Zo	2 4	Soils / Animal Biology	4
Ms	4*	Algebra and Trigonometry	4			Electives	7
Pe	1	Physical Education	0				
Bt or Zo	1 3	General Botany / Animal Biology	4				
			15				15

* Ms 5 and 6, or Ms 12 may be substituted

Biological Sciences

(Microbiology-Biochemistry-Biology-Botany-Entomology)

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
LSA	1	University Life	0	Ch	12 or 14	Chemistry	4
Ch	11 or 13	Chemistry	4	Ms	12	Anal. Geom. and Cal.	4
Eh	1	Freshman Composition*	3	Pe	2	Physical Education	0
Ms	4	Algebra and Trigonometry*	4	Bt or Zo	1 3	General Botany or Animal Biology	4
Pe	1	Physical Education	0			Elective	3
Bt or Zo	1 3	General Botany or Animal Biology	4				
			15				15

* If qualified, may take next higher level course.

Forestry and Wildlife

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
Ch	11			Ch	12		
or	13	Chemistry	4	or	14	Chemistry	4
Ge	1	Intro. to Engrg. Design	2	Ge	12	Forestry Drawing	2
Fy	1	Intro. to Forest Resources	2	Fy	2	Intro. to Forest Resources	2
Ms	4*	Algebra and Trigonometry	4	Eh	1	Freshman Composition	3
Bt	1	General Botany		Bt	1	General Botany	
		or	4			or	4
Zo	3	Animal Biology		Zo	3	Animal Biology	
Pe	1	Physical Education	0	Pe	2	Physical Education	0
						Electives	2
			16				17

* Ms 12 may be substituted

Natural Resource Management

		Subject	Hours			Subject	Hours
LSA	1	University Life	0	Ch	12		
Ch	11			or	14	Chemistry	4
or	13	Chemistry	4	Ms	12	Anal. Geom. & Calculus	4
Eh	1	Freshman Composition	3	Bt	1	General Botany	
Ms	4	Algebra & Trigonometry	4			or	4
Bt	1	General Botany		Zo	3	Animal Biology	
		or	4	Pe	2	Physical Education	0
Zo	3	Animal Biology				Elective	3
Pe	1	Physical Education	0				
			15				15

Life Sciences Division

BIOCHEMISTRY

PROFESSOR RADKE; ASSOCIATE PROFESSOR DEHAAS; ASSISTANT PROFESSORS JOHNSON, LERNER, WRATTEN; PART-TIME INSTRUCTOR MRS. PRATT; LECTURERS CHASE, SENSENIG

Biochemistry deals with the study of (1) the nature of the chemical constituents of living matter and of chemical substances produced by living things, (2) the functions and transformations of these chemical entities in biological systems, and (3) the chemical and energetic changes associated with these transformations in the course of activity of living matter. The ultimate goal of biochemistry is to describe the phenomena that distinguish the "living" from the "non-living" in the language of chemistry and physics.

The biochemist does research and development in pharmaceutical houses, medical schools and research centers on all aspects of human health. He studies all phases of foods and nutrition, including such areas as composition, utilization, preservation, additives, and contaminants.

There are many opportunities for the B.S. biochemist, and many more for those who continue for graduate degrees. The prescribed program in this catalog is a good preparation for both stopping points. A foreign language, or even two, is recommended for those definitely planning graduate study.

Courses of study can be developed to fulfill admission requirements for medical and dental schools. At least 120 degree hours at an accumulative grade-point average of 1.80 are required for graduation.

Curriculum Leading to a Bachelor of Science Degree in Biochemistry

Freshman Year. See Page 210

Curriculum for Biochemistry Majors

Required Courses		Credit Hours	Minimum Degree Hours Required
A. BIOCHEMISTRY			17
Bc 161, 162	Advanced Biochemistry	7	
Bc 164	Biochemical Lab Methods	4	
Bc 191, 192	Biochemical Research	6	
B. OTHER BIOLOGICAL AND PHYSICAL SCIENCES			41
Zo 3, 4	Animal Biology	8	
Mb 127, 128	General Microbiology	5	
Ch 13, 14	Chemistry	4	
Ch 140	Quant. Analysis	4	
Ch 151, 152	Organic Chemistry, Lec.	6	
Ch 161, 162	Organic Chemistry, Lab.	4	
Ps 1, 2	General Physics	10	
C. MATHEMATICS			12
Ms 4	Algebra and Trigonometry	4	
Ms 12	Anal. Geom. and Caculus	4	
Ms 27	Anal. Geom. and Calculus	4	
D. COMMUNICATIONS			8
Eh 1	Freshman Composition	3	
Sh 1	Funds. of Public Speaking	3	
Bc 171, 172	Seminar	2	
E. HUMANITIES AND SOCIAL SCIENCES			15
Minimum of two courses in each—recommend one or more foreign languages.			
F. FRESHMAN ORIENTATION			0
G. PHYSICAL EDUCATION			0
H. ELECTIVES			27
Minimum Degree Hours for Graduation			**120**

Courses in Biochemistry (Bc)

5. Chemistry for Nurses (3-year)—An introduction to the principles of inorganic, organic and biochemistry as needed for the three-year nursing curriculum. *Rec* 2, *Lab* 2, *Cr* 3. MR. WRATTEN

dents without disadvantage to themselves. Courses numbered 300 to 399 are graduate level courses which may be taken only by students admitted to the Graduate School.

Courses credited towards the baccalaureate and higher degrees are listed with the departmental abbreviation first, followed by the course number, e.g., Bc 21—Organic Chemistry; courses credited towards the two-year associate degrees are listed with the course number first and the departmental designator second, e.g., 2 Bc—Food Chemistry.

One number is used for a course which is given both fall and spring.

When a dash is used between the two numbers (e.g., 1-2), both semesters must be taken to obtain credit; when a slant is used (e.g., 1/2), the first semester may be taken by itself, but the second semester cannot be taken unless the first is taken previously; when a period is used (e.g., 1. 2), either semester may be taken for credit.

Courses offered in 1971-72 and alternate years are indicated by the sign (‡) placed before the number of the course; courses offered in 1970-71 and alternate years are indicated by the sign (†) placed before the number of the course.

FRESHMAN PROGRAMS

Students admitted to degree programs of the College of Life Sciences and Agriculture enroll in one of the following freshman programs.

Agricultural and Resource Economics

FALL SEMESTER				SPRING SEMESTER			
		Subject	Credit Hours			Subject	Credit Hours
LSA	1	University Life	0	ARE	24	Sociology of Rural Life	3
Ec	10	Prin. of Economics	3	Ba	9	Principles of Accounting	3
Eh	1	Freshman Composition	3	Ms*	6	Elements of College Math.	3
Ms*	5	Elements of College Math.	3	Pe	2	Physical Education	0
Pe	1	Physical Education	0			Electives	6
		Electives	6				
			15				15

* Ms 4 and 12 may be substituted

Agricultural Engineering

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
LSA	1	University Life	0	Ch	14	Chemistry Principles	4
Ch	13	Chemistry Principles	4	Eh	1	Freshman Composition	3
Ge	1	Introduction to Engrg. Design	2	Ge	2	Introduction to Engrg. Design	2
Ge	5	Engineering Orientation	0	Ge	6	Engineering Orientation	0
Ms	12	Anal. Geom. and Calculus	4	Ms	27	Anal. Geom. and Calculus	4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
Ps	1	General Physics	4	Ps	2	General Physics	4
			14				17

Agricultural Mechanization

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
LSA	1	University Life	0	Bt	1	General Botany	4
Ec	10	Prin. of Economics	3	Ge	2	Introduction to Engineering Design	2
Ge	1	Introduction to Engineering Design	2	Ps	2a	General Physics	4
Eh	1	English Composition	3	Pe	2	Physical Education	0
Ms	4	Algebra and Trigonometry	4			Electives	5
Ps	1a	General Physics	4				
Pe	1	Physical Education	0				
			16				15

Animal and Veterinary Sciences—Plant and Soil Sciences

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
LSA	1	University Life	0	Ch	12		
Ch	11			or	14	Chemistry	4
or	13	Chemistry	4	Pe	2	Physical Education	0
Eh	1	Freshman Composition	3	S	2	Soils	4
Ms	4*	Algebra and Trigonometry	4	or Zo	4	Animal Biology	
Pe	1	Physical Education	0			Electives	7
Bt	1	General Botany	4				
or Zo	3	Animal Biology					
			15				15

* Ms 5 and 6, or Ms 12 may be substituted

Biological Sciences

(Microbiology-Biochemistry-Biology-Botany-Entomology)

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
LSA	1	University Life	0	Ch	12		
Ch	11			or	14	Chemistry	4
or	13	Chemistry	4	Ms	12	Anal. Geom. and Cal.	4
Eh	1	Freshman Composition*	3	Pe	2	Physical Education	0
Ms	4	Algebra and Trigonometry*	4	Bt	1	General Botany or	4
Pe	1	Physical Education	0	Zo	3	Animal Biology	
Bt	1	General Botany or	4			Elective	3
Zo	3	Animal Biology					
			15				15

* If qualified, may take next higher level course.

Forestry and Wildlife

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
Ch	11			Ch	12		
or	13	Chemistry	4	or	14	Chemistry	4
Ge	1	Intro. to Engrg. Design	2	Ge	12	Forestry Drawing	2
Fy	1	Intro. to Forest Resources	2	Fy	2	Intro. to Forest Resources	2
Ms	4*	Algebra and Trigonometry	4	Eh	1	Freshman Composition	3
Bt	1	General Botany		Bt	1	General Botany	
		or	4			or	4
Zo	3	Animal Biology		Zo	3	Animal Biology	
Pe	1	Physical Education	0	Pe	2	Physical Education	0
						Electives	2
			16				17

* Ms 12 may be substituted

Natural Resource Management

		Subject	Hours			Subject	Hours
LSA	1	University Life	0	Ch	12		
Ch	11			or	14	Chemistry	4
or	13	Chemistry	4	Ms	12	Anal. Geom. & Calculus	4
Eh	1	Freshman Composition	3	Bt	1	General Botany	
Ms	4	Algebra & Trigonometry	4			or	4
Bt	1	General Botany		Zo	3	Animal Biology	
		or	4	Pe	2	Physical Education	0
Zo	3	Animal Biology				Elective	3
Pe	1	Physical Education	0				
			15				15

Life Sciences Division

BIOCHEMISTRY

PROFESSOR RADKE; ASSOCIATE PROFESSOR DEHAAS; ASSISTANT PROFESSORS JOHNSON, LERNER, WRATTEN; PART-TIME INSTRUCTOR MRS. PRATT; LECTURERS CHASE, SENSENIG

Biochemistry deals with the study of (1) the nature of the chemical constituents of living matter and of chemical substances produced by living things, (2) the functions and transformations of these chemical entities in biological systems, and (3) the chemical and energetic changes associated with these transformations in the course of activity of living matter. The ultimate goal of biochemistry is to describe the phenomena that distinguish the "living" from the "non-living" in the language of chemistry and physics.

The biochemist does research and development in pharmaceutical houses, medical schools and research centers on all aspects of human health. He studies all phases of foods and nutrition, including such areas as composition, utilization, preservation, additives, and contaminants.

There are many opportunities for the B.S. biochemist, and many more for those who continue for graduate degrees. The prescribed program in this catalog is a good preparation for both stopping points. A foreign language, or even two, is recommended for those definitely planning graduate study.

Courses of study can be developed to fulfill admission requirements for medical and dental schools. At least 120 degree hours at an accumulative grade-point average of 1.80 are required for graduation.

Curriculum Leading to a Bachelor of Science Degree in Biochemistry

Freshman Year. See Page 210

Curriculum for Biochemistry Majors

Required Courses		Credit Hours	Minimum Degree Hours Required
A. BIOCHEMISTRY			17
Bc 161, 162	Advanced Biochemistry	7	
Bc 164	Biochemical Lab Methods	4	
Bc 191, 192	Biochemical Research	6	
B. OTHER BIOLOGICAL AND PHYSICAL SCIENCES			41
Zo 3, 4	Animal Biology	8	
Mb 127, 128	General Microbiology	5	
Ch 13, 14	Chemistry	4	
Ch 140	Quant. Analysis	4	
Ch 151, 152	Organic Chemistry, Lec.	6	
Ch 161, 162	Organic Chemistry, Lab.	4	
Ps 1, 2	General Physics	10	
C. MATHEMATICS			12
Ms 4	Algebra and Trigonometry	4	
Ms 12	Anal. Geom. and Caculus	4	
Ms 27	Anal. Geom. and Calculus	4	
D. COMMUNICATIONS			8
Eh 1	Freshman Composition	3	
Sh 1	Funds. of Public Speaking	3	
Bc 171, 172	Seminar	2	
E. HUMANITIES AND SOCIAL SCIENCES			15
Minimum of two courses in each—recommend one or more foreign languages.			
F. FRESHMAN ORIENTATION			0
G. PHYSICAL EDUCATION			0
H. ELECTIVES			27
Minimum Degree Hours for Graduation			**120**

Courses in Biochemistry (Bc)

5. Chemistry for Nurses (3-year)—An introduction to the principles of inorganic, organic and biochemistry as needed for the three-year nursing curriculum. *Rec* 2, *Lab* 2, *Cr* 3. MR. WRATTEN

7. Fundamentals of Chemistry—A review of the essential material from Inorganic Chemistry followed by a study of the types and reactions of organic compounds. Prerequisite: one year of high school chemistry. *Rec* 3, *Lab* 2, *Cr* 4.
MR. LERNER

8. Elementary Physiological Chemistry—Carbohydrates, lipids, proteins, digestion, enzymes, metabolism, vitamins, hormones, blood and urine. Prerequisite: Bc 7 or the equivalent. *Rec* 3, *Lab* 2, *Cr* 4. MR. LERNER

21. Organic Chemistry—Hydrocarbons, alcohols, acids, ketones, aldehydes, esters, amines, and amides. Prerequisite: Ch 1 and 2. *Rec* 3, *Lab* 2, *Cr* 4.
MR. RADKE

122. Biochemistry—H-ion concentration; the properties, digestion, metabolism, and excretion of carbohydrates, fats and proteins; enzymes, vitamins, hormones. Prerequisite: Bc 1. *Rec* 3, *Lab* 2, *Cr* 4. MR. RADKE

159. Physical Biochemistry—A study of the fundamental laws, theories, and concepts of physical chemistry as they apply to biochemical problems. Prerequisite: Ch 140 and 152, Ps 2 or equivalent, Ms 12 or equivalent. *Rec* 3, *Lab* 3, *Cr* 4. MR. DEHAAS

161/162. Advanced Biochemistry—Carbohydrates, lipids, proteins, nucleic acids, vitamins, hormones, enzymes, coenzymes, metabolism, enzyme, kinetics, bioenergetics and other topics. Prerequisite: Ch 152. *Rec* 3/3, *Lab* 3/0, *Cr* 4/3.
STAFF

164. Biochemical Laboratory Methods—Chromatography, electrophoresis, enzymes, natural products, and other procedures employed in biological research. Prerequisite: Bc 161 or instructor's permission. *Lab* 8, *Cr* 4.
MR. JOHNSON, MR. WRATTEN

171. 172. Seminar—Preparation and presentation of papers dealing with current research in the field of biochemistry. *Cr* 1. STAFF

191. 192. Biochemical Research—Problems in biological or agricultural chemistry. A comprehensive report is required. Seniors and graduate students only. *Cr Ar.* STAFF

‡***220. Carbohydrates and Lipids***—The chemistry and metabolism of carbohydrates and lipids as they characterize different biological forms. Prerequisite: Bc 162 or permission. *Rec* 3, *Cr* 3. MR. DEHAAS, MR. LERNER

†***225. Proteins and Enzymes***—A comprehensive study of the structure and properties of proteins with special emphasis on their catalytic activity. Prerequisite: Bc 162 or permission. *Rec* 3, *Cr* 3. MR. RADKE, MR. WRATTEN

†***230. Vitamins and Hormones***—The chemistry and biological activity of the regulators of living systems. Prerequisite: Bc 162 or permission. *Rec* 3, *Cr* 3.
MR. DEHAAS

234. Plant Biochemistry—The biochemistry of photosynthesis, respiration and other metabolic processes in plants including growth regulators and essential elements. Prerequisite: Bc 162 or permission: *Rec* 3, *Cr* 3.

†***242. Biochemical Mechanisms***—Specific biochemical reaction mechanisms will be discussed in terms of the mechanistic principles of organic and inorganic chemistry. Prerequisite: Bc 159 or equivalent and Bc 161 or equivalent or permission. MR. LERNER

399. Graduate Thesis.—*Cr Ar.*
MR. DEHAAS, MR. JOHNSON, MR. LERNER, MR. RADKE, MR. WRATTEN

BIOLOGY

The Biology curriculum is designed to permit a student to gain a broad background in all of the natural sciences. He will at the same time receive some training in chemistry, physics and mathematics. In addition, the unusual extent of elective opportunities in this curriculum permits students to exercise considerable freedom in choosing courses. This enables capable students to transfer at a later date into any one of the specialized fields of biology or applied fields of biology namely, animal science, plant science, and forestry and wildlife sciences.

Students preparing to teach high school biology will find this program appropriate. So will persons preparing for careers in medicine, marine biology, food science, journalism, for work with U. S. fisheries or as naturalist with private or public agency. This curriculum is equally appropriate for students wishing to have a broad basic training in the sciences related to biology and expecting to go on to graduate school for more specialized training leading to careers in college teaching, and research at the university level, in government or in biology based industries.

The Biology curriculum provides a basis for the student to gain some specialization with options available in: (1) Teaching High School Biology, (2) Premarine Biology, (3) Food Science (See page 282), (4) Medicine, (5) Journalism.

The curriculum in Biology is an interdepartmental offering in the College of Life Sciences and Agriculture administered by a committee representing the Departments of Biochemistry, Botany, Entomology, and Microbiology.

Curriculum Leading to the B.S. Degree in Biology

Freshman Year. See Page 210

		Credit Hours	Minimum Degree Hours Required
A. BIOLOGICAL AND PHYSICAL SCIENCES			
1. Required			44
Ch 11-12 or 13-14	Chemistry	8	
Ms 4, 12	Algebra and Trigonometry	8	
Ps 1a-2a	General Physics	8	
Bt 1	General Botany	4	
Zo 3	Animal Biology	4	
En 26	General Entomology	4	
Mb 127	General Microbiology	3	
Mb 128	Gen. Microbiology Lab.	2	
Zo 162	Genetics	3	
2. Group Electives			20
Bc 21, 122	Organic and Biochemistry or	8 (10)	
Ch 151-152	Organic Chemistry Lec.		
Ch 161-162	Organic Chemistry Lab.		
Mb 136, Bt 154, 159, 163, En 153, 140, Zo 131, 139, 153, 158, 160	Taxonomy	4 (3)	
Bc 161, Bt 153, Mb 153, Zo 177	Physiology	4	

AnV 135, Bt 135, En 251, Zo 133, 136, 151	Anatomy	4	
B. COMMUNICATIONS			8
Eh 1	Freshman Composition	3	
Eh 7, 8, or 17	Composition	2 (3)	
Sh 1, 4, 31, or 41	Speech or Senior Seminar	3	
C. HUMANITIES AND SOCIAL SCIENCES minimum of 2 courses in each			15
D. FRESHMAN ORIENTATION			0
E. PHYSICAL EDUCATION (2 semesters)			0
F. FREE ELECTIVES*			33
Minimum Degree Hours Required for Graduation			**120**

* Recommended is a course in Ecology—Bt 130, En 143, En 211, Fy 19, Fy 228, or Zo 156

BOTANY AND PLANT PATHOLOGY

ASSOCIATE PROFESSOR MCINTYRE (Chairman); PROFESSORS CAMPANA, COOPER, HILBORN, MANZER, RICHARDS; ASSOCIATE PROFESSORS DAVIS, MCCRUM, NEUBAUER; ASSISTANT PROFESSORS GELINAS, HOMOLA, LABER, VADAS; EMERITUS PROFESSOR HYLAND; COLLABORATOR YOUNG; LECTURER SHIGO

The Botany curriculum leading to a bachelor of science degree is designed to afford the widest latitude for majors preparing for teaching and research in one or more of the biological sciences at all levels. Botany majors successfully completing the undergraduate requirements herein stated will be well qualified to enter graduate programs in botany and other biological disciplines at this and other institutions for advanced study.

Curriculum for Botany Majors

Freshman Year. See Page 210

Required Courses		Credit Hours	Minimum Degree Hours Required
A. BOTANY			30
Bt 1	General Botany	4	
Bt 2	Plant Kingdom	4	
Bt 135	Plant Anatomy	4	
Bt 153	Plant Physiology	4	
Bt 154	Taxonomy of Vascular Plants	4	
Bt 130	Ecology	3	
	Electives	7	
B. OTHER BIOLOGICAL SCIENCES			
Zo 3	Animal Biology	4	
By 127, 128	General Bacteriology	5	
Zo 162 or Bt 145	Principles of Genetics	3	

C. PHYSICAL SCIENCES			20
Ch 11-12 or 13-14	Chemistry	8	
Ch 151	Organic Chemistry Lec.	3	
Ch 161	Organic Chemistry Lab.	2	
or Bc 21	Organic Chemistry	(4)	
Ps 1a, 2a	General Physics	8	
D MATHEMATICS			8
Ms 4	Algebra and Trigonometry	4	
Ms 12	Analytic Geometry & Calculus	4	
E. COMMUNICATIONS			8
Eh 1	Freshman Composition	3	
Eh 7, 8, or 17	Composition	3	
Bt 161, 162	Seminar	2	
F. HUMANITIES AND SOCIAL SCIENCES			15
Minimum of two semester courses in each—and recommended not less than six hours in one of the following foreign languages: French, German, or Russian, which may meet the humanity requirement.			
G. FRESHMAN ORIENTATION			0
H. PHYSICAL EDUCATION			0
I. ELECTIVES			27
Minimum Degree Hours Required for Graduation			**120**

Courses in Botany (Bt)

1. General Botany—An introduction to the structure, function, and reduction of seed plants. Open to students of all colleges. *Rec* 3, *Lab* 2, *Cr* 4.
MR. GELINAS

2. The Plant Kingdom—The morphology, reproduction, ecology and phylogenetic significance of the major classes of the plant kingdom. Open to students of all colleges. Prerequisite: Bt 1. *Rec* 3, *Lab* 2, *Cr* 4. MR. RICHARDS

33. Dendrology—Classroom and field work on identification and classification of trees and native shrubs of North America. Prerequisite: Bt 1. *Lec* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. RICHARDS

47. 58. Problems in Botany—Open to juniors and seniors who have special interest and qualification in botany. The approval of the head of the department is required. *Cr Ar.* STAFF

101. Role of Physics and Chemistry in Bioscience; Cellular Level—Basic consideration of the constituents of matter, centering around the molecule, as an aid to the understanding of structure and function of the living cell. Prerequisite: one or more courses, at the college level, in at least two of the relevant science disciplines (physics, chemistry, biology). Lec. and/or Lab. 3 hours per week. *Cr* 3. MR. HYLAND

102. Role of Physics and Chemistry in Bioscience; Organismal Level—Detailed consideration of the physical and chemical aspects of matter as related to tissues and the organism as a whole. Discussion of new techniques and technical advances which have aided in the understanding of the life processes of living organisms through physics and chemistry. Prerequisite: Bt. 101. Lec. and/or Lab. 3 hours per week. *Cr* 3.

110.* The Plant World—A course in botany designed for teachers instructing at the elementary and secondary school levels. The role of plants in the economy of man; basic study of plants including origin, classification, structure and development, function, modification, environment and distribution. Laboratory work in plant collection, identification and preservation. Techniques in methods of preparation of material for study, exhibits and displays. Additional requirements will be stipulated for graduate credit. *Rec* 3, *Cr* 3. MR. HYLAND

115.* Our Common Trees and Shrubs—A field course designed primarily to familiarize elementary and secondary school teachers with our native woody plants. Emphasis is placed on identification, classification and economic importance. Labelled collections will be made by students and kept as reference material. Additional requirements will be stipulated for graduate credit. *Rec* 3, *Cr* 3. MR. HYLAND

120.* Structure of Plants Used by Man—A course designed to familiarize elementary and secondary school teachers with the structure of our common economic plants. Emphasis will be placed on the specific part of the plant used (i.e., stem, root, leaf, fruit, seed) and the nature of the tissues, cells or cell contents useful to man. Enrollment will be limited to 24. Prerequisite: Bt 1 or the basic general botany course required in any college or university of approved standing. Additional requirements will be stipulated for graduate credit. *Rec* 3, *Cr* 3. MR. HYLAND

124. Local Flora—Identification and classification of the common herbaceous flowering plants and ferns of Maine. Field trips will be taken to collect and study plants in various habitats. Additional requirements will be stipulated for graduate credit. Rec 3, *Cr* 3. MR. RICHARDS

125.* Non-Vascular Plants of Maine—Identification and classification of common algae, fungi, lichens and mosses of Maine. Field trips will taken to collect and study plants in various habitats. Additional requirements will be stipulated for graduate credit. *Rec* 3, *Cr* 3. MR. RICHARDS

130. Plant Ecology—Principles of autecology, synecology, and vegetative analysis. Major emphasis on population biology and interactions at the population, community, and ecosystem level. Prerequisite: one year of biology or permission. *Rec* 2, *Lab* 2, *Cr* 3. MR. VADAS

131.* Plants and Environment—The dynamic aspects of the environmental relationships of plants. *Rec* 3, *Cr* 3. MR. COOPER

135. Plant Anatomy—The origin, development, and structure of tissue systems of vegetative and reproductive organs of vascular plants. Prerequisite: *Bt* 1. *Rec* 3, *Lab* 2, *Cr* 4. MR. NEUBAUER

145. Genetics—Principles of genetics. Prerequisite: one year of biology. Open to juniors and seniors. *Rec* 3, *Cr* 3.

149.** Structure and Identification of Wood—A study in wood structure and the relation of wood anatomy to structural endurance, decay resistance, and utility. Enrollment will be limited to 24. Additional assignments, involving a detailed microscopic study of some phase of wood anatomy, will be required for graduate credit. *Rec* 2, *Lab* 2, *Cr* 3. MR. HYLAND

150. Botanical Microtechnique—Methods of killing, embedding, sectioning, and staining plant material. Methods of studying and recording microscopic preparation. Prerequisite: Bt 135 and permission. *Rec* 2, *Lab* 4, *Cr* 4. MR. NEUBAUER

153. Plant Physiology—Classroom and laboratory work on the physiology of plants. Prerequisite: Bt 1 and one year of chemistry. *Rec* 2, *Lab* 4, *Cr* 4.
MR. COOPER

153. Plant Physiology (Forestry)—Classroom and laboratory work on the physiology of plants. Prerequisite: Bt 1 and one year of chemistry. *Lec* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. COOPER

154. Taxonomy of Vascular Plants—Identification and classification of flowering plants. Prerequisite: Bt 1. *Rec* 2, *Lab* 4, *Cr* 4. MR. RICHARDS

156. Plant Pathology—Principles of plant disease. Open to juniors and seniors. Prerequisite: Bt 1. *Rec* 2, *Lab* 4, *Cr* 4. MR. CAMPANA, MR. MCINTYRE

156. Plant Pathology (Forestry)—Principles of plant disease. Open to juniors and seniors. Prerequisite: Bt 1. *Lec* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. CAMPANA

158. Bryology—Identification and classification of liverworts and mosses. Prerequisite: Bt 2 or an equivalent with the permission of the instructor. *Lec* 1, *Rec* 1, *Lab* 2, *Cr* 3.

‡***159. General Mycology***—Comparative morphology, classification and identification of fungi, plus investigation of unusual hereditary and physiological characteristics. Prerequisite: Bt 1. *Rec* 2, *Lab* 4, *Cr* 4. MR. HOMOLA

161. 162. Seminar—Literature reviews. Techniques, procedures and results in botanical research. *Rec* 1, *Cr* 1. STAFF

163. Introductory Phycology—Morphology, identification, and classification of algae with minor emphasis on culturing, sexuality, physiology, and ecology. Prerequisite: Bt 1 and 2, one year of chemistry or permission. *Lec* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. VADAS

‡***256. Advanced Plant Pathology***—Advanced study of plant disease with emphasis on the physiology of parasitism and microbial interaction. Prerequisite: Bt 53 and Bt 56. *Rec* 2, *Lab* 4, *Cr* 4. MR. MCINTYRE, MR. CAMPANA

258. Advanced Plant Physiology—Advanced study of the physiology of plants, including photosynthesis, mineral nutrition, growth regulators, water relations, and respiration. Prerequisite: Bt 152. *Rec* 2, *Lab* 4, *Cr* 4. MR. COOPER

‡***260. Comparative Morphology of Vascular Plants***—Basic concepts on the origin and development of vascular plants, their morphology, anatomy, homologies and interrelationships. Prerequisite: Bt 135 or equivalent and permission. *Rec* 2, *Lab* 4, *Cr* 4. MR. NEUBAUER

‡***262. Plant Geography***—The distribution of plants on the earth with emphasis on the causes of distributional phenomena. Field trips will be arranged. Prerequisite: Bt 154. *Rec* 3, *Cr* 3. MR. RICHARDS

301. Research Methods in Plant Science—Laboratory, greenhouse, and field techniques involved in botanical research. Prerequisite: Bt 153 or Bt 156 and permission of instructor. *Cr Ar.* STAFF

307. 308. Problems in Botany—*Cr Ar.* STAFF

399. Graduate Thesis—*Cr Ar.* STAFF

---

* Permission of instructor required; offered through CED.

ENTOMOLOGY

PROFESSORS SIMPSON, DIMOND, OLSON; ASSOCIATE PROFESSORS FORSYTH, D. LEONARD, MCDANIEL, OSGOOD, STORCH; VISITING PROFESSORS CHADWICK, SHANDS; FACULTY ASSOCIATE HOLBROOK

The Entomology curriculum is designed to provide training for various positions in government and industry or to lay a firm basis for further training at the graduate level, leading to teaching or extension positions in colleges or to research positions in experiment stations or in industry.

Students with sufficient background and interest will be encouraged to enter graduate school for further specialization. Such students are encouraged to elect foreign languages as undergraduates.

The Department of Entomology offers a master of science degree. A doctor of philosophy degree may be taken in the plant science field or through the Department of Zoology.

Curriculum Leading to a Bachelor of Science Degree in Entomology

Required Courses		Credit Hours	Minimum Degree Hours Required
A. ENTOMOLOGY			15
En 26	Introductory Entomology	4	
En 140	Elementary Taxonomy of Insects	4	
En 153	Advanced Taxonomy of Insects	4	
En 149	Economic Entomology	3	
B. OTHER BIOLOGICAL SCIENCES			40
Bt 1	General Botany	4	
Bt 154	Taxonomy of Vascular Plants	4	
Mb 127-128	Bacteriology	5	
Bc 21 and 122	Biochemistry	8	
Zo 3, 4	Animal Biology	8	
Zo 153	Invertebrate Zoology	4	
Zo 158	Parasitology	4	
Zo 162	Genetics	3	
C. PHYSICAL SCIENCES			16
Ch 11-12 or 13-14	Chemistry	8	
Ps 1a-2a	General Physics	8	
D. MATHEMATICS			8
Ms 4	Algebra and Trigonometry	4	
Ms 12	Analytic Geometry and Calculus	4	
E. COMMUNICATIONS			8
Eh 1	Freshman Composition	3	
Sh 1	Public Speaking	3	
En 161-162	Seminar or	2	
	Elective	2 (3)	
F. HUMANITIES AND SOCIAL SCIENCES			15
Not less than two semester courses in each area. A foreign language, French, German or Russian—at least 8 hours of any one—may be used to meet the humanities requirement			

G. FRESHMAN ORIENTATION	0
H. PHYSICAL EDUCATION	0
I. ELECTIVES: Suggested Zo 156 Animal Ecology Ms 19 Statistics	18
Minimum Degree Hours Required for Graduation	**120**

Courses in Entomology (En)

26. Introductory Entomology—Fundamental principles of insect life and the relation of insects to plants, animals, and man. A study of structure, metamorphosis, ecology, and classification. An insect collection is required in the spring semester. Students may wish to start their collections before taking the course. Prerequisite: Bt 1 or Zo 3. *Rec* 2, *Lab* 4, *Cr* 4. MR. STORCH

26a. Introductory Entomology for Foresters—Principles of insect life with emphasis in lectures on technical aspects of interest to professional foresters. Laboratories are identical with and combined with En 26. Offered in the spring semester only. Prerequisite: Bt 1 or Zo 3. *Rec* 2, *Lab* 4, *Cr* 4. MR. OSGOOD

47. 48. Problems in Entomology—Open to juniors and seniors in any college who have special interest and qualifications in entomology. The approval of the head of the department is required. *Cr Ar.* STAFF

140. Elementary Taxonomy of Insects—Study of insects with emphasis on classification of lower orders and the Coleoptera. Methods of collecting and identification. Prerequisite: En 26. *Rec* 2, *Lab* 4, *Cr* 4. MR. OSGOOD

143. Forest Insect Ecology—Study of factors which regulate the distribution and abundance of insects, particularly in the forest environment. Characteristics of outbreaks and methods of suppression are discussed. Prerequisite: En 26. *Rec* 2, *Lab* 2, *Cr* 3. MR. OSGOOD

†***149. Economic Entomology***—Introduction to the basic principles involved in applied control of insects other than those found in the forest environment. Emphasis on factors comprising biological, cultural, and chemical control methods and their ecological implications. Survey of legislation bearing on applied entomology. Prerequisite: En 26. *Rec* 2, *Lab* 2, *Cr* 3. MR. SIMPSON

†***153. Advanced Taxonomy of Insects***—Study of wing venation; classification of Diptera, Lepidoptera and Hymenoptera. Prerequisite: En 26. Rec 2, Lab 4, *Cr* 4. MR. OSGOOD

161. 162. Seminar—A study of the literature and techniques of entomology. *Rec* 1, *Cr* 1. STAFF

205. 206. Problems in Entomology—*Cr Ar.* STAFF

‡***210. Taxonomy of Immature Insects***—General morphology of immature insects. Identification of larvae in the orders Coleoptera, Lepidoptera, Diptera, and Hymenoptera. Prerequisite: En 251 and 153 or permission. *Rec* 1, *Lab* 4, *Cr* 3. STAFF

211. Insect Ecology—A study of factors governing distribution and abundance of insect populations in nature. Life-table approach to ecological studies using insects as examples. Outside readings. Prerequisite: En 151 and 153 or permission. *Rec* 1, *Lab* 2, *Cr* 2. MR. D. LEONARD

†***214. Medical Entomology***—Training in recognition, classification, life cycles, habits and control of insects and near relatives that cause disease or func-

tion as vectors of pathogens. Prerequisite: En 26 and Zo 158 or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. MCDANIEL

‡***251. Morphology of Insects***—External and internal anatomy of insects. Laboratory includes gross dissections of internal organs of representative insects. Prerequisite: En 26. *Rec* 2, *Lab* 4, *Cr* 4. MR. STORCH

312. Biological Control of Insects—Reading of significant original contributions. May be repeated with permission by covering different areas, e.g., viruses, fungi, parasites and predators, radiation sterility, etc. Prerequisite: En 149. *Rec* 1, *Cr* 1. MR. SIMPSON

†***314. Behavior of Arthropods***—Anatomy of the nervous system, especially sensory receptors. Basic patterns of orientation to extrinsic stimuli. Significance of behavioral patterns to the survival of individuals and populations. Prerequisite: permission. *Rec* 2, *Lab* 2, *Cr* 3. MR. D. LEONARD, MR. STORCH

315. Insect Toxicology—Lectures and reading assignments. Fundamentals of insect toxicology, recent advances in the field, nature, and mechanism of insect resistance to insecticides. Laboratory problems to be arranged. Prerequisite: En 151 and Bc 1 or Bc 2. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

399. Graduate Thesis—Cr Ar. MR. SIMPSON

MICROBIOLOGY

PROFESSORS PRATT AND WHITEHILL; ASSOCIATE PROFESSORS BAIN, BUCK, GERSHMAN; ASSISTANT PROFESSORS DESIERVO, NICHOLSON; LECTURER WAYMOUTH

The Microbiology curriculum is designed to give students a thorough knowledge of biological principles while providing skills needed to study microorganisms and tissue culture.

Students with interests in microbiology are prepared for wide variety of positions in industry, government, and public health laboratories. With proper selection of electives a student can satisfy requirements to all medical and dental schools.

Students who are well qualified and interested are encouraged to pursue graduate work for further specialization. The Department of Microbiology offers a master of science degree; a doctor of philosophy degree can be earned in a cooperating program.

Requirements for a B.S. degree are satisfactory completion of at least 120 degree hours at an accumulated grade-point average of not less than 1.80 in a course of study that conforms to the following curriculum.

Curriculum for Microbiology Majors
Freshman Year. See Page 210

Required Courses		Credit Hours	Minimum Degree Hours Required
A. MICROBIOLOGY			23
Mb 127	General Microbiology	3	
Mb 128	General Microbiology	2	
Mb 136	Determinative Bacteriology	4	
Mb 152	Pathogenic Bact. and Serology	4	
Mb 153	Bacterial Physiology	4	
Mb 176	Virology	4	
Mb 187, 188	Seminar	2	

B. GENERAL BIOLOGY			8
Bt 1 & Zo 3	General Botany and Animal Biol.	8	
or	or		
Zo 3 & Zo 4	Animal Biology (2 semesters)	8	
C. PHYSICAL SCIENCES			38
Ch 13, 14	General Chemistry	8	
Ch 151, 152	Organic Chemistry	8	
Ch 161, 162	Organic Chemisty Lab.	4	
Ch 140	Quantitative Analysis	4	
Ps 1a, 1b	General Physics	8	
Bc 161	Physiological Chemistry	4	
Bc 164	Biochem. Lab. Methods	4	
D. MATHEMATICS			8
Ms 4	Algebra and Trigonometry	4	
Ms 12	Anal. Geom. and Calculus	4	
E. COMMUNICATIONS			9
Eh 1	Freshman Composition	3	
Eh 7, 8, 17	Composition	3	
Sh 1	Speech	3	
F. HUMANITIES AND SOCIAL SCIENCES			15
Not less than two semester courses in each			
G. FRESHMAN ORIENTATION			0
H. PHYSICAL EDUCATION (2 semesters)			0
I. FREE ELECTIVES			19
Minimum Degree Hours for Graduation			**120**

Courses in Microbiology (Mb)

21. Introduction to Microbiology—The basic principles of bacteriology and their application to agriculture, industry, sanitation, public health and disease. A descriptive and demonstration course for non-technical students. *Rec* 3, *Cr* 3.

21a. Elementary Microbiology Laboratory—A laboratory and demonstration course. Microscopy, cultivation, biochemical activities and control of microorganisms are considered. Prerequisite or corequisite: Mb 21 or Mb 127. STAFF

23. Paramedical Bacteriology—An elementary course in bacteriology, as it applies to nursing. Emphasis on sanitation, infection, and resistance, and bacteriology of infectious diseases. *Rec* 3, *Lab* 2, *Cr* 4. MR. WHITEHILL

30. Fundamentals of Public Health—General consideration of the relationship between the health of the individual and environment. Prerequisite: Mb 21 or 127. *Rec* 2, *Cr* 2. MR. WHITEHILL

46. Clinical Bacteriology—A course designed for individuals engaged in clinical bacteriology. Techniques for the isolation and identification of bacterial pathogens of significance to man and animals utilizing morphological, biochemical, serological and phage typing procedures. Where possible, clinical specimens will be used. CED offering only. Prerequisite: permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3.

122. Microbiology and Man—The basic principles of bacteriology and their application to agriculture, industry, sanitation, public health and disease. Student participation in techniques dealing with laboratory procedures. Summer Session only. *Rec* 3, *Cr* 3.

127. General Microbiology—A basic biology course dealing with general principles as illustrated by microorganisms, in particular, bacteria and viruses. Includes a consideration of cell structure, cell metabolism, genetics, geochemical activities, and host- parasite relations. *Rec* 3, *Cr* 3. STAFF

128. General Microbiology Laboratory—A laboratory study of the properties of bacteria and related microorganisms. Emphasis is on technics and identification. Suggested for students majoring in sciences. Prerequisites or corequisite: Mb 127. *Lab* 4, *Cr* 2. STAFF

136. Determinative Bacteriology—A study of morphological, cultural and physiological characteristics of important bacterial groups with special emphasis placed on isolation and classification of organisms in our environment. Prerequisite: Mb 127, Mb 128. *Rec* 2, *Lab* 4, *Cr* 4. MR. BAIN

152. Pathogenic Bacteriology and Serology—The relationships and characteristics of microorganisms that cause disease in man and animals and the response of the latter to the invasion of the parasite. Prerequisite: Mb 127, Mb 128. *Rec* 2, *Lab* 4, *Cr* 4. MR. WHITEHILL

153. Bacterial Physiology—A study of the properties and behavior of bacteria with respect to their chemical and physical requirements for life and reproduction. Prerequisite: Mb 127, Ch 152. *Rec* 2, *Lab* 4, *Cr* 4. MR. BAIN

176. Virology—An introductory course in the study of viruses, emphasizing their nature, methods of cultivation, mode of transmission, and classification. Prerequisite: Mb 152 or permission of instructor. *Rec* 2, *Lab* 4, *Cr* 4. MR. BUCK

187. 188. Seminar—Preparation and presentation of papers dealing with current research and developments in the field of bacteriology. *Cr* 1. STAFF

191. 192. Problems in Microbiology—A laboratory and conference for students desiring to pursue some particular line of investigation. Prerequisite: permission of instructor. *Cr Ar.* STAFF

275. Tissue Culture Techniques and Mechanisms—A study of tissue culture techniques especially designed to acquaint the student with methods of growing tissue cells from various sources and the practical application. Prerequisite: Mb 128 or Bt 156. *Rec* 2, *Lab* 4, *Cr* 4. MR. BUCK

280. Immunology—A study of the immune response with particular emphasis on the structure of antigens and antibodies; the synthesis of antibody molecules; and the nature and significance of antigen-antibody reactions. Prerequisites: General Microbiology and Organic Chemistry. *Rec* 3, *Cr* 3. MR. NICHOLSON

282. Immunology Laboratory—A laboratory course designed to familiarize the student with diagnostic and experimental techniques for the characterization of antigens, antibodies, and antigen-antibody reactions. Prerequisite: Mb 280 or concurrent registration therein. *Lab* 3, *Cr* 1. MR. NICHOLSON

399. Graduate Thesis—*Cr Ar.* STAFF

NATURAL RESOURCE MANAGEMENT

The curriculum provides a strong inter-disciplinary emphasis in the natural and social sciences. The program attempts to meet an increasing need for people

trained in the field of natural resource management to be involved in planning and decision making related to wise use of limited land and water resources. A rapidly increasing population and more leisure time means keener competition by industrial, recreational, and agricultural interests for available land and water. Pollution and unwise use of these is the plague of our times.

All students will take courses in a basic core of courses in the physical, biological, and social sciences and the humanities. An opportunity for specialization is provided in one of four areas:

— ***Conservation Engineering***—principles and technology related to conservation of natural resources

— ***Resource Economics***—economics and business aspects of resource development

— ***Forest Resources***—multiple use and management of forest lands and conservation of wildlife and habitat

— ***Soil and Water Conservation***—soil conservation and hydrology

Upon completion of requirements, a B.S. degree in Natural Resource Management is awarded.

NATURAL RESOURCE MANAGEMENT

(Core Curriculum)

			Credits
1.	Mathematics and Physical Sciences		24
	Mathematics	11	
	Physics	5	
	Chemistry	8	
2.	Biological Sciences		15
	Botany	4	
	Ecology	3	
	Entomology	4	
	Zoology	4	
3.	Earth Sciences		6
	Geology	3	
	Soils	3	
4.	Humanities plus Social Sciences		24
	Economics	3	
	Literature	3	
	Philosophy	3	
	Political Science (Pol 1)	3	
	Public Administration (Pol 151) *or* Forest Policy Administration (Fy 146)	3	
	Sociology	3	
	Electives	6	

5. Communications		9
Freshman Composition (Eh 1)	3	
Advanced Professional Writing (Eh 17)	3	
Intro. to Oral Communications (Sh 1)	3	
6. Professional Specialization		42
Department or School options		
Minimum degree hours for graduation		**120**

Professional Specialization Options

The core curriculum represents the minimum credits that a student takes in the various areas to qualify for the degree. The professional specialization area requirement is met by selecting one of four options which follow:

Option in

(Conservation Engineering)

			Credits
Basic Engineering and Mathematics			20
Ms 19	Principles of Stat. Inference	3	
Ms 27	Analytical Geometry and Calculus	4	
Me 50	Statics	3	
Ce 5	Surveying	3	
Ce 26	Hydraulics	4	
Ce 65	Soil Mechanics	3	
Professional Field			20
S 156	Physical Properties of Soils	3	
AE 164	Instrumentation	3	
AE 165	Soil and Water Engineering	4	
Ce 155	Hydrology	3	
Ce 230	Water Resources Engineering	3	
AE 83, 84	Special Design Topics	4	
Electives			2
TOTAL			42

Option in

(Forest Resources)

			Credits
Timber			10
Fy 5	Mensuration	3	
Fy 7	Silviculture	4	
Fy 149	Forest Management and Valuation	3	

Fish and Game			8
	Fy 127 or 128	Game Management	3
	Fy 19	Ecology	2
	Zo 171	Fish Management	3
Water			9
	Ce 175	Cont. Environmental Pollution	3
	Fy 157	Water Resources	3
	Zo 170	Intro. to Oceanography	3
Recreation, Land Use, and People			8
	Fy 144	Forest Economics	3
	ARE 171	Land Resource Economics	3
	Fy 53	Forest Recreation	2
Electives			7
		TOTAL	42

Option in

(Soil and Water Conservation)

			Credits
Soil and Water			11
	Gy 2A	Geology	3
	S 50	Soil & Water Conservation	2
	S 154	Soil Plant Relationships	3
	Zo 170	Intro. to Oceanography, or	3
	Zo 168	Limnology	4
Plant Sciences			5
	Fy 48	Natural Resources	2
	Pl 21	Plant Sciences	3
Social Sciences			12
	ARE 150	Human Factors in Resource Development	3
	ARE 171	Land Resource Economics	3
	Ba 130	Legal Environment of Business	3
	Pol 2	Intro. to Government	3
Electives			14 (13)
		TOTAL	42

Option in

(Resource Economics)

			Credits
Professional Resource Economics			27
	Ba 9	Accounting	3
	Ba 130	Legal Environment of Business	3
	Ec 173	Economic Analysis	3

ARE 154	Production Economics	3	
ARE 159	Business Management	3	
ARE 166	Marketing	3	
ARE 168	Price Analysis	3	
ARE 171	Land Resource Economics	3	
ARE 272	Resource Use & Economic Growth	3	
Other Social Sciences			6
Ec 153	Money and Banking	3	
ARE 150	Human Factors in Resource Development	3	
Electives			9
	TOTAL		42

School of Forest Resources

DIRECTOR NUTTING; ASSOCIATE DIRECTORS (FORESTRY AND FOREST PRODUCTS) CORCORAN, (WILDLIFE) COULTER; PROFESSORS BAKER, CORCORAN, COULTER, DIMOND, GRIFFIN, MENDALL, SHOTTAFER, YOUNG; ASSOCIATE PROFESSORS GIDDINGS, MCELWEE, PLUMMER, RANDALL, SCHEMNITZ, SCHOMAKER; ASSISTANT PROFESSORS ASHLEY, GILBERT, HALE, KUTSCHA, OWEN, RICHENS, SHULER, WHITTAKER; INSTRUCTORS ROBBINS, WILSON

Three undergraduate curricula with eight sequences are offered in the School of Forest Resources. The objectives are: (1) to train students in the theories and techniques for positions in forest land management, forest product harvesting, manufacture and sale, wildlife management and natural resources; (2) to prepare qualifying students for graduate study; (3) to provide a broad education for effective citizenship.

Graduation requirements in the School of Forest Resources are: (1) passing grades in all required courses; (2) successful completion of 132 degree hours plus summer camp (8 hours) and spring trips (1 hour) or alternatives, as required in the curriculum and sequence selected; (3) an accumulative average of not less than 1.80.

FORESTRY AND FOREST PRODUCTS

The sequences for Forestry and Forest Products offer students an opportunity to qualify for a degree in forestry, membership in the Society of American Foresters or other professional societies, and for civil service positions in public agencies and for positions with private industry employing professional foresters. Graduates of the School have been employed in about equal numbers by private industry and public agencies. Students with qualifying grades are encouraged to pursue graduate work. All sequences provide an opportunity for a broad education by requiring both cultural and scientific courses supplemented by several hours of electives.

The University Forest is managed by the School. This tract of 1,750 acres lies within two miles of the campus and is used extensively for field laboratory work and for research. The School assists the Maine Forest Service in the management of Indian Township in eastern Maine. This tract of 17,000 acres is close to the location of Camp Robert I. Ashman where the summer camp courses required of forestry and wildlife majors are given. A large variety of wood-producing wood-using firms are located near the school and the summer camp area.

Field or work experience is essential to foresters. Students are urged to obtain summer woods or other appropriate employment.

Two off-campus training periods are required of forestry students. (1) A week's field trip through New England in silviculture or utilization is required of all forestry students at the completion of the junior year. (2) Immediately following the junior field trips, six weeks at camp near Princeton, Maine (Indian Township), is required.

The program in Wood Science and Technology emphasizes the study of the properties and basic structural components of wood, as well as the conversion and distribution of wood-based products. The off-campus training phase of this program provides for approved employment experience followed by a comprehensive report as a possible alternative to spring trip and summer camp requirements.

Graduate Study

Students are accepted for graduate work in the fields of forest economics, management, recreation, silviculture, utilization, and wood science and technology leading to the degree of master of science in forestry. A program leading to doctor of philosophy degree is offered.

WILDLIFE MANAGEMENT

The two sequences in Wildlife Management offer a broad training in the natural sciences. The management sequence is designed to train students for forestland, game habitat management, and, with high grades, for graduate work. The science sequence is designed for students with high grades who are most interested in biology and who plan to do graduate work. Upon completion of the curriculum requirements the student is granted the degree of bachelor of science in wildlife management.

Off-campus training of seven weeks is required of all students in the Wildlife Management sequence at the Forestry Summer Camp near Princeton.

Field experience is important to wildlife managers. Students are urged to obtain summer field employment.

Seniors and graduates are eligible for Civil Service examinations for positions with federal and state agencies that administer natural resources.

Graduate Study

Programs in wildlife at the M.S. and Ph.D. levels are offered and a number of graduate courses are available to qualified students.

The Maine Cooperative Wildlife Research Unit provides for a cooperative wildlife program jointly sponsored and financed by the University, the Maine Department of Inland Fisheries and Game, the U. S. Fish and Wildlife Service, and

the Wildlife Management Institute. The director of the school is the University representative on the Coordinating Committee. The purpose of the unit is to conduct and promote research, student training and public education in the wildlife field.

NATURAL RESOURCES (FOREST RESOURCES)

An interdisciplinary curriculum leading to a B.S. in Natural Resources (Forest Resources). Designed to offer a broad training in the various fields of natural resources. Courses in social sciences, humanities, and communications together with resource courses are required to provide a liberal education and a general natural resource background with the major in forest resources. This program is not designed to meet the requirements for professional degrees in forestry or wildlife. See details on page 223.

Curricula and Sequences

Students in forestry and wildlife have eight sequences from which to choose their program.

- Forest Management
- Forest Utilization
- Forest Science (Tree Growing)
- Wood Science and Technology
- General Forestry
- Wildlife Science
- Wildlife Management
- Natural Resources Management

Freshman Year

A common freshman year program is recommended for all students in the School of Forest Resources (see page 211). Selection of an upperclass specialization sequence is made near the end of the second semester.

Basic Core: All students are required to take the following 61 credit hours of core courses:

			Hours Required	Frosh.	Soph.	Jr.	Senior
Ch	11-12						
or	13-14	Chemistry	8	8			
Bt	1	Botany	4	4			
Bt	33	Dendrology or					
Bt	154	Taxonomy	4		4		
Ps	6	Physics	5		5		
Ms	4	Algebra & Trigonometry	4	4			
Zo	3	Zoology	4	4			
Eh	1	Freshman Composition	3	3			
Eh	17	Advanced Prof. Composition	3			3	
Sh	1	Oral Communications	3		3		
		Literature or Fine Arts	2		2		
		History or Government	2		2		
Ec	10	Economics	3		3		
Ge	1	Intro. to Engrg. Design	2	2			
Ce	5	Surveying	3		3		
Fy	1 & 2	Introduction to Forest Resources	4	4			
Fy	4 & 5	Mensuration	6		6		
Fy	60	Seminar	1				1
		Total	61	29	28	3	1

Additional Required Courses

All Forestry Sequences

			Credit Hours
En	26	Entomology	4
Fy	7	Silvics	3
Fy	8	Silviculture*	3
Fy	112	Wood Technology I	2
Fy	149	Timber Management and Valuation*	4
Fy	144	Forest Economics	3
Fy	13S	Spring Trip*	1
Fy	41S	Summer Camp*	8
			28

All Wildlife Sequences

			Credit Hours
S	3	Forest Soils	3
Fy	19	Wildlife Ecology	2
Fy	127	Wildlife Biology	4
Zo	131	Vertebrate Biology	4
Zo	153	Invertebrate Zoology	4
Fy	19S	Wildlife Ecology Camp	4
Fy	41S	Summer Camp	5
			26

* Except wood science (summer camp required for all participants in the five-year Pulp and Paper Program).

Forestry Management Sequence

			Credit Hours
S	3	Forest Soils	3
Bt	153	Plant Physiology	4
Bt	156	Forest Pathology	4
Ge	12	Forest Drawing	2
Ba	9	Accounting	3
Fy	6	Forest Photogrammetry	3
Fy	10	Forest Planting	2
Fy	11	Forest Fire Control	2
Fy	13	Harvesting Forest Crops	2
Fy	146	Forest Policy and Administration	3
Gy	6	Geology for Engineers	3
Fy	8s	Silviculture Trip	1

Forest Utilization Sequence

			Credit Hours
Bt	135	Plant Anatomy	4
Ge	12	Forestry Drawing	2
Ba	9	Accounting	3
Fy	11	Forest Fire Control	2
Fy	13	Harvesting Forest Crops	2
Fy	14	Forest Products	3
Fy	116	Wood Anatomy	4
Fy	146	Forest Policy and Administration	3
Fy	112	Wood Tech. I (with Lab.)	3
Fy	125	Wood Tech. II	3
Fy	135	Utilization Trip	1

Forest Science—Forest Growth Sequence

			Credit Hours
S	3	Forest Soils	3
Bt	153	Plant Physiology	4
Fy	10	Forest Planting	2
Fy	13	Harvesting Forest Crops	2
Fy	14	Forest Products	4
Fy	146	Forest Policy and Administration	3
Gy	6	Geology for Engineers	3
Ms	12	Anal. Geom. & Calculus	4
Ps 1 & 2		Physics	10

Wood Science and Technology Sequence

			Credit Hours
Bt	135	Plant Anatomy	4
Bt	156	Forest Pathology	4
Fy	14	Forest Products	4
Fy	116	Wood Anatomy	4
Ms	12 & 27	Anal. Geom. & Calculus	4
Ps 1 & 2		Physics	10
Fy	125	Wood Tech. II	3

General Forestry Sequence

	Credit Hours
Botany, Geology, Soils	6
Forestry	15

Wildlife Management Sequence

			Credit Hours
AnP	144	Disease & Parasite Cont.	3
En	26	General Entomology	4
Fy	6	Photogrammetry	3
Fy	41s	Summer Camp	5
Fy	19s	Wildlife Ecology	3
Fy	144	Forest Economics	3
Fy	149	Timber Management & Val.	4
Zo	171	Fish Management	4

Wildlife Science Sequence

			Credit Hours
En	26	General Entomology	4
Zo	153	Invertebrate Zoology	4
Fy	7 or 8	Silvics or Silviculture	3
Ps	1a	General Physics	4
Ps	2a	General Physics	4

Courses in the School of Forest Resources (Fy)

1. Introduction to Forest Resources—Instruments and techniques for field measurements—orientation. Required of freshmen in the School of Forest Resources. *Rec* 1, *Lab* 3, *Cr* 2. STAFF

2. Introduction to Forest Resources—A survey of the fields of forestry, wood technology, and wildlife. Required of freshmen in the School of Forest Resources. *Rec* 2, *Cr* 2. STAFF

4. Statistical Inference in Forest Resources—Elementary statistical background and sampling procedures based on statistics in forestry and wildlife. Use of desk calculators and introduction to electronic computers. Prerequisite: Ms 1 and 3. *Rec* 2, *Lab* 3, *Cr* 3. MR. ASHLEY

5. Forest Biometry—Determination of volume of standing and felled timber. Construction of log rules, volume tables, and yield tables. Determination of growth and yield. Prerequisite: surveying. *Rec* 2, *Lab* 3, *Cr* 3. MR. ASHLEY

6. Forest Photogrammetry—Construction of planimetric and topographic maps by photogrammetric methods. Determination of forest types and stand composition by interpretation and measurements of air photos. *Rec* 2, *Lab* 3, *Cr* 3. MR. ASHLEY

7. Silvics (Forestry Ecology)— Biological principles and environmental factors governing the natural establishment and development of forest trees and stands. Prerequisite: Bt 33. *Rec* 2, *Lab* 3, *Cr* 3. MR. GRIFFIN

8. Silviculture—Technical methods of controlling the composition, growth, quality, and regeneration of forest stands. Prerequisite: Fy 7. *Rec* 2, *Lab* 3, *Cr* 3. MR. GRIFFIN

8s. Silviculture Trip—One week is spent visiting public and private forests of the Northeast. Silvicultural problems and methods of managing important forest types of the region are studied. *Cr* 1. MR. GRIFFIN

10. Forest Planting—The planting, care, and selection of stock in nursery and field plantings. Seed collecting and processing. Mechanical planting and field techniques. One-day field trip required. *Rec* 1, *Lab* 3, *Cr* 2. MR. PLUMMER

11. Forest Fire Control—Forest fire behavior as influenced by fuels, weather, topography. Effects of fire. Methods of preventing and controlling fires. Use of fire in forest management. *Rec* 2, *Cr* 2. STAFF

13. Harvesting of Forest Crops—Harvesting methods in the various regions of the United States and Canada, with special emphasis on the Northeast. Discussion of organization, costs, equipment, and trends. *Rec* 2, *Cr* 2. MR. PLUMMER

13s. Utilization Trip—One-week field trip to northern New England and adjacent Canadian provinces to visit woods operations and forest management projects. *Cr* 1. MR. PLUMMER AND STAFF

14. Primary Wood Processes—Introduction to the conversion processes involved with the principal primary forest products, such as lumber, pulp, veneer, and derived products. Characteristic properties of typical products; effect of raw material on processing technology. *Rec* 3, *Lab* 3, *Cr* 4. MR. HALE

17. Wood Preservation—Causes of deterioration of wood in service; preservatives, preparation of material; wood preserving process. *Rec* 2, *one-half semester*, *Cr* 1. MR. BAKER

19. Ecology—Study of the relationships between living organisms and their environment with emphasis upon the ecosystem, ecological factors, succession, community distribution, populations and the role of ecology in natural resources. No Freshmen. *Rec* 3, *Cr* 3. MR. COULTER, MR. OWEN

19s. Wildlife Ecology—Field problems in forest-wildlife ecology. Recognition, measurement analysis and interpretation of problems in forest-wildlife relationships. Three weeks at summer camp. *Cr* 4. MR. SCHEMNITZ, MR. OWEN

24. Range Management—History and economic importance of the range livestock industry. Utilization and management of the forage resource; relation to other land use. National and regional problems in grazing use; administration of public grazing lands. *Rec* 2, *Cr* 2. STAFF

30. Wildlife Law Enforcement—The role of law enforcement in modern wildlife management. History and development of law and relationship to present policies. Description of organizations. Operations and duties of personnel. *Rec* 2, *Cr* 2. MR. SCHEMNITZ

41s. Forest Resources (Summer Camp)—Field practice in methods and problems involved in the management of a large forest property. Timber estimating and marketing, surveying, fire control, logging, preparation of a management plan. Visits to woods operations and utilization plants. Prerequisite: Fy 5, 8. Forty-eight hours a week. Forestry, six weeks. *Cr* 8; Wildlife, four weeks. *Cr* 5.
MR. ASHLEY AND STAFF

45, 46. Special Problems—Original investigation in forestry and wildlife work, the subject to be chosen after consultation with the staff. Open to high-ranking juniors and seniors. *Cr* Ar. STAFF

48. Natural Resources—The characteristics, status, utilization, and management of natural resources. The social aspects of resources management. Open to juniors and seniors. *Rec* 2, *Cr* 2. MR. COULTER

53. Forest Recreation Management—Methods of evaluation, planning and development of wildlands for recreation. Importance, problems, and trends. Public and private programs and policies. Offered to Forest Resources majors or by permission of instructor. Two Saturday field trips required. *Rec* 2, *Cr* 2.
MR. WHITTAKER

60. Seminar—Reviews of literature. Current problems in forestry and conser ation. Majors, Forest Resources. *Rec* 1, *Cr* 1. MR. NUTTING, MR. COULTER

112. Wood Technology I—The structural and physio-chemical nature of wood and its response to environmental, physical, and chemical influences. Study of growth-material relationships and basic laboratory techniques. Prerequisites: Bt 1. Without lab: *Rec* 2, *Cr* 2; lab, 2 hrs, *Cr* 1. (Lab required of utilization and Wood Technology majors). MR. SHULER

116. Wood Anatomy—Identification and anatomical characteristics of wood and wood fibers by gross and microscopic features. Prerequisite: Bt 135 or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. KUTSCHA

125. Wood Technology II—The mechanical properties of wood and wood composites and their use in structural applications. The relationship of mechanical and physical properties to basic processing techniques. Prerequisite: Fy 112. *Rec* 2, *Lab* 2, *Cr* 3. MR. SHOTTAFER

126. Process Analysis in Forest Utilization—Processing research and development problems and review of current methods of analysis and solution. Application of process design, systems analysis and materials technology in the investigative situation. Prerequisite: permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. SHOTTAFER AND STAFF

127. Wildlife Biology—The principles of wildlife biology. Study of the biological, economic and human relations factors influencing wildlife resources. Prerequisite: Fy 19, Bt 154, Fy 7, Zo 139 or 160, or equivalents. *Rec* 2, *Lab* 4, *Cr* 4. MR. SCHEMNITZ

128. Game Management—The practice of game management. Study of the biological, economic and human relations factors influencing management programs. For non-wildlife majors. *Rec* 2, *Cr* 2. MR. RICHENS

129. Research Methods in Wood Technology—Advanced methods of evaluating wood, wood based, and related materials. Introduction to techniques and concepts of evaluation design. Review of pertinent laboratory equipment and its applications. Prerequisite: Fy 4, Fy 125. *Rec* 1, *Lab* 4, *Cr* 3. MR. SHOTTAFER AND STAFF

144. Forestry Economics—Forest resources of U. S. and the world and prospects of meeting increased demand for forest products. Economic factors in forest production and use of economic analysis in making forest management decisions. Prerequisite: Ec 1, Ec 2. *Rec* 3, *Cr* 3. MR. CORCORAN

146. Forest Policy and Administration—Federal, state and private forest policies in U. S. comparisons to foreign countries. Land ownership and usage. Administration of national, state and private forests. Organizing, staffing, and equipping forestry enterprises. Majors, Forest Resources. *Rec* 3, *Cr* 3. MR. WHITTAKER

149. Timber Management and Valuation—Managing forest properties for sustained yield of timber products. Determination of annual cut and effect of taxation. Evaluating forest investments. Preparation of management plans. Majors, Forest Resources. *Rec* 3, *Lab* 2, *Cr* 4. MR. GIDDINGS

157. Forest-Water Relationships—Role of forests in water cycle. Effect of logging, recreation, mining, and other forest land uses on water resources. Prerequisite: Fy 4, Fy 7, or their equivalents, or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. SCHOMAKER

171. Production Analysis in Forestry—Introduction to concepts and procedures used in the evaluation of timber production and forest production manufacturing with emphasis on study organization, work measurement, job evaluation, cost control, network analysis and schematic models. Seniors, graduate students, or consent of instructor. *Rec* 2, *Cr* 2. MR. CORCORAN

172. Planning and Control of Forestry Operations—Applications of scientific methods to management decision problems of forestry operations. Emphasis on inventory control, allocation methods, replacement models, waiting-line analysis

sequencing, simulation, and competitive strategies. Seniors, graduate students, or consent of instructor. *Rec* 2, *Cr* 2. MR. CORCORAN

200. Forest Hydrology and Watershed Management—The study of hydrologic cycle as it applies to forest lands and forest land management. Methods of water-yield control through silvicultural practices. The effect of logging and other land-use practices on water quality, erosion, and the silting of water courses. Prerequisites: Fy 7, Fy 232, or consent of instructor. *Rec* 2, *Cr* 2. MR. SCHOMAKER

209. Regional Silviculture—Applied silvicultural practices and results of current silvicultural research in important forest types of the United States. Prerequisite: Fy 8. *Rec* 2, *Cr* 2. MR. GRIFFIN

215. Research Techniques in Wood Anatomy—Preparation of woody tissue for light microscopic examination and recording, including microtechniques and photomicrographic methods. Introduction to electron microscopy and interpretation of wood ultrastructure. Prerequisites: Bt 150 and Fy 116, or permission. *Lec* 2, *Lab* 4, *Cr* 4. MR. KUTSCHA

228. Advanced Wildlife Ecology—A study of the factors affecting the distribution, abundance, and physiology of wildlife species. Prerequisite: Fy 127, or permission of instructor. *Rec* 3, *Lab* 2, and occasional Saturday field trips. *Cr* 4. MR. OWEN

232. Forest Influences—Effects of forest vegetation upon climatic factors, soil water, stream flow, floods, erosion, and soil productivity. Prerequisite: Fy 7 and Ag 3. *Rec* 2, *Cr.* 2. MR. GRIFFIN

247. Advanced Forest Biometry—Advanced sampling methods and the principles of regression analysis as applied to forestry and wildlife in management and research. Applications with computers. Prerequisite: Fy 4, Ms 19 or Ag 70 and consent of instructor. *Rec* 3, *Cr* 3. MR. YOUNG

254. Forest Recreation Planning—Methods of measuring, analyzing, and forecasting recreational use of forest lands. Concepts of planning, and their application to forest recreation management. Prerequisite: Fy 53, Are 171, or permission of instructor. *Rec* 3, *Cr* 3. MR. WHITTAKER AND MR. CORCORAN

276. Forest Inventory and Growth—Principles and exploration in detail of approaches to inventory and growth. Field trips will be required. Forestry juniors, seniors, graduate students, and consent of instructor. Prerequisite: Fy 4 and 5. *Rec* 2, *Cr* 2. MR. YOUNG

301. 302. Forest Mensuration Problems—*Cr Ar.* MR. YOUNG AND MR. ASHLEY

303. 304. Forest Management Problems—*Cr Ar.* STAFF

305. 306. Game Management Problems—*Cr Ar.* STAFF

307. 308. Silviculture Problems—*Cr Ar.* MR. GRIFFIN

309. 310. Photogrammetry Problems—*Cr Ar.* MR. YOUNG AND MR. ASHLEY

311. 312. Research in Forestry Economics—*Cr Ar.* MR. CORCORAN

313. 314. Forest Recreation Problems—*Cr Ar.* STAFF

315. 316. Problems in Wood Technology—*Cr Ar.* STAFF

350. Graduate Seminar in Wildlife Science—*Cr Ar.* MR. COULTER

399. Graduate Thesis—*Cr Ar.* STAFF

School of Human Development

DIRECTOR THORNBURY; PROFESSOR RICE; ASSISTANT PROFESSORS BRIGHTMAN, DAHL, FRASER, OLIVER, PARADISE, SCHOMAKER; INSTRUCTORS DALTON, HUTCHINSON, LAFFERTY, MUSGRAVE, SAWYER, YOUNG

Human development encompasses physical, social, economic, and aesthetic aspects of living in complex, technologically advancing societies. Emphasis is given to the unique combination of needs of family units at a given time for food, housing, clothing, management of resources, human development, and interpersonal relationships with training designed to prepare the student for employment or family life. This involves coordinating knowledge from fields of learning that contribute to understanding needs and helping people to use this information to solve human problems.

