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UNIVERSITY OF MAINE

Catalog for 1967

UNIVERSITY OF MAINE
BULLETIN
ORONO, MAINE 04473
BULLETIN OF THE UNIVERSITY OF MAINE
Volume 69 August 15, 1966 Number 3
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Entered as second class matter at Orono, Maine, 04473

ABBREVIATIONS AND SYMBOLS

Ab	Agricultural Business and Economics
AE	Agricultural Engineering
An	Animal Sciences
AnP	Animal Pathology
As	Astronomy
At	Art
Ay	Anthropology
Ba	Business Administration
Bt	Botany
By	Bacteriology
Cd	Clothing and Design
Ce	Civil Engineering
Cf	Child Development and Family Relationships
Ch	Chemistry
ChE	Chemical Engineering
Cp	Comparative Literature
Ec	Economics
Ed	Education
Ee	Electrical Engineering
Eg	Engineering Graphics
Eh	English
En	Entomology
Fn	Food and Nutrition
Fr	French
Fy	Forestry
Gc	General Engineering
Ge	Geography
Gk	Greek
Gm	German
Gy	Geology
He	Home Economics Education
Hm	Home Management and Housing
Hr	Honors
Hy	History
Jr	Journalism
LSA	General Agriculture
Lt	Latin
Mc	Music
Me	Mechanical Engineering
Ms	Mathematics
Mt	Military
My	Modern Society
Nu	Nursing
P	Plants
Pa	Pulp and Paper
Pe	Physical Education
Pl	Philosophy
Ps	Physics
Pol	Political Science
Py	Psychology
Ru	Russian
S	Soils
Sh	Speech
Sp	Spanish
Sw	Social Work
Sy	Sociology
Zo	Zoology

† Courses offered during 1966-67 and alternate years.
‡ Courses offered during 1967-68 and alternate years.

INFORMATION IN THIS CATALOG COVERS 1966-67 ACADEMIC YEAR

The information contained in this catalog covers rules, regulations, curricula, and programs for the 1966-67 academic year. The University reserves the right to make changes at any time.

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CALENDAR FOR 1966-67

Fall 1966

		1966
Registration of all students	Mon., 1:00-4:30 P.M.	Sept. 12
who have not previously completed it by mail	Tues., 8:00-12 M	Sept. 13
Classes begin	Wed., 8:00 A.M.	Sept. 14
Midsemester reports due (covering the first half semester to Nov. 3)	Mon. noon	Nov. 7
Thanksgiving recess begins	Wed., 11:50 A.M.	Nov. 23
Classes resumed	Mon., 8:00 A.M.	Nov. 28
Christmas recess begins	Fri., 5:00 P.M.	Dec. 16
		1967
Classes resumed	Tues., 8:00 A.M.	Jan. 3
Classes end	Thurs., 5:00 P.M.	Jan. 12
Final examinations begin	Sat., 8:00 A.M.	Jan. 14
Registration of freshman and upperclass students	Mon.-Sat.	Jan. 16-21
Commencement	Saturday	Jan. 21
Final examinations end	Monday	Jan. 23
Registration of former and transfer students	Sat., 8:00-11:00 A.M.	Jan. 28

Spring 1967

Classes begin	Mon., 8:00 A.M.	Jan. 30
Midsemester reports due (covering the first half semester to March 18)	Thurs. noon	Mar. 23
Spring recess begins	Fri., 5:00 P.M.	Mar. 24
Classes resumed	Mon., 8:00 A.M.	Apr. 3
Maine Day	Wednesday	May 3
Graduate theses due	Friday	May 12
Classes end	Thurs., 5:00 P.M.	May 18
Final examinations begin	Mon., 8:00 A.M.	May 22
Final examinations end	Tuesday	May 30
Class Day	Tuesday	May 30
Commencement exercises	Wed., 2:30 P.M.	May 31
Alumni Day	Saturday	June 3

Summer Camp

Forestry Junior Camp	June 5-Aug. 5

Summer Session

Summer Session (three-week courses begin)	Mon., 7:45 A.M.	June 19
Summer Session (six-week courses begin)	Mon., 7:45 A.M.	July 10
Classes end	Friday	Aug. 18
Commencement exercises	Fri., 7:45 P.M.	Aug. 18
Summer Session (three-week courses begin)	Mon., 7:45 A.M.	Aug. 21

JULY 1967						
Mo	Tu	We	Th	Fr	Sa	
					1	
3	4	5	6	7	8	
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17	18	19	20	21	22	
24	25	26	27	28	29	
31						

JAN. 1968						
Su	Mo	Tu	We	Th	Fr	Sa
	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			

AUG. 1967						
Mo	Tu	We	Th	Fr	Sa	
	1	2	3	4	5	
7	8	9	10	11	12	
14	15	16	17	18	19	
21	22	23	24	25	26	
28	29	30	31			

FEB. 1968						
Su	Mo	Tu	We	Th	Fr	Sa
				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		

SEPT. 1967						
Mo	Tu	We	Th	Fr	Sa	
				1	2	
4	5	6	7	8	9	
11	12	13	14	15	16	
18	19	20	21	22	23	
25	26	27	28	29	30	

MAR. 1968						
Su	Mo	Tu	We	Th	Fr	Sa
					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						

OCT. 1967						
Mo	Tu	We	Th	Fr	Sa	
2	3	4	5	6	7	
9	10	11	12	13	14	
16	17	18	19	20	21	
23	24	25	26	27	28	
30	31					

APR. 1968						
Su	Mo	Tu	We	Th	Fr	Sa
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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

NOV. 1967						
Mo	Tu	We	Th	Fr	Sa	
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6	7	8	9	10	11	
13	14	15	16	17	18	
20	21	22	23	24	25	
27	28	29	30			

MAY 1968						
Su	Mo	Tu	We	Th	Fr	Sa
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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	

DEC. 1967						
Mo	Tu	We	Th	Fr	Sa	
				1	2	
4	5	6	7	8	9	
11	12	13	14	15	16	
18	19	20	21	22	23	
25	26	27	28	29	30	

JUNE 1968						
Su	Mo	Tu	We	Th	Fr	Sa
						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						

CALENDAR FOR 1967-68 (TENTATIVE)

Fall 1967

		1967
Registration of all students	Mon.. 1:00-4:30 P.M.	Sept. 11
who have not previously completed it by mail	Tues., 8:00-12 M.	Sept. 12
Classes begin	Wed., 8:00 A.M.	Sept. 13
Midsemester reports due (covering the first half semester to Nov. 1	Mon. noon	Nov. 6
Thanksgiving recess begins	Wed., 11:50 A.M.	Nov. 22
Classes resumed	Mon., 8:00 A.M.	Nov. 27
Christmas recess begins	Fri., 5:00 P.M.	Dec. 15
		1968
Classes resumed	Wed., 8:00 A.M.	Jan. 3
Classes end	Thurs., 5:00 P.M.	Jan. 11
Final examinations begin	Sat., 8:00 A.M.	Jan. 13
Registration of freshman and upperclass students	Mon.-Sat.	Jan. 15-20
Commencement	Saturday	Jan. 20
Final examinations end	Monday	Jan. 22
Registration of former and transfer students	Sat., 8:00-11:00 A.M.	Jan. 27

Spring 1968

		1968
Classes begin	Mon., 8:00 A.M.	Jan. 29
Midsemester reports due (covering the first half semester to March 16)	Thurs. noon	Mar. 21
Spring recess begins	Fri., 5:00 P.M.	Mar. 22
Classes resumed	Mon., 8:00 A.M.	Apr. 1
Maine Day (if approved)	Wednesday	May 1
Graduate theses due	Friday	May 10
Classes end	Thurs., 5:00 P.M.	May 16
Final examinations begin	Mon., 8:00 A.M.	May 20
Class Day	Tuesday	May 28
Final examinations end	Tuesday	May 28
Commencement exercises	Wed., 2:30 P.M.	May 29
Alumni Day	Saturday	June 1

Summer Camp

Forestry Junior Camp	June 3-Aug. 3

Summer Session

Summer Session (three-week courses begin)	Mon., 7:45 A.M.	June 17
Summer Session (six-week courses begin)	Mon., 7:45 A.M.	July 8
Classes end	Friday	Aug. 16
Commencement exercises	Fri., 7:45 P.M.	Aug. 16
Summer Session (three-week courses begin)	Mon., 7:45 A.M.	Aug. 19

CALENDAR FOR 1966-67

Fall 1966

		1966	
Registration of all students	Mon., 1:00-4:30 P.M.	Sept.	12
who have not previously completed it by mail	Tues., 8:00-12 M	Sept.	13
Classes begin	Wed., 8:00 A.M.	Sept.	14
Midsemester reports due (covering the first half semester to Nov. 3)	Mon. noon	Nov.	7
Thanksgiving recess begins	Wed., 11:50 A.M.	Nov.	23
Classes resumed	Mon., 8:00 A.M.	Nov.	28
Christmas recess begins	Fri., 5:00 P.M.	Dec.	16
		1967	
Classes resumed	Tues., 8:00 A.M.	Jan.	3
Classes end	Thurs., 5:00 P.M.	Jan.	12
Final examinations begin	Sat., 8:00 A.M.	Jan.	14
Registration of freshman and upperclass students	Mon.-Sat.	Jan.	16-21
Commencement	Saturday	Jan.	21
Final examinations end	Monday	Jan.	23
Registration of former and transfer students	Sat., 8:00-11:00 A.M.	Jan.	28

Spring 1967

Classes begin	Mon., 8:00 A.M.	Jan.	30
Midsemester reports due (covering the first half semester to March 18)	Thurs. noon	Mar.	23
Spring recess begins	Fri., 5:00 P.M.	Mar.	24
Classes resumed	Mon., 8:00 A.M.	Apr.	3
Maine Day	Wednesday	May	3
Graduate theses due	Friday	May	12
Classes end	Thurs., 5:00 P.M.	May	18
Final examinations begin	Mon., 8:00 A.M.	May	22
Final examinations end	Tuesday	May	30
Class Day	Tuesday	May	30
Commencement exercises	Wed., 2:30 P.M.	May	31
Alumni Day	Saturday	June	3

Summer Camp

Forestry Junior Camp		June	5-Aug. 5

Summer Session

Summer Session (three-week courses begin)	Mon., 7:45 A.M.	June	19
Summer Session (six-week courses begin)	Mon., 7:45 A.M.	July	10
Classes end	Friday	Aug.	18
Commencement exercises	Fri., 7:45 P.M.	Aug.	18
Summer Session (three-week courses begin)	Mon., 7:45 A.M.	Aug.	21

CALENDAR FOR 1967-68 (TENTATIVE)

Fall 1967

		1967
Registration of all students	Mon.. 1:00-4:30 P.M.	Sept. 11
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Classes resumed	Mon., 8:00 A.M.	Apr. 1
Maine Day (if approved)	Wednesday	May 1
Graduate theses due	Friday	May 10
Classes end	Thurs., 5:00 P.M.	May 16
Final examinations begin	Mon., 8:00 A.M.	May 20
Class Day	Tuesday	May 28
Final examinations end	Tuesday	May 28
Commencement exercises	Wed., 2:30 P.M.	May 29
Alumni Day	Saturday	June 1

Summer Camp

Forestry Junior Camp	June 3-Aug. 3

Summer Session

Summer Session (three-week courses begin)	Mon., 7:45 A.M.	June 17
Summer Session (six-week courses begin)	Mon., 7:45 A.M.	July 8
Classes end	Friday	Aug. 16
Commencement exercises	Fri., 7:45 P.M.	Aug. 16
Summer Session (three-week courses begin)	Mon., 7:45 A.M.	Aug. 19

BOARD OF TRUSTEES

LAWRENCE MARK CUTLER, B.A., M.D., President — 31 Grove Street, Bangor
Term expires September 2, 1971
W. GORDON ROBERTSON, Vice President — 84 Harlow Street, Bangor
Term expires September 29, 1969
ARTHUR HENRI BENOIT, B.S. — Monument Square, Portland
Term expires September 2, 1971
FRANK C. BROWN — 30 Rockefeller Plaza, New York 20, New York
Term expires March 28, 1967
LUCIA M. CORMIER, A.B., M.A. — 312 Fore Street, Portland
Term expires December 2, 1972
RALPH HENRY CUTTING — Keyes Fibre Company, Waterville
Term expires September 18, 1970
ROBERT NELSON HASKELL, B.S. — 33 State Street, Bangor
Term expires December 8, 1967
HUBERT HOWARD HAUCK, A.B. — 400 Congress Street, Portland
Term expires September 7, 1969
WILLIAM T. LOGAN, JR., A.B., M.Ed., *ex officio* — State House, Augusta
HELEN WORMWOOD PIERCE (MRS. LEONARD A., JR.), B.A.
Term expires November 20, 1966 — Rumford Road, Bethel
OWEN HALBERT SMITH, B.S. — Presque Isle
Term expires December 20, 1968
EXECUTIVE COMMITTEE: Cutler, Benoit, Brown, Cutting, Hauck
CLERK OF THE BOARD: Edith G. Wilson, B.A., M.A.

OFFICERS OF ADMINISTRATION*

OFFICERS OF THE UNIVERSITY

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VICE PRESIDENT FOR ACADEMIC AFFAIRS. Henry Austin Peck, Alumni Hall.
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DEAN OF WOMEN. Mary Stillman Zink, 219 Fogler Library.
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DIRECTOR OF ADMISSIONS. James Arnold Harmon, Wingate Hall.
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DIRECTOR OF PHYSICAL PLANT. Francis Stephen McGuire, Service Building.
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DIRECTOR OF RESEARCH. Franklin Paul Eggert, 76 Fogler Library.
DIRECTOR OF RESIDENCE AND DINING HALLS. William Carl Wells, Commons.
DIRECTOR OF STUDENT AID. Robert Clifton Worrick, 101 East Annex.
DIRECTOR OF UNIVERSITY COMPUTING CENTER AND DATA PROCESSING CENTER. Russell Albert Altenberger, 263 Aubert Hall.
DIRECTOR OF UNIVERSITY TESTING AND COUNSELING SERVICE. Robert Alexander Apostal, 114 College of Education Building.
EXECUTIVE DIRECTOR, GENERAL ALUMNI ASSOCIATION. T. Russell Woolley, 44 Fogler Library.

OFFICERS OF DIVISIONS OF THE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES. John J. Nolde, Dean, 100 Stevens Hall.
SCHOOL OF NURSING. Jean MacLean, Director, Wingate 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. Winthrop Charles Libby, Dean, 16 Winslow Hall.
SCHOOL OF FORESTRY. Albert Deane Nutting, Director, 104 Deering Hall.
SCHOOL OF HOME ECONOMICS. Margaret Elizabeth Thornbury, Acting Director, 24 Merrill Hall.
COLLEGE OF TECHNOLOGY. Thomas Harvey Curry, Dean, 110 Boardman Hall.
TECHNICAL INSTITUTE DIVISION. Thomas Harvey Curry, Director, 110 Boardman Hall.

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

GRADUATE SCHOOL. Franklin Paul Eggert, Dean, 76 Fogler Library.

SUMMER SESSION. Mark Richard Shibles, Director, 151 College of Education Building.

UNIVERSITY OF MAINE EXTENSION SERVICE. Winthrop Charles Libby, Director, 16 Winslow Hall.

CONTINUING EDUCATION DIVISION. John Mortimer Blake, Associate Director, 101 Education Building.

COOPERATIVE EXTENSION SERVICE. Edwin Hill Blake, Associate Director, 14 Winslow Hall.

MAINE AGRICULTURAL EXPERIMENT STATION. George Farrington Dow, Director, Holmes Hall.

MAINE TECHNOLOGY EXPERIMENT STATION. Thomas Harvey Curry, Director, 110 Boardman Hall.

DEPARTMENT OF INDUSTRIAL COOPERATION. Thomas Harvey Curry, Director, 110 Boardman Hall.

UNIVERSITY OF MAINE IN PORTLAND.

SCHOOL OF LAW. Edward S. Godfrey, Dean, 68 High Street.

UNDERGRADUATE STUDIES. David R. Fink, Jr., Dean, 96 Falmouth Street.

OFFICERS OF THE DEPARTMENTS

AGRICULTURAL BUSINESS AND ECONOMICS. Professor Homer Bastian Metzger, 36 Winslow Hall.

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

ANIMAL SCIENCES. Professor Bruce R. Poulton, 26 Rogers Hall.

ANIMAL PATHOLOGY. Professor John Franklin Witter, Hitchner Hall.

ART. Professor Vincent Andrew Hartgen, Carnegie Hall.

BACTERIOLOGY. Professor Frederick Herbert Radke (Acting Head), 231 Hitchner Hall.

BIOCHEMISTRY. Professor Frederick Herbert Radke, 231 Hitchner Hall.

BOTANY AND PLANT PATHOLOGY. Professor Richard John Campana, 215 Deering Hall.

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

CHEMISTRY. Professor John William Beamesderfer, 261 Aubert Hall.

CIVIL ENGINEERING. Professor George Knowlton Wadlin, Jr., 101 Boardman Hall.

ELECTRICAL ENGINEERING. Professor Ralph E. Armington, 101 Barrows Hall.

ENGINEERING GRAPHICS. Professor Matthew McNeary, 122 East Annex.

ENGLISH. Professor Cecil John Reynolds, 225 Stevens Hall.

ENTOMOLOGY. Professor Geddes Wilson Simpson, 306 Deering Hall.

FOOD SCIENCE. Professor Matthew Edward Highlands, 17 Holmes Hall.

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

FORESTRY. Director Albert Deane Nutting, 104 Deering Hall.

GEOLOGICAL SCIENCE. Professor Philip Henry Osberg, 138 Boardman Hall.

HISTORY. Professor William Hartley Jeffrey (Acting Head), 130 Stevens Hall.

HOME ECONOMICS. Acting Director Margaret Elizabeth Thornbury, 24 Merrill Hall.

INDUSTRIAL COOPERATION. Dean Thomas Harvey Curry, 110 Boardman Hall.

JOURNALISM. Associate Professor Brooks Witham Hamilton, 2 Fernald Hall.

Mathematics and Astronomy. Professor Spofford Harris Kimball, 304 College of Education Building.

Mechanical Engineering. Professor Francis Joseph Sullivan, 209 Boardman Hall.

Military Science. Colonel John Stephen Gerety, Armory.

Music. Professor Herrold Eugene Headley, Lord Hall.

Nursing. Professor Jean MacLean, Wingate Hall.

Philosophy. Professor Charles Franklin Virtue, 3 Stevens, North.

Physical Education and Athletics. Associate Professor Harold Scott Westerman, Memorial Gymnasium.

Physics. Professor Clarence Edwin Bennett, Physics Building.

Plant and Soil Sciences. Professor Roland August Struchtemeyer, 114 Deering Hall.

Political Science. Professor Eugene Alberto Mawhinney (Acting Head), 11 Stevens Hall, North.

Psychology. Professor Arthur Mark Kaplan, 301A Little Hall.

Sociology and Anthropology. Professor Glenn Morley Vernon, 44 Stevens Hall, South.

Speech. Professor Wofford Gordon Gardner, 310 Stevens Hall.

Zoology. Professor Kenneth William Allen, Coburn Hall.

CORRESPONDENCE

Inquiries should be directed as indicated below:

General administrative matters ..... President, Edwin Young
Scholarship records ..... Registrar, George H. Crosby
Admission to the freshman class and to
advanced standing (Orono) ..... Director of Admissions, James A. Harmon
University of Maine in Portland ..... Director of Admissions, Alfred E. Clarke
Financial affairs of students ..... Treasurer, Harry W. Gordon
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, Winthrop C. Libby
College of Technology ..... Dean of the College, Thomas H. Curry
University of Maine in Portland:
School of Law, Edward S. Godfrey, Dean, 68 High Street
Undergraduate Studies, David R. Fink, Jr., Dean, 96 Falmouth Street
Graduate School and scholarships available
for graduate students ..... Dean of Graduate School, Franklin P. Eggert
Summer Session for teachers and college students ..... Director, Mark R. Shibles

Continuing Education Courses ..... Assistant Directors

Edward W. Hackett, Jr.
University of Maine
101 Education Building, Orono

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

Lloyd J. Jewett
University of Maine in Augusta
Cony St., Augusta

Arnold G. Westerberg
University of Maine in Lewiston-Auburn
Room 404, 145 Lisbon St., Lewiston

John R. Benoit
Presque Isle

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, Miss Velma K. Oliver
Dormitory rooms for men, rooms in private homes,
and apartments ... Manager, Men's and Family Housing, Vernon C. Elsemore
Foreign students ..... Cecil J. Cutts, Adviser
Conferences and conventions ..... Dwight L. Rideout, Conference Coordinator

GENERAL INFORMATION

Alumni Hall, Administration Building

General Information

The University of Maine is part of the public educational system of the state. Its main campus is located in Orono, an attractive town of about 8,000 population, about half way between Kittery, the most southerly town in the state, and Fort Kent on the northern boundary.

The extensive campus of over 1,100 acres is situated about a mile from the business section of Orono and borders the Stillwater River, a branch of the Penobscot. The University is approximately eight miles from Bangor, the third largest city of the state, on U. S. Route 2A.

History—The University 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 engineering, 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.

By an act of the Maine Legislature, the University of Maine in Portland was established in 1957.

The merger of Portland University and the University of Maine was approved by the 100th Maine Legislature in 1961.

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 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, and Dr. Lloyd H. Elliott.

Organizations of the University—The University is controlled by a Board of Trustees. Eight members are appointed by the governor of the state, with the advice and consent of the executive council, for a term of seven years. Two members are appointed for three years by the governor upon the nomination of the General Alumni Association. The commissioner of education is an ex officio member of the board. 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 include the Colleges of Arts and Sciences, Life Sciences and Agriculture, Business Administration, Education, and Technology; University of Maine in Portland; School of Law in Portland; Graduate Study, Summer Session, 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.

The College of Arts and Sciences offers curricula in an approved field of concentration or in any of the following subjecs: Art, Chemistry, Economics, English, French, Geology, German, Political Science, (option in Public Management.) History, International Affairs, Journalism, Mathematics, Medical Technology, Music, Nursing, Philosophy, Physics, Psychology, Romance Languages, Sociology, Spanish, Speech, Theatre, and Zoology.

The College of Business Administration offers curricula in both Business Administration and Economics. The degree of bachelor of science is awarded to those who successfully complete the requirements in either of these two fields of study.

The College of Education offers during the academic year and its Summer Session program 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.

The College of Life Sciences and Agriculture offers programs leading to the bachelor of science degree in the following fields: Agricultural Business and Economics, Agricultural Engineering (jointly with the College of Technology), Agricultural Mechanization, Animal Sciences, Bacteriology, Biochemistry, Biology, Botany, Entomology, Forestry, Home Economics, Plant and Soil Sciences, and Wildlife Management. It also offers two-year preprofessional programs in Agricultural Education, Veterinary, Dairy Manufacturing, and Food Processing. Several

General Information

The University of Maine is part of the public educational system of the state. Its main campus is located in Orono, an attractive town of about 8,000 population, about half way between Kittery, the most southerly town in the state, and Fort Kent on the northern boundary.

The extensive campus of over 1,100 acres is situated about a mile from the business section of Orono and borders the Stillwater River, a branch of the Penobscot. The University is approximately eight miles from Bangor, the third largest city of the state, on U. S. Route 2A.

History—The University 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 engineering, 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.

By an act of the Maine Legislature, the University of Maine in Portland was established in 1957.

The merger of Portland University and the University of Maine was approved by the 100th Maine Legislature in 1961.

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 charge of a dean.

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two-year technical training programs and short courses are offered, and the college annually sponsors Farm and Home Week.

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, Pulp and Paper Computer Technology and in Power Systems Engineering. Two-year programs are also offered through the Technical Division of the college in Civil Engineering Technology, Electrical Engineering Technology, Mechanical Engineering Technology, and Chemical Engineering Technology.

THE UNIVERSITY OF MAINE IN PORTLAND is a full-fledged campus of the University, offering four-year degree programs in a number of areas of concentration, a graduate program in business administration, and a more limited variety of graduate courses in other areas of concentration.

Students currently starting their college work at the Portland campus may continue at Portland to complete University requirements for the degrees of associate in business administration, bachelor of science in business administration, bachelor of arts with concentration in English, French, mathematics, history and government, or sociology, bachelor of science in education with concentration in any of the appropriate academic areas previously listed for the teaching of secondary subjects, and master of business administration. Freshmen intending to concentrate in other areas or continue programs in other colleges of the University may complete at least one year of academic credits at Portland before transition to the Orono campus for more specialized work.

THE FACULTY OF GRADUATE STUDY offers programs of study leading to the degrees of master of arts, master of arts in teaching, master of arts in teaching (foreign language), master of science, master of business administration, master of science in engineering, master of education, and doctor of philosophy. The doctoral program is offered in the fields of animal nutrition, chemical engineering, chemistry, American history, plant science, clinical psychology, general-experminental psychology, and zoology. The professional degree of forest engineer is granted upon completion of the appropriate requirements.

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 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 in or related to agriculture and home economics 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 committees organized in nearly 500 Maine communities.

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 and the U. S. Department of Agriculture in serving the people of Maine.

THE CONTINUING EDUCATION DIVISION (*C.E.D.*) is a part of the University of Maine Extension Service. It coordinates the part-time study of adults in various locations in Maine and provides programs for recent high school graduates who wish to begin college study within commuting distance of their homes. Major C.E.D. centers are maintained at Auburn, Augusta, Biddeford, Brunswick, Orono, Portland, Presque Isle, Rockland, Rumford and York.

THE MAINE AGRICULTURE 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 DEPARTMENT OF INDUSTRIAL COOPERATION is the liaison office between: (1) University departments and (2) outside agencies sponsoring University research work. The department is located in Boardman Hall and is administered by the Dean of the College of Technology.

Buildings—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.

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. Its dining hall serves 350 students.

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

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.

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.

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.

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.

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.

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.

THE UNIVERSITY CABINS (1945), capacity 42 men students. These are cooperative units.

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.

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.

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

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, the studio for Educational Television, and a small auditorium. 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 the 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 Ath-

letics, 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.

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.

Aubert Hall (1914) houses the Department 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.

Boardman Hall (1949) houses the Department of Civil Engineering, including Geology and Sanitary Engineering, Department of Mechanical Engineering, Technology Experiment Station laboratories, Department of Industrial Cooperation, and office of the Dean of the College of Technology. It was named in honor of President Emeritus Harold Sherburne Boardman.

Carnegie Hall (1948), the former library building erected in 1960 through the generosity of Andrew Carnegie, is now devoted to the Department of Art. It was named in honor of the original donor.

Coburn Hall (1888) houses the Department of Zoology. It was named for the late Hon. Abner Coburn, a former president of the Board of Trustees and benefactor of the University.

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, including closed-circuit television, are located in this building.

Crosby Laboratory (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, Forestry, 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 Engineering Graphics, Wildlife Conservation, Student Placement Bureau, 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.

Fernald Hall (1870) the oldest building on the campus, contains offices and classrooms used by the Department of Journalism and editorial offices of "The Maine Campus." The building also contains a University snack bar.

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.

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 Department of Animal Pathology, Bacteriology, Biochemistry, and Animal 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 Lengyel, Professor Emerita of Women's Physical Education.

LORD HALL (1904) contains offices and laboratories for the Department of Music on the first and second floors and for the Maine Cooperative Fisheries in the basement. 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, a 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. It was named for the late Dr. Leon S. Merrill, dean of the College of Agriculture from 1911 to 1933.

PHYSICS BUILDING (1959) contains offices, classrooms, and laboratories for the Department of Physics.

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 offices and a classroom, the office of the Director of Admissions, the office of the Registrar, the office of the Director of the School of Nursing, quarters for the Data Processing 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 the Department of Public Information and Central Services. 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, Federal Office Building, Fisheries Building, Poultry Buildings, Stock Judging Pavilion, Maples, Mechanical Engineering Shops, Agricultural Engineering Shop Building, Observatory, Infirmary, University Press, the Central Heating Plant, Service Building, Entomology, several residences occupied by faculty members, and various farm buildings.

UNIVERSITY OF MAINE IN PORTLAND.—Please see section on University of Maine in Portland for list of the buildings at that campus.

FRATERNITY HOUSES.—The following fraternities have houses on or near the 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.

* Closed until 1968

RESIDENCE AND DINING HALLS—The rooms in most of the halls normally accommodate one or two students each. South Hannibal Hamlin Hall and Colvin Hall and the University Cabins will accommodate four students each. Assignment to Colvin Hall (the cooperative dormitory for women) and the University Cabins is based on financial need, cooperation, and satisfactory scholarship. A Graduate Women's Residence provides housing for 13 students.

The five dining halls serve the residents of the dormitories on a 21 meal per week basis. Meals are available to non-dormitory students at a transient meal rate or through purchase of a semester's meal ticket. Colvin Hall has its own dining room operated by residents of the dormitory. Residents in the University Cabins prepare their own meals on facilities provided in each building.

Undergraduate women not living at home are required to live in one of the women's dormitories. In exceptional circumstances, other arrangements may be approved upon application to the Dean of Women.

All men students who are members of the freshman class and who do not live at home are required to live in a University dormitory, except that the Dean of Men may authorize off-campus residence in exceptional cases.

Other male students assigned to dormitories are expected to reside within the dormitory systems for the complete semester unless they leave the University.

Dormitory residents are furnished bed linen each week without extra charge. Students will furnish towels, pillows and blankets.

Temporary housing is furnished students during the Thanksgiving, mid-year and spring recess periods at extra charge.

Dormitory regulations are to be observed at all times.

ATHLETIC FACILITIES—The University's facilities for athletics and physical education include the Memorial Gymnasium, the Memorial Indoor Field House, the Helen A. Lengyel Gymnasium, outdoor hockey rink, and numerous athletic fields.

The athletic fields for men include 10 tennis courts, two baseball fields, a football stadium, football practice fields (one of which is illuminated for evening

practice), a quarter-mile cinder track, a 220-yard straightaway, hammer and discus fields, fields for intramural sports, a two-mile-and-a-half cross country course, a four-mile cross country course, skiing facilities, and a skating rink.

The Helen A. Lengyel Gymnasium has two large floors 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. 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, a flock of sheep and a few swine 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.

The University Computing Center in Wingate Hall provides digital computing facilities and services for the instructional, research, and consulting needs of University students and faculty. Courses in computer programming are offered by the Department of Mathematics and Astronomy, the Department of Business and Economics, and the College of Technology. Complete computing service is provided to students and faculty doing research and consulting work, but the facilities are also made available to persons who wish to do their own programming and machine operation.