The undergraduate curriculum leads to a bachelor of science degree. About half of the student's program includes courses in the arts, humanities, social and biological sciences, and specialized subjects offered within the school in child development, family relationships, clothing, design, food, nutrition, home economics education, home management and housing. The other half of the student's program is designed to meet demands of preprofessional or professional employment as follows:

Food and Nutrition Programs—Dietetic intern in programs approved by the American Dietetic Association: food service administrator in commercial, industrial, publicly owned, or private food establishments; research assistant in food and nutrition; product development supervisor.

Education Programs—Teacher in childhood education in nursery and elementary schools; consultant in child development for a social service agency; teacher of home economics in public schools; teacher of youth and adults through extension activities; teacher of health and family life; educational director for consumer services.

Individual sequences of courses may be developed for students from other countries and persons not attempting to qualify for any of the recognized home economics professions covered in other sequences. These sequences will consist of selected advanced human development courses and related subjects in other divisions of the University.

A minimum of 120 semester hours is required for graduation at an accumulative grade point average of 1.80.

CURRICULUM FOR B.S. DEGREE IN HUMAN DEVELOPMENT

All students are required to take the following 34 hours:

Communications — 6 hours

Eh 1—Freshman English
Sh1—Fundamentals of Public Speaking or
Sh 31—Voice and Diction or
Sh 41—Fundamentals of Oral Interpretation

Physical Sciences — 8 hours

To be selected from botany, geology, chemistry, entomology, physics, bacteri-

ology or zoology. One year of this work must be basic courses in laboratory science.

Social Sciences

Py 1 is required and others to be selected from sociology, psychology, history, government, economics or modern society. Introductory courses are not to exceed 9 hours.

Humanities

Philosophy, art, literature, music, intermediate and advanced levels of language and honors. (Must represent two fields)

Requirements in pre-professional and professional sequences, and electives to make a total of the required 120 hours.
Additional Required Courses in Professional Sequences:

I. FOOD AND NUTRITION SEQUENCES:

(Science requirements depend upon option)

Option A—Dietetic Intern*

Ba	9	Princples of Accounting	3
By	127	Intro. to Bacteriology	3
Fn	41	Intro. to Food & Nutrition	3
Fn	42	Family Food Management	3
Fn	43	Experimental Foods	4
Fn	152	Human Nutrition	3
Fn	155	Abnormal Nutrition	3
Fn	61/62	Quantity Food & Food Service Management	6
Fn	63	Food Service Adminstration & Cost Control	3
Hm	93	Equipment	3
Py	111	Business & Industrial Psychology	3
Py	117	Educational Psychology	3
Zo	8	Anatomy & Physiology	4
		Total	44

* Approved by American Dietetic Association and recommended for all dietitians.

Option B—Food Service Administrators

Same as Option A, except that additional courses in business, economics, food and nutrition may be substituted for Fn 155, Py 111, and Py 117.

Option C — Nutritionists, research assistants in food and nutrition and supervisors in product development

Same as Option A, except courses in chemistry, math and physics may be substituted for Fn 61, Fn 62, Fn 63, Hm 93, Ba 9, Py 111, and Py 117.

II. EDUCATION SEQUENCES:

A limited number of students may arrange to spend one or two semesters at the Merrill-Palmer Institute in Detroit, Michigan.

CHILD DEVELOPMENT

Basic Core

Cf	2	Introduction to Child Development	3
Cf	3	Development of the Preschool Child	3
Cf	4	Development of the Young School Child	3

Cf	111	Family Relationships	3
Cf	155	The Adolescent & His Culture	3
Fn	41	Intro. to Food & Nutrition	3
Hm	185	The Family's Financial Problems	3
		Total	21

Option A—Elementary School Teachers (for certification to teach kindergarten through grade 6)

Cf	120	Creative Activities for the Young Child	3
Cf	121	Foundations for Academic Learning	3
Ed	B2	The American School	3
Ed	B4	The Teaching Process	3
Ed	M13	Teaching of Reading	3
Ed	M18	Teaching of Language Arts	3
Ed	M114	Teaching Arithmetic	3
Ed	M115	Teaching Social Studies	3
Ed	M116	Teaching Science	3
Ed	M190	Student Teaching	6
Ms	107	Structure of Arithmetic	3
Py	117	Educational Psychology	3
		Total	39

Option B—Nursery, Kindergarten School Teachers

Cf	109	Special Problems in Child Development	3
Cf	120	Creative Activities for the Young Child	3
Cf	121	Foundations for Academic Learning	3
Cf	122	Program Planning in Nursery School and Kindergarten	3
Ed	B2	The American School	3
Ed	M13	Teaching of Reading	3
	or		
Ed	M18	Teaching of Language Arts	
Ed	M116	Teaching of Science	3
Ed	X198	Problems in Education	3
Py	117	Educational Psychology	3
		Psychology Electives	9
		Total	36

Option C—Social Service Work in Child Development and Family Life

Cf	155	The Adolescent & His Family	3
Hm	81	Home Management Principles & Theories	3
Hm	191	Housing	3
Py	130	Social Psychology	3
Py	133	Abnormal Psychology	3
Sy	3/4	Intro. to Sociology	6
Sy	24	Sociology of Rural Life	3
Sy	126	Sociology of Urban Life	3
Sw	150/151	Social Welfare	6
Sw	152	Social Work as a Profession	3
Sw	154	Field Experience in Social Work	2
		Total	38

HOME ECONOMICS EDUCATION

To meet certification requirements for home economics teacher in the secondary school.

General education (34 hours from basic core)				50 hours
Professional				19 hours
He	71	Tech. in Teaching Home Ec.	2	
He	72	Curr. Dev. in Home Ec.	3	
Ed	B2	The American School	3	
He	176	Adult Education	3	
or				
He	180	Evaluation	3	
He	73	Supervised Student Teaching	8	
Home Economics				40 hours
Child Development & Family Relationships			8	
Clothing & Textiles			8	
Foods & Nutrition			8	
Housing, Home Furnishings & Equipment			8	
Family Economics & Management			8	

GENERAL HOME ECONOMICS

40 hours

The 40 hours of home economics courses as required under Home Economics Education

It is recommended that additional hours be elected in either Clothing and Textiles or Foods and Nutrition.

HEALTH AND FAMILY LIFE EDUCATION

This program is designed to give professional preparation for those persons who want to become public school teachers or supervisors in the newer fields of health and family life education. The program includes general health education, drug abuse, alcohol and tobacco education, and family life and sex education. The content of the curriculum has been designed to fulfill national and state recommendations regarding the preparation needed for such teachers. Graduates receive the degree of bachelor of science in health and family life education and are qualified for special certification at both the elementary and secondary levels.

Communications			6 hours
Eh	1	Freshman Composition (3)	
Sh	1	Fundamentals of Public Speaking or (3)	
Sh	31	Voice and Diction or	
Sh	41	Fundamentals of Interpretation	
Physical Sciences			12 hours
Bc	7	Fundamentals of Chemistry (4)	
Bc	8	Elementary Physiological Chemistry (4)	
Zo	8	Anatomy and Physiology (4)	
Social Sciences			12 hours
Py	1	General Psychology	
Sy	3	Introduction to Sociology	
(Introductory courses cannot exceed 9 hours.)			
Humanities			8 hours
Philosophy, art, literature or music (must represent two fields)			

Professional				20 hours
Pe	178	Health Education	3	
Pe	183	Planning the Health Education Curriculum	3	
Ed	B2	The American School	3	
Ed	B4	The Teaching Process	3	
He	73	Supervised Student Teaching	8	
Specialized Field				50 hours
Health (30 hours)				
Pe	198	Problems in Health or Physical Education, & Recreation	3	
Mb	30	Fundamentals of Public Health	2	
Fn	41	Introduction to Food & Nutrition	3	
Mb	127	General Bacteriology	3	
Mb	21A	Elementary Microbiology Laboratory	1	
Py	132	Mental Hygiene	3	
Py	133	Abnormal Psychology	3	
Cf	215	Sex Education of the Child from 5 to 12	3	
Cf	216	Family Life & Sex Education of Youth	3	
Pe	168	Proctective Practices & Safety in Physical Education & Athletics	3	
Pe	283	Administration of Elementary & Secondary School Health Program	3	
Family Living (20 hours)				
Cf	3	The Preschool Child	3	
Cf	4	The Young School Child	3	
Cf	111	Family Relationships	3	
Cf	155	The Adolescent & His Family	3	
Cf	109	Special Problems in Child Development	3	
Hm	185	The Family's Financial Problems	3	
Cf	285	New Findings in Child Development & Family Relationships	2	
Electives				12 hours
Should be selected primarily from the social sciences (sociology, history, government, economics or modern society) emphasizing especially sociology with such courses as Sy 24 (Sociology of Rural Life), Sy 110 (Social Organization), Sy 113 (Social Disorganization), Sy 126 (Sociology of Urban Life), or Sy 129 (The Individual and the Community).				
		*Total		50 hours

* 8 hours of specialized courses count as liberal education in addition to these 52.

COURSES IN THE SCHOOL OF HUMAN DEVELOPMENT

Child Development and Family Relationships (Cf)

2. Introduction to Child Development—Observations and study of interpersonal relations of young children are used as a basis for understanding human relations (and the "self"). Laboratory experience in the nursery school. *Cr* 3. Open to freshmen. STAFF

3. Development of the Preschool Child—Development of children from

infancy through the preschool years and factors affecting it. Special emphasis on the role of the family. Laboratory experience in the nursery school. Prerequisite or parallel: Py 1. *Rec* 2, *Lab* 2, *Cr* 3.

4. Development of the Young School Child—Developmental study of children of six through 12 years of age. Influencing factors, especially home and school, are given special consideration. Laboratory observations in nursery school and public schools. Prerequisite or parallel: Py 1, *Rec* 2, *Lab* 2, *Cr* 3.

109. Special Problems in Child Development—Prerequisite or parallel: a Cf course or Py 67. *Cr* 1-3. STAFF

111. Family Relationships—Interpersonal relationships in marriage preparation, courtship, choosing a mate, engagement. Husband-wife relationships in fulfilling physical, emotional, social, intellectual, spiritual needs. Parent-child relationships. Prerequisite: Sophomore. *Cr* 3. MR. RICE

119. Supervised Student Teaching in a Selected School—Prerequisite: Cf 120, 121. *Cr* 8.

120. Creative Activities for The Young Child—Contributions of the areas of play, art and music to the development of creativity in children 3 to 8 years of age. Experience with children in all three areas. Prerequisite: junior standing. Cf 2, 3 or equivalent. *Cr* 3.

121. Foundations for Academic Learning—Readiness programs for the kindergarten and primary child in four academic areas: reading, numbers, science and social science. Prerequisite: junior standing. Cf 4, 120. *Cr* 3.

122. Program Planning in the Kindergarten—Consideration of basic teacher responsibilities and skills necessary for effective teaching of kindergarten children. Prerequisite: senior standing. Cf 121, Ms 107, 108, Edm 13 or 18. *Cr* 3.

153. The Younger Child in Home and School—Developmental aspects of psychological, physiological and social growth of children through the elementary school years. Integrative use of home, school, and community resources for guiding the development of the child. Prerequisite: courses in psychology or permission. *Cr* 3. STAFF

155. The Adolescent and His Culture—The problems of youth and the role of parents, teachers and leaders in guiding him toward physical, intellectual, social, emotional, and spiritual maturity in the family, school, church, and community. Undergraduate or graduate credit. *Cr* 3. MR. RICE

215. Sex Education of the Child from 5 to 12—Why, what, when, and how of sex education based upon knowledge of the psycho-sexual-social development of the child. Methods, materials, curricula useful at home and in the classroom. Undergraduate or graduate credit. *Cr* 3. MR. RICE

216. Family Life and Sex Education of Youth—The roles of the home, school, community in preparing youth for marriage and family living. Goals, content, methods, materials, and curricula in family life and sex education of junior high and senior high youth. Undergraduate or graduate credit. *Cr* 3.
MR. RICE

Clothing and Design (Cd)

22. Principles of Clothing Construction—Principles involved in clothing construction with application to garments; practice in communications of principles for teaching. *Rec* 1, *Lab* 4, *Cr* 3. MISS LAFFERTY

25. Textiles—Fibers, yarns, fabrications, finishes, labels; end-uses in home and clothing. Consumer education and protection. *Rec* 3. *Cr* 3. MISS LAFFERTY

31. Design—Experiments with line, form, color, texture, and light as media of daily living in clothing and home furnishings. Components of quality in commercial products. Practice in criticism. Composition in natural and commercial materials. *Rec* 2, *Lab* 2, *Cr* 3. MR. DAHL

32. Creative Design—Organization of elements of design in two and three dimensions in various media for uses such as decorative arrangements, merchandise display, and educational visuals. *Lab* 4, *Cr* 2. MR. DAHL

33. Applied Textile Design—Application of design principles to such textile problems as block printing, batik, decorative needlework, and hand weaving. Prerequisite: Cd 31 or 32, or permission. *Lab* 4, *Cr* 2.

38. Special Problems in Design—*Cr* 1-3. MR. DAHL

39. Special Problems in Interiors—*Cr* 1-3. MR. DAHL

124. Creativity in Clothing Construction—Development of three dimensional form in constructing tailored garments, in manipulating basic patterns for garment design, and in draping. Prerequisite: Cd 22 or permission of instructor. *Rec* 1, *Lab* 4, *Cr* 3. MISS LAFFERTY

128. Seminar: Dress in Human Development—Dress as an aspect of our cultural heritage. Interaction of values, goals, and norms as evidenced in uses of dress throughout life. *Rec* 3, *Cr* 3.

129. Special Problems in Clothing and Textiles—*Cr* 1 to 3.

192. Interior Design and Home Furnishings—Focus on individuality and family situations in relation to functional and esthetic qualities of the home. Selection, arrangement, and evaluation of settings and furnishings. *Rec* 2, *Lab* 2, *Cr* 3. MR. DAHL

Food and Nutrition (Fn)

41. Introduction to Food and Nutrition—Study of human nutritional needs. Emphasis on the selection of food to meet these needs, considering economy of time and money. *Rec* 3, *Cr* 3. MRS. MUSGRAVE

42. Family Food Management—Analysis of the criteria for making intelligent food choices. Application of those standards in the planning of family meals. Limited amount of food preparation and service. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

43. Experimental Foods—An experimental approach to the preparation of foods. Emphasis on the scientific interpretation of results. Prerequisite: En 42 and Bc 8 or equivalent. *Rec* 2, *Lab* 4, *Cr* 4. STAFF

51. Nutrition for Nurses—An elementary consideration of the principles of nutrition as applied to the feeding of normal individuals of all ages. For three-year nursing students. *Rec* 2, *Cr* 2. STAFF

61. Quantity Food—Principles basic for retention of nutritive value and quality in the production and service of quantity food; preparation techniques; recipe standardization; portion control; sanitation and use and care of equipment. Prerequisite: Fn 43, *Rec* 2, *Lab* 2, *Cr* 3. MISS YOUNG

62. Food Service Management—Organization structure, efficient methods, and controls utilized by management in menu planning, purchasing, receiving, storing, preparing and serving food beverages. Prerequisite: Fn 43, *Rec* 2, *Lab* 2, *Cr* 3. MISS YOUNG

63. Food Service Administration and Cost Control—Supervised administration of selected food services. Theory of cost control; pricing; techniques for controlling costs through standardized procedures, purchasing practices, efficient management, and training of personnel. Prerequisite: Fn 62. *Rec* 2, *Lab* 2, *Cr* 3.
MISS YOUNG

149. Special Problems in Foods—*Cr* 1-3. STAFF

152. Human Nutrition—Body metabolism and requirements for nutrients by normal individuals. Prerequisite: Bc 8, and Zo 8 or equivalent. *Rec* 3, *Cr* 3.
MISS THORNBURY

‡***155. Nutrition in Abnormal Conditions***—Principles involved in adjusting diets for diseases and abnormal conditions that may be benefited by variations from normal diets. Prerequisite: Fn 52. *Rec* 3, *Cr* 3. STAFF

258. Seminar in Nutrition—Reports and discussions of recent developments in nutrition and related fields. Special attention to critical analysis. Prerequisite: Fn 152 or equivalent. *Rec* 1-2, *Cr* 1-2. MISS THORNBURY

359. Special Problems in Nutrition—*Cr* 1-3. STAFF

300. Readings in Nutrition—Critical review of the literature on energy metabolism, proteins, lipids, minerals, and vitamins. Attention to historical basis of present knowledge and to interpretation and application of experimental data. Content will vary, and the course may be repeated with credit. Background in biochemistry and physiology required. *Cr* 2-3. MISS THORNBURY

Home Economics Education (He)

70. Senior Seminar in Home Economics—History, philosophy, present organization, and future development of professional home economics. *Rec* 1, *Cr* 1. STAFF

71. Techniques in Teaching Home Economics—Selection and use of teaching methods, techniques, and materials to promote development of concepts and thinking processes in the classroom. Observation of home economics classes in junior and senior high schools. Prerequisite: junior standing. *Lab* 4, *Cr* 2.
MISS FRASER

72. Curriculum Development in Home Economics Education—Current educational philosophies, principles, and practices; their application to home economics education through program planning and curriculum development. Prerequisite: He 71 concurrently, or permission. *Rec* 3, *Cr* 3. MISS FRASER

73. Supervised Student Teaching—Concept development in selected subject areas with attendant unit development. Problems pertinent to teaching home economics. Observation, participation, and teaching in a selected junior or senior high school in the state, under immediate direction of the local teacher with supervision from University staff. Evaluation of this experience. Students live in the school communities for eight weeks. Prerequisite: He 72. *Cr* 8. MISS FRASER

He/EdL 151 Organization and Administration of Adult Education—The organization, financing, staffing, promotion, and evaluation of programs of adult education. Teaching resources and the role of the adult education administrator are given major emphasis. Prerequisite: advanced undergraduate or graduate standing. *Cr* 3.

†***176. Adult Education***—Need for and purpose of adult education programs. Consideration of learning program development, organization, and administration

of programs. Emphasis on adult education through the public schools, Cooperative Extension Service, and community agencies. *Rec* 3, *Cr* 3. STAFF

†*180. Evaluation*—Theory and basic principles of evaluation. Methods of evaluating progress towards goals; development of evaluative devices and the use of findings. Prerequisite: senior standing. *Rec* 3, *Cr* 3. STAFF

EdM 180/EdM 181. Teaching in Adult Education—A critical examination of major problems of teaching and learning in adult education. Emphasis on factors that affect learning ability, achievement, and motivation to learn through the adult life cycle. Prerequisite: advanced undergraduate standing. *Cr* 3.

279. Special Problems in Home Economics Education—*Cr* 1-3.

399. Graduate Thesis—*Cr Ar.* STAFF

Home Management and Housing (Hm)

81. Home Management Principles and Theory—Analysis of the managerial process and its relationship to decision making. Emphasis is placed on the use of resources including time and energy to attain family goals. *Rec* 3, *Cr* 3. MRS. SCHOMAKER

82. Management in Homes—Experience with families in observing different ways they manage resources to achieve goals. Work with families of various socio-economic levels toward solving management problems. Field trips included. *Rec* 1, *Lab* 2, *Cr* 2. MRS. HUTCHINSON

89. Special Problems in Home Management—*Cr* 1-3.

93. Equipment—Elementary principles of physics as a basis for understanding the selection, operation, care and maintenance of equipment. Prerequisite; junior standing. *Rec* 2, *Lab* 2, *Cr* 3. MRS. SCHOMAKER

185. The Family's Financial Problems—Influence of outside economic conditions and personal circumstances on family financial problems. The management process applied to family problems involving finances—economic position, meeting current living costs, protection against financial contingencies, credit, developing a savings and investment program, legal aspects of transactions. Prerequisite: junior standing or by permission. *Rec* 3, *Cr* 3. MRS. DALTON

191. Housing—Physical, social and emotional aspects of the housing environment. Floor plan principles in relation to family life cycle. Local government controls; natural problems in housing. Prerequisite: junior standing. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

COURSES GIVEN ON DEMAND

The following courses are given when there is sufficient demand during the academic year, through the Continuing Education Division, or in Summer Sessions.

Child Development and Family Relationships (Cf)

211. Seminar in Family Relationships—Reports and discussions of current literature in family relationships and related social sciences with special attention to critical analysis. *Cr* 3.

260. Seminar in Child Development—Reports and discussions of research findings in child development. *Cr* 3.

285. New Findings in Child Development and Family Relationships—Recent findings in child development and family relationships selected to help

teachers interpret children's interaction and adjustment to peers, to family, to school and to society. *Cr* 2.

Clothing and Design (Cd)

26. History, Market, and Analysis of Clothing—Styles of dress across space and time. Influences of mass market and end-use on garment design. Levels of quality, components of satisfaction, research developments. Prerequisite: junior standings. *Rec* 3, *Cr* 3.

123. Clothing Construction Analysis—Consumer analysis and alteration of manufactured garments. Survey of unfamiliar fabrics and construction processes. Problems based on background and professional needs of students. Prerequisite: Cd 22 or permission. *Lab* 4, *Cr* 2.

141. Seminar on Consumer Problems in Textiles and Clothing—Needs and satisfactions of individuals and families as to clothing and textiles in a variety of managerial, technological, personal, and social situations. Informative labeling and consumer protection. Properties and care of new fibers, fabrications, finishes. Prerequisite: undergraduate courses in textiles and clothing or permission. *Rec* 3, *Cr* 3.

Food and Nutrition (Fn)

69. Special Problems in Food Service Management—Individual investigation of aspects of institutional management. Emphasis on advanced problems in standardization, marketing, quality base for food cost, and/or personal management. Prerequisite: Fn 62 or permission. *Cr* 1-3.

145. Recent Advances in Food and Nutrition—Results of recent research and trends in food and nutrition. Emphasis on their significance for professional home economics. Prerequisite: a nutrition course or permission. *Rec* 3, *Cr* 3.

148. New Developments in Foods—Developments in food processing and marketing; overview of world food situation. Social and economic influence of trends on meal patterns, human satisfactions, and food management. *Rec* 3, *Cr* 3.

156. The Nutrition of Children—Relationship between nutrition and growth. Study of newer findings on nutritional requirements of children from infancy through adolescence. Prerequisite: a course in nutrition or chemistry and physiology, acceptable to instructor. *Cr* 2.

257. Modern Concepts in Food and Nutrition—Selected basic knowledge, principles, and concepts in the area of food and nutrition; adaption for use at various age levels in diverse educational situations. Prerequisite: permission. *Cr* 3.

Home Economics Education (He)

75. Advanced Home Economics Education—Current philosophy of teaching home economics; concept development in selected areas of the field with attendant unit development. Study of department management selection and use of space and equipment, and other pertinent problems related to teaching home economics in secondary schools. *Cr* 3.

90. Methods of Teaching Home Economics—Study of methodology effective in teaching at different development levels, in several subject areas, according to objectives of programs. Expermentation in methods and teaching aids, considering class size and time schedule. Emphasis on creative teaching. Review of research in methodology. *Rec* 3, *Cr* 3.

111. Supervision of Student Teaching in Home Economics—Theory and principles of supervision for improved educational programs; procedures for improved communication between supervisor and other personnel; evaluation of growth within individuals and programs. *Cr* 3.

Note: Designed for supervisory teachers, city/county/state supervisors, extension agents, and others in a supervisory capacity. Supervising teachers participating in student teaching programs do so on an individual basis. They must participate in a workshop or institute on the application of supervision theory to student teachers following a course which includes supervision principles and theory. These workshops will be sponsored by the institution with which the teacher will work.

320. Seminar in Home Economics Education—*Cr* 3.

Home Management (Hm)

186. Management of Household Resources—Current philosophy and literature in the field with respect to use and interaction of time, energy, money, and other resources. *Rec* 3, *Cr* 3.

187. The Consumer in the Present Economy—Distribution of consumer goods through the marketing system, change of marketing institutions; consumer information available, and consumer protection in the market. Emphasis on joint interest of those in marketing, the consumer, and the government in an efficient marketing system. *Rec* 3, *Cr* 3.

199. Special Problems in Housing—*Cr* 1-3.

Agricultural Sciences Division

AGRICULTURAL ENGINEERING

PROFESSORS SMITH, RHOADS, KLINGE, ROWE; ASSOCIATE PROFESSORS HUFF, SOULE, WILLIAMS; ASSISTANT PROFESSOR GRAY

The Agricultural Engineering Department offers major work leading to the degree of bachelor of science in agricultural engineering and to the degree of bachelor of science in agricultural mechanization.

B.S. in Agricultural Engineering

The Agricultural Engineering curriculum combines study in the biological sciences and the physical sciences with mathematics and engineering to provide a unique background for solving engineering problems associated with agriculture.

The basic curriculum is strengthened by elective options which permit the student to specialize in one of four areas according to his interests and needs. Areas of specialization are: (1) Design and application of machinery and power units for the agricultural industry; (2) Design and application of food and fiber processing systems; (3) Design of agricultural structures; and (4) Soil

and water conservation engineering. Electives in engineering and the life sciences aid in providing a broad base of knowledge for engineering practice.

Agricultural engineers are in great demand because of the rapidly expanding world population, a rising demand for higher standards of living, and limited natural resources. Employment opportunities are as diverse as the agricultural industry itself. Graduates in agricultural engineering may be employed as design engineers by machinery and farmstead systems manufacturers; as sales engineers by machinery, food or chemical companies; as research engineers by industry, government or state experiment stations or in teaching or extension positions by universities. Some practice as consulting engineers. An increasing number of opportunities for foreign service are opening up.

The curriculum in Agricultural Engineering is a joint responsibility of the College of Technology and the College of Life Sciences and Agriculture.

This degree requires satisfactory completion of at least 129 degree hours at an accumulative grade point average of not less than 1.80 in a course of study which conforms to the following curriculum:

Curriculum for the B.S. Degree in Agricultural Engineering
Freshman Year. See Page 209

			Credit Hours	Minimum Degree Hours Required
A. AGRICULTURAL ENGINEERING				25
AE	55	Materials in Ag. Eng.	3	
AE	80	Senior Seminar	0	
AE	82	Intro. to Ag. Eng.	2	
AE	83	Spec. Prob. in Ag. Eng.	1	
AE	84	Spec. Topics in Ag. Eng.	3	
AE	160	Agr. Machinery	3	
AE	163	Farm Structures Design	3	
AE	165	Soil & Water Eng.	4	
AE	167	Agricultural Power	3	
AE	169	Agr. Processing	3	
B. BASIC ENGINEERING				28
Ge	1	Intro. to Eng. Design	2	
Ge	2	Intro. to Eng. Design	2	
Ge	7	Computer Programming	2	
Me	33	Thermodynamics	3	
Me	53	Statics & Kinematics	4	
Me	54	Kinetics	4	
Me	51	Strength of Materials	4	
Ce	26	Hydraulics (or Me 59 Fluid Mechanics)	4	
Ee	41	Elementary Circuits	3	
C. TECHNICAL ELECTIVES (A group of engineering courses selected by the student and approved by his adviser)				9
D. BASIC PHYSICAL SCIENCE				32
Ch	13	Chemical Principles	4	
Ch	14	Chemical Principles	4	
Ms	12	Analytic Geom. & Cal.	4	
Ms	27	Analytic Geom. & Cal.	4	
Ms	28	Analytic Geom. & Cal.	4	
Ms	29	Differential Equations	4	
Ps	1	General Physics	4	
Ps	2	General Physics	4	

E. AGRICULTURAL AND BIOLOGICAL SCIENCE				11
Bt	1	General Botany (or Zo 3, Animal Biology)	4	
S	2	Soils	3	
		Electives	4	
F. COMMUNICATIONS, HUMANITIES AND SOCIAL SCIENCE				24
Eh	1	Freshman Composition	3	
Sh	1	Intro. to Oral Communication (or equivalent)	3	
		(Elective): Communications	3	
		Humanities and Social Science (courses selected from the catlog listing of Humanities and Social Science, a minimum of 2 courses in each area. Total of 15 Semester hours.)	15	
G. OTHER				
LSA	1	University Life	0	
Ge	5	Engineering Orientation	0	
Ge	6	Ag. Eng. Orientation	0	
Pe	1	Physical Education	0	
Pe	2	Physical Education	0	
Minimum Degree Hours for Graduation				**129**

LSA 1 University Life; Ge 5/6 Engineering Orientation; AE 80 Senior Seminar or AE 81 Departmental Seminar are required each semester.

Students transferring to University of Maine from the University of Massachusetts, New Hampshire, Rhode Island or Vermont under the Regional Program should check the bulletins of those institutions for the first two years in Agricultural Engineering.

Graduate Work in Agricultural Engineering

The degrees of master of science (Agricultural Engineering) and master of engineering (Agricultural Engineering) are offered with options for specialization in soil and water engineering, farm structures, agricultural power and machinery, and electric power and processing.

Several research assistantships are available each year. Incumbents devote half time to research on approved projects of the Agricultural Experiment Station.

B.S. in Agricultural Mechanization

The curriculum in Agricultural Mechanization provides training in specific aspects of engineering technology and couples this with training in business, economics, and agricultural subjects. It is designed to prepare graduates for work in the application of equipment and systems to food production, processing and handling either as field representatives of industrial concerns or as management personnel on mechanized production units.

Graduates find employment as technical sales representatives for machinery companies, farm service advisers for electric power companies, field advisers for fuel companies, machinery managers on corporation farms, field managers for food processors, and as agricultural contractors. Positions are also available with equipment companies in the fields of product development and product education.

This degree requires satisfactory completion of at least 120 degree hours at an accumulative grade point average of not less than 1.80 in a course of study which conforms to the following curriculum:

Curriculum for Agricultural Mechanization
Freshman Year. See Page 210

		Credit Hours	Minimum Degree Hours Required
A. ORIENTATION			0
LSA 1	University Life	0	
B. AGRICULTURAL MECHANIZATION PROFESSIONAL COURSES			24
AE 20	Principles of Agricultural Mechanization	3	
AE 31	Field Machinery Management	3	
AE 32	Farm Buildings & Equipment	3	
AE 34	Instrumentation	3	
AE 35	Soil Water Control	3	
AE 36	Farm & Forestry Power	3	
AE 83	Spec. Prob. in A. E.	3	
AE 84	Spec. Topics in A. E.	3	
C. PROFESSIONAL FIELD SUPPORTING COURSES			32
Ec 10	Principles of Economics	3	
Ba 9	Principles of Accounting	3	
Fs 101	Food Processing Industry	3	
	Electives (12 hours must be in LSA courses)	23	
D. BASIC SCIENCES AND ENGINEERING			25
Ge 1	Introduction to Eng. Design	2	
Ge 2	Introduction to Eng. Design	2	
Ms 4	Algebra & Trigonometry	3	
Ms 19	Principles of statistical Inference	3	
Ms 169	Computer Programming	3	
Ps 1a	General Physics	4	
Pe 2a	General Physics	4	
Ch 11 or Bc 7	Chemistry	4	
E. AGRICULTURAL AND BIOLOGICAL SCIENCES			16
Bt 1	General Botany	4	
AnV 45	Animal Science	3	
or			
Zo 3	Animal Biology	4	
S 2	Soils	3	
	Electives	6	
F. COMMUNICATIONS			9
Eh 1	Freshman Composition	3	
Sh 1	Introduction to Oral Communication (or equivalent)	3	
	Elective	2	
G. HUMANITIES AND SOCIAL SCIENCES			15
	Minimum of two semester courses in each		
H OTHER			0
Pe 1	Physical Education	0	
Pe 2	Physical Education	0	
Minimum Degree Hours Required for Graduation			**120**

Courses in Agricultural Engineering (AE)

Courses numbered below 50 or 101-150 are intended primarily for the Agricultural Mechanization curriculum or as service courses for students in other departments of the College of Life Sciences and Agriculture.

20. Principles of Agricultural Mechanization—Study of the principles involved in farm mechanization; measurement techniques; problem solving, functional analysis and principles of agricultural machines, structures and power sources. Prerequisite: Ms 4; *Rec* 2, *Lab* 2, *Cr* 3. MR. SMITH

‡31. Field Machinery Management—Economic selection of machinery to integrate field operations in food and fiber production systems; efficient management and use of machines and applications of power to field operations. Prerequisite: Ms 4, Ae 20 or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. SOULE

32. Farm Buildings and Equipment—Consideration of environmental control; methods and materials of construction; functional requirements and system economics of production, processing and storage buildings. Prerequisite: Ms 4. *Rec* 2, *Lab* 2, *Cr* 3. MR. WILLIAMS

†34. Instrumentation—A study of the basic principles and applications of instruments for measuring and controlling such phenomena as temperature, force, pressure, humidity, moisture content and flow rate. Applications to agriculture and biological sciences are stressed. Prerequisite: Ps 6. *Rec* 2, *Lab* 2, *Cr* 3. MR. ROWE

‡35. Soil Water Control—Field surveying, planning, layout and construction of soil and water control structures such as farm ponds, drainage systems, irrigation systems and soil erosion control systems. *Rec* 2, *Lab* 3, *Cr* 3. MR. KLINGE

†36. Farm and Forestry Power—Principles of construction, operation, and maintenance of internal combustion engines, tractors, and related equipment. Selection, application, and management of power equipment in farm and forestry activities. Prerequisite: Ms 4; *Rec* 2, *Lab* 2, *Cr* 3. MR. HUFF

37. Agricultural Engineering for Developing Countries—Principles and methods of improving agricultural and community facilities in rural and undeveloped areas, covering water supply and irrigation, electrification, improvised roads and bridges, light structures, power units, field machines, and sanitation. Prerequisite: Ms 4 or equivalent. *Rec* 2, *Lab* 3, *Cr* 3. MR. RHOADS, MR. SMITH

55. Materials in Agricultural Engineering—An introduction to physical and rheological properties of structural and biological materials useful in agricultural design and application. Prerequisite: Ps 2 or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. SOULE

79. Seminar—Recent literature, developments and problems in the field of agricultural mechanization. *Rec* 1, *Cr* 0. MR. RHOADS

80. Senior Seminar—Problems associated with professionalism and the first employment of the young agricultural engineer. *Rec* 1, *Cr* 0. MR. SMITH

81. Departmental Seminar—Presentation and discussion of current developments and problems that affect agricultural engineering and agricultural engineers. *Rec* 1 (monthly), *Cr* 0. STAFF

82. Introduction to Agricultural Engineering—An introduction to engineering experimentation involving biological material. For sophomores majoring in agricultural engineering. *Rec* 1, *Lab* 2, *Cr* 2. MR. HUFF

83. 84. Special Problems in Agricultural Engineering—*Cr Ar.* STAFF

†***160. Agricultural Machinery***—Analysis of functional and power requirements, capacity, and economics of agricultural machines. Principles of design; laboratory and field test. Prerequisite: Me 51. *Rec* 2, *Lab* 3, *Cr* 3. MR. SOULE

†***163. Farm Structures Design***—Structural design and environmental control in production, processing and storage buildings; consideration of functional requirements, system economics and methods and materials of construction. Prerequisite: Me 51. *Rec* 2, *Lab* 3, *Cr* 3. MR. WILLIAMS

‡***164. Instrumentation and Control Systems***—Analysis of dynamic measurement and control systems. Laboratory problems include temperature, force, moisture content, strain, and fluid flow measurements involving physical and biological systems. Ps 2 and Ms 28. *Rec* 2, *Lab* 2, *Cr* 3. MR. ROWE

†***165. Soil and Water Engineering***—Study of rainfall and runoff, flood control, land clearing techniques, and water resources engineering. Design of erosion control structures, small earth dams and farm reservoirs, drainage and irrigation systems. Prerequisite: Ce 26 or Me 59. *Rec* 3, *Lab* 3, *Cr* 4. MR. KLINGE

‡***167. Agricultural Power***—Tractor power units, construction, operating principles, testing and rating; vehicle mechanics as applied to tractors and other cross country vehicles; farm electrification; new energy sources and applications for agriculture. Prerequisite: Me 33. *Rec* 2, *Lab* 3, *Cr* 3. MR. HUFF

‡***169. Agricultural Process Engineering***—Unit operations and their applications as related to agricultural processing and processing equipment. Prerequisite: Me 33 and 59 or Ce 26 (may be taken concurrently). *Rec* 2, *Lab* 3, *Cr.* 3.
MR. RHOADS, MR. SMITH

380. Graduate Seminar—*Rec* 1, *Cr* 1. STAFF

383/384. Problems in Agricultural Engineering—*Cr Ar.* STAFF

399. Graduate Thesis—*Cr Ar.* STAFF

AGRICULTURAL AND RESOURCE ECONOMICS

PROFESSORS METZGER, PLOCH, PULLEN; ASSOCIATE PROFESSORS DELPHENDAHL, DUNHAM, HARLAN, JOHNSTON, KROFTA, WING; ASSISTANT PROFESSORS BENSON, HYATT, KING, TOBEY

The Department of Agricultural and Resource Economics offers a curriculum leading to the B. S. degree in agricultural and resource economics, with emphasis in agricultural business management and marketing, and resource and production economics. Majors in sociology of rural life and international affairs are also available. The department's program is designed to develop abilities to handle managerial responsibilities in the economic and social aspects of the food and fiber industries and allied fields, and the development of human and natural resources. The program provides a broad education in agricultural business, economics, and rural sociology.

Areas of instruction include the business and economic aspects of production, with emphasis on the economic use and management of capital, labor, land, and water resources; the business aspects of marketing, with emphasis on pricing, financing, merchandising, work simplification, quality control, and consumption; economics related to development of area resources; and social and human

factors associated with food production processing, distribution, consumption, and community development; and foreign languages and the political, legal, and economic aspects of international relations. In addition, training is complemented by a comprehensive, integrated program of courses in the life sciences, other social sciences, communication, arts and humanities.

Employment opportunities exist in food and agricultural businesses such as manufacturing and processing firms, wholesale and retail distribution firms, insurance and credit agencies, cooperatives, feed, fertilizer, and farm supply companies, federal and state governments, and colleges and universities; international organizations and international business and agriculture.

The department participates in offering an interdisciplinary curriculum leading to the B.S. degree in Natural Resource Management. (See page 223). The curriculum consists of a common core program emphasizing the physical, biological, and earth sciences, and the humanities and social sciences, plus a choice of four areas of professional specialization, one of which is resource economics.

Curriculum for Agricultural and Resource Economics
(Except Rural Sociology and International Affairs Options)

Required Courses		Credit Hours	Minimum Degree Hours Required
A. UNIVERSITY LIFE		0	0
PHYSICAL EDUCATION		0	0
B. BASIC SCIENCES			17
Ms 5 & 6 or 4 & 12	Elements of College Mathematics or College Algebra & Trigonometry, and Analytic Geometry and Calculus	6 (8)	
	Electives*	11 (9)	
C. COMMUNICATIONS			9
Eh 1	Freshman Composition	3	
Eh 17	Advanced Professional Exposition	3	
Sh 1	Introduction to Oral Communication	3	
D. HUMANITIES AND SOCIAL SCIENCES			15
	Electives**		
E. LIFE SCIENCES AND AGRICULTURE			12
	Electives (Any course in the College of Life Sciences & Agriculture, except Agricultural & Resource Economics courses.)		
F. BUSINESS AND ECONOMICS			18
Ec 10	Principles of Economics	3	
Ba 9	Principles of Accounting	3	
Ec 153	Money & Banking	3	
Ec 173	Economic Analysis	3	
	Electives (Any Ba or Ec courses)	6	
G. AGRICULTURAL AND RESOURCE ECONOMICS			26
ARE 24	Sociology of Rural Life	3	
ARE 154	Introduction to Production Economics	3	
ARE 159	Agricultural Business Management	3	
ARE 165	Food & Fiber Marketing	3	
ARE 168	Price Analysis & Forecasting	3	
ARE 171	Land Resource Economics	3	
ARE 193, 194	Seminar	2	
	Electives (Any ARE courses except ARE 48)	6	

H. RESEARCH METHODS AND STATISTICS				6
Ms	19	Principles of Statistical Inference	3	
Sy	120,	Methods of Social Research,		
Ba	147 or	Business Data Processing or		
Ms	169	Computer Programming	3	
I. FREE ELECTIVES		Any course in the University for which the student is qualified		17
Minimum Degree Hours Required for Graduation				**120**

* Choose from the following fields: Botany, Microbiology, Biochemistry, Chemistry, Geology, Physics, Zoology.

**Choose from the following fields: Humanities: Art, English, History (Hy 1 & Hy 2), Language, Literature, Music, Philosophy (Pl 1 & Pl 2), Speech.
Social Sciences: Anthropology, Economics, History (except Hy 1 & Hy 2), Journalism (Jr 22, Jr 85), Modern Society, Political Science, Sociology, Psychology.
Minimum of two (2) courses in the Humanities and two (2) courses in the Social Sciences.

Curriculum for Sociology of Rural Life

Students who major in rural sociology take the same program as major students in agricultural and resource economics except for the requirements listed under section F (18 hours) and G (26 hours). The following 44 credit hours substitute for section F and G:

Ec	10	Principles of Economics	3
ARE	48	Principles of Agricultural Economics	3
ARE	24	Sociology of Rural Life	3
ARE	42	World Population Resources	3
ARE	124	Contemporary Rural Problems	3
ARE	129	The Individual & the Community	3
ARE	150	Human Factors in Resource Development	3
ARE	81	Agriculture & Economic Growth	3
ARE	193, 194	Seminar	2
Py	1	General Psychology	3
Py	130	Social Psychology	3
Sy	3/4 or	Introduction to Sociology	6
		or	
Ay	1/2	Introduction to Anthropology	
		Electives (Sociology, Anthropology or Psychology)	6
			44

The student, after consultation with his adviser, should declare to the department head his intention to pursue the rural sociology major. This should be done at the time of preregistration for the fall semester of the sophomore year.

Curriculum for International Affairs

Required Courses			**Credit Hours**	**Minimum Degree Hours Required**
Orientation				0
Physical Education				0
BASIC SCIENCES				18
Ms	5 & 6	Elements of College Mathematics	6	
		Electives	12	
MODERN FOREIGN LANGUAGE				14
		First Year	8	
		Second Year	6	

COMMUNICATIONS			9
Eh 1	Freshman Composition	3	
Eh 17	Advanced Professional Exposition	3	
Sh 1	Intro. to Oral Communication	3	
HUMANITIES AND SOCIAL SCIENCES			21
Pol 1 & 2	Introduction to Government	6	
Pol 173 & 174	International Relations	6	
Pol 187	International Law	3	
Pol 188	International Organization	3	
LIFE SCIENCES AND AGRICULTURE			8
	Electives	8	
BUSINESS AND ECONOMICS			18
Ec 10	Principles of Economics	3	
Ba 9	Principles of Accounting	3	
Ec 137	Comparative Economic Systems	3	
Ec 139 & 140	International Trade and Commercial Policy	6	
	Electives (Any Ba or Ec course)	3	
AGRICULTURAL AND RESOURCE ECONOMICS			26
ARE 24	Sociology of Rural Life	3	
ARE 42	World Population Resources	3	
ARE 150	Human Factors in Resource Development	3	
ARE 154			
ARE 165	Introduction to Production Economics	3	
ARE 168	Food & Fiber Marketing	3	
ARE 171	Price Analysis and Forecasting	3	
ARE 186	Land Resource Economics	3	
ARE 193 & 194	World Policies for Agriculture	3	
	Seminar	2	
RESEARCH METHODS AND STATISTICS			6
Ms 19	Principles of Statistical Inference	3	
Ms 169, Ba 147 or Sy 120	Computer Programming, Business Data Processing or Methods of Social Research	3	
ELECTIVES			3
Hy 5 or 6	History of Western Europe	3	
Minimum Degree Hours Required for Graduation			**120**

* Elect from fields of: Botany, Biochemistry, Chemistry, Geology, Microbiology, Physics, Zoology.

Courses in Agricultural and Resource Economics (ARE)

48. Principles of Agricultural Economics—A study of economic principles applied to the business firm, with consideration given to production, marketing, use of human and natural resources, and governmental policy. *Rec* 3, *Cr* 3. Not open to ARE majors, except Rural Sociology option. MR. WING

81. Agriculture and Economic Growth—Principles and factors of economic development. Resource allocation in emerging nations. The role of agriculture in developing economies. Effect of transition to market economy on social and economic institutions. Function of national economic planning. *Rec* 3, *Cr* 3.
MR. DELPHENDAHL, MR. HARLAN

154. Introduction to Production Economics—The application of economic relationships and principles of problems of resource allocation at the firm level. Prerequisite: Ec 10 or ARE 48. *Rec* 3, *Cr* 3. MR. KROFTA

159. Agricultural Business Management—Discussion of the management principles and procedures applicable to agricultural businesses. Prerequisite: ARE 48 or Ec 10; and Ba 9. *Rec* 3, *Cr* 3. MR. WING

†***164. Statistical Quality Control***—Distribution and sampling theories with application to methods of process control and acceptance inspection. Prerequisite: permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3.

165. Food and Fiber Marketing—Economic principles applied to marketing structures, services and agencies; analysis of costs and efficiencies; impact of industry organization and government. Prerequisite: Ec 10. *Rec* 3, *Cr* 3. MR. KING

†***167. Food Distribution Management***—The management approach to marketing. Includes areas of decision making such as marketing organization, products, distribution policies, pricing, advertising and personal selling. Firm visits. Lab fee $5. Prerequisite Ec 10. *Rec* 2, *Lab* 2, *Cr* 3. MR. DUNHAM

168. Price Analysis and Forecasting—The consideration of supply, demand, and elasticity in affecting food prices; their application to price discrimination, future markets, and price programs; and the use of quantitative techniques in price forecasting. Prerequisite: Ec 10 and Ms 19 or permission of instructor. *Rec* 3, *Cr* 3.

171. Land Resource Economics—Principal economic and institutional factors affecting man in his use of land and resources; supply, demand, and future requirements; input-output relationships, benefit cost analysis; planning for more efficient use of resources. Prerequisite: Ec 10. *Rec* 3, *Cr* 3. MR. DELPHENDAHL

†***186. World Policies for Agriculture***—Analysis of national and international policies affecting food production and distribution. Areas of competition, changes in comparative advantage. Interrelationship of national and international policies. Current programs for international cooperation. Prerequisite: Ec 10. *Rec* 3, *Cr* 3. MR. DELPHENDAHL

193. 194. Seminar—Discussion of current economic problems. Prerequisite: seniors and graduates. *Rec* 1, *Cr* 1. MR. METZGER

197. 198. Independent Studies in Agricultural and Resource Economics and Rural Sociology—Analysis of and readings on current problems in agricultural and resource economics, and rural sociology. Prerequisite: permission of instructor. *Rec* 2, *Cr* 2. STAFF

ARE/Ec 225. Mathematical Economics—Advanced economic theory presented mathematically. Prerequisites: Ec 210, Ec 211, Ec 180 or permission of instructor. *Cr* 3.

ARE/Ec 230. Econometrics—An introduction to economic concepts and relationships expressed in statistical terms. Major emphasis will be given to economic models related to demand, supply, production and cost functions; input-output analysis and other models will also be considered. Prerequisite: Ms 6 or 12, Ms 19, Ec 173 or permission of instructor. *Rec* 3, *Cr* 3.

†***272. Resource Use and Economic Growth***—Resource utilization and economic growth in retrospect. Importance of resources. Theories, measurements of economic development. Public policies and planning for resource development. Prerequisite: ARE 171 or permission of instructor. *Rec* 3, *Cr* 3. MR. DELPHENDAHL

304. Marketing Theory and Concepts—Economic theory underlying the policies of marketing firms; the details of current marketing problems and cur-

rent market practices for selected commodities. Prerequisite: ARE 165. *Rec.* 3, *Cr* 3. MR. KING

307. Production Economics—The principles of optimum resource allocation applied to agricultural businesses under perfect knowledge and with consideration of uncertainties. The use of linear programming as a tool for attaining optimum resource allocation. Prerequisite: ARE 154, Ms 19 or permission. *Rec* 3, *Cr* 3. MR. KROFTA

359. Research Methods in Agricultural and Resource Economics—Nature of economic and social analysis; scientific objectivity; individual and public problems; formulation of hypotheses and models; empirical techniques; evaluation of current research procedures. Prerequisite: permission of instructor. *Rec* 3, *Cr* 3. MR. TOBEY

399. Graduate Thesis—*Cr Ar.* STAFF

Courses in Sociology of Rural Life (ARE)

24. Sociology of Rural Life—Significance of rural society in American culture. The impact of forces of change, including population movement. The significance of changes in the institutions of family, religion, education, and stratification. Course same as Sy 24. *Rec* 3, *Cr* 3. MR. PLOCH

42. World Population Resources—An introductory course with emphasis on size and distribution of the population resource in relation to other resources essential to life. Trends in growth and migration will be analyzed. Possible alleviation of problems through policy formulation will be discussed. *Rec* 3, *Cr* 3. MR. HYATT

124. Contemporary Rural Problems—A problem-oriented, class participation course focusing on the trends taking place in contemporary rural society. Includes rural population displacement and mobility, poverty, industrialization; consequent changes in occupational composition, and related changes. Prerequisite: ARE/Sy 24 or equivalent. *Rec* 3, *Cr* 3. MR. PLOCH

129. The Individual and the Community—Analysis of the functioning and structure of the community. Emphasis on ways in which individuals and groups are affected by community dynamics. Group process, leadership, and development are stressed. Community project. Prerequisite: ARE/Sy 24 or Sy 126 or permission. *Rec* 3, *Cr* 3. MR. PLOCH

†***150. Human Factors in Resource Development***—Methods of social change. Community and individual resistances to, and acceptance of, development programs. Consequences of development for community social systems. The development as an interactive force in the community. Prerequisite: ARE 24/Sy 4 or permission. *Rec* 3, *Cr* 3. MR. PLOCH

Graduate Work in Agricultural and Resource Economics

The degree of master of science in agricultural and resource economics is offered with an opportunity for study in marketing production economics, resource economics, and sociology of rural life. Students are encouraged to develop broad interdisciplinary programs combining departmental core requirements and approved electives. Candidates will be encouraged to elect graduate level courses in the Department of Agricultural and Resource Economics and other departments and colleges of the University.

The degree of master of agricultural and resource economics also is offered. Candidates for this degree are not required to write a thesis. They need not meet the full-time residence requirement, but must meet all other requirements of the master of science degree.

Full descriptions of these graduate degree programs are presented in the Graduate Catalog.

ANIMAL AND VETERINARY SCIENCES

PROFESSORS MUSGRAVE, BIRD, CHUTE, DICKEY, GERRY, H. LEONARD, POULTON, WITTER; ASSOCIATE PROFESSORS APGAR, BRUGMAN, HARRIS, HOOVER, O'MEARA, GERSHMAN, VAN DER HEIDE; ASSISTANT PROFESSORS BLAMBERG, GOATER, SNIFFEN; LECTURERS CORDELL, DAS, DEHOFF, FOX HOFSTRA, SAWIN, TASHJIAN

The Animal Sciences curriculum is designed to provide a broad biological training as well as a thorough understanding of the anatomy, behavior, breeding, genetics, management, nutrition and physiology of large animals, poultry and laboratory animals.

Because a basic knowledge in animal sciences is fundamental to successful work in many job situations, the curriculum offers a wide choice of electives in order that students may adapt their courses of study to meet specific professional interests or needs. Through the proper use of electives, students can prepare for admission to graduate school or veterinary college, teaching sciences in secondary schools, pursuing technical sales and service work in the animal and poultry industries, careers as laboratory animal technicians, or developing animal production enterprises such as dairy, poultry, or livestock farming.

Courses in Animal Pathology are offered to support the curriculum in the department and the curriculum in Wildlife Management. They also serve as elective opportunities for students in other agricultural sciences, agricultural engineering, and zoology. This department also administers the Pre-Veterinary Science program (see page 264).

Superior students should consider continuing their studies at the graduate level. The Department of Animal and Veterinary Sciences offers the master of science degree in animal science for a program of study in animal nutrition, animal physiology, or animal breeding. The doctor of philosophy degree may be earned in animal nutrition.

Curriculum for the B.S. Degree in Animal and Veterinary Sciences

Freshman Year. See Page 210

		Credit Hours	Minimum Degree Hours Required
A. ORIENTATION			0
B. ANIMAL AND VETERINARY SCIENCES			32
AnV 45	Animal Science	3	
AnV 155-156	Nutrition	6	
AnV 160	Animal Genetics & Breeding	3	
Electives in Animal & Veterinary Sciences		20	

C. BASIC SCIENCES*			20
Ch 11-12	General Chemistry or Bc 7-8 Biochem.	8	
Zo 3-4	Animal Biology	8	
	Mathematics	4	
D. LIFE SCIENCES AND AGRICULTURE			12
Electives in Life Sciences and Agriculture		12	
E. COMMUNICATIONS			8
Eh 1	Freshman Composition	3	
AnV 163-164	Seminar	2	
Sh 1	Speech (or equivalent)	3	
F. HUMANITIES AND SOCIAL SCIENCES			15
Choose a minimum of 2 courses in the Humanities and Social Sciences			
G. FREE ELECTIVES			33
Minimum Degree Hours Required for Graduation			**120**

* A student desiring to pursue graduate work should select at least 32 credit hours in the basic sciences in consultation with his adviser.

** A student preparing for a career in the animal production industries should select at least 12 credit hours in marketing, business and economics in consultation with his adviser.

Courses in Animal and Veterinary Sciences (AnV)

43. Tropical Agriculture— A consideration of the characteristics and problems of the soils, plants, and animals of the tropics. Programs and methods for stimulating their potential productivity will be explored. *Rec* 3, *Cr* 3.

45. Animal Science—Fundamental principles of the animal sciences, including animal genetics, breeding systems, the physiology of reproduction, animal nutrition and the physiology of lactation. *Rec* 3, *Cr* 3. MR. MUSGRAVE

46. Dairy Cattle Technology—The application of breeding, feeding, housing, selection, care, records, breed association programs and recent research findings to herd management. The laboratory is devoted to problems in and techniques of dairy cattle management. Field trip fee $4. Prerequisite: AnV 45. *Rec* 2, *Lab* 2, *Cr* 3. MR. H. LEONARD

48. Livestock Management—The selection, breeding, feeding, care and management of beef cattle, sheep, and swine. Prerequisite: AnV 45. *Rec* 3, *Lab* 2, *Cr* 4. MR. BRUGMAN

‡49. Livestock and Poultry Feeding—A course designed to acquaint the student with the nutritional value of various feedstuffs, the dietary requirements of animals and poultry, and the ingredients used to fulfill the requirements. *Rec* 3, *Cr* 3. MR. LEONARD, MR. GERRY

65. Meat Technology—The basic science of meat and meat processing, packing house methods and cutting of meat. *Rec* 2, *Lab* 2, *Cr* 3.
MR. BRUGMAN, MR. GERRY

66. Dairy Technology—Studies in the composition and properties of milk and milk products, and common dairy processes such as pasteurization, homogenization and quality control methods. Testing dairy products for fat, solids, adulteration and acidity. *Rec* 2, *Lab* 2, *Cr* 3. MR. H. LEONARD

85. Poultry Technology—The science of the biology, breeding, feeding, incubation, and diseases of the domestic fowl, and the housing, management, and business practices of the table egg, hatching egg, and broiler industries. Field trip fee $5. *Rec* 2, *Lab* 2, *Cr* 3. MR. HARRIS

135. Anatomy of Domestic Animals—Comparative anatomy of domestic mammals and birds emphasizing gross and histological features of the parts involved in major physiological processes, meat uses and diseases. Prerequisite: Zo 4 or equivalent. *Rec* 2, *Lab* 2, *Cr* 3. MR. WITTER, MR. CHUTE

136. Physiology of Domestic Animals—Special emphasis is placed on comparative features, especially of the circulatory, respiratory, digestive, and urogenital systems of domestic mammals and birds. Prerequisite: AnV 135 or equivalent. *Rec* 3, *Cr* 3.

137. Animal Diseases—Principles of herd health programs. The pathology, control, and prevention of important diseases and parasites of domestic animals. Juniors and seniors. Prerequisite: AnV 135 or permission. *Rec* 3, *Cr* 3. MR. WITTER

140. Poultry Diseases—Principles of hygiene and sanitation applied to the prevention and control of the diseases of poultry, including a detailed consideration of the pathological processes involved in the common diseases. Prerequisite: permission of instructor. *Rec* 3, *Cr* 3. MR. CHUTE

‡142. Physiology of Reproduction—The comparative function of the organs of reproduction in domestic animals. Special emphasis on the areas that are commonly associated with infertility and disease. Offered during spring of even years. Prerequisite: AnV 172 or with permission. *Rec* 2, *Lab* 2, *Cr* 3. MR. WITTER

144. Disease and Parasite Control (in Wildlife)—Known infectious and parasitic diseases of game and fur-bearing animals, zoonoses, emphasizing preventive and control measures and practice in autopsy and diagnostic techniques. Wildlife majors. *Rec* 2, *Lab* 2, *Cr* 3. MR. WITTER

150. Animal Mycopathology—Fungi of avian and mammalian importance including isolation, identification, pathogenicity indicators, tissue invasion, toxin assay and laboratory safety. Prerequisite: By 128 or equivalent. *Rec* 2, *Lab* 2, *Cr* 3. MR. O'MEARA

155. Animal Nutrition—Principles of nutrition, methods of experimentation and discussion of nutritional balances. Prerequisite: Zo 4, Ch 12. *Cr* 3. MR. APGAR

156. Applied Animal Nutrition—A study of the nutrient requirements of livestock and avian species. The nutritive value and characteristics of feedstuffs are studied as well as methods of formulating balanced nutrient intakes. Prerequisite: AnV 155. Rec 2, Lab 2, Cr 3. MR. HOOVER, MR. GERRY

157. 158. Problems in the Animal Sciences—Special study of research problems within the animal science field. *Cr Ar.* STAFF

160. Animal Genetics and Breeding — The principles of genetics. The transmission and expression of hereditary factors in animal breeding. Prerequisite: Zo 4. *Rec* 3, *Cr* 3. MR. DICKEY

161. Advanced Animal Breeding—The inheritance of the commercially valuable characteristics of animals. Mating systems and their effects. Progeny testing, selection indices and other methods to increase intensity and accuracy of selection. Prerequisite: AnV 160 or equivalent. *Rec* 3, *Cr* 3. MR. DICKEY

163. 164. Seminar—Preparation and presentation of papers dealing with research in the animal sciences. *Cr* 1. MR. DICKEY AND STAFF

170. Physiology of Lactation—A detailed study of the anatomy, development and function of the mammary gland. The biochemistry and physiology of milk secretion and udder evacuation. Prerequisite: Zo 4, Bc 122. *Cr* 3. MR. APGAR

172. Endocrinology—A detailed study of the animal endocrine system and functional relationships of each of the endocrine glands to growth, reproduction and lactation. Prerequisite: Zo 4, AnV 136. *Rec* 3, *Lab* 2, *Cr* 4.

MR. VAN DER HEIDE

175. Behavior of Domestic Animals—A survey of factors encompassing the fundamentals of behavior in domestic animals, including interrelationships of behavior and domestication. Special attention is given to social, mating, and feeding behavior of several mammalian and avian species. Prerequisite: Zo 4, Bc 122. *Rec* 3, *Cr* 3. MR. APGAR

‡182. Avian Physiology—Anatomy and physiology of the fowl with emphasis on the physiology of reproduction; special attention will be given to the current literature. Prerequisite: AnV 136 or permission of the instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. HARRIS

186. Bioassay—A study of various bioassay techniques and associated problems illustrated by laboratory exercises. Prerequisite: permission of instructor. *Rec* 1, *Lab* 4, *Cr* 3. MR. BIRD

200. Advanced Animal Pathology—The gross and histopathology of the reaction of domestic animals to nutritional disorders and various etiologic agents, such as bacteria, viruses, fungi, parasites, poisons, and toxins. Prerequisite: AnV 35, 36, Zo 51, Bc 60 or equivalent courses. *Rec* 2, *Lab* 2, *Cr* 3.

MR. VAN DER HEIDE, MR. WITTER

212. Advanced Ruminant Nutrition—The nutrition of ruminants as contrasted to non-ruminants; with special emphasis on rumen physiology, nutrient absorption and the role of rumen microorganisms in feed utilization. Prerequisite: permission. *Rec* 2, *Lab* 2, *Cr* 4. MR. HOOVER

214. Energy Metabolism—Principles of direct and indirect calorimetry and the application of these principles to research methods. Prerequisite: AnV 155, 212. *Rec* 2, *Lab* 2, *Cr* 3. MR. SNIFFEN

218. Population Genetics—Application of genetic and biometric principles to the characteristics of populations. Prerequisite: AnV 161. *Rec* 3, *Cr* 3.

MR. DICKEY

220. Gastrointestinal Physiology—A study of the anatomy and physiology of the gastrointestinal tract and the accessory organs of digestion in monogastric animals. Prerequisite: permission of instructor. *Cr* 3. MR. BIRD

310. Research Methods in Animal Science — A comprehensive study of statistical techniques applied to animal research. Includes principles of setting up experiments, analysis and interpretation of data and methods of reporting results. Prerequisite: Ms 167 or permission of instructor. *Rec* 4, *Cr* 3.

MR. APGAR

†316. Advanced Animal Nutrition — Studies in the metabolism and interrelationships of proteins, fats, carbohydrates, minerals and vitamins as they pertain to monogastric findings in this area. Prerequisite: AnV 155. *Cr* 3.

MR. BLAMBERG

363. 364. Graduate Seminar in Animal Science—*Cr* 1.

MR. HOOVER AND STAFF

390. Graduate Research in Animal Science—*Cr Ar.* STAFF

399. Graduate Thesis—*Cr Ar.* STAFF

POULTRY SCIENCE

Students desiring training in poultry science will major in animal sciences and will select courses with the sequence described on page 256. Students interested in this specialty will receive training in nutrition, physiology, and genetics and will have ample opportunity to select elective courses to prepare for a wide variety of career opportunities.

PLANT AND SOIL SCIENCES

PROFESSORS STRUCHTEMEYER, BROWN, HUTCHINSON, STILES, TREVETT; ASSOCIATE PROFESSORS CARPENTER, HEPLER, LOTSE, KOCHER, H. MURPHY, WAVE; ASSISTANT PROFESSORS ISMAIL, LANGILLE, LITTLEFIELD, ROURKE; EXTENSION SPECIALISTS ERHARDT, HOLYOKE; COLLABORATOR EPSTEIN

The curriculum in the Department of Plant and Soil Sciences has been organized to provide a well-balanced educational program for students interested in the study of plants, soils and natural resources. The program provides students with a knowledge of basic sciences, soils, plants, landscaping and natural resources.

Students with primary interest in soils can get specialized training in soil fertility, conservation, chemistry, physics and classification. Those with an interest in plants can obtain training in forages, fruits, vegetables, ornamental horticulture and landscaping.

Students can also obtain training in the management and conservation of natural resources. For further information on the Natural Resources program see page 223.

Upon meeting the requirements established by the University and the department, students will receive a B.S. degree in plant and soil sciences. Training received will qualify the student for careers in teaching, extension work, production and service functions for industry, Soil Conservation Service and other related government agencies, farming, landscaping, consulting, inspections, communications and sales.

Students who are well qualified and are interested in doing graduate work should plan early to go beyond the B.S. degree. Graduate programs at the M.S. and Ph.D. levels are available and qualified students should be encouraged to continue their education for an advanced degree.

Curriculum in Plants or Soils

Require_ Courses		Credit Hours	Minimum Degree Hours Required
A. ORIENTATION			0
B. BASIC SCIENCES			36
Ch 11-12 or 13-14	Chemistry	8	
Bc 21 & Bc 122	Organic & Biochemistry	8	
Bt 1	Botany	4	
Bt 153	Plant Physiology	4	
Ms 4 or 12	Mathematics	4	
Zo 163	Genetics		
or			
Gy 6	Geology	3	
Ps 6	Physics	5	

C. PLANTS AND SOILS			28
P21	Crop Science	3	
P22	Crop Management	4	
P173 & 174	Seminar	2	
S2	Soil Science	4	
S51	Soil Fertility	3	
S154	Soil-Plant Relationships	3	
	(Plant Sequence)		
	Additional plant courses	6	
	Departmental electives	3	
	or		
	(Soil Sequence)		
	Additional soils courses	6	
	Departmental electives	3	
D. LIFE SCIENCES AND AGRICULTURAL ELECTIVES			12
E. COMMUNICATIONS			9
Eh 1	Freshman Composition	3	
Eh 17	Adv. Prof. Writing	3	
Sh 1	Intro. to Oral Communication	3	
F. HUMANITIES AND SOCIAL SCIENCES			15
Minimum of two semester courses in each			
G. FREE ELECTIVES			20
Any course in the University for which the student is qualified.			
Minimum Degree Hours Required for Graduation			**120**

Soils Courses (S)

2. Soil Science—A study of the chemical, physical and biological properties of soil. Also considers origin, management, and inter-relationships of soils to plant growth. Prerequisite: Ch 1 or Bc 7. *Rec* 3, *Cr* 3, or *Rec* 3, *Lab* 2, *Cr* 4.
MR. HUTCHINSON

3. Forest Soil Science—Fundamentals of soil science including the study of development, properties, and management of soils and the inter-relationships of soils to forest growth. Prerequisite: Ch 1, *Rec* 2, *Lab* 2, *Cr* 3.
MR. STRUCHTEMEYER

50. Soil and Water Conservation—Management of our soil and water resources in accordance with need and capabilities of the land. *Rec* 2, *Cr* 2.
MR. STRUCHTEMEYER

51. Soil Fertility—A study of soil as a source of the essential nutrients needed for plant growth and the properties and use of fertilizers, liming materials, and manures. Prerequisite: S 2 or S 3. *Rec* 3, *Cr* 3. MR. HUTCHINSON

121. Earth Science I—Comprehensive study of the effects of natural forces on soil, atmosphere, climate, oceans, and land forms. (For primary school teachers). Offered in CED only. *Rec* 3, *Cr* 3. MR. MURPHY

122. Earth Science II (for secondary school teachers)—An introduction to astronomy and the earth sciences of meteorology and soils, with emphasis on basic principles. *Cr* 3. MR. HARPER, MR. TODD AND MR. MURPHY

†152. Soil Development and Classification—Genesis, morphology, classification, and mapping of soils. Interpretation of soil survey reports. Prerequisite: S 2 or S 3 and Gy 1a. *Rec* 2, *Lab* 3, *Cr* 3. MR. ROURKE

†154. Soil-Plant Relationships—Chemical properties of soils and plants with principles and methods of analyses. Prerequisite: S 2 or S 3 and S 51. *Rec* 2, *Lab* 3, *Cr* 3. MR. LOTSE

†***156. Physical Properties of Soils***—An intensive consideration of the physical properties of the soil and their effect on plant growth. Prerequisite: S 2 or S 3 and Ps 1, 3 or 6. *Rec* 2, *Lab* 3, *Cr* 3. MR. EPSTEIN

157. 158. Problems in soils—Opportunity is provided for specialization in specific areas of soil science. *Cr Ar.* STAFF

203. Radiobiology—Principles for using radioisotopes in biological research. Permission of instructor. *Rec* 2, *Lab* 4, *Cr* 4. MR. LANGILLE

252. Spectrochemical Analysis—The theory and practice of colorimetry, flame photometry, spectroscopy and other allied instruments in quantitative chemical analysis. Permission of instructor. *Rec* 2, *Lab* 4, *Cr* 4. MR. CARPENTER

‡***254. Chemistry of Soils***—Colloquia and laboratories on chemical transformation in soils, chemical relationships of soils and plants, and effects on organic and inorganic plant nutrition. Prerequisite: S 2, S 51, S 54, and Ch 41. *Rec* 2, *Lab* 4, *Cr* 4. MR. LOTSE

271. Experimental Design—Principles of research in biological sciences, design of experiments, statistical analyses and interpretation of data. Permission of instructor. *Rec* 3, *Lab* 2, *Cr* 4. MR. HEPLER

399. Graduate Thesis—*Cr Ar.*

Plant Courses (P)

1. Horticulture—A course on general horticultural practices pertaining to: home landscaping; the flower, vegetables, and fruit gardens; the hobby greenhouse, plant propagation; and the various cultural aspects related to the home grounds. *Rec* 3, *Cr* 3. MR. LITTLEFIELD

21. Crop Science—Application of environmental sciences to growth of agricultural crops. Response of crops to moisture, temperature, light and soil fertility. Effects of weeds, diseases and insect pests. Prerequisite: Bt 1. *Rec* 3, *Cr* 3. MR. BROWN

22. Crop Management—Principles and practices in the management of selected crops. (1) Agronomic and vegetable crops; (2) fruit crops; (3) ornamental plants. Prerequisite: P 21 or permission. *Rec* 4, *Cr* 4.
MR. ISMAIL AND MR. MURPHY

P/AnV 43. Tropical Agriculture—A consideration of the characteristics and problems of the soils, plants, and animals of the tropics. Programs and methods for stimulating their potential productivity will be explored. *Rec* 3, *Cr* 3.
MR. STRUCHTEMEYER, MR. BROWN, MR. MUSGRAVE

†***165. Post Harvest Physiology and Storage***—Discussion of biochemical and physiological processes associated with ripening and keeping quality of harvested plant products. Includes temperature, humidity, types of storage, handling and physiological disorders. Prerequisite: Bt 153 or permission. *Rec* 2, *Lab* 2, *Cr* 3.
MR. ISMAIL

166. Plant Propagation—The principles and methods involved in the propagation of herbaceous and woody plants by seeds, division, layering, cutting, budding, and grafting. Prerequisite: Bt 153. *Rec* 2, *Lab* 2, *Cr* 3. MR. KOCHER

167. 168. Problems in Plant Science—Persons wishing to specialize in potatoes, vegetable crops, forage crops and pomology can do so by developing problems in their areas of interest. *Cr Ar.* STAFF

173/174. Seminar—Review of literature, problems, and research as related to the areas of plants and soils. *Rec* 1, *Cr* 1. STAFF

177. 178. Advanced Studies in Crop Science—Study of basic practices in crop production. Areas are apples, forages, potatoes and sugar beets. *Cr* 3.
MR. STILES, MR. BROWN, MR. MURPHY, MR. HEPLER

‡201. Plant Growth Regulators—Concepts and techniques in the study of plant growth and development with emphasis on phytohormones and synthetic growth substances in relation to economic plants. Prerequisite: Bt 153. *Rec* 3, *Lab* 3, *Cr* 3. MR. KOCHER

202. Plant Breeding—Improvement of plants through hybridization and selection. Genetic principles as related to breeding methods will be discussed. Prerequisite: Zo 162. *Rec* 3, *Cr* 3. MR. HEPLER

277. Mineral Nutrition of Plants—Function of essential elements, mechanism of uptake, movement and distribution, essential element interactions and mineral nutrition in relation to ecology and plant breeding. Prerequisites: S 154 and Bt 153 or permission. *Rec* 2, *Cr* 2. MR. ERHARDT

399. Graduate Thesis—*Cr Ar.* STAFF

Ornamental Horticulture and Landscaping Courses

30. Ornamental Horticulture—Principles of growing ornamental plants in the home, small greenhouse, and on home grounds. *Rec* 2, *Lab* 2, *Cr* 3.

‡31. Landscape Plant Material—Study of the woody plants suitable for landscape design in New England including their selection, arrangement, planting, and care. Prerequisite: junior or senior standing. *Rec* 2, *Lab* 2, *Cr* 3.

33. Greenhouse Management—The application of plant growing science to commercial production under glass, placing special emphasis on plant growing, marketing, and care of the commercial range. Field trips. *Rec* 3, *Lab* 2, *Cr* 4.
MR. LITTLEFIELD

‡34. Agostology—The identification, fertilization, mowing, pest control, and soil requirements of grasses, suitable for use on lawns, golf courses, athletic areas, cemeteries and parks. Prerequisite: S 2. *Rec* 3, *Cr* 3. MR. HOLYOKE

†35. Landscape Designing—Principles of landscape design as applied to the home and institutional grounds; experience provided in preparing landscape plans. Prerequisite: Eg 1 or its equivalent or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3.

SPECIAL PRE-PROFESSIONAL PROGRAMS IN AGRICULTURAL EDUCATION, DAIRY MANUFACTURING FOOD PROCESSING, AND PRE-VETERINARY

A. Agricultural Education

The University offers the first two years of a four-year professional curriculum to prepare for teaching high school vocational agriculture. The last two years of the curriculum may be secured at the University of New Hampshire under provisions of a cooperative agreement whereby Maine students may enroll at the New Hampshire resident tuition rate.

The following is a recommended two-year course of study to be taken at the University of Maine by students contemplating a major in Agricultural Education. The last two years of the four-year sequence must be taken at the University of New Hampshire.

Pre-Agricultural Education Curriculum

First Year

FALL SEMESTER				SPRING SEMESTER			
Course			Credit Hours	Course			Credit Hours
LSA	1	University Life	0	Ch	12	Gen. Chemistry	4
AnV	45	Animal Science	3	P	1	Horticulture	3
Bt	1	Gen. Botany	4	S	2	Soils	4
Ch	11	Gen. Chemistry	4	Zo	3	Animal Biology	4
Eh	1	Freshman Comp.	3	Pe	2	Physical Education	0
Pe	1	Physical Education	0				
			14				15

Second Year

AE	36	Farm Power	3	AE	32	Farm Struct. & Equip.	3
AnV	49	Livestock Feeding	3	#Ms	4	Algebra and Trigonometry	4
Ec	10	Prin. of Economics	3	P	21	Crop Science	3
Py	1	Gen. Psychology	3	Elective		(En 26 or Ps 6 or humanities)	5
Sh	1	Oral Communication	3				
			15				15

#Ms 4 is required if the student completed two years of high school algebra, one year of plane geometry, and one half year of trigonometry.

B. Pre-Veterinary

The University of Maine does not offer a degree in veterinary medicine. Most students interested in the field attend four years as candidates for the B.S. degree. A few students gain admittance to a veterinary college after three years of pre-veterinary studies and the occasional student qualifies for admittance after two years of pre-veterinary study. This pattern is not peculiar to Maine alone, but is the trend nationally.

To help guide the prospective student interested in veterinary medicine, the following curricula is suggested for the first two years. Adjustments in the selection of courses can be made to fit special requirements of particular veterinary colleges. In addition to those courses listed below, the student should consider adding the following courses to their program: botany, calculus, German, comparative anatomy, and embryology.

Pre-Veterinary Curriculum

Freshman Year

		Subject	Credit Hours			Subject	Credit Hours
LSA	1	University Life	0	Ch	12	General Chemistry	4
AnV	45	Animal Science	3	Eh	1	Freshman Composition	3
Ch	11	General Chemistry	4	Hy	4	U. S. History	3
Ms	4	Algebra & Trigonometry	4	Pe	2	Phys. Education	0
Pe	1	Phys. Education	0	Zo	4	General Zoology	4
Zo	3	General Zoology	4			Electives	2
LSA	7	Freshman Seminar	1				
			16				16

Sophomore Year

Ay	1	Anthropology	3	Ay	2	Anthropology	3
Bc	21	Organic Chemistry	4	Bc	122	Biochemistry	4
Eh	7	Advanced Composition		Ps	2a	General Physics	4

		or	3	Sh	1	Oral Communication	3
Eh	9	Modern Literature				Elective from Humanities	3
AnV	160	An. Genetics & Breeding	3				
Ps	1a	General Physics	4				
			17				17

C. Dairy Manufacture

A cooperative agreement with the University of Vermont offers an opportunity for students to secure training in dairy manufacturing. The first two years of a four-year course are offered at the University of Maine. The final two years are completed at the University of Vermont. Residents of Maine are admitted to the University of Vermont for the last two years of the course at the Vermont resident tuition rate. The first two years of this program at Maine are supervised by the Department of Animal Sciences.

D. Food Processing

As a part of the New England Board of Higher Education plan for regional cooperation, the first two years of a program in Food Science and Technology may be taken at the University of Maine and the final two years of specialized training completed at the University of Massachusetts. Residents of Maine are admitted to the University of Massachusetts for the last two years at the Massachusetts resident tuition rate. The firs two years of the program at the University of Maine are supervised by the Department of Food Science.

Alternately, students wishing to major in the biological sciences with specialization in Food Science may do so at the University of Maine by enrolling in the Biology program (Food Science Option), described on page 282.

Pre-Food Science and Technology Curriculum

Freshman Year

FALL SEMESTER				SPRING SEMESTER			
		Subject	Credit Hours			Subject	Credit Hours
LSA	1	University Life	0	ARE	42	World Population	3
Ch	11			Ch	12		
or	13	Chemistry	4	or	14	Chemistry	4
Ms	4	Algebra & Trigonometry	4	Ms	12	Analytical Geometry and Calculus	4
Bt	1	General Botany	4				
Eh	1	Freshman Composition	3	Zo	3	Animal Biology	4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
			15				15

Sophomore Year

Ch	151	Organic Chemistry Lecture	3	ARE	48	Principles of Ag. Economics	3
Ch	161	Organic Chemistry Laboratory	2	Ch	140	Quantitative Analysis	4
		or		Ch	152	Organic Chemistry Lectures	3
Bc	21	Biochemistry	4	Ch	162	Organic Chemistry Laboratory	2
By	127	Bacteriology	3			or	
By	128	Bacteriology	2	Bc	122	Biochemistry	4
Ps	1a	Physics	4	Ps	2a	Physics	4
Sh	1	Oral Communication	3				
			16-17				15-16

TECHNICAL INSTITUTE DIVISION

ASSOCIATE DIRECTOR ROBERT B. RHOADS

The basic objectives of educational programs in the Two-Year Technical Division are: 1) to provide a practical working knowledge of fundamental principles in specific technical fields which will develop competence for gainful employment; 2) to develop competence in written and oral communication; 3) to contribute to the development of the student's intellectual capacity and personal growth; and 4) to prepare graduates for roles as citizens and effective community leaders. The program is not intended as preparatory course for four-year professional curricula and students are discouraged from entering the program with this objective. However, a transfer procedure is maintained for students whose educational objectives change and who demonstrate superior academic abilities.

Course offerings in the technical program are distinct and separate from those offered for baccalaureate degree students. Technical courses are of a practical nature and place emphasis upon the development of skills for immediate application. Instruction is provided by regular University staff who are specialists in their fields. Laboratory instruction and field experience represent an essential part of the technical training program.

An associate of science degree is awarded to graduates of the program. Requirements for this degree include the satisfactory completion of a prescribed technical curriculum with a minimum of 64 credit hours earned at an accumulative grade average of at least 1.80.

Seven curricula or options are offered covering a variety of fields of study.

A basic core curriculum of general education subjects is required in most programs, along with the technical subjects.

BASIC CORE CURRICULUM

All students enrolled in Two-Year Technical Division are expected to complete the following group of courses representing a basic core requirement:

	Subject	Hours
1 LSA	University Life	1
13 LSA	Applied Mathematics	3
1 Eh-2 Eh*	English Composition	6
2 Pol*	State & Local Government	3
3 Pol*	Current World Affairs	2
Pe 1-Pe 2	Physical Education	0
1 Sh	Oral Communication	3
		18

* Students in the Forest Management program take a substitute math course MST 2. Students in the Animal Medical Technology program are not required to take 2 Eh, 2 Pol, & 3 Pol.

I Animal Technology Curriculum

This program of study provides technical training and experience for careers in animal production in dairy cattle, poultry, beef cattle, pleasure horses, sheep, swine, and the related sales and service industries. Previous farm experience is considered helpful for enrollees. Graduates frequently return to the home farm or are employed as herdsmen or foremen on other farms. An increasing number of

graduates are employed in the integrated broiler or market egg industries or in sales and service in the feed, fertilizer, and machinery industries. Other employment opportunities include soil conservation service, breeding technicians, D.H.I.A. field men, and the Peace Corps.

				Required Hours
A. BASIC CORE CURRICULUM				18
B. ANIMAL & VETERINARY SCIENCE				23
	1 AnV	Dairy Cattle	3	
	2 AnV	Animal Production	3	
	3 AnV	Animal Selection	2	
	4 AnV	Animal Breeding	3	
	5 AnV	Milk Composition and Testing	3	
	6 AnV	Animal Feeding	3	
	12 AnV	Reproduction and Breeding	3	
	5 AnV	Livestock Diseases	3	
C. AGRICULTURE TECHNOLOGY				10
	3 ARE	Farm Management	3	
	2 P	Soils and Fertilizers	4	
	3 P	Forage Management	3	
D. FREE ELECTIVES				13
		Total		64

II. Animal Medical Technology Curriculum

This course of animal study provides technical training and experience for careers as laboratory animal technicians in biological and medical research laboratories, small animal hospitals, commercial testing laboratories for pharmaceutical and feed industries and veterinary aides. The curriculum provides specialized courses in animal care, handling, breeding, feeding, health, anatomy, and physiology, and in laboratory clinical work. Eight weeks of training is required at no additional cost to the student at the Animal Medical Center in New York City during the student's final semester.

				Required Hours
A. BASIC SUBJECT CURRICULUM				13
	13 AE	Mathematics	3	
	1 Eh	English Composition	3	
	Mhe 50	Man & His Environment	3	
	1 Sh	Oral Communication	3	
B. FUNDAMENTAL SCIENCES				28
	4 AnV	Animal Genetics & Breeding	3	
	6 AnV	Animal Feeding	3	
	9 AnV	Mammalian Anatomy	4	
	10 AnV	Mammalian Physiology	4	
	12 AnV	Reproduction & Breeding	3	
	19 AnV	Lab Animal Diseases	3	
	5 Bc	Biochemistry	4	
	2 By	Bacteriology	4	
C. APPLIED TECHNOLOGY				14
	14 AnV	Animal Care	3	
	16 AnV	Laboratory Animal Techniques	4	
	20 AnV	Pathogenic Microbiology	4	
	24 AnV	Laboratory Methods	3	

D. TRAINING AT THE ANIMAL MEDICAL CENTER NEW YORK CITY				9
	30 AnV	Radiology	2	
	32 AnV	Surgery and Medicine	3	
	34 AnV	Clinical Lab Methods	2	
	36 AnV	Gross & Historical Techniques	2	
E. ELECTIVE CREDITS				2
		Total		66

III. Food Service Management Curriculum

The two-year technical program in Food Service Management is designed to prepare individuals for supervisory or managerial positions in commercial and inplant feeding establishments, school lunch programs, and public and private institutions. The curriculum provides technical courses in food purchasing, quantity food production, food handling and food technology.

				Hours Required
A. BASIC CORE CURRICULUM				18
B. TECHNICAL FOOD SERVICE MANAGEMENT				17
	1 Fn	Nutrition in Human Development	3	
	2 Fn	Principles of Food Preparation	3	
	3 Fn	Quantity Food Production	3	
	4 Fn	Menu Planning & Analysis	2	
	5 Fn	Food Service Equipment	3	
	6 Fn	Food & Beverages Purchasing & Control	3	
C. BUSINESS AND ECONOMICS				12
	2 ARE	Economics	3	
	8 ARE	Accounting	3	
	16 AE	Work Simplification	3	
	20 ARE	Managing the Business Firm	3	
D. SOCIOLOGY				3
	6 ARE	Dynamics of Human Behavior	3	
E. FOOD TECHNOLOGY & HANDLING				8
	2 Bc	Food Chemistry	4	
	2 By	Food Bacteriology & Sanitation	4	
F. ELECTIVES				8
		Total		66

IV. Merchandising (Home Furnishings and Clothing) Curriculum

In recent years the rapid technological development of new textiles, new finishing processes for existing textiles, and new materials for home furnishings, has created a need for personnel in the retail field at the supervisory and managerial level who have an understanding of these materials. The curriculum will provide specialized courses in textiles, clothing, home furnishings, commercial and advertising design and fashion merchandising.

				Required Hours
A. BASIC CORE CURRICULUM				18
B. TECHNICAL HOME FURNISHINGS AND CLOTHING				19
	1 Cd	Introduction to Design	3	
	3 Cd	Textiles in Home and Clothing	3	

4 Cd	Furnishing and Decorating the Home	4	
6 Cd	Clothing the Family	3	
7 Cd	Commercial and Advertising Design	3	
8 Cd	Fashion Merchandising	3	
C. BUSINESS AND ECONOMICS			13
2 ARE	Economics	3	
4 ARE	Marketing	4	
8 ARE	Accounting	3	
10 ARE	Sales Promotion	3	
D. SOCIOLOGY			5
6 ARE	Dynamics of Human Behavior	3	
7 ARE	Sociology and the Individual	2	
E. ELECTIVES			9
			64

V. Forest Management Curriculum

Forest industries and federal and state resource agencies indicate a need for increasing numbers of forest technicians over the next few years. Many positions are salaried and are supervisory in nature. Duties may include timber cruising, scaling and marketing, administration of recreation, or assisting in forestry research. Much of the work will be in attractive outdoor surroundings. The curriculum includes six weeks of summer camp.

			Required Hours
A. BASIC CORE CURRICULUM (Substitute MsT2, Basic Mathematics, for 13 AE, Applied Mathematics)			17
B. TECHNICAL FORESTRY			21
2 Fy	Applied Silviculture	4	
3 Fy	Introduction to Forest Technology	1	
4 Fy	Aerial Photo Interpretation	3	
5 Fy	Forest Measurements	4	
6 Fy	Wood Products Utilization	3	
7 Fy	Forest Protection	2	
8 Fy	Seminar	1	
9 Fy	Forest Land Management	3	
C. SUPPORTING SUBJECT MATTER			26
2 ARE	Economics	3	
6 ARE	Dynamics of Human Behavior	3	
8 ARE	Accounting	3	
1 Bt	Introductory Botany	3	
5 AE	Engines and Tractors	3	
16 AE	Work Simplification	3	
Ge T1	Technical Drawing	2	
Ce T4	Elements of Surveying	3	
1 S	Fundamentals of Forest Soils	3	
D. OTHER			0
1 Pe	Physical Education	0	
2 Pe	Physical Education	0	
	Total		64

Summer Camp

(All students are required to have summer camp experience at the School of Forest Resources camp near Princeton)

10s Fy	Field Measurements	3
11s Fy	Fire Control Practice	1
12s Fy	Harvesting and Manufacturing	2
13s Fy	Recreation and Wildlife	2
		8

VI. Resource and Business Management Curriculum

This curriculum places major emphasis on the principles of business management and economics and provides practical training in preparation for business management careers in the food and fiber industries and recreation industries.

Students will be prepared for managerial, supervisory, sales, and service positions with business firms and government agencies. Opportunities are available in such fields as finance, feeds, farm machinery, food processing, food inspection, retail food stores, floral stores, wholesale nurseries, golf courses, campgrounds, recreation parks, and game farms.

Students will have an opportunity to participate in a supervised on-the-job training program for practical business experience during the summer between the first and second years.

The training in business management includes courses in economics, marketing, accounting, data processing, statistics, sales promotion, and business management.

Four specialized areas are available for those students who desire additional technical training for specific job opportunities. A student may select courses from one or a combination of these areas, depending upon his employment goals and interests.

			Required Hours
A. UNIVERSITY LIFE—1 LSA			1
PHYSICAL EDUCATION—Pe 1, Pe 2			0
B. COMMUNICATIONS			9
1 Eh	English Composition	3	
2 Eh	English Composition	3	
1 Ss	Oral Communication	3	
C. MATHEMATICS			3
13 LSA	Applied Mathematics	3	
D. SOCIAL SCIENCE			10
6 ARE	Dynamics of Human Behavior	3	
7 ARE	Sociology & the Individual	2	
2 Pol	State and Local Government	3	
3 Pol	Current World Affairs	2	

E. BUSINESS AND ECONOMICS			24
2 ARE	Economics	3	
4 ARE	Marketing	3	
8 ARE	Accounting I	3	
9 ARE	Accounting II	3	
10 ARE	Sales Promotion	3	
12 ARE	Statistics	3	
20 ARE	Business Management	3	
22 ARE	Data Processing	3	
ELECTIVE COURSES			17
Total Hours			64

SPECIALIZATION AREAS:

Electives may be selected from among courses offered in the Associate Degree Division of the College of Life Sciences and Agriculture. Suggested electives are listed below for those students who wish to specialize in a particular area; those who do not wish to specialize may select a combination of areas.

I. Agricultural Business Management

3 ARE	Farm Management	3
8 Ae	Farm Machinery	4
16 Ae	Work Simplification	3
4 AnV	Animal Breeding	3
6 AnV	Animal Feeding	3
1 En	Applied Entomology	3
1 P	Potato Production	3
2 P	Soils & Fertilizers	4

II. Food Industry Management

24 ARE	Food Distribution Management	4
15 Ae	Refrigeration & Transportation Engineering	3
2 Bc	Food Chemistry	4
7 Cd	Commercial & Advertising Design	2
6 Fn	Food and Beverage Purchasing Control	3
2 Mb	Food Bacteriology & Sanitation	4
9 P	Post-Harvest Physiology of Fruits & Vegetables	3

III. Resource Management

26 ARE	Recreation Management	3
11 Ae	Soil Water Management	3
1 Fy	Forestry	3
7 Fy	Forest Production	2
9 Fy	Forest Land Management	3
7 P	Home Ground Improvement	3
1 S	Fundamentals of Forest Soils	3

IV. Horticultural Management

1 Bt	Introduction to Botany	3
1 En	Applied Entomology	3
2 P	Soils and Fertilizer	4
7 P	Home Ground Improvement	3
P 30	Ornamental Horticulture	3
P 31	Landscape Plant Material	3
P 33	Greenhouse Management	4
P 35	Landscape Design	3

TECHNICAL COURSE DESCRIPTIONS

AGRICULTURAL AND RESOURCE ECONOMICS (ARE)

2. Economics—A study of economic principles applied to the economy as a whole and to the business firm. Consideration will be given to money and banking, government, demand, supply, competition and pricing. *Rec* 3, *Cr* 3.

MR. TOBEY

3. Farm Management—Managing the farm business for optimum returns; economic guides to decision making; management tools and their application; organizing resources for production; adjustments to change. *Rec* 3, *Cr* 3.

MR. HARLAN

4. Marketing—A study of marketing and the basic activities involved in this function of modern business. Covers theoretical principles, consumer and product characteristics, trade practices, market channels, and the improvement of markets and marketing. *Rec* 3, *Cr* 3. MR. WING

6. Dynamics of Human Behavior—An introductory course which explores the applications of social psychology. Five major areas will be covered; social basis of personality, status-roles, socialization, development of meanings, and the individual and the group. Attention will be given to work situations involving human relationships, leadership, and supervision. *Rec* 3, *Cr* 3. MR. HYATT

‡7. Sociology and the Individual—Emphasis is placed upon the relationship of the individual to the various social systems of which society is composed. An action approach is taken. The social systems of community, family, religion, education, and economics are especially emphasized. In addition, leadership, power structure, and social stratification are analyzed. *Rec* 2, *Cr* 2. MR. HYATT

8. Accounting—The principles and procedures used in the preparation of balance sheets and income statements. Deals with the systematic recording, classifying, and analyzing of business transactions. Emphasis is on the preparation and presentation of accounting information. *Rec* 2, *Lab* 2, *Cr* 3. MR. WING

9. Accounting II—Emphasis is on the preparation and analysis of financial statements for use by management. Stress is placed on accounting relationships, the limitations of financial data, and the ways in which financial information can be used. Prerequisite: 8 ARE. *Rec* 2, *Lab* 2, *Cr* 3. MR. WING

10. Sales Promotion—The use of advertising, sales techniques and merchandising in food marketing. Consideration also given to training of sales and service personnel. Case studies are used to develop an interdisciplinary approach to promotion. *Rec* 3, *Cr* 3.

12. Statistics—The nature and effective use of statistics, including the methods of organizing and interpreting data for business management decisions. Topics such as charts, graphs, distribution, sampling variability, indexes and time series will be studied. *Rec* 2, *Lab* 2, *Cr* 3. MR. HARLAN

14. 15. Independent Studies in Business Management—Analysis of and readings on current management problems in production, processing, distribution, and marketing. Prerequisite: permission of instructor. *Cr* 1. STAFF

20. Business Management—Forms of business organization, economic framework, the managerial functions, techniques of financial and credit management, the application of business records in managerial decision making and the concepts of managerial economics are presented in light of the needs of a firm. *Rec* 3, *Cr* 3. MR. HARLAN

22. Data Processing—The principles and techniques of electronic data processing. Special case studies will be used to give the student training in the practical application of the principles and operation of electronic data processing equipment and the use of the results in business management. Prerequisite: Permission of instructor; preference given to second-year students. *Rec* 3, *Cr* 3.
MR. KING

24. Food Distribution Management—The management approach to food marketing. Study of food distribution channels, including supermarkets, warehouse distribution centers, and other types of outlets. Case studies in management policies, faculty layout procedures, merchandising, price policies, sales promotion, and advertising will be used. Firm visits (Lab fee $5.00) Prerequisite: 4 ARE. *Rec* 2, *Lab* 4, *Cr* 4. MR. DUNHAM

26. Recreation Management—Planning, developing, and operating the commercial recreation firm, with emphasis on economic considerations. Examination of the socio-economic aspects of recreation, the relationship of recreation to the environment, and analysis of characteristics of different types of recreation enterprises. Prerequisite: 2 ARE. *Rec* 3, *Cr* 3. MR. TOBEY

AGRICULTURAL ENGINEERING (Ae)

5. Forestry Power Equipment—The construction principles and maintenance of spark ignition and diesel engines, power transmission and hydraulic systems for tractors, skidders and mobile equipment used in forestry operations. *Rec* 2, *Lab* 2, *Cr* 3. MR. ROWE

8. Farm Machinery and Tractors—The principles of construction, operation and adjustment of farm machinery, tractors and related equipment. Emphasis is on economic selection and management of optimum systems. Laboratory work includes testing and adjustment of internal combustion engines as well as testing and calibration of field machinery. *Rec* 2, *Lab* 2, *Cr* 3.
MR. SOULE

9. Farm Buildings—Functional planning and economic considerations, materials, methods of construction and environmental control for production, processing and storage buildings. *Rec* 2, *Lab* 2, *Cr* 3. MR. WILLIAMS

10. Electrification—Electrical terms and circuits. Electrical equipment for heat and power. Basic wiring techniques, including planning of wiring systems. *Rec* 2, *Lab* 2, *Cr* 3. MR. SMITH

11. Soil and Water Management—Elementary farm surveying. Application of soil and water structures such as farm ponds, drainage systems, irrigation systems, and soil erosion control systems. *Rec* 2, *Lab* 2, *Cr* 3. MR. KLINGE

12. Utilities—Selection, care and use of water and sewage disposal systems. *Rec* 2, *Lab* 2, *Rec* 3. STAFF

15. Refrigeration Technology—The principles, selection, and operation of refrigeration units and materials handling equipment associated with refrigerated storages and transportation. *Rec* 2, *Lab* 2, *Cr* 3. MR. RHOADS

16. Work Simplification—A study of the principles and methods for accomplishing work. Procedures cover: (1) measuring and improving efficiency of labor, and (2) comparing alternative methods of performing an operation. Problems furnish practice in planning improved work methods and managerial procedures. *Rec* 2, *Lab* 2, *Cr* 3. MR. RHOADS

ANIMAL SCIENCES (AnV)

1. Dairy Cattle—The practical application to herd management of lactation, environment, reproduction, sanitation, housing, and breed association programs. The laboratory is devoted to practical problems in the management of a herd of dairy cattle. Field trip fee $3. *Rec* 2, *Lab* 2, *Cr* 3. MR. LEONARD

2. Animal Production—Breeds and types of beef cattle, sheep, swine and pleasure horses; their care, feed, and management. *Rec* 2, *Lab* 2, *Cr* 3. MR. BRUGMAN

3. Animal Selection—A study of the principles of animal selection. *Rec* 1, *Lab* 2, *Cr* 2. MR. LEONARD

4. Animal Breeding—Animal genetics, systems of breeding and principles of selecting farm and laboratory animals. *Rec* 3, *Cr* 3. MR. DICKEY

5. Milk Composition and Testing—A study of milk constituents and properties. Emphasis on testing milk and milk products for fat and solids; methods of milk processing. *Rec* 2, *Lab* 2, *Cr* 3. MR. HOOVER

6. Animal Feeding—A study of the principles of nutrition, feeds and their values, and the nutritive requirements of animals. The laboratory is devoted to the principles of nutrition and ration formulation; one section for farm animals and one section for laboratory animals. Field trip fee $3. *Rec* 2, *Lab* 2, *Cr* 3. MR. LEONARD, MR. GERRY

7. Poultry Production—A general survey course designed to introduce the students to the many aspects of the poultry industry. Professional personnel serving the industry at the University are featured as guest speakers. *Rec* 3, *Cr* 3. MR. HARRIS

8. Meat and Meat Products—Methods of handling and preparing livestock for market, packing house methods, cutting and curing of meats with special emphasis on retailing of meat and poultry products. Laboratory fee of $5. *Rec* 1, *Lab* 4, *Cr* 3. MR. BRUGMAN, MR. GERRY

9. 10. Mammalian Anatomy and Physiology—A descriptive course covering the structure and function of the various tissues, organs, and systems of common laboratory and domestic animals. Laboratory space limited. Priority given to Animal Medical Technology students. Lecture section may be taken without laboratory. *Rec* 3, *Cr* 3 or *Rec* 3, *Lab* 2, *Cr* 4. MR. HARRIS

12. Reproduction and Breeding—A practical course in breeding of cattle, sheep, hogs, and laboratory animals, with emphasis on the reproductive cycle, handling of semen, and management of the breeding programs. *Rec* 2, *Lab* 2, *Cr* 3. MR. BRUGMAN

14. Laboratory Animal Care—The principles and practices of laboratory animal care in clinics, hospitals, and research laboratories; animal house design, equipment, management, and legal regulations. *Rec* 3, *Cr* 3. MR. BIRD

15. Livestock Diseases—Principles of hygiene and sanitation applied to the prevention and control of the common diseases of dairy cattle. *Rec* 3, *Cr* 3.

16. Laboratory Animal Techniques—Principles and practices of animal handling and restraint. Includes methods of breeding, injecting, preparation for surgery, anesthesiology, and minor surgery. *Rec* 2, *Lab* 2, *Cr* 3.

19. Laboratory Animal Diseases—Principles of disease prevention and control as they apply to common laboratory rodents, carnivores, primates, and birds. *Rec* 3, *Cr* 3.

20. Pathogenic Microbiology—Laboratory techniques and procedures for identification and isolation of pathogenic and parasitic organisms. *Res* 1, *Lec* 2, *Lab* 2, *Cr* 4. MR. GERSHMAN, MR. O'MEARA

21, 22. Problems in Animal and Poultry Production—*Cr Ar.* STAFF

24. Laboratory Methods—A descriptive and laboratory course studying animal clinical procedures in microscopy, urinalysis, hematological methods, blood analysis, and basic instrumentation. *Rec* 2, *Lab* 2, *Cr* 3. MR. O'MEARA

‡29. Advanced Poultry Production—The principles of incubation and embryo development; the housing, management, and business practices of the table egg, hatching egg, and broiler industry. Field trip fee $5. *Rec* 2, *Lab* 2, *Cr* 3.

30. Radiology—The basic fundamentals of radiological techniques. Emphasis is placed on applied aspects of radiology as practiced in modern animal medical hospitals. Taken for one-half semester. *Rec* 1, *Lab* 6, *Cr* 2. MR. HOFSTRA

32. Surgery and Medicine—A course designed to train students in the procedures and techniques involved in practical animal medicine and surgery. Taken for one-half semester. *Rec* 1, *Lab* 10, *Cr* 3. MR. CORDELL
MR. DE HOFF, MR. TASHJIAN

34. Clinical Laboratory Methods—A course designed to train students in practical clinical laboratory techniques in use in modern animal medical hospitals. Taken for one-half semester. *Rec* 1, *Lab* 6, *Cr* 2. MR. DAS

36. Gross and Histopathological Techniques—A course designed to train students in the principles and techniques of anatomic pathology and histopathology. Taken for one-half semester. *Rec* 1, *Lab* 6, *Cr* 2. MR. DAS

FOREST MANAGEMENT (Fy)

1. Forestry—Establishment and care of woodlots. Tree identification. Methods of estimating volume of standing timber and measuring forest products. Measurement of forest land. *Rec* 2, *Lab* 3, *Cr* 3. (Not open to forest technicians.)

2. Applied Silviculture—Practices and basic concepts in the regeneration, management and cultural treatments of forest stands in order to produce desired timber crops and recreational and other forest values. Field practice in planting, thinning, weeding and pruning and observation of various harvesting methods. *Lec* 2, *Lab* 4, *Cr* 4.

3. Introduction to Forest Technology—A review of the development of forestry in the United States and a survey of career opportunities with emphasis on the technical level. Suggestions for setting guidelines for education and self-development. *Lec* 2, *Cr* 1.

4. Aerial Photo Interpretation—Use of aerial photographs in connection with forest inventory techniques, locating and mapping forest areas, resources and improvements. *Rec* 2, *Lab* 3, *Cr* 3.

5. Forest Measurements—Methods of estimating the cubic volume of forest trees and stands and the volumes of useful products in logs, bolts and standing trees. Determination of growth rate as a basis for management practices. Sampling procedures. Field practice in measuring logs, trees and plots. *Rec* 2. *Lab* 3, *Cr.* 3.

6. Wood Products Utilization—A survey of the major forest products industries to give the student an understanding of how the products of the forest are utilized and marketed. Effect of wood quality requirements on forest management. Inspection trips to local wood-using plants. *Rec* 2, *Lab* 3, *Cr* 3.

7. Forest Protection—Problems involved and practices used in the pre-

vention and control of forest fires, insects, diseases and other causes of loss or damage. *Rec* 2, *Cr* 2.

8. Seminar for Forest Technicians—Discussion of developments affecting technicians, current activities in forestry, and evaluation of training. Subjects chosen by class members. *Rec* 1, *Cr* 1.

9. Forest Land Management—Land titles, surveys, owner's rights and liabilities, trespass and relations with the public. Organization and management of properties for timber production and other uses. Predicting returns from investment. *Rec* 2, *Lab* 3, *Cr* 3.

SUMMER CAMP

Forty-eight hours a week. Credit 8

10s. Field Measurements—Practice in several cruising methods. Locating boundaries and mapping a forest area, field work and office calculations in estimating volume. Preparation of operation report. Three weeks of camp.

11s. Fire Control Practice—Field practice in fire line construction and pumper operation with emphasis on crew organization and supervision. Visits to state district headquarters and lookout tower. Problems of providing adequate fire protection to a large forest area. One week of camp.

12s. Harvesting and Manufacturing—Practice in felling, yarding, bucking and piling and studying operation layout, supervision and safety. Observation of one or more harvesting systems. Studies at lumber and pulp and paper manufacturing plants. Marking of operating area for cutting. One week of camp.

13s. Recreation and Wildlife—Types of recreation development and examination of specific examples. Preparation of a development plan; wildlife in relation to forest management. Treatment of stands to produce more favorable habitat for wildlife. One week of camp.

HOME ECONOMICS

1 Fn. Nutrition in Human Development—Basic nutrition knowledge interpreted in light of the contribution good nutritional practices can make to the welfare of the individual and the community. *Rec* 3, *Cr* 3. STAFF

2 Fn. Principles of Food Preparation—Influence of kind and proportion of ingredients, methods of manipulation, and cookery on food products. Standards for acceptable products. Experience with a wide variety of foods under varied conditions. *Rec* 1, *Lab* 4, *Cr* 3. STAFF

3 Fn. Quantity Food Production—Recipe standardization portion and quality control; the sanitary, safe and economical use of food and equipment. Emphasis on principles and practices of food preparation that underlie the service of high quality, nutritious food in quantity. Prerequisite: 1, 2 Fn. *Rec* 1, *Lab* 4, *Cr* 3. MISS YOUNG

4 Fn. Menu Planning and Analysis—Principles of menu planning, types and uses, format, organization and pricing. Prerequisite: 1, 2 Fn. *Rec* 2, *Cr* 2. STAFF

5 Fn. Food Service Equipment: Layout and Design—The use, care, maintenance, and selection of small wares and heavy duty equipment. Study of general and itemized specifications; bid analysis and awarding of contracts. Consideration of sanitary codes that affects layouts; blueprint analysis through studies

of schematic drawings of equipment, departmental and overall food service layouts. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

6 Fn. Food and Beverage Purchasing and Control—A discussion of sources, grades, methods of purchase, care, and storage of foods; principles of food control, cost analysis and inventory procedures. *Rec* 3, *Cr* 3. STAFF

1 Cd. Introduction Design—Study of line form, light, color, and texture in merchandise for home furnishings and clothing to obtain beauty, expressiveness, and functionalism in daily living. *Rec* 2, *Lab* 2, *Cr* 3.

3 Cd. Textiles in Home and Clothing—Learning to recognize quality features of fabrics and to understand labels for fiber content, functional finish, and care. Fiber properties and performance data. Fair claim policy. Names and consumer uses of fabrics. *Rec* 3, *Cr* 3. STAFF

4 Cd. Furnishing and Decorating the Home—Planning functional and aesthetic qualities of the home for individual and family situations. Focus on organization, selectivity, and quality features of merchandise. Overall plan, setting, furniture. Wall and window treatments, lighting, table appointments, and accessories. Prerequisite: 1 Cd. *Rec* 2, *Lab* 4, *Cr* 4. STAFF

6 Cd. Clothing the Family—Clothing and accessories for physical, social, and economic needs of various age groups. Size, cut, fit, construction, and price level. Hanger appeal and combining value in the wardrobe. Studies of consumers' satisfaction. *Rec* 3, *Cr* 3. STAFF

7 Cd. Commercial and Advertising Design—Problems in display and visual communication emphasizing design, lighting, space, materials and color for two- and three-dimensional areas such as show cases in merchandising, two-dimensional advertising, educational displays and basic packaging design. *Rec* 1, *Lab* 2, *Cr* 3.

8 Cd. Fashion Merchandising—Sources of fashion with charting of trends. Promotion of fashion in home furnishings and clothing. Comparative shopping and evaluation of perishability. Prerequisite: 1-7 Cd *Rec* 3, *Cr* 3.

PLANT AND SOIL SCIENCES

1 P. Potato Production—Production of potatoes for seed, tablestock and processing. *Rec* 2, *Lab* 2, *Cr* 3. MR. MURPHY

3 P. Forage Management—Production of hay, silage, and pasture crops. Selection of seeding mixtures, establishment of forage seedings; use of lime and fertilizers to maintain forage productivity. Pasture management; harvesting and preservation of hay and silage. *Rec* 2, *Lab* 2, *Cr* 3. MR. BROWN

7 P. Home Grounds Improvement—Planning and planting the home grounds to make the home an interesting place in which to work and live. *Rec* 2, *Lab* 2, *Cr* 3.

9 P. Post Harvest Physiology of Fruits and Vegetables—A study of storage conditions and their effects on the physiological processes that occur in storage. *Rec* 2, *Lab* 2, *Cr* 3. MR. ISMAIL

1 S. Fundamentals of Forest Soils—Study of the properties of forest soils with interpretations of these properties in terms of tree growth. *Rec* 2, *Lab* 2, *Cr* 3. MR. STRUCHTEMEYER

2 S. Soils and Fertilizers—Soil properties and their relation to crop production, with special emphasis on management and use of commercial fertilizers. *Rec* 3, *Lab* 2, *Cr* 4. MR. MURPHY

SERVICE COURSES IN THE COLLEGE OF LIFE SCIENCES AND AGRICULTURE

1 LSA. University Life—Understanding the University; adjusting to an academic environment; providing guidelines for accepting responsibilities in business and social situations. *Rec* 1, *Cr* 1. MR. RHOADS AND MRS. HUTCHINSON

7 LSA. Remedial Mathematics—Basic mathematical operations and algebra. Solutions of problems associated with business and production. No credit.

13 LSA. Applied Mathematics—Use of graphical and statistical methods, slide rules and other mechanical aids, solution of problems in business, mechanics, agricultural production, and institutional management. *Cr* 3. STAFF

15 LSA. Placement Training—Provides "on-the-job" training in field related to program of study. Work is to be under supervision of employer and appropriate department or school in the College of Life Sciences and Agriculture. Prerequisite: C average. *Cr* 4. STAFF

1 Bt. Introductory Botany—The structure and life processes of seed plants, their propagation, breeding, classification, and relation to their environment. *Rec* 2, *Lab* 3, *Cr* 3. MR. HYLAND

2 By. Food Bacteriology and Sanitation—Basic principles of food microbiology together with illustrations of these principles to serve as an aid to workers in the fields related to food industries. *Rec* 2, *Lab* 2, *Cr* 3. MR. WHITEHILL

2 Bc. Food Chemistry—Chemical composition and reactions of materials encountered in the processing and preservation of foods. *Rec* 3, *Lab* 2, *Cr* 4. MR. RADKE

5 Bc. Animal Biochemistry—An introduction to the principles of inorganic, organic, and biochemistry. *Rec* 3, *Lab* 2, *Cr* 4. MISS SMITH

1 En. Applied Entomology—Consideration of insect benefits and detriments to man. General structure, classification, habits, and life histories of representative pest species. Study of all phases of control with emphasis on development, use and implication of pesticides to production and marketing. *Rec* 2, *Lab* 2, *Cr* 3. MR. FORSYTHE

SERVICE COURSES IN THE COLLEGE OF ARTS AND SCIENCES

1 Eh. English Composition—A review of grammar and the principles of effective expression for the purpose of direct application in written reports of practical value. *Rec* 3, *Cr* 3.

2 Eh. English Composition—A continuation of 1 Eh with particular emphasis given to expository writing. *Rec* 3, *Cr* 3.

2 Pol. State and Local Government—Selected topics on the structure and operation of state, county, and town government, with emphasis on Maine problems of particular interest and significance to Maine agriculture. *Rec* 3, *Cr* 3. MR. HELMKE

3 Pol. Current World Affairs—A survey of current national and international affairs with particular attention to American foreign policies. *Rec* 2, *Cr* 2. MR. HELMKE

1 Sh. Oral Communication—Principles of effective oral communication. Emphasis on selection of subject, organization of material and effective preparation. Experience in the preparation and delivery of short extemporaneous speeches. *Rec* 3, *Cr* 3.

HONORS PROGRAM

PROFESSORS CAMPANA, DIMOND, SIMPSON; ASSOCIATE PROFESSORS GERSHMAN, KROFTA, LOTSE, O'MEARA; ASSISTANT PROFESSOR LANGILLE

Students enrolled in the College of Life Sciences and Agriculture are eligible to participate in the University Honors Program. Freshmen and sophomores participate in the interdisciplinary University program; the work of the junior and senior years is conducted by the various departments of the college. For general information concerning the Honors Program, refer to the Honors Section in this catalog or contact the Secretary of the College Honors Committee, Professor Richard J. Campana.

41. Distinguished Freshman Seminar—Limited to 72 freshman students, by invitation. Discussions and demonstrations displaying the range and nature of the liberal arts and the sciences. *Cr* 3. MR. REYNOLDS, Chairman

45. Honors Colloquium—Readings and discussions on the basic concepts of Western civilization. *Cr* 3.

47. 48. Honors Group Tutorial—Oral and written reports, under tutorial direction, upon a planned sequence of books representative of the various fields of liberal education. Hr 47.48. fulfills the sophomore humanities requirement for those students registered in the Honors Program. *Cr* 3. MR. THOMPSON, Chairman

51. 52. Honors: Specialized Studies—A tutorially conducted survey of the student's major field, issuing in the choice of an approved thesis topic. *Cr* 3.

53. 54. Honors Thesis—The planning and completion of an honors thesis or research project. *Cr* 3.

Further information concerning the availability of other Honors courses may be obtained from the Secretary of the College Honors Committee.

INTERNATONAL AGRICULTURAL DEVELOPMENT

This option in International Agriculture is available to any student in the College of Life Sciences and Agriculture. The student would have as his primary emphasis an existing major field of study and become involved in international agriculture by selecting this option as a minor field of study. Such supplemental training is intended to give the student a better understanding of developmental problems in the underdeveloped countries of the world, and to provide useful skills for active involvement.

Curriculum for Option in International Agricultural Development

Required Courses			15 Hours
P/AnV	43	Tropical Agriculture	3
ARE	81	Agriculture and Economic Development	3
AE	37	Agricultural Engineering for Developing Countries	3
Foreign Language		(Two semesters one language)	6

Electives Courses			11 Hours
(Minimum of 11 credit hours selected from the following:)			
ARE	24	Sociology of Rural Life	3
ARE	42	World Population Resources	3
ARE	124	Contemporary Rural Problems	3
ARE	150	Human Factors in Resource Development	3
ARE	186	Policies of World Agriculture	3

Ay	141, 153, 155, 160	People and Cultures	3 each
Ay	165	Political Anthropology	3
Ay	167	Peasant Societies	3
Ec	139/140	International Trade and Commercail Policy	3/3
Fn	1	Principles of Nutrition	3
Ge	2	World Regional Geography	3
Hy	7, 8	Asian Civilization	3/3
Hy	138	Problems of Southeast Asia	3
Hy	149	Argentina, Brazil, and Chile	3
Hy	150	Mexcio	3
Hy	152	Problems of Latin America	3
Pol	173/174	International Relations	3/3
Pol	165	Government of South Asia	3
Pol	166	Government of East Asia	3
Pol	167	Emerging Africa	3
Pol	168	Government in Latin America	3
Pol	194	Asian Political Ideas	3
Pol	196	International Affairs Internship	3

Intermediate Foreign Language (Maximum 6 hours)

Total Hours 26 hours

PROGRAM LEADING TO CERTIFICATION AS A SECONDARY SCHOOL TEACHER OF AGRICULTURAL EDUCATION

Students may qualify for certification as a secondary school teacher of agricultural education upon meeting the baccalaureate degree requirements in one of several programs in the College of Life Sciences and Agriculture, plus background courses in certain subject matter areas, and in education.

A. TO TEACH VOCATIONAL AGRICULTURE:
Students seeking a B. S. degree in Agricultural Engineering, Agricultural Mechanization, Animal and Veterinary Sciences, Agricultural and Resource Economics, Plant and Soil Sciences, and Biology must meet the requirements of their particular degree plus an emphasis in *agriculture* by taking a minimum of six credit hours in each of four areas:

1. Agricultural Engineering
2. Animal and Veterinary Sciences
3. Agricultural and Resource Economics
4. Plant and Soil Sciences

B. TO TEACH FOREST AND WILDLIFE CONSERVATION:
Students seeking a B. S. degree in Forestry and Wildlife must meet the requirements of their particular degree which must include a minimum of six credit hours in each of two areas: (1) Forestry and (2) Wildlife

All students seeking certification are required, in addition, to complete the following Professional Education courses:

	Credit Hours
1. Ed B2, American School*	3
2. Ed B3, Growth Learning Process*	3
3. Ed B4, Teaching Process	3
4. Ed X198, Problems in Education (Agricultural Education)	3
5. Ed M, Student Teaching (First year of successful teaching)	6
	18

* May be considered as social science courses

While not required for certification, students are encouraged to take courses in two areas:

	Credit Hours
1. Social Sciences Economics, Sociology, Psychology	9
2. Professional Vocational Courses (during senior year or first or second year of teaching): Philosophy of Education; Shop Organization and Management; Methods and Materials of Instruction in Vocational Education; and Trade Analysis (Offered as extension courses through UM, Gorham and Vocational Technical Institutes)	12

JOURNALISM

The option in journalism is available to any student in College of Life Sciences and Agriculture. The student has his primary emphasis in one of the major fields of study in the College and adds journalism as a secondary field of study. The general electives in the various programs allow flexibility and permit selection of courses for a journalism minor.

This option is designed to prepare a student for a career in agricultural and biological science magazine or newspaper work, publication writing and editing, radio and television.

Curriculum for Option in Journalism

Required Courses	Credit Hours
Jr 22, Survey of Journalism*	3
Jr 85, Law of Publications*	3
Jr 31, News Writing	3
Jr 32, News Writing	3
(Above courses are prerequisite)	
Jr 95, Editing Laboratory (both print and broadcast media)	3
Jr 96, Editing Laboratory	3
Jr 93, Adv. Journalism Seminar	3
Jr 94, Adv. Journalism Seminar	3
Total Required	24

* Acceptable as social science course

Note: Suggest Sh 171, Writing and Broadcast (3 cr. hr.) may be substituted for one semester of Jr 31-32; Sh 173, Television Production Laboratory, *May be* substituted for one semester of Jr 95-96

FOOD SCIENCE

PROFESSORS HOGAN, HIGHLANDS, MURPHY; ASSISTANT PROFESSOR ILLYN

The Department of Food Science offers no undergraduate program leading to a bachelor of science degree. Rather, course offerings serve primarily as supporting courses for the various programs in the biological sciences and agricultural and resource economics. Students wishing some specialization in food science may enroll in the Biology program (page 214) and elect the courses specified in the Food Science Option.

Food Science Option

		Required	Credit Hours
ARE	48	Principles of Ag Economics	3
or			
Ec	10	Principles of Economics	3
Fn	152	Human Nutrition	3
Fs	98.99	Independent Studies	3
Fs	101	Food Processing Industry—Principles and Problems	3
		Recommended	
AnP	135	Anatomy of Domestic Animals	3
AnP	136	Physiology of Domestic Animals	3
ARE	159	Agricultural Business Management	3
ARE	164	Statistical Quality Control	3
Ms	19	Principles of Statistical Inference	3
P	165	Post Harvest Physiology and Storage	3

As a part of the New England Board of Higher Education plan for regional cooperation, the first two years of a program in Food Science and Technology may be taken at the University of Maine and the final two years of specialized training completed at the University of Massachusetts at resident tuition rates. See page 207 for the two-year program at the University of Maine.

Courses in Food Science (Fs)

Fs 98. 99. Independent Studies—Planning and completion of a literature or laboratory study in a restricted area of Food Science or Food Technology resulting in a written report. *Cr* MR. HIGHLANDS, MR. HOGAN, MISS MURPHY

101. Food Processing Industry Principles and Problems—Scope of the food manufacturing industry, processing principles and practices discussed in relation to product quality and problems involved. *Rec* 3, *Cr* 3.
MR. HIGHLANDS, MR. HOGAN

202. Food Industry Quality Control—Formulation of product criteria, quality evaluation (sensory and objective procedures) and quality control procedures. Prerequisite: Fs 101 or permission of the instructor. *Rec* 2, *Lab* 2, *Cr* 3.
MR. HIGHLANDS, MISS MURPHY

281. 282. Problems in Food Science—Enrollment by permission. *Cr Ar.*
MR. HIGHLANDS, MR. HOGAN

399. *Graduate Thesis*—*Cr Ar.* STAFF

GENERAL COURSES

LSA 1. University Life—A series of lectures and discussions on the history and traditions, rules and regulations of the University; study aids and procedures; advising and counseling services; and professional fields of training. Guest speakers are selected to broaden student understanding and perspective of human affairs. *Lec* 1, *Cr* 0.

LSA 17. 18. Freshman Seminar—Small group discussions of a planned sequence of books and articles dealing with various issues of modern society. Open to all freshmen in the College of Life Sciences and Agriculture other than those enrolled in the University's Honors Program. *Rec* 1, *Cr* 1. MR. PULLEN, Chairman

Mhe. 50. Man and His Environment—Effect of the biological and physical environment on life and man. Full semester course, upperclass only. *Rec* 3, *Cr* 3.
MR. DAVIS

¶ Block course of 8 weeks for seniors in practice teaching. *Rec* 6, *Cr.* 3.
MR. HUTCHINSON, MR. O'MEARA

COLLEGE OF TECHNOLOGY

ELDRED W. HOUGH, DEAN

College of Technology

The College of Technology, which recommends the degree of bachelor of science upon completion of any of its curricula, provides instruction in the following:

Agricultural Engineering (Jointly with College of Life Sciences and Agriculture)
Chemical Engineering
Chemistry
Civil Engineering
Electrical Engineering
Engineering Physics
Mechanical Engineering
Pulp and Paper Technology

By special arrangement, a five-year Pulp and Paper Program is available in conjunction with any of the above curricula or the Forestry curriculum.

For information on the two-year programs in Engineering Technology see page 316.

The freshman year is common to all engineering curricula and chemistry.

Freshman Year

FALL SEMESTER				SPRING SEMESTER			
Subject			Hours	Subject			Hours
Ch	13	Chemical Princ.	3 3 4	Ch	14	Chemical Princ.	3 3 4
Ge	1	Intro. to Design	0 4 2	Eh	1	Freshman Comp.	3 0 3
Ms	12	Anal. Geom. & Cal.	4 0 4	Ge	2	Intro. to Design	0 4 2
Pe	1	Physical Education	0 2 0	Ms	27	Calculus	4 0 4
Ps	1	General Physics	3 3 4	Pe	2	Physical Education	0 2 0
Ge	5	Orientation	1 0 0	Ps	2	General Physics	3 3 4
				Ge	6	Orientation	1 0 0

For information on advanced placement, see page 42.