The center is equipped with an IBM 1620 digital computer, an IBM 407 accounting machine, and other peripheral equipment. The 1620 computer is card-oriented and has 40,000 positions of core storage and a 1311 disk drive.

Ira C. Darling Center for Research, Testing and Service—An estate located in Wentworth Point on the Damariscotta River in Walpole, Maine, is being developed as a marine station. The site comsists of more than 130 acres of land and has more than one mile of shore frontage. Laboratory facilities are available for faculty and graduate research.

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 about 400,000 books and pamphlets and receive

some 2,800 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, Pierce, Picasso, Matisse, Rouault, Hamabe and others. Many of these works are hung in public areas throughout the campus.

The University of Maine Program of Exhibitions—Throughout the academic year, the Department of Art presents each month eight different art exhibitions: four in Carnegie Hall and one each in the Oakes Room of the 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 25 or more different exhibitions of original art throughout the schools and academies of Maine. There is no charge for these exhibitions. All inquiries about these exhibits should be addressed to Professor Vincent A. Hartgen, Head of the Department of Art.

Scientific Collections—The following collections are located on the 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 Collins'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, and K. P. Jansson. Numerous centuries of Plantae Exsiccatae Grayanae are significant additions. Fifty 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 which 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. One case containing mineralogical specimens is located in the Agricultural Engineering Building.

ZOOLOGY—These collections in Coburn Hall consist of a working collection of bird skins, a display of bird mounts, and a study collection of various other groups of both vertebrates and invertebrates. The Anson Allen Collection of Invertebrates and of Maine Birds, presented by Mrs. Mattie Munson, and the Eckstorm Collection of birds, presented by Mrs. Fannie H. and Mrs. P. F. Eckstorm, form an important part of the whole.

Planetarium—A Planetarium, operated under the supervision of the Department of Mathematics and Astronomy, 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 Director of Student Services.

The University of Maine Anthropology Museum—The Department of Sociology and 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. Loan collections from other institutions are exhibited periodically. The museum is open to the public whenever the University is open. Regular hours are Tuesday through Thursday, 9 a. m. to 4 p. m. and Friday 9 a.m. to 2 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 22 times a year to give information to students, faculty, alumni, and the general public.

UNIVERSITY OF MAINE STUDIES, SECOND SERIES, consists of research studies by members of the faculty and graduate students, published under the direction of the Faculty of Graduate Study. A price list may be obtained from the Bulletin Room, Winslow Hall. Orders and exchanges should be sent to the Bulletin Room.

AGRICULTURE EXPERIMENT STATION PUBLICATIONS include technical and popular bulletins miscellaneous publications, and miscellaneous reports in which are contained the results of research studies; and Official Inspections which contain the results of inspection of feeding stuffs, fertilizers, agricultural seeds, fungicides and insecticides, and foods and drugs. A report of progress is issued quarterly as Maine Farm Research. 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.

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—The University Trustees have set aside $100,000 to form a permanent fund, the income to be used by the faculty for carrying on various kinds of research work. Applications for grants from this fund should be addressed to the Secretary, Coe Research Fund Committee.

Placement Bureau—The University Placement Bureau was established in 1935 in cooperation with the General Alumni Association. Its services are available to undergraduate and graduate students and alumni of the University. The bureau serves both teaching and non-teaching fields.

Purposes of the Placement Bureau are: (1) to counsel and assist students and alumni in their career planning: (2) to notify registrants of suitable employment opportunities; (3) to assist candidates to prepare effective applications; (4) to cooperate with employers in their search for qualified personnel; and (5) to develop career information for University men and women in both new and traditional fields of opportunity. No charge to students, graduates, or employers is made. The bureau also offers assistance to students in securing employment during the summer vacation.

For teaching positions, guidance is given to prospective candidates in compiling essential credentials. Service is rendered to presently employed teachers in maintaining continuous records of achievement to facilitate professional advancement.

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 30, 44 and 45. Information on loan funds and scholarships is contained in a special bulletin, Financial Assistance, available on request.

Health Service—The University Health Service 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 the student:

1. Twenty-four-hour emergency care, including weekends when the University is in session; emergency visits by the physician when necessary.
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 Service staff.
9. Supervision of the University environment to minimize exposure of students to health hazards.
10. A Mental Health Section, under the direction of a clinical psychologist, provides evaluation and therapy for students with personal and emotional problems. Treatment is offered for problems of long standing as well as those acute problems brought on by the pressures of University life. The length of therapy is dependent upon the student's needs.

To meet these goals, the Health Service maintains a 25-bed Infirmary, a medical staff of four physicians, three of whom are full-time employees of the University, a clinical psychologist, 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.

Office of Religious Affairs—The Office of Religious Affairs consists of a Committee on Religious Affairs and a Director of Religious Affairs. The Director of Religious Affairs, whose office is on the second floor of the Memorial Union, serves as adviser to the Student Religious Association, counselor to students, and works toward coordination among the faith groups and between these groups and the University.

Committee on 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.

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 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 in Applied Science (A.A.S.), with specification of the major field, to those who complete the two-year curriculum in the College of Life Sciences and Agriculture.

Associate in Business Administration (A.B.A.) to those who complete the two-year curriculum. Offered only on the Portland campus.

Associate in Engineering (A. Eng.) to those who complete the two-year curriculum in the College of Technology.

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, except students in the School of Nursing.

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

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

Bachelor of Laws (L.L.B.) to those who complete the three-year curriculum in the School of Law.

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

Master of Arts (M.A.) and Master of Science (M.S.) with designation of the major subject or field; Master of Arts in Teaching (M.A.T.), or Master of Education (M.Ed.) are granted for one year's graduate work completed with distinction.

Master of Business Administration (M.Bus. Ad.) is offered only on the Portland campus through a Continuing Education Division program of courses.

Master of Mechanical Engineering (M.M.E.) is offered in the College of Technology.

Doctor of Education (Ed.D.) is offered in the College of Education.

Doctor of Philosophy (Ph.D.) is offered in animal nutrition, chemical engineering, chemistry, American history, physics, plant science, psychology, and zoology.

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 have completed seven-eighths of the required hours at the end of the fall semester of the senior year. 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. For this purpose the letters A, B, C, D, E, P, Abs., and Def. are used.

The meaning of these symbols is: A, high honors; B, honors; C, satisfactory, successful, and respectable meeting of the course objectives; D, low level passing work; E, failed; P, passed non-credit course; Abs., absent from examination, Def., deficient in some specific class activity. The term "Acceptable" is used in reporting on the completion of a master's or doctoral thesis. 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 grades=0.

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; (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 in the College of Education, which requires an accumulative average of not less than 2.00.

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 students at the end of each semester. Progress reports are sent to the parents of freshmen at the middle of each semester. Grade reports for the Summer Session are sent to the parents of all students from the University who are attending the session.

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 of legal age.)

Credit Hour—One credit hour is assigned to a class that meets 50 minutes a week over a period of a semester; or laboratory, field work, computation or other types of instruction that meets, in general, at least two hours a week or the equivalent thereof over a period of a semester. Semesters are approximately 17 weeks in length from the beginning until the close of classes.

Student Regulations—It is assumed that all students entering the Univer-

sity 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 Dean of Men or the Dean of Women 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 the Dean of Men or Dean of Women and bear an official University sticker. There is a registration fee of $1.00. In addition, evidence of automotive 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 not 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.

Drinking—The possession or use of intoxicating beverages is prohibited on the University of Maine campus and at all University functions whether held on or off campus.

Physical Examination—The University requires that all entering students, freshman, 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 previously outlined may also be required of readmission students.

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

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 the 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 29), 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 no more than three 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.

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 sophmore 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: Agriculture, Associate Professor W. M. Bain, 256 Hitchner Hall; Arts and Sciences, Associate Professor R.B. Thomson, 205 East Annex; Business, Associate Professor J.D. Coupe, 22 South Stevens; Education, Professor G.H. Davis, 132 Education Building; Technology, Professor R. C. Hill, 201 Boardman Hall; University of Maine in Portland, Assistant Professor J. Jaques, Payson Smith Hall.

Council—The University Honors Council, consisting of Vice President Peck, chairman, Professors Hill and Davis, Associate Professors Bain and Thomson, and Assistant Professor Jaques, 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 Associate Professor Thomson, 205 East Annex, Secretary of the Honors Council.

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

DISTINGUISHED MAINE STUDENTS PROGRAM

The Board of Trustees, in 1963, 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. Each Distinguished Maine Student also receives a financial award equivalent to one semester's tuition. Larger awards may be made in some cases and are determined by the financial need of the student, as calculated by the Office of Student Aid. 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 a special first-semester seminar course during their freshman year. 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 of various student organizations and resident groups, plus the four officers who are elected by vote of the students. The Senate is responsible for appointing student members of committees, for campus elections, for events such as Maine Day and for consideration of 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, including 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 New England Women's Student Government Association and National Intercollegiate Association of Women Students.

Religious Affairs—Four major 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 STUDENT RELIGIOUS ASSOCIATION, called SRA, is the coordinating agent of the recognized faith groups and religious activities of the campus and is governed by a cabinet of representatives from the groups and the campus at large.

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, next to the Office of Religious Affairs is open at all times.

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

Departmental Honor and Professional Honor Societies—These organizations elect undergraduates from those who have demonstrated superior scholarship in a particular departmental or professional field. Minimal scholastic membership requirements are lower than 3.0 accumulative average.

Alpha Zeta (1906)—Agriculture
Eta Kappa Nu (1961)—Electrical Engineering
Xi Sigma Pi (1917)—Forestry
Pi Mu Epsilon (1965)—Mathematics
Sigma Pi Sigma (1949)—Physics

Other Student Organizations—

a. Professional Societies—Many departments or divisions of the University sponsor an organization to bring together students having a common interest. Such clubs follow:

Student Branch of the American Society of Agricultural Engineers
Student Chapter of the American Institute of Chemical Engineers
Student Affiliates of the American Chemical Society
Student Branch of the American Society of Civil Engineers
Student Branch of the Institute of Electrical and Electronic Engineers
Branch of the American Home Economics Association
Branch of the American Society of Mechanical Engineers
Pershing Rifles—Military
Scabbard and Blade—Military
Student National Education Association
Student Chapter of Music Educators National Conference
Student Chapter of Wildlife Society

b. Departmental Clubs:

Animal-Dairy Science Club
Associated Nursing Students
College 4-H Club
Forestry Club
Future Farmers of America
Home Economics Club
Philosophy Club
Physical Education Majors
Plant and Science Club
Press Club—Journalism
Rock and Hammer—Geology

The following organizations elect to membership students who have achieved distinction in the field represented:

National
Pi Kappa Delta—Forensics
Local
Maine Debating Council—Forensics
Maine Masquers—Theatre
Mu Alpha Epsilon—Music
Sigma Mu Sigma—Psychology

c. Additional Student Clubs and Associations:

All-Maine Women
Alpha Phi Omega
Amateur Radio Club
Circle K. Club
Deutscher Verein
Interfraternity Council
International Club
Intervarsity Christian Fellowship
Intramural Athletic Association
Le Cercle Francais
Maine Business Club
Maine Outing Club
Mathematics Club
"M" Club
Memorial Union Activities Board
Men's Athletic Association
Men's Central Dormitory Council
Modern Dance Club
Mrs. Maine Club
Off-Campus Women
Panhellenic Council
Public Management Club
Sailing Club
Senior Skulls
Sophomore Eagles
Sophomore Owls
Square Dance Club
Women's Athletic Association
Young Democrats Club
Young Republican Club

Musical Organizations—Students have many opportunities to continue their musical 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 one 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 Band—This is a band of symphonic proportions that plays extensively throughout the school year. In the early fall it plays as a marching band at football games. The remainder of the year it is a concert band. In the spring the band makes a tour to high schools and communities of the state.

University of Maine Chorophonic Society—This is a chorus of 150 singers that presents concerts of the larger choral works.

University Orchestra—A full symphony orchestra that presents three or more concerts during the school year. The orchestra also assists in the presentations of the Chorophonic Society.

University Singers—This group sings extensively on the campus throughout the year and because of its size and versatility is able to present concerts in the communities and high schools over the state.

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 make-up. 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 programs of both stations enable 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.

Showcase, 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, except the Law Review of the School of Law.

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) closed 1966-67, 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). 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).

Admission

All correspondence concerning undergraduate admission and financial aid should be addressed to the Director of Admissions, Wingate Hall, University of Maine, Orono, Maine 04473. Maine students who desire to attend the University of Maine in Portland (see section of catalog devoted to University of Maine in Portland) should write to the Director of Admissions, University of Maine in Portland, 96 Falmouth Street, Portland, Maine 04103. Maine students who plan to begin their programs at the Augusta or Lewiston-Auburn Campus (Arts and Sciences, Business Administration and Education) should indicate this fact on their applications. All applications are filed at our Orono office.

ADMISSION TO THE FRESHMAN CLASS

The approval of candidates for admission is on a selective basis. The University is interested in candidates whose 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. The principal, teachers, and adult acquaintances of the applicant may be asked to give confidential information regarding character, personality, school and community activities, and ability to pursue a college course successfully.

All 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. (See section concerning the C.E.E.B. Tests which follows.) Applicants for the Two-Year Technical Programs in the College of Life Sciences and Agriculture and the two-year (A.B.A.) program in Business Administration at the Portland Campus are not required to take the Achievement Tests.

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 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. 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 final report is unsatisfactory.*

SCHOLASTIC APTITUDE AND ACHIEVEMENT TESTS

All candidates for admission are required to take the Scholastic Aptitude Test (S.A.T.) and three Achievement Tests administered by the College Entrance Examination Board. [Candidates for the two-year technical programs in the College of Life Sciences and Agriculture and the two-year (ABA) program in Business Administration at the Portland Campus take the Scholastic Aptitude Test only.] Candidates are urged to take the December or January tests. The Achievement Tests may be delayed, if necessary, until March. The Achievement Tests should include English composition. [Level I (Standard) in Mathematics is also required of all engineering candidates] and two other tests of the candidates' choice, or as recommended by the Director of Admissions. 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, December 3, 1966
Saturday, January 14, 1967
Saturday, March 4, 1967
Saturday, May 6, 1967
Saturday, July 8, 1967

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.

VETERANS ADMINISTRATION INFORMATION

Miss Elizabeth S. Reid, assistant registrar, 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 Certificate of Eligibility should be made at a Regional V.A. Office.

SPECIAL LIVING ARRANGEMENTS

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.

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 and the reason for requesting an exception to the rule. Such requests will be carefully reviewed by the Dean of Women, or the Dean of Men.

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 Admissions. Applications should be filed before March 1, and preferably at the time the application to the University 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.

Upperclass students may apply annually 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 for 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, with the exception of a limited number of men assigned to cafeteria jobs, are not encouraged to undertake part-time jobs that require an excessive amount of time.

A specially prepared bulletin entitled Financial Assistance is available on request. Detailed descriptions of all types of financial aid programs are included, together with a descriptive summary of each scholarship and loan fund held or administered by the University.

REQUIREMENTS FOR ADMISSION

COLLEGE OF ARTS AND SCIENCES

English	4 units
Foreign Language	2 units in one language
Algebra*	1 unit
Plane Geometry	1 unit
History or Social Science	1 unit
Electives†	7 units
Total	16 units

*Two units of Algebra are required in the curricula for Chemistry, Geology, Mathematics, Physics, Public Management, Pre-Medical, Medical Technology, and Zoology.

†Chemistry is recommended as an elective for Science, Medical Technology and similar curricula, and required for the Nursing program.

COLLEGE OF BUSINESS ADMINISTRATION

I.

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

II. Two-Year (ABA) Program—Portland campus.

Candidates for admission to the two-year (ABA) program in Business Administration at the Portland campus must have graduated from high school and must complete the C.E.E.B. Scholastic Aptitude Test. Candidates' verbal aptitude will receive special attention in the selection of freshmen for this program.

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.

COLLEGE OF LIFE SCIENCES AND AGRICULTURE

I. Animal Sciences, Plant and Soil Sciences, Agricultural Business and Economics, Agricultural Engineering, Biological Sciences, School of Forestry:

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 Home Economics:

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:

Candidates for admission to the Two-Year Technical Programs must have graduated from high school and must complete the C.E.E.B. Scholastic Aptitude Test. A student should have two units of high school mathematics, one of which should be algebra. One year of algebra will be a requirement for admission in the 1968-69 academic year. Students who contemplate transfer to the regular four-year curriculum must satisfy entrance 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
	Plane Geometery	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 (Standard) Mathematics Achievement Test administered by the College Entrance Examination Board and an acceptable grade in trigonometry or its equivalent.

*Trigonometry is not required of candidates for the two-year engineering technology programs.

II. Two-Year Engineering Technology Division:
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).

ADMISSION OF SPECIAL AND SHORT COURSE STUDENTS

In exceptional cases, 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 UNIVERSITY OF MAINE EXTENSION SERVICE

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 32 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 Associate Director, Continuing Education, Education Building, University of Maine, Orono. Maine 04473; or Assistant Director, C.E.D., Payson Smith Hall, University of Maine, 96 Falmouth Street, Portland, Maine 04103.

FORMER STUDENTS

Former students who desire to return to the University must file an early application 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. Application forms may be obtained from the Director of Admissions.

ADMISSION BY TRANSFER

A student desiring to transfer to the University of Maine from another college of recognized standing must file application with the Director of Admissions at least two months before the opening of the semester. This request must include a statement of the names and addresses of all high schools, preparatory schools, junior colleges, colleges, and universities 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, Wingate Hall, University of Maine, Orono, Maine 04473.

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

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. A few of these programs begin at the freshman level. Other regional programs begin at the sophomore, junior, senior, or graduate level, that is, at the level where the specialized courses are first introduced.

Information may be obtained from the New England Board of Higher Education, 31 Church Street, Winchester, Mass., or from the admission offices of the various New England state universities.

Financial Information

STUDENT EXPENSES

The student expenses outlined in the following paragraphs are the anticipated charges for the academic year 1966-67. Changing costs may require an adjustment of these charges. For the year 1967-68 board and room charges will be increased to $425 a semester in the regular dormitories.

Tuition and Fees for the Academic Year*

Regular Students	Residents of Maine	Non-Residents of Maine
Tuition	$400.00	$1,000.00

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	$200.00	$500.00
Board and Room (University Dormitories)	400.00	400.00
	$600.00	$900.00

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

The activities of each of the four undergraduate classes are supported from dues paid by individual members. These dues, which range from $5 to $9 per year, are incorporated as part of the spring semester term bill.

The University has arranged to provide a student health and accident insurance plan on an optional basis for a premium of $25 for 12 months following fall registration. The insurance is routinely charged to every fully-enrolled student on the fall semester bill; if it is not desired the student must so notify the Treasurer's Office at the time of registration.

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 Program—Students whose circumstances are such that payment of their semester bills in full at the time of registration would work a real hardship will be permitted to use the following schedule:

Fall Semester

½ the total semester charge at registration
⅙ the total semester charge on October 1
⅙ the total semester charge on November 1
⅙ the total semester charge on December 1

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*Please see catalog section on University of Maine in Portland for charges at that campus.

Spring Semester

½ the total semester charge at registration
⅙ the total semester charge on March 1
⅙ the total semester charge on April 1
⅙ the total semester charge on May 1

For the 1966-67 academic year no extra assessment will be made to students using the above deferment schedule, but if it is found that too many take advantage of its provisions it will become necessary in the future to make a service charge for its use. This installment program is not available for charges totalling less than $180 for the semester. The privilege of using this program will be withdrawn if payments are not made promptly as scheduled.

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

	Residents of Maine	Non-Residents of Maine
Tuition	$200.00	$500.00
Room and Board (University Dormitories)*	400.00	400.00
Freshman Orientation Period	16.00	16.00
Matriculation Fee	25.00	25.00
	$641.00	$941.00

* See statement under Room and Board.

For freshmen who do not room and board in University dormitories, the charge is $241.00 for residents of Maine and $541.00 for non-residents.

For graduate students and students classified as "special," and for those registered for less than a normal program, the rate will be $20 ($50 for non-residents) per semester hour up to and including ten 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 Concert 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, 1966, is $400.00. The charge for room and board in Hannibal Hamlin Hall for the fall semester, 1966, is $350.00. For the fall semester 1967, these charges will be increased $25.

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.

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 $20 per credit hour, except as indicated otherwise in the Continuing Education bulletin.

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 correlated with the Installment Program. Tuition and room 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

Board payments for all students will be refunded on the basis of the number of full weeks remaining in the semester.

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

	Resident	Non-Resident
Tuition	$160.00	$400.00

Room and board and the course fee for Fy 19S 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 initial 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 purposed 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 21 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 nonresident.

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 Treasurer of the University of Maine.

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 Assistance. Entering students may obtain a copy by writing to the Director of Admissions, Wingate Hall. Students currently in attendance at any of the several 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 Assistance bulletin. Scholarship funds for the Graduate School are listed in the Graduate School Catalog.

LOAN FUNDS

The Jacob Agger Loan Fund
The American Institute of Electrical Engineers Loan Fund
The Androscoggin County Alumni Loan Fund
The Bangor Business and Professional Women's Loan Fund
The William E. Barrows Loan Fund
The Henry N. Berry III Law Student Loan Fund
The O. Merrill Bixby Loan Fund
The Boston Alumnae 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 1926 Loan Fund
The Class of 1931 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 1941 Memorial 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
The Thomas G. Feltman-John E. Field, Jr., Loan Fund
The John Fils Memorial Fund
The Maine State Florists Association Loan 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 Kittredge 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 Alunmi Teachers Association Loan Fund
The Maine Association of Engineers Loan Fund
The Maine Campus Fund
The Mrs. Maine Club Loan Fund
The Leslie E. Norwood 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 Women's Loan Fund
The Frances D. Young Loan Fund

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 University of Maine in Portland Scholarship
The University of Maine School of Law 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 Appreciation Scholarship Fund
The Robert I. Ashman Fund
The Bancroft and Martin Scholarship Fund
The Bangor Daily News Scholarship Fund
The Harold H. Beverage Award Fund
William Bingham, 2nd, Scholarships
William Bingham, 2nd, Scholarships in Honor of Payson Smith
The William E. Bowler Scholarship Fund
The Geraldine Brewster Scholarship Endowment Fund
The Edgar W. Brigham Scholarship Fund
The Adelaide G. Bunker Educational Fund
The Class of 1905 Scholarship
The Class of 1940 Student Emergency Fund
The Class of 1943 Student Aid Fund
The Class of 1954 Scholarship
The Class of 1957 Scholarship
The Class of 1961 Scholarship
The Albert D. Conley Fund
The Donald P. Corbett Fund
The Walter Joseph Creamer Fund
The Oliver Crosby Scholarship Fund
The Harold R. Cummings Scholarship Fund
The Mabel and Mary Daveis Fund
The Frank Conant Day Fund
The Arthur Lowell Deering Fund
The Charles Alexius Dickinson 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 Deacon Ephraim Flint Scholarship Fund
The Fort Kent Future Farmers Scholarship Fund
The Ella Somerville Foster Scholarship
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 Eugene Hale Scholarship Fund
The Helen C. Hardison Scholarship 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 David Dunlap Holmes Scholarship Fund
The Hovey Memorial Scholarships
The Will R. Howard Scholarship Fund
The Carrol C. Jones Scholarship
The Max Kagan Family Foundation Scholarship Fund
The Kidder Scholarship
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 Limestone Future Farmers Scholarship Fund
The Maine Extension Association Scholarship Fund
The Thomas G. Mangan Scholarship Fund
The Marguerite E. McQuaide Scholarship Fund
The Rebecca and Benjamin Mendelson Memorial Scholarship Fund
The Marion Farrington Merritt Memorial Fund
The Philip I. Milliken Fund
The Alma Taylor Milne Fund
The Calvin H. Nealley Scholarships
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 Portland Junior College Fund
The Frank P. Preti Scholarship Fund
The Frederick G. Quincy Scholarship Fund
The Henri Raffy Memorial 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
The Mary S. Snow Memorial Fund
The Frank Elwyn Southard Fund
The Anne E. Stodder Scholarship Fund
The James and Sarah Striar 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 Donald S. Walker Scholarship Fund
The Charles P. Weston Scholarship Fund
The Mott F. Wilson Scholarship Fund
The Gerald E. Wing Scholarship Fund
The Charles F. Woodman Fund

Annual Scholarships

The American Can Company Foundation Scholarship
The Army ROTC Scholarships
The Associated Women Students Scholarship
The Elizabeth Abbott Balentine Scholarships
The Lucius D. Barrows Scholarship
The Bates and Rogers Foundation Scholarships
The Beta Sigma Pi Sorority Scholarship
The Boston Paper Trade Association Scholarships
The Louis Calder Foundation Scholarships
The Class of 1960 Scholarship
The Charles M. Cox Trust Fund Scholarship
The George P. Davenport Scholarship Fund
The Delta Delta Delta-Frances Kent Murray Scholarship
The Depositors Trust Foundation Scholarships
The Geigy Dyestuffs Scholarship
The General Foods Fund Scholarships
The General Motors Scholarship
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 Knox County Fish and Game Association Scholarship
The Maine Consumer Finance Association Tuition Scholarship
The Maine Farmer and Homemaker Scholarship
The Maine Hoo-Hoo Club Scholarship
The Maine Managers' Scholarship
The Maine Poultry Improvement Association Scholarship
The Maine Vegetable Growers' Association Scholarship
The National Plant Food Institute Scholarship
The David M. Nelson Scholarship
The Northeastern Division Paper Industry Management Association Scholarship
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 Pulp and Paper Foundation Scholarships
The Ralston Purina Scholarship
The Retail Lumber Dealers Association of Maine Scholarship
The Rice and Miller Company Scholarship Fund
The Harrison L. Richardson Scholarship

The David R. Rittenhouse Class of 1968 Scholarships

The Sears-Roebuck Agricultural Foundation Scholarships

The Lila and Vernon Segal Fund

The Senior Alumni Association Scholarships

The Senior Skull Scholarship

The Simmons Foundation Grant-in-Aid

The Carl R. and Laura Smith Scholarship

The Somerset County Soil and Water Conservation District Scholarship

The Sophomore Owl Scholarship

The Lucy Stone League Inc. Scholarship

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 Eastern Pennsylvania Alumni Association Scholarship

The Northern Connecticut Alumni Association Scholarship

The North Shore (Massachusetts) University of Maine Alumni Association Scholarship

The Portland Alumnae 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 Maria S. Appleton Fund

The Hazen H. Ayer Scholarship Fund

The Dr. Tibor J. Bebek Memorial Fund

The Hosea B. Buck Memorial Scholarship

The Ava H. Chadbourne Fund

The James W. Clarkson Fund

The Class of 1906 Scholarship

The Class of 1909 Scholarship

The Class of 1910 Scholarship

The Class of 1911 Scholarship

The Class of 1912 Scholarship

The Class of 1915 Student Aid Fund

The Class of 1916 Scholarship

The Class of 1917 Scholarship

The Class of 1919 Fund

The Class of 1920 Scholarship

The Class of 1921 Scholarship

The Class of 1923 Scholarship

The Class of 1924 Scholarship

The Class of 1925 Scholarship

The Class of 1927 Scholarship

The Class of 1928 Fund

The Class of 1929 Student Aid Fund

The Class of 1930 Fund

The Class of 1937 Scholarship

The Class of 1953 Grant-in-Aid Fund

The Class of 1958 Scholarship

The Charles E. Crossland Fund

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The Eugene Danforth Scholarship Fund

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The James Adrian Gannett Scholarship

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The George P. Gould and Antoinette Gould Torrey Fund

The Pearl R. Graffam Scholarship Fund

The Lucy F. Griffin Fund

The George W. Hamblen Fund

The Robert C. Hamlet Prize
The George O. Hamlin Scholarship Fund
The James Norris Hart Scholarships
The Arthur A. Hauck Fund
The President Hauck Scholarship Fund
The Thelma Louise Kellogg Fund
The Benjamin C. Kent Fund
The Harriet S. Kilby Scholarship
The Harland A. Ladd Scholarship Fund
The Nathan Levitan Scholarship Fund
The Alfred B. Lingley Scholarship Fund
The George E. Lord Scholarship Fund
The Harold P. Marsh Scholarship Fund
The Frank P. Morison Fund
The William A. Murray Fund
The Greater New York Alumni Association Scholarship
The Penobscot Valley Alumni Association Scholarship
The Harold M. Pierce Fund
The Wesley C. Plumer Scholarship
The John Reed '89 Scholarship Fund
The Rhode Island Alumni Association Scholarship
The Senior Alumni Scholarship Fund
The Ben Sklar Scholarship Fund
The Anna Strickland Fund
The William Jordan Sweetser Fund
The Chestina Blaisdell Urann Fund
The Viles Family Scholarship Fund
The Alburney E. Webber, Jr., Scholarship
The Ralph Whittier Fund
The Dorothy H. and Arthur O. Willey Fund

University of Maine Pulp and Paper Foundation Funds

The Knud Dahl Scholarship Fund
The Samuel Dauman Scholarship Fund
The Paul Hodgdon Scholarship Fund
The Everett P. Ingalls Fund
The Manuel C. McDonald Scholarship Fund
The J. Larcom Ober Scholarship Fund
The Ralph A. Wilkins Scholarship Fund

PRIZES

Endowed Prizes and awards

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

Annual Prizes and Awards

The Alpha Omicron Pi Alumnae Prize
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 Memorial Watch

Commencement, 1966

Stevens Hall, home of College of Arts and Sciences

COLLEGE OF ARTS AND SCIENCES

JOHN J. NOLDE, DEAN

Carnegie Hall, home of Department of Art

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 14 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 37). 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 in nursing (B.S.). All students are required to complete 128 degree hours.

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. 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.

The passing of a comprehensive examination is a requirement for the degree in certain departments.

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—Emphasis 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. ENGLISH and SPEECH. All freshmen are required to complete Eh 1/2, Freshman Composition and Sh 1, Public Speaking.

II. FOREIGN LANGUAGE. All students 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 be taken in the freshman year by those students who continue a language taken for at least two 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 two year-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 two of the following year-courses: Hy 3. 4, United States History, Hy 5/6, History of Western Europe, My 1/2, Modern Society, Ec 1/2, Principles of Economics, Pol 1/2, Introduction to Government, Ay 1/2, Introduction to Anthropology, or Sy 3/4, Introduction to Sociology. Py 1/2, General Psychology, may be taken in the sophomore year to satisfy a year of the social science requirement. Hy 3. 4 and Hy 5/6 may not be used in combination to satisfy this requirement, and also Ay 1/2 and Sy 3/4 may not be used in combination 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
   - Ch 1/2, General Chemistry
   - Gy 1/2, Physical and Historical Geology
   - Ms 1, 3; 12, Trigonometry, Algebra, 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, Bt 1, Animal Biology and Botany

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

V. HUMANITIES. Sophomores are to select a year-course from the following: Hy 1. 2, Classical and Medieval Civilization, Pl 1. 2, Philosophy and Modern Life, Eh 15. 16, Masterpieces of English and American Literature, and Cl 1. 2, Greek and Latin Literature in English Translation, and Hr 47. 48, Honors Group Tutorial for those students registered in the Honors Program.

VI. Women students are to take and pass Physical Education during the freshman year.

VII. Men are required to take and pass one year of Physical Education.

For those students electing Basic Military Science, the maximum registration is 17 credit hours *exclusive* of this subject; for others, the maximum registration is 17 hours. The minimum is 14 hours. Normally not more than six hours may be taken in one subject in either semester of the sophomore year.

During the first two years, a student must show evidence of ability to pursue advanced courses successfully. Work of C grade or above will be interpreted as satisfactory. *Students with records consistently below this standard will be advised to withdraw from the University at the end of their sophomore year.*

Throughout the freshman and sophomore years, the student is under the general supervision of the dean of the college. The dean is assisted by faculty advisers who give each student individual guidance in selecting courses and give advice on personal problems.

The Last Two Years—On the completion of 56 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 his major instructor. The latter 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. In general, it is assumed that upperclass students will take advanced courses.

Selected students may take advanced courses in Military Science and Tactics during their junior and senior years, for which a maximum of 12 credit hours may be received.

Comprehensive Examinations—Some departments of the college require comprehensive examinations of their senior major students. Certain departments also give basic preparatory comprehensives in the spring semester of the junior year. The comprehensive examination provides the student with an opportunity to demonstrate his knowledge of the salient features of his general field of study. It aims to make clear the unity of the field as a whole. It is designed to develop perspective and to encourage organization of materials, accuracy and range of knowledge. The student is thus able to evaluate his ability in the field of his major interest and to make a smooth transition to his professional and graduate work.

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.

Professional Certificates for Teachers—Professional 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, speech and English, and speech and history.

Medical Technology—This course has been developed in cooperation with the Eastern Maine General Hospital, 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 61) 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 town 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 in writing, 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.

SPECIMEN CURRICULA

Preprofessional, vocational, and departmental curricula are available and may be obtained from the Director of Admissions on request. These curricula will provide the student with a general idea of the character of preparation recommended. All possible latitude is allowed in order to permit development of the student's own interests and aptitudes. A few representative curricula follow:

SPECIMEN CURRICULUM FOR ART

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	1	Freshman Composition	3	Eh	2	Freshman Compositon	3
Hy	5	Hist. of Western Europe	3	Hy	6	Hist. of Western Europe	3
At	3	Princ. of Art or		At	4	Princ. of Art or	
		At 1 Freehand Drwg.	2			At 2 Freehand Drwg.	2
Pe	1	Physical Education	0	Pe	2	Physical Education	0
				Sh	1	Public Speaking	2
		Des. or Lab. Science	3-4			Des. or Lab. Science	3-4
		Foreign Language	3-4			Foreign Language	3-4
			14-16				16-17

Sophomore Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	15	Masterpieces of Lit. or Hy 1, Class. & Med. Civil.	3	Eh	16	Masterpieces of Lit. or Hy 2. Class. & Med. Civil.	3
At	1	Freehand Drwg. or At 3. Princ. of Art	2	At	2	Freehand Drwg. or At 4, Princ. of Art	2
At	5	Art Apprec. & History	3	At	6	Art Apprec. & History	3
		Des. or Lab. Science	3-4			Des. or Lab. Science	3-4
		Foreign Language or Social Science	3-4			Foreign Language or Social Science	3-4
		Elective	2-3			Elective	2-3
			16				16

Junior Year

			Hours				Hours
At	11	Advanced Drwg.	2	At	12	Advanced Drwg.	2
At	7	Crafts and Design	2	At	8	Crafts and Design	2
At	19	Art in Community or At 21, American Art	2	At	20	Art in Community or At 22, American Art	2
At	25	Renais. Art in Italy or At 27, The Northern Renais.	2	At	26	Renais. Art in Italy or At 28, The Northern Renais.	2
		Electives	9			Electives	9
			17				17

Senior Year

			Hours				Hours
At	15	Painting & Rendering	2	At	16	Painting & Rendering	2
At	9	Advanced Crafts & Design or At 97, Art Project	2	At	10	Advanced Crafts & Design or At 98, Art Project	2
At	21	American Art or At 19, Art in the Community	2	At	22	American Art or At 20, Art in the Community	2
At	23	Contemp. Art Forms or At 31, Masterpieces of Graph.	2	At	24	Contemp. Art Forms or At 32, Masterpieces of Graph.	2
				At	30	Art Materials & Techniques	3
		Electives	8			Electives	5
			16				16

SPECIMEN CURRICULUM FOR CHEMISTRY

FALL SEMESTER — SPRING SEMESTER

Freshman Year

			Hours				Hours
Ch	1	General Chemistry	4	Ch	2	General Chemistry	4
Eh	1	Freshman Composition	3	Eh	2	Freshman Composition	3
Gm	11	Scientific German (Elem.)	3	Gm	12	Scientific German (Elem.)	3
Ms	1	Trigonometry	2	Ms	12	Anal. Geometry and Calculus	4
Ms	3	College Algebra	2	Pe	2	Physical Education	0
Pe	1	Physical Education	0				
Sh	1	Public Speaking	2				
			16				14

Sophomore Year

			Hours				Hours
Ch	31	Qualitative Analysis and Inorganic Chemistry	4	Ch	140	Quantitative Analysis	4
Gm	13	Scientific German (Intermed.)	3	Gm	14	Scientific German (Intermed.)	3
Ms	27	Anal. Geometry and Calculus	4	Ms	28	Anal Geometry and Calculus	4
Ps	1	General Physics	5	Ps	2	General Physics	5
			16				16

Junior Year

			Hours				Hours
Ch	151	Organic Chemistry Lecture	3	Ch	152	Organic Chemistry Lecture	3
Ch	161	Organic Chemistry Laboratory	2	Ch	162	Organic Chemistry Laboratory	2
Ch	171	Physical Chemistry	5	Ch	172	Physical Chemistry	5
		Humanities	3			Humanities	3
		Social Science	3			Social Science	3
			16				16

Senior Year

			Hours				Hours
*Ch	164	Intermed. Quant. Analysis	4	*Ch	154	Adv. Inorg. Chem.	3
*Ch	185	Chemical Literature	2	*Ch	190	Inter. Organic Chemistry Lab	3
		Social Science	3			Social Science	3
		Electives (Other than Chemistry)	7-9			Electives (Other than Chemistry)	7-9
			16-18				16-18

*For American Chemical Society Certification.

SPECIMEN CURRICULUM IN INTERNATIONAL AFFAIRS

The study of International Affairs may lead to a major in International Affairs in any of the following four areas: economics; foreign languages; and political science. A suggested curriculum for the first two years is outlined below. Detailed programs covering the last two years for each of the four areas of study 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 the permission of the Committee on International Affairs. Normally a student would take four years of a modern foreign language or its equivalent. He would study in each of the three departments.

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	1	Freshman Composition	3	Eh	2	Freshman 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. Public Speaking	2			Foreign Language	4
		Foreign Language	4			Elective	1-2
		Elective	1-2				
			16-17				16-17

Sophomore Year

			Hours				Hours
Ec	1	Principles of Economics	3	Ec	2	Principles of Economics	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
		Elective	2			Elective	2
			17				17

SPECIMEN CURRICULUM FOR MEDICAL TECHNOLOGY

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
†Ch	1	General Chemistry	4	†Ch	2	General Chemistry	4
Eh	1	Freshman Composition	3	Eh	2	Freshman Composition	3
Pe	1	Physical Education	0	Pe	2	Physical Education	0
				Sh	1	Public Speaking	2
†Zo	3	Animal Biology	4	†Zo	4	Animal Biology	4
		Modern Language	3-4			Modern Language	3-4
			14-15				16-17

Sophomore Year

			Hours				Hours
†Bc	1	Organic Chemistry	4	†Bc	2	Biochemistry	4
†Ps	3	Descr. Physics	3	Py	2	General Psychology	3
Py	1	General Psychology	3	†Zo	158	Animal Parasitology	4
†Zo	151	Histology	4			Modern language or Social Science	3
		Modern Language or Social Science	3			Elective	3
			17				17

Junior Year

			Hours				Hours
†By	27	General Bacteriology	5	†By	52	Pathogenic Bacteriology	4
Eh	15	Masterpieces of Literature	3	†Ch	140	Quanitative Analysis	4
Ms	1	Trigonometry	2	Eh	16	Masterpieces of Literature	3
		Social Science or Electives	3-6	Ms	3	College Algebra	2
						Social Science or Electives	3
			16				16

*Senior Year

Twelve months in either the Eastern Maine General Hospital, 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 PHYSICS

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
*Ps	1, or 1a	General Physics	5-4	*Ps	2, or 2a	General Physics	5-4
Ms	12	Anal. Geometry and Calculus	4	Ms	27	Anal. Geometry and Calculus	4
Eh	1	Freshman Composition	3	Eh	2	Freshman Composition	3
Gm	11	Scientific German	3	Gm	12	Scientific German	3
Pe	1	Physical Education	0	Pe	2	Physical Education	0
			14-15				14-15

Sophomore Year

			Hours				Hours
Ps	17	Intermediate Physics	4	Ps	18	Intermediate Physics	4
Ms	28	Calculus	4	Ms	29	Calculus	4
Gm	13	Scientific German (Intermed.)	3	Gm	14	Scientific German (Intermed.)	3
		Social Science	3			Social Science	3
Sh	1	Funds. of Public Speaking	2				
			16				14

Junior Year

			Hours				Hours
Ch	1	General Chemistry	4	Ch	2	General Chemistry	4
Ps	153	Electrical Measurements	3	Ps	172	Optics	3
Ps	155	Electricity and Magnetism	2	Ps	176	Physical Measurements	2
Ms	150	Ord. Diff. Equations	3	Ms	151	Vectors and Matrices	3
		Humanities	3			Humanities	3
		Social Science	3			Social Science	3
			18				18

Senior Year

			Hours				Hours
Ps	169	Modern Physics	3	Ps	162	Heat and Thermodynamics	3
		Elective	11-14			Elective	11-14
			14-17				14-17

Students preparing for secondary school teaching may, with consent, substitute courses in Education for certain of the above junior and senior courses.

*Ps 1 and 2 (10 hours) and Ms 12 and 27 are recommended if trigonometry is presented for admission. A suitable major in physics may be developed, however, with Ps 1a, 2a, Ms 1, 3, and 12 taken in the freshman year. Either Ps 181 or Ps 182 (or both) are strongly recommended. Ms 152 and Ms 153 are recommended, but students planning to teach at the secondary school level may wish to substitute courses in Education.

SPECIMEN CURRICULUM FOR ZOOLOGY, PREMEDICAL, AND PREDENTAL MAJORS

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	1	Freshman Composition	3	Eh	2	Freshman Composition	3
*Gm	1	Elementary German	4	Gm	2	Elementary German	4
Ms	1	Trigonometry	2	Ms	12	Anal. Geometry and Calculus	4
Ms	3	College Algebra	2	My	2	Modern Society	3
My	1	Modern Society	3	Pe	2	Physical Education	0
Pe	1	Physical Education	0	Zo	4	Animal Biology	4
Zo	3	Animal Biology	4				
			18				18

Sophomore Year

			Hours				Hours
Ch	1	General Chemistry	4	Ch	2	General Chemistry	4
Gm	3	Intermediate German	3	Gm	14	Scientific German	3
Py	1	General Psychology	3	Py	2	General Psychology	3
Sh	1	Public Speaking	2	Zo	136	Vertebrate Embryology	4
Zo	133	Comparative Anatomy	4			Elective	2-3
			16				16-17

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	163	Princ of Genetics	3			Humanities	3
		Humanities	3			Elective	4-6
		Elective	2-3				
			17-18				16-18

Senior Year

			Hours				Hours
Zo	151	Histology	4	Ch	140	Quantitative Analysis	4
Zo	177	Animal Physiology	4	Zo	178	General Physiology	4
Zo	195	Zoology Seminar	1	Zo	196	Zoology Seminar	1
		Elective	6-8			Elective	6-8
			15-17				15-17

* 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 1/2, General Chemistry, with or without Animal Biology in the freshman year.

SPECIMEN CURRICULUM IN PUBLIC MANAGEMENT
Leading to
Degree of B.A. in Public Management (City and Town Manager Option)

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eg	1	Engineering Drawing	2	Eg	12	Forestry Drawing	2
Eh	1	Freshman Composition	3	Eh	2	Freshman Composition	3
Hy	3	United States History	3	Hy	4	United States History	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
Sh	1	Public Speaking	2			Modern Language	3-4
		Modern Language	3-4			Elective	2-3
			16-17				16-17

Sophomore Year

			Hours				Hours
Ce	5	Surveying	3	Ch	2	General Chemistry	4
Ch	1	General Chemistry	4	Pol	2	Introduction to Government	3
Pol	1	Introduction to Government	3	Pol	8	Maine Government	1
Pol	7	Maine Government	1	Sy	4	Intro. to Sociology	3
Sy	3	Intro. to Sociology	3	Ms	19	Statistics	3
		Modern Language	3			Modern Language	3
			17				17

Junior Year

			Hours				Hours
Ec	1	Principles of Economics	3	Ec	2	Principles of Economics	3
Ba	9	Principles of Accounting	3	Ba	10	Principles of Accounting	3
Ce	31	Sanitary Engineering	3	Pol	34	Municipal Administration	3
Pol	33	The American City	3	Pol	40	Community Planning	2
Sy	126	Sociology of Urban Life	3	Sy	24	Sociology of Rural Life	3
		Humanities	3			Humanities	3
			18				17

Senior Year

			Hours				Hours
Pol	144	Public Relations	2	Pol	152	Administrative Law	3
Pol	151	Public Administration	3	Pol	184	Constitutional Law	3
Pol	183	Constitutional Law	3	Sw	151	Social Welfare	3
Ce	29	Highway Engineering	3				
Sw	150	Social Welfare	3				
			14				9

NOTE: A summer intern program is required for the degree (see Pol).

SPECIMEN CURRICULUM IN SOCIOLOGY AND ANTHROPOLOGY

Introduction to Anthropology (Ay 1/2), Introduction to Sociology (Sy 3/4), Statistical Methods for Sociological Research (Sy 119), Methods of Social Research (Sy 120), Sociological Theory (Sy 160), and History of Sociology (Sy 161), are required of all majors.

Freshman Year

Ay	1	Introduction to Anthropology	Ay	2	Introduction to Anthropology
Sy	3	Introduction to Sociology	Sy	4	Introduction to Sociology
Eh	1	Freshman Composition	Eh	2	Freshman Composition
Fr	3	(or Gm 3) Intermediate French or Intermediate German	Fr	4	(or Gm 4) Intermediate French or Intermediate German
Pe	1	Physical Education	Pe	2	Physical Education
Zo	3	Animal Biology, or Ms 5, Elements of College Mathematics	Sh	1	Funds. Public Speaking
			Zo	4	Animal Biology, or Ms 6, Elements of College Mathematics

Sophomore Year

Py	1	General Psychology	Py	2	General Psychology
Ay	1	Introduction to Anthropology or Sy 3, Introduction to Sociology	Ay	2	Introduction to Anthropology or Sy 4, Introduction to Sociology
		Foreign Language, if not completed in freshman year			Foreign Language, if not completed in freshman year
		Humanities course			Humanities course

Department recommended elective: Ec 1/2, Principles of Economics. Anthropology recommended electives: Gy 1/2, Principles of Geology; Gy 1a, Descriptive Geology, Physical; and/or Gy 2a, Descriptive Geology, Historical; and Zo 133, Comparative Anatomy. Social Welfare recommended elective: Pol 1/2, Introduction to Government.

Students who major in the Department of Sociology and Anthropology will establish, in consultation with their major adviser, the program for their junior and senior years. Consult this catalog for specific courses in the three program areas offered by the department—sociology, anthropology, and social welfare, and for department requirements concerning advanced courses.

COURSES OF INSTRUCTION

Courses numbered 1-99 are for undergraduates. Courses numbered 100-199 are for undergraduates but may be taken for graduate credit with approval of the student's adviser. Courses numbered 200-299 are for graduate credit but may be taken by undergraduates with approval of the student's adviser. Courses numbered 300-399 are for graduates.

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.

Courses offered in 1966-67 and alternate years are indicated by the sign (‡) placed before the number of the course; courses offered in 1967-68 and alternate years are indicated by the sign (†) placed before the number of the course.

ART (At)

PROFESSOR HARTGEN; MR. DAVID DECKER, MR. RONALD GHIZ, MR. MICHAEL LEWIS

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 crafts 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 36 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 a large collection of slides, reproductions, artifacts and original works of art, all of which are available to the art student. Also, some six or seven 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.

1/2. Free-Hand Drawing and Sketching—Fundamentals of drawing. Principles of perspective, shades and shadows, and composition. Pencil, charcoal, graphite, and crayon. *Lab* 4, *Cr* 2. MR. DECKER AND MR. GHIZ

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

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

7/8. Crafts and Design—Fundamentals of design through crafts experience. Blockprinting, silk screening, clay modeling, plaster casting, papier mache, posters, wire sculpture. Two and three dimensional design problems. *Lab* 4, *Cr* 2. MR. DECKER

9/10. Advanced Crafts and Design—Advanced work in design problems using crafts experiences introduced in basic course. Two and three dimensional problems carried into layout, graphics, fabrics, etc. Prerequisite: At 1/2 or At 7/8 *Lab* 4, *Cr* 2. MR. DECKER

11/12. Advanced Free-Hand Drawing and Sketching—Advanced studies in form, space, composition, and cast drawing. Field trips for outdoor sketching and painting. Development from charcoal to watercolor painting. Prerequisite: At 1/2, *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. Painting and Rendering—Studio studies and landscape painting with emphasis on composition, palette and techniques. Problems using pastel, sepia, watercolor, gouache, and oil. Prerequisite: At 11/12. *Lab* 4, *Cr* 2. MR. GHIZ

19. 20. Art in the Community—The place of art in everyday life. First semester deals with the residence, school, church, civic architecture and city planning; second semester, industrial design, fashions, advertising, 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

41/42. Commercial Art and Publications Design—The design of booklets, catalogs, magazines, newspapers, posters, etc. Exercises in lettering and lay-

out. Prerequisite: At 1/2 or permission. *Lab* 4, *Cr* 2. (Given on sufficient demand.) Not offered in 1966-67.

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

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. *Rec* 2, *Lab* 1, *Cr* 3. Permission of instructor. MR. LEWIS

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* 3. MR. LEWIS

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

CHEMISTRY (Ch)

PROFESSORS BEAMESDERFER, BOGAN, BRAUNSTEIN, DOUGLASS, DUNLAP, MARTIN, WOLFHAGEN; ASSOCIATE PROFESSOR GEORGITIS; ASSISTANT PROFESSORS GREEN, RUSS, MR. HILL, MR. HILTON, MR. TRIPP AND 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.

The chemistry curriculum and courses in the Department of Chemistry are described under the College of Technology.

ECONOMICS (Ec)

PROFESSORS ALMOND, COUPE, DEVINO, PECK, SIEDLIIK, YOUNG, AND S. C. YU; ASSOCIATE PROFESSOR CLARK; ASSISTANT PROFESSORS BARTLETT, CRAPO, FORSGREN, GOODMAN, MCCLURE, NADEL, SANDS, TALLEY, L. YU, AND ZIEGENBEIN; INSTRUCTOR CURRY; GRADUATE ASSISTANTS CRONAN, DUNN, HOFFMAN AND MACKINNON

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 1/2 — Principles of Economics
   Ec 132 — Business Cycles
   Ec 173 — Economic Analysis
   Ba 9 — Principles of Accounting I
   Ms 19 — Principles of Statistical Inference
2. Completion of at least 18 additional hours in economics (Ec) courses. However, no student will be granted degree credit for course work in business and economic in excess of 48 hours. Students planning to major in economics should complete Ec 1/2, Principles of Economics, no later than the sophomore year.

Course offerings in economics and in business administration are described under the College of Business Administration.

ENGLISH (Eh)

PROFESSORS REYNOLDS, HANKINS, WENCE, EDWARDS, FIFE, RANDEL, AND TERRELL; ASSOCIATE PROFESSORS MANLOVE, HOLMES, IVES, SPRAGUE, BENNETT; ASSISTANT PROFESSORS ANDERSEN, CARLSON; INSTRUCTORS NEWALL, RENAUD, HOFFMAN, LEMELIN, EAGAN, SEMSEL, HOBBS, ADAMS, BISHOP, GREEN, FITZGERALD, SCHUMACHER, TOWNSEND; GRADUATE ASSISTANTS BARDEN, COLE, EATON, GUIMOND, LINDQUIST, LOGAN, RICHARDSON, SELIGMAN, SHAW, SILEO, STEVENS, STEWART, TALLMAN, AND WIGGIN

Students expecting to major in English should take Eh 3.4, English Literature, in their sophomore year. For these students, Eh 3. 4 satisfies the humanities requirement. One semester of second-year composition (Eh 7 or 8) and Eh 43, American literature, are likewise required at some time in the college course. Whenever the student's program allows, Eh 7 or 8 will be taken along with Eh 3. 4 in the sophomore year. Majors are expected to take, during their college course, between 36 and 48 hours in the department, of which at least nine hours must be selected from the following courses: Eh 151, 152, 153, 157, 158, 159, 161, 162, 164, 165, 166, 181.

The departmental major examinations comprise: (a) an examination over the mechanics of composition in January of the junior year and (b) an examination over English and American literature in the final senior semester. Both tests are written. A passing grade in each examination is required for graduation.

The department offers the master of arts degree in English, normally requiring 24 semester hours of course credits and the writing of a satisfactory thesis. Students are required to attend a graduate seminar, at which they will present papers prepared in connection with the material of their other courses. For those who need it, the department will plan a combined curriculum in English and Education, allowing the student to secure the master of arts in English and his teaching certificate for high school work; the time normally required is one academic year and two summer sessions.

Courses in Composition and Rhetoric

1/2. Freshman Composition—Expository and narrative writing, with the reading of illustrative material. Required normally of all freshmen and prerequisite for all other English courses. *Cr* 3. MR. HOLMES, Chairman

5. Technical Composition—The principles and techniques of business correspondence and of technical reports and papers. Prerequisite: junior standing in Technology or Agriculture. *Cr* 2. MR. TERRELL, Chairman

7. 8. Second-Year Composition—A course in writing for those who wish to develop greater skill either for their own pleasure or for professional uses. In the first semester the writing of formal and informal expository essays; in the second semester, descriptive and narrative writing. *Cr* 3. MR. WENCE, Chairman

19. Expository Writing—Primarily for student majors in Business Administration. Training in clear expository writing of formal reports, business letters, and similar materials. Prerequisite: junior standing. *Cr* 2. MR. BENNETT

77. 78. Creative Writing—An advanced course for students of ability. Prerequisite: English 7 or 8 or permission of instructor. *Cr* 3. MR. HOLMES

Courses in Literature

3. 4. English Literature—The chief authors of English literature in chronological order, with reading and class discussion of their work. From the beginning to 1700 in the first semester; 1700 to the present in the spring. *Cr* 3.
MISS FIFE, Chairman

9. Modern Literature—Readings in contemporary fiction from 1914 to the present. Recommended for non-majors. *Cr* 2. MR. SPRAGUE, Chairman

15. 16. Masterpieces of English and American Literature—An introduction to literary appreciation through the study of selected masterpieces from English and American literature. Not recommended for those who have had Eh 3.4 or advanced courses in literature. *Cr* 3. MR. MANLOVE, Chairman

43. American Literature—American literature in the 18th and 19th centuries, with emphasis on the principal writers. *Cr* 3. MR. EDWARDS, Chairman

In order to take courses in English literature numbered above 50, students should have previously taken two of the following: Eh 3, 4, 9, 15, 16, 43. With the approval of an English adviser, the student may substitute for these any two courses that fill the humanities requirement.

†***135. 136. Recent Drama***—Outstanding dramatists and plays, mainly of the 20th century. British and American drama in the first semester and European drama in the second. *Cr* 2. MR. EAGAN

‡***142. Writers of Maine***—A study of the Maine scene and Maine people as used by Sarah Orne Jewett, E.A. Robinson, Edna St. Vincent Millay, Mary Ellen Chase, Robert P. T. Coffin, Kenneth Roberts, E. B. White, and others. *Cr* 2.
MISS FIFE

145. 146. Twentieth Century Literature—The novel and poetry from 1900 to the present. British writers are considered in the first semester, American writers in the second. *Cr* 3. MR. TERRELL, Chairman

153. Chaucer—Selections from the major poetry of Chaucer, with consideraation of the literary and historical backgrounds *Cr* 3. MR. BENNETT

†***155. Poetry of the Romantic Movement***—Wordsworth, Coleridge, Scott, Byron, Shelley, Keats, and their contemporaries, against the background of their time. *Cr* 3. MR. HANKINS

‡***156. Victorian Poetry***—Browning, Tennyson, Arnold, the Pre-Raphaelites, and their contemporaries. *Cr* 3. MR. EDWARDS

157. 158. Shakespeare—A study of Shakespeare's comedies, tragedies, and history plays. Comedies and history plays are stressed in the first semester, tragedies in the second. *Cr* 3. MR. REYNOLDS

†***159. Elizabethan Prose and Verse***—Not including the drama. Poems, sonnet sequences, romances, pastorals, translations. The pageant of Elizabethan life and thought. Special attention to Spenser's *The Faerie Queene*. *Cr* 3. MR. SPRAGUE

‡***161. 162. British Drama***—In the fall semester, Shakespeare's contemporaries, with some attention to the drama before and after Shakespeare. In the spring, a survey of British drama from the Restoration to 1900. *Cr* 3.
MR. SPRAGUE, MR. RENAUD

‡***164. Milton***—The poetry and prose of Milton with consideration of the iterary and historical background of his time. *Cr* 3. MISS FIFE

†***165. The Age of Dryden and Pope***—Restoration literature, and the evolution of Neo-classicism in the early 18th century. *Cr* 3. MR. MANLOVE

‡***166. The Age of Johnson***—The later 18th century. Johnson and his circle. The beginnings of Romanticism. *Cr* 3. MR. MANLOVE

169. The American Novel—American novelists to 1900. *Cr* 3. MR. RANDEL

‡***170. The American Drama***—The development of drama in America from colonial times to the First World War. *Cr* 3. MR. NEWALL

†***171. Early American Literature***—From the beginnings to 1800. *Cr* 3. MR. LEMELIN

‡***172. The New England Renaissance***—A study of the great authors of New England in the mid-19th century. Their works, personalities, and social background. *Cr* 3. MR. LEMELIN

†***181. The Earlier English Novel***—The principal English novelists from the beginnings to Sir Walter Scott. *Cr* 3. MR. WENCE

‡***182. The Later English Novel***—The principal English novelists from Dickens to Hardy. *Cr* 3. MR. WENCE

†***183. Nineteenth Century Prose***—Not including fiction. The major essayists from Lamb to Stevenson. Studies of content and literary style. *Cr* 3. MR. HANKINS

†***192. The Rise of Realism in America***—A survey of literature from 1865 to 1914, including such authors as Mark Twain, Bret Harte, Howells, James, Henry Adams, Hamlin Garland, and Edith Wharton. *Cr* 3.

193. The American Short Story—Selected short stories by American authors from the beginnings to the present day. Offered in Continuing Education and in Summer Session. *Cr* 3. MRS. CARLSON

194. Twentieth Century British Fiction—The best British novels since 1900. Not open to students who have had Eh 145. Offered in Continuing Education only. *Cr* 3. MR. TERRELL

195. Twentieth Century British Poetry—The major poets of England, Wales, Scotland, and Ireland from 1900 to the present. Not open to students who have had Eh 145. Offered in Continuing Education only. *Cr* 3. MR. TERRELL

196. Twentieth Century American Poetry—The major poets of the United States from 1900 to the present. Not open to students who have had Eh 146. Offered in Continuing Education only. *Cr* 3. MR. TERRELL, MR. IVES

197. Twentieth Century American Fiction—The best American novels since 1900. Not open to students who have had Eh 146. Offered in Continuing Education only. *Cr* 3. MR. TERRELL

‡***325. Bibliography and Methods of Research***—A study of bibliographical materials and methods of research, to meet the practical needs of the graduate student of English and American literature. *Cr* 1. MR. SPRAGUE

343. Seminar in American Romanticism. *Cr* 3. MR. RANDEL

344. Seminar in American Realism. *Cr* 3. MR. RANDEL

395. Graduate Seminar—Subjects and credit vary. Investigations, written and oral reports. The course may be repeated with different subjects: (a) Linguistics and semantics; (b) Literature of the English Renaissance; (c) 18th and 19th Century English Literature; (d) 20th Century Literature, British and American; (e) Folklore.

399. Graduate Thesis—*Cr Ar.*

Courses in Linguistics

21. Modern Grammar—Traditional, structural, and generative grammars, with particular implications for prospective teachers of English and others inter-

ested in the basic theories of grammar. Attention is given to problems of usage. For juniors and seniors. *Cr* 3. MR. BENNETT

***149. Introductory* Linguistics**—Linguistics as a basis for understanding the theory and functioning of language; modern methods of phonological, morphological, and syntactic analysis, with some attention to language change and dialectology. *Cr* 2. MR. BENNETT

†***151/152. Old English***—Old English grammar and the reading of easy prose and poetry. Readings from *Beowulf* in the second semester. *Cr* 3. MR. REYNOLDS

†***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. Recommended for those preparing to teach English. Sophomores require permission of instructor. *Cr* 2. MR. REYNOLDS

‡***168. The American Language***—Current vocabulary, syntax and usage, as developed from colonial times. Some attention to regional speech and the problem of Standard English. American vs. British English. *Cr* 2. MR. REYNOLDS

Courses in the Teaching of English

184. The Teaching of 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. CARLSON, MR. HOLMES

Courses in Comparative Literature

†***Cp 87. Oriental Masterpieces: The Near East***—Selections from the literature of India, Iran, and the Arab countries. *Cr* 3.