GRADUATION REQUIREMENTS

(Common to all curricula in the College of Technology beginning with the Class of 1971)

I. An accumulative average of 1.80.

II. Passing grades in all courses required by college and major department.

1. For department requirement see subsequent sections.
2. College requirements.
   a. Common freshman year shown on page 286 or equivalent.
   b. Ms 28 and 29, or equivalent, (Ms 29 is not required of Chemistry majors).
   c. Non-technical courses: Eighteen credit hours are required. In general these courses will be:
      1) distributed between the Social Sciences and Humanities, but
      2) tailored to student's interests if recommended by adviser.
      [The Engineering Physics curricula does not follow the above guideline—see page 309.
      The Social Sciences include courses listed in the catalog under Business, Economics, Modern Society, Psychology, Sociology and Anthropology. Courses in Accounting, Industry Management, Finance and Personnel Administration are excluded.
      The Humanities include courses listed in the catalog under Art, English, Foreign Languages and Classics, History, Political Science, Music and Philosophy. Courses of a cultural and non-technical nature offered in the Speech Department, namely, American Public Address, Theatre History and Theatre Today, and a maximum of three additional credits in Theatre will be accepted. No more than three credits will be accepted in applied music (band, chorus, instrumental or voice music lessons).
      Courses in Scientific German (Gm 13 and 14) and English Composition are excluded.

III. Degree credit for ROTC is not allowed.

Course Expenses

For College of Technology students the minimum and maximum course expenses (inclusive of required equipment, books, and supplies, but exclusive of Military deposit) are indicated in the following table:

Freshmen	$150 per-year, of which approximately $100 will be required the first semester
Sophomores	$100—140 per year
Juniors	$100—160 per year
Seniors	$100—160 per year

In chemistry and chemical engineering courses, students may be required to pay for apparatus broken or lost and for certain non-returnable supplies.

Graduate Study

Graduates from accredited undergraduate programs are eligible for graduate study in the College of Technology, provided their undergraduate records meet general requirements. (See general requirements in the catalog section on Gradu-

ate Study). Candidates must complete, without credit, any undergraduate courses which may be prerequisite to courses included in the program of graduate study. In the master's degree program, in general, from 6 to 10 credit hours will be devoted to a thesis in the field of major interest. Selection of courses must conform to a general plan laid down either before study begins or very soon after registration.

There are a number of cooperative work-study programs being planned in the College of Technology. For further details see the Dean.

Honors Program

Honors courses listed on page 119 are available to students in the College of Technology. The University Honors Program is described on page 35. The successful completion of Hr 41 or Hr 45 will exempt a student from Eh 1. Hr 41, Hr 45 (if not used to replace Eh 1), Hr 47, and Hr 48 may be applied to the non-technical elective requirement. Subsequent honors work will replace portions of the standard curriculum as specified by the student's department head. The area of honors work will be shown on the student's transcript.

DEPARTMENTS OF INSTRUCTION

Courses numbered 1 to 99 are undergraduate courses. They are open to graduate students but credit earned in these courses may not be used to satisfy advanced degree requirements. Courses numbered 100 to 199 are upperclass undergraduate courses which may be used for graduate degree credit by graduate students if given prior approval by the graduate students' advisory committee. Courses numbered 200 to 299 are graduate courses which may be elected by undergraduate honor students, or those undergraduates whose advancement in the field will permit their taking a graduate level course among graduate students without disadvantage to themselves. Courses numbered 300 to 399 are graduate level courses which may be taken only by students admitted to the Graduate School.

One number is used for a course which is given both fall and spring.

When a slant is used between the two numbers (e.g., 1/2), the first semester may be taken by itself, but the second cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit; when a dash is used (e.g., 1-2), both semesters must be taken to obtain credit.

AGRICULTURAL ENGINEERING

PROFESSORS SMITH, KLINGE, RHOADS, ROWE; ASSOCIATE PROFESSORS HUFF, SOULE, WILLIAMS; ASSISTANT PROFESSOR GRAY

The Agricultural Engineering curriculum combines study in the biological sciences and the physical sciences with mathematics and engineering to provide a unique background for solving engineering problems associated with agriculture.

The basic curriculum is strengthened by elective options which permit the student to specialize in one of four areas according to his interests and needs. Areas of specialization are: (1) Design and application of machinery and power units for the agricultural industry; (2) Design and application of food

and fiber processing systems; (3) Design of agricultural structures; and (4) Soil and water conservation engineering. Electives in engineering and the life sciences aid in providing a broad base of knowledge for engineering practice.

With the rapidly expanding world population, a rising demand for higher standards of living and with limited natural resources, agricultural engineering graduates are in great demand. Employment opportunities are as diverse as the agricultural industry itself. Graduates in Agricultural Engineering may be employed as design engineers by machinery and farmstead systems manufacturers; as sales engineers by machinery, food or chemical companies; as research engineers by industry, government or state experiment stations or in teaching or extension positions by universities. Some practice as consulting engineers. An increasing number of opportunities for foreign service are opening.

The curriculum in Agricultural Engineering is a joint responsibility of the College of Technology and the College of Life Sciences and Agriculture.

Graduate Work in Agricultural Engineering

The degree of master of science (Agricultural Engineering) and master of engineering (Agricultural Engineering) is offered with options for specialization in soil and water engineering, farm structures, agricultural power and machinery, and electric power and processing.

Several research assistantships are available each year. Incumbents devote half time to research work on approved projects of the Agricultural Experiment Station.

AGRICULTURAL ENGINEERING CURRICULUM

Freshman Year. See Page 286

Sophomore Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours			Subject			Hours		
			R	L	C				R	L	C
AE	55	Materials in Ag. Eng.	2	2	3	AE	82	Intro. to A.E.	1	2	2
Ge	7	Computer Programming	1	2	2	Me	51	Strength of Matls.	4	0	4
Me	53	Applied Mechanics I	4	0	4	Me	54	Applied Mech. II	4	0	4
Ms	28	Anal. Geom. & Calculus	4	0	4	Ms	29	Calculus & Diff. Eq.	4	0	4
		Humanities Elective			3			Humanities Elective			2
					16						16

Junior Year

			R	L	C				R	L	C
AE	169	Ag. Processing	2	3	3	AE	167	Ag. Power	2	3	3
Ee	41	Elem. Circuits	3	0	3	Me	33	Thermodynamics I	3	0	3
Ce	26	Hydraulics***	3	2	4	Sh	1	Intro. to Oral Comm.	3	0	3
		Tech. Elective			3			Ag. & Bio. Sci. Elec. (or equivalent)			5
		Humanities Elec.			4			Humanities Elec.			3
					17						17

Senior Year

		R	L	C			R	L	C
AE 160	Ag. Machinery	2	3	3	AE 163	Farm Struct. Design	2	3	3
AE 165	Soil & Water Eng.	3	3	4	AE 84	Spec. Topics in AE			3
AE 80	Seminar	1	0	0		Ag. & Bio. Sci. Elec.			3
AE 83	Spec. Prob. in AE			1		Tech Elective			3
	Ag. & Bio. Sci. Elec.			3		Humanities Elective			3
	Tech. Elective			3					
	Humanities Elective			3					
				17					15

* 11 hours of elective credit as approved by the student's adviser must be in Biological or Agricultural Science. S2, Soils and Bt1, General Botany or Zo3, Animal Biology must be included.

** 9 hours of technical elective credit must consist of a coherent group of engineering courses approved by the student's adviser.

Students transferring to the University of Maine under the Regional Program from the Universities of Massachusetts, New Hampshire, Rhode Island, or Vermont should check the bulletins for those institutions for the first two years in Agricultural Engineering.

*** Me 59 Fluid Mechanics may be substituted.

For course descriptions in Agricultural Engineering, see page (245).

CHEMICAL ENGINEERING

(Including Pulp and Paper Technology)

PROFESSORS BOBALEK, CHASE, DURST, HOUGH, ZABEL, ZIEMINSKI; ASSOCIATE PROFESSORS CECKLER, GORHAM, MUMMÉ, SIMARD, THOMPSON; LECTURER MARSHALL; INSTRUCTORS COSKUNER, ERSKINE

The Chemical Engineering curriculum aims to provide the education necessary for professional work in the design, operation and improvement of the processes of chemical industry. The curriculum provides a broad background in the humanities and in the fundamentals of science and engineering, and affords the opportunity for the application of these fundamentals in professional courses.

Since it is essential that chemical engineers have a sound understanding of the chemical sciences, the curriculum includes fundamental courses in Chemistry. So the student may gain an early understanding of the significance of his major field, professional Chemical Engineering courses are introduced in the sophomore year and are continued through three years in logical sequence. Necessary basic knowledge of electrical and mechanical engineering is provided by courses in the appropriate departments. Also, the faculty counselor will assist in defining a program of elective courses which allows each student to develop special interests where chemical engineering science is important. The curriculum leads to the degree of bachelor of science in chemical engineering.

An important activity of this department is the Division of Pulp and Paper Technology. Students who are interested in the pulp and paper industry or allied fields may elect to take a senior year curriculum largely composed of specialized professional subjects in the pulp and paper field, the other years being similar to the general Chemical Engineering curriculum. This curriculum leads to the bachelor of science degree in pulp and paper technology. It is possible for stu-

dents, who do not desire a B.S. degree, to register as special students for a series of related Pulp and Paper and Chemical Engineering courses.

A five-year pulp and paper program with emphasis on courses in management of technical enterprises is available. This curriculum contains the required courses of the four-year curricula in Chemical or in some other field of science or engineering and Pulp and Paper Technology. It also includes selected courses in economics and business administration or in systems analysis and process control. It leads to the degree of bachelor of science and a certificate indicative of a one-year equivalent of collateral studies in the curriculum in Pulp and Paper Management in addition to minimal B. S. degree requirements.

Graduate Work in Chemical Engineering

Candidates for the degree of master of science in chemical engineering must have received the degree of bachelor of science. They must also have completed a curriculum consistent with the requirements of the American Institute of Chemical Engineers, or take the necessary courses to accomplish that objective without receiving graduate credit for them. Graduate credit for the advanced degree generally consists of a minimum of 20 hours of graduate level courses and 10 hours of thesis. Some industrial fellowships and assistantships are available to graduate students. A candidate who accepts either of these usually requires two years to complete the requirements for the master of science degree in chemical engineering.

Graduate work leading to the master of science degree is also offered in the Pulp and Paper Division interdisciplinary and in the graduate faculty program in systems engineering. Candidates who complete, concurrently, in a five-year program, requirements for both the B.S. degree and certificate in Pulp and Paper may receive graduate credit for 20 hours of suitable courses taken in the fifth year, provided that they have been admitted tentatively to Graduate School before beginning their fifth year. Admission to Graduate School is required only of those students in the Certificate Program who wish to obtain graduate program degree hour credit for a part of the study which overlaps requirements for the certificate, and which is not included as a requirement for the B.S. degree.

Graduate programs are also available that lead to the doctor of philosophy degree in chemical engineering.

CURRICULUM IN CHEMICAL ENGINEERING

Freshman Year. See Page 286

Sophomore Year

FALL SEMESTER					SPRING SEMESTER				
Subject			Hours		Subject			Hours	
			R	L C				R	L C
ChE	1	Fund. of Chem. Eng.	2	4 4	ChE	2	Fund. of Chem. Eng.	2	4 4
Ch	151	Organic Chemistry	3	0 3	Ch	152	Organic Chemistry	3	0 3
Ms	28	Calculus	4	0 4	Ch	41	Quantitative Analysis	2	3 3
		*Electives (3-6 hrs.)			Ms	29	Differential Equations	4	0 4
							*Electives (0-3 hrs.)		
		Total	14-17				Total	14-17	

Junior Year

FALL SEMESTER		R	L	C	SPRING SEMESTER		R	L	C
ChE 160	Elements of Chem. Eng.	4	0	4	ChE 162	Elements of Chem. Eng.	4	0	4
ChE 196	Process Control	3	0	3	ChE 195	Chem. Eng. Thermo	4	0	4
Ch 171	Physical Chem.	3	5	5	Ch 172	Physical Chemistry	3	5	5
	*Electives (3-6 hrs.)					*Electives (3-6 hrs.)			
	Total	15-18				Total	16-19		

Senior Year

FALL SEMESTER		R	L	C	SPRING SEMESTER		R	L	C
ChE 168	Chem. Eng. Kinetics	3	0	3	Ee 41	Electric Circuits	3	0	3
ChE 177	Chem. Process Industries	3	0	3	ChE 163	Chem. Eng. Lab.	0	4	2
ShE 161	Chem. Eng. Lab.	0	4	2		*Electives (9-12 hrs.)			
Me 55	Statics and Strength of Materials	3	0	3					
	*Electives (3-6 hrs.)								
	Total	14-17				Total	14-17		

* Electives

In addition to the courses which are a common requirement for all candidates for the degree of bachelor of science in Chemical Engineering, each student must complete a program of at least 30 credit hours of elective courses which will be determined by each student, subject to the advice and the approval of his faculty adviser. At least 18 credit hours of each student's elective program must consist of an approved program in fields of study such as modern languages, philosophy, economics, or other areas of the social sciences or the humanities. The program of non-technical courses aims to acquaint the student in some depth with the structure and application of other intellectual disciplines outside of science and technology which are important to communication or participation in human affairs.

At least 12 credit hours of the elective program must be made up of courses in engineering, or in basic sciences, (chemistry, physics, the life sciences, or mathematics). Each student's program of technical electives should aim to develop some identifiable special interest which expands his understanding either of some scientific foundations or of some special applications of chemical engineering science.

Curriculum in Pulp and Paper Technology

Sophomore and Junior years. Identical with Chemical Engineering with the exception of Ch 171 and Ch 172 which are recommended electives. This program satisfies the requirements for the degree of bachelor of science in Pulp and Paper Technology.

Senior Year

FALL SEMESTER Subject		Hours R	L	C	SPRING SEMESTER Subject		Hours R	L	C
Me 55	Statics and Strength of Materials	3	0	3	Ee 41	Electric Circuits	3	0	3
Pa 165	Pulp Technology	3	0	3	Pa 166	Paper Technology	3	0	3
Pa 173	Pulp Mfg. & Testing	0	8	4	Pa 174	Paper Mfg. & Testing	0	8	4
Pa 189	Pulp & Paper Mill Insp.	0	4	2	Pa 199	Thesis	0	4	2
Pa 199	Thesis	0	2	1		Technical Elective			3
Pa 172	Pulp & Paper Mill Equip.	3	0	3					
	Total	16				Total	15		

Five-Year Curriculum in Pulp and Paper Technology

In the fourth and fifth years a minimum of 30 credit hours beyond the B.S. degree are required. The required courses are: Pa 165 (or Pa 172), Pa 166, Pa 295, Pa 173, Pa 174, and Pa 199. A variety of course programs can be developed by the student with consultation and approval of his adviser. Two sample programs are given below as illustrations of curricula which complete, by the end of the fifth year, the requirements for a B.S. degree and a certificate for advanced study in Pulp and Paper Technology. Also, the Certificate Program may be taken concurrently with some approved M.S. programs, after receiving the B.S. degree. It should be recognized, however, that the Certificate Program is a fifth year extension of studies at the undergraduate level in those courses which are required, and all courses taken in this fifth year may not apply as degree requirements for the M.S. program.

Curriculum Sample I
Sophomore and Junior Years: Identical with Chemical Engineering

Fourth Year

FALL SEMESTER Subject		Hours R	L	C	SPRING SEMESTER Subject		Hours R	L	C
*ChE 177	Chem. Process Industries	3	0	3	*ChE 163	Chem. Eng. Lab.	0	4	2
*ChE 196	Process Control	3	0	3	*Pa 166	Paper Technology	3	0	3
*Pa 165	Pulp Technology	3	0	3	Ee 41	Electric Circuits	3	0	3
*ChE 161	Chem. Eng. Lab.	0	4	2	ChE 151	Digital Computer	2	2	3
ChE 150	Analog Computer Pro.	2	2	3		Elective (3 or 6 cr. hrs.)			
	Electives			3					
	Total			17		Total			14-17

Alternative Curriculum Sample II
Sophomore and Junior Years: Identical with Mechanical Engineering

Fourth Year

FALL SEMESTER Subject		Hours R	L	C	SPRING SEMESTER Subject		Hours R	L	C
*Me 24	Mechanical Design I	2	3	3	*Pa 166	Paper Technology	3	0	3
Pa 172	Pulp and Paper Equipment	3	0	3	*Me 72	Mechanical Lab.	0	3	2
*Me 71	Mech. Lab.	0	3	2	*Me 186	Power Plants	3	0	3
Ba 9	Prin. of Accounting	3	0	3	Ba 130	The Legal Env. of Busn.	3	0	3
	Me Technical Elective			3		Me Elective			3
	Humanity-Social Science			3					
	Total			17		Total			14

Curriculum Sample I

Fifth Year

(For Chemical Engineering)

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours			Subject			Hours		
			R	L	C				R	L	C
*Me	55	Statics & Strength of Materials	3	0	3	*Pa	174	Paper Mfg. & Testing	0	8	4
*Pa	173	Pulp Mfg. & Testing	0	8	4	*Pa	296	Graduate Seminar	1	0	1
*Pa	295	Graduate Seminar	1	0	0	*Thesis			0	4	2
*Pa	199	Thesis	0	2	1			Electives			9
		Electives			3-6						
		Total			14-17			Total			16

* Required Courses

Curriculum Sample II

Fifth Year

(For Mechanical Engineering)

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours			Subject			Hours		
			R	L	C				R	L	C
*Pa	173	Pulp Mfg. & Testing	0	8	4	*Pa	174	Paper Mfg. & Testing	0	8	4
Pa	199	Thesis	0	2	1	Pa	199	Thesis	0	4	2
Pa	295	Seminar	1	0	0	Pa	296	Seminar	1	0	1
*Me	160	Heat Transfer	3	0	3	*Ee	42	Electrical Machinery	3	0	3
Ba	151	Business Finance	3	0	3			Me Elective			3
		Elective			3-6			Free Elective			3
		Total			14-17			Total			16

* Required Courses

Courses in Chemical Engineering

(In each laboratory course a breakage card is required.)

1/2. Fundamentals of Chemical Engineering—The application of the principles of material and energy balances to the solution of problems in chemical engineering operations and processes through quantitative correlation of basic concepts of chemistry, physics, and mathematics. Laboratory work includes the use of basic chemical engineering equipment and analytical devices, and the fundamentals of report writing. Prerequisite: Ch 2, *Rec* 2, *Lab* 4, *Cr* 4.

MR. CECKLER, MR. GORHAM, MR. THOMPSON

150. Analog Computer Programming—Fundamentals of linear and non-linear analog computer programming. Solutions of ordinary and partial linear and non-linear equations. Simulation of physical systems representing various engineering and scientific disciplines. Simulation of process control systems. Prerequisite: Ms 29 (or concurrent registration) or permission of the instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. MUMMÉ

151. Digital Computation—Fundamentals of machine language. Symbolic Programming Systems. Emphasis on student use of equipment via laboratory exercises. Examples and applications in engineering and science. Prerequisites: None (Gc 7 is recommended, but not required). *Rec* 2, *Lab* 2, *Cr* 3. MR. MUMMÉ

154. Elements and Applications of the Theory of Automatic Control—An introductory survey of the theory of automatic control systems with sufficient emphasis on operational techniques to support laboratory practice by the student in application of the theory to some specific examples of industrial process control problems. Prerequisite: Ms 29. *Rec* 2, *Lab* 2, *Cr* 3. MR. MUMMÉ

160/162. Elements of Chemical Engineering—Introduction to rate operations, stage operations, and the principles of molecular and turbulent transport of mass, momentum, and energy. Application of these principles to the chemical engineering unit operations. Prerequisite: Ms 29; ChE 2. *Rec* 4, *Cr* 4. MR. CHASE

161/163. Chemical Engineering Laboratory—Application of the principles of the unit operations in the laboratory, using pilot scale equipment. Emphasis is placed upon the preparation of formal reports. Prerequisite: ChE 160 for 161; ChE 162 for 163. *Lab* 4, *Cr* 2. MR. DURST

168. Chemical Engineering Kinetics—Kinetics of homogeneous reactions and solid catalytic reactions. Heat and mass transfer in, and design of, reactors. Prerequisite: ChE 162. *Rec* 3, *Cr* 3. MR. ELTON

177. Chemical Process Industries—Representative industrial chemical processes. Quantitative and qualitative evaluations of the processes and proposed changes and improvements are stressed. *Rec* 3, *Cr* 3. MR. ZIEMINSKI

178. Elements of Chemical Plant Design—Special studies of principles and methods in coordination of engineering data and theory to problems in plant design. *Rec* 3, *Cr* 3. MR. ZIEMINSKI

195. Chemical Engineering Thermodynamics—Application for thermodynamics to the analysis of systems of interest to chemical engineers. Topics include the first and second laws of thermodynamics, thermodynamic properties, chemical equilibrium, and an introduction to statistical and irreversible thermodynamics. Prerequisite: ChE 2; ChE 160. *Rec* 4, *Cr* 4. MR. THOMPSON

196. Process Control—Process dynamics described by ordinary differential equations and by linearized approximations. Solution of system equations by use of Laplace transforms. Concepts of feedback control and close-loop system analysis. Prerequisite: ChE 162. *Rec* 3, *Cr* 3. MR. CECKLER, MR. GORHAM, MR. MUMMÉ, or MR. ZABEL

199. Undergraduate Thesis—Original investigation of a chemical engineering problem, and reporting of the results. *Cr Ar.*; Accumulative credit hours for 2 or more semesters is 3-6. STAFF

Graduate Courses

220. Colloid Technology—*Rec* 3, *Cr* 3.

221. Fuel and Combustion—*Rec* 3, *Cr* 3.

222. Chemical Engineering Plant Design—*Rec* 3, *Cr* 3.

223. Economic Balance—*Rec* 3, *Cr* 3.

230. Introduction to Polymer Science—*Rec* 3, *Cr* 3.

242. Process Dynamics and Control—*Rec* 3, *Cr* 3.

252-253. Special Problems in Computer Programming and Systems Analysis.

270. Chemical Engineering of Pulp and Paper Manufacturing—*Rec* 3. *Cr* 3.

287. Chemical Engineering Practice. Time and credit to be arranged.

330. Advanced Chemical Engineering Thermodynamics—*Rec* 3, *Cr* 3.

331. Kinetics and Catalysis—*Rec* 3, *Cr* 3.

CHEMISTRY CURRICULUM

Freshman Year. See Page 286

Sophomore Year

FALL SEMESTER Subject			Hours R L C	SPRING SEMESTER Subject			Hours R L C
Ch	140	Quantitative Anal.	2 6 4	Ch	152	Organic Chemistry Lecture	3 0 3
Ch	151	Organic Chemistry Lecture	3 0 3	Ch	162	Organic Chemistry Laboratory	0 4 2
Ch	161	Organic Chemistry Laboratory	0 4 2	Sh	1	Public Speaking	3 0 3
Ms	28	Anal. Geometry and Calculus	4 0 4			Soc. Sci. Elective	3
		Soc. Sci. Elective	3	*Ms	29	Differential Equations	4 0 4
				Ge	7	Computer Programming	2

Junior Year

			R L C				R L C
Ch	171	Physical Chemistry	3 5 5	Ch	172	Physical Chemistry	3 5 5
Gm	1	Elementary German	3 0 3	*Ch	190	Intermediate Organic Chemistry Lab	1 4 3
		Hum. Elective	3	Gm	2	Elementary German	3 0 3
		Other Elective(s)	3-6			Hum. Elective	3
						Other Elective	0-3

Senior Year

			R L C				R L C
Ch	154	Adv. Inorganic Chemistry	3 0 3	*Ch	164	Instrumental Analysis	2 6 4
*Ch	185	Chem. Literature	2 0 2	Eh	17	Adv. Prof'l. Writing	2 0 2
Gm	13	Scientific German	3 0 3			Soc. Sci. or Hum. Elective	3
		Electives	6			Other Electives	6

* Required for American Chemical Society certification.

Courses in Chemistry (Ch)

11/12. General Chemistry—Descriptive chemistry and qualitative applications of principles are stressed. History of some of the concepts of modern chemistry is explored. Sufficient familiarity with high school algebra to handle elementary problems is presumed. Recommended as a terminal course. *Rec* 3, *Lab* 3, *Cr* 4.

13/14. Chemical Principles—Study of a restricted number of topics in sufficient detail to provide the student with a foundation for subsequent work in more advanced courses in science and engineering. Quantitative applications are stressed. Recommended for students seriously interested in science, engineering and the teaching of secondary school science. *Rec* 3, *Lab* 3, *Cr* 4.

41. Quantitative Analysis—Similar to Ch 140 except that fewer laboratory determinations are made. Prerequisite: Ch 14. *Rec* 2, *Lab* 3, *Cr* 3.

99. Undergraduate Thesis—The thesis will embody the result of an original investigation carried out in the library and in the laboratory. Open only to seniors with the consent of the department head. *Cr* 1 to 3.

140. Quantitative Analysis—An introductory course illustrating the fundamental principles of gravimetric and volumetric analysis. Prerequisite: Ch 14. *Rec* 2, *Lab* 6, *Cr* 4.

151/152. Organic Chemistry Lecture—An introduction to the chemistry of carbon compounds. Prerequisite: Ch 14, *Rec* 3, *Cr* 3.

154. Advanced Inorganic Chemistry—Advanced theoretical and descriptive inorganic chemistry emphasizing periodic relationships. Prerequisite: Ch 14 and 140. Corequisite: Ch 171. *Rec* 3, *Cr* 3.

155. Advanced Inorganic Chemistry—A systematic study of the preparation and physical and chemical properties of nonorganic materials emphasizing periodic trends. Prerequisite: Ch 154. Corequisite: 172. *Rec* 3, *Lab* 3, *Cr* 4.

161/162. Organic Chemistry Laboratory—An introduction to the synthesis and study of organic compounds in the laboratory. Prerequisite: credit or concurrent registration in Ch 151/152. *Lab* 4, *Cr* 2.

164. Instrumental Analysis—Emphasis on instrumental methods. Prerequisite: Ch 140. Corequisite: Ch 172. *Rec* 2, *Lab* 6, *Cr* 4.

169/170. Physical Chemistry—The lecture portion only of Ch 171/172. Prerequisite: Ch 14, Ps 2 or 2a, Ms 28 and permission of the department. *Rec* 3, *Comp* 1, *Cr* 3.

171/172. Physical Chemistry—A detailed study of fundamental principles of chemistry and their applications. Prerequisite: Ch 41 or 140, Ps 2 or 2a, Ms 28. *Rec* 3, *Comp* 1, *Lab* 4, *Cr* 5.

179. Advanced Physical Chemistry Laboratory—An advanced laboratory course with emphasis on the use of physico-chemical methods. Given on sufficient demand. Prerequisite: Ch 172. *Lab* 6 or 8, *Cr* 3 or 4.

180. ***Radiochemistry***—(Not available 1969-70.) Chemical aspects of nuclear properties and processes. Application of techniques involving radioactivity to chemical problems. Given on sufficient demand. Prerequisite: Ch 172, *Lab* 6 or 8, *Cr* 3 or 4.

185. Chemical Literature—A study of methods for searching the chemical literature. Prerequisite: Ch 152 and elementary German. *Rec* 2, *Cr* 2.

190. Intermediate Organic Chemistry Laboratory—An introduction to the isolation, identification and semi-micro scale preparation of organic compounds. Prerequisite: Ch 152; Ch 162. *Rec* 1, *Lab* 4, *Cr* 3.

Graduate Courses in Chemistry

213. The Chemistry of Cellulose and Wood Components—*Rec* 3, *Cr* 3.
251. Topics in Advanced Organic Chemistry—*Rec* 2, *Cr* 2.
256. Theoretical Organic Chemistry—*Rec* 3, *Cr* 3.
271. Topics in Advanced Physical Chemistry—*Rec* 2, *Cr* 2.
276. Physico-Chemical Methods—*Rec* 2, *Cr* 2.
277. Intermediate Physical Chemistry—*Rec* 3, *Cr* 3.
278. Intermediate Physical Chemistry—*Rec* 3, *Cr* 3.
289. Advanced Organic Chemistry Laboratory—*Lab* 6 or 8, *Cr* 3 or 4.
290. Organic Qualitative Analysis—*Lab* 8, *Cr* 4.
291. Intermediate Organic Chemistry—*Rec* 3, *Cr* 3.
295. Chemical Thermodynamics—*Rec* 3, *Cr* 3.
351. Topics in Advanced Organic Chemistry—*Rec* 2, *Cr* 2.
353. The Chemistry of Organic Sulfur Compounds—*Rec* 2, *Cr* 2.
354. The Chemistry of Heterocyclic Compounds—*Rec* 2, *Cr* 2.
361. Topics in Advanced Inorganic Chemistry—*Rec* 2, *Cr* 2.

CHEMISTRY CURRICULUM

Freshman Year. See Page 286

Sophomore Year

FALL SEMESTER Subject			Hours R L C	SPRING SEMESTER Subject			Hours R L C
Ch	140	Quantitative Anal.	2 6 4	Ch	152	Organic Chemistry Lecture	3 0 3
Ch	151	Organic Chemistry Lecture	3 0 3	Ch	162	Organic Chemistry Laboratory	0 4 2
Ch	161	Organic Chemistry Laboratory	0 4 2	Sh	1	Public Speaking	3 0 3
Ms	28	Anal. Geometry and Calculus	4 0 4			Soc. Sci. Elective	3
		Soc. Sci. Elective	3	*Ms	29	Differential Equations	4 0 4
				Ge	7	Computer Programming	2

Junior Year

			R L C				R L C
Ch	171	Physical Chemistry	3 5 5	Ch	172	Physical Chemistry	3 5 5
Gm	1	Elementary German	3 0 3	*Ch	190	Intermediate Organic Chemistry Lab	1 4 3
		Hum. Elective	3	Gm	2	Elementary German	3 0 3
		Other Elective(s)	3-6			Hum. Elective	3
						Other Elective	0-3

Senior Year

			R L C				R L C
Ch	154	Adv. Inorganic Chemistry	3 0 3	*Ch	164	Instrumental Analysis	2 6 4
*Ch	185	Chem. Literature	2 0 2	Eh	17	Adv. Prof'l. Writing	2 0 2
Gm	13	Scientific German	3 0 3			Soc. Sci. or Hum. Elective	3
		Electives	6			Other Electives	6

* Required for American Chemical Society certification.

Courses in Chemistry (Ch)

11/12. General Chemistry—Descriptive chemistry and qualitative applications of principles are stressed. History of some of the concepts of modern chemistry is explored. Sufficient familiarity with high school algebra to handle elementary problems is presumed. Recommended as a terminal course. *Rec* 3, *Lab* 3, *Cr* 4.

13/14. Chemical Principles—Study of a restricted number of topics in sufficient detail to provide the student with a foundation for subsequent work in more advanced courses in science and engineering. Quantitative applications are stressed. Recommended for students seriously interested in science, engineering and the teaching of secondary school science. *Rec* 3, *Lab* 3, *Cr* 4.

41. Quantitative Analysis—Similar to Ch 140 except that fewer laboratory determinations are made. Prerequisite: Ch 14. *Rec* 2, *Lab* 3, *Cr* 3.

99. Undergraduate Thesis—The thesis will embody the result of an original investigation carried out in the library and in the laboratory. Open only to seniors with the consent of the department head. *Cr* 1 to 3.

140. Quantitative Analysis—An introductory course illustrating the fundamental principles of gravimetric and volumetric analysis. Prerequisite: Ch 14, *Rec* 2, *Lab* 6, *Cr* 4.

151/152. Organic Chemistry Lecture—An introduction to the chemistry of carbon compounds. Prerequisite: Ch 14, *Rec* 3, *Cr* 3.

154. Advanced Inorganic Chemistry—Advanced theoretical and descriptive inorganic chemistry emphasizing periodic relationships. Prerequisite: Ch 14 and 140. Corequisite: Ch 171. *Rec* 3, *Cr* 3.

155. Advanced Inorganic Chemistry—A systematic study of the preparation and physical and chemical properties of nonorganic materials emphasizing periodic trends. Prerequisite: Ch 154. Corequisite: 172. *Rec* 3, *Lab* 3, *Cr* 4.

161/162. Organic Chemistry Laboratory—An introduction to the synthesis and study of organic compounds in the laboratory. Prerequisite: credit or concurrent registration in Ch 151/152. *Lab* 4, *Cr* 2.

164. Instrumental Analysis—Emphasis on instrumental methods. Prerequisite: Ch 140. Corequisite: Ch 172. *Rec* 2, *Lab* 6, *Cr* 4.

169/170. Physical Chemistry—The lecture portion only of Ch 171/172. Prerequisite: Ch 14, Ps 2 or 2a, Ms 28 and permission of the department. *Rec* 3, *Comp* 1, *Cr* 3.

171/172. Physical Chemistry—A detailed study of fundamental principles of chemistry and their applications. Prerequisite: Ch 41 or 140, Ps 2 or 2a, Ms 28. *Rec* 3, *Comp* 1, *Lab* 4, *Cr* 5.

179. Advanced Physical Chemistry Laboratory—An advanced laboratory course with emphasis on the use of physico-chemical methods. Given on sufficient demand. Prerequisite: Ch 172. *Lab* 6 or 8, *Cr* 3 or 4.

180. ***Radiochemistry***—(Not available 1969-70.) Chemical aspects of nuclear properties and processes. Application of techniques involving radioactivity to chemical problems. Given on sufficient demand. Prerequisite: Ch 172, *Lab* 6 or 8, *Cr* 3 or 4.

185. Chemical Literature—A study of methods for searching the chemical literature. Prerequisite: Ch 152 and elementary German. *Rec* 2, *Cr* 2.

190. Intermediate Organic Chemistry Laboratory—An introduction to the isolation, identification and semi-micro scale preparation of organic compounds. Prerequisite: Ch 152; Ch 162. *Rec* 1, *Lab* 4, *Cr* 3.

Graduate Courses in Chemistry

213. The Chemistry of Cellulose and Wood Components—*Rec* 3, *Cr* 3.
251. Topics in Advanced Organic Chemistry—*Rec* 2, *Cr* 2.
256. Theoretical Organic Chemistry—*Rec* 3, *Cr* 3.
271. Topics in Advanced Physical Chemistry—*Rec* 2, *Cr* 2.
276. Physico-Chemical Methods—*Rec* 2, *Cr* 2.
277. Intermediate Physical Chemistry—*Rec* 3, *Cr* 3.
278. Intermediate Physical Chemistry—*Rec* 3, *Cr* 3.
289. Advanced Organic Chemistry Laboratory—*Lab* 6 or 8, *Cr* 3 or 4.
290. Organic Qualitative Analysis—*Lab* 8, *Cr* 4.
291. Intermediate Organic Chemistry—*Rec* 3, *Cr* 3.
295. Chemical Thermodynamics—*Rec* 3, *Cr* 3.
351. Topics in Advanced Organic Chemistry—*Rec* 2, *Cr* 2.
353. The Chemistry of Organic Sulfur Compounds—*Rec* 2, *Cr* 2.
354. The Chemistry of Heterocyclic Compounds—*Rec* 2, *Cr* 2.
361. Topics in Advanced Inorganic Chemistry—*Rec* 2, *Cr* 2.

***371. Topics in Advanced Physical Chemistry—Rec** 2, **Cr** 2.*
***373. Statistical Thermodynamics—Rec** 3, **Cr** 3.*
***374. Colloid and Surface Chemistry—Rec** 2, **Cr** 2.*
***395. Graduate Seminar—Rec** 1, **Cr** 1.*
***398. Graduate Research—Cr** Ar.*
***399. Graduate Thesis—Cr** Ar.*

CIVIL ENGINEERING

PROFESSORS GORRILL, HAMILTON (Chairman), SPROUL, TAYLOR; ASSOCIATE PROFESSORS GREENWOOD, HALL, NIGHTINGALE; ASSISTANT PROFESSORS DUNTON, FRIEL, GHOSH, SHEA, WOODARD; MR. LORD, MR. WEST

The Civil Engineering curriculum provides a broad understanding of engineering problems in general and at the same time provides for specialization in several branches of civil engineering and in the field of public management. The curriculum is broad enough to qualify graduates with the bachelor of science degree to start in any field of civil engineering. However, special emphasis is placed upon transportation engineering, sanitary engineering, and structural engineering. While graduates with the B.S. degree may go directly into Town Management, the Public Management option specifically prepares graduates for a fifth year in the Department of Political Science, at the end of which they receive degrees of master of arts in public management. Arrangements for this program are made with the head of the Department of Political Science.

While the foundation of all engineering is highly technical, an attempt is made throughout to help the student sense the broader aspects of engineering problems. In addition to this, studies in the social sciences and humanities are included to assist the graduate to place his education within the perspective of man and society.

A Pulp and Paper Option is available in collaboration with the Chemical Engineering Department. This five-year program leads to the degree of bachelor of science in civil engineering and a certificate in Pulp and Paper. See page 293 for course requirements.

In addition to the college requirements for graduate candidates for B.S. degree in Civil Engineering, students are required to have a minimum grade point average of 2.0 in all Civil Engineering (Ce) courses.

Graduate Program in Civil Engineering

Graduate programs are well established in the fields of sanitary engineering, transportation engineering, soils and structural engineering. The graduate program is flexible enough to meet the student's personal desires. The general program will include advanced courses in the student's major field which will constitute approximately half to three-quarters of his requirements. The remainder of the program will consist of advanced courses in mathematics, non-technical courses, and the graduate thesis. This general program leads to the degree of master of science in civil engineering. A graduate program is also available that leads to the doctor of philosophy degree in sanitary engineering.

CIVIL ENGINEERING CURRICULUM

A minimum of 127 degree hours

Freshman Year. See Page 286

Sophomore Year

FALL SEMESTER				SPRING SEMESTER			
Subject			Hours R L C	Subject			Hours R L C
Ms	28	Calculus	4 0 4	Ms	29	Cal. Diff. Equ.	4 0 4
Ce	5	Surveying	2 3 3	Ce	28	Highway Engr.	3 0 3
Me	50	Statics	3 0 3	Me	51	Strength of Mat'l.	4 0 4
Gc	7	Computer Prog.	1 2 2	Ee	41	Elec. Circuits	3 0 3
		Non Tech. Elective	3			Non Tech. Elective	3
			15				17

Junior Year

			R L C				R L C
Ce	40	Structures I	3 3 4	Ce	41	Structures II	3 3 4
Ce	31	Sanitary Eng. I	3 0 3	Ce	32	Sanitary Eng. II	3 0 3
Ce	26	Hydraulics	3 3 4	Gy	6	Geology	2 2 3
Ce	30	Transportation	3 0 3	Ce	20	C. E. Mat'l.	3 3 4
		Non Tech. Elective	3			Non Tech. Elective	3
			17				17

Senior Year

			R L C				R L C
Ce	61	Engr. Relations	2 0 2	Me	52	Dynamics	3 0 3
Ce	42	Structures III	3 3 4	Ce	176	Soils Engr.	3 0 3
Ce	65	Soils Mechanics	2 2 3	Ce	101	Planning Eng. Proj.	3 0 3
		Tech. Elective	3			Tech. Elective	3
		Non Tech. Elective	3			Non Tech. Elective	3
			15				15

Public Management Option

The Public Management Option is designed to give the civil engineering student some of the basic tools of government administration at the local level, in preparation for administration of public works departments, city or town managerships, etc. It is strongly recommended that students interested in careers in local government follow the option with a fifth year leading to a masters degree in public management in the College of Arts and Sciences. The following courses are recommended.

			Hours
Ec	½	Principles of Economics	6
Pol	¼	Introduction to Government	6
Pol	7.8	Maine Government	2
Pol	133	The American City	3
Pol	134	Municipal Administration	3
Pol	151	Public Administration	2
Pol	152	Administrative Law	3
Pol	195	Municipal Internship*	3
Pol	200	City and Regional Planning	2

* (Summer at end of junior year)

Courses in Civil Engineering (Ce)

5. Surveying—Surveying instruments and their use and the various methods commonly used for plane surveying. The geometry of simple and vertical curves. *Rec* 2, *Cr* 3.

20. Materials— The properties and testing of materials which are significant in civil engineering construction. Prerequisite: Me 51. *Rec* 3, *Lab* 2, *Cr* 4.

26. Hydraulics—An elementary course presenting fundamental principles of fluid flow and their applications to engineering problems. Includes study of hydrostatics, liquid measuring devices, and channel and pipe flow. Prerequisite: Me 50, *Rec* 3, *Cr* 4.

28. Highway Engineering Fundamentals—The principles of highway economics, finance and planning are presented and utilized in the basic analysis, location, and geometric design of highway transportation routes. Prerequisite: Ce 5 or with consent of instructor. *Rec* 3, *Cr* 3.

30. Transportation Engineering—This subject is studied in the context of the planning process and applicable systems analysis concepts. Topics include the history and development of transportation modes, components of transport systems, operating characteristics and economic evaluations. Prerequisite: Ce 28 or consent of instructor. *Rec* 3, *Cr* 3.

31. Introduction to Sanitary Engineering—Determination of water volume and quality requirements; wastewater volumes; development and distribution of water; protection of stream water quality. Prerequisite: Ce 26 or equivalent or concurrently. *Rec* 3, *Cr* 3.

32. Sanitary Engineering Design—Study and design in problems involved in providing municipal water supplies, sewers, wastewater treatment and stream pollution control. Prerequisite: Ce 31 and Ce 26. *Rec* 3, *Cr* 3.

40. (Structures I) Determinate Structural Analysis and Design—The analysis of determinate beams, frames, and trusses. The selection of members and the design of beams, columns and connections. Prerequisite: Me 51. *Rec* 3, *Lab* 3, *Cr* 4.

41. (Structures II) Indeterminate Structural Analysis and Design—The analysis of indeterminate beams, frames, and trusses using virtual work, moment area, slope deflection and moment distribution. The design and detailing of steel frames and trusses. Prerequisite: Ce 40. *Rec* 3, *Lab* 3, *Cr* 4.

42. (Structures III) Reinforced Concrete Structures—The design and detailing of reinforced concrete structures; buildings, retaining walls and footings using the latest ACI requirements. Prerequisite: Ce 41. *Rec* 3, *Lab* 3, *Cr* 4.

60. Structural Design—The designing and detailing of structural systems. Special design projects to be completed by the student. Prerequisite: Ce 41. *Lab* 9, *Cr* 3.

61. Engineering Relations—The business, legal, and ethical phases of engineering. Contract specifications and professional registration laws. *Rec* 2, *Cr* 2.

65. Soil Mechanics—A study of the fundamental physical properties behavior and performance of soil as a construction material. Prerequisite: Me 51. *Rec* 2, *Lab* 2, *Cr* 3.

68. Highway Engineering—Highway location and relocation, including plans of proposed improvement; subgrade structure; base courses and low type pavements. Prerequisite: Ce 28. *Rec* 2, *Lab* 3, *Cr* 3.

99. Thesis—The study of and report upon some original investigation of design. Time to be arranged. *Cr* 2 or 3.

101. Planning Engineering Projects—CPM, PERT, resource leveling, work study, linear programming, and related operations research techniques applied to the planning and scheduling of engineering projects. Prerequisite: Gc 7 and senior standing or consent of instructor. *Rec* 3, *Cr* 3.

155. Hydrology—Application of statistical analysis to rainfall and runoff. The collection and presentation of factors affecting rainfall and runoff data. Methods for developing hydrographs and flood routing. Prerequisite: Ce 26 or the equivalent.*Rec* 3, *Cr* 3.

171. Sanitary Engineering—Water purification, design and operational control of water treatment plants. Prerequisite: Ce 32. *Rec* 2, *Lab* 3, *Cr* 3.

174. Sanitary Engineering—The theory and design of wastewater disposal works, followed by brief studies of municipal and rural sanitation. Prerequisite: Ce 171. *Rec* 2, *Lab* 3, *Cr* 3.

172. Highway Engineering—Material coverage includes the composition and thickness design of high type roadway pavements, the study of the level of service concept and intersection capacity and the operation and geometric design of both urban and rural intersections. Prerequisite: Ce 68 or the consent of the instructor. *Rec* 2, *Lab* 3, *Cr* 3.

175. Contemporary Environmental Pollution—A study of causes, characteristics, effects and solutions to contemporary man's pollution of the air, land and water resources. Engineering and technological solutions. Legal, social, individual and technological obstacles to solutions. Prerequisites: junior class standing. *Rec* 3, *Cr* 3.

176. Soils Engineering—The application of soil mechanics to common engineering design and construction. Prerequisite: Ce 65. *Rec* 3, *Cr* 3.

178. Chemistry in Sanitary Engineering—Elementary principles of organic, physical and colloidal chemistry and their use and significance in sanitary engineering practice. Analytical chemistry and tests as related to water. Prerequisite: Ch 2 or equivalent and Ce 131. *Rec* 2, *Lab* 3, *Cr* 3.

179. Microbiology in Sanitary Engineering—Basic principles of biochemistry and microbiology, disinfection, enteric organisms, biology of wastewater treatment, natural purification of streams and disease-producing organisms. Prerequisite: Ce 178 or equivalent; may be taken concurrently. *Rec* 2, *Lab* 6, *Cr* 4.

181. Seminar—Written and oral reports with discussions on assigned topics in any special branch of civil engineering. *Rec* 1-3, *Cr* 1-3.

192. Indeterminate Structures—The analysis of indeterminate beams, trusses and frames using the methods of moment-area, elastic weights, conjugate beam, 3-moment theorem, elastic center, column analogy, slope-deflection, and moment distribution. Prerequisite: Ce 41. *Rec* 3, *Cr* 3.

Graduate Courses

200. City and Regional Planning—*Rec* 2, *Lab* 2, *Cr* 3.

205. Traffic Operations and Geometric Design—*Rec* 3, *Lab* 3, *Cr* 4.

206. Traffic Flow Theory—*Rec* 2, *Lab* 2, *Cr* 3.

230. Water Resources Engineering—*Rec* 3, *Cr* 3.

240. Radiological Health—*Rec* 2, *Lab* 3, *Cr* 3.

300. Traffic Planning —*Rec* 3, *Cr* 3.
301. Traffic Planning II—*Rec* 3, *Cr* 3.
303. Urban Transportation Planning—*Rec* 3, *Lab* 3, *Cr* 4.
310. Transportation Systems and Terminal Design—*Rec* 3, *Cr* 3.
320. Water Treatment Theory—*Rec* 3, *Cr* 3.
322. Sewage Treatment Theory—*Rec* 3, *Cr* 3.
323. Industrial Wastes—*Rec* 2, *Lab* 6, *Cr* 4.
324. Public Health Engineering—*Rec* 3, *Cr* 3.
330. Sanitary Eng. Design I—*Rec* 2, *Lab* 4, *Cr* 3.
331. Sanitary Eng. Design II—*Rec* 2, *Lab* 4, *Cr* 3.
350. Sanitary Eng. Seminar—*Rec* 1, *Cr* 1.
364. Engineering Properties of Soils—*Rec* 2, *Lab* 6, *Cr* 4.
365. Advanced Soil Mechanics—*Rec* 3, *Cr* 3.
366. Highway Soils Engineering—*Rec* 3, *Lab* 3, *Cr* 4.
370. Advanced Soils Laboratory—*Lab* 6, *Cr* 2.
376. Foundations and Underground Structures—*Rec* 3, *Cr* 3.
390. Vibrations of Structures—*Rec* 3, *Cr* 3.
391. Numerical Analysis of Structures—*Rec* 3, *Cr* 3.
392. Rigid Frames and Arches—*Rec* 3, *Cr* 3.
393. Folded Plates, Domes and Shells—*Rec* 3, *Cr* 3.
394. Structural Members—*Rec* 3, *Cr* 3.
395. Advanced Indeterminate Structures—*Rec* 3, *Cr* 3.
396. Advanced Reinforced Concrete Structural Design—*Rec* 3, *Cr* 3.
397. Plastic Design in Steel—*Rec* 3, *Cr* 3.
398. Selected Civil Engineering Topics
399. Graduate Thesis

ELECTRICAL ENGINEERING

PROFESSORS GIBSON, CROSBY, LIBBEY, PARSONS, SHEPPARD, TURNER; ASSOCIATE PROFESSORS BROWN, EDE, IRONS, (on leave) YOUNG; ASSISTANT PROFESSORS FIELD, HAMILTON, OTTO, VETELINO, WHITNEY; MR. MARSHALL

The Electrical Engineering undergraduate curriculum consists of a logical sequence of courses firmly rooted in basic science and mathematics, progressing upward through engineering sciences, and culminating in a wide variety of courses in the specific subject areas of electrical engineering.

Central to the curriculum are integrated course sequences in circuit and network analysis, solid-state electronics, fundamentals of electromechanical energy conversion and control, electromagnetic fields, and communication theory. Opportunity is provided in the senior year for each student to elect courses in electroacoustics, communication theory and systems, digital and analog computer systems and applications, feedback control systems, illuminating engineering, electric power transmission and systems, engineering management, and advanced mathematics.

Through this solid foundation in electrical engineering, which is accompanied by introductory studies in chemistry, classical and modern physics, thermodynamics, and properties of materials, the curriculum provides a sound educational base for grade study as well as for employment in any of the broad spectrum of job opportunities in the electrical and related industries.

Beginning with the Class of 1974 a candidate for the bachelor's degree in electrical engineering must maintain an average of not less than 1.80 in junior and senior Ee subjects, in addition to meeting those requirements shown in the General Information section of the catalog under "Grading System".

Special Program in Electrical Engineering

A special five-year program in Pulp and Paper Technology is available to electrical engineering students with options in management and computer engineering. This program superimposes certain requirements in the senior year, and provides for the awarding of the bachelor of science in electrical engineering degree at the end of the senior year and a certificate in pulp and paper management or pulp and paper computer engineering at the end of the fifth year.

Graduate Work in Electrical Engineering

A program of graduate study leading to the degree of master of science in electrical engineering provides course offerings in feedback control systems, system transients, electrical power systems, statistical communication theory, electroacoustics, electro-magnetic waves, microwave circuits, analog and digital computer systems, pulse and digital circuits, and network synthesis. As a condition for acceptance as a candidate for the degree, the student must have obtained honor grades in a large portion of his major undergraduate work.

Freshman Year. See Page 286

Sophomore Year

FALL SEMESTER				SPRING SEMESTER			
Subject			Hours	Subject			Hours
Ee	1	Circuit Anal. I	5	Ee	2	Circuit Anal. II	3
Cp	11	Literature*	3	Ee	12	Basic Elect. Lab.	2
Gc	7	Computer Programming	2	Ms	29	Diff. Eq.	4
Ms	28	Analyt. & Calculus	4	Me	52	Applied Mech.	3
Me	55	Statics and Strength	3	Ee	9	Electrical Eng. Materials	3
				**		Humanities Elect.	3
			17				18

* Any other literature or Comparative Literature course offered by the Department of English for which the student can qualify may be substituted.

Junior Year

Ee	3	Circ. Anal. III	4	Ee	31	Elements of Comm.	3
Ee	13	Electronics I	3	Ee	14	Electronics II	3
Ee	23	Electromech. Energy Conv. I	3	Ee	25	Electromech. Energy Conv. II	3
Ee	17	Ee Laboratory	3	Ee	18	Ee Laboratory	3
**		Humanities Elect.	3	**		Humanities Elect.	3
			16				15

Senior Year

Ee	150	E-M Fields	3	Me	33	Thermodynamics I	3
Ee	161	Electronics III	4	**		Humanities Elect.	3
**		Humanities Elect.	3	***		Technical Electives	9
***		Technical Electives	6				
			16				15

**Refers to non-technical Electives. 18 credit hours required with a minimum of 6 in each area.

***Technical electives include upper-level Electrical Engineering courses, Ms 153/154, Ms 187 and Ms 196. Certain other mathematics, physics and engineering courses may be substituted with special permission. Each student's selection of five technical electives must be approved by his adviser during preregistration in the spring semester of his junior year.

Lower Level Courses

Circuits, Fields and Systems

1. Basic Circuit Analysis I—Basic laws and theorems of electric circuits; complete solution of first and second order systems; a-c steady state analysis. Prerequisite: Ps 2 and Ms 27. *Rec* 4, *Comp or Lab* 3, *Cr* 5, for Ee majors; *Rec* 4,

2. Basic Circuit Analysis II—Complex frequency analysis, poles and zeroes, frequency response; transformers; three phase circuits; Fourier series. Prerequisite: Ee 1. *Rec* 3, *Cr* 3.

3. Circuit Analysis III—The complex frequency plane and its application; Fourier analysis; Fourier and LaPlace transforms; two-port networks. Prerequisite: Ms 29, Ee 2; Ee 17 required concurrently. *Rec* 3, *Comp* 2, *Cr* 4.

Materials, Electronic Devises and Electronics

9. Electrical Engineering Materials—Elementary band theory; crystal structure; diffusion and electrochemistry. Thermal properties of solids; electron emission; properties of semi-conductor materials; the p-n junction; magnetism and magnetic materials; dieletric materials; and the optical properties of materials. Prerequisite: Ps 2, Ms 27. *Rec* 3, *Cr* 3.

12. Basic Electrical Laboratory—Use of techniques developed in Ee 1, 2 for the analysis of circuits containing linear, nonlinear, passive and active elements; includes analysis of simple electronic circuits and the use of the oscilloscope. Prerequisite: Ee 2 required concurrently. *Rec* 1, *Lab* 3, *Cr* 2.

13. Electronics I—Conduction mechanisms in metals and semiconductors; physics of semiconductor devices; piecewise linear circuit models and parameters of devices; biasing and stability. Prerequisite: Ee 12, Ps 36; Ee 17 required concurrently. *Rec* 3, *Cr* 3.

14. Electronics II—Transistor amplifier circuits; high-frequency device models; field-effect transistors; integrated circuits; time and frequency domain response; feedback; oscillator circuits. Prerequisite: Ee 13 or consent of the department; Ee 18 required concurrently. *Rec* 3, *Cr* 3.

17/18. Electrical Engineering Laboratory—A laboratory course concurrent with and related to Ee 13, 14 and Ee 23, 25 Written reports are required and techniques of presentation as well as technical accuracy are stressed. Prerequisite: Ee 12 or equivalent; concurrent Ee 13/14 or Ee 23/25. *Rec* 1, *Lab* 3, *Cr* 1 to 3.

Energy Conversion, Machines and Control

23. Electromechanical Energy Conversion I—Characteristics of transformers, the torque equation, three-phase induction motors, synchronous machines, direct-current machines. Prerequisite: Ee 2, co-requisite Ee 17. *Rec* 3, *Cr* 3.

25. Electromechanical Energy Conversion II—Characteristics of two-phase servo motors and single phase induction motors; a-c tachometer generators; synchros and induction resolvers; system dynamics and transfer functions; direct energy conversion. Prerequisite: Ee 23, co-requisite Ee 18. *Rec* 3, *Cr* 3.

Communication, Information Theory, and Computer Theory

31. Elements of Communication—Characteristics of the auditory and vocal systems; elements of vision; colorimetry; basic information theory; physiological probability; coding and decoding of information; cybernetics; noise; storage of information; switching circuits; principles of feedback and automation. Prerequisite: Ps 2 and Ms 27. *Rec* 3, *Cr* 3.

Service Courses

41. Elementary Circuits—An introduction to d-c and a-c circuits analysis for students majoring in fields other than electrical engineering. Prerequisite: Ms 27, Ps 2. *Rec* 3, *Cr* 3.

42. Electric Machinery—An introduction to magnetic circuits and electromechanical energy conversion devices for students majoring in fields other than electrical engineering. Prerequisite: Ee 41. *Rec* 3, *Cr* 3.

43. Electronics—An introduction to electronic devices and circuits for students majoring in fields other than electrical engineering. Prerequisite: Ee 41. *Rec* 1½, *Lab* 1½, *Cr* 3.

Upper Level Courses

Circuits, Fields, and Systems

150. Electromagnetic Fields—Solution of static electric and static magnetic field problems by methods of vector analysis; boundary value conditions; derivation of Maxwell's equations; introduction to time-varying electromagnetic fields. Prerequisite: Ms 29. *Rec* 3, *Cr* 3.

153. Microwave Transmission—High frequency lossy and lossless lines; propagation of waves in free space; antennas; wave guides. Prerequisites: Ee 150. *Rec* 2, *Comp* 3, *Cr* 3.

155. Electric Power Transmission—Line constants, EHV transmission calculations, distributed parameters, traveling wires and reflections, lighting, corona, ABCD constants, circle diagrams. Prerequisite: Ee 2, 23. *Rec* 2, *Comp* 3, *Cr* 3.

156. Electric Power Systems—Power systems representing matrix formation, symmetrical component theory, stability and fault calculations. Load flow studies using digital computers and network analyzer techniques. Prerequisite: Ee 155. *Rec* 2, *Comp or Lab* 3, *Cr* 3.

Materials, Electronic Devices and Electronics

161. Electronics III—Continuation of Ee 14; narrow-band amplifiers, modulation and demodulation techniques, regenerative and non-regenerative switching circuits and waveform generators; system design making use of integrated circuits. Prerequisite: Ee 14, Ee 3, Ee 17/18. *Rec* 3, *Lab* 3, *Cr* 4.

164. Electronics and Communication Laboratory—Measurement techniques, generation, amplification, and shaping of waveforms; noise; modulation and demodulation; solid-state circuit design; integrated circuits. Prerequisite: Ee 161. *Rec* 1, *Lab* 4, *Cr* 3.

Energy Conversion, Machines, and Control

171. Servomechanism Fundamentals—Analysis of feedback control systems using frequency- and time-domain techniques, s-plane, Bode, Nichols and state-variable approaches. Introduction to compensation-network design. Prerequisite: Ee 3, Ee 25, Ms 29, or permission. *Rec* 2, *Comp or Lab* 3, *Cr* 3.

173. Industrial Electrical Control—Study of manual and automatic control of motors, and feedback methods in regulated systems using rotating amplifiers and static switching devices such as silicon-controlled rectifiers and magnetic amplifiers. Prerequisite: Ee 23. *Rec* 3, *Cr* 3.

Communication, Information Theory and Computer Theory

180. Analog and Digital Computer Systems—Analog computer applications, including iterative and approximation techniques; solution of non-linear and partial differential equations; use of special analog elements. Introduction to switching theory and logic design beginning with Boolean Algebra. Coding, error correction and binary arithmetic are considered in terms of both combinational and sequential systems. Prerequisites: Ms 29, Ee 14. *Rec* 3, *Cr* 3.

183/184. Communications Systems—This is a basic sequence of courses in modern communication systems which cover the representation of signals in both time and frequency domain. Emphasis is placed on practical and theoretical aspects of random signal processing. Linear and exponential modulation, sampling, digital modulation multiplexing, coding and basic information theory are also covered. Prerequisite: Ee 3 and Ms 29.

Miscellaneous

191. Illuminating Engineering—General and advanced illumination theory, illuminating sources and their application, photometry, interior and exterior lighting problems, national electric code, design of electric distribution systems for buildings and for exterior lighting. Prerequisite: Ee 2, or 41. *Rec* 2½, *Lab* 1, *Cr* 3.

194. Engineering Administration—Executive techniques in engineering organizations, including capitalization and amortization, engineering surveys and planning, labor relations and utilization, time and motion study, statistical quality control, technical purchasing and inventory control, safety programs, and patent applications. Open only to upperclass and graduate students. *Rec* 3, *Cr* 3.

196. Electro-Acoustics—Fundamentals of acoustic waves; electromechanical and acoustical circuits; radiation; electro-acoustic systems of microphones and loudspeakers; architectural acoustics; sound measuring systems; noise reduction. Prerequisite: Senior or Graduate standing. *Rec* 3, with four laboratory periods substituted for equivalent class time. *Cr* 3.

198. Selected Topics in Electrical Engineering—Topics in electrical engineering not regularly covered in other courses. The content is not fixed but can be varied to suit current needs. The course may, with permission of the de-

partment, be taken more than once. Prerequisite: consent of the department. *Cr* 1-3.

Thesis

199. Thesis—The study of and report upon some original investigation or design. See regulations regarding degrees. *Cr* 1-3.

Graduate Courses

222/223. Transients in Linear Systems—*Rec* 3, *Cr* 3.
235. Advanced Electric Power Systems—*Rec* 3, *Cr* 3.
237. Power System Protection and Relaying—*Rec* 3, *Cr* 3.
240/241. Introductory and Applied Network Synthesis—*Rec* 3, *Cr* 3.
242. Computer Methods in Network Analysis—*Rec* 3, *Cr* 3.
250. Electromagnetic Waves—*Rec* 3, *Cr* 3.
260/261. Pulse and Digital Circuits—*Rec* 3, *Cr* 3.
263. Microwave Circuits—*Rec* 3, *Cr* 3.
271. Modern Control Theory—*Rec* 3, *Cr* 3.
272. Non-Linear Control Systems—*Rec* 3, *Cr* 3.
273. Sampled Data Control Systems—*Rec* 3, *Cr* 3.
280/281. Communication Engineering—*Rec* 3, *Cr* 3.
295. Communication Seminar—*Rec* 2, *Cr* 2.
298. Selected Advanced Topics in Electrical Engineering— *Cr* 1-3.
399. Graduate Thesis— *Cr* 6-10.

ENGINEERING PHYSICS

PROFESSORS CAMP, BENNETT, BISCOE, CARR, AND KRUEGER; ASSOCIATE PROFESSORS BROWNSTEIN, COFFIN, EDGERTON, HARMON, AND MORROW; ASSISTANT PROFESSORS CLARK, HESS, ROCKMORE, SMITH, AND TARR; MR. R. G. LITTLEFIELD, MR. R. H. LITTLEFIELD, MR. T. BURKE

This curriculum is an answer to an established demand on the part of industry for college men trained in physics in an engineering atmosphere. It recognizes the fact that for certain students, undergraduate specialization in a single engineering field is not a rigid requirement for success in industrial work, especially if there is evidence of concentration on the scientific principles underlying engineering. This program is basically one of applied science, supplemented by a sequence of technical electives in one or more of the well-defined engineering or science fields. It is developed around a framework of required courses in intermediate and advanced physics, mathematics, and chemistry, in addition to certain strictly engineering courses, some required and some elected in the last two years. Thus, the emphasis is placed upon both engineering and physics.

The curriculum also is suited for those students who, by virtue of their ability and interest, may be preparing to do graduate work. Graduates have successfully pursued graduate study in physics and in various fields of engineering.

Graduate Work in Physics

Graduate opportunities and requirements for the master of science degree and the doctor of philosophy degree in physics are given in the catalog of the Grauate School.