‡***Cp 88. Oriental Masterpieces: The Far East*** — Selections principally from the literature of China and Japan. *Cr* 3.

‡***Cp 139. 140. The English Bible***—The English Bible studied as one of the masterpieces of English literature. Considerable attention is paid to the historical and cultural backgrounds of Biblical literature. *Cr* 2. MR. REYNOLDS

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

†***Cp 174. Modern Literary Criticism***—From Coleridge to the present modern trends in criticism. *Cr* 3. MR. ANDERSEN

†***Cp 175. 176. European Literature*** — Continental European literature in translation from Homer to the Renaissance in the first semester and from the Renaissance to the 20th century in the second. Recommended for majors in history or foreign languages, and for students preparing for library work. *Cr* 3. MISS FIFE

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

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

‡***Cp 189. 190. The Novel in Europe*** —A brief survey, with reading of representative novels. In the first semester. The Novel in Western Europe, including Italy, Germany, France, and Spain. In the second semester, The Novel in Eastern and Northern Europe, including Russia, Poland, and Scandinavia. *Cr* 3. MR. TERRELL

Courses in Folklore

Cp 133. Introduction to Folklore—Folk tales, legends, beliefs, and other oral traditions of the world, with an emphasis on American folklore. *Rec* 3, *Lab* 1. *Cr* 3. MR. IVES

Cp 134. Ballad and Folksong—Types and traditions of folksong in America, especially the ballad; English, Scottish, Irish, Spanish, French, and Negro materials. *Rec* 3, *Lab* 1. *Cr* 3. MR. IVES

Cp 179. Folk Narratives of the World—Folk tales and folk traditions of other lands; the influence of folklore upon epic, saga, romance, and other narrative forms. Offered on request. *Cr* 2. MR. IVES

Cp 191. Projects in Folklore—Individual supervised projects, particularly in the field of collecting folk materials. Prerequisite: Cp 133 or Cp 134, and permission of the instructor. *Cr* 2. MR. IVES

FOREIGN LANGUAGES AND CLASSICS

PROFESSORS MOODY, MILES, GROSS AND RUSSELL; ASSOCIATE PROFESSORS REID, RIOUX*, ROGGENBAUER, AND O'NEILL; ASSISTANT PROFESSORS CLARK, MURRAY, AND TATEM; INSTRUCTORS, MR. BEAN, MR. BOLDUC, MRS. BRIMMER, MR. EYSSAUTIER, MRS. EYSSAUTIER, MR. FITZPATRICK, MR. GALBIS, MR. HALL, MR. HERLAN, MR. MURPHY, MISS OLAN, MR. PYLES, MR. REGAN, MR. SMALL; PART-TIME INSTRUCTORS, MRS. DELPHENDAHL, MRS. GOFF, MRS. GREEN, AND MRS. GROSS

The department offers major work to candidates for the bachelor of arts degree 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—Students electing to major in French, German, or Spanish will be required to take a minimum of 24 hours in literature and related courses of the subject matter field beyond the intermediate level.

Romance Languages—Students electing to major in Romance Languages will be required to take a minimum of 24 hours chosen from literature and related courses in French and Spanish beyond the intermediate level.

Modern Languages—Students electing to major in Modern Languages will be required to take a minimum of 24 hours chosen from literature and related courses in one of the Romance Languages and German beyond the intermediate level.

Latin—Students electing to major in Latin will be required to take a minimum of 20 hours of the subject matter field beyond the intermediate level.

International Affairs—Students electing to major in International Affairs should see page 60 of this catalog.

Hy 5/6 is also required for students whose main concentration is French or German; Hy 147. 148 is required for Spanish majors; and Hy 101.102 majors. French majors are also expected to take Hy 121. 122.

Fl 166 is normally required of majors who plan to teach in elementary or secondary schools.

Courses recommended for students who do not major in the department, but who plan to obtain certification for teaching French are: Fr 7/8, Fr 9. 10, Fr 157. 158, Fl 166, and a minimum of two semesters of literature courses. For those who

wish to obtain certification for teaching German, the following courses are recommended: Gm 7/8, Gm 9. 10, Gm 157. 158, Fl 166, and a minimum of two semesters of literature courses. For those who wish to obtain certification for teaching Latin, the following courses are recommended: Lt 9. 10, Lt 47. 48, Fl 166, and a minimum of two semesters of literature courses. For those who wish to obtain certification for teaching Spanish, the following courses are recommended: Sp 7/8, Sp 9. 10, Sp 157. 158, Fl 166, and a minimum of two semesters of literature courses.

The department also offers work leading to the master of arts degree in French, Spanish, Romance Language, Modern Languages, and German in terms of the general requirements for graduate work. A program of courses up to 24 hours which does not duplicate undergraduate work will normally be selected from courses numbered 100 or above in the French, German, and Spanish curricula listed below. Evidence of oral ability in the langauge undertaken will be required. The thesis will be an essential aspect of the work and will be evaluated at no less than one-fifth of the graduate program. The Summer Session Catalog should be consulted for special aspects involved when the degree is sought through attendance at the summer sessions. See also Graduate Study Bulletin.

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

Fl 201-202. Linguistics—Comparative grammar, elements of phonology and morphology, introduction to linguistic science and semantics. Given upon sufficient demand. *Cr* 2.

FRENCH (Fr)

1-2. Elementary French—Emphasis on 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* 4. STAFF

3/4. Intermediate French—Continuation of 1-2. Laboratory practice. For students who have completed French 1-2 or who have completed two or three years of high school French. *Cr* 3. STAFF

3a. 4a. Supplementary Oral French—For freshmen whose high school French was deficient in oral work. This course can be taken only in conjunction with Fr 3/4. *Cr* 1. 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, or the equivalent. Well qualified students who have not taken Fr 7 may with permission elect Fr 8. *Cr* 3. STAFF

9. 10. Readings in French Literature—For students who wish further practice in reading before beginning advanced literature courses. STAFF

153. 154. Contemporary French Literature—The works of leading writers from World War I to the present, with special attention to the novel and drama. *Cr* 3.

157. 158. French Civilization — Readings, discussion, lectures, oral and

written reports on French culture designed to increase listening comprehension and skill in oral and written expression. Laboratory practice. *Cr* 3. MRS. BRIMMER

167/168. Advanced Grammar and Composition—Designed to give prospective teachers and others who plan to use French professionally a sound foundation in grammar, syntax, and the writing of correct, idiomatic French. Prerequisite: Fr 3/4 or the equivalent. *Cr* 2. MR. CLARK

‡171. 172. French Literature of the Seventeenth Century—Lectures and readings of representative authors, including such writers as Corneille, Moliere, Racine, La Fontaine, Pascal, Boileau. *Cr* 3.

†173. 174. French Literature of the Eighteenth Century—Lectures and readings of the works of leading writers, including Voltaire, Montesquieu, Diderot, and Rousseau. *Cr* 3.

175. 176. French Literature of the First Half of the Nineteenth Century Lectures and readings of prose, poetry, and drama by representative writers, with special emphasis on Romanticism and Realism. *Cr* 3. MR. O'NEILL

177. 178. French Literature from 1850 to the First World War—Lectures and readings of representative poets, novelists, and dramatists of the Parnassian, Naturalist, and Symbolist movements. *Cr* 3. MR. MOODY

181. 182. Seminar—A survey of major periods of French literature, civilization and language. Attention to the history of ideas. Extensive readings and reports. *Cr* 3. STAFF

197. 198. Projects in French—Individual work in a project of the student's selection. Prerequisite: consent of the department head. *Cr Ar.* STAFF

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* 4. 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

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, or the equivalent. Well qualified students who have not taken Gm 7 may with permission elect Gm 8. *Cr* 3. STAFF

9. 10. Readings in German Literature—For students who wish further practice in reading before beginning advanced literature courses. *Cr* 3. MR. MILES

11-12. Scientific German (Elementary)—Beginning course in German for students in the Colleges of Life Sciences and Agriculture and Technology and for students in the College of Arts and Sciences who are majoring in chemistry or physics. *Cr* 3. STAFF

13. Scientific German (Intermediate)—Continuation of Course 12, which is prerequisite. May be followed by Gm 14. *Cr* 3. MR. ROGGENBAUER

14. Scientific German—May replace Gm 4 for premedical, predental, zoology, and psychology major students. Completion of Courses 13 and 14, or 3 and 14 fulfills the language generalization requirements. *Cr* 3. MR. ROGGENBAUER

†151. 152. Early Modern German Literature, 1750-1832 — Readings of

representative works of the periods of Enlightenment, Storm and Stress, and Romanticism. *Cr* 3. MR. ROGGENBAUER

‡***153. 154. Late Modern German Literature, 1832 to World War II***—A survey of the major literary movements, emphasizing the novel and drama. *Cr* 3. MR. ROGGENBAUER

†***155. 156. The Classical Period in German Literature, Goethe and Schiller***—Readings of major works of these authors, including *Faust* and *Wilhelm Tell*. *Cr* 3. MR. MILES

‡***157. 158. German Civilization***—Readings, discussions, lectures, oral and written reports on German culture designed to increase listening comprehension and skill in oral and written expression. Laboratory practice. *Cr* 3. MR. REID

197. 198. Projects in German—Individual work on a project of the student's selection. Prerequisite: consent of the department head. *Cr Ar*. STAFF

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. *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

‡***9, 10. Greek Tragedy***—A study in Greek of one play of each of the dramatic poets. Aeschylus, Sophocles, and Euripides; reading in translation of other plays. Given upon sufficient demand. *Cr* 3. MR. TATEM

LATIN (Lt)

1-2. Elementary Latin—Fundamentals of the Latin language. For students who have little or no previous instruction. *Cr* 4. MR. 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***—Review of grammar and syntax. The writing of Latin prose. Prerequisite: Lt 10 or the equivalent. *Cr* 1. 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 1966-67. *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 1966-67. *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 1968-69. *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 1968-69. *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 1967-68. *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 1967-68. *Cr* 3. MR. TATEM

197. 198. Projects in Latin—Individual work on a project of the student's selection. Prerequisite: consent of the department head. *Cr Ar*. STAFF

RUSSIAN (Ru)

1-2. Elementary Russian—Emphasis on development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. *Cr* 4. MR. PYLES

3/4. Intermediate Russian—Continuation of 1-2. Laboratory practice. This course fulfills the language generalization requirement. *Cr* 3. MR. PYLES

9. 10. Third Year Russian — Further emphasis on the acquisition of linguistic skills, with selected readings. *Cr* 3. MR. PYLES

11/12. Russian Literature—This course is flexible in content and follows the individual needs and interests of the student. Continued emphasis on oral Russian. Prerequisite: Ru 9. 10 or the equivalent. Given upon sufficient demand. *Cr* 3. MR. PYLES

SPANISH (Sp)

1-2. Elementary Spanish—Emphasis on 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*. 4. 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

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, or the equivalent. Well qualified students who have not taken Sp 7 may with permission elect Sp 8. *Cr* 3. STAFF

9. 10. Readings in Spanish Literature—For students who wish further practice in reading before beginning advanced literature courses. *Cr* 3. STAFF

†***151. Nineteenth Century Spanish Literature***—Chief works of Romanticism, Regionalism and the Generation of 1898 in relation to the cultural and political backgrounds. *Cr* 3. MR. MURRAY

†***152. Contemporary Spanish Literature***—A study of the Generation of 1898, the Generation of 1927, Tremendismo, and other currently significant literary trends. *Cr* 3. MR. MURRAY

‡***153. 154. Modern Latin-American Literature***—The literary scene since Independence: the Romantic upheaval, Gaucho literature, early modern novels.

Modernism and subsequent poetry, later novels and short stories; recent literary works with attention to contemporary cultural life and thought. *Cr* 3. MR. GROSS

†***155. Galdos and Benavente***—The lives, times, and works of two of Spain's greatest and most representative authors; Benito Perez Galdos, novelist, and Jacinto Benavente, playwright. Given upon sufficient demand. *Cr* 3. MR. GROSS

‡***157. 158. Hispanic Civilization***—Readings, discussions, lectures, oral and written reports on Hispanic culture with attention to increasing listening comprehension and skill in oral and written expression. Laboratory practice. *Cr* 3. MR. MURRAY

†***159. The Renaissance and Golden Age***—Readings of representative masterpieces of the period when Spain emerged from the Middle Ages, reached cultural and political unity and built its colonial empire. *Cr* 3. MR. GROSS

†***160. Cervantes***—A study of the life and literary works of Cervantes with special emphasis upon the reading and interpretation of *Don Quixote*. Lectures on the political, social and literary background of the period. *Cr* 3. MR. GROSS

197. 198. Projects in Spanish—Individual work on a project of the student's selection. Prerequisite: consent of the department head. *Cr Ar*. STAFF

399. Graduate Thesis—*Cr* 6.

CLASSICS (Cl)

1. 2. Greek and Latin Literature in English Translation — The first semester is devoted to Greek and Latin epic literature; the second semester, to Greek and Latin dramatic 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)

PROFESSOR OSBERG; ASSOCIATE PROFESSORS BORNS, HOWD;
ASSISTANT PROFESSORS HALL, MEYER

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, and paleontology to pursue additional courses in appropriate ancillary sciences. Specialization within a particular branch of the geological sciences requires graduate work.

The requirements for the major include: Gy 1/2 or 3/4; Gy 11, 12; Gy 13, 14; Gy 15, 16; Ch 1/2; Ps 1a/2a; Ms 12, 19, 27, 28; and four additional semesters in science, two of which must be in an ancillary discipline. A specimen curriculum follows. Each geology major must maintain a 2.00 average in geology courses.

GEOLOGY SPECIMEN CURRICULUM

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	1	English Composition	3	Eh	2	English Composition	3
Ch	1	General Chemistry	4	Ch	2	General Chemistry	4
Gy	3	Prin. of Geology	4	Gy	4	Prin. of Geology	4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
		Elem. Foreign Language	4			Elem. Foreign Language	4
		Social Science	3			Social Science	3
			18				18

Sophomore Year

			Hours				Hours
Gy	11	Prin. of Mineralogy	4	Gy	12	Prin. of Petrology	4
*Gy	13	Invert. Paleo. or	3	*Gy	14	Prin. of Stratigraphy or	4
Ps	1a	Gen. Physics	4	Ps	2a	Gen. Physics	4
Ms	1	Trigonometry	2	Ms	12	Anal. Geometry & Calculus	4
Ms	3	Algebra	2			Intermediate Foreign Lang.	3
		Intermediate Foreign Lang.	3				
			14 or 15				15

Junior Year

			Hours				Hours
*Gy	13	Invert. Paleo. or	3	*Gy	14	Prin. of Stratigraphy or	4
Ps	1a	Gen. Physics	4	Ps	2a	Gen. Physics	4
Gy	15	Structural Geology	3	Gy	16	Field Methods	3
Ms	27	Anal. Geom. & Calculus	4	Ms	28	Anal. Geom. & Calculus	4
Sh	1	Speech	2			Humanities	3
		Humanities	3			Elective	3
			15 or 16				17

* Not given in 1966-67

Senior Year

			Hours		Hours
Ms	19	Statistical Inference	3	Social Science	3
		Social Science	3	Elective	15
		Elective	12		
			18		18

1 (1a). Physical Geology—A study of earth materials and processes, volcanism, mountain building, the work of seas, streams, ice and winds. Laboratory work includes an elementary consideration of minerals, rocks and maps. One-day field trip and two afternoon field trips. Open to non-science majors only. Gy 1: *Lec* 3, *Lab and field trips. Cr* 4; Gy 1a: *Lec* 3, *Cr* 3.

2 (2a). Historical Geology—The geologic history of the earth and the development of life upon it. Laboratory includes study of selected fossils and various types of geologic maps. One one-day field trip. Open only to non-science majors. Prerequisite: Gy 1 or Gy 1a. Gy 2: *Lec* 3, *Lab* 2, *Field trip, Cr* 4. Gy 2a: *Lec* 3, *Field trip. Cr* 3.

3/4. 3a/4a. Principles of Geology—A course for geology and other science students, giving insight into the origin, composition and structure of the

earth, and into the geologic agents and processes which have modified it. Optional laboratory: Identification of minerals and rocks; experiments and exercises illustrating geologic processes and features. Gy 3/4: *Rec* 3, *Lab* 2, *Cr* 4; Gy 3a/4a: *Rec* 3, *Cr* 3.

6. Geology for Engineers—A study of geology as related to civil engineering practice. *Rec* 2, *Lab* 3, *Cr* 3.

11. Mineralogy—An introduction to crystallography and the crystal chemistry of minerals. Identification of the common rock-forming minerals by their physical properties. Prerequisite: Ch 1, 2 (may be taken concurrently). *Rec* 3, *Lab* 2, *Cr* 4.

12. Introduction to Petrology—Mode of occurrence, classification, and genesis of rocks. Identification of rocks on the basis of their macroscopic properties. Prerequisite: Gy 11, Ch 1. *Rec* 3, *Lab* 2, *Cr* 4.

13. Invertebrate Paleontology—Classification and evaluation of the major phyla of fossil invertebrate and their use in stratisgraphic interpretation. *Lec* 2, *Lab* 2, *Cr* 3.

14. Stratigraphy—Stratigraphic correlation, facies changes, the stratigraphic system, and elements of sedimentology. Weekend field trips to northern and coastal Maine. Additional one-day and afternoon field trips. *Lec* 3, *Lab* 3, *Cr* 4.

15. Structural Geology—A consideration and analysis of the principal geologic structures, their recognition, delineation, and methods of study. Field trips, laboratory problems, and map interpretation. Prerequisite: Gy 1 or 3. *Rec* 2, *Lab* 3, *Cr* 3.

16. Field Geology—A consideration of the methods of field geology and an analysis of some of the problems encountered in the field. Use of the plane-table, Bunton compass, and other instruments. Prerequisite: Gy 15. *Rec* 2, *Lab* 3 (*one week is spent in the field*). *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 or 2.

Courses for Undergraduates and Graduates

‡***151. Geomorphology***—A study of the origin, development, and modifications of the earth's surface features with field and laboratory analyses. Prerequisite: Gy 1 and 2, or Gy 3 and 4. *Rec* 2, *Lab* 3, *Cr* 3.

†***152. Glacial Geology***—A study of the works of glaciers, with special reference to the Pleistocene continental ice sheets. Several field trips. Prerequisite: Gy 1 and 2, or Gy 3 and 4. *Rec* 2, *Lab* 3, *Cr* 3.

‡***154. Geology of North America***—A study of the tectonic development of selected regions of North America which illustrate the theories and principles of continental evolution. Prerequisite: Gy 1 and 2, or Gy 3 and 4. *Rec* 3, *Cr* 3.

†***155. Optical Mineralogy***—Elementary theory of the polarizing microscope and the optical properties of crystalline substances. Use of the polarizing microscope in the determination of non-opaque minerals. Prerequisite: Gy 11. *Rec* 2, *Lab* 6, *Cr* 4.

†***156. Petrography***—Description of the structural, chemical, and physical properties of the rock-forming minerals. Interpretation of textural and chemical relationships in rocks. Petrographic calculations. Application of micrometric analysis and universal stage techniques in the solution of petrographic problems. Prerequisite: Gy 155, Ms 19, and Ms 28. *Rec* 2, *Lab* 6, *Cr* 4. MR. OSBERG

†*157. Metallic Mineral Deposits*—A study of the chemical and physical factors controlling the formation of metallic mineral deposits, followed by the analysis of several important mining districts which are outstanding examples of the control of mineralization by certain factors discussed earlier in the course. Laboratory: Identification of ore minerals by chemical tests and by observation of physical properties. Prerequisite: Gy 11 and Gy 15. *Rec* 3, *Lab* 3, *Cr* 4.

159. Advanced Engineering Geology—A study of selected geological topics and problems related to civil engineering practice. Prerequisite: Gy 6. *Rec* 2, *Cr* 2.

Graduate Courses

Gy 301. Directed Study in Geology
†Gy 311. X-ray Techniques in Mineralogy and Petrology
†Gy 312. Topics in Petrology
†Gy 321. Sedimentology
†Gy 322. Advanced Stratigraphy
†Gy 331. Advanced Structural Geology
‡Gy 333. Tectonic Geology
†Gy 341. Topics in Geomorphology and Pleistocene Geology
‡Gy 342. Pleistocene Epoch
‡Gy 351. Geological Exploration
†Gy 352. Ore Forming Fluids
Gy 399. Graduate Thesis

NOTE: † 1967-68
‡ 1966-67.

HISTORY (Hy)

PROFESSORS JEFFREY, STEWART, TRAFFORD; ASSOCIATE PROFESSORS HAKOLA, HENDERSON, MINGER, PEASE; ASSISTANT PROFESSORS BANKS, BATTICK, CHONG, DOTY, GRAVES, SMITH, VON WAHLDE; INSTRUCTORS BENSON, JOHNSON, SCHRIVER; GRADUATE ASSISTANTS ALDRICH, CASEY, LISTER, MISS NIELSON, RANDELL, RICHARDSON

The history major must complete Hy 3. 4, 5/6, and at least 24 hours of advanced history courses approved by his adviser.

The department offers the M.A. degree in history, with specialties in most areas of history, and the Ph.D. degree, with specialty in American history. Students will be admitted to these graduate programs upon presentation of credentials required by the Graduate School, including transcripts indicating excellent undergraduate records and satisfactory scores in both the aptitude and advanced tests of the Graduate Record Examination. 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. GRAVES

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. MISS STEWART, Chairman

9. 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* 2. MR. BANKS, MR. SMITH

101. 102. Ancient History—Political, social, and economic history of the civilizations of the ancient Mediterranean world. Egypt, the Near East, and Greece will be covered in the first semester; and Rome, in the second semester. *Cr* 3. MR. GRAVES

103. 104. The Middle Ages—Europe from late antiquity through the Renaissance. Emphasis on such topics as the Carolingian Empire, feudalism, medieval church and state, the Renaissance problems, and the impact of peripheral areas on Western Europe. Prerequisite: Hy 5/6. *Cr* 3. MR. GRAVES

105. 106. The Renaissance and Reformation—The political and economic forces and the social and cultural achievements of Europe in the period 1300-1650. The first semester will deal with the Renaissance. The second semester will deal with the Protestant revolt, the Catholic reform, and the wars of religion. Prerequisite: Hy 5/6. *Cr* 2. MR. GRAVES

109. Europe in the 18th Century—European history from the early 18th century through the Congress of Vienna, with special emphasis on the Enlightenment and the Enlightened Despots, the causes and the political, social, and economic aspects of the French Revolution, the career and European impact of Napoleon, and the spread of revolutionary principles in Europe. Prerequisite: Hy 5/6. *Cr* 3. MR. DOTY

†***110. Europe in the 19th Century***—Europe from the Congress of Vienna through the Franco-Prussian war. Consideration will be given such topics as liberalism and nationalism, reaction and revolutions, the unification of Italy and Germany, and contemporary cultural and intellectual movements. Prerequisite: Hy 5/6. *Cr* 3. MR. DOTY

‡***111. 112. Europe Since 1870***—Expanding industrialism, imperialism, and their effect upon world politcs; the background and causes of World War I; the Paris peace settlement and its resultant problems; the rise and character of communism, fascism, and nazism; and the background of World War II and post World War II problems. Prerequisite: Hy 5/6. *Cr* 3. MR. DOTY

115. 116. History of England—A general survey of the political, social, economic, constitutional and cultural aspects of England. Emphasis will be placed on such topics as trial by jury, the evolution of parliament, the Protestant revolt, the commercial and industrial revolutions, and the growth of democracy. Prerequisite: Hy 5/6 or permission. *Cr* 3. MR. TRAFFORD, MR. BATTICK

117. Tudor and Stuart England—The development of ideas and institutions in the British Isles from 1485 to 1714. Special emphasis will be given to the growth of parliamentary power, political theory, social and economic changes, and foreign affairs. Prerequisite: Hy 115.116 or permission. *Cr* 3. MR. BATTICK

†***120. Modern England***—England since 1815, with emphasis on the gradual democratization of her government, the continuing industrial revolution, social

and cultural change, the merging of Empire into Commonwealth, and her survival through two world wars. Prerequisite: Hy 115.116 or permission. *Cr* 3.

MR. TRAFFORD

121. 122. History of France—Political, social, economic, and cultural development of France. The first semester will cover the formation of the French monarchy through the French Revolution and Napoleon. The second semester will cover the Bourbon Restoration to the present. Prerequisite: Hy 5/6 or permission. *Cr* 3. MR. DOTY

123. 124. History of Russia—Russian history from earliest times to the present. The first semester will cover the rise of Russia to the 19th century; the second semester will treat of 19th century Russia, the collapse of the Tsardom, and the Soviet Union. Prerequisite: Hy 5/6 or permission. *Cr* 3.

MR. VON WAHLDE

126. Russian Cultural History—Russian intellectual, cultural, and social history of the 18th and 19th centuries. Special attention is paid to the intellectual theories of the revolutionary movement. Prerequisite. Hy 5/6 or 123. 124. *Cr* 3.

MR. VON WAHDLE

127. 128. History of Science—Development of the physical and biological sciences from pre-Greek civilization to the 20th century. Consideration will be given to the transmission of scientific thought from one civilization to another, and to the reciprocal relations between scientific thought and intellectual and social culture. Not open to freshmen. *Cr* 3.

129. 130. Economic History of Europe—The economic history of western Europe in the medieval and modern periods. Emphasis on such topics as agriculture, feudalism, the rise of towns and guilds, mercantilism, capitalism, and industrialism. Prerequisite: Hy 5/6 or permission. *Cr* 3. MR. HAKOLA

131. Germany Since 1815--The national unification of Germany, the era of Bismarck and William II, and the wars and revolutions of the 20th century. The main emphasis is on Germany's political evolution as determined by economic and social factors. Prerequisite. Hy 5/6. *Cr* 3. MR. VON WAHLDE

135. 136. History of China—The fall semester will include the history and culture of the Chinese people from earliest times to the 19th century. The spring semester will be concerned with the "modernization" of China: the coming of the West, the impact of Western ideas, and the resulting revolutionary movement. Prerequisite: six hours of history. *Cr* 3. MR. CHONG

137. History of Modern Japan—The course will be primarily concerned with the history of Japan during the past century. The major focus will be the coming of the West, the impact of Western ideas upon traditional Japanese culture, and the rise and fall of the Japanese empire. Prerequisite: six hours of history. *Cr* 3. MR. CHONG

138. Problems of Southeast Asia—A survey of countries recently emerged from colonialism, such as Indonesia and Malaya. Prerequisite: same as for Hy 137. *Cr* 3. MR. CHONG

139. 140. The Middle East—The Middle East in modern times, with special emphasis on the impact of the west in terms of political, economic, and cultural change. Prerequisite: six hours of history. *Cr* 2.

141. 142. The British Commonwealth—A survey of the modern British Commonwealth, considering the history, the contemporary position and problems of Canada, the West Indies, and British Africa in the first semester, and of the

Commonwealth countries in Asia and the Pacific in the second. Prerequisite: Hy 5/6 or 115. 116. *Cr* 3. MISS STEWART

147. 148. Hispanic America—The Spanish and Portuguese colonial empires in America to their achievement of independence, and the national period of Hispanic America. Prerequisite: Hy 3.4 or 5/6. *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. Prerequisite: Hy 148 or permission. *Cr* 3. MR. JEFFREY

150. Mexico—A history of Mexico, from early times to present. Prerequisite: Hy 148 or permission. *Cr* 3. MR. JEFFREY

151. Latin America and the United States—United States' participation in Latin American affairs from the recognition of independence and the Monroe Doctrine to the good neighbor policy and the present day. Prerequisite: six hours of history. *Cr* 2. MR. JEFFREY

152. Problems of Latin-America—Recent problems facing Latin American nations in relation to the world and in their internal development. Prerequisite: six hours of history. *Cr* 2. MR. JEFFREY

157. 158 Canadian History—A survey of Canadian history from early French settlement to the present, with emphasis on political and economic evolution, and Canada's relations with the U.S. Prerequisite: sophomore standing and Hy 3.4 or 5/6. *Cr* 3. MISS STEWART

161. 162. American Colonial History—The founding and the political, social, and economic development of the colonies. English colonial policy. The development of the colonies in the 18th century; the remote and immediate causes of the revolution. Prerequisite: junior or senior standing. *Cr* 2. MR. HENDERSON

†***163. Revolution and Confederation***—The causes of the American Revolution, the war with special attention to the "internal revolution," and the post war period to 1789. Prerequisite: Hy 3.4 or Hy 161. 162. *Cr* 3. MR. PEASE

165. 166. Era of Jefferson and Jackson—An analysis of American political, cultural, social, and economic development in the first half of the 19th century. Prerequisite: Hy 3.4. *Cr* 3. MR. PEASE

167. Civil War and Reconstruction—The period of national disruption and reunification, with emphasis on the collapse and reconstruction of the national political and social fabric, the acceleration of economic change, the emergence of the industrial trend, and the development of the new sectionalism. Prerequisite: Hy 3. *Cr* 3. MR. PEASE

169. 170. Twentieth Century America—The Spanish-American War, the progressive movement, the Wilson reforms, World War I, the depression of 1929, the New Deal, World War II, and subsequent events. Prerequisite: Hy 3.4. *Cr* 2. MR. MINGER, MR. SMITH

171. 172. Economic History of the United States—From the colonial period to the present with special attention to the problems raised by the economic evolution of the country. Cr 3. MR. HAKOLA

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. Prerequisite: Hy 3.4. *Cr* 3. MR. MINGER

175. 176. Social and Intellectual History—American social and cultural developments as reflected in philosophy, literature, religion, science, politics and economics. Prerequisite: Hy 3.4. *Cr* 3. MR. BANKS

177. 178. Constitutional History of the United States—A study of the

constitutional institutions in the United States with only incidental treatment of political and economic events except where they directly affect the background or growth of constitutionalism in the United States. Prerequisite: Hy 3.4. *Cr* 3.

181. 182. History of the West—A study of the factors involved in the movement of population, the evolution of agricultural and pioneering techniques, and the formation and migration of capital on the several frontiers, of frontier life and culture, and of the influences of territorial and agricultural expansion in American history. Prerequisite: Hy 3.4. *Cr* 2. MR. SMITH

†***183. Maritime History of the United States***—Ships and trade from colonial days to the present, including famous ships and ship builders, the evolution from wood to iron and steel ships, the effect of the Civil War and world wars on our merchant marine. Permission required. *Cr* 2.

291. Historical Methods and Materials—A study of bibliographical tools, resource potentials, and research and writing techniques, with special attention to principles of document analysis and the use of quantitative data. The materials of the course are applied to specific student research problems and topics. *Cr* 3.

MR. PEASE

292. History of Historical Writing—A survey of the principal schools of historical writing and of their products, with detailed student analysis of the philosophical principles, specific purposes, and research and writing techniques of selected major historians. *Cr* 3. MR. PEASE

299. Seminar—Projects for qualified students. *Cr* 2 or 3.

301. Topics in Colonial History—*Cr Ar.*

302. Topics in U. S. History from the Revolution to 1877—*Cr Ar.*

303. Topics in U. S. History since 1877—*Cr Ar.*

305. Topics in American Social and Intellectual History—*Cr Ar.*

306. Topics in American Foreign Relations—*Cr Ar.*

307. Topics in Latin American History—*Cr Ar.*

308. Topics in Canadian History—*Cr Ar.*

311. Topics in 19th Century European History—*Cr Ar.*

312. Topics in 20th Century European History—*Cr Ar.*

313. Topics in English History—*Cr Ar.*

350. Independent Readings—*Cr Ar.*

360. Supervised College Teaching—*Cr Ar.*

397. Philosophy of History—*Cr Ar.*

399. Graduate Thesis in History—*Cr Ar.*

HONORS PROGRAM (Hr)

PROFESSORS MILES, BISCOE, FLYNN, GLANVILLE, HARTGEN, NOLDE, AND REYNOLDS; ASSOCIATE PROFESSORS J. BENNETT, REID, SPRAGUE, SWINFORD, AND THOMSON (SECRETARY); ASSISTANT PROFESSOR BANKS, MR. SCONTRAS

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—Limited to Distinguished Maine Students and to a limited number of other students, by invitation. Discussions and demonstrations displaying the range and nature of the Liberal Arts and Sciences. *Cr* 3. MR. SIMPSON

45. Honors Colloquium—Readings and discussion on the basic concepts of Western civilization. Normally taken in the freshman year. *Cr* 3.
MR. THOMSON, Chairman

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 project. *Cr* 3.

JOURNALISM (Jr)

ASSOCIATE PROFESSOR HAMILTON

The Department of Journalism has two purposes: (1) to provide a major program leading to the bachelor of arts degree in journalism with a combination of preprofessional training and a liberal education for those interested in newspaper, public relations or allied journalism careers; and (2) to provide courses for any students in the University who have an interest in writing as an aid to their other interests or in the study of modern mass communications as part of society.

Prospective majors in their first two years will fulfill the basic requirements of the College of Arts and Sciences. Freshmen and sophomores may wish to make choices to fulfill some of these on the basis of options listed below. My 1/2 is recommended for freshmen; Eh 7 or 8 as a sophomore elective. Those interested in radio and television news may elect Sh 21.

Majors in their junior and senior years are required to take Jr 31. 32; 93. 94; and 95. 96, to provide their preprofessional background. Laboratory facilities include a newsroom with typewriters, a copydesk, photographic equipment, and a journalism library. *The Maine Campus,* a student-operated weekly newspaper, is a practical laboratory. Students also have access to the University printing plant, the campus radio station and television studios, and are served daily with As-

sociated Press news. Part-time work is available for a limited number on Maine newspapers and in the University publicity office. Some summer work is available.

Majors will round out their programs in accord with one of the options below, depending on the student's interest and aptitudes. With the requirements as listed for each, the student will still have some elective time for courses in other areas properly included in a liberal education.

Public Affairs Option—For the student preparing for news work in mass communications in the United States, with emphasis on American public affairs. Required courses: Pol 1/2; Ec 1/2; Hy 3.4; plus at least 24 hours of advanced courses in one or two of these social sciences approved by the adviser.

Foreign Affairs Option—For the student preparing for work abroad in mass communications or related activities. The student must complete courses in French, German, or Spanish at least up to the 157. 158 (or fourth year) level. Other required courses: Hy 5/6; Pol 1/2; Pol 35/36; Ec 1/2; plus at least 18 hours in advanced courses approved by the adviser.

Economics Affairs Option—For the student with a special interest in economics, preparing for newspaper work, public relations, industrial editing or related activities. Required courses: Ms 1, 3 and 12 or 5/6; Ec 1/2; Hy 19. 20; and at least 24 hours of advanced economics and related courses approved by the adviser.

Linguistics, Literature and Humanities Option—For the student interested in this broader background as preparation for a writing career. Required courses: Eh 3. 4 or 15. 16; 7 or 8; four hours chosen from Eh 21, 49, 67 and 68; plus at least 12 additional hours in advanced literature and composition courses.

Social Welfare Option—For students preparing for journalism careers with an interest in social welfare, or in the increasing emphasis on sociological research in mass communications, or in a career in social work. Required courses: Pol 1/2, Ec 1/2, Py 1/2, Ay 1/2, Sy 3/4 (as many as possible taken during the sophomore year), plus either of the following plans of advanced courses: Sy 50/51 and 52/53 or Sy 120 and 160, plus six more hours of sociology courses numbered from 10 through 38.

Science Writing Option—Designed to combine liberal arts and a strong science background with journalism training for those interested in this new, specialized field. Prospective majors should elect Ms 1, 3, and 12 for their freshman science requirement, and German for the language requirement. The student will be required to complete 32 to 40 hours in a science and the necessary requirements or prerequisites in related sciences.

22. Survey of Journalism—A beginner's course in the structure and operation of modern news media. Includes visit to a modern newspaper plant. Open to all freshmen and sophomores. *Cr* 2. MR. HAMILTON

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* 2. MR. HAMILTON

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. Open to all juniors and seniors. *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. For seniors who have had 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. *Six hours of class work a week. Cr* 3. MR. HAMILTON

97. Departmental and Feature Writing—Given when there is sufficient demand. *Cr* 2.

98. Newspaper Makeup—Given when there is sufficient demand. *Cr* 2.

MATHEMATICS AND ASTRONOMY

PROFESSORS KIMBALL, EVES, AND WOOTTON; ASSOCIATE PROFESSORS SWINFORD, NORTHAM, HAMM, J. TOOLE, ALTENBERGER, AND HARPER; ASSISTANT PROFESSORS DODGE, HOOPER, PERRY, STEARNS, GEIGER, GREEN, MESTECKY, MURPHY, HANNULA, AND SOULE; MR. DUBE, MR. EDE, MR. WAGNER, MR. ABBOTT, MR. DELAITE, MISS JENSEN, MR. DRANCHAK, MISS KEM, MR. MERRIMAN, MR. MIXER, AND MR. SAWTELLE; MRS. TOOLE, AND MR. MICKEWICH; MR. CALARCO, MR. CARTER, MR. JOHANSSON, MR. GODSOE, MR. GOWER, MR. PERRY, AND MR. SHELTON

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, artificial satellites and interplanetary flight; occultations and eclipses; stellar parallaxes and motions; binary star orbits; stellar structure and evolution. Prerequisite: Ms 29 and As 9 or As 16. Not given every year. *Cr* 3.

** University of Maine in Augusta

MATHEMATICS (Ms)

Students who plan to major in mathematics should take Ms 12, 27, and 28 during their first two years, and Ms 29 if they begin their college programs with Ms 12. They should begin with Ms 1 and Ms 3 if they have had less than three and one-half years of high school mathematics or have not had a course in trigonometry. When possible, prospective majors should also take Ms 21 and Ms 22 in the sophomore year.

The student's program of courses for the junior and senior years will depend on his vocational plans. In selecting upper level courses the mathematics major will be assisted by a Mathematics Department member assigned by the department to act as his adviser.

All mathematics majors must earn a minimum of 39 credit hours in mathematics exclusive of Ms 1, Ms 3, Ms 17 and Ms 19. An appropriate selection of

the more highly technical courses will be recommended by the adviser for the major who plans on industrial employment or graduate work. Majors are advised to satisfy the college language requirement through French, German, or Russian.

The general requirements for the master of arts degree are given in the Graduate Bulletin. Candidates for this degree in mathematics are expected to have a substantial undergraduate training in this subject.

Two years of high school algebra are prerequisite for any of the following courses, with the exception of Ms 7, Ms 9, Ms 10, and Ms 19, for which one year is required.

Students taking Ms 12 may not take Ms 5/6 for credit.

1. Trigonometry—The trigonometric functions, their properties and applications. *Cr* 2.

3. College Algebra—Basic topics in algebra necessary for further work in mathematics. *Cr* 2.

5/6. Elements of College Mathematics—Modern viewpoints on certain basic mathematical material. 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, 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 inequalities. 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.

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.

21. Elements of Set Theory—An introduction to general set theory. *Cr* 2.

22. Elements of Real Number Theory—The real number system developed from a foundation in intuitive set theory. *Cr* 2.

23. Theory of Equations—A brief introduction to modern algebra followed by material on the solution of polynomial equations. Prerequisite: Ms 28 or consent of the instructor. *Cr* 3.

24. Introduction to Linear Algebra—Vector spaces, linear transformations, matrices, linear and quadratic forms. Prerequisite: Ms 21. *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 differences; applications. Prerequisite: Ms 27. *Cr* 4.

29. Calculus and Differential Equations—Multiple integrals in two and three dimensions and an introduction to ordinary differential equations; applications. Prerequisite: Ms 28. *Cr* 4.

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 of symbolic logic will be developed with a decidedly set-theoretic background. Prerequisite: Ms 21 and Ms 27. *Cr* 2.

103. Mathematics of Optimization—A course in modern mathematical methods emphasizing programming, game and decision theory with applications in social and industrial science and economics. Prerequisite: Ms 24. *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 29. *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. *Cr* 3.

133. Stochastic Processes—An introduction to stochastic processes with emphasis on normal Poisson and Markov processes. Applications in various fields will be considered. 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.

150. Ordinary Differential Equations—Solution of ordinary differential equations and applications. Prerequisite: Ms 29. *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 29. *Cr* 3.

152. Introduction to Complex Variables—Analytic functions, integration, series, and mapping. Prerequisite: Ms 29. *Cr* 3.

153. Partial Differential Equations—Fourier series and integrals, orthogonal functions, the Sturm-Liouville problem, wave and heat flow equations. Prerequisite: Ms 150. *Cr* 3.

154. Solid Analytic Geometry—Analytic geometry in three dimensions. Not given every year. Prerequisite: Ms 28. *Cr* 3.

155/156. Differential Equations—An introduction to the theory and solution of ordinary and partial differential equations. Not given every year. Prerequisite: Ms 28. *Cr* 3.

161. History of Mathematics—The development of elementary mathematics from ancient to modern times. Prerequisite: Ms 12. *Cr* 3.

164. College Geometry—Modern Euclidean geometry, including such topics as the nine-point circle, harmonic section, and inversion. *Cr* 3.

165. Theory of Numbers — Elementary properties of the integers. Prerequisite: Ms 28. *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 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 fiields. Prerequisite: Ms 19 or 130. *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. Concentrates on the IBM Fortran language. Students will work on the University's IBM 1620 Computer. Prerequisite: one year of college mathematics or consent of the instructor. *Cr* 3.

171. 172. Higher Algebra—A semester of groups, rings, and fields, followed by a semester of matrix theory. Prerequisite: Ms 28. *Cr* 3.

173/174. Advanced Calculus — Functions of real variables, limits, infinite series, partial differentiation, and other topics. Prerequisite: Ms 29. *Cr* 3.

175/176. Higher Geometry—An introduction to various geometries, such as projective and non-Euclidean. Not given every year. Prerequisite: Ms 28. *Cr* 3.

177/178. Topology—An introduction to point set topology. The concept of convergence is developed using filters. The development includes regular, compact, normal and uniform spaces. Prerequisite: Ms 28 or consent. *Cr* 3.

179. Finite Groups—Theory of groups, including Sylow's theorems and Abelian groups. Prerequisite: Ms 28 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 1620 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.

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. *Cr* 3.

271/272. Abstract Algebra—The basic structure theorems for groups, rings, fields, and modules. Prerequisite: Ms 172. *Cr* 3.

300. 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, grades K-12, who are candidates for the M.Ed. degree. Prerequisite: permission of the instructor. Not given every year. *Cr* 3.

‡*379/380. Functions of a Complex Variable* — Prerequisite: Ms 174 or consent of the department. *Cr* 3.

†*383/384. Functions of a Real Variable*—Prerequisite: Ms 174 or consent of the department. *Cr* 3.

399. Graduate Thesis—Cr Ar.

MODERN SOCIETY (My)

ASSOCIATE PROFESSOR MCKAY (CHAIRMAN); MR. SCONTRAS

Modern Society 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.

Basically a general education course, it is designed both for those students who may major in the social sciences and also for those whose chief interests are in other curricula but who need this contribution to a well-rounded education.

Modern Society is open primarily to freshmen in the College of Arts and Sciences. In the other colleges, the course is open to any student who has not had a minimum of two years of social science at the college level.

1/2. Modern Society—The course includes such topics as public opinion, propaganda analysis, group ways and controls, the culture concept, physical resource and population problems, social class, race relations, crime, business and labor organization, trends in agriculture, consumer problems, freedom and power in society, political parties and elections, democracy and totalitarianism. *Cr* 3.

MUSIC (Mc)

PROFESSOR HEADLEY; ASSISTANT PROFESSORS CAVANAGH, COLLINS, JACOBS; LECTURER HARE; MISS FOLEY

The curricula of the Department of Music lead to baccalaureate degrees as follows:

1. ***Bachelor of Arts Degree*** with a major in music.
   For the student who wants a major in music as part of a general cultural education. The music requirements are as follows:

Basic Music	Theory	16
	History	6
	Literature	2
	Form and Analysis	2
Music Performance	Performance Major	16
	Music Organization	4
	Music Electives	2
	Total	48

   A recital on the major instrument or voice is required in the senior year. It should be understood that this degree is non-professional, is not preparation for graduation study, and serves as only partial preparation for teacher training through the College of Arts and Sciences.
2. ***Bachelor of Science in Music Education***—for students in the College of Education who intend to make music a career either as a teacher, and/or a 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. Upon completion of this degree, a student will be certified to teach in the public schools.

See Division of Music Education in the College of Education section of this catalog.

A proficiency examination in piano must be passed by all degree students in music before the senior year. See the music adviser for details.

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:

* First level,	MC 1-2 *Cr* 1 to 2
Second level,	MC 3-4 *Cr* 1 to 2
Third level,	MC 5-6 Cr 1 to 2
Fourth level,	MC 7-8 *Cr* 1 to 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 who have not progressed beyond the first level at the end of the sophomore year will be advised to change their major field.

Instruction is provided in the following areas. The letter following the instrument, or voice, indicates the area and should be used in conjunction with the numbers above when enrolling.

Example: MC 1 A

Voice	A	Violin	D	Flute	H	French Horn	N	Percussion	U
Piano	B	Viola	E	Oboe	J	Trumpet	P		
Organ	C	Violoncello	F	Clarinet	K	Baritone Horn	R		
		Double-Bass	G	Bassoon	M	Trombone	S		
						Tuba	T		

Music majors enroll for two hours credit for the major instrument or voice, one hour for the second instrument or voice. *All other students* enroll for one hour credit.

A maximum of 16 hours in a performance area is allowed toward a degree in music. *Credit in music performance must be matched by an equal number of credits in courses in music history, literature, or theory of music before it will be counted toward graduation.*

Each student taking instruction in a performance 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 Secretary of the Department of Music.

One half-hour lesson each week, $30. One hour lesson each week, $60.

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.

A fee of $5.00 is charged for the use of a practice room. After being accepted by a teacher, the student should report immediately to the music office for a fee statement. The lesson fee and rental must be paid to the Treasurer's Office before lessons can begin.

Musical Organizations and Ensembles (Mc 0)

1. 2. University Singers—Rehearsal and performance of choral concert repertoire. Membership through audition requires sight reading ability. Before requesting an audition the student should take the Music Fundamentals Test (See Secretary of the Department of Music). Three hours of rehearsal a week, and attendance at Chorophonic Society rehearsals. Attendance at all rehearsals and public performances required. May be repeated for credit. *Lab* 3, *Cr* 1.

3. 4. Chorophonic 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.

11. Marching Band — Rehearsal, drill, and performance at University athletic events. 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. May be repeated for credit. (Spring semester only.) *Lab* 4, *Cr* 1.

13. 14. Symphonic Band—Rehearsal and performance of symphonic band repertoire. Membership through audition. Attendance at all rehearsals and public performances required. May be repeated for credit. *Lab* 4, *Cr* 1.

21. 22. University Orchestra—Rehearsal and performance of symphonic works. Membership through audition. Attendance at all rehearsals and public performances required. May be repeated for credit. *Lab* 4, *Cr* 1.

31. 32. Vocal Ensemble—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 L 1, and MC T 1 or equivalent. *Cr* 3.

3. Teaching and Supervision of Elementary Music—A comprehensive study of the elementary music programs for music specialists. Prerequisite: MC T 14 A, B, and MC L 22. *Cr* 3.

†***11. Teaching of Secondary Music***—Methods, materials, organization, and administration of the various aspects of the secondary school music curriculum. Prerequisite: MC T 14 A, B, and MC L 22. *Cr* 3.

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 for beginners in voice. Prerequisite: MC T 1 or passing of Music Fundamentals Test. *Lab* 2, *Cr* 1.

‡*5/6. Piano Class*—A class designed to give basic command to the keyboard to those students who need it as a tool. Recommended especially to those students who are required to take a proficiency examination in secondary piano and who lack the basic keyboard skills. Prerequisite: MC T 1, or passing of Music Fundamentals Test. *Lab* 2, *Cr* 1.

‡*9/10. String Class*—Basic skills pertaining to each of the four string instruments. First semester, study of all the instruments; second semester, concentrated work on one instrument. Prerequisite: MC T 1, or passing of Music Fundamentals Test. 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 passing of Music Fundamentals Test. *Lab* 4, *Cr* 2.

†*17. Brass Class*—Basic skill pertaining to the brass instruments. Prerequisite: MC T 1, or passing of Music Fundamentals Test. *Lab* 4, *Cr* 2.

‡*21. Percussion Class* — Basic skills pertaining to the percussion instruments. Prerequisite: MC T 1, or passing of Music Fundamentals Test. *Lab* 2, *Cr* 1.

†*31. Basic Conducting*—Fundamentals of conducting with attention given to conducting patterns, size of beat, baton technique, use of each hand, and conducting experience with the class as a laboratory group. Prerequisite: MC T 1, or passing of Music Fundamentals Test *Lab* 2, *Cr* 1.

‡*41. Choral Procedures and Techniques*—Advanced choral conducting, and study of basic problems in the organization and training of choral groups. Prerequisite: MC P 31. *Lec* 1, *Lab* 2, *Cr* 2.

‡*45. Instrumental Procedures and Techniques*—Advanced instrumental conducting, and study of basic problems in the organization and training of bands and orchestras. Prerequisite: MC P 31. *Lec* 1, *Lab* 2, *Cr* 2.

51. 52. Accompanying—A course designed for music majors whose concentration is voice-keyboard. Prerequisite: MC 2B or C. *Lab* 2, *Cr* 1.

Numbers in parentheses—old course numbers.

Courses in Music History (Mc H)

1/2. History of Music—The history of music from plain-song to the present day with a study of the significant musical trends, the influence of social, political and cultural forces upon musical development, and the contributions of individual composers. 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 Schutz 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 representative works from Beethoven through Debussy. Prerequisite: MC H 2, or permission of the 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—The development of music appreciation through a study of music from the 4th century to the present day, with emphasis on the various historical movements in the arts, together with a study of the great composers and their contrasting styles as exemplified by their most important compositions. *Cr* 3.

21-22. Survey of Music Literature—A comprehensive survey of music literature with in-class listening, and with analyses and comments by instructor. Primarily for music majors. *Lab* 2, *Cr* 1.

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. Required of music majors at no credit for those failing to pass the Music Fundamentals Test. *Cr* 3.

11A/12A. Elementary Harmony—Four-part harmony in diatonic relationships. To be taken concurrently with MC T 11B/12B. Prerequisite: MC T1 or passing of Music Fundamentals Test (see Secretary of the Department of Music). *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. Prerequisite: MC T 1, or passing of Music Fundamentals Test (see Secretary of the Department of Music). *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 13 B/14 B. Prerequisite: MC T 12 A. *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.

21. Modal Counterpoint—Contrapuntal techniques as practiced by composers of the 16th and 17th centuries. Written exercises and analysis. Prerequisite: MC T 11A/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 11A/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 13B/14B, and MC T 22, or its equivalent. *Cr* 2.

†***141. Form and Analysis***—Harmonic and structural analysis of musical forms from the smallest to the largest. Prerequisite: MC T 11A/12A, or the 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 11A/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 larger forms. Prerequisite: MC T 161. May be repeated for credit. *Cr* 2.

THE SCHOOL OF NURSING

PROFESSOR MACLEAN, DIRECTOR; ASSISTANT PROFESSORS CAMPBELL, TRYON, ROSCOE; MRS. CARROLL, MRS. WILLIAMS
COOPERATING WITH THE FACULTY: MISS DOLAN, MISS SULLIVAN

The School of Nursing was established in 1958 through a gift of $93,000 from Congresswoman Mrs. Frances Payne Bolton of Ohio. The school, a division of the College of Arts and Sciences, offers a four-year program which combines liberal arts and professional nursing education. Upon satisfactory completion of the course, students receive the bachelor of science degree and are eligible to take State Board Examinations for licensure as registered nurses.

The program is planned so that most of the general education courses come in the first two years and the clinical nursing in the junior and senior years. The student lives on the college campus in Orono during the first two years and in the clinical areas the last two years.

The course requires eight full semesters, plus a summer session between the sophomore and junior years. The course is completed at the end of the second semester of the fourth year.

The student in the School of Nursing is a regularly enrolled undergraduate in the University and as such is entitled to use all the facilities of the University for study, scholarship aid, and extracurricular activities.

The Maine Medical center in Portland and a psychiatric hospital provide the clinical fields for the major portion of the nursing courses. Field experience in public health nursing is provided through cooperation with the Division of Public Health Nursing of the State of Maine, Department of Health and Welfare.

Fees and expenses will be essentially the same as those of other students for all four years, with the addition of the summer session, and nursing uniforms ($90.00) which are purchased during the spring of the sophomore year.

The student must provide herself with a car for public health nursing experience and must pay the cost of this. She must have a driver's license, current in some state in order to register for the senior year.

Housing is provided by the University both on campus and in Portland. The student is responsible for the charges for board and room during the two eight-week courses in psychiatric nursing and public health nursing.

In order to enter the junior year of the program the student must have a minimum accumulative average of 1.8.

The School of Nursing reserves the right to request the withdrawal of any student who fails to make satisfactory adjustment to the field of nursing.

Courses in Nursing (Nu)

1. Introduction to Nursing—A discussion of nursing education and the role of nursing as a profession with consideration for the changes in health pro-

blems during this century. Emphasis on current health problems and their implication for nursing. *Cr* 2. MRS. WILLIAMS

2. Introduction to Nursing—A history of nursing; the cultural and social factors that have influenced its development and the influence of nursing on the culture today. *Cr* 2. MRS. WILLIAMS

3. Fundamentals of Nursing — Introduction to nursing care of the patient; understanding and meeting the patient's personal needs. Guided experience in applying principles and developing evaluation, planning, manual communication and teaching skills. Given at Maine Medical Center during summer of junior year. Not given in 1967. *Cr* 4. MRS. CARROLL

4. Community Health—This course is concerned with the health and welfare needs of individuals and families and with how the community attempts to meet them. It includes some of the essentials of promoting health and preventing disease and stresses the role of the health worker in community health organization. Field trips to local agencies are arranged. *Cr* 3. MRS. CAMPBELL

5A-5B. Medical-Surgical Nursing—A selective experience is provided in the nursing care of persons with short and long term medical and surgical illnesses requiring hospitalization. Includes opportunities for health care planning during hospitalization and rehabilitation, and practice in nursing techniques with emphasis on mental health concepts, communication skills, and public health principles. Special therapies such as diet, drugs, and physicaltherapy are integrated. *Cr* 7 each. MRS. CARROLL

6. Nursing of Children—The nursing care of children based on an understanding of the well child and the child's adjustment to illness. Guided clinical experience is offered in the care of the ill child. Portions of the course are planned and taught in conjunction with the course Nursing of Mothers and Infants. *Cr* 7.

7. Nursing of Mothers and Infants—A family centered approach to the nursing of mothers and newborn infants. Study emphasizes the nursing of normal mothers and infants, but includes discussion of deviations from the normal. It includes guided clinical experience in the care of mothers and infants. Portions of the course are taught in conjunction with the course Nursing of Children. *Cr* 7. MISS TRYON

9. Public Health Nursing—This course is designed to develop understanding of the scope, philosophy, fundamental principles, current trends and problems of public health nursing. Emphasis is placed on the approaches used, responsibilities and activities of the public health nurse in providing family centered nursing service in the community. Clinical practice in a generalized public health nursing agency provides the student with an opportunity to observe and to put into practice the concepts and principles learned in the classroom. *Cr* 7. MISS ROSCOE

10. Psychiatric Nursing—Provides an opportunity for guided experience in the nursing care of the mentally ill. The approach is based on the concepts of mental health and the dynamics of human behavior. Community aspects are discussed. *Cr* 7.

13. Advanced Nursing—Provides opportunities to increase knowledge and skills in nursing while caring for patients with complex, acute and chronic health problems. *Cr* 7. MRS. CARROLL

14. Leadership in Nursing—Emphasizes the principles of learning, teaching, and administration as these principles are utilized by the professional nurse who will function as a health leader in the hospital and community. *Cr* 7.

15. Introduction to Pharmacology—An orientation to pharmacology including study of legislation, preparation, administration and action of drugs; laboratory. *Cr* 1. MISS MACLEAN, MRS. WILLIAMS

16/17. Growth and Development—Normal growth and development of the human being from conception through adolescence. The physiological, mental and emotional aspects are considered. *Cr* 1 each.

18/19. Nursing Seminar—The present situation in nursing; the problems of the profession and the individual practitioner. Opportunity for independent study. *Cr* 4.

CURRICULUM IN NURSING

Freshman Year

			Hours
Bc	7	Fundamentals of Chemistry	4
Bc	8	Elementary Physiological Chemistry	4
Eh	1/2	Freshman Composition	6
Nu	1, 2	Introduction to Nursing	4
Pe	1, 2	Physical Education	0
Zo	3	Animal Biology	4
Zo	10	Anatomy and Physiology	5
		Elective* or **Sy 3/4, Sociology	6
			33

Sophomore Year

			Hours
By	21A	Bacteriology	4
Fn	152	Human Nutrition	3
Nu	4	Community Health	3
Nu	15	Introduction to Pharmacology	1
Py	1/2	General Psychology	6
Sh	1	Fund. of Public Speaking	2
Sy	3/4	Sociology or Elective**	6
		Electives*	5 or 6
			31 or 32

Summer School

Nu	3	Fundamentals of Nursing	4

Junior Year

Nu	5A/5B	Medical-Surgical Nursing	14
Nu	6	Nursing of Children	7
Nu	7	Nursing of Mothers & Infants	7
Nu	16/17	Growth and Development	2
Py	117	Educational Psychology	3
Eh	16	Masterpieces of Lit.	3
			36

Senior Year

Nu	9	Public Health Nursing	7
Nu	10	Psychiatric Nursing	7
Nu	13	Advanced Nursing	7
Nu	14	Leadership in Nursing	7
Nu	18/19	Nursing Seminar	4
			32

* Chosen from the humanities and social sciences. Permission to substitute must be secured from the Director of the School of Nursing.

** Sy 3/4 is required and must be taken either freshman or sophomore year.

PHILOSOPHY (Pl)

PROFESSOR VIRTUE; ASSISTANT PROFESSOR BRIMMER; MR. KOEHN

Philosophy, man's search for basic understanding of himself, his culture and his world, has always been both a key to understanding and a goal of liberal education. As a key it offers insight into intellectual method; as a goal it provides immediate participation in cultural processes themselves.

While the usual entry into formal philosophy is through Pl 1. 2, Philosophy and Modern Life, Pl 135, Ethics, and Pl 136, Logic, provide another introduction. Upperclassmen and exceptional sophomores may well consider the sequence offered by the History of Philosophy, Pl 155. 156. 157. 158, though any one of these period courses may be taken independently. Philosophy majors complete a minimum of 24 hours in philosophy exclusive of Pl 1. 2.

1. 2. Philosophy and Modern Life—Pl 1 pays special attention to logic, the nature of knowledge and world views. Pl 2 is concerned with the value disciplines of ethics, aesthetics and religion. The whole course relies directly on original philosophic writings and provides an introduction to the philosophers themselves. *Cr* 3. MR. KOEHN

15. Our Religious Heritage—The Hebrew-Christian tradition and its contemporary expression. *Cr* 2.

16. Philosophy of Religion — Basic problems of religious thought; language and other symbolism; experience and its interpretation; reason and faith; concepts of God and the soul; the function of religion in personal and social life. *Cr* 2. MR. BRIMMER, MR. KOEHN

17. Religions of the East—Hinduism, Buddhism, Confucianism, Taoism, Shinto, and Islam—their founders, scriptures, modes of worship and ethics. *Cr* 2.

33. Aesthetics—Analysis of aesthetic experience and inquiry into the nature of beauty and the philosophy of art. *Cr* 3. MR. BRIMMER, MR. KOEHN

135. Ethics—Right and wrong, good and bad conduct as considered by classical theorists in ethics, moralists and persons making ethical decisions. *Cr* 3. MR. KOEHN

136. Logic—The principles and methods of valid reasoning, making full use of contemporary symbols techniques. *Cr* 3. MR. BRIMMER

151. Philosophy of Science—The presuppositions, principles, methods and scope of scientific thinking. *Cr* 3. MR. BRIMMER

155. 156. 157. 158. History of Philosophy — The development of philosophic thought from Ancient Greece to the 20th century:

†***155. Ancient Philosophy***—From the earliest Greeks to Plotinus, with central emphasis on Plato and Aristotle, and including the Epicureans and Stoics. *Cr* 3. MR. BRIMMER, MR. KOEHN

†***156. Medieval Philosophy***—The development of thought from Neo Platonic philosophy and the Judaic, Christian and Islamic traditions to the philosophy of the High Middle Ages. *Cr* 3. MR. BRIMMER, MR. KOEHN

‡***157. Early Modern Philosophy***—The emergence of rationalism and empiricism on the continent and in Great Britain; from Bacon and Descartes to Hume and Kant. *Cr* 3. MR. BRIMMER, MR. KOEHN

‡***158. Late Modern Philosophy***—The philosophy of Kant and the development of philosophy in Europe and Great Britain in the 19th century. *Cr* 3. MR. BRIMMER, MR. KOEHN

165. 166. Topics in Philosophy—Individual and small group study. By consent of the instructor. *Cr Ar.* MR. BRIMMER

70. Perspectives in Culture—The interrelations of the sciences and the arts in contemporary culture. For seniors in practice teaching only. *Cr* 3. MR. VIRTUE

Offered occasionally: 22. Readings in Philosophy; 140. American Thought; 54. Man and the Social Order; 62. Recent Philosophy.