Freshman Year. See Page 286

Sophomore Year

FALL SEMESTER			R	L	C
		*Hum. Elective (Bands I or II)	3	0	3
Me	7	Mach. Processes	0	3	1
Ms	28	Anal. Geom. & Calculus	4	0	4
Ps	17	Intermed. Physics	2	0	3
Ps	19	Intermed. Laboratory	0	2	1
Ps	36	Intro. to Modern Physics	3	0	3
		Total			15

SPRING SEMESTER			R	L	C
Ge	7	Computer Programming	1	2	2
		*Hum. Elective (Bands I or II)	3	0	3
Ms	29	Ord. Diff. Equations	4	0	4
Ps	18	Intermed. Physics	2	0	3
Ps	20	Intermed. Laboratory	0	2	1
Ps	172	Optics	3	0	3
		Total			16

Junior Year

FALL SEMESTER			R	L	C
Ee	1	Electric Circuits	4	0	4
		*Hum. Elective	3	0	3
Me	55	Statics & Strength of Materials			3
Ms	153	Part. Diff. Equations	3	0	3
Ps	153	Elec. Measurements	0	4	2
Ps	155	Electricity & Magnetism	3	0	3
		Total			18

SPRING SEMESTER			R	L	C
Ee	2	Electric Circuits	3	0	3
		*Hum. Elective	3	0	3
Me	33	Thermodynamics I	3	0	3
Ms	154	Part. Diff. Equations	3	0	3
Ps	169	Atomic Physics	3	0	3
Ps	176	Phys. Measurements	0	4	2
		Total			17

Senior Year

FALL SEMESTER			R	L	C
		**Engineering Electives	3	0	3
			3	2	4
		*Hum. Elective	3	0	3
Ms		***Math Elective	3	0	3
		†Physics Electives	3	0	3
Ps	181	Advanced Lab	0	6	3
Ps	198a	Seminar	1	0	0
		Total			15-16

SPRING SEMESTER			R	L	C
		**Engineering Electives	3	0	3
			3	2	4
		Free Elective	3	0	3
		*Hum. Elective	3	0	3
Ps	182	Advanced Lab	0	6	3
Ps	196	†Physics of Materials or Physics Elective	3	0	3
Ps	198b	Seminar	1	0	1
		Total			16-17

*Humanitiy Electives—18 hours with not less than 6 hours in each band. Suggestions: Band I, Economics, Psychology, Anthropology, etc. Band II, Foreign Language, Literature, History, Philosophy, etc.

**Engineering Elective—toward completion of 12 hours, but no less than 4 semester courses in an engineering sequence.

***Math Elective may be postponed until spring semester or may be satisfied by Ps 191.

†Senior Physics Electives—Fall Ps 191, Ps 170, Ps 163; Spring Ps 192, Ps 186, Ps 196, plus approved 200 series courses either semester.

GENERAL ENGINEERING

PROFESSOR MCNEARY; ASSOCIATE PROFESSORS DESCHANES, METCALF, WESTFALL; ASSISTANT PROFESSOR VIGER; MR. PLISGA, MR. GRENCI

The Department of General Engineering does not have major students, but offers service courses to students majoring in other curricula, principally engineering and forestry.

Courses offered are those that are introductory and general, or commonly required, in all engineering curricula. Introduction to Engineering Design is taught to first-year students through the medium of engineering drawing. Basic instruction in computer programming, both digital and analog, is provided for sophomores in engineering.

The Department of General Engineering is responsible for the orientation and advising of freshman engineering students and offers an orientation course at the freshman level.

General Engineering (Ge)

1/2. Introduction to Engineering Design—Creative exercises in multi-view drawing using freehand and instrumental techniques. Course 2 introduces pictorial drawing, descriptive geometry, and concludes with the preparation of working drawings for an elementary design problem requiring creative thinking. *Rec & Lab* 4, *Cr* 2. STAFF

3. Descriptive Geometry—The solution of problems of a three-dimensional nature by graphic methods. Theoretical and applied problems are given. Prerequisite: Ge 1. *Rec & Lab* 4, *Cr* 2. STAFF

5/6. Orientation—A series of meetings involving lectures and discussions, with frequent use of audio-visual material to acquaint engineering freshmen with the nature of engineering and science. *Rec* 1, *Cr* 0. MR. MCNEARY

7. Computer Programming for Engineers—Digital programming using Fortran IV language and appropriate numerical methods for the solution of applied problems involving roots of equations, numerical integration, and matrix algebra. The last five weeks of the semester are devoted to analog computer exercises, including time and magnitude scaling. Prerequisite: Ms 28 (may be taken concurrently). *Rec* 1, *Lab* 2, *Cr* 2. MR. MCNEARY

12. Forestry Drawing—A further study of multi-view and pictorial drawings with applied problems in cartography and other fields related to forestry. Prerequisite: Ge 1. *Rec & Lab* 4, *Cr* 2. MR. WESTFALL

14. Architectural Drawing—The preparation of floor plans, elevations, sections, and pictorial renderings of homes and small buildings. Prerequisite: Ge 1. *Rec & Lab* 4, *Cr* 2. MR. WESTFALL

150. Nomography—The construction of graphical representations of equations which must be solved repeatedly. Prerequisite: Ge 1, Ms 27. *Rec* 1, *Lab* 2, *Cr* 2. MR. MCNEARY

MECHANICAL ENGINEERING

PROFESSORS SULLIVAN, HILL, LYMAN, CAMPBELL, CLIFFORD; ASSOCIATE PROFESSORS SCHNEIDER, WEBSTER, CHAPMAN, GRANT, SUCEC, LEE, JOHNSON; ASSISTANT PROFESSORS HOPKINS, SCHMIDT; MR. HALL, MR. MADDEN, MR. GROSS

The Mechanical Engineering curriculum uses a broad foundation of mathematics, basic science, and engineering science to prepare the student for more specialized training in advanced courses.

Mechanical engineering embraces two major areas of interest; heat power and mechanical design. Professional careers in mechanical engineering include design, development, research, teaching, management and sales.

The curriculum is designed to allow the student to select electives in the area

of his interest and aptitude. Sequences of courses are available in fluid and solid mechanics, thermal science and heat power, mechanical design, and environmental design and control. A minimum of 122 degree hours is required for the bachelor of science degree.

A Pulp and Paper Option is offered in corporation with the Chemical Engineering Department. The five-year program includes all courses required in the Mechanical Engineering curriculum and leads to the degree of bachelor of science in mechanical engineering and a certificate indicating completion of the pulp and paper program.

Graduate Work in Mechanical Engineering

The department offers programs leading to the degrees of master of science in mechanical engineering, master of mechanical engineering, and master of engineering (mechanical). The course of study may be chosen in any of the department's fields.

Freshman Year. See Page 286

Sophomore Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours			Subject			Hours		
			R	L	C				R	L	C
Ee	41	Elem. Circuits	3	0	3	Ge	7	Computer Programming	1	2	2
Ms	28	Anal. Geom. & Calculus	4	0	4	Ms	29	Calc. & Diff. Eq.	4	0	4
Me	53	Appl. Mech. I, (Statics and Kinematics)	4	0	4	Me	33	Thermodynamics I	3	0	3
Ps	36	Modern Physics	3	0	3	Me	51	Str. of Materials	4	0	4
		Elective			3	Me	54	Appl. Mech. II, (Kinetics)	4	0	4
					17						17

Junior Year

			R	L	C				R	L	C
Ee	43	Electronics	2	2	3	Me	38	Mechanical Lab	0	3	2
Me	8	*Mfg. Processes	1	4	3	Me	59	Fluid Mechanics	3	0	3
Me	21	Material Science	3	0	3	Me	164	Mech. Vibrations	3	0	3
Me	34	Thermodynamics II	3	0	3			*Elective			3
		Elective			3			Elective			3
					15						14

*Alternated

Senior Year

			R	L	C				R	L	C
Me	71	Mechanical Lab	0	3	2	Ee	42	Electrical Mach.	3	0	3
Me	124	Mechanical Design I	2	3	3	Me	72	Mechanical Lab	0	3	2
Me	160	Heat Transfer	3	0	3			Technical Elective			3
		Technical Elective			3			**Elective			3
		Elective			3			Elective			3
					14						14

**Technical or Free

M. E. Technical Electives

			R	L	C				R	L	C
Me	84	Indus. Management	3	0	3	Me	188	Dynamics of Machines	3	0	3
Me	94	Hydraulic Machinery	3	0	3	Me	189	Prin. Optimum Design & Reliability	3	0	3
Me	123	Kinematics of Linkages	3	0	3	Me	190	Adv. Thermodynamics	3	0	3
Me	156	Theory of Elasticity	3	0	3	Me	191	Heat & Vent. Systems	3	0	3
Me	157	Adv. Dynamics	3	0	3	Me	192	Aerodynamics	3	0	3
Me	158	Adv. St. of Materials	3	0	3	Me	193	I. C. Engines	3	0	3
Me	167	Direct Energy Conversion	3	0	3	Me	195	Gas Dynamics I	3	0	3
Me	181	Turbomachinery	3	0	3	Me	196	Air Condg. & Refrig.	3	0	3
Me	186	Power Plants	3	0	3						
Me	187	Mech. Des. II	2	3	3						

PULP AND PAPER OPTION IN MECHANICAL ENGINEERING

The first three years of this program are the same as the regular Mechanical Engineering program, including all specified courses through the junior year with the additional requirement of Ec ½, Principles of Economics. The specific requirements for the Pulp and Paper certificate as well as a sample program may be found in the Chemical Engineering section of this catalog.

Courses in Mechanical Engineering (Me)

7. Machine Processes—Theory of metal forming, the machine tools and materials of modern manufacturing, mass production processes, use of basic machine tools. *Rec* & *Lab* 3, *Cr* 1.

8. Manufacturing Processes—Theory and application of modern metal shaping machines and processes. Design analysis for economical fabrication. Characteristics and operation of machine tools. *Rec* 1, *Lab* 4, *Cr* 3.

11. Introductory Engineering Metallurgy—Methods of defining the microstructure of metals, phase diagrams, and mechanical properties. Thermal, mechanical, and chemical manipulation of microstructure. Not for mechanical engineering degree credit. *Rec* 3, *Cr* 3.

12. Elementary Heat Power—Elementary thermodynamics, mechanical apparatus, power plant equipment; engineering calculations relative to heat, power, work, and mechanical and electrical energy. Not for mechanical engineering degree credit. *Rec* 3, *Cr* 3.

21. Materials Engineering and Science—The principles of material science with emphasis on the relationship between structure and properties and their control through composition, mechanical working and thermal treatment. Prerequisite: Me 34, 51, and Ms 29. *Rec* 3, *Cr* 3.

33. Thermodynamics I—A study of energy and energy transformations; the First and Second Laws applied to systems and to control volumes; thermodynamic properties of systems, availability of energy. Prerequisite: Ps 1, Ms 28. *Rec* 3, *Cr* 3.

34. Thermodynamics II—A continuation of Me 33. Thermodynamics of mixtures; chemical thermodynamics, thermodynamics of fluid flow, vapor and gas cycles, applicable to compressors, internal combustion engines and turbines. Prerequisite: Me 33. *Rec* 3, *Cr* 3.

38. Mechanical Laboratory—An introduction to laboratory techniques, instrumentation and calibration of equipment. Application to thermodynamics, mechanics of materials, fluid mechanics, and metallurgy. Prerequisite: M.E. junior. *Lab* 3, *Cr* 2.

50. Applied Mechanics, Statics—The study of force systems and equilibrium, trusses, frames, friction, distributed forces, centroids, and moments of inertia. Prerequisite: Ms 27 and Ps 1. *Rec* 3, *Cr* 3.

51. Strength of Materials—The principles of solid mechanics and their applications to practical problems, stresses and deflections in axial loading, torsion, beams, columns, combined stresses. Prerequisite: Me 50 or Me 53 and Ms 28. *Rec* 4, *Cr* 4.

52. Applied Mechanics, Dynamics—A study of motion of particles and rigid bodies; force. mass and acceleration; impulse and momentum; work and energy and simple harmonic motion. Prerequisite: Me 50, Ms 28. *Rec* 3, *Cr* 3.

53. Applied Mechanics I—The study of force systems and equilibrium, structural models, friction, distributed forces, centroids, and moments of inertia. Analysis of mechanisms. Prerequisite: Ms 27 and Ps 1. *Rec* 4, *Cr* 4.

54. Applied Mechanics II—A study of the motion of particles and rigid bodies; force, mass and acceleration; impulse and momentum; work and energy; harmonic motion. Prerequisite: Me 53 and Ms 28. *Rec* 4, *Cr* 4.

55. Statics and Strength of Materials—The basic principles of statics and their applications in strength of materials. Equilibrium of various systems. Stresses and deformations of axially loaded members, connections, circular shafts, beams and columns. Prerequisite: Ms 27 and Ps 1. *Rec* 3, *Cr* 3.

59. Fluid Mechanics—Fluid statics, kinematics, Bernoulli equation, momemtum, free-surface flow, viscosity, pipe friction, dimensional analysis and similtude, and an introduction to compressible. Prerequisite: Me 33 and Me 52 or Me 54. *Rec* 3, *Cr* 3.

62. Heat Transfer and Heat Flow—For non-mechanical engineers. The laws of conduction, convection, and radiation of heat energy. Principles of fluid flow for non-viscous and viscous fluids. Application of the principles of heat transfer and fluid flow to engineering problems. Prerequisite: Me 33. *Rec* 3, *Cr* 3.

71/72. Mechanical Laboratory—Designed experiments to encourage analytical and experiment investigations in the thermal science and solid and fluid mechanics area. Individual student project investigations. Prerequisite: M. E. senior. *Lab* 3, *Cr* 2.

84. Industrial Managment—A study of the relation between accounting, marketing, production and wage administration in the modern industrial plant. Prerequisite: M. E. senior. *Rec* 3, *Cr* 3.

94. Hydraulic Machinery—Prerequisite: Me 59. *Rec* 3, *Cr* 3.

99. Seminar—*Rec* 1, *Cr* 1.

101. Metallagraphy—Structure, metallic bonding and properties of metals. Solidification, alloying, and constitution diagrams. Deformation and annealing. Prerequisite: Me 21. *Lab* 6, *Cr* 3.

123. Kinematics of Linkages—Analysis of displacement, velocities, and acceleration in machine parts and linkages. Kinematic synthesis of mechanisms, analog and digital computer techniques. Prerequisite: Me 52 or 54. *Rec* 3, *Cr* 3.

124. Mechanical Design I—Analysis of mechanical elements. Advanced concepts in mechanics of materials, stress concentration, fatigue, factor of safety. Introduction to creative synthesis and economic design. Prerequisite: Me 51 or 55 and Ms 29. *Rec* 2, *Comp* 3, *Cr* 3.

150. Experimental Mechanics—Experimental methods and techniques for analysis of stress, strain and displacement and their engineering significance.

Electric strain gages, brittle lacquers, mechanical and optical strain gages, and introduction to photoelasticity. Prerequisite: Me 51. *Rec* 2, *Lab* 2, *Cr* 3.

156. Theory of Elasticity—Plane stress and plane strain, stress function. Problems in Cartesian and polar coordinates. Photo-elasticity, strain energy. Three-dimensional problems. Prerequisite: Me 51. *Rec* 3, *Cr* 3.

157. Advanced Dynamics—Particle dynamics vibrations, numerical methods, planetary motion, projectiles. Variable mass motion, angular momentum, impact, engine balancing. Constraints, generalized coordinates and forces. Lagrange's equations. Hamilton's principle. Gyroscopes. Prerequisite: Me 52 or Me 54. *Rec* 3, *Cr* 3.

158. Advanced Strength of Materials—Limitations of elementary stress formulas, theories of failure, unsymmetrical bending, curved flexural members, flat plates, torsion of non-circular bars, thick-walled cylinders, stress concentrations, energy methods, and introduction to theory of elasticity. Prerequisite: Me 51. *Rec* 3, *Cr* 3.

160. Heat Transfer—A study of the fundamental laws of heat transfer by conduction, convection and radiation. Application of the study of engineering problems via analytical, numerical, and graphical techniques. Prerequisite: Me 59. *Rec* 3, *Cr* 3.

164. Mechanical Vibrations—Free and forced vibrations with viscous damping for discrete and continuous mass systems. Derivation and application of energy methods. Applications. Prerequisite: Me 52 or Me 54. *Rec* 3, *Cr* 3.

167. Direct Energy Conversion—Analysis of direct energy conversion. Energy converters such as thermionic, thermoelectric, photoelectric, fuel cells, and magneto-hydrodynamic generators considered as components of power systems. Prerequisite: Me 33. *Rec* 3, *Cr* 3.

181. Turbomachinery—Fundamental analysis of the theory and design of turbomachinery flow passages; control and performance of turbomachinery; gas-turbine engine process. Prerequisite: Me 34. *Rec* 3, *Cr* 3.

186. Power Plants—Power station engineering and economy. Design, construction and operating theory of steam, internal-combustion, and hydroelectric power plants. An introduction to nuclear power plants, utilization of solar energy, fuel cells, and associated problems. Prerequisite: M. E. senior. *Rec* 3, *Cr* 3.

187. Mechanical Design II—Formulation and design of mechanical elements and systems covering a variety of problems confronting the practicing mechanical engineer. Emphasis on original design problems and the development of creative ability. Prerequisite: Me 124. *Rec* 2, *Comp* 3, *Cr* 3.

188. Dynamics of Machines—The forces due to reciprocating and rotating masses with special application to balancing high-speed machinery, designing governors and flywheels. Prerequisite: Me 164. *Rec* 3, *Cr* 3.

189. Principles of Optimum Design and Reliability—Optimization of mechanical engineering systems, statistical treatment of systems breakdown, utilization of reliability theory in design. Prerequisite: Me 124 or permission. *Rec* 3, *Cr* 3.

190. Advanced Thermodynamics I—An introduction to combustion, with applications to the performance of propulsion systems, particularly rocket engines. Prerequisite: Me 34. *Rec* 3, *Cr* 3.

191. Heating and Ventilating System Design—Determination of heating ventilating requirements for buildings and industrial processes. Analysis of heat

transfer devices and their applications. Heating and ventilating system design, layout and control. Prerequisite: Me 34. *Rec* 3, *Cr* 3.

192. Aerodynamics—Flow of an ideal fluid; application of dimensional analysis to engineering problems; properties of airfoils; engine and propeller characteristics; airplane performance calculations; propeller theory. Prerequisite· Me 59. *Rec* 3, *Cr* 3.

193. Internal Combustion Engines—Application of thermodynamic laws and principles to internal combustion engine cycles, theory of design and operation; fuels and combustion, carburetion, detonation, cooling, and lubrication. Prerequisite: Me 34. *Rec* 3, *Cr* 3.

195. Gas Dynamics I—An introduction to the basic dynamics of compressible flows. Fundamental equations and concepts will be considered in isentropic flow, normal shock waves, flows in constant area ducts, and generalized one-dimensional continuous flow. Prerequisite: Me 34 an 59. *Rec* 3, *Cr* 3.

196. Refrigeration and Air Conditioning—Methods of producing artificial low temperatures. Refrigeration for controlled-temperature applications in comfort air conditioning and industrial manufacturing processes and their control. Prerequisite: Me 34. *Rec* 3, *Cr* 3.

Graduate Courses

202. Advanced Thermodynamics II—*Rec* 3, *Cr* 3.
203. Analytical Thermodynamics—*Rec* 3, *Cr* 3.
210. Advanced Heat Transfer I—*Rec* 3, *Cr* 3.
220. Advanced Fluid Mechanics I—*Rec* 3, *Cr* 3.
222. Gas Dynamics II—*Rec* 3, *Cr* 3.
231. Fatigue Theory—*Rec* 3, *Cr* 3.
232. Nonlinear Vibrations—*Rec* 3, *Cr.* 3.
233. Introduction to Continuum Mechanics—*Rec* 3, *Cr* 3.
234. Advanced Vibrations I—*Rec* 3, *Cr* 3.
235. 236. Mechanical Engineering Analysis—*Rec* 3, *Cr* 3.
238. Advanced Vibrations II—*Rec* 3, *Cr* 3.
304. Selected Topics in Advanced Thermodynamics—*Rec* 3, *Cr* 3.
311. Advanced Heat Transfer II—*Rec* 3, *Cr* 3.
312. Advanced Topics in Heat Transfer—*Rec* 3, *Cr* 3.
330. Theory of Plates and Shells—*Rec* 3, *Cr* 3.
391. Mechanical Engineering Projects—*Cr Ar.*
399. Graduate Thesis—*Cr Ar.*

TECHNICAL INSTITUTE DIVISION

College of Technology

ASSOCIATE DIRECTOR R. B. RHOADS

The Technical Institute Division of the College of Technology offers programs leading to an associate of science in engineering technology degree in the following:

Chemical Engineering (pulp & paper) Technology
Civil Engineering Technology
Electrical Engineering Technology
Mechanical Engineering Technology

The objective of the two-year programs is to provide an education for young

people who are interested in technical employment at an engineering technician level. The Technical Institute programs are job-oriented and offer specialized training enabling graduates to perform the variety of duties required of them.

Technological advance in all industries has escalated the professional level of the associate degree engineering technician. He is sufficiently trained in the basic sciences and communications to assist in decision making, to plan and conduct experiments with only slight supervision, to analyze and report data effectively, and eventually to assume the full responsibility of a junior engineer.

Successful completion of studies means that the graduate has acquired high technical competence and a foundation for further study. Graduates from the Technical Institute should find ready employment as engineering technicians or as engineering aides in industry and business, with local or state government, or with consulting engineers.

Graduates with superior records from the Technical Institute Division may be considered for admission to the Colleges baccalaureate degree programs in engineering with the transfer credit to be determined on an individual basis, or may transfer to one of the many schools that have recently initiated baccalaureate programs in engineering technology.

Graduation Requirements

For the associate of science in engineering technology degree, a total of 71 credits are required for Chemical Engineering (Pulp and Paper) Technology and 72 credits are required for Civil Engineering Technology, Electrical Engineering Technology, and Mechanical Engineering Technology. A student must accumulate a minimum grade point average of 1.80 and receive a passing grade in all required courses in the program of study.

CHEMICAL ENGINEERING (PULP & PAPER) TECHNOLOGY

The curriculum in Chemical Engineering Technology provides classroom and laboratory training in the principles of chemical engineering practices with emphasis on pulp and paper technology. The program stresses engineering principles but instructs as well in the skills of laboratory research and testing. Training in data analysis, writing and speaking develop in the student an interest and proficiency for communicating his ideas and the results of his work. Successful completion of studies means that the student has acquired the technical competence to assume a strong supporting role in any engineering assignment.

CHEMICAL ENGINEERING (PULP & PAPER) TECHNOLOGY CURRICULUM

SEMESTER 1						SEMESTER 2					
Subject			Hours			Subject			Hours		
			R	L	C				R	L	C
CheT	1	Chemical Science	3	0	3	CheT	2	Chemical Science	3	0	3
CheT	6	Data Analysis	2	0	2	CheT	3	Chemical Analysis	0	8	4
EhT	1	Eng. Comp.	3	0	3	MsT	4	Basic Mathematics	3	0	3
MsT	2	Basic Mathematics	3	0	3	PaT	2	Paper Technology	3	0	3
PaT	1	Pulp Technology	3	0	3	Pe	2	Physical Education	0	2	0
Pe	1	Physical Education	0	2	0	PsT	8	Basic Physics	3	2	4
PsT	7	Basic Physics	3	2	4						
			17	4	18				12	12	17

SUMMER INTERNSHIP (MILL WORK)

SEMESTER 3 Subject			Hours R	L	C	SEMESTER 4 Subject			Hours R	L	C
CheT	4	Chem. Eng. Elem.	3	0	3	2	ARE	Intro. to Economics	3	0	3
CheT	5	Process Instru.	1	2	2	CheT	7	Chemical Processes	3	0	3
CheT	8	Data Analysis II	3	0	3	PaT	4	Unit Processes (P&P)	0	8	4
PaT	3	Pulp & Paper Anal.	0	12	6	1	Sh	Oral Communication	3	0	3
1	Sh	Oral Communication	3	0	3			Electives	6	0	6
			10	14	17				15	8	19

Courses in Chemical Engineering (Pulp & Paper Technology) (CheT)

1/2. Chemical Science—Principles of chemistry, with emphasis on their application to engineering. The basics of organic chemistry are introduced and used to discuss important areas of polymers and wood. *Rec* 3, *Cr* 3; *Rec* 3, *Cr* 3.

3. Analytical Chemistry—A study and training in analytical techniques of chemistry. Presentation is divided into volumetric, gravimetric and instrumental methods. Applications are to typical industrial materials. Prerequisite: CheT 1. *Lab* 8, *Cr* 4.

4. Elementary Chemical Engineering—An introduction to the basics of chemical engineering. The physic-chemical principles underlying calculations are presented and their applications to processes are illustrated. Prerequisite: CheT 2. *Rec* 3, *Cr* 3.

5. Process Instrumentation—An introduction to principles and techniques used for measuring industrial process variables such as temperature, pressure, flow, etc., and an introduction to process control. Prerequisite: CheT 3. *Rec* 1, *Lab* 2, *Cr* 2.

6. Data Analysis I—A course to familiarize the student with published sources of technical data and methods of analyzing and summarizing the data. Elementary statistics, graphical presentations, and report writing will be emphasized. *Rec* 2, *Cr* 2.

7. Chemical Processes—An introduction to unit processes common to chemical process industries. Prerequisite: CheT 4. *Rec* 3, *Cr* 3.

8. Data Analysis II—Continuing from Data Analysis I, a further study is made of statistics. Then, principles of designing experiments and optimizing results are discussed. The course concludes with instruction in Fortran programming and he use of computers for data analysis. Prerequisite: CheT 6. *Rec* 3, *Cr* 3.

20. Selected Topics in Chemical Engineering Technology—A course to explore the methods and techniques of development of quantitative concepts in engineering science. Student project groups will participate in directed studies, field trips, seminars, and laboratory experiments which illustrate how engineers adapt basic concepts of mathematics and science to creative problem solving and communications in our technological civilization. Prerequisite: permission of instructor. *Rec* 1, *Lab* 4, *Cr* 3.

PaT 1. Pulp Technology—A course on the manufacture of various kinds of wood pulp used in paper making. Wood as a raw material, the major pulping processes, and bleaching methods are discussed. Prerequisite: CheT 1 or concurrent. *Rec* 3, *Cr* 3.

PaT 2. Paper Technology—A course describing the processes for the

manufacture of paper. Stock preparation, paper machines, surface finishing and quality control are described. Prerequisite: PaT 1. *Rec* 3, *Cr* 3.

PaT 3. Pulp and Paper Analysis—A laboratory course on the various physical and chemical tests to characterize pulp and paper. Prerequisite: PaT 1. PaT 2. *Lab* 12, *Cr* 6.

PaT 4. Pulp and Paper Processes—A laboratory course covering the unit operations in the making of pulp and paper. Prerequisite: PaT 3. *Lab* 8, *Cr* 4.

CIVIL ENGINEERING TECHNOLOGY

The curriculum is designed to provide the student with a basic grounding in the physical and mathematical sciences as preparation for his specialized studies in Civil Engineering Technology. These specialized studies are coordinated so as to prepare the graduate to assist as an aide to professional civil engineers in the areas of surveying, materials testing, highway engineering, construction engineering and structural engineering.

The emphasis in all the work is on the practical aspects of civil engineering design and construction. The program includes on-the-job summer training after the first year of study. Employment opportunities are excellent for the well-trained engineering technician in the construction field.

Civil Engineering Technology Curriculum

SEMESTER 1

Subject			Hours R	L	C
CeT	1	Plane Surveying	2	6	4
EgT	1	Technical Drawing	0	4	2
EhT	1	English Comp.	3	0	3
MsT	2	Basic Mathematics	3	0	3
Pe	1	Physical Education	0	2	0
PsT	7	Basic Physics	3	2	4
			11	14	16

SEMESTER 2

Subject			Hours R	L	C
CeT	2	Adv. & Geodetic Surveying	3	3	4
CeT	11	Structural Mech.	3	0	3
EgT	2	Technical Drawing	0	4	2
EhT	2	English Comp.	3	0	3
MsT	4	Basic Mathematics	3	0	3
Pe	2	Physical Education	0	2	0
EeT	30	Circuits, Machines & Electronics	4	3	5
			16	12	20

SUMMER INTERNSHIP REQUIRED WITH HIGHWAY DEPARTMENT OR CONTRACTOR OR CONSULTANT

SEMESTER 3

Subject			Hours R	L	C
2	Ab	Intro. to Economics	3	0	3
CeT	3	Hwy. & Bld. Surv.	2	3	3
CeT	12	Struct. Design	3	3	4
CeT	21	Material Props. & Testing	2	3	3
CeT	30	Hwy. Operations	3	4	5
			13	13	18

SEMESTER 4

Subject			Hours R	L	C
6	Ab	Dynamics of Human Behavior	3	0	3
CeT	13	Struct. Design	3	3	4
CeT	22	Materials Props. & Testing	2	3	3
CeT	31	Const. Engineering	3	3	4
CeT	40	Civil Engr. Mgmt.	3	0	3
			14	9	17

Courses in Civil Engineering Technology (CeT)

1. Plane Surveying—surveying instruments and their use in line measurement, leveling and traversing. Construction and drawing of plans, profiles, and topographic maps. *Rec* 2, *Lab* 6, *Cr* 4.

2. Advanced and Geodetic Surveying—Curves and earthwork compuation and field layout. Property surveys and legal aspects. Astronomical observations, triangulation, and precise leveling using precision surveying instruments. Prerequisite: CeT 1. *Rec* 3, *Lab* 3, *Cr* 4.

3. Construction Surveying—Computation and layout of buildings, bridges, pipelines, and highways. Construction and quantity surveys together with appropriate mapping are undertaken. Problems in highway curves and earthwork for an advanced nature are worked. *Rec* 2, *Lab* 3, *Cr* 3.

4. Elementary Surveying—The use of surveying instruments and the various methods used for plane surveying. Stadia and mapping work. Course is for forestry technology students only. Prerequisite: Ms T2 or equivalent. *Rec* 2, *Lab* 3, *Cr* 3.

11. Structural Mechanics—Analytical and graphical solutions of force systems. Load, shear, moment and deflection values are solved for in beams, trusses, and frames under static loading. Studies of stresses and strains that occur as structural members are subjected to shearing, tensile, compressive and flexural forces. *Rec* 3, *Cr* 3.

12/13. Structural Design—Application of structural analysis principles to the design of timber, steel, and concrete beams, trusses, and frames. Current design codes and practices are used. *Rec* 3, *Lab* 3, *Cr* 4.

20. Selected Topics in Civil Engineering Technology—Topics in Engineering Technology not regularly covered in other courses. The content is varied to suit individual needs. The course may be taken more than once. Prerequisite: consent of the instructor. *Cr Ar* 1-3 hr.

21. Material Properties and Testing—The study and testing of the properties of materials used in the construction of civil engineering work. Timber, steel, concrete, soil aggregates, and bituminous materials are tested. Their selection and application to specific purposes are emphasized. *Rec* 2, *Lab* 2, *Cr* 3.

22. Material Properties and Testing—The study and testing of the properties of soils and the use of soils as a construction material. Includes the study of index properties, moisture and drainage, frost action, compression, shearing strength, lateral pressures, bearing capacity, and consolidation of soils. *Rec* 2, *Lab*

30. Highway Engineering—Studies of the history and development of highways, systems and organizations. Highway financing and economy. Data collection and surveys for highway needs. Design of the horizontal and vertical alignments and design of the cross-section, base and pavements. Special topics of roadside developments, maintenance, rights of way and highway drainage. Study of construction of the roadway from clearing to paying, including use of the mass diagram. *Rec* 3, *Lab* 3, *Cr* 4.

31. Construction Engineering—Field aspect of civil engineering management. Project analysis and scheduling using CPM-I. Studies of use, performance and economics of construction equipment. Laboratory consists of a design, materials take-off and cost estimate of a complete construction project plus field trips and movies showing various construction practices and safety. *Rec* 3, *Lab* 3, *Cr* 4.

40. Civil Engineering Management—Office aspect of civil engineering management. Basic principles of contract law. Writing specifications for a contract and interpreting specifications for inspection. Professional ethics, arbitration and the engineer as an expert witness. Study of the distinguishing relationships in partnerships and corporations. *Rec* 3, *Cr* 3.

ELECTRICAL ENGINEERING TECHNOLOGY

The purpose of this two-year program is to prepare the student for practical work in the application of electrical engineering principles to equipment and instrumentation. Graduates will find employment opportunities in all types of industry, in large firms as responsible assistants to electrical engineers, and in small firms whose electrical needs require more than the talents of an electrician or an electrical technician.

In the first semester the groundwork is laid in algebra and trigonometry, mechanics and d-c circuits. In the second semester a-c circuits and laboratory techniques are introduced in the electrical courses, and the beginning of calculus in the math course. Fundamentals of computer programming are also studied. The third semester includes the introduction of electronics and machine theory. In the fourth semester applications are treated in electronics, control, and instrumentation, and an opportunity for independent work is provided in a semester projects course. The program is rounded out with courses in English, speech, machine shop, and technical drawing.

Electrical Engineering Technology Curriculum

SEMESTER 1

Subject			Hours Rec or Comp	Lab		Cr
Ee	T11	Basic Electricity	2	0	3	3
Eg	T1	Technical Drawing	0	4	4	2
Eh	T1	English Comp.	3	0	0	3
Me	T9	Machine Shop & Welding	1	0	4	3
Ms	T2	Basic Mathematics	3	0	0	3
Pe	1	Physical Education	0	0	2	0
Ps	T7	Basic Physics	3	0	3	4
			12	0	16	18

SEMESTER 2

Subject			Hours Rec or Comp	Lab		Cr
Ee	T21	Basic Circuits	3	3	3	5
Ee	T22	Basic Methods of Tech. Computation	0	4	0	2
Eg	T2	Technical Drawing	0	0	4	2
Eh	T2	English Comp.	3	0	0	3
Ms	T4	Basic Mathematics	3	0	0	3
Pe	2	Physical Education	0	0	2	0
Sh	1	Fund. of Public Speaking	3	0	0	3
			12	7	9	18

SEMESTER 3

Subject			Hours Rec or Comp	Lab		Cr
EeT	33	Electronics	3	3	3	5
EeT	34	Eng. Materials	3	0	0	3
EeT	35	Elec. Machinery	3	3	3	5
EeT	37	Tech. of Elec. Measurement	2	0	3	3
MsT	6	Basic Mathematics	3	0	0	3
			14	6	9	19

SEMESTER 4

Subject			Hours Rec or Comp	Lab		Cr
Ee	T43	Applied Electronics	3	0	3	4
Ee	T45	Power Distribution, Illu. and Acoustics	3	0	3	4
Ee	T47	Elec. Instrumentation & Control	3	0	3	4
Ee	T48	Elec. Projects	0	0	6	2
		Non-Tech. Elective	3	0	0	3
			12	0	15	17

Courses in Electrical Engineering Technology (EeT)

11. Basic Electricity—A non-calculus introduction to elementary electric and magnetic concepts, d-c networks and network theorems, and magnetic circuits; including laboratory use of instruments for making d-c circuit measurements. Prerequisite: Ms T2 concurrent. *Rec* 2, *Comp or Lab* 3, *Cr* 3.

20. Selected Topics in Electrical Engineering Technology—Topics in Engineering Technology not regularly covered in other courses. The content is varied to suit the needs of individuals. The course may be taken more than once. Prerequisite: Consent of the instructor. *Cr Ar* 1-3 hr.

21. Basic Circuits—Continuation of EeT 11, constituting a non-calculus introduction to reactive elements, and continuing into the phasor analysis of single-phase and polyphase a-c circuits in the steady state. Prerequisite: EeT 11, MsT 4 concurrent. *Rec* 3, *Comp* 3, *Lab* 3, *Cr* 5.

22. Basic Methods of Technical Computation—Computations by use of the slide rule. Elements of digital computer programming and numerical analysis techniques. Prerequisite: MsT 4 concurrent. *Comp* 4, *Cr* 2.

30. Circuits, Machines, and Electronics—Electrical concepts and devices, elementary circuit analysis; fundamentals of AC and DC machinery; principles of electronic devices and circuits. Prerequisite: PsT 7. Prerequisite or corequisite: MsT 4. Fall: *Rec* 4, *Comp or Lab* 3, *Cr* 5, for mechanical engineering technicians. Spring: *Rec* 3, *Comp or Lab* 3, *Cr* 4, for civil and chemical engineering technicians.

33. Electronics—Basic physical principles of vacuum, gaseous, and solid state electronic devices. Analysis of rectification, amplification, feedback, and signal generation circuits. Load line analysis and equivalent circuits. Prerequisite: EeT 21. *Rec* 3, *Comp* 3, *Lab* 3, *Cr* 5.

34. Engineering Materials—Physical and electrical properties of materials used in electrical equipment and electronic devices. Emphasis on electrical insulation, semiconductor materials, and magnetic materials. *Rec* 3, *Cr* 3.

35. Electrical Machinery—Theory, performance characteristics and operational control of DC and AC machines. Prerequisite: EeT 21. *Rec* 3, *Comp* 3, *Lab* 3, *Cr* 5.

37. Techniques of Electrical Measurement—The theory and operation of both basic and sophisticated measuring devices and equipment. *Rec* 2, *Lab* 3, *Cr* 3.

43. Applied Electronics—Industrial and commercial electronic circuits and systems, emphasizing amplitude and frequency modulation, detection, radio and television transmitters and receivers, and digital circuits and computers. Prerequisite: EeT 33. *Rec* 3, *Lab* 3, *Cr* 4.

45. Power Distribution, Illumination and Acoustics — Distribution of electric power to lead centers, losses, voltage regulation, power factor correction. General illumination theory; elementary acoustic theory. Prerequisite: EeT 21. *Rec* 3, *Comp* 4 *or Lab* 3, *Cr* 4.

47. Electrical Instrumentation and Control—A study of controllers used for AC and DC motors; the use of selsyn devices, magnetic amplifiers, amplidynes, silicon controlled rectifiers and photo-electric devices in control systems. Prerequisite: EeT 35. *Rec* 3, *Lab* 3, *Cr* 4.

48. Electrical Projects—The student will design, build and test a specific piece of equipment such as an amplifier, voltage regulator, or a piece of test equipment. *Lab* 6, *Cr* 2.

MECHANICAL ENGINEERING TECHNOLOGY

The field of mechanical engineering technology includes environmental control, mechanical design, manufacturing processes, heat power and internal combustion engines, and the many technical activities associated with them. The two-year program prepares its graduates for a variety of opportunities as engineering technicians in engineering departments, manufacturing operations and the mechanical service industries.

The curriculum provides a well-rounded education in mechanical engineering technology. Classroom instruction in the various subjects is supplemented by extensive training in their practical application in the laboratory and shop.

Students are urged to take technical or industrial employment during the summer between the two years.

SEMESTER 1

Subject			Hours R	L	C
CheT	1	Chemical Science	3	0	3
GeT	1	Technical Drawing	0	4	2
EhT	1	English Comp.	3	0	3
MeT	7	Mach. Tool Lab.	1	4	3
MeT	1	Orientation	1	0	0
MsT	2	Math I	3	0	3
Pe	1	Phys. Ed.	0	2	0
PsT	7	Basic Physics	3	2	4
			14	12	18

SEMESTER 2

Subject			Hours R	L	C
2	Are	Intro. to Econ.	3	0	3
GeT	2	Technical Drawing	0	4	2
EhT	2	English Comp.	3	0	3
MeT	8	Mach. Tool Lab.	1	3	2
MeT	50	Statics & Kinematics	4	0	4
MsT	4	Math II	3	0	3
Pe	2	Phys. Ed.	0	2	0
			14	9	17

SEMESTER 3

			R	L	C
EeT	30	Circuits, Machines & Electronics	4	3	5
GeT	3	Mach. Drawing	0	4	2
MeT	5	Heat Treatment	1	2	2
MeT	11	Mach. Tool Lab	0	3	1
MeT	17	Dynamics	2	0	2
MeT	33	Heat Power Fund.	3	2	4
MsT	6	Math III	3	0	3
			13	14	19

SEMESTER 4

			R	L	C
6	ARE	Dynamics of Human Behavior	3	0	3
MeT	34	Mach. Tech. Lab.	1	4	3
MeT	36	Heat Engrg.	3	2	4
MeT	61	Strength of Materials & Mach. Design	3	2	4
MeT	70	Metal Product Mfg.	3	3	4
			13	11	18

Courses in Mechanical Engineering Technology (MeT)

1. Orientation—A series of meetings involving lectures, discussions, guest speakers and audio-visual aids. The purpose of the course is to inform students entering mechanical engineering technology about the field and opportunities in it. *Cr* 0.

5. Heat Treatment—Modern non-ferrous metal heat treating operations and the basic principles underlying them. Analysis of the effects of thermal and mechanical operations on microstructure and attendant mechanical properties. *Rec* 1, *Lab* 2, *Cr* 2.

7. Machine Tool Laboratory—Theory and application of fundamental metal removing processes. Basic metrology and tool nomenclature. *Rec* 1, *Lab* 4, *Cr* 3.

8. Machine Tool Laboratory—Class project, machine repair and maintenance, interdepartmental cooperation on student projects and advanced machine

tool operation and set-up. Oxyacetylene welding and electric arc welding. Prerequisite: Me 7. *Rec* 1, *Lab* 3, *Cr* 2.

9. Machine Shop and Welding for Electrical Engineering Technicians—Fundamental bench work and light machine work using drill presses, lathes, milling machines, shapers and surface grinders. Familiarization with and use of oxyacetylene and electric arc welding equipment. *Rec* 1, *Lab* 4, *Cr* 3.

11. Machine Tool Laboratory—Design and manufacture of prototype assembly in conjunction with GeT 3. Application of skill and theory in supervising group projects. Construction and use of production tooling set-ups. Advanced metrology. Prerequisite: MeT 8. *Lab* 3, *Cr* 1.

17. Dynamics—Kinetics of particles; translation, rotation and plane motion of rigid bodies; work and energy impulse and momentum. Prerequisite: MeT 50. *Rec* 2, *Cr* 2.

33. Heat Power Fundamentals—Elementary thermodynamics, mechanical apparatus, power plant equipment. Engineering calculations relative to heat, power, work and mechanical and electrical energy. Prerequisite: PsT 7. *Rec* 3, *Cr* 3.

34. Mechanical Technology Laboratory—Experimental applications of solid and fluid mechanics, thermodynamics, and metallurgy. Introduction to digital computer programming.

36. Heat Engineering—Heat transmission and properties of air. Heating systems, ventilation requirements and design. Refrigeration cycles, refrigerant properties, load calculations for summer air conditioning and industrial refrigeration. Refrigeration equipment and controls. Prerequisite: MeT 33. *Rec* 3, *Lab* 2, *Cr* .4

50. Statics and Kinematics—The study of forces and rigid bodies in equilibrium, properties of area and masses. The analysis of motion; linkages, cams, gear teeth and gear trains. Prerequisite PsT 7. *Rec* 4, *Cr* 4.

61. Strength of Materials and Machine Design—Stress and strain in materials and members subject to tension, compression, torsion, and flexure. Study of columns, combined stresses, beam deflection indeterminate problems with axial loading. Design of machine elements, theories of failure, fatigue and stress concentration. *Rec* 3, *Lab* 2, *Cr* 4.

70. Metal Product Manufacturing Technology—A presentation of production processes and problems to include: process planning, automation, numerical control, quality analysis, quality control, specialized machine tools and current advances in the field of metal working. Completion of prototype assembly and evaluation of same. *Rec* 3, *Lab* 3, *Cr* 4.

Service Courses for the Technical Institute Division

EhT 1. English Composition—A review of grammar and the principles of effective expression for the purpose of direct application in written reports of practical value. *Rec* 3, *Cr* 3.

EhT 2. English Composition—A continuation of EhT 1 with particular emphasis given to expository writing. *Rec* 3, *Cr* 3.

GeT 1/2. Technical Drawing—Exercices in instrumental drawing, multiview drawing, freehand technical sketching, and lettering. Course 2 introduces instrumental pictorial drawing, threads and fasteners, and working drawings. *Lab* 4, *Cr* 2.

GeT 3. Machine Drawing.—Analysis of space relationships with matching

applied problems. Practical design problems utilizing various engineering materials. Preparation of complete working drawings. Prerequisite: EgT 2. *Lab* 4, *Cr* 2.

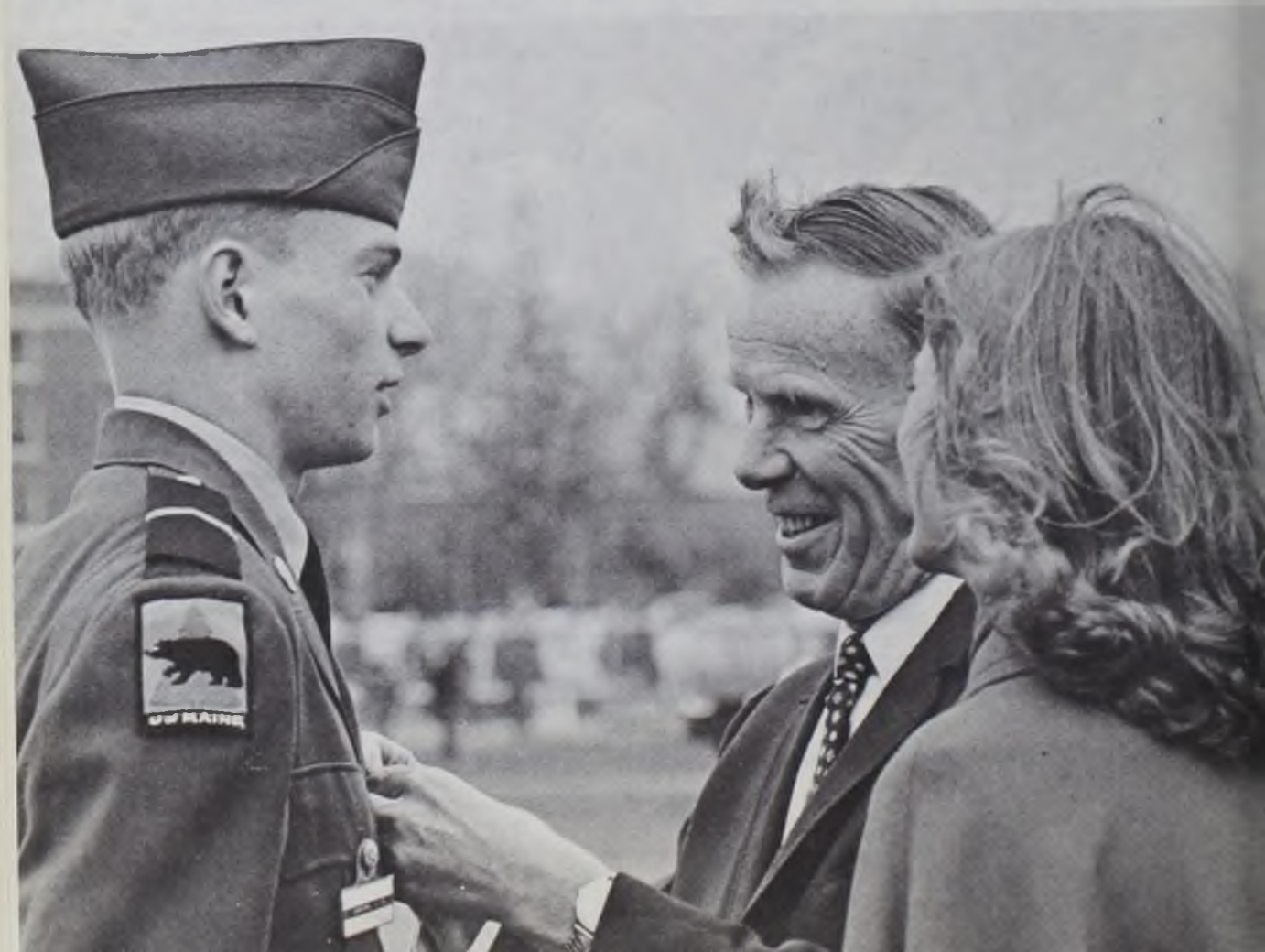
MsT 2. Mathematics I—Algebra and trigonometry, including numbers, functions, graphs, factoring and fractions, exponents and radicals, logarithms, linear equations, quadratic functions, equations of higher degree and solutions of triangles. *Rec* 3, *Cr* 3.

MsT 4. Mathematics II—Elements of analytic geometry and introductory calculus, including straight lines, conic sections, polar coordinates, an introduction to the derivatives and its applications. *Rec* 3, *Cr* 3.

MsT 6. Mathematics III—Further topics in the calculus, including an introduction to integration, derivatives of transcendental functions and techniques of integration. *Rec* 3, *Cr* 3.

PsT 7. Basic Physics—An introduction to the basic concepts of mechanics, sound and heat with illustrations taken from technical applications. Calculus is not used. Lec with *Dem* 1, *Rec* 2, *Cr* 4.

78
60
10
52
34


UM MAINE

University of Maine at Augusta

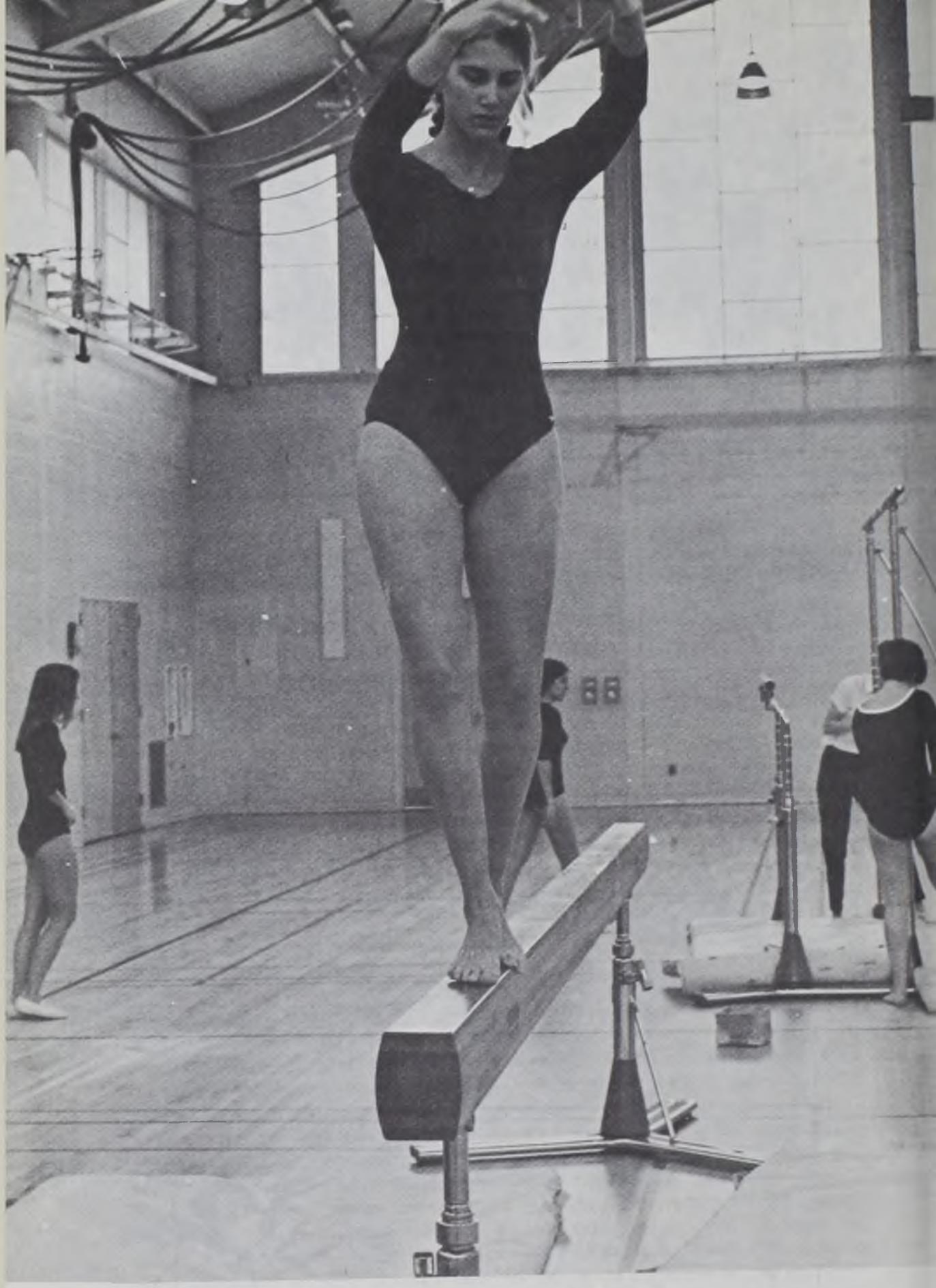
The University of Maine at Augusta is located at the Belgrade interchange of Interstate 95 in the state's capital city. Since the city is the heart of state government, it is the pulse of the entire state and offers wide variety of educational, professional, and recreational activities. The facilities include a classroom building, auditorium and temporary structures for the library, art studios and gallery and the bookstore.

Associate of arts degrees are offered in Liberal Studies, Art and General Studies. Programs in Law Enforcement, Nursing and Administration (with a public or business major) lead to associate of science degrees. These programs specifically provide: (1) high quality education for qualified high school graduates who wish to attend two years of college at a low cost, (2) two years of college education to students who wish to continue their education at senior colleges, (3) two years of general, semi-professional and occupational-technical education combined with liberal arts for students who may not wish to pursue a baccalaureate degree, and (4) guidance, counseling and testing.

A wide variety of undergraduate and graduate level courses are offered in the evening under the direction of the Continuing Education Division. A master's degree program is offered in Public Administration in order to provide advanced education and training for government personnel. The Continuing Education Division also offers a series of courses which leads to a certificate in management as well as several short-term courses, non-credit courses and seminars.

Student Personnel Services is primarily concerned with the out-of-class segment of the student's college experience and includes financial aid, placement, and a counseling and testing center. A College Level Examination Program (CLEP) Center is located at Augusta and is an advanced placement and credit program offered by the College Entrance Examination Board. At minimal cost any person interested may arrange to take the examinations in the Counseling Center. In lieu of the medical assistance provided at other campuses by the Student Health Center, the University has arranged to pay the cost of accident coverage, without charge to the student, for each full-time student. Additional sickness insurance is available at an annual cost of $21.50 for students.

Detailed information about the Augusta campus may be obtained by requesting a catalog from: University of Maine at Augusta; Augusta, Maine, 04330.



University of Maine at Bangor

(PENOBSCOT VALLEY COMMUNITY COLLEGE)

The University of Maine at Bangor, destined to be one of the first units in the system of community colleges in the State of Maine, is located on a portion of the former Dow Air Force Base in Bangor. As a community college the primary objectives are to offer a variety of two-year Associate Degree Programs, one-year Certificate Programs, and other short-term programs which are designed to meet special educational needs. At present 11 Associate Degree programs are offered at the University of Maine at Bangor. In many programs the students will make use of extended campus resources such as special laboratories at the Orono campus or clinical facilities within the immediate community. Transportation to and from extended campus facilities is provided by the college.

The Bangor campus has two classroom buildings, Eastport Hall and Caribou Hall, dormitories and dining facilities. The library is located in Eastport Hall. For recreational purposes there is a gymnasium, student union building, 500-seat theatre, and game building with 8 bowling lanes, billiard tables, and ping-pong available. There are many intramural activities, including a bowling league.

A personnel dean and admissions counselor are available in Bangor Hall for consultation on a regular basis. Resident counselors are available on every floor of every dormitory for counseling and are responsible for the general supervision of their building. In addition, every dormitory has a head counselor who is responsible for the resident counseling program. The Housing Office is located in Bangor Hall.

A health service is staffed by a full-time registered nurse during the day hours and immediate call service to the Orono Health Center is available at any time of the day or night. Students requiring short periods of hospitalization are taken care of in the newly completed infirmary in Orono.

The Office of Student Aid and the Placement Bureau at Orono provide assistance to students at the Bangor campus.

PM
.05
PM
1.0

Graduate School

Programs of study leading to degrees of master of agricultural and resource economics, master of arts, master of arts in teaching, master of business administration, master of science, master of education, master of engineering, master of library service, master of mechanical engineering, master of public administration, doctor of education and doctor of philosophy are offered by the University. The Ph.D. degree is awarded in the fields of animal nutrition, chemical engineering, chemistry, civil engineering, forest resources, history, oceanography, physics, plant science, clinical psychology, general-experimental psychology and zoology.

The Certificate of Advanced Study, designed for teachers and school administrators, is awarded for the completion of a planned program of thirty hours of work beyond the master's degree.

Graduate programs in education and in certain other fields may be carried on, in whole or in part, during the Summer Sessions. A limited amount of credit toward the degree of master of education may be earned in continuing education courses given at various centers in the state and in the Continuing Education Division of the University. Candidates for the M.A. degree in English, history, and occasionally in other fields, may find it possible to complete a part of their work in C.E.D. classes. However, only six hours of continuing education work can be accepted toward the M.A. or M.S. degree in education.

The professional degree of forest engineer is granted upon completion of appropriate requirements.

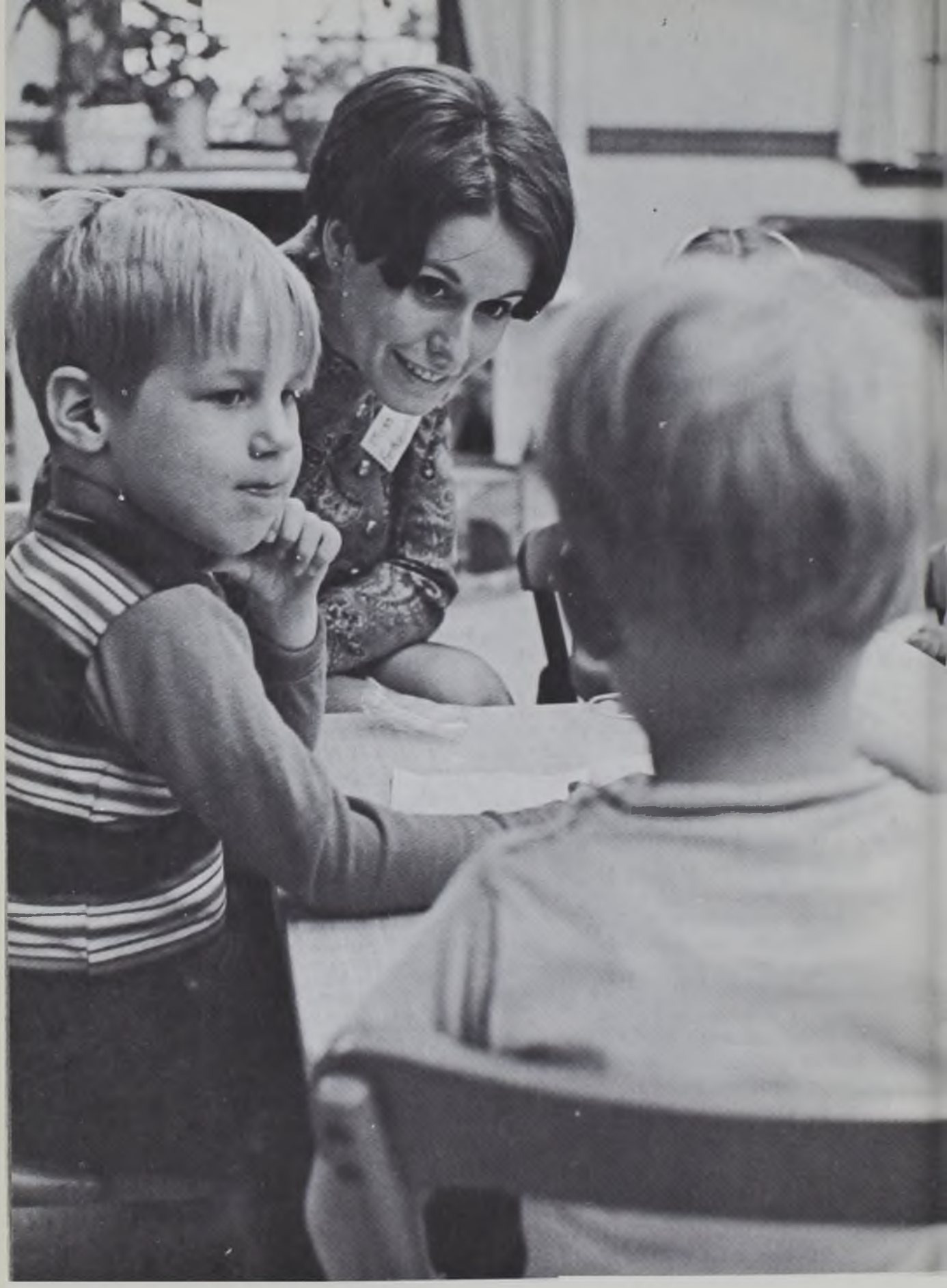
The applicant who wishes to work toward the degree of master of arts or master of science is ordinarily expected to have had an undergraduate major or its equivalent in the field in which he proposes to do his advanced work. Applicants for most programs leading to the degree of master of education are expected to have had sufficient work in professional education to qualify for the appropriate type of certification. Teaching experience is also ordinarily expected.

A thesis usually is required of candidates for the M.A. and M.S. degrees, and is required for the Ph.D. degree and Ed.D. degree.

All work for the M.A., M.S., and non-thesis master's programs (with the exception of M.Ed.) must be completed within an eight-year period. The limit for the M.Ed., C.A.S., Ed.D., and Ph.D. degrees is 10 years.

The catalog of the Graduate School, containing more detailed information concerning graduate programs and financial assistance, may be obtained from the Office of the Graduate School, 2 Winslow Hall, Orono.

Students may not register for graduate degree credit until duly admitted to a program of graduate study at the University of Maine.



Military Science

PROFESSOR OF MILITARY SCIENCE, LT. COL. FELL; ASSOCIATE PROFESSOR, MAJ. SPEKHARDT; ASSISTANT PROFESSOR, MAJ. RUGGERIO; ASSISTANT PROFESSORS CAPT. NORTON, CAPT. PAYNE; INSTRUCTORS, SERGEANT MAJOR SALLEY, SERGEANT FIRST CLASS MITCHELL; ADMINISTRATIVE CHIEF, SERGEANT FIRST CLASS HOFFMANN; SUPPLY CUSTODIAN, THOMAS GEAGHAN; SUPPLY CLERK, SPECIALIST FOURTH CLASS ANNIS

General—The Department of Military Science conducts the General Military Science curriculum prescribed by the Department of the Army for the Senior Division, Army Reserve Officers Training Corps. Under this program, Reserve commissions are awarded in the various branches of the Army after considering the preference and qualifications of the individual and the needs of the service. Commissions in the Regular Army are offered to selected students.

Purpose—The purpose of the Army ROTC is to train college students as junior officers who have the qualities and the attributes essential to their progressive development as Army officers, with particular emphasis on the United States Army Reserve. The senior division also provides junior officers for the Regular Army through the selection of a number of volunteers, under the Distinguished Military Graduate Program, for direct appointment as Regular Army second lieutenants.

Curriculum—The complete course of instruction is four academic years plus a summer camp of six weeks between the junior and senior years. For students transferring from other institutions and for other selected students, the four-year course may be compressed into two years; however, to gain necessary credit for the basic course, the compressing student must attend an additional six-week summer camp between the sophomore and junior year. The course is organized and correlated in sequence with the various four-year college curricula. For example:

Basic Course:

Mt 1 and 2, freshman year, 2 hours per week
Mt 3 and 4, sophomore year, 3 hours per week

Advanced Course:

Mt 5, junior year, 4 hours per week
Mt 6, junior year, 3 hours per week
Summer Camp, end of junior year, 6 weeks
Mt 7, senior year, 3 hours per week
Mt 8, senior year, 4 hours per week

During the freshman, junior and senior years, students complete some of the military instruction by taking selected subjects from a list of approved academic

courses in the general areas of Science Comprehension, General Psychology, Effective Communication, and Political Institutions and Development. The academic subjects must be the equivalent of 30 hours for freshmen, 45 class hours for juniors, and 45 class hours for seniors.