Because of their philosophic content, Ms 185, Mathematical Logic and Ms 197/198, Foundations of Mathematics, and Pol 189. 190, Political and Social Thought, are particularly recommended to students of philosophy.

PHYSICS (Ps)

PROFESSORS BENNETT, BISCOE, AND KRUEGER; ASSOCIATE PROFESSORS COFFIN, WYLIE, CARR, TODD, AND THOMAS; ASSISTANT PROFESSORS HARMON, ROCKMORE, AND BROWNSTEIN; MR. ANDERSON, MR. LITTLEFIELD; MR. DAVIS, MR. WHITTEN, MR. ORR, MR. DORAN, MR. FULLER, AND MR. LAWRENCE

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, 153, 155, 162, 169, 172, 176, along with Ms 12, 27/28, 29. Additional courses in physics and mathematics should be considered as electives, subject to departmental approval.

Students who plan to major in physics should register for mathematics and physics in the freshman year. This usually means the postponement of one of the required freshman courses for Arts and Sciences students.

Fundamental training, which is adequate for secondary school teaching, is provided by Ps 1/2 (or 1a/2a) and 17, 18 along with mathematics through the calculus.

The following courses of the more descriptive variety are open to all students and have no prerequisites: 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* 2, *Lab* 2, *Cr* 5. MR. BENNETT AND STAFF

1a/2a. General Physics—The fundamentals of mechanics, sound, heat, electricity, magnetism, light, and modern physics. Similar to Ps 1/2 but modified laboratory program 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. WYLIE AND STAFF

3. Descriptive Physics—For the non-science student. A treatment in nonmathematical language of the more important topics in physics. Designed to develop an appreciation for the concepts, vocabulary, and methods of the science rather than a false sense of mastery. *Lec with Dem* 3, *Cr* 3.

MR. BENNETT AND MR. TODD

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 accomplished by a careful selection of the topics treated. *Lec* with *Dem* 3, *Lab* with *Discussion* 4. *Cr* 5. MR. LITTLEFIELD AND OTHERS

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 prerequisites. *Rec* 3, *Cr* 3. MR. TODD

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. TODD

17. 18. Intermediate Physics—A more mathematical treatment with the calculus of many of the topics in Courses 1/2, or 1a/2a, either of which is a prerequisite. (With special permission, students may register for this course under the number Ps 17a. 18a without laboratory for *three credit hours.*) *Lec* 2, *Comp* 2, *Lab* 2, *Cr* 4. MR. COFFIN AND OTHERS

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* 3, *Cr* 3. MR. TODD

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. THOMAS

Course 17. 18 (or the equivalent) and calculus are prerequisite for the following advanced courses:

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. HARMON AND OTHERS

155. Electricity and Magnetism—An advanced treatment of the fundamental aspect of electrostatics, magnetism, electromagnetic phenomena, direct and alternating currents. *Rec* 3, *Cr* 3. MR. BISCOE

161. Advanced Meteorology—A more theoretical treatment than Course 10, combined with which the meteorology requirement for government service is satisfied. Not given every year. *Rec* 3, *Cr* 3. MR. TODD

162. Heat and Thermodynamics—The law of thermodynamics and statistical physics. Thermodynamic description of the properties of matter. Elementary concepts of classical and quantum statistics. *Rec* 3, *Cr* 3. MR. BISCOE

166. Physical Electronics—Electronic ballistics, electronic emission, high-vacuum, solid state, and gaseous electronics. *Rec* 3, *Cr* 3.

169. Modern Physics—Atomic and molecular physics. Includes atomic structure, X-rays, quantum concepts and spectroscopy. *Rec* 3, *Cr* 3. MR. WYLIE

170. Nuclear Physics—Basic concepts, radioactivity, nuclear reactions, alpha-, beta and gamma-decay. A more specialized course than Ps 169. May be taken without the Ps 18 prerequisite by departmental permission. *Rec* 2, *Cr* 3, *if taken with laboratory or Cr* 2 *if taken without laboratory.* MR. THOMAS

172. Optics—A practical study of geometric optics including ray tracing, aperture limitations, light source and receivers, photometry and color. *Rec* 3, *Cr* 3. MR. BENNETT

176. Physical Measurements—A third year laboratory course in which experiments are selected from various branches of physics. *Lab* 4, *Cr* 2.
MR. CARR AND OTHERS

181. 182. Advanced Laboratory Physics — Selected advanced experiments and projects in the field of physics, for senior students. Opportunity is given to develop original ideas and to construct apparatus. Departmental approval required. *Lab* 6, *Cr* 3. MR. CARR, MR. HARMON, MR. KRUEGER

184. Advanced Nuclear Physics—A theoretical course, being an extension of course 170, which is prerequisite. Special emphasis on nuclear forces, neutron physics, high energy reactions, nuclear spin and magnetism, and multipole radiations. Not given every year. *Rec* 2, *Cr* 2.

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. BROWNSTEIN

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. MR. THOMAS

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

198a. 198b. Physics Seminar—Oral and written reports on approved topics. Primarily for seniors. *Sem* 1, *Cr* ½. MR. BENNETT

199. Problems in Physics—A thesis project primarily for undergraduates and ordinarily of an experimental nature. *Cr Ar.* (1-3). STAFF

201. Mechanics—Kinematics and dynamics of rigid body motion using the Lagrange formulation of the equations of motion. Linear transformation theory and Hamiltonian mechanics. Hamilton-Jacobi theory and applications. Prerequisite: Ps 191 or equivalent. *Rec* 3, *Cr* 3. MR. KRUEGER

205. Modern Physics—The fundamental principles underlying present-day modern physics for beginning graduate students. Includes an introduction to quantum mechanics as a basis for more specialized courses. 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

212. Electrodynamics I—Basic properties of the electromagnetic field and its propagation in isotropic and anisotropic media, guided propagation and stationary wave fields. Interactions between the electro-magnetic field and matter are examined. 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. Methods of Theoretical Physics—Topics selected to strengthen the background in theoretical physics required of Ph.D. students. These may include applications of Green's function methods, integral equations, variational methods and finite dimensional vector spaces. The level is that of *Methods of Theoretical Physics* by Morse and Feshbach. Prerequisite: Ps 192 or equivalent. *Rec* 3, *Cr* 3.
MR. ROCKMORE

220. Quantum Mechanics I—The physical concepts and mathematical methods currently used on problems dealing with atomic and subatomic physics. Quantum mechanical states as vectors in Hilbert Space. Dirac notation. Representation theory. Heisenberg, Schrodinger, and interaction pictures. A limited number of applications to physical phenomena will be considered. Prerequisite: Ps 205. *Rec* 3, *Cr* 3. MR. ROCKMORE

230. Statistical Mechanics—Macroscopic properties of matter derived from a statistical consideration of microscope properties of elementary systems. Relationships to Thermodynamics and Kinetic Theory are examined. Prerequisite: Ps 162 of its equivalent, and mathematics through differential equations. *Rec* 3, *Cr* 3. MR. HARMON

234. X-Rays — Diffraction Theory applied to structure determinations of solids, liquids and gases. Not offered every year. *Rec* 3. *Cr* 3. MR. BISCOE

291. Special Topics in Theoretical or Experimental Physics—Subjects which may be studied under this heading depend upon current interests of students and staff. Will ordinarily be in areas for which no formal courses are offered. Given on demand. *Cr Ar.* STAFF

307. Nuclear Physics—Specialized application to the atomic nucleus of the principles of modern physics as developed in Ps 205, which is prerequisite. Not offered every year. *Rec* 3, *Cr* 3.

313. Electrodynamics II—Propagation of electromagnetic waves as observed in both fixed and moving frames of reference. Scattering of electromagnetic waves including diffraction theory. Electromagnetic field fluctuations and coherence theory. Prerequisite: Ps 212. Not offered every year. *Rec* 3, *Cr* 3.

315. Spectroscopy at Microwave and Radio Frequencies—Interpretation of spectra at microwave and radio frequencies. Techniques associated with nuclear magnetic resonance and electron spin resonance are considered. Prerequisite: Ps 205, Ps 192, or equivalent. *Rec.* 3, *Cr* 3. MR. CARR

321. Quantum Mechanics II—Relativistic wave equations. Quantization of fields. Systems of coupled fields. Examples are considered. Prerequisite: Ps 220. Not offered every year. *Rec* 3, *Cr* 3. MR. BROWNSTEIN

324. Solid State Physics—Application of the principles of modern physics to the study of the solid state of matter. Theoretical concepts are correlated with experimental evidence in the physical reasoning which underlies the interpretation of the physical properties of solids. Prerequisite: Ps 205. *Rec* 3, *Cr* 3.
MR. WYLIE

325. Solid State Physics II—An extension of Ps 324 to include such topics as lattice waves, electron states, electron-electron interaction, transport properties, magnetism and superconductivity. Prerequisite: Ps 324 or equivalent. *Rec* 3, *Cr* 3.

328. Plasma Physics—Gas kinetic theory extended to systems of charged particles; development of macroscopic theory from the Liousville equation; macroscopic properties of plasmas, including a consideration of plasma oscillations and interactions with electromagnetic radiation. 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 the Ph.D. are offered in physics. See section on Graduate Study for detailed requirements. Research facilities are available in such fields as molecular physics and electronics, optical properties of gases at high pressure, X-ray diffraction, physical optics, solid state physics, nuclear magnetic resonance, election spin resonance and limited aspects of plasma physics. Several graduate assistantships are available in this department.

POLITICAL SCIENCE

PROFESSORS MAWHINNEY AND DOW; ASSOCIATE PROFESSORS THOMSON, SCHOENBERGER, CLARK, AND COLLINS; ASSISTANT PROFESSORS HEIDORN, HAYES, AND HORAN; MR. BAGGETT; MR. HELMKE, AND MISS PRESCOTT

Students may major in the following fields: (1) Political Science, (2) International Affairs, or (3) Public Management. Students currently enrolled in the History and Government major may complete that major.

Specific requirements for majors:

1. Political Science: A minimum of 36 hours of work in the department. Required courses: Pol 1/2, Pol 183/184 or 189. 190, and for all seniors Pol 161/162. In related areas the student is required to take either Hy 3. 4 or 5/6 and three of the following: Ay 1/2, Ec 1/2, Pl 1. 2, Py 1/2, or Sy 3/4.

Political Science majors who wish to develop the relationship between political science and any one of the fields of economics, history, psychology or sociology and anthropology may, in consultation with his adviser, select 12 hours of work beyond the foundation course in that field.

2. International Affairs: See page 60.

3. Public Management: See page 64.

The department offers M.A. degrees in Political Science and Public Management. Students desiring to concentrate in International Affairs may do so within the M.A. in Political Science. Students will be admitted as candidates upon presentation of credentials indicating excellent undergraduate records with sufficient subject matter background and filing Graduate Record Examination scores.

Courses in Geography (Ge)

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.

23. 24. 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 their strategic necessities, and on historical reviews of their resultant foreign policies. Prerequisite: junior standing. *Cr* 3. MR. SCHOENBERGER

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.

Courses in Political Science (Pol)

1/2. Introduction to Government—The first semester includes the development and nature of the state, theories and types of government, constitutionalism, the nature, structure and control of political power, freedom and order, and the modern state in international relations. The second semester emphasizes the structure, practices and problems of American national government. *Cr* 3.

MR. MAWHINNEY, 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. HEIDORN

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. DOW 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

33. The American City—The process of government in modern cities; forms of city government; metropolitan areas; home rule; nominations and elections; relations with the federal and state governments. Prerequisite: Pol 1/2 *Cr* 3. MR. HEIDORN

34. Municipal Administration—The management, financial control, and administration of modern American cities; personnel administration; the city plan; and line functions—fire, police, and recreation. Prerequisite: Pol 33 *Cr* 3. MR. HEIDORN

40. Community Planning—The need and nature of community planning; legislative basis and administrative organization; zoning, master plans, land use fiscal abilities, and services; practical formulation of city plans. Prerequisite: Pol 1/2. *Cr* 2. MR. HEIDORN

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. MAWHINNEY

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. CLARK

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. CLARK

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. MR. DOW

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. MR. HAYES

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. MR. HAYES

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. MAWHINNEY

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. CLARK

159. Problems of American Government—Analysis of basic problems of U.S. national government. Case studies in such areas as federalism, civil rights, congressional-presidential relations, judicial functions, taxation, and foreign affairs. Prerequisite: Pol 1/2. *Cr* 2. MR. HEIDORN

160. Problems of State Government—A consideration of the theory, organization and functions of the American states and their present-day problems. Prerequisite: Pol 1/2. *Cr* 2. MR. HEIDORN

161/162. Scope and Methods of Political Science — The first semester covers the scope and nature of the study of politics: power and society; basic descriptive political theory and the role of political institutions. The second semester consists of present methodological techniques in empirical political research, including analysis of empirical theory, statistical quantification and research evaluation. Prerequisite: Pol 1/2. *Cr* 3. MR. THOMSON, MR. HAYES

†***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. Prerequisite: Pol 1/2. *Cr* 3. MR. CLARK

†***166. Governments of East Asia***—A study of the contemporary governments and politics of China, Japan and Korea. Prerequisite: Pol 1/2. *Cr* 3.
MR. SCHOENBERGER

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, or 61. *Cr* 3. MR. THOMSON

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, or 61. *Cr* 3. MR. THOMSON

173. 174. International Relations—In the fall semester there is an analysis of the theory and practice of international politics. In the spring semester this conceptual framework is applied to recent American foreign policy. Prerequisite: six hours of history or government. *Cr* 3. MR. SCHOENBERGER

‡***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 economic, political and social development of the constitution through Supreme Court decisions. Case study of decisions affecting constitutional relationships in federal system, commerce, taxation, war powers; Bill of Rights and Fourteenth Amendment. Court procedures. 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

†***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. 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), Muslim. Seminar style, one two-hour meeting per week. Prerequisite: junior standing. *Cr* 3. MR. THOMSON

195. Municipal Internship—Selected students are assigned to towns and cities usually during the summer. Each municipal intern works under the direction of a city or town manager, one-half of his time being spent on a major project, the remainder in learning about the varied tasks of a manager. Required for the B.A. degree in Public Management. When approved, this course may be repeated for credit. *Cr* 3. MR. DOW

196. International Affairs Internship—The student will be assigned for a summer to a government agency, an international organization, or a business with overseas operations. Readings and reports are required in addition to the on-the-job training. Open to junior and senior International Affairs majors. *Cr* 3.

MR. SCHOENBERGER

297. 298. Seminar—Projects for qualified students. *Cr* 2 or 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.

350. Independent Readings—*Cr Ar.*

399. Graduate Thesis.

PSYCHOLOGY (Py)

PROFESSORS KAPLAN, ANTONITIS, BRUSH, GLANVILLE, NICHOLS, AND QUINSEY; ASSOCIATE PROFESSOR WADE; ASSISTANT PROFESSORS DIXON, FREY, KULBERG, STONE; INSTRUCTOR GERSHMAN; LECTURERS BRUSH, GRANT, HAMMER, HORNBERGER, AND WERBOFF; GRADUATE ASSISTANTS BOOTH, HYMOFF, OZMON, STANEK, STAPLES

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 36 hours, which must include Py 1/2, Py 141, Py 171, and Py 74. In addition each major is required to take at least one course from each of the following areas:

I: Py 45 or Py 147/148
II: Py 151, 155, 156, 161, 165, 167
III: Py 130, 132, 133, 138
IV: Py 20, 21, 123, 124, 126, 127, 128
V: Py 111, 114, 117, 143

All majors are required to take a written comprehensive examination in the senior year covering the major work. A passing grade on the examination is required for graduation.

A limited number of women majors interested in family life and child development may arrange to spend one semeser at the Merrill-Palmer School in Detroit, Michigan, in the junior year.

Py 1/2, General Psychology, is a prerequisite for all advanced courses in the department.

1/2. General Psychology—Survey of psychology as the science of behavior. Lecture and discussion of major areas such as motivation, personality, intelligence, learning, etc. Not open to freshmen. *Cr* 3. STAFF

5. Applied Psychology for Nurses—An introductory course for three-year nurses. *Cr* 2. MR. BRUSH

Unless other prerequisites are stated, Course 1/2 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 Experimental Psychology—General principles, methods and techniques of experimental psychology. Applications of general methodology and specific techniques to major problem areas in behavioral research. Laboratory exercises provide experience in collecting and reporting data. Prerequisite: Py 141. *Rec* 2, *Lab* 2, *Cr* 3. MR. ANTONITIS, MR. DIXON

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* 2. MR. KAPLAN

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* 2. MR. BRUSH

114. Aptitude Testing—The use and interpretation of psychological tests and related techniques in vocational guidance and vocational selection. Occupational description and classification. Applications in such fields as business, industry, education, and public agencies. *Rec* 2, *Lab* 2, *Cr* 3. MR. QUINSEY

117. Educational Psychology—The underlying psychological principles useful to the teacher. Problems of growth, intelligence, personality, social life, sex hygiene, and attitude. Principles of effective learning. *Cr* 3. MR. QUINSEY

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

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, the community, and the world of work. Delinquency and abnormality in adolescents. *Cr* 2. MRS. BRUSH

126. Psychology of the Retarded Child—Description and analysis of various types and levels of retardation and a study of causative factors. Consideration of psychological principles and techniques applicable to the identification, care, and training of retarded children. Prerequisite: Py 123 and/or 20. 21. *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* 2. MRS. GERSHMAN

128. Psychology of the Exceptional Child—A consideraion 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—The psychological principles which enter into the social behavior of man. Representative topics include culture and personality, crowd behavior, prejudice, and propaganda. *Cr* 3. MR. QUINSEY

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 situation will be emphasized. *Cr* 3.
MR. KULBERG

133. Abnormal Psychology—The origin, development, and manifestations of the psychoneuroses and major psychoses with a view to better understanding of adjustment. Emphasis on the biological, social, and psychological determinants of maladjusted behavior. Prerequisite: Py 1/2 with grade of C or better. *Cr* 3.
MR. KAPLAN

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. Prerequisite: Py 1/2 with grade of C or better. *Cr* 3. MR. BRUSH

141. Statistics in Psychology—A survey of techniques used to obtain, display, analyze, and interpret data in psychology. Prerequisite: Ms 19. *Cr* 3.
MR. FREY, MR. WADE

143. Psychological Test Theory and Individual Differences—The fundamental theoretical bases of test construction with emphasis on practical applications will be presented along with statistical concepts necessary for proper evaluation of tests and other assessment techniques. *Cr* 3. MR. GULO

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. Prerequisite: Py 141 or taken concurrently. *Rec* 2, *Lab* 4, *Cr* 4.
MR. FREY, 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. DIXON

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. WADE

156. Theories of Learning—An examination of the most important current psychological theories concerning the nature of the learning process including the behavioristic positions (Guthrie, Skinner, the Hullian group, Estes), Gestalt positions (Lewin, Tolman), and dynamic psychology (psychoanalysis). Applications of the theories will be made. *Cr* 3. MR. ANTONITIS

‡161. Sensation and Perception—A systematic examination of selected sensory and perceptual processes. Emphasis on experimental methods, research findings and theoretical interpretations. *Cr* 3. MR. GLANVILLE

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.

167. Animal Behavior—An examination of the behavior exhibited by animals in natural and laboratory environments including learning, social behavior, communication, navigation, etc. Various methods of investigating and classifying animal behavior are critically evaluated. *Cr* 3. MR. FREY

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

190. 191. Problems in Psychology—Primarily for graduate students and seniors with grade B or better. Opportunity to select and study particular psychological problems under guidance. Admission by consent of head of the Department. *Cr Ar.* MR. KAPLAN AND STAFF

192. 193. Problems in Experimental Psychology—Prerequisite: Py 45 or Py 147/148 and consent of the head of the Department. *Cr Ar.* STAFF

194. 195. Problems in Psychometrics—Prerequisite: Py 143 and consent of the head of the Department. *Cr Ar.* MR. KAPLAN AND STAFF

196. 197. Problems in Aptitude Testing and Counseling—Prerequisite: Py 114 and consent of the head of the Department. *Cr Ar.* MR. QUINSEY

198. 199. Problems in Psychological Theory—Prerequisite: 12 hours in psychology with grade of B or better and consent of the head of the Department. *Cr Ar.* MR. KAPLAN AND STAFF

222. Advanced Child Psychology—Intensive reading and evaluation of recent research literature in child psychology. Emphasis on special areas related to the normal, retarded, and emotionally handicapped child. Prerequisite: consent of instructor. *Cr* 3. MR. NICHOLS

224. Experimental Child Psychology—Major research methods, principles, and techniques in the experimental study of child behavior: closely supervised research experiences with children. The student will plan and conduct an original investigation. Prerequisite: Py 123, Py 147/148 or equivalent. *Rec* 2, *Lab* 4, *Cr* 4. MR. NICHOLS

234. Advanced Psychopathology—Intensive readings and discussion of the etiology of maladapted behavior with particular emphasis on topics such as schizophrenia, suicide, sociopathy, behavior disorders in children, etc. Prerequisite: Py 133 and consent of instructor. *Cr* 3. MR. KULBERG

242. Psychological Methodology—An intermediate level survey of the variour methods and techniques employed by psychologists in the evaluation of data

and the verification of hypotheses. Prerequisite: Py 45 or 147, and 141. *Cr* 4.
MR. WADE

245. Nonparametric Techniques in Psychology—A survey of nonparametric techniques of hypothesis testing which are uniquely suited to the data of the behavioral sciences. Prerequisite: Py 141 or consent of instructor. *Cr* 2.
MR. FREY

247. Introduction to Factor Analysis—Multivariate techniques used in psychology with special emphasis on factor analysis and techniques of application to a variety of problems. Prerequisite: Py 141 or consent of instructor. *Cr* 3.
MR. FREY

251. Advanced Physiological Psychology—Emphasis on development of laboratory skills and techniques; preparing students for independent research in physiological psychology. Supervised research in electro-physiological stimulation, cannulization techniques, and special behavioral response measurements. Prerequisite: Py 165. *Rec* 1, *Lab* 5, *Cr* 4.

261. Advanced Social Psychology—A consideration of current theoretical and methodological issues in social psychology including interpersonal perception, attitude and attitude change, communication and persuasion, language and cognition *Cr* 3. MR. STONE

303. Ethics and Professional Problems—Discussion of common professional problems encountered in the practice of psychology; consideration of responsibilities and limitations of the psychologist in the light of the ethics recommended by the American Psychological Association. *Cr* 1. MR. GRANT

311. Advanced Experimental Psychology I—Analysis and development of practical research designs in experimental, clinical and applied psychology; library research, apparatus design, and critique of proposed research by the student. Prerequisite: Py 147/148 or its equivalent. *Rec* 1, *Lab* 4, *Cr* 3.
MR. WADE AND STAFF

312. Advanced Experimental Psychology II—Conduct of one or more original investigations of limited scope; analysis of results, report, and critique. Prerequisite: Py 311. *Rec* 1, *Lab* 4, *Cr* 3. MR. DIXON AND STAFF

315. Advanced Experimental Design—Designed to provide graduate students with a sophisticated approach to the planning, conduct, and evaluation of research in psychology. Experimental designs will be considered that are unique to research in psychology. Prerequisite: Py 242. *Cr* 2. MR. WADE

321. Individual Psychological Testing—Intensive training in the administration, scoring, and interpretation of the Revised Stanford-Binet Scale and the Wechsler Adult Intelligence Scale. Historical background and current problems in the theory and practice of testing. Prerequisite: consent of instructor. *Rec* 2. *Lab* 4, *Cr* 4. MRS. BRUSH

323. Clinical Assessment I—Intensive training in the administration, scoring, and clinical interpretation of a variety of techniques often used in the psychological assessment of children. Included are the Draw a Person Test, Stanford-Binet, WISC, Wide Range Achievement Tests. Prerequisite: consent of instructor. *Rec* 2, *Lab* 4, *Cr* 4.

324. Clinical Assessment II—Intensive training in the administration, scoring, and clinical interpretation of a variety of techniques often used in the psychological assessment of adults. Included are the WAIS, Bender Gestalt, Graham-Kendall. Prerequisite: consent of instructor. *Rec* 2, *Lab* 4, *Cr* 4.

325. Personality Assessment I—A general orientation to projective tech-

niques. Administration and scoring of the Rorschach Test. Analysis and interpretation of Rorschach protocals (quantitative, sequence and content analysis). Prerequisite: Py 138 and consent of the instructor. *Rec* 1, *Lab* 4, *Cr* 3.

MR. BRUSH

326. Personality Assessment II—Advanced Rorschach interpretation with emphasis on specific clinical protocols. Consideration will also be given to other test instruments including TAT, Sentence Completion, and MMPI. Prerequisite: Py 325. *Rec* 1, *Lab* 4, *Cr* 3. MR. HAMMER

327. Clinical Interviewing—Principles, dynamics, and techniques of interviewing as applied to a variety of clinical situations and settings. Prerequisite: consent of instructor. *Cr* 2.

328. Consultation—Principles and techniques of consultation. A consideration of the role of the psychologist consultant within a variety of settings including the school, social agency, industry, etc. Prerequisite: consent of instructor. *Cr* 2.

331. Practicum in Clinical Diagnosis I—Closely supervised experience in interviewing, administration, scoring, interpreting, and writing psychological test reports in a clinical setting. The student will spend two days each week in such a setting. Prerequisite: Py 323, 324, 325, 326, 341, 342. *Cr* 3. MR. HAMMER

332. Practicum in Clinical Diagnosis II—A continuation of Py 331 but usually in a different clinical setting. Prerequisite: Py 331. *Cr* 3. MR. HAMMER

333. Practicum in Psychotherapy I—Closely supervised experience in psychotherapy; a careful analysis of the recordings of students' therapy sessions. The student will spend two days each week in a clinical setting. Prerequisite: Py 332 or consent of instructor. *Cr* 3.

334. Practicum in Psychotherapy II—A continuation of Py 333 but usually in a different clinical setting. Prerequisite: Py 333. *Cr* 3.

341. Seminar in Personality Theories I—An intensive consideration of the original classic and contemporary writings of the major psychodynamically oriented theorists such as Freud, Jung, Horney, and Alexander. Prerequisite: consent of instructor. *Cr* 3. MR. HAMMER

342. Seminar in Personality Theories II—An intensive consideration of a variety of personality theories and theorists including field theory, phenomenology, existentialism, personal constructs, social learning etc. Prerequisite: Py 138 and/or consent of instructor. *Cr* 3. MR. HORNBERGER

343. Seminar in Clinical Psychology—A critical review of current research literature in the area of clinical psychology including tests and measurements, psychotherapy, and personality theory. *Rec* 2. *Cr* 3. MR. KULBERG

351. Child Psychopathology—Intensive readings and discussion of the development and dynamics of psychological disorders in children. Consideration will also be given to the implications for psychotherapy. Prerequisite: Py 341, 342. *Cr* 3. MR. KAPLAN

355. Seminar in Psychotherapy—Intensive readings and discussion of the principles and techniques of psychotherapy as they relate to both children and adults. Prerequisite: Py 341, 342 and consent of instructor. *Cr* 3.

357. Case Studies in Pschotherapy—A critical review of actual psychotherapy recordings based on psychological theory, principles and techniques of psychotherapy. Prerequisite: Py 355 and consent of instructor. *Cr* 2.

361. Seminar in History and Systems of Psychology—Intensive readings and consideration of the historical development of selected psychological con-

cepts, theories, and points of view; also critical discussion of selected systems of psychology. Prerequisite: Py 171 or its equivalent. *Cr* 3. MR. GLANVILLE

362. Seminar in Physiological Psychology—Current problems and theories of physiological psychology and the methods and techniques employed in studying them. *Rec* 2, *Cr* 3.

363. Seminar in Learning—An advanced consideration of significant topics in the area of learning. Reports and discussion of current research and theory. *Rec* 2, *Cr* 3.

364. Seminar in Motivation—A consideration of the phenomena and theoretical constructs subsumed under the concept of motivation. Presentation by the student of critical reports of current research. *Rec* 2, *Cr* 3. MR. DIXON

365. Seminar in Perception—An advanced consideration of significant topics in the area of perception. Reports and discussion of current research and theory. *Rec* 2, *Cr* 3. MR. WADE

366. Seminar in Social Psychology—Consideration of significant topics in the area of social psychology. Reports and discussion of current research and theory. Prerequisite: Py 261 or consent of instructor. *Cr* 3. MR. STONE

371. Topics in Child Psychology—Intensive study of selected areas in child psychology. Prerequisite: consent of instructor. *Cr* 3.

372. Topics in Comparative Animal Behavior—Critical discussions of comparative and development aspects of animal behavior stressing phylogenetic and ontogenetic comparisons. Consideration of antecedent factors such as genetic, prenatal, and early postnatal experiences that may alter development processes. Prerequisite: consent of instructor. *Cr* 3.

373. Topics in Physiological Psychology—Examination of the neurological bases of behavior with emphasis on anatomical, neurological, and biochemical properties of the nervous system and behavioral correlates in man and animals. Prerequisite: Py 165 or consent of instructor. *Cr* 3.

374. Topics in Learning—Intensive examination of selected models of learning emphasizing their roles as laboratory vehicles for investigating behavior. Methodological implications will be considered within a framework of classical, instrumental, and statistical research orientations. Prerequisite: Py 155 or consent of instructor. *Cr* 3.

375. Topics in Sensation and Perception—Consideration of current experimental literature in selected areas of sensation and/or perception; critical examination of the newer theoretical issues; discussion and evaluation of theoretical interpretation of sensory and perceptual phenomena. Prerequisite: Py 161 or consent of instructor. *Cr* 3.

376. Topics in Quantitative Methods in Psychology—Intensive study of selected areas dealing with experimental design and measurement in psychology. *Cr* 3.