FALL SEMESTER

	Subject	Hours Rec	Lab	Cr
Mt 1	Military Science Basic	1	1	0*
Mt 3	Military Science Basic	2	1	0*
Mt 5	Military Science Advanced	3	1	3
Mt 7	Military Science Advanced	2	1	2

*Grades included in College Accumulative.

SPRING SEMESTER

	Subject	Hours Rec	Lab	Cr
Mt 2	Military Science Basic	1	1	0*
Mt 4	Military Science Basic	2	1	0*
Mt 6	Military Science Advanced	2	1	2
Mt 8	Military Science Advanced	3	1	3

GENERAL

Basic Military Science (Mt 1, 2, 3, 4)—All physically fit male citizens enrolled in the University of Maine are eligible for enrollment in the Basic Military Science Course (two years).

Advanced Military Sciences (Mt 5, 6, 7, 8)—Students requesting admission to Advanced Military must: have completed Basic Military Science or have received credit for previous military training; meet the physical standards prescribed by the Department of the Army; be selected by the PMS and the President of the University according to their leadership, military ability, and potential as an officer in the Army Reserve. The general objective is to provide a basic military education, and in conjunction with other college disciplines, to develop individual character, leadership training and attributes essential to a military and civilian leader.

Credits—Credit for placement due to previous active military service or ROTC training toward admission into Advanced Military Science may be granted on the following basis:

Four or more months of active military service or active duty for training. Credit for placement for Mt 1, 2, 3, 4.

Previous training in the Army, Navy, Air Force, or Coast Guard Academies, and in the Army, Naval or Air Force ROTC. Credit for equivalent training.

Military School Division ROTC. Partial credit in accordance with Army Regulations.

Completion of Junior Division (high school) ROTC training. Credit not to exceed Mt 1, 2.

Completion of he six-week basic summer camp between Mt 4 and Mt 5. Credit for Mt 1, 2, 3, 4.

Enrollment—Basic Military Science cadets are issued modified officer-type uniforms free of charge for use during leadership laboratory. These uniforms must be returned to the Military Department at the end of each academic year and upon separation from the University.

Advanced Military Science cadets are provided regulation officer-type uniforms

which remain in their custody while enrolled in the course. Upon successful completion of the course and upon graduation and appointment, these uniforms become their personal property. These uniforms can be modified by the addition of braid to conform with uniforms worn by officers on active duty.

Deferment—University Military Training and Service Act provides for the deferment of all Advanced Military Science ROTC members. Basic Military Science ROTC members who have satisfactorily completed Mt 1 may, at the discretion of the PMS, also be deferred.

Pay—Advanced Military Science cadets are paid an allowance of $50 per month for 10 months of each year. For the six-week period of Summer Camp they receive $208.80 plus rations, quarters, all necessary uniforms and equipment, and a monetary allowance for transportation at the rate of six cents per mile between their home of record, Summer Camp, and return. Upon completion of Mt 8 and graduation, qualified personnel are commissioned 2nd lieutenants in the U.S. Army Reserve. These officers receive a uniform allowance of $300 upon reporting for active duty to cover costs of necessary uniforms.

Obligation—Cadets commissioned as second lieutenants are required to serve on active duty for periods up to two years, dependent upon the needs of the service. Individuals being appointed in the Regular Army and personnel completing the Flight Training and Scholarship Program are required to serve on active duty for a period of three and four years respectively.

SCHOLARSHIP PROGRAM

The Department of Army offers a three-, two-, and one-year ROTC Scholarship to select freshman, sophomore, and junior cadets, respectively, who are enrolled in the Military Program, and who have demonstrated outstanding leadership and scholastic qualities. This scholarship pays full tuition for the respective number of years, all textbooks and laboratory fees, plus $50 per month for the appropriate number of years.

LEADERSHIP LABORATORY

General—Military leadership is taught using the brigade organization as a training vehicle. The brigade consists of a Brigade Headquarters, two battalions, and a mountain and cold weather unit. Individual cadets are assigned to positions of leadership and promoted to more advanced positions based on their leadership and experience.

The training of the cadet as a part of the brigade exposes him to the initial need-to-know military subjects from drill to field work. Maximum stress is placed on leadership by example, command responsibility, and completed staff action.

Organization: Brigade Headquarters—Brigade headquarters consists of a commander and full staff. This headquarters has the responsibility of direction and coordination of all brigade activities to include field exercises, physical fitness tests, drill competitions and the like.

Ranger Battalion—The Ranger Battalion meets for one two-hour evening period each week. The objective of this battalion's training program is the development of the individual. This is accomplished through a program which

includes extensive physical training, hand-to-hand combat, all-weather survival, land navigation, small unit tactics, and close order drill. Maximum emphasis is placed on individual participation and accomplishment through which self-confidence and leadership are developed.

1st Battalion—The 1st Battalion meets for one single-hour evening period each week. The objectives of this unit are essentially the same as those for the Ranger Battalion within the shorter time available.

Mountain and Cold Weather Unit—Formally Company M-12, 12th Regiment, Pershing Rifles, this unit was organized to establish a small Cold Weather Tactical Unit with plans to establish a rescue squad during their weekly two-hour training periods. This unit receives instruction in tactics, military courtesy, physical training, and other military subjects. Activities also include tactical maneuvers, bayonet training, hand-to-hand combat, map reading, operations orders, and other related subjects.

ADDITIONAL COURSES

Flight Training—Army ROTC Flight Training is offered to selected senior ROTC cadets as an extracurricular subject at no extra cost. Upon completion of 35 hours ground instruction and 37½ hours in-flight instruction, cadets are eligible for a CAA pilot's certificate and are qualified for further Army flight training when on active duty. U.S. Army flight uniforms are provided for this instruction.

Rifle Marksmanship Training—Offered to all enrolled ROTC students. The ROTC Rifle Team has an enviable record and has won many trophies. Those qualifying may compete in the scheduled varsity and ROTC matches. Rifle marksmanship is also a major sport of the University and is coached by the Military Department. Participation enables individuals to earn their freshman numerals and their varsity letter.

20th Maine (Military Honor Society)—The 20th Maine is the University of Maine's Military Honor Society composed of the outstanding advanced course cadets. The society is in no way fraternal in nature. The mission of the society is two-fold: first, one of service to the University's surrounding community and also service to the Military Department; and second, one of self-improvement. Speakers and movies covering subjects of current military interest are scheduled throughout the year at society meetings.

Pershingettes—A girls' drill team, the Pershingettes, was organized in February 1966. The trick drill team performs at the University of Maine football and basketball games, as well as local parades. It is also functioning as a service organization on campus, and is one of the co-sponsors for the Military Ball. New this year has been the initiation of the Pershingette Invitational Drill Meet, with schools throughout the state participating. It is projected that this event will become an annual affair.

Physical Education and Athletics

PROFESSORS WESTERMAN (Director), WOODBURY, SEZAK; ASSOCIATE PROFESSORS LEPLEY, HAAS, BROWN, BUTTERFIELD, CASSIDY, STYRNA, WALKUP; ASSISTANT PROFESSORS ABBOTT, ANDERSON, CARVILLE, COBB, HADLEY, JORDAN, PHILBRICK, PICKETT; INSTRUCTORS AMES, BALLINGER, CHAPPELLE, CRICHTON, DEVARNEY, FOLGER, MACKINNON, STOYELL

The development of alert minds, strong wills, and healthy, enduring bodies is the goal of physical education at the University of Maine. As one factor in achieving this goal, participation in athletics and/or other forms of physical activity by all students is strongly encouraged.

Immediate responsibility for instruction, supervision, and guidance in this area rests with the Department of Physical Education and Athletics, a department comprising three divisions: the Division of Physical Education for Men, the Division of Physical Education for Women, and the Division of Intercollegiate Athletics.

PHYSICAL EDUCATION FOR MEN

Prescribed courses in physical education are required of all non-veteran freshmen. These courses are designed to improve body control and strength, to stimulate the development of mental and physical alertness, to establish habits of regular physical activity, to teach basic motor skills, and to provide experience in various kinds of recreative sports that may be enjoyed while in college and during later years. The program of activities is planned with due regard to individual differences so that it may be suited to the needs and adjusted to the capabilities of individual students. During the fall and spring, emphasis is placed on outdoor activities, while appropriate indoor activities are stressed during the winter.

Any student who has failed a Pe course because of lack of attendance must register for and pass both semesters of the required course.

A prescribed uniform is required for all physical education classes.

The Intramural Athletic Association, composed of one representative from each participating unit and acting under the supervision of the Division of Physical Education for Men, promotes general participation in athletics. Schedules are arranged in a wide variety of outdoor sports and each student is given an opportunity to engage in the activities of his choice with others of comparable skill. Teams representing the several dormitories, fraternities, and other housing units compete for championships in their respective leagues. As new interests develop, and when facilities can be made available, new sports are added. The program of intramural athletics is closely coordinated with the prescribed courses in physical education and with intercollegiate athletics to the end that "Athletics for All" may be a reality among Maine men.

Pe 1, 2. Physical Education—These courses or their equivalent are required of all non-veteran freshmen. Introduction and participation in outdoor and indoor games, fundamentals in individual activities, and participation in a program of physical fitness.

PHYSICAL EDUCATION FOR WOMEN

The role of physical education serves a vital part in the total program for the University woman. Instruction in the service program provides a means for physical development and maintenance of organic efficiency through a program of selected vigorous and moderate activities. Providing knowledge of structure and function for the basic tool of movement—the body—and providing satisfying opportunities for manipulating the body with or without an implement are also purposes of instruction. The Service Program is equally concerned with encouraging the pursuit of exercise as a pleasurable and healthy habit and instilling appreciation, respect, and love for participation in activity.

The University requirement for physical education for women is governed by each individual college. At present, each college requires two semesters of physical education to be completed in the freshman year.

The Department of Physical Education for Women believes that progress which is consistent with its philosophy may best be achieved through the following recommendation:

To fulfill the one-year requirement, students may elect two of three areas. The areas are designated as: 1) Individual and Dual or Team Sports; 2) Dance; 3) Fitness or Gymnastics. When the area requirements are satisfied, the student is free to select any activity with the stipulation that it not be a repeat activity.

Within each area there is a variety of different activities for which the student may register. This allows the student to choose the activities in which she has an interest and would enjoy.

Students with activity restrictions, because of health, are scheduled into the Service Program by the Division of Physical Education for Women on recommendations from the University Student Health Service. The student must first go through the University Health Service for classification and then through the Physical Education Department for activity scheduling. The student then remains in the restricted program unless she is reclassified by the University Health Service.

Pe 1, 2. Physical Education—Activities are chosen from two of the following areas: 1) Team Sports, (basketball, field hockey, volleyball, lacrosse) and/or Individual Sports, (archery, badminton, fencing, golf, riflery, skiing, tennis); 2) Fundamentals of Gymnastics of Fitness; 3) Dance (modern or folk). Two hours a week. No credit.

INTERCOLLEGIATE ATHLETICS

As an integral part of the University's program of physical education, intercollegiate athletics help to serve the general purposes of that program. In addition, they constitute an effective means of maintaining interest in all-round physical fitness; they set standards of excellence in physical efficiency; they provide a wholesome and natural common interest around which University loyalties may be rallied and institutional esprit developed; and they afford experience in emotional control and in the capacity to think quickly and act vigorously while under the pressure of strong opposition.

Intercollegiate athletics are governed by an Athletic Advisory Board, the membership of which is representative of the University faculty and administration, the Board of Trustees, the alumni, and the undergraduates. Regular schedules are

arranged and expert coaches are provided for the following sports: baseball, basketball, cross-country, football, golf, rifle, sailing, soccer, tennis, track, winter sports, and wrestling. Provision is made for freshman as well as varsity competition in these sports. In coaching procedures and in all other particulars the program is conducted with primary concern for the best interests of the individual participant and his relationship toward the broader objectives of the University.

FACILITIES

The University facilities for athletics and physical education are listed on page 23.

Continuing Education Division

The Continuing Education Division is a part of the University of Maine Public Service Division. The primary function of the division is to coordinate the part-time study of adults in various Maine communities during later afternoon, evening and Saturday classes. Educational opportunities through C.E.D. are available at about 25 locations within Maine. An increasing number of courses are available by means of Educational Television. Television courses are administered by the Continuing Education Division. Courses offered by means of the division may be for degree credit or non-degree credit. Courses are available occasionally over radio, also.

The division provides a source of continuing education for mature and qualified persons who wish to supplement an earlier education. Programs offered may sometimes be applied toward degree programs or may be primarily for professional or personal use. However, all programs offered are designed to prepare adults to meet the challenges of a rapidly changing world and provide experiences in learning which will lead to a fuller and richer life.

Adult students in C.E.D. classes have varied backgrounds and interests. Most of them carry on full-time occupations, have graduated from high school some time ago and have determined for themselves the need for earning a degree or for specific courses to be used for personal or occupational development. A number of students have recently graduated from high school and are beginning their college career by commuting to C.E.D. classes before transferring to a campus.

A large variety of degree credit, non-degree credit and special short courses are available in many locations, operated by the C.E.D. Specific information concerning subjects currently available may be obtained from University of Maine Extension Service agents or from members of the Continuing Education Division at Orono, Portland, Presque Isle, Auburn and Augusta. C.E.D. personnel will be able to advise students on registration procedures for courses available. Regular tuition charges or nominal fees are charged for programs offered.

The Continuing Education Division also assists in the administration of many conferences and seminars conducted on the Portland, Augusta and Orono campuses.

Summer Session

The University offers a 12-week Summer Session of professional courses in elementary and secondary education, and academic subjects. In addition, special workshops in both elementary and secondary education are conducted for a period of three weeks. Some courses are organized on a three-week basis, thereby enabling the student who enrolls for a workshop to complete a full six-week Summer Session schedule. Several conferences on special educational problems, usually lasting a week, are available for students who are interested in them. A few courses are scheduled during the early evening hours to accommodate students who must be employed during the summer months.

The session also affords opportunities for students in the University of Maine or other similar institutions to secure credits toward a degree, thus enabling them to accelerate their program. Students from other colleges of the University system who are admitted to advanced standing as candidates for the bachelor's degree in the College of Education may do a considerable part of their work in the Summer Session.

As an integral part of the University organization, the Summer Session has similar standards of academic achievement. The faculty consists of members of the University staff and numerous visiting professors from other institutions.

The session is for the benefit of teachers and school administrators who desire to take professional courses in the field of education or to pursue other subjects which may be helpful to them in connection with their work. Hence, special attention is given to teachers' courses in the various subjects offered.

The facilities of the Summer Session are open to both men and women, and students are admitted without examinations. The requirements for admission are, in general, the same as those for the other sessions of the University. Students are expected to have completed as a minimum preparation a standard high school course or its equivalent.

Transcripts for work previously done are necessary only when the student plans to become a candidate for a degree at the University of Maine. New students who expect to become candidates for the master's degree should communicate with Dr. Franklin P. Eggert, Dean of the Graduate School.

Classes meet five times a week, Monday to Friday inclusive. The normal registration for the six-week session is for two or three courses.

Registration for the Summer Session is held early in June, and the session ends early in September. (See 1970-71 calendar, page 4) The bulletin describing courses offered during this period is issued about March 15. For further information concerning the program address Director of the Summer Session, 14 Merrill Hall, University of Maine, Orono, Maine 04473.

Educational Television and Radio

The University of Maine owns and operates WMEH-FM, Bangor; WMEB-TV, Channel 12, Orono; WMEM-TV, Channel 10, Presque Isle; WMED-TV, Channel 13, Calais; and translator stations WORAR, Channel 4, Madawaska and WORAY, Channel 4, St. Francis, which together comprise the State of Maine Educational Broadcasting Network. These stations are interconnected by a privately owned microwave relay system with central programming source at the University of Maine at Orono. The stations are interconnected with ETV stations WCBB, Augusta, Maine; WENH (New Hampshire Network), Durham, New Hampshire; the Vermont ETV Network; WGBH-TV and WGBX-TV, Boston, Massachusetts; the national Public Broadcast Service and the Eastern Educational Network. The stations maintain a regular schedule of programs for adults and children, both for home and in-school use.

Studio and control facilities for the Maine Educational Broadcasting Network are located in Alumni Hall on the Orono campus. The facilities consist of equipment for the production and recording of radio and television programs, and the distribution of these programs to each of the stations. In addition to programs produced by the Network, other sources of programming include national and regional broadcast libraries and networks, including: National Public Radio Network, Eastern Public Radio Network, National Educational Radio, National Educational Television, Eastern Educational Television Network and Public Broadcast Service. Of the locally produced programs, many are presented in cooperation with other educational, cultural and public service agencies of the state. The network maintains a full-time professional staff of 38 people, supplemented by some part-time personnel.

An expanding closed circuit television system (CCTV) currently interconnects several classroom buildings on the Orono, Portland and Gorham campuses with the Alumni Hall facilities. A number of courses at Orono and Portland-Gorham are taught, in part, by television, utilizing both cable and 2500 megahertz closed circuit systems. Cable systems exist on both the Orono and Portland campuses, while 2500 megahertz systems service the University of Maine at Bangor and the Portland-Gorham campuses.

The network radio and television operations offer students an excellent opportunity for part-time employment and training in the broadcast fields.

Personnel

EMERITI

ASHMAN, ROBERT IRVING (1930-1957); A.B., Cornell University, 1913; M.F., Yale, 1929; Sc.D., Maine, 1957; Professor Emeritus of Forestry.

BAILEY, RUSSELL MANLEY (1931-1967); B.S., Maine, 1928; Associate Professor Emeritus of Genetics.

BAKER, GREGORY (1935-1968); B.S., Maine, 1924; M.F., Yale, 1939; Professor Emeritus of Forestry.

BENNETT, CLARENCE EDWIN (1934-1970); Ph.B., Brown, 1923; Sc.M., 1924; Ph.D., 1930; Professor Emeritus of Physics.

BEVERLY, VERNE CURTIS (1923-1956); B.S., Maine, 1920; County Agent Emeritus.

BEYER, FRANK KEMP (1947-1968); B.S., Cornell University, 1929; M.S., University of Wisconsin, 1930; Associate Professor Emeritus of Forestry.

BOGAN, EDGAR JUNIOR (1929-1968); A.B., Miami (Ohio), 1926; A.M., Princeton, 1929; Ph.D., Ohio State, 1947; Professor Emeritus of Chemistry.

BONNEY, LUTHER ISAAC (1957-58); B.A., Bates, 1906; M.A. (Hon.), 1951; Sc.D. in Ed., Maine, 1959; Dean Emeritus, University of Maine in Portland.

BRANN, BERTRAND FRENCH (1909-1953); B.S., Maine, 1909; M.S., 1911; S.M., Massachusetts Institute of Technology, 1912; Professor Emeritus of Chemistry.

BRICKER, HERSCHEL LEONARD (1928-1970); A.B., Coe, 1928; Professor Emeritus of Speech.

BRIWA, KATHRYN ELIZABETH (1941-1960); A.B., Vassar, 1915; M.A., Columbia, 1929; Ph.D., 1940; Nutrition Specialist Emerita.

BRUSH, EDWARD NEWCOMB (1928-1970); A.B., Vermont, 1925; A.M., Harvard, 1926; Ph.D., 1932; Professor Emeritus of Psychology.

BUZZELL, MARION STEPHANIE (1919-1958); B.A., Maine, 1914; M.A., 1915; Associate Professor Emerita of Romance Languages.

CLAPP, ROGER (1929-1969); B.S., Cornell University, 1928; M.S., Maine, 1932; Associate Professor Emeritus of Ornamental Horticulture.

CLAYTON, MARY MORRIS (1934-1956); B.S., Columbia, 1918; M.S., Rochester, 1926; Ph.D., 1929; Nutritionist Emerita.

COMEGYS, ESTHER (1941-1960); B.A., Wellesley, 1921; M.A., University of Pennsylvania, 1926; Ph.D., Radcliffe, 1941; Associate Professor Emerita of Mathematics.

COOK, ARLIN MILLER (1930-34) (1959-1970); A.B., Western Reserve, 1927; M.A., Columbia, 1928; Associate Professor Emeritus of Speech.

CORBETT, RALPH ASHTON (1930-1966); B.S., Maine, 1930; M.S., Wisconsin, 1949; Extension Dairy Specialist Emeritus.

CRABTREE, KENNETH GERARD (1926-1964); S.B., Massachusetts Institute of Technology, 1923; P.E., (Maine); Professor Emeritus of Electrical Engineering.

CRANE, PERCY FREMONT (1936-1958); B.S., Bowdoin, 1917; Director of Admissions Emeritus.

CRAWFORD, JOHN RAYMOND (1930-1962); B.A., Culver-Stockton, 1924; M.A., State University of Iowa, 1929; Ph.D., 1931; Professor Emeritus of Education.

CREAMER, WALTER JOSEPH (1919-1961); B.S., Maine, 1918; E.E., 1921; B.A., 1923; Professor Emeritus of Communication Engineering.

CROSBY, RUTH (1929-1962); A.B., Mount Holyoke, 1919; A.M., Radcliffe, 1920; Ph.D., 1929; Professor Emerita of English.

CROSSLAND, CHARLES EDWARD (1917-1961); B.S., Maine, 1917; LL.D., 1962; Vice President for Administration Emeritus.

CURTIS, THEODORE SMALL (1930-1966); B.S., Maine, 1923; Faculty Manager of Athletics Emeritus.

DAY, CLARENCE (1913-1953); M.S., Maine, 1929; Extension Editor Emeritus.

DIRKS, CHARLES ORVILLE (1927-1960); B.S., Kansas State College, 1924; M.S., Iowa State College, 1925; Ph.D., Cornell University, 1935; Professor Emeritus of Entomology.

DOTEN, HENRY LEROY (1939-1964); B.S., Maine, 1923; C.E., 1942; P.E., (Maine); Business Manager Emeritus.

DOUGLASS, IRWIN BRUCE (1940-1970); B.S., Monmouth College, 1926; Ph.D., Kansas, 1932; Sc.D., Monmouth College, 1958; Professor Emeritus of Chemistry.

DOW, EDWARD FRENCH (1929-1969); B.S., Bowdoin, 1925; A.M., Harvard, 1926; Ph.D., 1932; Professor Emeritus of Government.

DOW, GEORGE FARRINGTON (1927-1969); B.S., Maine, 1927; M.S., 1929; Ph.D., Cornell University, 1938; Director Emeritus of the Maine Agricultural Experiment Station.

EASTMAN, CHARLES LESLIE (1925-1966); B.S., Maine, 1922; Extension Agent Emeritus

EDWARDS, HERBERT JOSEPH (1947-1969); B.A., Ohio State, 1923; A.M., Princeton, 1927; Ph.D., Ohio State, 1930; Professor Emeritus of English.

EVANS, WESTON SUMMER (1923-1962); B.S., Maine, 1918; M.S., 1923; Sc.D., 1962; P.E. (Maine); Dean Emeritus of Technology.

FIFE, HILDA MARY (1946-1969); A.B., Colby, 1926; A.M., Cornell University, 1933; Ph.D., 1941; Professor Emerita of English.

FOLSOM, DONALD (1918-1957); A.B., Nebraska, 1912; M.A., Minnesota, 1914; Ph.D., 1917; Plant Pathologist Emeritus.

FOSTER, FRANK CLIFTON (1947-1960); B.S., Colby, 1916; B.D., Union Theological Seminary, 1924; M.A., Columbia, 1924; Ph.D., 1933; Professor Emeritus of Education.

GANNETT, JAMES ADRIAN (1908-1953); B.S., Maine, 1908; M.A., (Hon.), 1928; Registrar Emeritus.

GREENE, PEARL STUART (1923-1948); B.A., Northwestern, 1909; B.S., Lewis Institute, 1914; A.M., Columbia, 1923; Professor Emerita of Home Economics.

HALL, HOWE WIGGINS (1923-1956); B.S., Maine, 1914; M.S., 1925; Assistant Professor Emeritus of Animal Husbandry.

HANKINS, JOHN ERSKINE (1956-1970); B.A., University of South Carolina, 1924; M.S., 1925; Ph.D., Yale University, 1929; Professor Emeritus of English.

HAUCK, ARTHUR ANDREW (1934-1958); A.B., Reed, 1915; Ph.D., Columbia, 1932; LL.D., Lafayette, 1936; LL.D., New Hampshire, 1937; LL.D., Rhode Island,

1943; LL.D., New Brunswick, 1943; LL.D., Reed, 1946; LL.D., Bowdoin, 1947; LL.D., Boston University, 1948; L.H.D., Bates, 1950; L.H.D., Nasson College, 1952; L.H.D., University of Florida, 1953; LL.D., University of Kentucky, 1953; Litt.D., Colby, 1953; LL.D., Maine, 1958; President Emeritus.

HAWLEY, HENRY CHARLES (1946-1965); A.B., Oberlin, 1923; M.B.A., Harvard, 1925; D.C.S., 1930; Professor Emeritus of Business and Economics.

HITCHNER, ELMER REEVE (1922-1959); B.S., Pennsylvania State, 1915; M.S., 1916; Ph.D., Wisconsin, 1931; Professor Emeritus of Bacteriology.

HYLAND, FAY (1926-1965); M.S., Michigan State College, 1925; M.S., Maine, 1929; Sc.D., 1965; Professor Emeritus of Botany.

IBBOTSON, LOUIS TAPPE (1928-1963); A.B., Hamilton, 1922; B.L.S., New York State Library School, 1925; Librarian Emeritus.

JENNESS, LYLE CLAYTON 1923-1966); B.S., New Hampshire, 1922; M.S., Maine, 1925; P.E., (Maine); Sc.D., N. H., 1966; Professor Emeritus of Chemical Engineering.

JOHNSON, JUSTIN OLEY (1958-1960); B.S., Colby, 1927; Assistant Professor Emeritus of Mathematics, University of Maine, Portland.

JORDAN, MAYNARD FRED (1917-18; 1919-21; 1925-60); B.A., Maine, 1916; M.A., 1921; Professor Emeritus of Astronomy.

LATHROP, FRANK HEIDMAN (1934-1954); B.S., Clemson, 1913; M.S., Ohio State, 1915; Ph.D., 1923; Entomologist Emeritus.

LENGYEL, HELEN ANNA (1924-1949); Diploma, Sargent School for Physical Education, 1915; B.A., Maine, 1927; M.A., 1936; Professor Emerita of Physical Education.

LEVINSON, RONALD BARTLETT (1926-1962); A.B., Harvard, 1919; Ph.D., Chicago, 1924; L.H.D., Maine, 1962; Professor Emeritus of Philosophy.

LUCAS, WARREN STANHOPE (1920-1958); B.A., Maine, 1914; M.A., 1922; Professor Emeritus of Mathematics.

MARTIN, FREDERICK THURMAN (1934-1969); Ch.E., Lehigh University, 1925; Ph.D., Johns Hopkins, 1929; P.E., (Maine); Professor Emeritus of Chemistry.

MERCHANT, CHARLES HENRY (1924-1962); B.S., Cornell University, 1920; M.S., 1922; Ph.D., 1928; Professor Emeritus of Agricultural Economics.

MILES, KATHERINE ADELE (1946-1969); B.A., Ohio State University, 1925; B.S., in Ed., 1925; M.A., 1927; Ph.D., University of Minnesota, 1945; Professor Emerita of Child Development.

MONROE, MERNA MYRTHA (1931-1966); B.S., Iowa State, 1929; M.S., Kansas State, 1932; Associate Professor Emerita of Housing.

MURRAY, JOSEPH MAGEE (1934-1970); B.A., Maine, 1925; M.A., University of Michigan, 1927; Ph.D., 1929; Dean Emeritus of Arts and Sciences and Professor Emeritus of Zoology.

MUSGRAVE, MARGUERITE RUTH (1929-1962); B.S., Columbia, 1925; A.M., 1926; Lecturer Emerita in Design.

NASON, ESTELLE (1922-1957); B.S., Maine, 1922; Home Demonstration Agent Leader Emerita.

OTTO, CARL EVERETT (1924-1961); B.A., Cincinnati, 1916; M.A., 1920; Ph.D., 1922; Associate Professor Emeritus of Chemistry.

PLUMMER, BERNIE ELLIOTT, JR. (1925-1968); B.S., Maine, 1924; M.S., 1925; Professor Emeritus of Biochemistry.

PRAGEMAN, IRVING HENRY (1927-1962); Ph.B., Yale, 1918; M.E., 1923; P.E. (Maine); Professor Emeritus of Mechanical Engineering.

QUINSEY, DONALD LEROY (1942-1969); B.S., University of Illinois, 1924; M.S., 1932; Ph.D., 1935; Professor Emeritus of Psychology.

RANKIN, ROME (1947-1967); M.A., University of Michigan, 1934; Ph.D., University of Kentucky, 1948; Professor Emeritus of Physical Education.

SCHRUMPF, WILLIAM ERNEST (1928-1958); B.S., Maine, 1928; M.S., 1930; Associate Agricultural Economist Emeritus.

SHEIVE, LUCY FARRINGTON (1927-36) (1943-45) (1956-69); B.S., Maine, 1927; Consumer Marketing Agent Emerita.

SHIBLES, LOANA SPEARIN (1946-1961); Castine Normal, 1926; Club Agent Emerita.

SMALL, GEORGE WILLIAM (1929-1956); B.A., Tennessee, 1915; M.A., Johns Hopkins, 1921; Ph.D., 1922; B.Litt., Oxford, 1927; Professor Emeritus of English Language and Literature.

SMITH, HARRY WOODBURY (1912-1952); B.S., Maine, 1909; M.S., 1922; Ph.D., Rutgers, 1934; Professor Emeritus of Biochemistry.

SNYDER, MARY ELLA (1936-1962); A.B., Gooding College, 1919; M.S., Iowa State College, 1936; Associate Professor Emerita of Food and Nutrition.

SPARROW, THERON ALONZO (1926-1964); B.S., Maine, 1924; M.S., 1938; P.E. (Maine), Professor Emeritus of Mechanical Engineering.

STEINMETZ, FERDINAND HENRY (1922-1954); B.S., Illinois, 1915; M.S., Minnesota, 1921; Ph.D., 1926; Pd.D., Eastern Illinois State College, 1949; Professor Emeritus of Botany.

SWEETMAN, MARION DEYOE (1927-1961); B.S., Iowa State College, 1921; M.S., 1922; Ph.D., Minnesota, 1927; Professor Emerita of Home Economics.

SWIFT, HAROLD CLAYTON (1920-1961); B.S., Maine, 1918; M.S., 1923; Associate Professor Emeritus of Agricultural Engineering.

TODD, FRANK HAROLD (1946-1970); B.S., Bowdoin, 1935; M.A., Maine, 1936; Associate Professor Emeritus of Physics.

TURNER, ALBERT MORTON (1922-1956); A.B., Harvard, 1912; A.M., 1914; Ph.D., 1920; Professor Emeritus of English and Comparative Literature.

VIRTUE, CHARLES FRANKLIN (1946-1968); B.A., University of Cincinnati, 1925; Ph.D., Yale, 1933; Professor Emeritus of Philosophy.

WALLACE, STANLEY MOORE (1922-1959); Diploma, New Haven School of Gymnastics, 1917; Professor Emeritus of Physical Education.

WATSON, HARRY DEXTER (1920-1961); B.S., Maine, 1920; M.S., 1929; P.E. (Maine); Professor Emeritus of Mechanical Engineering.

WEBSTER, FRED LOT (1944-1961); County Agent Emeritus.

WHITMORE, ALBERT AMES (1915-1949); B.S., Maine, 1906; M.A., 1917; Professor Emeritus of History.

WHITNEY, WALTER REGINALD (1928-1933; 1935-1965); B.S., Bowdoin, 1923; A.M., Harvard, 1935; Professor Emeritus of English.

WILSON, EDITH GRACE (1931-1970); B.A., Southern California, 1923; M.A., 1928; Dean of Women Emerita.

NAMED PROFESSORSHIPS

Adelaide C. Bird and Alan L. Bird Professor of American History, DR. ARTHUR M. JOHNSON.

Louis Calder Professor of Pulp and Paper Technology, MR. LOWELL ZABEL.

Lloyd H. Elliott Professor of English (position vacant).
D. S. Gottesman Research Professor of Pulp and Paper Technology, Dr. Edward Bobalek.
John Homer Huddilston Professor of Art, Mr. Vincent A. Hartgen.
Maine Bankers Association Professor of Finance, Dr. Norris O. Johnson.
Nicholas M. Salgo Professor of Business Administration, Dr. Robert E. Jensen.
Arthur O. Willey Professor of Mechanical Engineering, Dr. Ashley S. Campbell.

PERSONNEL*

(Dates in parentheses indicate year of initial appointment)

Abbott, Walter Hicks (1960); B.S., Maine, 1958; M.S. in Ed., 1965; Assistant Professor of Physical Education and Head Football Coach.

Abelson, Robert M. (1967); B.S., Queens College, 1952; M.S., Virginia Polytechnic Institute, 1954, Ph.D., Boston University, 1961; Associate Professor of Psychology.

Acheson, James Michael (1968); B.A., Colby College, 1962; Assistant Professor of Anthropology.

Adams, Graham Clevearn (1966); A.B., University of North Carolina, 1961; M.A., Indiana University, 1966; Instructor in English.

Ahrens, William C. (1968); B.A., University of Maine, 1965; M.L.S., Long Island University, 1968; Assistant University Librarian for Public Services; Assistant Professor of Library Service.

Akeley, Robert Vinton (1969); B.S., Maine, 1937; M.S., 1942; Sc.D. (Hon.), 1967; Associate Professor of Horticulture.

Albion, Robert G.; A.B., Bowdoin, 1918; M.A., Harvard, 1920; Ph.D., 1924; Visiting Professor of History.

Allen, Kenneth William (1963); B.S., Wheaton College (Illinois), 1952; M.S., Maine, 1956; Ph.D., Rice University, 1959; Professor and Chairman, Department of Zoology.

†Alpander, Guvenc G. (1965); B.A., Middle East Technical University, Ankara, Turkey, 1962; M.P.A., Michigan State University, 1963; Ph.D., 1966; Associate Professor of Management, College of Business Administration.

Ames, David Merton (1968); B.S., University of Maine, 1967; M.Ed., 1968; Instructor in Physical Education for Men.

Andersen, Charles Lowell (1955); B.A., University of Utah, 1949; M.A., 1951; Assistant Professor of English.

Anderson, Maple Ruth (1968); B.S., Paul Quinn College, 1961; Administrative Officer, University Libraries.

Anderson, Janet Rae (1966); B.A.E., Wayne State College, 1963; M.Ed., Maine, 1967; Assistant Professor of Physical Education, Women's Division.

Annis, Cecil Herbert, Jr. (1964); B.S., Kansas State University, 1959; Extension Agent (Waldo County); Cooperative Extension Service.

Antonitis, Joseph John (1950); A.B., Indianna University, 1946; A.M., Columbia, 1947; Ph.D., 1950; Professor of Psychology.

Apgar, William Peter (1963); B.S., Rutgers, 1954; M.S., 1961; Ph.D., 1963; Associate Professor of Animal Sciences.

† On leave of absence, 1970-71.

ARMS, CHADWICK CUMMINGS (1964); B.S., Vermont, 1951; M.S., 1960; Area Dairy Specialist, Cooperative Extension Service.

ASHLEY, MARSHALL DOUGLAS (1969); B.S., Maine, 1965; M.S., 1968; Ph.D., Purdue University, 1969; Assistant Professor of Forest Resources.

AXFORD, ROGER W. (1968); A.B., Nebraska Wesleyan University, 1942; M.A., University of Chicago, 1949; Ph.D., 1961; Coordinator of Adult Education, Continuing Education Division; Associate Professor of Adult Education.

BAGGETT, DANA RICHARD (1965); B.A., Maine, 1955; M.G.A., University of Pennsylvania, 1959; Director, Bureau of Public Administration.

BAILEY, ANDREW D. JR. (1970); B.S., Minnesota, 1964; M.S., 1966; Assistant Professor of Accounting.

BAILEY, DONALD WAYNE (1969); B.S., University of California (Berkeley), 1949; Ph.D., 1953; Lecturer in Zoology (Jackson Laboratory).

BAILEY, THOMAS EDWARD, JR. (1968); B.A., Fordham University, 1964; M.A., Queens College, 1966; Instructor in English.

BAIN, WILLIAM MURRAY (1959); A.B., Indiana University, 1951; M.A., 1953; Ph.D., 1959; Associate Professor of Microbiology.

BAKER, WILLIAM J. (1970); B.A., Furman University, 1960; B.D., Southeastern Seminary, 1963; Ph.D., Cambridge University, 1967; Assistant Professor of History.

BALAKRISHNAN, V.K. (1970); M.A., Madras University, 1956; M.A., Wisconsin, 1965; Assistant Professor of Mathematics.

BALLINGER, JAMES ORLA (1969); B.S. in Ed., Maine, 1966; M.Ed., 1969; Instructor in Physical Education, Assistant and Freshman Coach of Track and Cross Country.

BANKS, RONALD FILLMORE (1963); B.S., Gorham State Teachers College, 1956; M.A., Maine, 1958; Ph.D., 1966; Associate Professor of History; Assistant to the President.

BARDEN, ALBERT ARNOLD, JR. (1946); A.B., Brown, 1932; Sc.M., 1934; Ph.D., Northwestern, 1941; Professor of Zoology.

BARR, RICHARD LORMOR (1968); B.S., Purdue University, 1964; M.S., University of Maine, 1968; Extension Agent (Franklin County); Cooperative Extension Service.

BARTLETT, MERRILL DAY (1958-59) (1961); B.A., Maine, 1952; M.A., 1958; Associate Professor of Business Administration; Assistant Dean, College of Business Administration.

BATES, EDWIN HILL (1953); B.S., Maine, 1937; M.S., University of Wisconsin, 1961; Director, Cooperative Extension Service; Director of Public Services.

BATTICK, JOHN FRANCIS (1964); A.B., Boston University, 1958; A.M., 1959; Ph.D., 1967; Assistant Professor of History.

BAUSCHATZ, PAUL C. (1969); B.S., Massachusetts Institute of Technology, 1957; M.A., Columbia, 1959; Assistant Professor of English.

BEAMESDERFER, JOHN WILLIAM (1947); B.S., Gettysburg College, 1932; M.S., University of Michigan, 1939; Ph.D., 1947; Professor of Chemistry.

BEITZELL, ROBERT EGNER (1967); B.A., Wesleyan University, 1952; M.A., Columbia, 1955; Ph.D., North Carolina, 1967; Assistant Professor of History.

BELL, HARRY ADELBERT (1956); B.S., Maine, 1949; Area Dairy Specialist, Cooperative Extension Service.

BELYEA, PAUL RAYMOND (1958); B.S., Maine, 1956; M.S., 1958; Associate Chemist, Department of Biochemistry, Agricultural Experiment Station.

BENNETT, AUSTIN EDWARD (1963); B.S. in Ed., University of Connecticut, 1951; M.Ed., Colorado State University, 1962; Community Development Specialist, Cooperative Extension Service.

BENNETT, JACOB (1963); A.B., Boston University, 1949; M.A., Columbia University, 1949; Ph.D., Boston University, 1960; Professor of English.

BENOIT, JOHN ROSAIRE (1966); B.S. in Ed., Maine, 1959; M.Ed., 1965; Assistant Director of Summer Session.

BENSON, FRED JOHN (1969); B.S., Western Illinois University, 1963; M.S., Southern Illinois University, 1965; Agricultural Business Management Specialist; Assistant Professor of Agricultural and Resource Economics.

BENTLY, MICHAEL DAVID (1969); B.S., Auburn University, 1963; M.S., 1965; Ph.D., University of Texas, 1969; Assistant Professor of Chemistry.

BERCE, LEWIS CHARLES (1966); B.S., Maine 1950; Extension Agent (Aroostook County), Cooperative Extension Service.

BILLINGTON, MURRAY R. (1961); B.S., Maine Maritime Academy, 1955; B.A., Maine, 1961; Director of Purchases.

BIRD, FRANCIS HOWE (1961);B.S., University of Michigan, 1936; Ph.D., University of California, 1948; Professor of Poultry Science.

BISCOE, JONATHAN (1946); B.S., Massachusetts Institute of Technology, 1931; M.S., 1932; Professor of Physics.

BISHOP, DAVID WINN (1962); B.S., Harvard, 1949; M.A., Maine, 1951; Ed.D., New York University, 1970; Associate Professor of Education.

BISHOP, JAMES JOSEPH (1970); B.A., Maine, 1961; M.A., Florida State, 1965; Instructor in English.

BISSELL, LEWIS PROUTY (1949); B.S., New Hampshire, 1940; M.F., Yale, 1947; Extension Forester, Cooperative Extension Service.

BLAISDELL, CORINNE MERRILL (1928-38) (1951); B.S., Farmington Normal, 1928; Extension Agent, (Penobscot County), Cooperative Extension Service.

BLAKE, JOHN MORTIMER (1961); B.S., Boston University, 1941; I.A., Harvard, 1943; Vice President for Finance and Administration.

BLAKE, STANLEY EARL, JR. (1968); B.S., Suffolk University, 1966; M.S., University of New Hampshire, 1968; Teaching Associate in Zoology.

BLAMBERG, DONALD LEE (1966); B.S., University of Maryland, 1954; M.S., 1956; Ph.D., 1960; Assistant Professor of Animal Sciences.

BLANKE, RICHARD DONALD (1969); B.A., San Fernando Valley State, 1963; M.A., University of California at Berkeley, 1964; Ph.D., 1970; Assistant Professor of History.

BLEASE, JOHN A. (1960); B.S., University of Rhode Island, 1960; Assistant Chemist, Department of Biochemistry, Agricultural Experiment Station.

BOBALEK, EDWARD GEORGE (1963); B.S., St. Mary's College (Winona, Minnesota), 1938; M.S., Creighton University, 1940; Ph.D., Indiana University, 1942; D.S. Gottesman Research Professor and Head, Department of Chemical Engineering.

BOLARIA, BHOPINDER SINGH (1965); B.A., Punjab University, India, 1955; M.A., 1958; M.A., Kansas State University, 1961; Ph.D., Washington State University, 1967; Assistant Professor of Sociology.

BOOKER, LILLIAN W. (1955); B.S., New Hampshire, 1937; Extension Agent (Kennebec County), Cooperative Extension Service.

BORNS, HAROLD WILLIAM, JR. (1955); B.S., Tufts, 1951; M.A., Boston University, 1955; Ph.D., 1959; Special Assistant to the President for Environmental Studies; Professor of Geological Sciences.

BOST, JAMES STEPHEN (1962); A.B., University of Illinois, 1947; A.M., 1951; Ph.D., Indiana University, 1961; Associate Professor of Speech.

BRADBURY, HARRY EDWARD (1958); B.S., Maine, 1954; M.S., Rutgers, 1956; Associate Chemist, Department of Biochemistry, Agricultural Experiment Station.

BRAGDON, FREDERICK EAGAN (1970); B.A., Connecticut, 1960; M.A.,Wyoming, 1963; Instructor in Geological Sciences.

BRESINSKY, HENRIK (1969); B.A., Western State College of Colorado, 1959; M.A., University of Wyoming, 1961; Ph.D., Arizona State University, 1969; Assistant Professor of Mathematics.

BRIGHTMAN, LLOYD ALLEN (1969); A.B., Brown, 1950; M.A., University of Rhode Island, 1958; Assistant Professor of Child Development.

BRIMMER, JACQUELINE DELOBEL (1964); Licence d'Anglais (licence d'enseignement), Universite de Lille, France, 1935; Diplôme d'études supérieures, 1937; Assistant Professor of French.

BROCKWAY, PHILIP JUDD (1935); B.A., Maine, 1931; M.A., 1940; Director, Career Planning and Placement.

BROGUNIER, JOSEPH EDWARD (1969); A.B., Brown University, 1958; M.A., Purdue University, 1964; Assistant Professor of English.

BROWN, CARLETON MERLE (1955); B.S., Maine, 1949; M.S., 1959; Associate Professor of Electrical Engineering.

BROWN, CECIL SANFORD (1953); B.S., New Hampshire, 1949; M.S., Cornell University, 1951; Ph.D., 1955; Professor of Agronomy.

BROWN, ELEESE VIRGINIA (1970); B.S., New Hampshire, 1963; M.A., University of Illinois, 1967; Assistant Professor of Art.

BROWN, ELLA CORINNE (1962); B.S., University of Missouri; 1949; M.A., Montana State University, 1961; Associate Professor of Physical Education, Women's Division.

BROWN, HAROLD HUSTON (1968); B.S., University of Maine, 1961; M.Ed., 1965; Extension Agent (Waldo County), Cooperative Extension Service.

BROWN, LEROY C. (1960; B.S., Maine, 1941; Area Poultry Specialist, Cooperative Extension Service.

BROWNSTEIN, KENNETH ROBERT (1965); B.S., Rensselaer Polytechnic Institute, 1957; Ph.D., 1966; Associate Professor of Physics.

BRUCE, DONALD MALCOLM (1967); B.S., Maine, 1960; M.Ed., 1967; Youth Education Specialist, Cooperative Extension Service.

BRUGMAN, HERMAN HENRY (1950); B.S.A., University of Manitoba, 1944; M.S., University of Minnesota, 1947; Ph.D., 1948; Associate Professor of Animal Sciences.

BUCK, CHARLES ELON (1951); B.S., North Dakota State College, 1942; M.S., 1947; Ph.D., Ohio State University, 1951; Associate Professor of Microbiology.

BUNKER, ROBERT, HILDING (1970); A.B., Massachusetts State (Lowell), 1967; Instructor in English.

BURKE, MELVIN (1966); B.A., Wayne State University, 1960; M.A., 1962; Ph.D., University of Pittsburgh, 1967; Associate Professor of Economics.

BURKE, THOMAS JOSEPH (1968); B.A., Nasson College, 1963; M.A.T., Brown University, 1967; Teaching Associate in Physics.

BURNHAM, GREGORY SMITH (1968); B.A., University of Colorado, 1961; Assistant Professor of Management, College of Business Administration.

BURNS, FRANCIS ROY (1969); B.S., Northern Michigan University, 1967; M.A., Western Michigan University, 1969; Instructor in Speech.

BURNS, WARREN T. (1968); A.B., Muhlenberg College, 1950; M.A., Penn. State University, 1963; Ph.D., 1969; Assistant Professor of Speech.

BUTTERFIELD, JOHN EVERETT (1955); B.S., Maine, 1953; Associate Professor of Physical Education, Head Baseball Coach, Assistant Freshman Football Coach.

BUTTON, LLOYD H., JR. (1954); B.S., Vermont, 1953; M.S., 1954; Area Dairy Specialist, Cooperative Extension Serbice.

BUTZOW, JOHN WILLIAM, JR. (1968); B.S., Saint Bonaventure University, 1961; M.S., 1963; Ed.D., University of Rochester, 1968; Assistant Professor of Education.

BYTHER, THOMAS ERNEST (1966); B.A., Ricker College, 1964; M.A., Maine, 1966; Assistant Professor of Mathematics; Operations Manager, Computing and Processing Center.

CAMP, PAUL RICE (1967); B.A., Wesleyan University, 1941; M.A., Harvard, 1947; Ph.D., Pennsylvania State University, 1951; Professor and Chairman Department of Physics.

CAMPANA, JEAN M. (1970); B.S., University of Maine, 1970; Head, Periodicals Division, Raymond H. Fogler Library.

CAMPANA, RICHARD JOHN (1958); B.S., University of Idaho, 1943; M.F., Yale, 1947; Ph.D., 1952; Professor of Botany.

CAMPBELL, ASHLEY SAWYER (1950-57) (1968); S.B., Harvard University, 1940; S.M., 1947; Sc.D., 1949; Arthur O. Willey Professor of Mechanical Engineering.

CARLSON, CONSTANCE HEDIN (1962); A.B., Vassar, 1937; M.A., Maine, 1945; Assistant Professor of English.

CARPENTER, ELAINE SHAW (1949); Alma College; Head, Circulation Division, Raymond H. Fogler Library.

CARPENTER, PAUL NATHANIEL (1943-44) (1946); B.S., Bates, 1933; M.S., Maine, 1949; Associate Professor of Agronomy, Agricultural Experiment Station.

CARR, EDWARD FRANK (1957); B.S., Michigan State University, 1954; Ph.D., 1954; Professor of Physics.

CARSTARPHEN, LINDA ANN (1968); B.A., University of Georgia, 1963; M.A., 1967; Assistant Professor of Political Science.

CARVILLE, LINWOOD LELAND (1960); B.S., Maine, 1953; M.E., 1954; Assistant Director of Physical Education and Athletics; Assistant Professor of Physical Education.

CASEY, ALLEN JAY, JR. (1969); B.A., Wake Forest College, 1964; M.A., 1965; Assistant Professor of History.

CASSIDY, MARGARET EILEEN (1937); Diploma, Sargent School of Physical Education, 1928; B.S. in Ed., Maine, 1939; Associate Professor of Physical Education, Women's Division.

CAUGHRAN, ALEX MADISON (1953-57) (1960); B.A., Drury College, 1937; M.Ed., University of Missouri, 1949; Ed.D., 1953; Professor of Education.

CAZDEN, NORMAN (1969); B.S., The City College of New York, 1943; A.M., Harvard University, 1944; Ph.D., 1948; Associate Professor of Music.

CECKLER, WILLIAM HERBERT (1969); B.S., University of Rochester, 1951; M.S., Massachusetts Institute of Technology, 1953; Sc.D., 1960; Associate Professor of Chemical Engineering.

CHADWICK, LEIGH EDWARD (1970); B.S., Haverford, 1925; M.A., Pennsylvania, 1929; M.A., Harvard, Ph.D., 1939; Visiting Professor of Entomology.

CHAPMAN, BEN ROBERTS (1956); B.S., Maine, 1952; M.S., 1963; Associate Professor of Mechanical Engineering.

CHAPMAN, DORIS VERNON (1967); B.A., Maine, 1958; M.A., 1960; Instructor in English.

CHAPMAN, KENNETH S. (1957); B.S., Maine, 1954; M.S., Vermont, 1956; Area Potato Specialist, Cooperative Extension Service.

CHAPPELLE, THOMAS NELSON (1968); B.S., Maine, 1962; Instructor in Physical Education; Assistant and Freshman Basketball Coach; Head Golf Coach.

CHASE, ANDREW JACKSON (1949); B.S., Maine, 1949; M.S., 1951; Professor of Chemical Engineering.

CHASE, GEORGE OSCAR; B.A., Duke University, 1947; M.D., 1951; Lecturer in Biochemistry.

CHEN, CHAO-WEN (1970); B.S., Tapei Institute of Technology, 1960; M.A., Alabama, 1966; Ph.D., 1969; Assistant Professor of Mathematics.

CHERRY, MARIANNA (1969); B.A., Wheaton College (Mass.), 1946; M.A., Bryn Mawr College, 1951; Ph.D., Yale University, 1964; Lecturer in Zoology (Jackson Laboratory).

CHERULNIK, PAUL DAVID (1969); B.A., SUNY (Buffalo), 1963; Assistant Professor of Psychology.

CHIAPPONE, ANTHONY DONALD (1967); B.S., SUCE, Geneso, New York, 1954; M.S., Syracuse University, 1961; Ed.D., 1963; Associate Professor of Education.

CHUTE, HAROLD LEROY (1949); D.V.M., University of Toronto, 1949; V.S., Ontario Veterinary College, 1949; M.Sc., Ohio State, 1953; D.V.Sc., Toronto, 1955; Professor of Animal Pathology, Agricultural Experiment Station; Director of Development.

CLARK, ALTON HAROLD (1968); B.A., Maine, 1961; M.S., University of Wisconsin, 1963; Ph.D., Cornell University, 1967; Assistant Professor of Physics.

†CLARK, DAVID HENRY (1963); B.A., University of Oklahoma, 1954; M.S., University of Wisconsin, 1960; Ph.D., 1962; Associate Professor of Economics.

CLARK, DOUGLAS L. (1970); A.B., Princeton, 1967; M.A., Indiana, 1968; Extension Agent, Cooperative Extension Service.

**CLARK, GORDON BAINE (1964); B.A., Rollins College, 1952; M.A., Maine, 1964; Assistant Professor of English, University of Maine, Augusta.

CLARK, JAMES MILFORD (1960); B.A., University of Michigan, 1952; M.A., University of the Philippines, 1955; Ph.D., University of Michigan, 1962; Associate Professor of Political Science, and Vice President for Academic Affairs.

†On leave of absence, 1970-71.

**On leave of absence, spring semester 1970-71.

CLARK, RUSSELL EMERY (1958); B.S., Maine, 1957; Extension Agent (Oxford County), Cooperative Extension Service.

CLIFFORD, GEORGE EDWIN (1946-51) (1954); B.S., Maine, 1943; M.S. in Education, 1951; (Maine); Professor of Mechanical Engineering.

COBB, ROBERT ARTHUR (1969); B.S., Springfield College, 1964; M.S., 1967; Assistant Professor of Physical Education.

COFFIN, VICTOR HALFORD (1943); B.A., Maine, 1931; M.S., 1948; Associate Professor of Physics.

COHEN, WILLIAM SEBASTIAN (1968); B.A., Bowdoin, 1962; LL.B., Boston University, 1965; Instructor in Business Administration (part-time).

COLBATH, JAMES ARNOLD (1968); B.S., Maine, 1948; M.A., Western Reserve University, 1950; M.F.A., 1951; Ph.D., 1962; Director of Maine Masque Theatre; Associate Professor of Speech.

COLLINS, EDWARD, JR. (1962); B.A., Marshall University, 1954; M.A., 1957; Ph.D., Emory University, 1959; Professor of Political Science.

COLLINS, MALVINA YERGER (1968); B. Mus., Texas, 1950; M. Mus., 1954; Instructor in Music (part-time).

COLLINS, ROBERT C. (1964); B.M., University of Texas, 1951; M.M., 1952; Associate Professor of Music.

COOK, HENRY J., JR. (1959); B.S., University of Rhode Island, 1952; M.S., 1957; Area Dairy Specialist, Cooperative Extension Service.

COOK, JAMES RICHARD (1963); B.S., Concord College, (Athens, West Virginia), 1950; M.S., West Virginia University, 1955; Ph.D., University of California (Los Angeles), 1960; Associate Professor of Zoology and Botany.

COOK, RICHARD ALFRED (1965); B.S., 1965; M.S., Maine, 1968; Assistant Nutritionist, School of Human Development, Agricultural Experiment Station.

COOK, WILLIAM PAUL (1964); B.S., Maine, 1964; Assistant Chemist, Department of Biochemistry, Agricultural Experiment Station.

**COOPER, GEORGE RAYMOND (1950); B.A., Colorado State College of Education, 1942; M.S., Iowa State, 1948; Ph.D., 1950; Professor of Botany.

CORCORAN, THOMAS JOSEPH (1961); B.S., Michigan College of Mining and Technology, 1955; M.S., Purdue, 1960; Ph.D., 1962; Professor of Forest Resources; Associate Director of Forestry and Forest Products, School of Forest Resources.

CORDELL, JOSEPH T; B.S., Michigan State University, 1949; V.M.D., University of Pennsylvania, 1953; Lecturer in Animal Sciences. (The Animal Medical Center, New York City).

COSKUNER, UMIT (1968); B.S., Lowell Technological Institute, 1967; Instructor in Chemical Engineering (Technical Institute Division) (part-time).

COTNOIR, RUSSELL CHARLES, SR. (1968); B.S., Bryant College, 1966; M.P.A., University of Rhode Island, 1968; Instructor in Public Administration, University of Maine, Augusta.

COULTER, MALCOLM WILFORD (1948); B.S., Connecticut, 1942; M.S., Maine, 1948; Ph.D., Syracuse University, 1966; Professor of Wildlife Resources, Associate Director of Wildlife, School of Forest Resources.

COUPE, JOHN DONALD (1958-61) (1962); B.S., Worcester Polytechnic Institute, 1953; M.A., Clark University, 1957; Ph.D., 1960; Professor of Economics; Chairman, Department of Economics.

**On leave of absence, spring semester 1970-71.

CRAM, GORDON WILBUR (1956); B.S., Maine, 1953; Assistant Chemist, Department of Biochemistry, Agricultural Experiment Station.

CRICHTON, MARY GERALDEAN (1968); B.S., Aroostook State Teacher's College, 1965; M.S., 1968; Instructor in Physical Education, Women's Division.

CROSBY, GEORGE HOWARD (1955); B.A., Colby, 1936; Registrar.

CROSBY, HOWARD ALVAH (1946); B.S., Maine, 1943; E.E., 1959; P.E. (Maine); Professor of Electrical Engineering.

CROXFORD, HORACE ALCANDER (1963); B.A., Maine, 1930; M.Ed., 1947; Assistant Professor of Education.

CSUPECZ, ANDREA MATILDA (1969); B.S., Fairleigh Dickinson, 1967; M.A., Maine, 1969; Instructor in English.

CUNNINGHAM, GEORGE SNOWDEAL (1962-63) (1967); B.A., Maine, 1933; M.Ed., 1958; Associate Professor of Mathematics.

CUSHMAN, PARKER GRINDELL (1940); B.S., Maine, 1931; Director of Physical Plant.

CYRUS, EDGAR ALLAN (1960); B.A., West Virginia University, 1958; M.A., Western Reserve University, 1960; M.F.A., 1966; Assistant Professor of Speech.

DAHL, JOHN IRWIN (1969); B.A., Minnesota, 1958; M.F.A., 1959; Assistant Professor of Design.

DALTON, DOROTHY BLANKER (1964); B.S., Tufts, 1943; Part-time Instructor in Family Economics; Assistant to the Director, School of Human Development.

DALTON, JOHN COLEMAN (1968); B.S., Boston University, 1950; M.A., Assumption College, 1965; Associate Professor of Business Management, University of Maine at Augusta.

DANFORTH, CHARLES D. (1970); B.Mus., Northern Conservatory of Music, 1963; M.Mus., Boston University, 1966; Assistant Professor of Music, University of Maine at Augusta.

DAS, KRUSHNA M. D.V.M., Bihar Veterinary College, 1946; M.S., Cornell University, 1960; Ph.D., 1962; Lecturer in Animal Sciences. (The Animal Medical Center, New York City.)

DAVIS, GEORGE THEODORE (1951); A.B., Pennsylvania State University, 1935; M.S., 1941; Ed.D., Harvard, 1950; Professor of Education.

DAVIS, WILLIAM EDMUND (1969); A.B., Providence College, 1958; M.S., University of Rhode Island, 1961; Ph.D., University of Connecticut, 1968; Assistant Professor of Education.

DAY, RICHARD B. (1956); B.S., Maine, 1942; Extension Agent (Franklin County), Cooperative Extension Service.

DEAN, DAVID (1966); A.B., Lehigh University, 1949; Ph.D., Rutgers, 1957; Professor of Zoology; Director of the Ira C. Darling Center for Research, Teaching and Service.

DEAN, LOUISE HENDY (1969); B.A., Douglass College, 1948; Center Librarian, Ira C. Darling Center.

DEARBORN, EVELYN ELLSWORTH (1966); B.A., Maine, 1949; M.L.S., University of Pittsburgh, 1965; Cataloger, Raymond H. Fogler Library.

DEARBORN, JOHN HOLMES (1966); B.A., University of New Hampshire, 1955; M.S., Michigan State University, 1957; Ph.D., Stanford University, 1965; Associate Professor of Zoology.

DEARBORN, VANCE EDWARD (1964); B.S., 1949; M.A., Maine, 1969; Public Affairs Specialist, Cooperative Extension Service.

DECKER, DAVID OWEN (1965); B.A., Marlboro College, 1960; M.A., New York University, 1964; Assistant Professor of Art; Acting Chairman, Department of Art.

DECOTEAU, RUTH CALLAGHAN (1934-1941) (1951); B.S., Maine, 1933; Extension Agent (Oxford County), Cooperative Extension Service.

DE HAAS, HERMAN (1959); B.S., Westminster College, 1947; M.S., University of Michigan, 1950; Ph.D., 1955; Associate Professor of Biochemistry.

DEHOFF, WILLIAM DAVID; B.S., Ohio State University, 1960; D.V.M., 1964; Lecturer in Animal Science. (The Animal Medical Center, New York City).

DELPHENDAHL, JOHANNES (1962); Dipl. Landw., University of Hohenheim, Germany, 1950; M.S., University of Massachusetts, 1956; Ph.D., Michigan State University, 1961; Associate Professor of Resource Economics.

DELPHENDAHL, RENATE (1967); B.A., Michigan State University, 1959; M.A., Maine, 1967; Assistant Professor of Latin and German.

DENTON, GEORGE HENRY (1969); B.S., Tufts University, 1961; M.S., Yale University, 1964; Ph.D., 1965; Associate Professor of Geological Sciences.

DESCHANES, BERNARD OLIVER (1957); B.S., Maine, 1955; M.S., 1962; Associate Professor of General Engineering.

DEVARNEY, RICHARD WILLIAM (1968); B.S. in Ed., Maine, 1966; Instructor in Physical Education, Assistant Football Coach; Freshman Baseball Coach.

DEVINE, WILLIAM III (1969); B.A., Maine, 1968; M.S., University of Illinois, 1969; Instructor in Speech.

DEVINO, WILLIAM STANLEY (1960); B.A., University of Vermont, 1951; M.A., University of Connecticut, 1953; Ph.D., Michigan State University, 1959; Professor of Business and Economics; Dean, College of Business Administration.

DEWITT, HUGH HAMILTON (1969); B.A., Stanford University, 1955; M.A., 1960; Ph.D., 1966; Assistant Professor of Zoology, Ira C. Darling Center.

DEWITT, ROBERT LEE (1968); B.A., University of New Brunswick, 1960; M.A., 1965; Assistant Professor of Sociology.

DICKEY, HOWARD CHESTER (1947); B.S., Michigan State, 1934; M.S., West Virginia University, 1936; Ph.D., Iowa State, 1939; Professor of Animal Sciences.

DIMOND, JOHN BARNET (1959); B.S., University of Rhode Island, 1951; M.S., 1953; Ph.D., Ohio State University, 1957; Associate Dean of Life Sciences and Agriculture; Professor of Entomology.

DOANE, JAMES W. (1970); A.B., Middlebury, 1964; Assistant Professor of Economics.

DOCKERY, CHARLES DWIN (1969); B.A., Earlham College, 1961; M.A., University of Iowa, 1963; Instructor in French.

DODGE, CLAYTON WILLARD (1956); B.A., Maine, 1956; M.A., 1959; Associate Professor of Mathematics.

DONNINI, MARY WRIGHT (1955); B.S., Maine, 1938; M.Ed., Boston University, 1964; Extension Agent (Cumberland County), Cooperative Extension Service.

DONOVAN, JOHN WILLIAM (1969); B.S., Husson, 1964; Extension Agent (Cumberland County), Cooperative Extension Service.

DOPHEIDE, WILLIAM RAYMOND (1968); B.S., Western Michigan University, 1952; M.S., Pennsylvania State University, 1955; Ph.D., Michigan State University, 1968; Director of Speech and Hearing Clinic; Associate Professor of Speech.

DOTY, CHARLES STEWART (1964); B.A., Washburn Municipal University, 1950;

M.A., University of Kansas, 1955; Ph.D., Ohio State University, 1964; Associate Professor of History.

DOUGLASS, RODNEY BLAINE (1968); B.A., University of Maine, 1965; M.S., Pennsylvania State University, 1967; Instructor in Speech.

DOWE, PAUL JONES (1948); B.S., Maine, 1948; Extension Agent (Androscoggin-Sagadahoc Counties), Cooperative Extension Service.

DRUMMOND, ROBERT JOHN (1969); A.B., Waynesburg College, 1949; A.M., Columbia University, 1952; A.M., Teachers College, Columbia University, 1956; Ed.D., 1959; Associate Professor of Education.

DUBE, GERALD FRELENCE (1964); B.A., Maine, 1963; M.A., 1964; Assistant Professor of Mathematics; Assistant Director, Computing and Processing Service.

DUBORD, OLIVE CONANT (1957); B.S., Maine, 1957; Extension Agent (Franklin County), Cooperative Extension Service.

†DUCHESNEAU, THOMAS D. (1967); A.B., St. Anselm's College, 1963; Ph.D., Boston College, 1969; Associate Professor of Economics.

DUFOUR, F. PHILIP (1966); B.A., Maine, 1957; Director, State Technical Services; Director Special Programs.

DUGGAN, PAUL WAYNE (1969); B.A., University of Maine, 1969; Head, Circulation Services, Raymond H. Fogler Library.

DULLEA, GERARD J. (1970); A.B., Boston College, 1965; M.A., Lehigh University, 1967; Instructor in English.

DUNHAM, PAUL CLINTON (1966); B.A., Vermont, 1959; M.A., 1963; Director of Institutional Research.

DUNHAM, WALLACE CLAYTON (1966); B.S., University of Vermont, 1952; M.S., Ohio State University, 1956; Associate Professor of Agricultural and Resource Economics.

DUNLAP, ROBERT DOWNING (1949); B.A., Colgate, 1943; M.S., Pennsylvania State University, 1944; Ph.D., 1949; Professor of Chemistry.

DUNNING, CLEMENT STEVENS (1947); B.S., Maine, 1947; Extension Agent (Cumberland County), Cooperative Extension Service.

DUNTON, EVERETT WILLIS (1968); B.S., Maine, 1950; Assistant Professor of Civil Engineering (Technical Institute Division).

DUPLISEA, ERIC A. (1969); B.S. in Ed., Kent State University, 1963; M.A., 1965; Assistant Professor of Education.

DURST, RICHARD EDWARD (1949); B.S., Otterbein College, Westerville, Ohio, 1929; Ph.D., Ohio State, 1948; P.E. (Ohio, Maine); Professor of Chemical Engineering.

EDE, ALAN WINTHROP (1960); B.S., Worcester Polytechnic Institute, 1955; M.S., Maine, 1963; Ph.D., Oregon State University, 1968; Associate Professor of Electrical Engineering.

EDGECOMB, ALICE DYER (1969); B.S., Farmington, 1965; M.S., Gorham, 1969; Extension Agent, (Cumberland County), Cooperative Extension Service.

EDGERTON, ROBERT FRANK (1968); B.S., University of Rochester, 1957; Ph.D., 1963; Associate Professor of Physics.

EGGERT, FRANKLIN PAUL (1949); B.S., Cornell University, 1942; M.S., 1947; Ph.D., 1949; Professor of Horticulture; Dean of Graduate School.

ELIAS, ROCHID JOSEPH (1965); B.A., Saint Francis College, 1963; M.A., Maine,

† On leave of absence, 1970-71.

1965; Assistant Professor of Mathematics, University of Maine at Augusta.

ELLIS, WILLARD R. (1968); B.S., Maine, 1968; Instructor in Agricultural Engineering.

EMERICK, RICHARD GIBBS (1958); B.A., Syracuse University, 1950; M.A., University of Pennsylvania, 1954; Ph.D., 1960; Professor and Chairman, Department of Anthropology; Director of the Anthropology Museum.

EPSTEIN, ELIOT (1960); B.S., New York State College of Forestry, 1951; M.S., Massachusetts, 1953; Ph.D., Purdue, 1955; Lecturer in Plant and Soil Sciences.

ERHARDT, WILFRED HENRY (1966); B.S., South Illinois University, 1958; M.S., University of Nebraska, 1961; Ph.D., University of Wisconsin, 1966; Vegetable Crops Specialist, Cooperative Extension Service.

ERSKINE, PAUL EDWARD; B.S., Maine, 1964; Part-time Instructor in Chemical Engineering, Technical Institute Division.

EVANS, CHERYL LYNN (1969); B.A., Maine, 1967; Associate Director, Upward Bound Program, Cooperative Extension Service.

EVANS, EMILY BLAIR (1968); B.S., Pennsylvania State University, 1938; M.S., 1943; Extension Agent, (Aroostook County-Fort Kent), Cooperative Extension Service.

EVANS, ROBERT E. (1968); B.S., Pennsylvania State University, 1938; M.S., 1946; Extension Agent, (Aroostook County-Fort Kent), Cooperative Extension Service.

EVES, HOWARD WHITLEY (1954); B.S., University of Virginia, 1934; M.S., Harvard, 1936; Ph.D., Oregon State College, 1948; Professor of Mathematics.

FARLOW, STANLEY JEROME (1968); B.S., Iowa State University, 1959; M.S., State University of Iowa, 1961; Ph.D., Oregon State University, 1967; Assistant Professor of Mathematics.

FARRAR, JOHN NORTH (1966); B.A., Maine, 1951; M.Ed., 1958; Assistant Director, Continuing Education Division (Portland), University of Maine Extension Service.

FARTHING, GENE WILLIAM, JR. (1969); B.A., Grinnell College (Iowa), 1965; M.A., 1967; Ph.D., University of Missouri, 1969; Assistant Professor of Psychology.

FEICHTINGER, OSKAR (1870); B.A., Wisconsin State University, 1961; M.A., Nebraska, 1964; Ph.D., Montana State, 1969; Assistant Professor of Mathematics.

FELL, GEORGE (1967); Lieutenant Colonel, Artillery, United States Army; B.A., Boston College, 1953; Professor of Military Science.

FELL, HOWARD BARRACLOUGH (1968); M.Sc., Victoria University, 1939; Ph.D., Edinburgh, 1941; D.Sc., 1949; Lecturer in Zoology (Harvard Museum of Comparative Zoology).

FENDERSON, CARLL NATHANIEL (1969); B.S., Maine, 1950; M.S., 1953; Associate Professor of Biology, University of Maine, Augusta.

FERGUSON, EDWARD NEIL (1970); B.S., Rensselaer Polytechnic Institute, 1961; M.A., University of Oregon, 1963; Ph.D., 1967; Assistant Professor of Mathematics.

FERLAND, GLORIA M. (1970); B.A., Maine, 1948; M.Ed., Boston University, 1953; Lecturer in Education.

FIELD, JOHN CLARK (1969); B.S., 1963; M.S., 1965; Ph.D., Northeastern University, 1969; Assistant Professor of Electrical Engineering.

FINK, LOYD KENNETH, JR. (1969); B.S., University of Illinois, 1961; Ph.D., Universiy of Miami, 1968; Assistant Professor of Geological Sciences, Ira C. Darling Center.

FITZGERALD, PETER HOPKINS (1966); A.B., Manhattan College, 1961; M.A., Maine, 1965; Instructor in English.

†FITZPATRICK, ROBERT JOHN (1965); A.B., Spring Hill College, 1963; M.A., 1964; Assistant Professor of French.

FLYNN, CARL MUNRO (1933-1936) (1940); B.A., Maine, 1930; M.A., Wesleyan, 1932; M.A., Harvard, 1939; Ph.D., 1940; Professor of Zoology and Assistant Dean, College of Arts and Sciences.

FOBES, KENNETH BROWN (1948); B.S. in Ed., Maine, 1949; Lecturer in Education and Assistant Dean of the College of Education.

FOLEY, KATHRYN ANN (1960); B.M., Manhattanville College, 1957; M.M., Villa Schifanoia, 1958; Assistant Professor of Music.

FOLGER, PHILIP EMMONS, JR. (1966); B.A., Middlebury College, 1962; Instructor in Physical Education, Head Coach of Skiing and Tennis, Freshman Soccer Coach.

FORSGREN, RODERICK ALFRED (1965); B.B.A., University of Minnesota, 1952; B.S., St. Cloud State, 1956; M.B.A., University of Denver, 1959; D.B.A., University of Colorado, 1965; Associate Professor of Management, College of Business Administration; Assistant Dean of the Graduate School.

FORSYTHE, HOWARD YOST, JR. (1969); B.S., Maine 1958; M.S., Cornell University, 1960; Ph.D., 1962; Associate Professor of Entomology.

FOX, RICHARD ROMAINE; B.S., University of Connecticut, 1956; M.S., University of Minnesota, 1958; Ph.D., 1959; Lecturer, Department of Animal Sciences (Jackson Laboratory).

FRASER, BARBARA JOAN (1969); B.S., Cornell University, 1956; M.Ed., Maine, 1968; Assistant Professor of Home Economics Education.

FREEMAN, STANLEY LEONARD, JR. (1952); B.A., Bates, 1948; M.A., Teachers College, Columbia University, 1950; Ed.D., 1957; Professor of Education; Assistant Chancellor for Academic Affairs.

FRENCH, PAULETTE (1969); B.A., Colby College, 1963; Certificat de Professeur de Français a l'étranger, University of Paris, 1964; M.A., University of Maryland, 1967; Instructor in Romance Languages.

FREY, ROGER BURNHAM (1960); B.A., 1956; M.A., 1960; Ph.D., Maine, 1966; Associate Professor of Psychology; Acting Director of University of Maine at Bangor.

FRIDINGER, WALTER PETER (1961); B.S., Lebanon Valley College, 1938; Center Director, Continuing Education Division at Portland; Acting Director, Continuing Education Division.

FRIEL, LEROY LAWRENCE (1970); B.S., West Virginia University, 1962; M.S., 1963; Assistant Professor of Civil Engineering.

FRISBIE, KENNETH MILLS; A.B., University of Delaware, 1930; M.Ed., Temple University, 1952; Lecturer in Education.

FUCHS, ARNOLD J.; B.A., Hunter College, 1958; Ph.D., Adelphi University, 1961; Lecturer in Psychology.

FUENTES, GREGORIO J. (1967); Litentiate in Mathematical Sciences, University of

† On leave of absence, 1970-71

Madrid, 1953; M.A., Rutgers University, 1966; Assistant Professor of Mathematics.

FURBER, CONAN PAUL (1966); B.S., Maine, 1961; M.S., 1966; Assistant Professor of Civil Engineering (Technical Institute Division).

GALBIS, IGNACIO RICARDO (1966); LL.D., University of Havana, 1952; M.A., Mississippi State University, 1966; Assistant Professor of Spanish.

GALL, ARTHUR (1965); B.S., North Dakota State University, 1951; M.S., 1964; Extension Entomologist, Cooperative Extension Service.

GARDNER, WOFFORD GORDON (1946); A.B., Southwestern College, 1935; M.A., Northwestern University, 1941; Ph.D., 1952; Professor and Chairman, Department of Speech.

GEIGER, WILLIAM ROGER (1965); B.E.S., Fenn College, 1961; M.S., Western Reserve University, 1964; Ph.D., 1965; Associate Professor of Mathematics.

GELINAS, DOUGLAS ALFRED (1968); B.S., Fitchburg State College, 1963; M.S., Purdue University, 1966; Ph.D., 1968; Assistant Professor of Botany.

GEORGITIS, WILLIAM J. (1956); B.S., Bowdoin, 1942; M.S., Maine, 1949; Associate Professor of Chemistry.

GERRY, RICHARD WOODMAN (1948); B.S., Maine, 1938; M.S., Purdue, 1946; Ph.D., 1948; Professor of Poultry Science.

GERSHMAN, ELAINE SONIA (1965); B.S., Maine, 1963; M.Ed., 1965; Assistant Professor of Psychology.

GERSHMAN, MELVIN (1958); B.Sc., Ohio State University, 1954; M.Sc., University of Massachusetts, 1957; Associate Professor of Bacteriology, Associate Professor of Animal Pathology, Agricultural Experiment Station.

GETCHELL, AMASA STANLEY (1942); B.S., Maine, 1938; M.S., 1940; Associate Professor of Chemistry, Agricultural Experiment Station.

GHIZ, RONALD GEORGE (1966); B.F.A., Massachusetts College of Art, 1964; M.F.A., Ohio University, 1966; Assistant Professor of Art.

GHOSH, MRIGANKA MOULI (1968); B. Tech., Indian Institute of Technology, 1958; M.S., University of Illinois, 1962; Ph.D., 1965; Assistant Professor of Civil Engineering.

GIBSON, RICHARD CUSHING (1967); S.B., Massachusetts Institute of Technology, 1942; S.M., 1946; Sc.D., 1953; Professor and Chairman, Department of Electrical Engineering.

GIDDINGS, EDWIN LATHROP (1946-48) (1968); B.S., Maine, 1933; M.F., Yale University, 1934; Associate Professor of Forest Resources.

GILBERT, FREDERICK F. (1968); B.Sc., Acadia University (Nova Scotia), 1965; M.Sc., University of Guelph (Ontario), 1966; Ph.D., 1968; Assistant Professor of Wildlife Resources.

GILLESPIE, JAMES DUFF (1950); B.S., Bradley University, 1949; M.A., 1951; Associate Professor of Speech.

GLANVILLE, ALBERT DOUGLAS (1937); A.B., Cornell University, 1927; M.A., Illinois, 1928; Ph.D., Cornell University, 1932; Professor of Psychology.

GOATER, JOHN CHARLES, JR. (1955); B.S., Virginia Polytechnic Institute, 1948; Livestock Specialist, Cooperative Extension Service.

GODWIN, ROBERT CHANDLER (1967); B.Mus., University of Jacksonville, 1956; M.Mus., Eastman School of Music, 1957; D.M.A. University of Illinois, 1966; Professor and Chairman, Department of Music.

GOLD, JOEL ARTHUR (1968); B.A., Toledo University, 1961; M.A., 1963; Ph.D., Colorado State University, 1966; Assistant Professor of Psychology.

GOLYA, THOMAS JOSEPH (1967); B.F.A., Kent State University, 1965; M.F.A., Ohio University, 1967; Assistant Professor of Art, University of Maine, Augusta.

GOODFRIEND, PAUL LOUIS (1966); B.S., The University of Virginia, 1952; Ph.D., Georgia Institute of Technology, 1957; Associate Professor of Chemistry.

GOODMAN, JEAN SALZMANN (1963); Ph.B., University of Wisconsin, 1942; M.S., University of Minnesota, 1963; C.P.A., State of Wisconsin, 1947; Associate Professor of Accounting, College of Business Administration.

GORHAM, JOHN FRANCIS (1953); B.S., Maine, 1950; M.S., 1952; Associate Professor of Chemical Engineering.

GORRILL, WILLIAM ROY (1948); B.S., Northeastern University, 1948; M.S., Maine, 1956; P.E., (Maine); Professor of Civil Engineering.

GOUIN, ARTHUR NELSON, JR. (1967); B.A., Maine, 1953; M.Ed., 1962; Extension Agent, Cooperative Extension Service.

GOULD, CHARLES SEWELL (1966); B.S., Rutgers, 1949; M.S., 1951; Extension Agent (Androscoggin-Sagadahoc Counties), Cooperative Extension Service.

GOULD, DONALD P. (1968); B.A., Maine, 1964; M.L.S., 1969; Coordinator of Technical Services, Raymond H. Fogler Library; Instructor in Library Service.

GRANT, CHARLES OSCAR (1962); B.A., Maine, 1958; Ph.D., University of Buffalo, 1962; Lecturer in Psychology; Director, Center for Counseling and Psychological Services.

GRANT, DONALD ANDREW (1956); B.S., Maine, 1956; M.S., 1963; P.E. (Maine); Ph.D., 1969; Rhode Island; Associate Professor of Mechanical Engineering.

GRANT, FREMA S. (1955); B.S., Farmington State Teachers College, 1929; Extension Agent (York County), Cooperative Extension Service.

GRANT, WALTER J. (1960); B.S., Maine, 1955; M.S., 1957; Collaborator in Agronomy (USDA).

GRAVES, ROBERT ALEXANDER (1959); M.D., University of Rochester, 1948; Director, Student Health Center.

GRAY, ASHLEY CLEMENT (1968); B.S., Farmington State College, 1952; M.Ed., Maine, 1955; Ph.D., University of Connecticut, 1967; Associate Professor of Education.

GRAY, DURWOOD EARL (1963); B.S., Maine, 1963; Extension Agent (Washington County), Cooperative Extension Service.

GRAY, GLEASON LINWOOD (1968); B.S., Maine, 1968; Instructor in Agricultural Engineering.

GREEN, BRIAN (1962-63) (1965); B.Sc., Liverpool University, England, 1956; Ph.D., 1959; Associate Professor of Chemistry.

GREEN, CHARLES ALLAN (1965); B.A., Ohio University, 1954; B.S., 1954; M.S., 1958; Ph.D., University of Wisconsin, 1964; Associate Professor of Mathematics.

GREEN, EDWARD J. (1971); B.A., University of California at Santa Barbara, 1958; Ph.D., Massachusetts Institute of Technology, 1965; Associate Professor of Geological Sciences, Darling Center.

GREENWALD, SARA ANN (1969); B.F.A., San Francisco Art Institute, 1964; M.S., Illinois Institute of Technology, 1967; Instructor in Art.

GREENWOOD, GEORGE WATKINS (1963); B.S., Maine, 1951; M.S., University of Illinois, 1960; Ph.D., 1963; Associate Professor of Civil Engineering.

GREGORY, RICHARD WALLACE (1969); B.S., Colorado State University, 1958; M.S., University of Washington, 1962; Ph.D., Colorado State, 1969; Assistant Professor of Zoology; Assistant Leader, Cooperative Fisheries Unit.

GRIFFIN, CONRAD WILSON (1963); B.S., University of Connecticut, 1955; M.S., Kansas State University, 1960; Extension Agent (York County), Cooperative Extension Service.

GRIFFIN, RALPH HAWKINS (1956); B.S., Virginia Polytechnic Institute, 1943; M.F., Yale University, 1947; D.F., Duke University, 1956; Professor of Forest Resources.

GROSS, JOHN FRANCIS (1968); B.S., University of Maine, 1968; Instructor in Mechanical Engineering.

GROSS, MARY LOUISE (1967); B.A., Stanford University, 1934; M.A., 1936; Lecturer in Spanish.

GROSS, STUART MURRAY (1948); A.B., Stanford University, 1932; M.A., 1936; Professor of Spanish.

GUSHEE, NELLIE IRENE (1966); B.S., Maine, 1962; M.S., 1966; Extension Specialist in Nutrition, Cooperative Extension Service.

GUTMAN, DANIEL (1968); B.S., City College of New York, 1946; License-es-Lettres, University of Paris, 1950; Associate Professor of Linguistics.

HAAS, MARY ANN (1965); B.A., Nemo State Teachers College, Missouri, 1954; M.A., 1955; Ph.D., University of Iowa, 1966; Associate Professor of Physical Education and Head, Women's Division.

HACKETT, EDWARD W., JR. (1963); B.A., Maine, 1952; M.Ed., 1953; Center Director, Continuing Education Division at Orono; Director of Summer Session at Orono; Acting Associate Director, Continuing Education Division.

HADLEY, ALTON LEON, III (1967); B.S., Maine, 1963; M.S., Massachusetts, 1966; Assistant Professor of Physical Education, Assistant Football Coach.

HAGGARD, GARY (1970); B.S., Seattle University, 1962; M.S., Purdue, 1964; Ph.D., 1968; Assistant Professor of Mathematics.

HAKOLA, JOHN WILLIAM (1959); B.A., Montana State University, 1950; M.A., 1951; Ph.D., Indiana University, 1961; Associate Professor of History.

HALE, RICHARD AUGUSTUS, II (1966); B.S., Maine, 1947; M.F., Yale University, 1948; Assistant Professor of Wood Technology.

HALL, AVAIRD EDWARD (1965); Instructor in Mechanical Engineering (Technical Institute Division).

HALL, BARBARA B. (1965); Assistant College Librarian, University of Maine at Augusta.

HALL, BRADFORD ALLYN (1962); B.A., Maine, 1955; M.Sc., Brown University, 1959; Ph.D., Yale, 1964; Associate Professor of Geological Sciences.

HALL, DOUGLAS AREY (1965); B.A., Maine, 1959; M.A., University of Colorado, 1965; Assistant Professor of German.

HALL, MILLARD WAYNE (1966); B.E., Vanderbilt University, 1962; M.S., University of Illinois, 1963; Ph.D., 1968; Associate Professor of Civil Engineering.

HALLEE, NEAL D. (1968); B.S., Maine, 1966; M.S., 1968; Agricultural Engineer (Marketing), Cooperative Extension Service.

HALLMAN, LUDLOW B. (1970); B. Mus., Oberlin, 1963; M. Mus., Southern Illinois University, 1965; Assistant Professor of Music.

HAMILTON, BROOKS WITHAM (1952); A.B., Bates, 1941; Professor of Journalism.

HAMILTON, KEITH EVERARD (1966); B.S.E.E., Rutgers University, 1960; M.S., University of Colorado, 1966; Assistant Professor of Electrical Engineering.

HAMILTON, WAYNE ANDREW (1960); B.S., Ohio Northern University, 1958; M.S., Case Institute of Technology, 1960; Ph.D., Oklahoma State University, 1967; P.E., (Ohio), (Maine), Professor and Chairman, Department of Civil Engineering.

HAMM, PHILLIP LORD (1952); B.S. in Ed., Maine, 1943; M.A., 1955; Associate Professor of Mathematics.

HAMMER, MAX (1969); B.S., City College of New York, 1956; Ph.D., University of North Dakota, 1961; Associate Professor of Psychology.

HANCOCK, RONALD LEE; A.B., University of Kansas City, 1952; M.D., University of Kansas, 1959; Lecturer in Biochemistry. (Jackson Laboratory).

HANNULA, THOMAS ANDREW (1966); B.S., University of Illinois, 1962; M.S., 1964; Ph.D., 1967; Associate Professor of Mathematics.

HARE, CLAYTON FREDERICK (1965); Royal Conservatory, Toronto; Royal Academy of Music, London; specialized music study in Europe; Fellow of International Institute of Arts and Letters; Lecturer in Music.

HARLAN, REGINALD KELSEY (1968); B.S., Texas Technical College, 1949; M.S., 1954; Ph.D., Ohio State University, 1961; Associate Professor of Agricultural and Resource Economics.

HARMON, GERALD STEARNS (1953-1956) (1962); B.A., Maine, 1953; M.S., 1956; Ph.D., Agricultural and Mechanical College of Texas, 1962; Associate Professor of Physics.

HARMON, JAMES ARNOLD (1946-1955) (1956); B.S., in Ed., Maine, 1940; Director of Admissions.

HARPER, JOHN FRANK, JR. (1960); B.S., United States Naval Academy, 1931; M.S., Purdue, 1960; Associate Professor of Astronomy and Mathematics.

HARRIGAN, JOHN EDWARD, JR. (1967); B.A., University of Hawaii, 1955; M.A., 1957; Extension Agent (Somerset County), Cooperative Extension Service.

HARRIMAN, EDWIN ALLAN (1965); B.S., Maine, 1959; Extension Agent (Somerset County), Cooperative Extension Service.

HARRIS, PAUL CHAPPELL (1959); B.Sc., McGill University, 1952; M.S., University of Maryland, 1956; Ph.D., 1960; Associate Professor of Poultry Science.

HART, JAMES EMMET (1968); B.S. in Ed., Ohio State University, 1960; M.A. in Ed., Ball State University, 1965; Ed.D., 1968; Assistant Professor of Education.

HARTGEN, FRANCES CAROLINE (1967); A.B., Syracuse University, 1937; M.Ed., Maine, 1953; Reference Librarian-Archivist, Raymond H. Fogler Library.

HARTGEN, VINCENT ANDREW (1946); B.F.A., University of Pennsylvania, 1941; M.F.A., 1942; John Homer Huddilston Professor of Art and Head of Department of Art.

HARTMAN, MARYANN (1969); B.A., Westminster College, 1949; M.A., Kent State University, 1965; Ph.D., Bowling Green State University, 1969; Assistant Professor of Speech.

HASBROUCK, SHERMAN ST. CLAIR (1966); B.A., Yale, 1950; M.P.A., The Maxwell School, Syracuse University, 1951; Master of Urban Studies, Yale, 1965; Community Development Specialist, Cooperative Extension Service.

HASKELL, STUART PHELPS, JR. (1957-65) (1966); B.A., Maine, 1956; Business Manager of Intercollegiate Athletics.

HATCH, RICHARD WALLACE (1962); B.S., Tufts University, 1950; M.S., Cornell University, 1956; Ph.D., 1959; Associate Professor of Zoology; Leader, Cooperative Fishery Unit.

HATHAWAY, BRUCE DRISKO (1970); B.A., Maine, 1966; M.A., University of Virginia, 1969; Instructor in Spanish.

HATLEN, BURTON NORVAL (1967); B.A., University of California at Berkeley, 1958; M.A., Columbia, 1959; M.A., Harvard, 1961; Assistant Professor of English.

HAYES, JAMES ARTHUR (1968); A.B., DePauw University, 1952; M.A., University of Chicago, 1959; Assistant Professor of German.

HAYES, KENNETH PHILBRICK (1965); B.A., Maine, 1960; M.A., Yale, 1963; Ph.D., University of Massachusetts, 1969; Associate Professor of Political Science.

HAYNES, JULIAN F. (1969); B.A., Rice University, 1960; Ph.D., Western Reserve University, 1964; Associate Professor of Zoology.

HAYS, HERMAN JOHN (1967); B.S., Columbia University, 1952; M.S., New York University, 1956; Assistant Professor of Mathematics.

HEALY, ELLIOTT LIVINGSTON, JR. (1969); B.A., University of Maryland, 1965; Instructor in English, University of Maine at Augusta.

HELMKE, JOHN (1968); B.S., 1966; M.A., Maine, 1970; Instructor in Political Science.

HENDERSON, JAMES STEPHEN (1969); B.A., Maine, 1965; M.A., Emory University, 1967; Ph.D., 1968; Assistant Professor of Political Science.

HEPLER, PAUL RAYMOND (1956); B.S., Michigan State College, 1948; M.S., University of Illinois, 1950; Ph.D., 1956; Associate Professor of Horticulture.

HERBOLD, ANTHONY E. (1970); B.A., Stanford, 1955; M.A., University of Michigan, 1960; Ph.D., 1963; Associate Professor of English.

HERLAN, JAMES JOHN (1966); A.B., Yale, 1957; M.A., Maine, 1967; Assistant Professor of French.

HERLIHY, GERALD MCMORROW (1970), B.S., Vermont, 1960; M.S., Long Island University, 1968; Director of ONWARDS.

HESS, CHARLES THOMAS (1969); B.A., Wabash College (Indiana), 1962; Ph.D., Ohio University, 1967; Assistant Professor of Physics.

HIDU, HERBERT (1970); B.S., Connecticut, 1949; M.S., Pennsylvania State University, 1960; Ph.D., Rutgers, 1967; Assistant Professor of Zoology, Darling Center.

HIGHLANDS, MATTHEW EDWARD (1935-1946) (1947); B.A., Maine, 1928; S.M., Massachusetts Institute of Technology, 1934; Ph.D., University of Massachusetts, 1951; Professor of Food Science.

HILBORN, MERLE TYSON (1935); B.S., Maine, 1932; M.S., 1934; Ph.D., Yale, 1940; Professor of Plant Pathology, Agricultural Experiment Station.

HILL, BERYL BARTON (1945-51) (1958); B.S., Massachusetts State University, 1940; Extension Agent (Androscoggin-Sagadahoc Counties), Cooperative Extension Service.

HILL, RALPH ARTHUR (1957); B.S., Maine, 1928; M.S., Vermont, 1930; Ph.D., Columbia, 1942; Research Associate in Chemistry.

HILL, RICHARD CONRAD (1946); B.S., Syracuse, 1941; P.E. (Maine); Professor of

Mechanical Engineering; Director, Technology Honors Program; Director, Department of Industrial Cooperation.

HJELM, RALPH OSCAR (1969); B.A., Upsala College, 1944; B.D., Augustana Theological Seminary, 1947; S.T.M., Union Theological Seminary, 1949; Ph.D., Harvard University, 1954; Professor of Philosophy.

HODGKINS, LAURENCE WHITNEY (1954); B.S., 1950; M.S., Maine, 1969; Extension Agent (Kennebec County), Cooperative Extension Service.

HOFSTRA, PETER CHARLES; A.B., Calvin College, 1939; M.D., University of Michigan, 1943; Lecturer in Animal Sciences. (The Animal Medical Center, New York City).

HOGAN, JEANNE LEFEVRE; B.A., Douglass College, Rutgers University, 1944; Reference Librarian, Interlibrary Loan, Raymond H. Fogler Library.

HOGAN, JOHN MATTHEW (1961); B.Sc., Rutgers, 1941; Ph.D., 1949; Professor and Head, Department of Food Science, Agricultural Experiment Station.

HOLBROOK, FREDERICK RANDALL (1970); B.S., New Hampshire, 1961; M.S., Massachusetts, 1962; Ph.D., 1967; Faculty Associate in Entomology.

HOLMES, EDWARD MORRIS (1965); A.B., Dartmouth, 1933; M.Ed., Maine, 1954; A.M., Brown, 1956; Ph.D., 1962; Professor of English.

HOLT, CHARLES FRANCIS (1963); B.S., Maine, 1950; M.S., Cornell, 1961; Field Program Coordinator, Cooperative Extension Service.

HOLYOKE, VAUGHN H. (1958); B.S., Maine, 1956; M.S., Rutgers, 1961; Crops Specialist, Cooperative Extension Service.

HOMOLA, RICHARD LOUIS (1966); B.S., Muhlenberg College, 1956; M.S., University of Vermont, 1962; Ph.D., University of Michigan, 1969; Assistant Professor of Botany.

HOOPER, ROGER BRAY (1964); A.B., Tufts University, 1950; M.A.L.S., Wesleyan University, 1960; M.A., Bowdoin, 1963; Associate Professor of Mathematics.

HOOVER, WILLIAM H. (1962); B.S., Pennsylvania State University, 1956; M.S., 1958; Ph.D., 1961; Associate Professor of Animal Sciences.

HOPKINS, HARRY SAUNDERS (1957); B.S., (Agr.), Maine, 1942; B.S., (Mech. Eng.), 1947; M.Ed., 1952; Assistant Professor of Mechanical Engineering.

HORAN, JAMES FRANCIS (1965); B.A., University of Connecticut, 1958; Assistant Professor of Political Science.

HOUGH, ELDRED WILSON (1969); B.S., University of Illinois, 1939; M.S., California Institute of Technology, 1941; Ph.D., 1943; Dean, College of Technology; Professor of Chemical Engineering.

HOWD, FRANK HAWVER (1959); A.B., University of Rochester, 1951; M.S., 1953; Ph.D., Washington State University, 1956; Associate Professor of Geological Sciences.

HOYLE, GARY BERTRAND (1970); B.A., Maine, 1969; Teaching Associate in Science, University of Maine at Augusta.

*HUFF, EDWARD REMICK (1966); B.S., Maine, 1952; M.S., 1966; Associate Professor of Agricultural Engineering.

HUNTER, JAMES HERBERT (1957); B.S., Maine, 1953; M.S., 1957; P.E. (Maine); Associate Professor of Agricultural Engineering, Agricultural Experiment Station, Presque Isle, Maine Potato Handling Research Center.

HUNTING, ROBERT STILWELL (1968); B.S., Boston University, 1938; M.A., 1939;

* On leave of absence, fall semester 1970-71.

Ph.D., Brown University, 1951; Professor and Chairman, Department of English.

HUQ, ABUL MOAZZAMUL (1969); B.A., Dacca University (East Pakistan), 1949; M.A., Harvard University, 1952; Ph.D., 1954; Professor of Economics.

HUTCHINSON, DIONE WILLIAMS; B.S., Maine, 1955; Part-time Instructor in Home Management and Foods, School of Human Development.

HUTCHINSON, FREDERICK EDWARD (1953); B.S., Maine, 1953; M.S., 1958; Ph.D., Pennsylvania State, 1966; Professor of Soils.

HUNTLEY, CHARLOTTE L. (1961); B.A., University of Maine, 1970; Head, Reserve Division, Raymond H. Fogler Library.

HYATT, STEPHEN (1962); B.A., Maine, 1957; M.S., Pennsylvania State University, 1961; Assistant Professor of Rural Sociology, and Extension Rural Sociologist.

ILLYN, TATIANA N. (1958); Degree of Chemist, Chemical Pharmaceutical Institute, Vinnitza, Russia, 1929; Master of Chemistry, 1936; Assistant Professor of Food Science, Agricultural Experiment Station.

IMHOFF, EDGAR ALLEN (1969); B.S., University of Utah, 1958; M.S., University of Wisconsin, 1967; Director of the Water Resources Center.

†IRONS, FRED H. (1967); B.E.E., Ohio State University, 1956; M.S.E.E., Massachusetts Institute of Technology; E.E., 1961; Associate Professor of Electrical Engineering.

ISMAIL, AMR ABDELFATTAH (1969); B.Sc., University of Cairo (Egypt), 1960; M.S., University of Massachusetts, 1965; Ph.D., Maine, 1969; Assistant Professor of Horticulture.

IVES, EDWARD DAWSON (1955); A.B., Hamilton College, 1949; M.A., Columbia, 1950; Ph.D., Indiana University, 1962; Professor of Folklore, Department of Anthropology.

JACOBS, RICHARD MORRIS (1963); B.A., Colorado State College, 1956; M.A., 1957; M.F.A., State University of Iowa, 1959; Ph.D., 1964; Associate Professor of Music.

JACOBS, SALLY COPE (1970); B.A., Colorado State, 1958; M.S., State University of Iowa, 1963; Instructor in Biochemistry (part-time).

JAEGER, GILBERT BEYER (1948); B.S., Cornell University, 1942; Area Poultry Specialist, Cooperative Extension Service.

JAMES, DAVID LEWIS (1969); B.A., Birkbeck College (London), 1965; M.A., University of British Columbia, 1967; Assistant Professor of English.

JARDINE, AUTICE (1965); B.S., Maine, 1952; M.Ed., 1957; Assistant Professor of Education.

JEFFREY, WILLIAM HARTLEY (1946); A.B., Drew, 1942; M.A., Universty of Michigan, 1944; Ph.D., University of Colorado, 1950; Professor of History.

JENSEN, ROBERT EUGENE (1968); B.S., University of Denver, 1960; M.B.A., 1961; Ph.D., Stanford University, 1965; Nicolas M. Salgo Professor of Business Administration, College of Business Administration.

JEWETT, LLOYD JAY (1956); B.S., 1956; M.S., Maine, 1959; Associate Professor of Business Management; Provost, University of Maine at Augusta.

JOHNSON, ARTHUR MENZIES (1968); A.B., Harvard College, 1944; M.A., 1948; Ph.D., Vanderbilt, 1954; University Professor of History.

† On leave of absence, 1970-71.

JOHNSON, EDWARD GARFIELD, JR. (1967); B.S., Ball State University, 1948; M.A., 1953; Ed.D., University of Toledo, 1967; Assistant Professor of Education.

JOHNSON, JEREMY E. (1968); B.S., Cornell, 1951; M.S., 1956; Director, Computing and Processing Service; Associate Professor of Mechanical Engineering.

JOHNSON, NORRIS OLIVER (1967); B.S., Syracuse University, 1927; M.A., Harvard, 1932; Ph.D., 1934; Maine Bankers Association Professor of Economics, College of Business Administration.

JOHNSON, RICHARD ANDREW (1963); B.S., Maine, 1954; M.S., 1960; Extension Agent (Piscataquis County), Cooperative Extension Service.

JOHNSON, STANLEY LLOYD (1969); B.S., Cornell University, 1956; Ph.D., 1965; Assistant Professor of Biochemistry.

JOHNSTON, EDWARD FRANKLIN (1954); B.S., Maine, 1953; M.S., Pennsylvania State University, 1955; Associate Professor of Agricultural and Resource Economics, Agricultural Experiment Station.

JORDAN, WESLEY DINGLEY (1965); B.S. in Ed., Maine, 1962; M.Ed., 1969; Assistant Professor of Physical Education and Head Athletic Trainer.

JUDD, WILLIAM JOSEPH (1968); B.S., State University of New York at Cortland, 1956; M.S., Syracuse University, 1966; Director of Audio Visual Services and Assistant Professor of Education.

JURENAS, ALGIRDAS (1968); Candidate of Philosophy, University of Vilnius, 1943; Th.D., Harvard, 1967; Assistant Professor of Philosophy, University of Maine at Augusta.

KAHN, ROBERT JOEL (1968); B.A., State University of New York at Buffalo, 1966; M.A., Middlebury College, 1968; Instructor in Spanish.

KAKALIK, JOHN SEWALL (1969); B.A., Michigan State University, 1965; Assistant Professor of Marketing.

KANDUTSCH, ANDREW AUGUST (1966); B.A., Ripon College, 1950; M.S., University of Wisconsin, 1952; Ph.D., 1954; Lecturer in Zoology (Jackson Laboratory).

KAPLAN, ARTHUR MARK (1958); B.A., Maine, 1949; M.A., Boston University, 1950; Ph.D., Cornell University, 1956; Professor of Psychology; Vice President for Student Affairs.

KAPLAN, DORIS F.; B.S., Pratt Institute, 1942; M.A., Teachers College, Columbia University, 1945; M.L.S., Maine, 1967; Reference Librarian (part-time), Raymond H. Fogler Library.

KEANE, ROBERT E. (1968); B.A., Maine, 1960; Director of Personnel (classified).

KEARNEY, HAROLD MORTON (1965); A.B., Colby, 1947; M.Ed., Boston University, 1959; Ed.D., 1962; Youth Education Specialist and Counseling Consultant (Upward Bound) Cooperative Extension Service.

KEENE, JAMES THURSTON (1960); B.S., Maine, 1960; M.S., 1968; Assistant Professor of General Engineering.

KENDA, WILLIAM VINCENT (1967); B.S., Northwestern University, 1964; M.F.A., University of Iowa, 1966; Instructor in English.

KEYO, HOWARD ARTHUR (1946); B.S., Boston University, 1931; Director of Department of Public Information and Central Services.

KING, FRANCIS RICHARD (1967); B.S., University of Massachusetts, 1957; M.S., 1963; Assistant Professor of Agricultural and Resource Economics.

KITTRIDGE, CHARLES W. (1955); B.S., Maine, 1949; Agricultural Engineer, Cooperative Extension Service.

KLINGE, ALBERT FREDERICK (1965); B.S., Purdue University, 1952; M.S., 1955; Ph.D., University of California, 1965; Professor of Agricultural Engineering.

KOCHER, FEDERICO (1969); Ing. Agronomo, University of Chile, 1958; M.S., Inter-American Institute of Agricultural Science, 1961; Ph.D., Rutgers, 1964; Associate Professor of Horticulture.

KONTIO, RAE CLARK (1961); B.S., Maine, 1958; Extension Agent (Kennebec County), Cooperative Extension Service.

KRALL, KENNETH BARNARD; A.B., Gettysburg College, 1959; M.S., Syracuse University, 1960; Part-time Instructor in Journalism; Director of Programming, State of Maine Educational Television Network.

KROFTA, RAYMOND NORBET (1966); B.S., University of Wisconsin, 1958; M.S., 1961; Ph.D., 1962; Associate Professor of Agricultural and Resource Economics.

KRUEGER, GEORGE CORWIN (1950); A.B., Reed, 1945; Ph.D., Brown, 1951; Professor of Physics.

KULBERG, GORDON ERIC (1966); B.S., Tufts, 1956; M.S., Iowa State University, 1958; Ph.D., Vanderbilt University, 1965; Associate Professor of Psychology.

KULBERG, JANET MARIE (1967); B.S., Iowa State University, 1955; M.A., Columbia University, 1957; Ph.D., George Peabody College; 1967; Assistant Professor of Psychology.

KUTSCHA, NORMAN PAUL (1968); B.S., Syracuse, 1959; M.S., Wisconsin, 1961; Ph.D., Syracuse, 1967; Assistant Professor of Wood Technology.

LABER, LARRY JACKSON (1970); B.S., Vermont, 1959; M.S., 1961; Ph.D., University of Chicago, 1967; Assistant Professor of Botany.

LAFFERTY, HELEN KATHLEEN (1968); B.S., Framingham State College, 1966; M.S., Cornell, 1968; Instructor in Textiles and Clothing.

LAKE, SUSAN GLIDDEN (1965); B.S., University of Massachusetts, 1932; M.S., Cornell University, 1952; Home Management Specialist, Cooperative Extension Service.

LANGFORD, ERIC SIDDON (1969); S.B., Massachusetts Institute of Technology, 1959; M.S., The State University, Rutgers, 1960; Ph.D., 1963; Associate Professor of Mathematics.

LANGILLE, ALAN RALPH (1967); B.Sc., MacDonald College of McGill University, 1960; M.S., University of Vermont, 1962; Ph.D., Pennsylvania State University, 1967; Assistant Professor of Agronomy.

LAWLER, FREDERICK CYRIL (1969); B.S., New Hampshire, 1934; Assistant Director, Juvenile Delinquency Advisory Study, Cooperative Extension Service.

LAWRENCE, ROBERT T. (1969); B.S., Husson, 1958; M.S., Maine, 1965; Instructor in Accounting (part-time).

LEACH, ROGER STANFORD (1963); B.S., Maine, 1952; M.S., Pennsylvania State University, 1954; Ph.D., 1956; Field Program Coordinator, Cooperative Extension Service.

LEBLANC, LORRAINE M. (1945); Head, Acquisitions Division, Raymond H. Fogler Library.

LEE, LIN (1966)); B.S., National Taiwan University, 1957; M.S., Michigan Technological University, 1961; Sc.D., Washington University (St. Louis), 1967; Associate Professor of Mechanical Engineeering.

LEMELIN, ROBERT ERNEST (1965); B.S., Southern Connecticut State College, 1959; M.A., University of Maryland, 1963; Ph.D., 1967; Assistant Professor of English.

LEONARD, DAVID E. (1970); B.S., Connecticut, 1956; M.S., 1958; Ph.D., 1964; Associate Professor of Entomology.

LEONARD, HERBERT ARTHUR (1939); B.S., Maine, 1939; M.S., Cornell University, 1950; Professor of Animal Sciences and Farm Manager.

LEPLEY, PAUL MICHAEL (1967); B.S., University of Michigan, 1955; M.Ed., Pennsylvania State University, 1961; Associate Professor of Physical Education.

LERNER, JOSEPH (1968); B.S., Rutgers University, 1963; Ph.D., 1967; Assistant Professor of Biochemistry.

LEWIS, MICHAEL HOWARD (1966); B.S., State University College, New Paltz, New York, 1963; M.A., Michigan State University, 1964; Assistant Professor in Art.

LIBBEY, WALDO MCCLURE (1944); B.S., Maine, 1943; S.M., Massachusetts Institute of Technology, 1951; Ph.D., Worcester Polytechnic Institute, 1969; Professor of Electrical Engineering.

LIBBY, MERTON EUGENE (1952); B.S., Maine, 1948; M.S., 1960; Extension Agent (Penobscot County), Cooperative Extension Service.

LIBBY, WINTHROP CHARLES (1934); B.S., Maine, 1932; M.S., 1933; LL.D., Ricker College, 1968; Professor of Agronomy; President.

LINDLOF, JOHN ALAN (1962); B.A., Yale, 1947; M.Ed., Temple University, 1953; M.Ed. in Science, University of New Mexico, 1960; Associate Professor of Education.

LITTLEFIELD, LYLE (1947-51) (1954); B.S., Maine, 1945; M.S., 1952; Assistant Professor of Ornamental Horticulture.

LITTLEFIELD, ROBERT HAROLD (1968); B.A., Colby College, 1960; M.A., Tufts University, 1963; Instructor in Physics.

LITTLEFIELD, RONALD GEORGE (1965); A.B., Colby, 1960; M.S., University of Massachusetts, 1963; Instructor in Physics.

LOCKE, PHILIP MOSIMAN (1968); B.S., Bluffton College, 1959; M.S., University of New Hampshire, 1964; Ph.D., 1967; Assistant Professor of Mathematics.

LÓPEZ MUÑOZ, JOSÉ LUIS (1969); Licenciado en Medicina, Madrid University, 1956; Ph.D., Lateran University (Rome), 1960; Assistant Professor of Spanish.

LOTSE, ERIK GUNNAR (1967); Agronomy, College of Agriculture, Uppsala, Sweden, 1953; Agronomie Licentiat, 1964; Associate Professor of Soil Chemistry.

LOVEITT, BURLEIGH PILLSBURY (1965); B.S., Fitchburg State Teachers College, 1940; M.Ed., Maine, 1957; Extension Agent (Cumberland County), Cooperative Extension Service.

LOVEJOY, MABEL KIRKPATRICK (1963); B.S., Maine, 1928; Extension Agent (Penobscot County), Cooperative Extension Service.

LOWELL, ROBERT EDWARD (1966); B.S., Lyndon Teachers College, 1957; M.S., University of Connecticut, 1959; Ph.D., 1969; Assistant Professor of Education.

LUNT, EMILY REBECCA (1967); B.S., Simmons College, 1926; Cataloger, Raymond H. Fogler Library.

LUSZCZYNYNSKI, LAURA BERENICE (1969); B.A., Wayne State University, 1962; Instructor in Romance Languages.

LUSZCZYNSKI, WALTER ROBERT (1969); B.A., Wayne State University, 1957; M.A., 1959; Ph.D., 1966; Associate Professor of French.

LUTZ, MARK A. (1970); B.S., University of California at Berkeley, 1966; M.A., 1967; Assistant Professor of Economics.

LYMAN, JOHN ROBERT (1948); B.S., Tufts College, 1947; P.E. (Maine); Professor of Mechanical Engineering.

MACCAMPBELL, BARBARA BARRETT (1957); B.A., Ohio Wesleyan, 1939; M.A., 1941; M.S.L.S., Western Reserve, 1950; Reference Librarian Documents, Raymond H. Fogler Library.

MACCAMPBELL, JAMES CURTIS (1957); B.A., Ohio Wesleyan, 1939; M.A., Ohio State University, 1946; Ph.D., 1957; M.S., Simmons College, 1962; University Librarian; Professor and Chairman, Department of Library Service.

MACDONALD, CLYDE W., JR. (1969); B.A., Bates, 1958; M.A., Maine, 1965; Instructor in Modern Society.

MCALICE, BERNARD JOHN (1967); B.S., University of Rhode Island, 1962; Ph.D., 1969; Assistant Professor of Zoology, Ira C. Darling Center for Teaching, Research and Service.

MCANDREW, WILLIAM JAMES (1969); B.A., York University (Toronto), 1967; Assistant Professor of History.

MCCLEAVE, JAMES DAVID (1968); A.B., Carleton College, 1961; M.S., Montana State University, 1963; Ph.D., 1967; Assistant Professor of Zoology.

*MCCLURE, MELVIN THEODORE (1961-62) (1965); B.A., Maine, 1957; M.S., University of Illinois, 1960; Ph.D., 1968; Associate Professor of Accounting, College of Business Administration.

MCCORMICK, BEVERLY H. (1969); B.A., Maine, 1967; M.A., 1969 Lecturer in English.

**MCCRUM, RICHARD CASWELL (1957); B.S., University of Arizona, 1951; M.S., Maine, 1953; Ph.D., University of New Hampshire, 1964; Associate Professor of Plant Pathology, Agricultural Experiment Station.

MCDANIEL, IVAN NOEL (1957); B.S., Eastern Illinois State College, 1951; M.S., 1951; Ph.D., University of Illinois, 1958; Associate Professor of Entomology, Agricultural Experiment Station.

MCGORRILL, ADELAIDE C. (1968); B.A., University of Maine, 1944; M.L.S., 1969; Cataloger, Raymond H. Fogler Library.

MCGUIRE, ROBERT GRAHAM (1967); B.A., Wayne University, 1941; M.A., 1942; Associate Professor of Communications, University of Maine at Augusta.

MCINTYRE, GARY ALLEN (1963); B.S., Oregon State College, 1960; Ph.D., 1964; Associate Professor of Plant Pathology; Chairman, Department of Botany and Plant Pathology.

MCKAY, EDGAR BURNHAM (1947); B.S., Colby, 1930; M.Ed., Maine, 1951; Associate Professor of Modern Society; Director of the New England Atlantic Provinces-Quebec Center.

MACKINNON, EWEN IAN STEWART (1967); B.S., Maine, 1961; Instructor in Physical Education; Head Wrestling Coach and Freshman Football Coach.

* On leave of absence, fall semester 1970-71.
** On leave of absence, spring semester 1970-71.

McNeary, Matthew (1937); B.S., Pennsylvania State, 1932; M.S., Maine, 1941; P.E. (Maine), Professor and Head of Department of General Engineering.

McReel, Nancy D. (1970); B.A., Vassar, 1944; A.B.L.S., University of Michigan, 1947; Reference Librarian, Raymond H. Fogler Library.

Madden, Carroll G. (1967); Instructor in Mechanical Engineering (Technical Institute Division).

Magaro, Peter Anthony (1968); B.S., Pennsylvania State University, 1959; M.A., University of Illinois, 1961; Ph.D., 1965; Associate Professor of Psychology.

Mairhuber, John Carl (1968); B.S., in M.E., University of Rochester, 1942; M.S., University of Rochester, 1950; Ph.D., University of Pennsylvania, 1959; Professor of Mathematics, and Head, Department of Mathemics and Astronomy.

Major, Charles Walter (1959); A.B., Dartmouth, 1948; M.S., University of Tennessee, 1954; Ph.D., 1957; Associate Professor of Zoology.

Major, Mary H. (1969); A.B., North Georgia College, 1947; M.S., Tennessee, 1950; Instructor in Zoology (part-time).

Maneker, Jerry Sam (1968); B.A., Adelphi University, 1963; M.A., New York University, 1966; Assistant Professor of Sociology.

Manlove, George Kendall (1950); A.B., Oberlin, 1936; M.A., 1946; Ph.D., Duke University, 1960; Professor of English.

Manzer, Franklin Edward (1958); B.S., Maine, 1955; Ph.D., Iowa State College, 1958; Professor of Plant Pathology, Agricultural Experiment Station.

Marshall, Bowen Floyd (1967); B.S., Maine, 1966; M.S., 1968; Instructor in Electrical Engineering.

Marshall, Stanley Nickerson, Jr. (1969); B.S., Maine, 1961; M.S., 1964; Lecturer in Chemical Engineering Technology, Technical Institute Division.

Marshall, William H. (1968); B.A., Yale University, 1955; M.A.T., Harvard University, 1963; M.A., Middlebury College, 1967; Assistant Professor of Languages, University of Maine at Augusta.

Marsters, Irvine Walter, Jr. (1966); B.A., Maine, 1963; Government Career Development Supervisor, Bureau of Public Administration.

Massie, Virginia Harvey (1962); B.S., Maine, 1954; Extension Agent (Knox-Lincoln Counties), Cooperative Extension Service.

Mawhinney, Eugene Alberto (1948-49) (1959); B.S., Maine, 1947; M.A., 1949; Ph.D., University of Illinois, 1955; Professor and Head, Department of Political Science.

Mead, David Lee (1970); A.B., Armed Forces Institute, 1958; B.A., California Western University, 1965; M.A., 1967; Ph.D., United States International University, 1968; Associate Professor of Sociology.

Mendall, Howard Lewis (1937); B.A., Maine, 1931; M.A., 1934; Professor of Wildlife Resources; Leader, Cooperative Wildlife Research Unit.

Merrill, Carroll Franklin, Jr. (1967); B.A., Maine, 1961; M.A., 1968; Instructor in Mathematics.

Merrill, Edward Osgood (1940); B.S., Maine, 1938; Associate Professor of Chemistry, Agricultural Experiment Station.

Merriman, Bertch Allyn (1966); B.S., Western Michigan University, 1954; M.S., Michigan State University, 1962; Assistant Professor of Mathematics.

MESERVEY, RUTH (1945); B.S., Maine, 1929; B.S., Simmons College, 1942; Senior Cataloger, Raymond H. Fogler Library.

†MESTECKY, FRANK JOSEPH (1965); B.A., Creighton University, 1960; M.A., University of Wisconsin, 1961; Ph.D., University of Iowa, 1965; Associate Professor of Mathematics.

METCALF, HENRY BEMIS (1964); B.S., Maine, 1956; M.S., Northeastern, 1964; Associate Professor of General Engineering.

METZGER, HOMER BASTIAN (1950); B.S., Pennsylvania State College, 1939; M.S., 1948; Ph.D., 1950; Professor and Chairman, Department of Agricultural and Resource Economics.

MEYER, MARVIN CLINTON (1946); B.S., Southeast Missouri State College, 1932; A.M., Ohio State University, 1936; Ph.D., University of Illinois, 1939; Professor of Zoology.

MEYER, WALTER FREDERICK (1968); B.M., Eastman School of Music, 1965; M.M., 1966; Instructor in Music.

MICKA, EDWARD STEPHEN (1965); B.S., Massachusetts, 1952; M.S., New Hampshire, 1958; Ph.D., Connecticut, 1965; Collaborator in Agricultural and Resource Economics.

MILES, EDWIN KENNETH (1933); B.A., Lawrence, 1929; M.A., Northwestern 1930; Ph.D., University of Pennsylvania, 1933; Professor of German.

MILLER, ALAN ROBERT (1967); B.S., Boston University, 1952; M.Ed., University of Massachusetts, 1968; Associate Professor and Chairman, Department of Journalism.

MILLER, JAMES RANDALL (1968); B.S., Purdue University, 1951; M.A., Bowling Green State University, 1962; Ph.D., Kent State University, 1968; Assistant Professor of Education.

MILLER, STACY R. (1935); B.S., Maine, 1932; Administrative Officer, Cooperative Extension Service.

MITCHELL, GERALD DOUGLAS (1968); Instructor in Military Science.

MONTVILLE, FRANCIS ELI (1961); B.S., University of Rhode Island, 1954; M.S., 1957; Extension Economist (Resource Development), Cooperative Extension Service.

MOODY, DOROTHY SHAW; B.A., Oberlin College, 1929; Part-time Cataloger, Ray-H. Fogler Library.

MOODY, GEORGE TUFFORD (1965); Ph.B., Wesleyan University, 1929; Ph.D., Johns Hopkins, 1932; Professor of French and Head, Department of Foreign Languages and Classics.

MORANG, STEVEN (1969); B.A., University of New Hampshire, 1950; M.B.A., Babson Institute of Business Administration, 1957; Assistant Professor of Business and Economics, University of Maine at Augusta.

MORGAN, KENNETH FILMORE (1968); B.A., Maine, 1963; M.A., Northwestern University, 1966; Instructor in History (Continuing Education Division).

MORRISON, JEAN LUTO (1967); B.Mus., University of Pennsylvania, 1948; B.S.L.S., Drexel Institute, 1949; Cataloger, Raymond H. Fogler Library.

MORROW, RICHARD A. (1970); B.Sc., Queen's University, 1958; M.Sc., University of British Columbia, 1959; Ph.D., Princeton, 1963; Associate Professor of Physics.

† On leave of absence, 1970-71.

MORSE, CURTIS SPAULDING (1968); B.S., University of New Hampshire, 1963; M.S., 1965; Assistant Professor of Mathematics.

*MOSHER, PAUL N. (1949); B.S., Maine, 1941; Potato Specialist, Cooperative Extension Service.

MOWER, CAROL P.; B.A., University of Maine, 1953; M.A., Northwestern University, 1957; Part-time Instructor in Speech (fall semester).

MUIR, FOREST VERN (1968); B.S., Southern Illinois University, 1961; M.S., 1963; Ph.D., Ohio State, 1967; Assistant Professor of Poultry Science and Extension Poultry Specialist.

MUMMÉ, ALICE (1968); B. Mus., Lawrence College, 1954; M. Mus., Nebraska, 1956; Instructor in Music (part-time).

MUMMÉ, KENNETH IRVING (1963); B.S., Lawrence College, 1954; M.S., Maine, 1966; Ph.D., 1970; Associate Professor of Chemical Engineering.

MUN, ALTON MOON (1961); B.A., University of Southern California, 1949; M.S., University of Illinois, 1951; Ph.D., University of Indiana, 1956; Associate Professor of Zoology.

MURCHIE, HARRY H. (1969); B.S., Gorham, 1955; M.Ed., New Hampshire, 1962; D.Ed., Maine, 1970; Assistant Professor of Education; Counselor, University of Maine at Augusta.

MURO, JAMES J. (1965); B.S. in Ed., Lock Haven State College (Pennsylvania), 1956; M.Ed., Rutgers University, 1961; Ed.D., University of Georgia, 1965; Associate Professor of Education.

MURPHY, ELIZABETH FLORENCE (1930); B.A., Maine, 1930; M.A., 1934; Professor of Horticulture, and Food Science, Agricultural Experiment Station.

MURPHY, GRATTAN PATRICK (1965); B.S., Rockhurst College, 1957; M.S., St. Louis University, 1962; Ph.D., 1966; Associate Professor of Mathematics.

MURPHY, HUGH JEROME (1950); B.S., Maine, 1948; M.S., 1950; Associate Professor of Agronomy.

MURPHY, PATRICIA JEANNE (1969); B.S., Nasson College, 1966; M.A., Michigan State University, 1968; Extension Agent (Waldo County), Cooperative Extension Service.

MURRAY, GARY ROBERT (1968); A.S.A., Bentley College, 1957; B.B.A., Clark University, 1960; M.B.A., University of Maine in Portland, 1967; C.P.A. (Maine); Assistant Professor of Business Management, University of Maine at Augusta.

MURRAY, GEOFFREY PETER (1970); A.B., Bowdoin, 1961; M.A., Johns Hopkins, 1965; Ph.D., 1968; Assistant Professor of Romance Languages.

MUSGRAVE, KATHERINE O. (1969); B.S., Maryville College, 1941; M.S., Oklahoma State, 1968; Instructor in Foods and Nutrition (part-time).

MUSGRAVE, STANLEY DEAN (1968); A.S., Blackburn College, 1941; B.S., University of Illinois, 1947; M.S., 1948; Ph.D., Cornell University, 1951; Professor and Chairman of the Department of Animal and Veterinary Sciences.

MYER, GEORGE HENRY (1965); B.A., University of California at Santa Barbara, 1959; Ph.D., Yale University, 1965; Assistant Professor of Geological Sciences

MYERS, FRANK WILLIAM (1957); B.A., Maine, 1935; M.Ed., 1947; Associate Professor of Education and Assistant Director of the Summer Session.

NADELHAFT, JEROME JOSHUA (1967); B.A., Queens College, New York City, 1959; M.A., University of Wisconsin, 1961; Ph.D., 1965; Assistant Professor of History.

* On leave of absence, fall semester 1970-71.

*Nesbit, Philip (1962-1965) (1967); B.M.Ed., University of Miami, 1957; M.M., New England Conservatory, 1962; Assistant Professor of Music.

Ness, Norman Renfrew (1942); B.S., Maine, 1938; Dairy Specialist, Cooperative Extension Service.

Neubauer, Benedict Francis (1965); B.A., St. John's University, 1960; Ph.D., Iowa State University, 1965; Assistant Professor of Botany.

Nichols, David Leigh (1962); B.A., Maine, 1950; M.A., 1951; Ph.D., Ohio State, 1966; Associate Professor of Education.

Nichols, John Wilson (1954); B.A., Western Maryland College, 1948; M.A., University of Florida, 1949; Ph.D., 1954; Professor of Psychology.

Nicholson, Bruce Lee (1969); B.S., University of Maryland, 1965; Assistant Professor of Microbiology.

Nightingale, Richard Irvine (1958); B.S., 1958; M.S., Maine, 1960; Ph.D., University of Arizona, 1970; Associate Professor of Civil Engineering.

Nolan, James Anthony (1968); A.B., Dartmouth College, 1961; Assistant Professor of Sociology.

Nolde, John Jacob (1950); B.A., Cornell University, 1941; Ph.D., 1950; Dean, College of Arts and Sciences; Professor of History.

Northam, Edward Stafford (1964); B.S., University of Michigan, 1947; M.S., 1948; Ph.D., Michigan State University, 1953; Associate Professor of Mathematics.

Norton, Gary Joseph (1969); Captain, U. S. Army; B.A., Maine, 1965; Assistant Professor of Military Science.

Norton, Stephen Allen (1968); A.B., Princeton University, 1962; M.A., Harvard University, 1963; Ph.D., 1967; Assistant Professor of Geological Sciences.

Nutting, Albert Deane (1931-48) (1958); B.S., Maine, 1927; Director, School of Forest Resources; Head, Department of Forest Resources, Agricultural Experiment Station.

Oak, Jessie Lawrence (1955); B.S., Maine, 1928; Extension Agent (Aroostook County), Cooperative Extension Service.

Oliver, Shirley Doten (1962); B.S. in Ed., Maine, 1949; M.Ed., 1953; Assistant Professor of Child Development.

Olson, Robert Edward (1946); B.S., Cornell University, 1938; M.S., 1946; Ph.D., 1954; Professor of Entomology.

O'Meara, David Charles (1954); A.B., Bates, 1952; M.S., Maine, 1954; Associate Professor of Animal Biology, Agricultural Experiment Station.

O'Neill, Elmer Wesley, Jr. (1965); A.B., Princeton, 1935; M.A., 1940; Ph.D., 1952; Professor of French.

Opheim, Vernon Holman (1969); B.A., Concordia College (Minnesota), 1954; M.Mu.Ed., MacPhail College of Music, 1966; Assistant Professor of Music.

Osberg, Philip Henry (1957); A.B., Dartmouth, 1947; M.A., Harvard, 1949; Ph.D., 1952; Professor and Head, Department of Geological Sciences.

Osgood, Eben Averill, Jr. (1963); B.S., Maine, 1951; M.F., Duke University, 1956; Ph.D., University of Minnesota, 1962; Associate Professor of Entomology.

* On leave of absence, fall semester 1970-71.

OSTROW, ISAAC MARTIN (1970); A.B., Brooklyn College, 1956; M.F.A., Ohio University, 1962; Assistant Professor of Music.

OTTO, FRED BISHOP (1968); B.S., Maine, 1956; M.A., University of Connecticut, 1960; Ph.D., 1964; Assistant Professor of Electrical Engineering.

OUELLETTE, ALLEN JEAN (1965); B.S., Fort Kent State Teachers College, 1963; Instructor in English (CED).

OWEN, RAY BUCKLIN, JR. (1968); A.B., Bowdoin College, 1959; M.S., University of Illinois, 1966; Ph.D., 1968; Assistant Professor of Wildlife Resources.

PAGE, ROBERT LEROY (1969); B.S., Tufts University, 1953; M.A., Maine, 1959; Associate Professor of Mathematics and Physical Sciences, University of Maine at Augusta.

PALMER, KENNETH TOWNSEND (1969); B.A., Amherst College, 1959; M.A., Pennsylvania State, 1961; Ph.D., 1964; Associate Professor of Political Science.

PARADISE, LOIS MAY (1967); B.S., Texas Women's University, 1949; M.S., Iowa State University, 1951; Assistant Professor of Child Development and Head Start Regional Training Officer.