399. Graduate Thesis—*Cr Ar.*

GRADUATE WORK IN PSYCHOLOGY

The department offers work leading to the master of arts degree and the doctor of philosophy degree, the general requirements for which are listed in the catalog of the graduate school. Candidates will be expected to have taken fundamental courses in psychology, including a laboratory course in experimental psychology and a basic course in statistics.

Graduate programs are offered in general-experimental psychology and in clinical psychology. Those interested in the general-experimental area may concentrate in learning, motivation, physiological psychology, animal behavior, child behavior, or experimental design and statistics. The program in clinical psychology provides students with a broad background in theory, psychopathology, assessment, and psychotherapy through courses, seminars, and practicum experiences. Those who are enrolled in work leading to the doctorate in clinical psychology must also satisfactorily complete a one-year internship in a training center acceptable to their program committee. An acceptable thesis is required for both the M.A. and Ph. D. degrees.

SOCIOLOGY AND ANTHROPOLOGY

PROFESSORS VERNON, ROMANYSHYN, SEZAK; ASSOCIATE PROFESSORS EMERICK, MCKAY; ASSISTANT PROFESSORS BOLARIA, FINNER, ROWAN AND SNOW; INSTRUCTORS BALDWIN, MOSS, SCONTRAS; COOPERATING MEMBERS: PROFESSOR PLOCH; ASSISTANT PROFESSOR HYATT

The Department of Sociology and Anthropology presents a program of study designed to further the student's perception and understanding of social interactions and group processes, and to provide fundamental concepts and basic research skills in the three disciplines for which the department is responsible—sociology, anthropology, and social work.

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. The general department requirements for each program area are the same.

Specific Requirements for Majors

In addition to the general requirements of the College of Arts and Sciences, the department requires all majors to take Introduction to Anthropology (Ay 1/2), Introduction to Sociology (Sy 3/4), Statistical Methods for Sociological Research (Sy 119), Methods of Social Research (Sy 120), Sociological Theory (Sy 160), and History of Sociology (Sy 161).

The two introductory courses, Ay 1/2 and Sy 3/4, should be taken during the freshman or the sophomore year. The introductory courses may be taken concurrently. A minimum of 36 hours of department course work must be taken; the maximum number of hours permitted within the department is 48.

THE THREE PROGRAM AREAS

Students may concentrate in one of the three department program areas. Students whose primary interest is sociology should select at least 15 hours in sociology (Sy) in addition to the required courses noted above. Non-department electives recommended are General Psychology (Py 1/2), Social Psychology (Py 130), and Principles of Economics (Ec 1/2).

Students who concentrate in anthropology should, in addition to the required courses noted, select any of the courses in anthropology (Ay). Non-department electives recommended are Principles of Geology (Gy 1/2) or Descriptive Geology, Physical (Gy 1a), and Comparative Anatomy (Zo 133).

For students who concentrate in social welfare, the following required courses meet the current recommendations of the Council on Social Work Education, of which this department is a constituent member: Social Welfare (Sw 150/151) and Social Work as a Profession (Sw 152/153). In addition, Field Experience in Social Work (Sw 154/155) is available as an elective.

Students who wish to explore the requirements for graduate study on the professional or career aspects of any of the three disciplines (sociology, anthropology, social welfare) should consult with their department adviser.

Sociology of Education (Sy 5ed), Sociology for Nurses (Sy 6n), and Marriage (Sy 7) do not receive 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 Bulletin of the Graduate Division.

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

138. Race and Culture Conflict—Analysis of casual factors in group conflict, with emphasis on the problem of minority groups and non-western people in culture contact situations. Prerequisite: Ay 1/2, or permission of the instructor. *Cr* 3. MR. EMERICK

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

141. Peoples 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

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 1/2, or permission of instructor. *Cr* 3. MR. EMERICK

151. North American Indian Ethnology—A survey of the ethnology of the North American Indian from the southern edge of the Eskimo area to northern Mexico. Emphasis upon cross-cultural comparison through the use of specific

ethnographic studies. The formulation of generalizations of geographical and temporal significance. Prerequisite: Ay 1/2, or permission of the instructor. *Cr* 3. MR. SNOW

152. Central and South American Indian Ethnology—A survey of the ethnology of Central and South American Indian cultures including the West Indies but excluding contemporary peasant societies. Designed as a sequence course to Ay 151 and using the same approach. Prerequisite: Ay 1/2, or permission of the instructor. *Cr* 3. MR. SNOW

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

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. MR. SNOW

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 1/2, or permission of the instructor. *Cr* 3. MR. SNOW

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. MR. SNOW

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. MR. SNOW

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

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 con-

currently 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 General Hospital. Credits are not accepted toward the department major. *Cr* 2. MR. SEZAK

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. MR. BALDWIN

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. HYATT AND 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, religion 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, MR. ROWAN

113. Social Disorganization — 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. STAFF

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. ROWAN

115. Sociology of Adolescence—Attention is given to the social behavior of adolescents, the development of adolescent culture and the involvement of adolescents in the various social systems and the class structure of society. Prerequisite: Sy 3 or permission of instructor. *Cr* 3. MR. SEZAK

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 19 or permission of the instructor. *Cr* 3.
MR. FINNER

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. FINNER

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.

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.

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. ROWAN

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. FINNER, MR. SEZAK

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, 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. MR. FINNER

135. Human Ecology—Spatial distribution of human beings and related activities and social processes. Prerequisite: Sy 3 or permission of instructor. *Cr* 3.
MR. ROWAN, MR. FINNER

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. MR. ROWAN

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. MR. BOLARIA

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. MR. ROWAN

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. MR. ROWAN

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. MR. VERNON

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. MR. VERNON

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. VERNON

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

305. Advanced Sociology of Education—An analysis of the social processes and social patterns involved in the educational system. Selected problems in the sociology of education will be given intensive study. Individual research will be required. *Cr* 3. MR. SEZAK

310. Seminar in Social Organization—Attention is given to the relationships between social variables which contribute to the organization of society. Inter-institution as well as intra-institution relationships are considered. *Cr* 3. MR. BOLARIA, MR. ROWAN

313. Seminar in Social Disorganization—Attention is given to the interrelationships of social variables and to the factors that hinder the effective functioning of the group. *Cr* 3. STAFF

318. Advanced Sociology of the Family—A comparative analysis of family organization among selected societies. Special emphasis will be focused on the nuclear family of Western society, relating the structure and function of the family to broader forms of social organization. Individual research will be required. *Cr* 3. MR. SEZAK

320. Seminar in Research Methods—Advanced course for those who intend to do research or graduate work. Attention is paid to various methods and techniques used by sociologists. *Cr* 3. MR. FINNER

326. Seminar in Formal Organization—Examination of the nature and types of formal organizations, the relationships between them and the larger social context of which they are a part, and various aspects of their internal structure. Major emphasis is on theoretical orientations and methodological considerations. *Cr* 3. MR. BOLARIA

329. Seminar in Community Studies—Changes in the structure and function of rural, suburban and urban communities and of their interrelationships and relationships with the larger society. Emphasis upon theory and research. *Cr* 3. MR. ROWAN

360. Seminar in Sociological Theory—Considers the development of major sociological theories, with attention given to the relationship of such theories to the understanding of social behavior and to contemporary research. *Cr* 3. MR. VERNON, MR. ROWAN

382. Advanced Sociology of Religion—Advanced study of the social dimensions of religion. Particular emphasis is placed on current research and theory. *Cr* 3. MR. VERNON

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: courses Ay 1/2 or Sy 3. *Cr* 3. MR. ROMANYSHYN

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. ROMANYSHYN

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* 2. MR. ROMANYSHYN

DEPARTMENT OF SPEECH

PROFESSORS GARDNER AND BRICKER; ASSOCIATE PROFESSORS GILLESPIE, BARUSHOK, BOST, AND COOK; ASSISTANT PROFESSORS COLE, CYRUS, MOSER, AND MACLAUCHLIN*, MR. HENDERSON, MR. FENTER, MR. BENNER, MR. WEATHERTON

The major studies, leading to a degree in speech or a degree in theatre, are designed to provide a broad background of training and to allow some degree of specialization within a particular area. Courses required of all majors are Sh 3, 21, 31, 41, and 198. In addition, all majors are required to complete satisfactorily a three-hour course in four out of the five areas of speech (rhetoric and public address, theatre, radio and television, speech and hearing therapy, and oral interpretation), plus 10 more elective hours in the department. Students planning to do graduate work in speech correction may substitute certain courses

* On leave 1966-67.

in psychology or zoology. Platform tests of proficiency in original speaking must be passed satisfactorily in both the junior and senior years.

All prospective majors should select Py 1/2, General Psychology, as part of the sophomore social science requirement, and those particularly interested in speech correction should elect Zo 3/4, Animal Biology, to satisfy partially the natural science and mathematics requirement. Majors are expected to take advantage of the laboratory opportunities offered by the department through University Forensics, the Maine Masque Theatre, Radio Station WMEB-FM, and the Speech and Hearing Center.

Advanced courses recommended for majors who plan to teach are Sh 7, 15, 16, 181, 192, 197.

The department offers work leading to the master of arts degree in speech as outlined in the general requirements for graduate work. Students will be admitted as candidates upon presentation of credentials indicating excellent undergraduate records.

Courses in Rhetoric and Public Address

The University forensic program offers practical experience in debate, discussion, oratory, and extemporaneous speaking through competition with other colleges and universities. All undergraduate students in the University may participate in the program.

1. Fundamentals of Public Speaking—An analysis of the problems of the beginning speaker—choice of subject, selection and arrangement of material, audience analysis, and delivery. Classroom experience in the preparation and delivery of short speeches. *Cr* 2. MR. COOK, CHAIRMAN

3. Advanced Public Speaking—Principles and methods of the composition and delivery of the types of speeches common to business and professional life with emphasis on analysis, materials, structure, and style. Prerequisite: Sh 1. *Cr*. 2. MR. COLE, MR. MOSER

5. Group Discussion—The principles, methods, and types of democratic group procedure in problem-solving. Emphasis on preparing for, participating in, and leading group discussions. Class participation in the discussion of current issues. *Cr* 3. MR. MOSER

7. Debate—The principles of argumentation and debate with attention to analysis, evidence, reasoning, construction of cases, and refutation. Participation in debates on current issues. *Cr* 3. MR. GARDNER

9. Parliamentary Procedure—Consideration of the principles and rules by which a group transacts its business. Training in such functions as drawing up a constitution, the presentation and disposition of motions, and serving as presiding officer. *Cr* 1. MR. GARDNER

51. 52. Varsity Debate—An intensive study of the national proposition with active participation in intercollegiate debates. Limited to varsity debaters. Prerequisite: permission. *Cr* 1. MR. GARDNER, MR. MOSER, MR. COLE

154. Public Discussion and Debate—Philosophy, principles, and methods of group procedures in dealing with controversial problems. Consideration of the points of similarity and difference. Attention to analysis, evidence, and reasoning as the basis for preparation and participation. Not offered every year. *Cr* 3.

155. American Public Address—Consideration of representative American speakers from colonial times to the present. A critical analysis of the invention,

structure, and style of selected speeches. Limited to upperclassmen. Prerequisite: Sh 1. *Cr* 3. MR. COLE

156. Persuasion—An advanced study of the problems involved in influencing an audience. Consideration of such factors as mental attitudes, attention, rationalization, adaptation, suggestion, and motivation. Limited to upperclassmen. Prerequisite: Sh 1. *Cr* 3. MR. GARDNER

157. Classical Rhetoric—An analysis of Greek and Roman rhetoric in relation to theories and methods of public speaking, with particular emphasis on Aristotle, Cicero, and Quintilian. Prerequisite: four hours in the rhetoric and public address area. *Cr* 3. MR. COLE

158. Secondary School Forensic Program—An analysis of the duties, responsiblities, and opportunities of the director or coach of extemporaneous speaking, oratory, discussion and debate, with attention to the training procedures in these areas. Not offered every year. *Cr* 3.

Courses in Theatre

The Maine Masque Theatre presents four major productions each year 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. Theatre Today—An examination of the contemporary American theatre and its place in society. Consideration is given to present conditions in the educational, community, and professional theatre; to dramatic theory; to play construction; and to styles in drama and criticism as these apply to play presentation. *Cr* 2. MR. BRICKER

15. Stagecraft—An introduction to the physical and technical aspects of stage presentation, including the elements of design, staging, and theatre lighting. Backstage work on major and laboratory theatre productions will be required. *Lec* 2, *Lab* 2, *Cr* 3. MR. FENTER, 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 will be required. *Lec* 2, *Lab* 2, *Cr* 3. MR. BRICKER

17. Fundamentals of Acting—The basic skills of acting. The course will include the actor's internal preparation for playing a role and the development of his external techniques for projecting the role to his audience. *Lab* 4, *Cr* 2. MR. BOST

†***162. Theatre History***—A survey of the drama, physical theatre, and modes of production from early Greek festivals to the present day. Limited to upperclassmen. *Cr* 3. MR. BARUSHOK

‡***163. Scene Designing***—Principles, methods, and materials used in scene designing, with consideration of the director-designer relationship. Laboratory projects in preparing the complete design for a particular production, including drawings, models, and plans. Limited to upperclassmen. Prerequisite: Sh 15. *Lab* 4, Cr 2. MR. CYRUS

†***164. Stage Lighting***—Principles, methods, and materials used in stage lighting, including their artistic and technical applications in theatre, film, and television. Projects will include problems in lighting particular productions. Limited to upperclassmen. Prerequisite: Sh 15. *Cr* 2. MR. CYRUS

166. Stage Directing—The translation of all aspects of the theatre production into an artistic unity, with emphasis on theatre aesthetics. Consideration of the principles of art, such as balance, proportion, light and shadow, rhythm, color, and line, as applied to theatre. Limited to upperclassmen. Prerequisite: Sh 16. *Cr* 3. MR. BOST

‡***167. Advanced Acting***—The adaptation of basic acting skills to the particular dramatic production, with emphasis on the actor's role-interpretation as it is influenced by the director-actor relationship. Limited to upperclassmen. Prerequisite: Sh 17. *Lec* 2, *Lab* 2, *Cr* 3. MR. BRICKER

168. Creative Theatre—Designed for teachers, youth leaders, and recreational directors. A study of the principles, methods, and techniques involved in the use of creative dramatics in the classroom, in the church, and on the playground. Not offered every year. *Cr* 3.

169. Theatre Laboratory—Advanced laboratory work in the divisions of designing, lighting, or directing. The student may register, in different semesters, for credit in each of the divisions. Prerequisite: in designing, Sh 163 and permission; in lighting, Sh 164 and permission; and in directing, Sh 166 and permission. *Lab* 4, *Cr* 2. MR. BARUSHOK, CHAIRMAN

†***260. Production of Pre-Modern Drama***—An investigation of the problems involved in the presentation of selected pre-modern dramas, from Aeschylus to Ibsen, for present day audiences. Prerequisite: permission. *Cr* 3. MR. BARUSHOK

‡***261. Production of Modern Drama***—An investigation of the problems involved in the presentation of selected masterpieces of modern drama, from Ibsen to Miller, for present day audiences. Prerequisite: permission. *Cr* 3. MR. BOST

‡***265. Dramatic Theory***—An analysis of major theories of dramatic writings and dramatic production from Aristotle to the present day, with consideration of their influence on the theatre and drama. Prerequisite: Sh 162 and permission. *Cr* 3. MR. BARUSHOK

Courses in Radio and Television

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 Radio and Television—Survey of the nature of the broadcasting media, history and influence, network and station organization, regulations, and types of programs. *Cr* 2. MR. BENNER

22. Radio-TV Announcing—Problems and responsibilities of the announcer: articulation and pronunciation; operation of studio equipment; and the handling of various speaking situations. Prerequisite: Sh 21. *Lec* 1, *Lab* 2, *Cr* 2. MR. HENDERSON

23. Broadcasting Practices—Designed to provide basic experience in various aspects of the operation of radio and television stations through utilization of the facilities of WMEB-FM and WMEB-TV. Prerequisite: Sh 21. *Lab* 4, *Cr* 2. STAFF

24. Broadcasting Laboratory—Concentration in specific areas of broadcasting where special aptitude is shown. Prerequisite: Sh 23. *Lab* 4, *Cr* 2. STAFF

‡***171. Writing for Broadcast***—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. Limited to upperclassmen. Prerequisite: Sh 22 or permission. *Cr* 3. MR. BENNER

172. Producing the Radio Program—The problems involved and the philosophy underlying the planning and production of a radio series. Sound production practices will be emphasized through intensive laboratory sessions. Major class productions will be broadcast over WMEB-FM. Prerequisite: Sh 22 or permission. *Lec* 2, *Lab* 2, *Cr* 3. MR. HENDERSON

173. Television Techniques—An introduction to the theory and procedures of television production. Laboratory sessions in studio operation will use facilities of WMEB-TV. Prerequisite: Sh 172 or permission. *Lec* 2, *Lab* 2, *Cr* 3. MR. BENNER

174. Broadcast Programming—The problems in planning, preparing, and scheduling programs for radio and television. Major consideration will be given to the interrelationships of audience analysis, station policy, advertising needs, and industry and federal guidelines. Prerequisite: Sh 22 or permission. *Cr* 3.

177. Teaching with Radio and Television—The values and potentials of 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. *Cr* 3. MR. HENDERSON, MR. BENNER

179. Problems in Broadcasting—Independent investigation of special problems related to radio and television. Prerequisite: nine hours of broadcasting and permission. Apply directly to the head of the department before registration. *Cr* 1-3. STAFF

Courses in Speech and Hearing Therapy

The Speech and Hearing Clinic 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.

0. Remedial Speech—An analysis of the student's personal speech problems followed by an intensive program of training designed to increase oral effectiveness. Prerequisite: permission of instructor. *Cr* 0. STAFF

181. Introduction to Speech Correction—A survey of the symptoms and causes of voice and articulation defects with training in the recognition, diagnosis, and treatment of minor speech problems. Recommended for prospective teachers. Limited to upperclassmen. *Cr* 3. MR. GILLESPIE, MR. WEATHERTON

182. Speech Correction Methods—Further study of the causes of speech disorders with emphasis given to methods of therapy used at the classroom level. Supervised planning of actual therapy sessions will constitute a portion of the course. Prerequisite: Sh 181. *Cr* 3. MR. WEATHERTON, MR. GILLESPIE

‡***183. Articulation Disorders***—An analysis of the nature and causes of abnormal articulation; diagnostic testing; etiological therapy; and articulation therapy. Prerequisite: Sh 180 and 181. *Cr* 3. MR. GILLESPIE

184. Voice Disorders—An analysis of the types, symptoms and causes of abnormal voice production. Consideration of diagnostic practices, medical and pyschological referral procedures, and methods used in correction of vocal problems of pitch, intensity, rate and/or quality. Prerequisite: Sh 180 and 181. *Cr* 3. MR. GILLESPIE

185. 186. Problems in Functional Speech Defects—Detailed study of a functional speech problem followed by the planning and administration of remedial speech procedures. Weekly remedial sessions, conferences with the instructor, and special library study. Prerequisite: Sh 182. *Cr* 1. STAFF

187. The Hard of Hearing Child in the Classroom—The types, symptoms, and causes of hearing loss and the use of testing procedures. Consideration of the effects of hearing loss upon the communicative, educational, and personality development of the student. Emphasis upon the application of the principles and methods of retraining the handicapped in hearing. Not offered every year. *Cr* 2.

†***188. Introduction to Audiology***—The anatomy and physiology of the ear; the psycho-acoustics of audition; theories of hearing; causes and types of hearing loss; detection of hearing loss; administration of pure-tone tests of auditory acuity and hearing conservation. Prerequisite: Sh 180 and 181. *Cr* 3.

189. Stuttering—A consideration of the symptoms, theories of causation, and principles involved in the management of stuttering. Prerequisite: six hours in speech and hearing therapy. Not offered every year. *Cr* 3.

Courses in Oral Interpretation

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* 2. MR. BARUSHOK, CHAIRMAN

†***190. Choric Speaking***—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. Limited to upperclassmen. Prerequisite: Sh 41 or permission. *Cr* 3. MR. BOST

191. Oral Reading of Literature—A study of the art of oral interpretation including evaluation and analysis of material and the development of skills for reading literature aloud. *Not open to students who have taken a course in fundamentals of oral interpretation.* Limited to upperclassmen. Not offered every year. *Cr* 3.

192. Advanced Oral Interpretation—Consideration of the particular problems involved in the oral reading of each of the following: (1) prose, (2) poetry, and (3) drama. Limited to upperclassmen. Prerequisite: Sh 41. *Cr* 3.

MR. BARUSHOK

General Courses

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* 2.

MR. GILLESPIE, MR. COOK, MR. WEATHERTON

32. Phonetics—A study of the formation, auditory recognition, and phonetic (IPA) transcription of the sounds of English language, with an examination of the causes of sound change in connected speech. *Cr* 2. MR. GILLESPIE

180. Bases of Speech—An examination of the physical, physiological, psychological, and sociological foundations of speech. The interrelationship of information provided by the natural and behavioral sciences in the understanding of the speech and hearing process. *Cr* 3. MR. GILLESPIE

193. Speech Education in the Elementary School—The relation of speech education to the total elementary curriculum. Consideration of the development of good speech through classroom activities. Attention to fundamental principles, materials, and methods of procedure. Not offered every year. *Cr* 3.

194*. Speech for Teachers—Designed to improve the oral effectiveness of

the individual teacher through study and practice in giving extemporaneous speeches, reading aloud, and using discussion procedures. *Cr* 3. STAFF

195. 196. Problems in Speech—For the advanced student desiring to study a particular problem of his own choice under the guidance of a member of the staff. Prerequisite: permission of the head of the department. *Cr* 2. STAFF

†***197. Teaching of Speech***—Problems, methods, and materials related to the teaching of speech in the secondary school. Particular attention to the extracurricular speech program. Prerequisite: permission. *Cr* 3. MR. GARDNER

198. Seminar in Speech—Oral and written reports by class members. Required of all senior majors and graduate students. Prerequisite: permission. *Cr* 2. MR. GARDNER

399. Graduate Thesis—*Cr Ar.*

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* Graduate credit with the approval of the student's adviser.

ZOOLOGY (Zo)

PROFESSORS ALLEN, MURRAY, SPEICHER, MEYER, EVERHART, FLYNN, BARDEN; ASSOCIATE PROFESSORS HATCH, MAJOR, MUN, SASS, COOK, VALLEAU; ASSISTANT PROFESSORS HAEFNER, ROBERTS; LECTURERS BRANCH, PORTER, RODERICK, SCHLAGER, WADSWORTH, RIDGWAY; MRS. WEATHERBEE, MRS. COOK, MRS. MAJOR; MR. BARLOW, MR. LAWRENCE, MR. MAYERS, MR. WEIBUST

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 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 through its chief of fisheries who is also a professor of zoology. 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; or Zo 3 and Bt 1, General Botany
Ch 1/2, General Chemistry
Ch 151/152, 161/162, Organic Chemistry (with lab), or Bc 1, Organic Chemistry and Bc 2, Biochemistry
Ms 12, Calculus
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, Vertebrate Embryology
Zo 163, Genetics
Zo 177, Animal Physiology

Courses in Zoology (Zo)

3/4. Animal Biology—A basic two-semester course. The first semester deals with principles of life, including properties of cells, heredity, ecology, evolution and a brief review of major invertebrate types. The second semester is an introduction to vertebrate structure and function including embryology. *Lec* 2, *Lab* 4, *Cr* 4. MR. SPEICHER AND STAFF

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* 4, *Cr* 5. MR. SASS AND STAFF

8. Anatomy and Physiology—The general principles of animal life, with emphasis on the structure and functions of the human body. 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 AND STAFF

10. Anatomy and Physiology—Similar to Zo 8, with additional time for laboratory. For studens in the School of Nursing. *Lec* 2, *Rec* 1, *Lab* 4, *Cr* 5.
MR. SASS AND STAFF

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.

132. Ichthyology—The characteristics of fishes, their life histories and economic importance, with emphasis on fresh-water species. Lectures supplemented by laboratory study and dissection. Prerequisite: Zo 3-Bt 1 or Zo 3/4. *Lec* 2, *Lab* 4, *Cr* 4. MR. EVERHART

133. Comparative Anatomy—The structure, origin, and history of the vertebrate organ-systems. Prerequisite: Zo 3-Bt 1 or Zo 3/4. *Lec* 2, *Lab* 4, *Cr* 4.
MR. FLYNN

136. Vertebrate Embryology—The development and formation of tissues, organs, and organ-systems in vertebrates. Prerequisite: Zo 3-Bt 1 or 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. MUN

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-Bt 1 or Zo 3/4. *Lec* 2, *Lab* 3, *Cr* 3.
MR. BARDEN

151. Histology — Microscopic anatomy of animal tissues and methods of preparing microscopic slides. Prerequisite: Zo 3-Bt 1 or Zo 3/4. *Lec* 2, *Lab* 4, *Cr* 4. MR. ROBERTS

153. Invertebrate Zoology — The morphology, physiology, life histories, phylogenetic relationship, and economic importance of invertebrates exclusive of insects. Prerequisite: Zo 3-Bt 1 or Zo 3/4. *Lec* 2, *Lab* 4, *Cr* 4. MR. MEYER

158. Animal Parasitology—The life histories, economic importance, methods of control, host necropsy and the preparation of parasites. Prerequisite: Zo 3-Bt 1 or Zo 3/4. *Lec* 2, *Lab* 4, *Cr* 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-Bt 1 or Zo 3/4. *Lec* 2, *Lab* 4, *Cr* 4.
MR. BARDEN

163. Principles of Genetics — The nature of hereditary factors and the mechanisms by which they are transmitted and expressed. Prerequisite: Zo 3/4. *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: Bt 145 or Zo 163. *Cr* 2. MR. SPEICHER

168. Limnology—The ecology of inland waters, with primary emphasis on the physical, chemical and biological factors controlling productivity. Prerequisite: first-year courses in zoology and chemistry. Zoology 153, and Entomology are recommended. *Lec* 2, *Lab* 4, *Cr* 4. MR. HATCH

169. Introduction to Biological Oceanography — The study of marine organisms and their interrelationships with the chemical, geological, and physical aspects of their environment. Prerequisite: introductory zoology and introductory chemistry. Zo 153 is recommended. *Lec* 2, *Lab* 4, *Cr* 4. MR. HAEFNER

171. Fish Management—Modern methods of fish management including propagation and distribution, fisheries legislation, biological surveys, and environment improvements. Prerequisite: Zo 132 and En 26. *Lec* 2, *Lab* 4, *Cr* 4. MR. EVERHART

177. Animal Physiology—Physiological processes in vertebrates with emphasis on the integration of organ systems. Prerequisite: at least one year of chemistry. *Lec* 2, *Lab* 4, *Cr* 4. MR. MAJOR

178. General Physiology—The vital phenomena common to all organisms. Membrane properties are treated at length. Prerequisite: Zo 177, Organic Chemistry, and one year of physics. *Lec* 2, *Lab* 4, *Cr* 4. MR. MAJOR

179. Experimental Endocrinology—A comprehensive survey of the vertebrate endocrine glands and their functional relationships. The experimental and comparative approach is emphasized. Prerequisite: Zo 3/4 or equivalent, Zo 177, and Organic Chemistry. *Lec* 2, *Lab* 4, *Cr* 4. MR. VALLEAU

180. Cell Mechanisms — A physico-chemical analysis of cell metabolism. Emphasis is placed on mechanisms controlling growth and division. Prerequisite: Zo 3/4, Organic Chemistry or Biochemistry. *Lec* 2, *Cr* 2. MR. COOK

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

195. 196. Zoology Seminar—Oral reports and discussion by class members, covering biological topics of current interest. *Rec* 2, *Cr* 1. 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

337. Experimental Embryology—Causal analysis of the mechanisms, interactions, and genetic and biochemical factors in morphogenesis, neurogenesis and protein synthesis in the embryo. Prerequisite: Zo 136 and permission of the instructor. *Rec* 2, *Lab* 4, *Cr* 4. MR. MUN

352. General Cytology—The problems of cell structure, cell division and the interrelation of cytology and genetics. Prerequisite: Zo 151 and Genetics, or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. SPEICHER

354. Advanced Genetics—Advanced consideration of hereditary phenomena with emphasis on current research in molecular, physiological and developmental genetics. Prerequisite: Zo 163 or equivalent. *Lec* 3, *Cr* 3. MR. ROBERTS

355. Faunistic Zoology—The collection, preservation, and identification of fresh water and terrestrial invertebrates (exclusive of insects) and of lower vertebrates; habits and life histories of selected forms. Prerequisite: Zo 153 or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. MEYER

356. Animal Ecology—The interrelationships between animals and their physical and biotic environment. Topics include essentials of existence, food, reproduction, populations, communities, migration, distribution, succession, rhythms, adaptations, and applications. Prerequisite: Zo 355 or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. BARDEN

357. Population Dynamics—Methods of estimating population size, growth rate and mortality rates, production and yield. Problems of predicting population fluctuations and cycles, theories of population harvest for maximum sustained yield, and various types of yield equation. Prerequisite: Ms 19, or Fy 147, S 171, acquaintance with the calculus. Zo 171, Zo 356, or En 211 recommended. *Lec* 2, *Cr* 2. MR. HATCH

362. Estuarine Ecology—Analysis of the geology, physics, chemistry, and biology of the estuarine ecosystem. Prerequisite: Zo 169 and Zo 356 or equivalent. *Rec* 2, *Lab* 4, *Cr* 4. MR. HAEFNER

370. Advanced Topics in Aquatic Biology—A seminar type course designed to acquaint the student with current research in biological oceanography and fishery science. Prerequisite: Zo 169 or consent of instructor. *Lec* 2, *Cr* 2. STAFF

380. Comparative Physiology—The physiological variations found in the animal kingdom and an interpretation of these variations in terms of evolutionary significance, anatomical changes and ecological conditions. Prerequisite: Zo 177, or permission of instructor. *Lec* 3, *Cr* 3. STAFF

381. Experimental Physiology—Advanced laboratory and surgical procedures. Last half of course will be devoted to a class project, the entire group functioning as a research team. Prerequisite: consent of instructor. *Lab* 4, *Cr* 3. MR. MAJOR

384. Advanced Cell Physiology—Seminar in current topics in cellular and molecular biology including modern methods of investigation. Prerequisite: consent of instructor. *Lec* 2, *Cr* 2. MR. COOK

385. Comparative Endocrinology—This course is concerned with endocrine mechanisms in lower vertebrates and invertebrates. The comparative physiological and comparative biochemical approach is emphasized through lecture and laboratory demonstration. Prerequisite: year of physiology. *Lec* 3, *Cr* 3. MR. VALLEAU

391. 392. Problems in Zoology—*Cr Ar.* STAFF

399. Graduate Thesis—*Cr* 6-10. STAFF

Coburn Hall, Department of Zoolo
one of the University's first buildin

COLLEGE OF BUSINESS ADMINISTRATION

W. STANLEY DEVINO, DEAN

South Stevens, home of Business Administration

College of Business Administration

The College of Business Administration offers four-year programs in two major areas of study: Business Administration and Economics. Upon successful completion of the prescribed curriculum in one of these fields the student is awarded the bachelor of science degree.