PARATORE, PHILIP CARLO (1969); B.S., State University, New Paltz, New York, 1964; M.F.A., Pratt Institute, 1968; Instructor in Art, University of Maine at Augusta.

PARSONS, KENNETH LANGMAID (1942-44) (1945); B.S., Maine, 1934; E.E., 1959, P.E. (Maine); Professor of Electrical Engineering.

PATIN, DONALD LEO (1967); B.S., Wisconsin State University, 1958; Ph.D., Ohio State University, 1964; Assistant Professor of Chemistry.

PATTERSON, HOWARD HUGH (1968); B.A., Occidental College, 1961; M.S., Massachusetts Institute of Technology, 1965; Ph.D., Brandeis, 1968; Assistant Professor of Chemistry.

PAYNE, WILLIAM BARRETT (1969); Captain, U. S. Army; B.S., United States Military Academy, 1964; Assistant Professor of Military Science.

PEASE, JANE HANNA (1969); A.B., Smith College, 1951; M.A., University of Rochester, 1957; Ph.D., University of Rochester, 1970; Assistant Professor of History.

PEASE, WILLIAM HENRY (1966); B.A., Williams College, 1947; M.A., Wisconsin, 1948; Ph.D., Rochester, 1955; Professor of History.

PERKINS, FRED LEMUEL, JR. (1968); B.A., Bates College, 1942; Supervisor of Secondary Education in Journalism.

PERRY, ALVAH LIONEL (1943-45) (1946-47) (1949); B.S., Maine, 1942; M.S., 1947; Ph.D., Pennsylvania State University, 1957; Professor of Business and Economics, University of Maine at Augusta.

PERRY, JOANNE SPRINGER (1948-56) (1958); B.A., Maine, 1946; M.A., 1948; Assistant Professor of Mathematics.

PERRY, STEPHEN M. (1968); B.S., Gorham State College, 1966; M.A., Maine, 1968; Instructor in Mathematics, University of Maine at Augusta.

PETTIT, JOHN MELVILLE (1969); B.S., University of Illinois, 1958; M.A., Ohio State University, 1962; Ph.D., Purdue University, 1969; Associate Professor of Speech.

PHILBRICK, GILBERT EMERY (1966); B.S. in Ed., Maine, 1955; Assistant Professor of Physical Education and Head Basketball Coach.

PICKERING, MARISUE CARSON; B.A., Ohio University, 1959; M.Ed., Boston University, 1962; Part-time Instructor in Speech.

PICKETT, ROBERT ARTHUR (1966); B.S. in Ed., 1959; M.Ed., Maine, 1969; Assistant Professor of Physical Education, Assistant Football Coach.

PLISKOFF, STANLEY STEWART (1969); A.B., Washington Square College of Arts and Sciences, New York University, 1951; M.A., 1953; Ph.D., 1956; Professor and Head, Department of Psychology.

PLOCH, LOUIS ALBERT (1954); B.S., Pennsylvania State University, 1950; M.S., 1951; Ph.D., Cornell University, 1954; Professor of Rural Sociology.

PLUMMER, HENRY ALMON (1946); B.S., Maine, 1930; M.F., Yale, 1950; Associate Professor of Forest Resources, School of Forest Resources.

PLUNKETT, JAMES TERRY (1969); A.B., Notre Dame, 1959; M.A., 1960; Ph.D., University of Minnesota, 1969; Assistant Professor of English, University of Maine at Augusta.

POGORZELSKI, HENRY ANDREW (1969); M.A., Princeton University, 1968; Ph.D., City University of New York, 1969; Associate Professor of Mathematics.

POLSTEIN, MARTIN (1967); B.S., City College of New York, 1950; M.A., 1952; Associate Professor of Social Science, University of Maine at Augusta.

PORTER, JOSEPH E.; M.D., Lecturer in Medical Technology, Maine Medical Center, Portland.

PORTER-SHIRLEY, CARL HEARTZ (1959); B.S. in Ed., Bridgewater State Teachers College, 1927; M.Ed., Rhode Island College of Education, 1928; Ed.D., (Hon.) Catholic Teachers College of Providence, Rhode Island, 1959; Professor of Education and Director of Teacher Training.

POTTS, RONALD SARGENT (1968); A.B., Bowdoin, 1950; M.D., McGill University, 1954; Lecturer in Medical Technology (Central Maine General Hospital).

POULIN, LAWRENCE EARL (1967); B.S. in Ed., Maine, 1950; Extension Agent (Hancock County), Cooperative Extension Service.

POULTON, BRUCE ROBERT (1956); B.S., Rutgers University, 1950; M.S., 1952; Ph.D., 1956; Professor of Animal Sciences; Dean of the College of Life Sciences and Agriculture; Director of the Maine Agricultural Experiment Station.

PRATT, DARRELL BRADFORD (1967); B.S., Maine, 1942; M.S., Purdue, 1945; Ph.D., Harvard, 1951; Professor and Chairman, Department of Microbiology; Professor of Zoology.

PRATT, DOROTHY ELLIOTT; B.S., Tufts College, 1943; Part-time Instructor in Biochemistry.

PRATT, HORACE ASA (1930); B.S., Maine, 1930; M.S., 1936; P.E., (Maine); Testing Engineer, Highway Laboratory, Technology Experiment Station.

PRESCOTT, GEORGE ARTHUR (1961); B.S. in Ed., Boston University, 1941; Ed.M., 1948; Ed.D., 1950; Professor of Education.

PUFFER, CHARLES LORING (1966); B.A., Maine, 1932; Lecturer in Education, Educational Coordinator in CED.

PULLEN, WINSTON EUGENE (1946); B.S., Maine, 1941; M.S., Cornell University, 1942; Ph.D., 1950; Professor of Agricultural and Resource Economics and Associate Dean of the College of Life Sciences and Agriculture.

PYLES, LEWIS REX (1964); B.A., University of Miami (Florida), 1959; M.A., University of Michigan, 1963; Assistant Professor of Russian and French.

RADKE, FREDERICK HERBERT (1952); B.S., Hamline University, 1947; Ph.D., Iowa State, 1952; Professor and Head, Department of Biochemistry.

RAMSDELL, GORDON ESTEY (1947); B.S., Maine, 1942; M.S., 1951; Associate Professor of Biochemistry, Agricultural Experiment Station.

RANDALL, ARTHUR GORDON (1946); B.S., Yale, 1933; M.F., 1934; Associate Professor of Forest Resources, School of Forest Resources.

RANDALL, MARY ELIZABETH (1966); B.A., Maine, 1965; Registrar, University of Maine at Augusta.

RANDALL, RICHARD JOHN (1967); B.A., Maine, 1966; M.A., 1967; Instructor in Sociology, Director of Student Affairs, University of Maine at Augusta.

RANDEL, WILLIAM PEIRCE (1965); B.S., Columbia University, 1932, A.M., University of Michigan, 1933; Ph.D., Columbia University, 1945; Professor of English.

RASAIAH, JAYENDRAN CUMARASWAMY (1969); B.Sc., University of Ceylon, 1957; Ph.D., University of Pittsburgh, 1965; Assistant Professor of Chemistry.

REED, FRANK DUDLEY (1938); B.S., New Hampshire, 1929; Extension Economist, Marketing, Cooperative Extension Service.

REED, MARY FLORENCE (1930); B.A., Maine, 1929; B.S., Simmons College, 1930; Assistant University Librarian for Technical Services, Raymond H. Fogler Library.

REID, EDWARD ROBERT (1959); A.B., Yale, 1946; M.A., Middlebury College, 1950; Associate Professor of German and Associate Dean of the College of Arts and Sciences.

REID, WILLIAM MICHAEL (1968); B.A., Central College, 1962; M.A., University of Missouri, 1964; Ph.D., 1969; Assistant Professor of Political Science.

RENAUD, WALTER JOSEPH (1965-67) (1968); B.A., University of Massachusetts, 1959; M.A., Harvard University, 1961; Instructor in English.

REYNOLDS, CECIL JOHN (1935); B.S.C., Mount Allison, 1926; B.A., 1927; B.A., Oxford, 1929; B.Litt., 1930; A.M., Harvard 1932; Professor of English.

REYNOLDS, CLARK GILBERT (1968); B.A., University of California, Santa Barbara, 1961; M.A., Duke, 1963; Ph.D., 1964; Associate Professor of History.

RHOADS, ROBERT BARLOW (1952); B.S., Maine, 1950; M.S., 1951; P.E. (Maine); Professor of Agricultural Engineering, College of Life Sciences and Agriculture; Associate Director, Technical Institute Division, College of Technology.

*RICE, FRANCIS PHILIP (1964); A.B., Stanford University, 1943; M.A., New York University, 1948; B.D., Princeton Theological Seminary, 1949; Ed.D., Columbia University, 1955; Professor of Family Life, School of Human Development and Family Life Specialist, Cooperative Extension Service.

RICE, HARRIET EPSTEIN (1965-67) (1969); B.A., Maine, 1964; M.A., Columbia University, 1965; Assistant Professor of Speech.

RICHARDS, CHARLES DAVIS (1952); B.A., Wheaton College, Illinois, 1943; M.A., University of Michigan, 1947; Ph.D., 1952; Professor of Botany.

RICHARDS, GEORGE DAVID (1970); A.B., Hamilton College, 1959; M.A., Duke University, 1964; Ph.D., 1969; Assistant Professor of English.

RICHENS, VOIT B. (1968); B.S., Washington State University, 1957; M.S., Utah State University, 1961; Ph.D., 1967; Assistant Professor of Wildlife Resources.

RIDGWAY, GEORGE J. (1966); B.S., University of Washington, 1949; M.S., 1951; Ph.D., 1954; Lecturer in Zoology (Bureau of Commercial Fisheries, Boothbay Harbor, Maine).

* On leave of absence, fall semester 1970-71.

RIDGWAY, RITA KELL (1966); B.S., James Millikin University, 1936; Extension Agent (Androscoggin-Sagadahoc Counties), Cooperative Extension Service.

RIOUX, ROBERT NORMAND (1959); B.A., University of Connecticut, 1949; M.A., Oklahoma State University, 1950; Doctorat d'université de Paris en Lettres, 1956; Professor of Romance Languages.

ROBBINS, WALLACE CLIFTON (1965); B.S., Maine, 1954; M.S., University of New Brunswick, 1956; Instructor in Forest Resources.

ROBERTS, DODD EDWARD (1964); B.A., Maine, 1951; M.A., 1955; Ed.D., University of Missouri, 1958; Associate Professor of Education.

ROBERTS, FRANKLIN LEWIS (1964); B.S., Maine, 1955; M.S., 1957; Ph.D., North Carolina State College, 1964; Associate Professor of Zoology.

ROBERTS, LEWIS POLLARD (1935); B.S., Maine, 1931; Sugar Beet Specialist, Cooperative Extension Service.

ROBERTSON, CRAIG ANDREW (1969); B.A., University of Kansas, 1961; M.A., 1965; Assistant Professor of History.

ROBERTSON, SUSAN E. (1969); B.S., Marywood College, 1960; M.L.S., Rutgers University, 1967; Reference Librarian, Raymond H. Fogler Library.

ROBINSON, JAMES ARTHUR (1956); B.S., Maine, 1950; Area Potato Specialist, Cooperative Extension Service.

ROBINSON, WILLIAM E. (1960); B.S., Vermont, 1952; M.S., Purdue University, 1955; Associate Professor of Business Management, University of Maine at Augusta; Director of Continuing Education Center at Augusta.

RODERICK, THOMAS HUSTON; A.B., University of Michigan, 1952; M.S., 1953; Ph.D., University of California, 1959; Lecturer in Zoology (Jackson Laboratory).

ROGERS, CARL ADEN (1944); B.S., Vermont, 1935; M.S., Kansas State University, 1964; Extension Agent (Hancock County), Cooperative Extension Service.

ROGGENBAUER, JOSEF (1961); Diplomkaufmann, University of Vienna, Austria, 1950; M.A., Middlebury, 1965; Doctorate, University of Innsbruck, Austria, 1953; Professor of German.

ROSS, RUTH V. (1960); B.S., State Teachers College, Framingham, Massachusetts, 1928; Extension Agent (Aroostook County), Cooperative Extension Service.

ROURKE, ROBERT VINCENT (1964); B.S., Maine, 1959; M.S., 1964; Assistant Professor of Plant and Soil Sciences, Agricultural Experiment Station.

ROWE, RICHARD JAY (1959); B.S., Cornell University, 1952; B.S., Iowa State University, 1957; M.S., 1959; Ph.D., Cornell, 1969; P.E. (Maine); Professor of Agricultural Engineering.

RUGGERIO, DOMINIC WILLIAM (1969); Captain, U. S. Army; B.A., Norwich University, 1961; Assistant Professor of Military Science.

RUSS, CHARLES ROGER (1965); B.S., Marquette University, 1959; M.S., 1961; Ph.D., University of Pennsylvania, 1965; Assistant Professor of Chemistry.

RUSSELL, ELIZABETH SHULL (1969); A.B., University of Michigan, 1933; M.A., Columbia University, 1934; Ph.D., University of Chicago, 1937; Lecturer in Zoology (Jackson Laboratory).

RUSSELL, OLGA WESTER (1966); A.B., Connecticut College, 1934; A.M., University of California (Berkeley), 1939; A.M., Radcliffe, 1944; Ph.D., 1957; Professor of French.

RYAN, CHARLES WILLIAM (1966); B.S., Slippery Rock State College, 1959; M.A., Colgate University, 1961; Ph.D., University of Toledo, 1966; Associate Professor of Education.

RYCKMAN, RICHARD MICHAEL (1967); A.A., City College of San Francisco, 1960; B.A., State University of New York at Buffalo, 1963; Ph.D., 1968; Assistant Professor of Psychology.

SALEEBEY, MICHAEL DENNIS (1967); B.A., University of California, Santa Barbara, 1958; Master of Social Welfare, University of California, Los Angeles, 1960; Assistant Professor of Social Welfare, Department of Sociology.

SANDERS, JOSEPH FRANCIS; B.S., Boston University, 1947; M.A., 1948; Ph.D., 1953; Lecturer in Psychology, V.A. Center, Togus.

SANFORD, ALPHEUS (1958); B.A., Maine, 1947; M.Ed., Boston University, 1954; Ed.D., 1959; Professor of Education.

SAPER, BERNARD (1969); B.A., Brooklyn College, 1946; M.A., Columbia, 1947; Ph.D., University of California (Berkeley), 1951; Professor of Psychology.

SASS, BERNARD (1946); B.S., City College of New York, 1934; M.A., Teachers College, Columbia, 1936; Associate Professor of Zoology and Medical Technology Coordinator.

SAUNDERS, BRUCE THOMAS (1969); B.S., Villanova University, 1964; Ph.D., University of Connecticut, 1969; Assistant Professor of Education.

SAUNDERS, CLARA KAMERLING (1969); B.A., University of Maine, 1969; Reference Librarian, Raymond H. Fogler Library.

SAVAGE, DONALD THOMAS (1969); B.B.A., University of Massachusetts, 1960; M.S., University of Wisconsin, 1961; Ph.D., 1967; Associate Professor of Economics.

SAWIN, PAUL B.; B.S., Cornell University, 1924; M.S., Kansas State University, 1925; M.S., Harvard, 1930; Sc.D., 1931; Lecturer in Animal Sciences (Jackson Laboratory).

SAWYER, BARBARA A. (1969); B.S., State University College, Oneonta, 1959; M.S., Nebraska, 1969; Instructor in Child Development.

SCHEMNITZ, SANFORD DAVID (1962); B.S., University of Michigan, 1952; M.S., University of Florida, 1953; Ph.D., Oklahoma State University, 1958; Associate Professor of Wildlife Resources.

SCHER, SAUL NATHANIEL (1969); B.A., Queens College, City University of New York, 1954; M.F.A., Columbia University, 1958; Ph.D., New York University, 1965; Associate Professor of Speech.

SCHMIDT, WILLIAM FREDERICK (1968); B.S., University of Kentucky, 1964; M.S., University of Washington, 1966; Ph.D., 1968; Assistant Professor of Mechanical Engineering.

SCHNEIDER, WALTER LESLIE (1964); B.M.E., Pratt Institute, 1948; M.M.E., Yale University, 1950; Dr. Eng. Sc., New York University, 1958; Associate Professor of Mechanical Engineering.

SCHNITKER, DETMAR FRIEDRICH (1969); M.S., North Carolina, 1966; Ph.D., Illinois, 1967; Assistant Professor of Geological Sciences, Ira C. Darling Center.

SCHOENBERGER, WALTER SMITH (1956); A.B., University of Pittsburgh, 1950; M.A., 1953; M.A., The Fletcher School of Law and Diplomacy, 1954; Ph.D., 1963; Professor of Political Science.

SCHOMAKER, CHARLES EDWARD (1963); B.S., Pennsylvania State University, 1950;

M.F., 1954; Ph.D., Michigan State University, 1962; Associate Professor of Forest Resources.

SCHOMAKER, PEGGY K. (1966); B.S., Pennsylvania State University, 1949; M.S., 1957; Ph.D., Michigan State University, 1961; Assistant Professor of Consumer Economics and Management.

SCHRIVER, EDWARD OSWALD (1968); B.S., Gorham State College, 1954; M.Ed., Maine, 1955; B.D., Andover Newton Theological School, 1960; M.A., Maine, 1961; Ph.D., 1967; Assistant Professor of History and Archivist of Raymond H. Fogler, Library.

SCHUMACHER, JOHN FLOYD (1966); A.B., Bowdoin College, 1965; M.A., Maine, 1967; Assistant Professor in English, University of Maine at Augusta.

SCONTRAS, CHARLES ANDREW (1961); B.S., New Hampshire, 1952; M.Ed., Maine, 1957; Associate Professor of Modern Society.

SEAGER, ROBERT II (1967); B.A., Rutgers, 1948; M.A., Columbia, 1949; Ph.D., Ohio State University, 1956; Professor and Chairman, Department of History.

SENSENIG, DAVID M.; B.S., Haverford College, 1942; M.D., Harvard Medical School, 1945; Lecturer in Biochemistry.

SEZAK, SAMUEL (1939); B.A., Maine, 1931; M.Ed., 1953; Professor of Physical Education.

SEZAK, WILLIAM (1946-1948) (1949); B.S., in Ed., Boston University, 1938; M.Ed., Maine, 1946; Ed.D., Columbia, 1956; Professor of Sociology and Acting Chairman, Department of Sociology.

SHEA, KENNETH ROBERT (1968); B.S., Maine, 1965; Assistant Professor of Civil Engineering (Technical Institute Division).

SHEPPARD, EDMUND MACMILLAN (1962); B.S., University of Miami, 1956; S.M., Massachusetts Institute of Technology, 1958; Ph.D., Purdue, 1962; Professor of Electrical Engineering.

SHIBLES, MARK RICHARD (1947); B.A., Colby, 1929; M.Ed., Boston University, 1935; L.H.D., Colby, 1954; Sc.D. in Ed., Boston University, 1955; Dean of the College of Education and Professor of Education.

SHIGO, ALEX LLOYD; B.S., Waynesburg College, 1956; M.S., West Virginia University, 1958; Ph.D., 1959; Lecturer in Botany.

SHIN, ROY W. (1969); B.A., Macalester, 1958; M.A., 1962; Ph.D., Minnesota, 1969; Assistant Professor of Political Science.

SHOTTAFER, JAMES EDWARD (1964); B.S., State University of New York, 1954; M.S., State University of New York and Syracuse University, 1956; Ph.D., Michigan State University, 1964; Professor of Wood Technology.

SHULER, CRAIG EDWARD (1969); B.S., Colorado State University, 1960; M.S., 1966; Ph.D., 1969; Assistant Professor of Forest Resources.

SIDES, SAMUEL EDWIN (1956); B.S., Maine, 1951; P.E., (Maine); Associate Professor of Agricultural Engineering, Agricultural Experiment Station, Presque Isle, Maine Potato Handling Research Center.

SIMARD, GERALD LIONEL (1967); B.S., Bates, 1933; Ph.D., Massachusetts Institute of Technology, 1937; Associate Professor of Chemical Engineering.

SIMPSON, GEDDES WILSON (1931); A.B., Bucknell, 1929; M.A., Cornell University, 1931; Ph.D., 1935; Professor and Chairman, Department of Entomology.

SINGERMAN, ALAN JAY (1968); A.B., Ohio University, 1964; Diplome, Univer-

sity of Paris, 1962; M.A., Indiana University, 1966; Assistant Professor of French.

SINGERMAN, LUCRETIA VIRGINIA (1968); B.A., Ohio University, 1964; M.A., Indiana University, 1967; Instructor in German.

SKAGGS, CHARLES THOMAS (1969); B.S., Western Illinois University, 1964; M.S., 1966; Ph.D., University of Iowa, 1969; Assistant Professor of Education; Coordinator of Testing and Research.

SKALING, STEPHEN ROBERT (1970); B.A., University of Maine; Stack Supervisor, Raymond H. Fogler Library.

†SKORPEN, ERLING RAYMOND (1968); A.B., College of Idaho, 1954; B.A., Oxford University, 1956; M.A., 1958; Ph.D., Yale University, 1960; Associate Professor of Philosophy.

SMALL, WILLIAM ULLRICH (1967); B.S., Bowdoin College, 1949; M.B.A., Columbia University, 1951; Assistant Director, (Portland), Continuing Education Division.

SMITH, CHARLES WILLIAM, JR. (1968); B.S., Allegheny College, 1962; Ph.D., Ohio University, 1968; Assistant Professor of Physics.

SMITH, DAVID CLAYTON (1965); B.S., in Ed., Farmington State Teachers College, 1955; M.Ed., Maine, 1956; M.A., 1958; Ph.D., Cornell University, 1965; Associate Professor of History.

SMITH, NORMAN (1962); B.Sc., Leeds (England), 1952; M.Sc., Durham (England), 1954; M.S., Maine; 1959; Professor and Chairman, Department of Agricultural Engineering.

SNIFFEN, CHARLES JAMES (1970); B.S., Ohio State, 1960; M.S., New Hampshire, 1967; Assistant Professor of Animal Nutrition.

SNOW, ROGER VINTON, JR. (1967); B.A., Williams College, 1941; Coordinator, Bureau of Labor Education.

SOBEL, EUGENE LEE (1970); B.A., Reed College, 1962; Ph.D., Johns Hopkins, 1966; Assistant Professor of Mathematics.

SOULE, HAYDEN MAYO, JR. (1960); B.S., Maine, 1960; M.S., 1968; Associate Professor of Agricultural Engineering.

SOULE, WILLIAM LAMSON, JR. (1966); A.B., Harvard College, 1953; M.E.A., The George Washington University, 1963; Assistant Professor of Mathematics.

SPEICHER, BENJAMIN ROBERT (1937); A.B., Denison, 1929; M.S., Pittsburgh, 1931; Ph.D., 1933; Professor of Zoology.

SPEKHARDT, MICHAEL STEPHEN (1968); Major, Artillery, U.S. Army; B.A., Seton Hall University, 1957; Assistant Professor of Military Science.

SPRAGUE, RICHARD STANTON (1956); B.A., Maine, 1949; M.A., Yale, 1951; Ph.D., Boston University, 1961; Professor of English.

SPROUL, OTIS JENNINGS (1955); B.S., Maine, 1952; M.S., 1957; Sc.D., Washington University, 1961; P.E., Maine; Professor of Civil Engineering.

STEARNS, WILLIAM FRANKLIN (1960); B.S. in Ed, Maine, 1958; M.A., 1960; Assistant Professor of Mathematics.

STEVENS, FRANCIS ROBERT (1957); B.S., Maine, 1951; Area Poultry Specialist, Cooperative Extension Service.

STEVENS, LEROY CARLTON (1967); B.S., Cornell University, 1942; Ph.D., University of Rochester, 1952; Lecturer in Zoology.

† On leave of absence, 1970-71.

STEVENS, MARGARET F. (1951); B.S., Simmons, 1934; Youth Education Specialist, Cooperative Extension Service.

STEWART, ALICE ROSE (1947); B.A., Maine, 1937; A.M., Radcliffe, 1938; Ph.D., 1946; Professor of History.

STEWART, DONALD M. (1968); B.A., Maine, 1935; M.A., 1937; Executive Director, General Alumni Association.

STILES, DWIGHT GOULD (1968); B.S., University of New Hampshire, 1942; Area Potato Specialist, Cooperative Extension Service.

STILES, WARREN CRYDER (1962); B.S., Rutgers, 1954; M.S., 1955; Ph.D., Pennsylvania State University, 1958; Professor of Pomology; Extension Fruit Specialist, Cooperative Extension Service.

STOLT, SANDRA LONKO (1969); B.A., Maine, 1969; Research Associate, Forest Resources.

†STONE, WILLIAM FRANK (1966); B.A., Maine, 1956; M.A., University of Florida, 1961; Ph.D., 1963; Associate Professor of Psychology.

STORCH, RICHARD HARRY (1965); B.A., Carleton College, 1959; M.S., University of Illinois, 1961; Ph.D., 1966; Associate Professor of Entomology.

STOYELL, PAUL DEWITT (1968); B.S., Ithaca College, 1964; M.Ed., Maine, 1969; Instructor in Physical Education; Head Soccer Coach.

STRUCHTEMEYER, ROLAND AUGUST (1946); B.S., University of Missouri 1939; M.A., 1941; Ph.D., Ohio State University, 1951; Professor of Soils and Head, Department of Plant and Soil Sciences.

STUBBS, DONALD ALAN (1970); A.B., Washington and Lee, 1962; Ph.D., George Washington, 1967; Assistant Professor of Psychology.

STYRNA, EDMUND (1956); B.S., New Hampshire, 1948; Associate Professor of Physical Education, Head Coach of Track and Cross Country.

SUCEC, JAMES (1964); B.S., University of Connecticut, 1962; M.S., 1963; Associate Professor of Mechanical Engineering.

SULLIVAN, FRANCIS JOSEPH (1948); S.B., Harvard, 1936; M.S., Kansas State College, 1941; P.E. (Maine); Professor and Chairman, Department of Mechanical Engineering.

SUPPLE, ROBERT VINCENT (1948); Ed.B., State University of New York, 1943; A.M., New York University, 1945; Ph.D., 1951; Professor of Education.

*SWEETSER, THOMAS CURTIS (1964); B.S., Maine, 1950; Extension Agent (Aroostook County), Cooperative Extension Service.

SWINFORD, LEE H. (1959); B.A., University of California, 1923; Ph.D., 1931; Professor of Mathematics.

SYVINSKI, ELIZABETH CHELLIS (1955); B.S., Massachusetts, 1955; Extension Agent (York County), Cooperative Extension Service.

†TALLEY, SAMUEL HOUSTON (1966); B.A., Syracuse University, 1953; M.B.A., 1958; M.A., University of Michigan, 1962; Ph.D., Syracuse University, 1966; Associate Professor of Economics.

TARR, CHARLES EDWIN (1968); B.S., University of North Carolina, 1961; Ph.D., 1966; Assistant Professor of Physics.

TASHJIAN, ROBERT JOHN; A.B., Clark University, 1951; V.M.D., University of Pennsylvania, 1956; Lecturer in Animal Sciences (The Animal Medical Center, New York City).

† On leave of absence, 1970-71.

* On leave of absence, fall semester 1970-71.

TATEM, DAVID (1965); B.A., Randolph-Macon College, 1942; M.A., Columbia University, 1946; Associate Professor of Classics.

TAYLOR, FRANK MELROY (1940); B.S., Lafayette College, 1928; C.E., 1937; M.S., Maine, 1951; P.E. (Maine); Professor of Civil Engineering.

TEACHOUT, ROGER SAGE (1969); B.A., Syracuse University, 1948; M.A., 1953; Assistant Professor of Political Science, University of Maine at Augusta.

TERRELL, CARROLL FRANKLIN (1948); B.A., Bowdoin, 1940; M.A., Maine, 1950; Ph.D., New York University, 1956; Professor of English.

THOMPSON, EDWARD VALENTINE (1966); A.B., Cornell University, 1956; Ph.D., Polytechnic Institute of Brooklyn, 1962; Associate Professor of Chemical Engineering.

THOMPSON, WALTER ALFRED (1956); B.S., Maine, 1951; Extension Agent (Hancock County), Cooperative Extension Service.

THOMSON, ROBERT BRUCE (1947-1950) (1953); A.B., Harvard, 1932; LL.B., 1936; Professor of Political Science; Director of the University's Honors Program.

THORNBURY, MARGARET ELIZABETH (1961); B.S., Oneonta State Teachers College, 1954; M.S., Ohio State University, 1957; Ph.D., 1961; Professor of Food and Nutrition and Director, School of Human Development.

TIBBETTS, CATHERINE LAVIN (1968); B.A., St. Joseph's College, 1964; M.L.S., Maine, 1968; Gifts and Exchanges Librarian, Raymond H. Fogler Library.

TOBEY, DONALD MARVIN (1969); B.S., Cornell University, 1964; M.S., University of Wisconsin, 1967; Ph.D., 1969; Assistant Professor of Agricultural and Resource Economics.

TOOLE, JOHN WILLIAM (1959); A.B., Harvard, 1946; M.A., Maine, 1948; M.A., University of Illinois, 1951; Associate Professor of Mathematics.

TRAFFORD, DAVID WHITE (1947); B.A., Maine, 1939; M.A., Indiana University, 1940; Ph.D., 1947; Professor of History; Acting Chairman, Department of History.

TREDWELL, ROBERT FERTIG (1967); A.B., Oberlin College, 1955; Ph.D., Yale, 1960; Associate Professor and Chairman, Department of Philosophy.

TREVETT, MOODY FRANCIS (1946); B.S., Massachusetts State, 1929; M.S., 1940; Professor of Agronomy.

TRIPP, MARLAND EUGENE (1951-1956) (1957); B.S., Maine, 1950; Extension Agent (Knox-Lincoln Counties), Cooperative Extension Service.

TRUBOV, HERMON (1962); B.F.A., Ohio University, 1947; M.A., Columbia University, 1948; Ph.D., Syracuse University, 1956; Professor of Education.

TUMARKIN, ANN WELSH (1969); A.B., Pembroke College, 1964; Assistant Professor of Anthropology.

TURNER, WALTER WEEKS (1947); B.S., Massachusetts Institute of Technology, 1947; M.S., 1947; P.E. (Maine); Professor of Electrical Engineering.

UYAR, KIVILCIM JIM (1970); B.A., Robert College (Istanbul), 1966; M.B.A., University of Illinois, 1969; Assistant Professor of Management.

VADAS, ROBERT LOUIS (1967); B.S., Utah State University, 1962; Ph.D., University of Washington, 1968; Assistant Professor of Botany and Zoology.

VALLEAU, WILLIAM GRAY (1962); B.S., University of Kentucky, 1955; M.S., Rutgers University, 1962; Ph.D., 1963; Associate Professor of Zoology.

VAN DER HEIDE, LOUIS (1968); D.V.M., University of Utrecht; (Holland), 1958; Associate Professor of Animal and Veterinary Sciences.

VANGERMEERSCH, RICHARD GUSTAVE JEROME (1967); B.S.A., Bryant College, 1959; M.S., University of Rhode Island, 1964; Assistant Professor of Accounting, College of Business Administration.

VAN LUIK, JAMES MACNAUGHTON (1969); B.S., Hillsdale College, 1951; M.S., (in Library Science) Columbia University, 1955; Assistant Professor of Library Service.

VAN RHEENEN, DWAYNE DALE (1970); B.A., Harding College, 1966; M.A., University of Missouri, 1967; Assistant Professor of Speech.

VETELINO, JOHN FRANK (1969); B.S., Rhode Island, 1964; M.S., 1966; Ph.D., 1969; Assistant Professor of Electrical Engineering.

VIGER, NORMAN JOHN (1966); B.S., Maine, 1966; M.M.E., 1968; Assistant Professor of General Engineering.

VIRGIN, PETER C. (1969); B.S., Maine, 1969; Programmer; Instructor in Mathematics.

VITRO, FRANK THOMAS (1969); B.S., Notre Dame, 1963; M.A., Boston College, 1966; Ph.D., Iowa, 1969; Assistant Professor of Education and Assistant Professor of Psychology.

VOSE, PRESCOTT HALE (1950); B.S., Bowdoin, 1929; M.B.A., Harvard, 1931; Budget Officer.

VROOMAN, THEODORE HERBERT (1965); B.A., St. Lawrence University, 1942; M.Ed., 1947; Assistant Professor of Education.

WADE, EDWARD ALEXANDER (1962); A.B., San Diego State College, 1949; M.A., University of Oregon, 1952; Ph.D., University of Wisconsin, 1955; Associate Professor of Psychology.

WADSWORTH, RICHARD C. (1954); A.B., Cornell University, 1926; M.D., University of Rochester School of Medicine and Dentistry, 1931; Lecturer in Medical Technology, Eastern Maine Medical Center.

WAKELIN, EDMUND F. (1963); B.A., Dartmouth, 1939; District Recreational Specialist, Cooperative Extension Service.

WALDEN, RONALD WILLIAM (1969); B.A., Bates, 1958; S.T.B., Boston University, 1963; Director, Upward Bound Project, Cooperative Extension Service.

WALKUP, MARY JO COLEMAN (1967); B.S., University of Houston, 1955; M.S., Springfield College, 1960; Ph.D., University of Iowa, 1966; Associate Professor of Physical Education, Women's Division.

†WALLACE, IAN (1967); B.A., St. Peter's College, Oxford, 1965; M.A., Oxford (England), 1968; B. Litt., 1970; Assistant Professor of German.

WALLACE, ROBERT LOUIS (1966); B.S., Maine, 1954; M.Ed., 1961; Assistant Professor of Physical Education.

WARNE, EDMUND RUSSELL (1969); B.A., The University of Redlands (California), 1961; M.A., University of Washington, 1962; B.D., Yale Divinity School, 1965; Ph.D., Yale University, 1970; Assistant Professor of Philosophy.

WARNER, MARDIS R. (1950-55) (1956); B.S., Ohio State, 1949; B.A.E., Ohio State, 1949; Agricultural Engineer, Cooperative Extension Service.

WAVE, HERBERT EDWIN (1967); B.S., Maine, 1952; M.S., Rutgers, 1960; Ph.D., 1961; Associate Professor of Plant and Soil Sciences.

WAYMOUTH, CHARITY; B.Sc., University of London, 1936; Ph.D., University of Aberdeen, 1944; Lecturer in Microbiology (Jackson Laboratory).

† On leave of absence, 1970-71.

WEATHERBEE, RITA ROSFIN; B.S., Simmons College, 1952; M.A., Maine, 1954; Part-time Instructor in Zoology.

WEBER, STEPHEN LEWIS (1969); B.A., Bowling Green State University, 1964; Ph.D., University of Notre Dame, 1969; Assistant Professor of Philosophy.

WEBSTEB, JAMES HOUGHTON (1969); B.A., Maine, 1959; M.A., Clark University, 1966; Assistant Professor of Finance, College of Business Administration.

WEBSTER, KARL SMITH (1965); B.S., Vermont, 1949; M.S., Pennsylvania State University, 1958; Associate Professor of Mechanical Engineering.

WEISZ, HANS (1966); M.D., University of Vienna, 1929; Ph.D., 1931; Lecturer in Philosophy.

WELLS, WILLIAM CARL (1931-1945) (1947); B.A., Maine, 1931; Director of Residence and Dining Halls.

WENCE, MILFORD EDWARD (1937); B.A., State University of Iowa, 1933; M.A., 1934: Ph.D., 1937; Professor of English.

WEST, PAUL ALBERT (1968); Instructor, Technical Division, Department of Civil Engineering.

WESTERMAN, HAROLD SCOTT (1949); B.A., University of Michigan, 1946; Professor of Physical Education; Director of Physical Education and Athletics.

WESTFALL, CLAUDE ZEBEDEE (1954); B.S.F., West Virginia University, 1952; M.S., Maine, 1954; Associate Professor of General Engineering.

WHEELER, DAVID WEYMOUTH (1970); B.A., Maine, 1965; Center Director, Continuing Education Division, Lewiston-Auburn.

WHELDEN, HARRY CROSSMAN, JR. (1955); B.S., University of Connecticut, 1948; Poultry Specialist, Cooperative Extension Service.

WHITE, MARY LOU (1968); B.S. in Ed., University of Akron, 1955; M.S., University of Wisconsin, 1965; Assistant Professor of Education.

WHITEHILL, ALVIN RICHARD (1961); A.B., Dartmouth, 1937; Ph.D., Cornell University, 1942; Professor of Microbiology.

WHITMAN, RUSSELL ALLEN (1968); B.A., San Jose State College, 1954; M.A., 1958; M.Ed., Oregon State University, 1964; Counselor, Center for Counseling and Psychological Services; Assistant Professor of Education.

WHITNEY, ALLISON INGALLS (1962); B.S., Maine, 1962; M.S., 1964; Assistant Professor of Electrical Engineering.

WHITNEY, HARRY F. (1955); B.S., Maine, 1954; M.S., Cornell University, 1955; Extension Agent (Waldo County), Cooperative Extension Service.

WHITNEY, JUDITH STEARNS; B.S., Maine, 1964; M.S., 1966; Part-time Instructor in Chemistry.

WHITTAKER, JAMES CURTISS (1968); B.S., Purdue University, 1958; M.S., 1960; Ph.D., Ohio State University, 1965; Assistant Professor of Forest Resources.

WICKS, ULRICH (1969); B.A., Northern Illinois University (DeKalb), 1963; Assistant Professor of English.

WIHRY, DAVID FRANCIS (1969); A.B., Merrimack College, 1964; Assistant Professor of Economics.

WIKSTROM, NELSON (1968); B.A., Northeastern University, 1963; M.A., The University of Connecticut, 1965; Ph.D., 1969; Assistant Professor of Political Science.

WILDES, GLENN K. (1958); B.S., University of Rhode Island, 1954; M.S., 1957; Area Dairy Specialist, Cooperative Extension Service.

WILKINSON, JOSEPH NORMAN (1970); B.A., Michigan, 1964; M.A., 1965; Ph.D., 1970; Assistant Professor of Speech.

WILLIAMS, ROBERT B. (1964); B.S.A.E., University of Maine, 1957; M.S., 1965; Associate Professor of Agricultural Engineering, Agricultural Experiment Station.

WILSON, JAMES ALBERT (1968); B.A., Lake Forest College, 1962; Assistant Professor of Economics.

WILSON, JOHN ROBERT (1969); A.B., Bates College, 1963; M.A., University of Kansas, 1967; Assistant Professor of English.

WILSON, SARA CURTIS (1946); B.S., Farmington State Normal, 1938; Extension Agent (Washington County), Cooperative Extension Service.

WING, KENNETH EVERETT (1966); B.S., Cornell University, 1958; M.Ed., 1960; Ph.D., 1966; Associate Professor of Agricultural and Resource Economics.

WITTER, JOHN FRANKLIN (1932); B.S., Maryland, 1928; D.V.M., Michigan, 1932; Professor of Animal Pathology.

WLODKOWSKI, ZINAIDA SAPANKEVYCH (1967); B.A., Windham College, 1964; M.A., New York University, 1965; Assistant Professor of Languages, University of Maine at Augusta.

WOHLGEMUTH, ANDREW RICHARDS (1969); A.B., University of Pennsylvania, 1959; M.A., Syracuse University, 1966; Ph.D., 1969; Assistant Professor of Mathematics.

WOLFHAGEN, HELEN JANE (1964); B.S., Willamette University, 1942; Ph.D., University of California at Berkeley, 1949; Lecturer in Chemistry.

WOLFHAGEN, JAMES LANGDON (1952); A.B., Linfield College, 1946; Ph.D., University of California, 1951; Professor and Head, Department of Chemistry.

WOOD, CLAIR GILBERT (1970); A.B., Ricker College, 1957; M.A.T., Brown University, 1963; Instructor in Chemistry.

WOODARD, FRANKLIN EARL (1968); B.S., Maine, 1961; M.S., 1963; Ph.D., Purdue University, 1965; Assistant Professor of Civil Engineering.

WOODBURY, HAROLD MACE (1937); B.S., Maine, 1937; M.A., 1948; Professor of Physical Education; Head of Men's Division, Department of Physical Education and Athletics.

WOODWARD, WALDA ALBION (1962); B.S., Maine, 1958; Extension Agent (Knox-Lincoln Counties), Cooperative Extension Service.

WOOTTON, ALBERT GEORGE (1956); B.S., Rutgers, 1931; M.A., Columbia, 1951; Professor of Mathematics.

WORK, GERALD GEORGE (1967); A.B., Albright College, 1960; M.Ed., Ohio University, 1962; Ph.D., 1967; Associate Professor of Education.

WORRICK, ROBERT CLIFTON (1946); B.S., Maine, 1943; Director of Student Aid.

WRATTEN, CRAIG CHARLES (1966); B.S., Bethany College, 1960; M.S., University of Wisconsin, 1962; Ph.D., 1965; Assistant Professor of Biochemistry.

WULFF, KATHRYN GILLETT (1968); B.A., Keene State College, 1968; M.L.S., Maine, 1969; College Librarian, Augusta.

WYMAN, OSCAR LEWIS II (1965); B.S., Maine, 1949; M.S., University of Massachusetts, 1963; State Program Coordinator, Cooperative Extension Service.

YAEGER, EARL C. (1970); B.S., North Dakota State University, 1960; Faculty Associate in Agricultural Engineering.

YOUNG, DAVID BRUCE (1960); B.S., Duke University, 1955; M.S., 1959; Associate Professor of Electrical Engineering.

YOUNG, HAROLD EDLE (1948); B.S., Maine, 1937; M.F., Duke, 1946, Ph.D., 1948; Professor of Forest Resources.

YOUNG, ROBERT JAMES (1969); B.A., Ottawa University (Kansas), 1959; Ph.D., Oregon State, 1963; Lecturer in Botany and Plant Pathology.

YOUNG, SUSAN EVELYN (1965); B.S., Maine, 1963; Certified by American Dietetic Association, 1964; Instructor in Institutional Management, School of Human Development.

YVON, BERNARD R. (1970); B.S., Westfield State Teachers College, 1960; M.Ed., Westfield State College, 1963; Ed.D., Wayne State, 1970; Assistant Professor of Education.

ZABEL, LOWELL WALLACE (1967); B.A., Lawrence University, 1935; Louis Calder Professor of Chemical Engineering.

ZEICHICK, HERBERT H. (1969); B.S., Boston University, 1958; M.Ed., 1960; Extension Agent, (Penobscot County), Cooperative Extension Service.

ZIEGENBEIN, DON RALPH (1964); B.S., Babson Institute, 1961; M.B.A., 1962; Assistant Professor of Finance, College of Business Administration.

ZIEMINSKI, STEFAN ANTONI (1954); Dipl. Ing. Technical University (Lwow, Poland), 1927; Doctor of Technical Science, 1929; P.E. (Maine); Professor of Chemical Engineering.

ZINK, MARY STILLMAN (1960); B.A., Cornell University, 1938; M.A., Yale University, 1955; Ph.D., Cornell University, 1960; Dean of Freshmen, Professor of Education.

ZOLLITSCH, REINHARD (1964-66) (1969); M.A., (English), Maine, 1964; M.A. (German), Massachusetts, 1969; Instructor in German.

ZOLLWEG, JOHN ALLMAN (1970); A.B., Oberlin, 1964; Ph.D., Cornell University, 1969; Assistant Professor of Chemistry.

Summary of Student Enrollment

1969-70

	Orono Campus		
	Men	Women	Total
Graduates	556	176	732
Fifth Year	20	–	20
Seniors	912	568	1480
Juniors	915	669	1584
Sophomores	1019	758	1777
Freshmen	1035	864	1899
Specials	154	87	241
Three-Year Nurses	–	26	26
Two-Year Courses:			
First Year	198	51	249
Second Year	183	44	227
Unclassified Degree Candidates	23	35	58
Audition	5	7	12
	5020	3285	8305
Summer Session	2129	2353	4482*
Grand Total (Omitting duplicates in Summer Session)	6491	5154	11645

*Includes classes held in Portland and other locations.

Classification By Colleges

Graduates	556	176	732
Arts and Sciences	1421	1585	3006
Business Administration	538	34	572
Education	590	925	1515
Life Sciences and Agriculture	897	552	1449
Technology	1018	13	1031
	5020	3285	8305

Candidates For Degrees

Graduates	507	160	667
Arts and Sciences	1336	1504	2840
Business Administration	520	31	551
Education	574	899	1473
Life Sciences and Agriculture	885	542	1427
Technology	990	13	1003
	4812	3149	7961

CLASSIFICATION BY RESIDENCE

	Orono Campus		
	Regular Session	Summer Session	Total
Maine, by counties:			
Androscoggin	394	121	515
Aroostook	607	144	751
Cumberland	683	534	1217
Franklin	122	12	134
Hancock	275	116	391
Kennebec	556	144	700
Knox	204	47	251
Lincoln	97	50	147
Oxford	254	57	311
Penobscot	2136	656	2792
Piscataquis	152	57	209
Sagadahoc	107	60	167
Somerset	243	76	319
Waldo	164	86	250
Washington	132	53	185
York	401	148	549
	6527	2361	8888
Maine	6527	2361	8888
Massachusetts	682	108	790
New York	239	208	447
New Jersey	243	52	295
Connecticut	151	41	192
Pennsylvania	68	56	124
New Hampshire	49	49	98
Maryland	26	44	70
Vermont	32	24	56
Ohio	15	37	52
Illinois	8	43	51
Virginia	32	18	50
Rhode Island	28	7	35
Florida	11	22	33
California	10	20	30
District of Columbia	16	13	29
Michigan	8	19	27
Wisconsin	7	12	19
North Carolina	1	14	15
Delaware	10	3	13
Missouri	–	13	13
Texas	8	3	11
Georgia	3	7	10
Iowa	3	7	10
Minnesota	2	7	9

CLASSIFCATION BY RESIDENCE, Continued

	Orono Campus		
	Regular Session	Summer Session	Total
Tennessee	4	5	9
Arizona	2	6	8
Indiana	2	6	8
Alabama	4	2	6
Washington	–	6	6
Colorado	2	3	5
Kentucky	1	4	5
New Mexico	1	3	4
Kansas	–	3	3
North Dakota	–	3	3
West Virginia	–	3	3
Canal Zone	1	1	2
Louisiana	–	2	2
Nebraska	1	1	2
Oklahoma	2	–	2
Oregon	–	2	2
Utah	1	1	2
Alaska	–	1	1
Arkansas	–	1	1
Montana	–	1	1
South Carolina	–	1	1
Wyoming	1	–	1
Canada	43	80	123
India	10	2	12
China	8	–	8
Ecuador	3	1	4
Thailand	4	–	4
Chile	1	2	3
France	2	1	3
Japan	–	3	3
Korea	3	–	3
Uganda	3	–	3
Brazil	2	–	2
Germany	1	1	2
Pakistan	2	–	2
Saudi Arabia	2	–	2
Spain	2	–	2
Taiwan	2	–	2
Bermuda	1	–	1
Cameroun	1	–	1
Colombia	–	1	1
England	–	1	1
El Salvadore	–	1	1
Ethiopia	1	–	1
Ghana	1	–	1

CLASSIFCATION BY RESIDENCE, Continued

	Orono Campus		
	Regular Session	Summer Session	Total
Greece	1	–	1
Haiti	1	–	1
Holland	1	–	1
Iraq	–	1	1
Kenya	1	–	1
Mexico	1	–	1
Nassau	1	–	1
Netherlands	–	1	1
Poland	1	–	1
Portugal	–	1	1
Rhodesia	1	–	1
Turkey	1	–	1
Union of South Africa	1	–	1
Uruguay	1	–	1
Venezuela	–	1	1
Zambia	1	–	1
	8305	3340	11645

Index

	Page
Accounting	179
Activities, student	37
Administration, officers of	6
Admission	41
Arts and Sciences	70
Education, College of	15, 184
Freshman	41
Application for	41
On high school record	42
Subject requirements	44
Graduate School	331
Short courses in agriculture	45, 266
Special students	47
Summer Session	341
Transfer students	48
Two-year courses in agriculture	45
Advance Placement	42
Agricultural and Resources Economics	250
Agricultural Education	263
Agricultural Engineering	245, 249, 288
Agricultural Experiment Station	16, 27
Agriculture, College of Life Sciences and	15, 206
Agricultural Science Division	207
Degree programs	206
School of Forest Resources	227
School of Human Development	235
Service courses	278
Special students	47
Two-year Technical Division	272
Alumnus, The Maine	27
Anatomy	167
Animal and Veterinary Sciences	256
Anthropology	79
Anthropology Museum	27
Applied courses in music	129
Aroostook Farm	16
Art	85
Art collection	25
Arts and Sciences, College of	70
Admission	70
Bangor Theological Seminary	74
Courses offered	71
Curricula, specimen	75
General information	70
Graduation requirements	71
Honors program	73, 119
Pass-Fail Option	73
School of Nursing	134
Transfer credit	70
Ashman (camp), Robert I.	228
Astronomy	140
Athletic facilities	23
Athletics	338

Page

Audio-Visual Center 188
Augusta, U. of M. at 15, 327
Automobiles 34
Band 38, 131
Bangor Theological Seminary 74
Biochemistry 211
Biology 214
Birds (see Ornithology)
Blueberry Farm 16
Board of Trustees 5
Botanical Plantation 26
Botany and Plant Pathology 26, 215
Buildings (Orono campus) 18
Bulletin, University of Maine 27
Bulletins, Extension 27
Bureau of Educational Research and Service 187
Business Administration, College of 15, 174
Business Data Processing 179
Business Economics 180
Calendar, 1969-70 4
Campus, The Maine 40
Career Planning and Placement, office of 28
Certificate for teachers 73, 189
Change of Campus 34
Chapman Farm 16
Chemical Engineering 290
Chemistry 88, 300
Child Development 236
Chorus 39, 130
Church Services 30
City Management (Civil Eng.) 300
Civil Defense Education and Training 18
Civil Engineering 300
Classics 107
Clothing and Design 244
Clubs, departmental 38
Coe Research Fund and the Weppler Fund 28
Collection, art 25
Collections, scientific 26
Communications 53
Comparative Literature 90
Comprehensive examinations (see Examinations)
Computing and Data Processing Services 24
Continuing Education 17, 47, 187, 340
Cooperative Extension Service 17
Correspondence 9
Correspondence courses (see Continuing Education)
Council 36
Curricula, specimen (see under each college)
Counseling and Psychological Services 28
Dairy Manufacturing 263
Darling Research Center 25

Page

Debate 160
Debate and Forensics 39
Degrees 31
  Education 185
  Graduate School 331
  Residence requirements 32
  With distinction 32
  With honors 32
Dentistry, preparation for 74
Departmental clubs 38
Departments, officers of 7
Deposits 52
Dismissal 34
Distinguished Maine Students Program 36
Doctor's Degree 32, 331
Dormitories (list of) 18
Dormitory regulations 22
Dormitory rooms 23, 51
Drafting, Engineering (see Graphics)
Dramatics 39, 161
Drawing 87, 311
Economics 91
Education, College of 15, 184
  Admission 184
  Art Education, Division of 196
  Audio-Visual Center 188
  Bureau of Educational Research and Service 187
  Courses of Instruction 190
  Continuing Education courses 187
  Graduation requirements 185
  Music Education, Division of 196
  Observation and Student Teaching 195
  Physical Education, Division of 197
  Residence requirements 187
  Teacher's certificate 189
  Teacher Education Program 189
Educational Television 342
Electrical Engineering 304
Electronics 306
Emeriti 343
Employment, opportunities for 29, 53
Engineering Physics 309
English 94
Entomology 26, 219
Entrance (see admission) Examinations
  Comprehensive in Arts and Sciences 70
Environmental Studies 62
Exhibitions, program of 25
Expenses 50
Experiment Station, Agricultural 16
Experiment Station, Technology 16
Extension bulletins 27
Faculty 347
Faculty Summer Research Grants 28
Family Relationships 239
Farms
  Agricultural Experiment Station 16

Page

University 23
Farm Management 272
Fees 49, 287
Financial Information 49
Financial aid and Scholarships 43
Fishery Science (see Zoology)
(Darling Center)
Fishes (see Ichthyology)
Folklore 84
Food Processing 263
Food Science 282
Food and Nutrition 241, 244
Foreign Languages and Classics 98
French 100
German 102
Greek 104
Italian 104
Latin 104
Russian 105
Spanish 106
Foreign Language requirements 98
Foreign Student Adviser 29
Foreign Study 73
Forest Resources, School of 227
Former students 47
Foundation, U. of M. Funds 59
Fraternities 40
Fraternity houses 22
Free-hand drawing 86
French 100
Freshman charges 51
Freshman curriculum (College of
Arts and Sciences) 75
Freshman curriculum (College of
Technology) 286
Freshman Orientation 31
Fruits, courses in 262
General Engineering 310
General Information (University) 13
Geography (see Political Science) 145
Geology 26
Geological Sciences 107
German 102
Glee Club (see chorus)
Government (see
Political Science) 145
Grading system 32
Graduate School 16, 331
Graduation, requirements for
Agriculture, College of Life
Sciences 208
Arts and Sciences, College of 70
Business Administration, College of 175
Education, College of 185
Graduate School 331
Residence requirements 53, 187
Technology, College of 287
Greek 104
Guidance Service 28
Guidance courses 190, 200

Page

Gymnasium uniforms for women 51
Heads of Departments 7
Health Service 29, 49
Heat Engineering (see
Mechanical Engineering)
Highmoor Farm 16
Highway Engineering (see
Civil Engineering)
History 111
History (of the University) 13
Home Economics 238
Home Economics Education 238, 242
Home Management and Housing 243
Honor societies 38
Honors Program 35, 73, 119,
188, 279, 288
Horticulture 262
Humanities 72
Human Development, School of 235
Hydraulic Engineering (see
Civil Engineering)
Ichthyology 170
Industrial Cooperation,
Department of 16
Information for Veterans 43
Instruments, private lessons in 129
Installment Plan 49
Insurance 29, 49
International Affairs 120
International Agricultural
Development 279
Internship, Municipal 148
Journalism 120
Kinematics 314
Laboratory apparatus, use of 31, 287
Labor Education, Bureau of 16
Landscape courses 263
Languages 98
Latin 104
Law Review 28
Liberal Studies 15
Libraries, The 25
Life Sciences and Agriculture,
College of 15
Linguistics 98
Literature 90
Loan Funds 54
Machine Design (see
Mechanical Engineering)
Machine Work (see
Mechanical Engineering)
Maine Alumnus, The 27
Maine Bulletin, The 27
Maine Masque Theatre 39
Maine Technical Services Program 17
Major subject, College of
Arts and Sciences 71
Master's Degree 32, 331
Mathematics 123
Matriculation Fee 49

Page

Mechanical Engineering 311
Mechanical Engineering Technology 323
Mechanics (see Mechanical Engineering)
Medical Technology 74
Medicine, preparation for 74
Memorial Union 37
Metallurgy (see Chemistry)
Meteorology (see Physics)
Microbiology 221
Military Science 333
Modern Languages 98
Modern Society 127
Motor vehicles 34
Music 128
Music, courses 128
Musical organizations 38, 130
Natural Resource Management 223
New England Center for Continuing Education 17
New England Regional Cooperation 48
New Hampshire, U. of 263
Nursing, School of 134
Nutrition 236, 241, 244
Oratorio Society 38
Orchestra 38, 131
Organizations of the University 14
Ornamental Horticulture 263
Ornithology 168
Paper Making 292
Part-time work 53
Payment of bills 49
Penobscot Valley Community College 329
Personnel 347
Philosophy 134, 137
Philosophy, Doctor of 32, 331
Photography 141
Physical Education (for men) 337
Physical Education (for women) 338
Physical examination 34
Physics 140
Physiology (see Zoology)
Piano, course in 130
Placement for Teachers 29, 190
Planetarium 27
Plant courses 262
Plant Pathology 215
Plant and Soil Sciences 260, 277
Policy Statement 14
Political Science 145
Poultry Science 256
Predental studies 74
Premedical studies 74
Presidential Scholars 36
Pre-veterinary 264
Prism, The 40
Prizes 61
Projects-in-Learning 149

Page

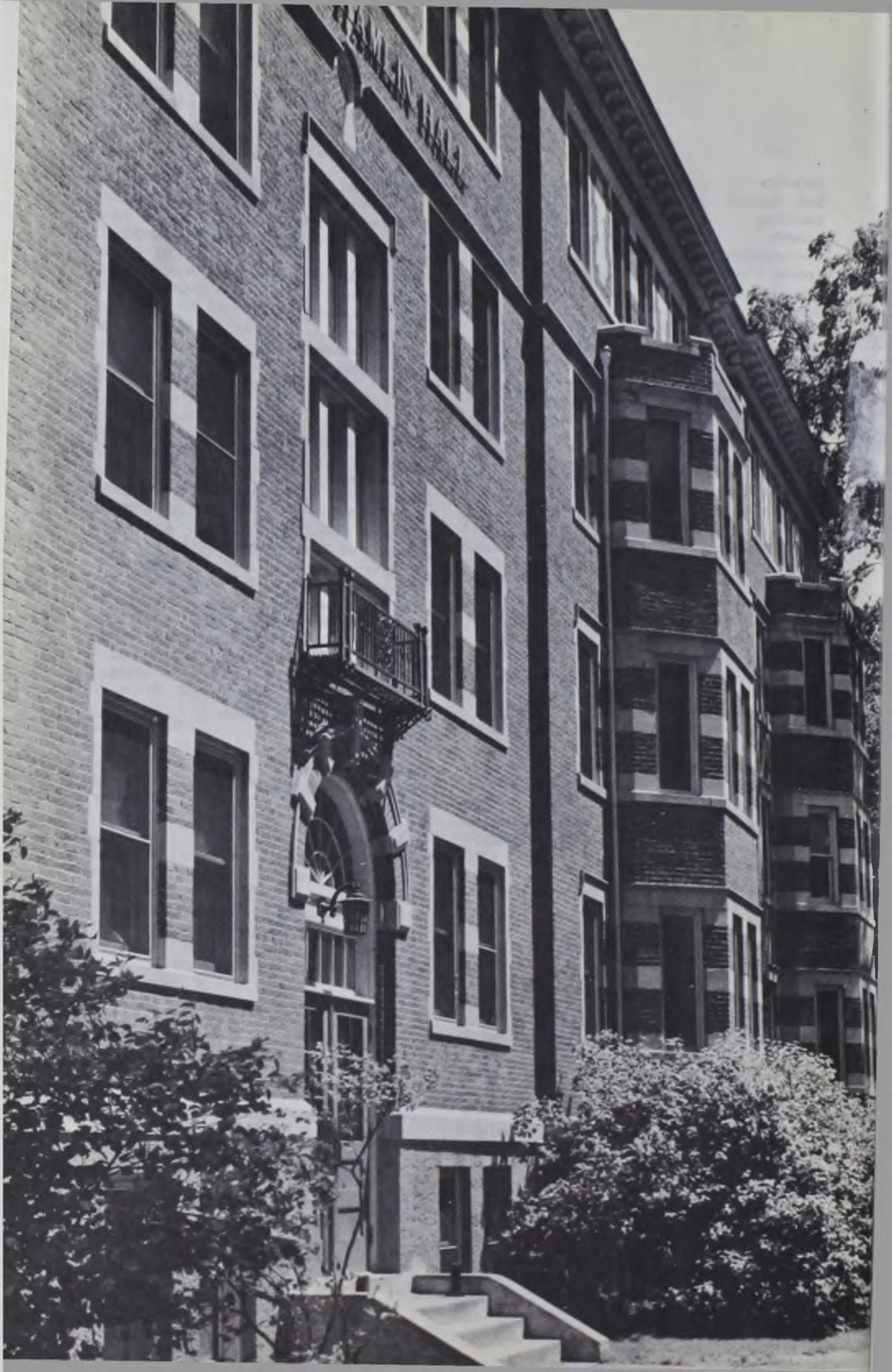
Property, responsibility for 34
Psychology 150
Public Administration, Bureau of 16
Public Management curricula 74, 77, 301
Public Services, Division of 16
Public Speaking 160
Publications
Agricultural Experiment Station 27
Cooperative Extension Service 27
Student 40
University 27
Pulp and Paper 290, 292, 313
Pulp and Paper Foundation Funds 60
Radio and Television (Department of Speech) 39, 162
Radio Engineering (see Electrical Engineering)
Radio Station WMEB-FM 39
Ranking system 32
Refunds 52
Regional Cooperation, New England 48
Registration
Freshman 31
Upperclassmen 31
Regulations for students 34
Religious affairs 30
Requirements for admission (see admission)
Requirements for graduation (see graduation)
Research and Federal Relations, office of 16
Residence and dining halls 22
Residence requirements
Education, College of 187
For degrees 37
Rules governing 53
Responsibility for personal property 34
Rhetoric, courses in 84, 160
Romance Languages 98
Rooms (Dormitory) 22, 50
Room and board 51
R.O.T.C. 333
Rules Governing Residence 53
Rural Sociology 157
Russian 105
Sanitary Engineering (see Civil Engineering)
Scholarships 43, 55
Scholastic Aptitude and Achievement Tests 42
Scholastic Honor Societies 38
School of Forest Resources 227
School of Nursing 134
Scientific collections 26
Social Fraternities and Sororities 40
Social Work 155

Page

Sociology 154
Soils Courses 261
Sororities 40
Spanish 106
Special living arrangements 43
Special Program Division 17
Special students 47
Speech 160
Student activities 37, 161
Student aid 29, 53
Student employment 29, 53
Student expenses 49, 287
Student government 37
Student organizations 38
Student publications 40
Student registrations 33
Student Religious Association 30
Student senate, general 37
Student teaching 195
Summary of Student
Enrollment 387, 388, 389, 390
34
Summer Forestry Camp 52, 228
Summer Sessions 17, 74, 187, 341
Supervised teaching 186
Suspension 34
Surveying 302
Teachers Certificate (see
Certificate)
Technology, College of 15, 286
Course expenses 287
Courses offered and
specimen curricula 288
Graduate Study 287
Graduation requirements 287
Technology Experiment Station 16
Technical Institute Division 207
Telephone engineering (see
Electrical Engineering)
Tests, aptitude and achievement 42
Theatre 39, 161
Thesis requirements, Graduate
Study 331

Page

Title I HEA 17
Transfer credit, College of Arts
and Sciences 70
and Business Administration 175
Transfer students 48, 187
Trigonometry 123
Trustees, Board of 5
Tuition charges 49
Two-year Division in
Agriculture 45, 266
Two-year Technical Course
descriptions 272
Ubris 40
University
Buildings 18
General Information 13
History 13
Organizations 14
Publications 27
University Farms 23
University Forest 24
University of Maine Bulletin 27
University of Maine
Foundation Funds 59
U. of M. at Augusta 15, 327
University of Maine at Bangor 47
University of Maine Law Review 28
University of Maine Studies 27
University of New Hampshire 270
University Open House 18
University Placement Bureau 28
University Singers 38
Upperclassmen 31
Vegetables, courses in 262
Veterans Administration
Information 43
Veterinary Science 257
Voice, course in 160
Wildlife Management 228
Withdrawal 34
Woodland Preserve 24
Women's student government 37
Zoology (including Fishery
Science) 26, 165


HAMILTON HALL