The college also provides graduate programs leading to the degrees of master of business administration and master of arts in economics. 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 devolop the students' 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, business data processing 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 15 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.

The undergraduate program in the field of economics is designed to prepare students broadly for careers in the civil service, law, management, public affairs, labor relations, and for general citizenship. Economics is a social science

and as such must be studied in the perspective of a broad training in the liberal arts and sciences. Many students who plan to attend graduate and professional schools will find the undergraduate economics program to be valuable training for advanced academic work. Within the field of economics, courses are available in such fields as: price and value theory, money and banking, income and employment theory, history of economic thought, international trade and finance, labor and industrial relations, comparative economic systems, public finance and taxation, and the social control of business.

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 37 of this catalog. All deficiences 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 128 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 and the B.S. in Economics are given below:

I. B.S. IN BUSINESS ADMINISTRATION PROGRAM

A. General Foundation Subjects - 52 credits

1. Humanities and Fine Arts (25 credits)

Eh 1;2—Freshman Composition
Eh 19 —Expository Writing
Sh 1 —Fundamentals of Public Speaking
The remaining required credit hours may be selected in such fields as art, the classics, English composition, foreign languages, literature, music, philosophy, and the theatre. Strongly recommended is: Pl 1.2—Philosophy and Modern Life.

2. Social Sciences (15 credits)

   This requirement may be fulfilled by course work in such fields as anthropology, government, history, modern society, psychology, and sociology. No course work in economics may be used to fulfill any part of this requirement.

3. Mathematics and Sciences (12 credits)

   Ms 5/6—Elements of College Mathematics
   Ms 19—Principles of Statistical Inference
   The remaining credits required may be taken in an advanced mathematics course or in a science such as astronomy, biology, botany, chemistry, geology, physics, and zoology.

B. Core Requirements in Business and Economics - 33 credits

Ec 1/2—Principles of Economics
Ec 168—Social Control of Business
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 149—Business Economics
Ba 151—Business Finance

C. Major Field - 15 credits

Accounting Major
Ba 41/42—Intermediate Accounting
Ba 143 —Advanced Accounting
Ba 145 —Cost Accounting I
Ba 148 —Auditing
Marketing Major
Ba 159 —Business Management and Policy
Ba 165 —Advertising
Ba 167 —Sales Management
Ba 169 —Marketing Research
Ba 170 —Managerial Marketing
Finance Major
Ba 156 —Investment Strategy
Ba 157 —Forward Planning and Capital Decisions
Ba 158 —Corporate Treasury Dynamics
Ec 153/154—Money and Banking
Management Major
Ba 159/160—Business Management and Policy
Ba 161 —Personal Management
Ba 162 —Industrial Relations
Ec 133 —Labor Economics

D. Electives - 28 credits

A minimum of six credits must be chosen in business or economics subjects.

II. B.S. IN ECONOMICS PROGRAM

A. General Foundation Subjects

1. Humanities and Fine Arts

   Eh 1/2—Freshman Composition
   Sh 1—Fundamentals of Public Speaking
   A minimum of six additional credit hours must be taken in a field (s) such as art, the classics, English composition, literature, music, philosophy, and the theatre.

2. Social Sciences

   Students must select at least 12 credit hours, including one full-year course, from the following list:
   Ay 1/2—Introduction to Anthropology
   Gt 1/2—American Government
   Hy 3.4—United States History*
   Hy 5/6—History of Western Europe*
   My 1/2—Modern Society
   Py 1/2—General Psychology
   Sy 3/4—Introduction to Sociology
   *Students may not select more than six hours of history to fulfill the 12-hour minimal requirement.

3. Laboratory Science

   Students must select at least one full-year course in a scientific field such as astronomy, biology, botany, chemistry, geology, physics, and zoology.

4. Mathematics or Foreign Language

   This requirement must be fulfilled by completion of an intermediate course in a foreign language (e.g., Fr 3/4 - Intermediate French) or completion of Ms 5/6 - Elements of College Mathematics.

5. Ms 19—Principles of Statistical Inference

B. Course Requirements in Economics and Business

1. Core Requirements:

   Ec 1/2—Principles of Economics
   Ec 132—Business Cycles
   Ec 173—Economic Analysis
   Ba 9 —Principles of Accounting I

2. Completion of at least 18 additional hours in economics (Ec) courses. However, no student will be granted degree credit for course work in business and economics in excess of 48 hours.

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
Eh 1	Freshman Composition	3	Eh 2	Freshman Composition	3
*Ms 5	Elements of College Mathematics	3	*Ms 6	Elements of College Mathematics	3
Ec 1	Principles of Economics	3	Ec 2	Principles of Economics	3
	Social Science Elective	3		Social Science Elective	3
	Humanities Elective	3		Humanities Elective	3
Pe 1	Physical Education	0	Pe 2	Physical Education	0
		15			15

* Business Administration majors are required to take Ms 5 and 6. Students planning to major in Economics in the College of Business Administration may elect to substitute a foreign language in place of mathematics.

COURSES OF INSTRUCTION

PROFESSORS ALMOND, COUPE, DEVINO, PECK, SIEDLIK, YOUNG, AND S. C. YU; ASSOCIATE PROFESSOR CLARK; ASSISTANT PROFESSORS BARTLETT, BURKE, CRAPO, FORSGREN, GOODMAN, MCCLURE, NADEL, SANDS, TALLEY, L. YU, AND ZIEGENBEIN; INSTRUCTOR CURRY; GRADUATE ASSISTANTS CRONAN, DUNN, HOFFMAN, AND MACKINNON

Courses in Business Administration (Ba)

9. Principles of Accounting I—An introductory course in accounting with emphasis on the basic accounting cycle, 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. *Cr* 3. MR. SANDS

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, Ba 10. *Cr* 3. MR. YU

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: Ec 1/2; Ba 9. *Cr* 3. MR. ALMOND, MR. BARTLETT

76. Federal Tax Reporting—Federal tax laws as they affect individuals, partnerships, corporations, and estates. An opportunity is given the student to become familiar with tax forms. Prerequisite: Ba 9/10. *Cr* 3. MR. SIEDLIK

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. MR. ALMOND

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 approcah to logistical system analysis and decision making. Prerequisite: Ba 23, 63. *Cr* 3. MR. ZIEGENBEIN

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. SIEDLIK

143. Advanced Accounting I—Principles, theory, and procedures of parent and subsidary 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. YU

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. YU

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 application of electronic data processing equipment to accounting systems. Basic principles of operation and programming. Selected case problems. Prerequisite: Ba 9. *Cr* 3. MR. SIEDLIK

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. SIEDLIK

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, Ba 9. MR. SANDS

151. Business Finance—The first semester deals with the promotion, organization, and financing of the single proprietorship, partnership, and corporation. The second semester utilizes advanced cases and problems related to the theory and principles developed in the first semester. Prerequisite: Ec 1/2, 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. TALLEY

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. ZIEGENBEIN

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; 160. 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. Prerequisite: Ec 1/2; Ba 23, 63, 149, 151. MR. FORSGREN

161. Personnel Management—The selection, training, and management of personnel in private and public business. Designed for the student interested in administration, office management, or personnel work in education, business, engineering, public service, and other fields. Prerequisite: Ec 1/2. *Cr* 3. MR. FORSGREN

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. CLARK

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. BARTLETT

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. ALMOND

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. MR. BARTLETT

170. Managerial Marketing—A managerial approach with emphasis upon 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 devolopment of abilities in solving marketing management problems. Prerequisite: Ba 63 and Ms 19. MR. ALMOND

For graduate courses in Business Administration, see the Graduate School Catalog.

Courses in Economics (Ec)

1/2. Principles of Economics—Analysis of the fundamental characteristics and institutions of modern economic society, including business and labor organization, national and international policies. *Cr* 3. STAFF

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 1/2. *Cr* 3. MR. NADEL

37. Comparative Economic Systems—The structures and operating principles of the major contemporary economic systems are examined and compared. Prerequisite: Ec 1/2. *Cr* 3. MR. NADEL

132. Business Fluctuations—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 1/2. *Cr* 3. STAFF

133/134. Labor Economics—A discussion of labor in an industrial society serves as background for an examination of the origins and structure of the labor movement, the theories of the labor movement, the theories of 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 1/2. *Cr* 3. MR. CLARK

135. History of Economic Thought—A survey of the development of basic economic principles and theories from pre-industrial 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 Macroeconomics. Prerequisite: Ec 1/2. *Cr* 3. MRS. CURRY

139/140. 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 1/2. *Cr* 3. MR. NADEL

153/154. Money and Banking—The first semester includes a survey of the nature, characteristics, and functions of the monetary and banking system of the United States. The second semester deals with the money market, central banking problems, and related international aspects of banking policy. Prerequisite: Ec 1/2. *Cr* 3. MR. CLARK, MR. ZIEGENBEIN

168. Social Control of Business—Public policy toward business; government powers and private rights; government aids; regulation of competition and monopoly; public enterprise. Prerequisite: Ec 1/2. *Cr* 3. MR. COUPE

171/172. Public Finance—The study of the background, administration and economic effects of national, state and local taxes, such as those on property, income, and sales. Analysis of government policies of spending, borrowing and taxing with emphasis on their effects upon national economic conditions. Prerequisite: Ec 1/2. *Cr* 3. STAFF

173. Economic Analysis—Price, income, and employment theory as tools in the study of economics. Prerequisite: Ec 1/2. *Cr* 3. MR. COUPE

174. Economic Policy—Current economic problems on national and international levels. Prerequisite: Senior standing in B.A. Program in Economics, or permission. *Cr* 3. STAFF

210. Micro-economic Theory—An examination of the development of modern economic analysis with regard to the consumer, the firm and market structures. Prerequisite: permission. *Cr* 3. MR. COUPE

211. Macro-economic Theory—An examination of the development of modern economic analysis with regard to employment, income distribution, and stabilization policies. Prerequisite: permission. *Cr* 3. STAFF

212. 213. Economics Research Seminar—The study of research methodology in economics developed by critical analysis of specific student research problems. Prerequisite: permission. *Cr* 3. STAFF

220. Monetary Theory and Policy—A review of the development of contemporary banking and monetary theory. Primary emphasis is given to an analysis of the effects of alternative monetary policies. Prerequisite: Ec 153. Cr 3. MR. CLARK

221. Public Finance and Fiscal Policy—An analysis of the theories of taxation and government spending. The impact of borrowing and tax policies.

Special emphasis is on the fiscal policies of government activity under differing general economic conditions. Prerequisite: Ec 171. *Cr* 3. STAFF

222. International Economic Theory and Policy—An analysis of major factors in international economic relations. Subjects discussed include patterns of international specialization, balance of international payments, foreign exchange, U.S. international commercial policy and foreign investments. Prerequisite: Ec 139. *Cr* 3. MR. NADEL

223. Seminar in Labor Economics—An examination of basic theories of the labor union movement, the attempts to formulate new approaches in wage theory, and the relationship of wages, prices, employment and economic growth. Discussion includes the role of a free labor union movement in modern society and appropriate public policy. Prerequisite: Ec 133. *Cr* 3. MR. CLARK

229. Readings in Economics—Specialized topics in economics can be pursued by the student on an independent basis. Prerequisite: permission. *Cr* 3. STAFF

The arches at South Steve

Lecture hall—Physics Buildi

COLLEGE OF EDUCATION

MARK R. SHIBLES, DEAN

Education Building

admission to the University exactly as they would if they expected to enroll 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.)

GUIDANCE SERVICE FOR STUDENTS

A guidance and testing service is provided for all students enrolled in the College of Education. This service is briefly described below.

Testing—Students admitted to the College of Education may be expected to take a series of tests, either before or immediately after their first registration in a regular session.

These tests will cover general scholastic ability and achievement in broad academic fields. In addition, tests, scales, and inventories in such areas as personality, interests and aptitudes will be available to students who desire this service.

Test results will be made known to the student through his adviser. Test results will be used by the adviser as a basis for counseling.

Counseling—Upon admittance to the College of Education each student is assigned a staff member who acts as his major adviser. The major adviser will assist the student in selecting a field of concentration, advise with him on the selection of specific courses, check registration and graduation requirements and counsel with personal and vocational problems.

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 128 degree hours of 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 a factor as follows: A by 4, B by 3, C by 2, and D by 1.

Included in the 128 semester hours required for graduation for those who follow the *elementary teacher* program are a minimum of 51 degree hours in general education, 26 degree hours of courses in professional subjects, and 24 hours in a major academic field. 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 50 degree hours in general education, 18 degree hours in professional education, and a minimum of 50 degree hours in the 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 field and an 18-hour teaching minor in either another academic field or in the area of health or recreation. Those who follow the music or art education program are required to complete a 24-hour academic major.

Students who follow the *elementary teacher* program are required to complete a 24-hour academic teaching field 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
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 no less than 30 credit hours in professional education 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 pubic schools for the other half semester.

GENERAL SECONDARY ONLY

Plan I—Observation and Student Teaching for half days for full semester

Plan II—Observation and Student Teaching for full days for half semester

Freshman Year

FALL SEMESTER			Hours
Ed	A 2	Orientation	0

Sophomore Year

FALL SEMESTER			Hours
Py	1	General Psychology	3
SPRING SEMESTER			
Py	2	General Psychology	3
Ed	B 2	The American School	3

FALL SEMESTER			Hours
Py	1	General Psychology	3
SPRING SEMESTER			
Py	2	General Psychology	3
Ed	B 2	The American School	3

Junior Year

FALL SEMESTER			Hours
Ed	B 3	Growth-Learning Process	3
SPRING SEMESTER			
Ed	B 4	The Teaching Process	3

FALL SEMESTER			Hours
Ed	B 3	Growth-Learning Process	3
SPRING SEMESTER			
Ed	B 4	The Teaching Process	3

plus a Special Methods Course selected from the following:

Eh	84	The Teaching of English in the Secondary School	3
Ed M	141	Teaching Social Studies in the Secondary School	3
Ed M	142	Teaching Science in the Secondary School	3
Ms	49	Mathematics for Teachers	3
Fl	66	The Teaching of Foreign Languages	3

Senior Year

FALL SEMESTER			Hours
*Ed M	193	Half-Day Student Teaching	6
SPRING SEMESTER			
*Ed M	193	Half-Day Student Teaching	6

*Special conferences and group discussions as required. Student Teaching to be taken in either but not both of the semesters indicated.

FALL SEMESTER			Hours
Ed M	191	Full-Day Student Teaching	6
Sy	5ed	Educational Sociology	3
Pl	70	Perspectives in Culture	3
Mhe	50	Man and His Environment	3
SPRING SEMESTER			
Ed M	191	Full-Day Student Teaching	6
Sy	5ed	Educational Sociology	3
Pl	70	Perspectives in Culture	3
Mhe	50	Man and His Environment	3

GENERAL ELEMENTARY ONLY

Plan I—Observation and Student Teaching for half days for full semester

Plan II—Observation and Student Teaching for full days for half semester

Sophomore Year

FALL SEMESTER			Hours
Py	1	General Psychology	3
SPRING SEMESTER			
Py	2	General Psychology	3
Ed B	2	The American School	3

FALL SEMESTER			Hours
Py	1	General Psychology	3
SPRING SEMESTER			
Py	2	General Psychology	3
Ed B	2	The American School	3

Junior Year

FALL SEMESTER			Hours
Ed B	3	Growth-Learning Process	3
Ed M	18	Teaching the Language Arts	2
SPRING SEMESTER			
Ed B	4	The Teaching Process	3
Ed M	115	Teaching Social Studies in the Elem. School	2

FALL SEMESTER			Hours
Ed B	3	Growth-Learning Process	3
Ed M	114	Teaching Arithmetic in Elem. School	2
Ed M	13	Teaching of Reading	2
SPRING SEMESTER			
Ed B	4	The Teaching Process	3
Ed M	116	Teaching Science in the Elementary School	2

Senior Year

FALL SEMESTER			Hours
*Ed M	192	Half-Day Stud. Teach. (Elem.)	8
SPRING SEMESTER			
*Ed M	192	Half-Day Stud. Teach.	8

*Special conference and group discussions as required. Student Teaching to be taken in either but not both of the semesters indicated.

FALL SEMESTER			Hours
*Ed M	190	Full-Day Stud. Teach. (Elem.)	8
Sy	5ed	Educational Sociology	3
Pl	70	Perspectives in Culture	3
Mhe		Man and His Environment	3
SPRING SEMESTER			
*Ed M	190	Full-Day Stud. Teach. (Elem.)	8
Sy	5ed	Educational Sociology	3
Pl	70	Perspectives in Culture	3
Mhe	50	Man and His Environment	3

Normally these courses are taken in the years indicated; however, a student who did not start this sequence during his sophomore year may still be admitted to the College of Education. Such students when admitted must complete these courses in sequence. It may be necessary for such students to use more than the normal eight semesters to satisfy graduation requirements.

Students whose work before entering the College of Education has been at an institution other than the University of Maine will be expected to complete the above requirements, or their equivalent.

RESIDENCE REQUIREMENTS

A minimum of 30 semester hours of credit must be earned while in residence at the University 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 six 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 which is allowed toward fulfilling the requirements for the degree. In all cases, this requirement of 30 hours of residence work must be met after the student has become a candidate for a degree in the College of Education.

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, Mark R. Shibles, College of Education, Orono, Maine 04473. Information concerning extension programs in the C.E.D. program may be obtained by writing Dean Winthrop C. Libby, College of Life Sciences and Agriculture, 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 test 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 are also 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 their 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 28 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 of 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 departmental affiliation, the student must enroll as a teacher educator 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 require-

ments 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 certificate 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, and if they follow the same pattern will receive the same grade certificate. This pattern is given on pages 150-151.

Pattern A

(1) A minimum of 30 semester credit hours in a subject field together with (2) a minimum of 21 semester credit hours in a second subject field.

Pattern B

A minimum of 50 semester credit hours within an area of specialization (i.e., social studies, English, science and mathematics, the sciences) in which at least three common subject fields are represented.

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

Courses numbered 1-99 are for undergraduate credit and are open to graduate students only with consent of adviser. Courses numbered 100-199 are upperclass undergraduate courses but are available for beginning graduate students with approval of adviser. Courses numbered 200-299 are primarily graduate courses but are open to undergraduate honor students or upon recommendation of adviser. Courses numbered 300-399 are exclusively for graduate students.

The following courses may be offered during the regular academic year, through the Continuing Education Division, or the Summer Session.

PROFESSORS SHIBLES, CAUGHRAN, DAVIS, FINK, FREEMAN, KLIENDIENST, MACCAMPBELL, RANKIN, SUPPLE, AND ZINK; ASSOCIATE PROFESSORS APOSTAL, ISABEL BISHOP, LINDLOF, MYERS, OHNMACHT, PORTER-SHIRLEY, PRESCOTT, SANFORD, AND TRUBOV; ASSISTANT PROFESSORS DAVID BISHOP, BOYCE, CHRONISTER, CROXFORD, GENTRY, JARDINE, LOWELL, MICHIELLI, MURO, NICHOLS, ROBERTS, RHOADES, SOULE, RYAN, AND VROOMAN; INSTRUCTOR VAIL; LECTURERS FOBES AND FRISBIE; COOPERATING STAFF MEMBERS CARLSON, ENGLISH; LEWIS, ART; JACOBS, MUSIC; MILES AND NICHOLS, FOUNDATION COURSES; WOOTTON, MATHEMATICS; O'NEIL, FOREIGN LANGUAGES

Appraisal—Pupil Adjustment and Personnel Practice (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 B 2 and Ed B 3, or equivalent. *Cr* 3. MR. PRESCOTT, MR. OHNMACHT

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; teachers' function in homeroom activities for either elementary or secondary school classroom teachers (primarily as in-service course). Prerequisite: Ed B 3 and Ed B 4 or equivalent. *Cr* 3. MR. SANFORD, MR. MURO

251. Introduction to School Guidance Services—Basic course for students planning to specialize either in guidance or secondary school administration. Philosophy, principles and practices of school guidance activities. Survey of school guidance services. Prerequisite: Ed B 3 and Ed B 4 or equivalent. *Cr* 3. MR. FREEMAN, MR. SANFORD, MR. MURO

252. Guidance in Groups—Dynamics of small groups; effects of the group on the individual member; methods of group leadership; group activities for guidance. Prerequisite: Ed A 251. MR. SANFORD, MR. MURO

255. Introduction to Counseling—The functions of the guidance counselor in educational, vocational and personal counseling; methods of gathering data and interviewing. Prerequisite: Ed A 251 or equivalent. *Cr* 3. MR. SANFORD, MR. MURO

261. Student Personnel Services in Higher Education—A survey of the history, philosophy, and current trends in student personnel services. The interrelationships between these services as they assist the student to attain his academic potential is emphasized. *Cr* 3. MISS ZINK

320. Educational Measurement—Basic measurement theory; use of descrip-

tive statistical techniques for pupil diagnosis and evaluation; use of tests and testing programs in schools. Prerequisite: Ed B 4 or Ed 120 or equivalent. *Cr* 3.
MR. PRESCOTT

321. Statistical Methods in Education—A course which pre-supposes and builds upon the statistics offered in Ed A 320, dealing with problems of sampling, probability, tests of significance, and correlation techniques not carried out in Ed A 320. Considerable emphasis to be placed on non-parametric statistics. Statistical techniques required by students doing research will be considered. Prerequisite: Ed A 320. *Cr* 3. MR. LINDLOF

351. Vocational Development Theory—A study of vocational behavior as it is related to personality development and social background. The course considers the relationship between life stages and career patterns, and how the concept of self is implemented and possibly changed through work experiences. Close attention is given to programs of research on vocational behavior. *Cr* 3.
MR. RYAN

352. Group Procedures in Counseling—An extension of counseling theory and practice to the group rather than the one-to-one relationship. An evaluation of small group discussions as a learning medium for personal growth of participants. Research in group counseling will be examined. The role of the counselor as he develops his relationships with groups will be given particular attention. Prerequisite: Ed A 255. *Cr* 3. MR. SANFORD, MR. MURO

353. Occupational and Educational Information—Sources and nature of occupational and educational information; collection, evaluation, and use of informational materials with individuals and groups. Prerequisite: Ed A 150 or Ed A 251. *Cr* 3. MR. FREEMAN, MR. MURO

354. Organization and Administration of School Guidance Services—Planning the guidance services for a school system; budget making; staff relationships. Prerequisite: Ed A 353, Ed A 255 and Ed A 320 or equivalent. *Cr* 3.
MR. SANFORD

355. Advanced Counseling—Counseling theory and philosophy; supervised interview contacts with clients. Prerequisite: Ed A 255 or equivalent. *Cr* 3.
MR. SANFORD, MR. APOSTAL, MR. MURO

390. Guidance Institute — See special announcement in current Summer Session Catalog. *Cr* 6.

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 teaching in all regular undergraduate programs. Not open to freshmen. *Cr* 3. MR. TRUBOV, MR. VROOMAN, AND MR. BISHOP

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. DAVIS, MR. SANFORD, MISS MILES,
MR. JOHN NICHOLS, MR. MURO, MR. RYAN

4. The Teaching Process—The procedures of instructional planning, including such items as improved use of small groups, classroom space, and ap-

propriate 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. PRESCOTT, MR. CAUGHRAN, MR. LINDLOF,
MR. DAVID NICHOLS AND MR. GENTRY

Curriculum and Instructional Materials (Ed C)

113. Principles of Curriculum Construction (Conservation) for Elementary School Teachers—This course is open to all elementary teachers who have completed a Conservation Education Workshop or its equivalent. The program of the Curriculum Workshop is concerned with the production of instructional materials on natural resource conservation for schools. Specifically, it provides opportunities for writing reference and reading materials for children, units of study, instructional guides, bibliographies, and for making many types of visual aids useful in teaching conservation at the various school levels. *Cr* 3.

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 equivalent. *Cr* 3.

MR. FREEMAN

123. Principles of Curriculum Construction (Conservation) for Secondary School Teachers—This course is open to all secondary teachers who have completed a Conservation Education Workshop or its equivalent. The program of the Curriculum Workshop is concerned with the production of instructional materials on natural resource conservation for schools. Specifically, it provides opportunities for writing reference and reading materials for children, units of study, instructional guides, bibliographies, and for making many types of visual aids useful in teaching conservation at the various school levels. *Cr* 3.

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 equivalent. *Cr* 3.

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. GENTRY

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* 2-3.

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. RHOADES

146. Natural Science Education—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—Primarily for elementary school teachers. 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—Primarily for general science and biology teachers in the secondary school. See general description under Ed C 148. *Cr* 3.

210. Planning the Curriculum for The Retarded Child—The aims and philosophy of education for the retarded child, present status of the curriculum and the factors affecting current curriculum changes. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or equivalent. *Cr* 3.

211. Planning the Elementary School Curriculum—Aims and philosophy of elementary education; present status of the curriculum; factors affecting curriculum changes, curriculum development and modern child psychology. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or equivalent. *Cr* 3. MRS. BISHOP

221. Planning the Secondary School Curriculum—Current plans of curriculum revision and reorganization with special attention to reorganization programs designed to bring the curriculum into harmony with the needs of modern life. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or equivalent. MR. BISHOP

224. Planning the Junior High School Curriculum—Current plans of curriculum revision and reorganization of the junior high school program. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or equivalent. MR. BISHOP

233. The Dynamics of the Curriculum—The various problems and issues of curriculum development related to all areas of instruction; the nature and scope of educational experiences and opportunities essential for a vital program; the role of administration, supervision, and guidance in the improvement of instruction. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or equivalent. *Cr* 3.

236. Campus Culture and Student Activities in Higher Education — A study of the role of the student personnel administrator in relation to student government, student organizations, the development of student leadership, faculty-student relations. Prerequisite: Ed A 261. *Cr* 3. MISS ZINK

237. New Media in Education—Current development and utilization of new media in educational instruction. An advanced course. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or equivalent. *Cr* 3. MR. GENTRY

312. Principles of Curriculum Construction (Elementary)—Designed to give supervisors, administrators and teachers a general overview of principles and methods of curriculum construction and revision; contributions of research to curriculum building, selection of content material and the development of new courses of study in the elementary school. Prerequisite: Ed C 211. *Cr* 3.

322. Principles of Curriculum Construction (Secondary)—Designed to give supervisors, administrators and teachers a general overview of principles and methods of curriculum construction and revision; contributions of research to curriculum building, selection of content material and the development of new courses of study in the secondary school. Prerequisite: Ed C 221, Ed C 224, or equivalent. *Cr* 3.

Seminars, Research and the Thesis (Ed G)

Each seminar except Ed 300 and Ed G 306 requires an appropriate course completed at the graduate level as a prerequisite.

300. Seminar: Education in the United States—This seminar is intended to provide a common background of understandings in the philosophy and issues of modern education. Another purpose is to provide experience in library research techniques and report writing. Required of all students in the Master of Education Program. *Cr* 3.

MRS. BISHOP, MR. CHRONISTER, MR. NICHOLS, MR. RHOADES, MR. SOULE

301. Seminar in Reading—Discussions and individual reports on problems related to better reading instruction. Prerequisite: Ed M 150 or equivalent. *Cr* 3.

MR. CAUGHRAN, MR. ROBERTS

302. Seminar in Arithmetic—Study and reports on special problems in arithmetic instruction. Prerequisite: Ed M 251, or equivalent. *Cr* 3. MRS. BOYCE

303. Seminar in Social Studies (Elementary)—Problems in the development of the curriculum, materials, resources, and methods of social studies in elementary schools. Prerequisite: Ed M 215, or equivalent. *Cr* 3. MR. SUPPLE

304. Seminar in Science (Elementary)—Problems in curriculum, materials, resources, and methods of science in the elementary school. Prerequisite: Ed M 116, or equivalent. *Cr* 3. MR. DAVIS

305. Seminar: The Retarded Child—Study of the current problems of the retarded and development of individual projects related to the retarded. Prerequisite: Ed M 270, Methods of Teaching the Retarded, or equivalent course. *Cr* 3.

306. Seminar in Higher Education in the U. S.—An examination of the American system of higher education. The history, philosophy, and legal basis of higher education will be studied. Current issues in administration, teaching, research, and student services are examined under leadership of members of University of Maine administration and faculty. *Cr* 3. MISS ZINK, MR. FREEMAN

307. Seminar in Language Arts—Discussions and experiences designed to improve the practices and the background of language arts. Prerequisite: Ed M 230, or equivalent. *Cr* 3. MR. ROBERTS, MR. CAUGHRAN

308. Seminar in Student Personnel Problems—Selected problems in student personnel administration will be studied in depth according to needs and interest of seminar participants. Prerequisite: Ed A 261, Ed G 306, Ed A 255. *Cr* 3. MISS ZINK

309. Seminar in College Teaching—Discussion and analysis of effective college teaching practices. The special services which support the instructor's activities will be related to the total teaching process. Open to all graduate students preparing for work in higher education. Registration by permission. *Cr* 3.

MR. FREEMAN

315. Seminar in Methods of Teaching—Study and reports of specific problems in the area of teaching. Prerequisite: a basic course in methods or a year of teaching experience. *Cr* 3. MR. SUPPLE, MR. NICHOLS

316. Seminar in Audio-Visual Aids—Special problems or projects in the field of audio-visual aids to instruction selected to meet the needs of the individual student. Prerequisite: Ed C 133 or equivalent. *Cr* 3. MR. GENTRY

321. Seminar in Social Studies (Secondary) — Problems in curriculum, materials, resources and methods in social studies in the secondary school. Prerequisite: Ed M 141, or equivalent course. *Cr* 3. MR. SUPPLE

322. Seminar in Science (Secondary)—Problems in curriculum, materials, resources, and methods in science in the secondary school. Prerequisite: Ed M 142, Teaching Science in the Secondary School, or equivalent course. *Cr* 3.
MR. DAVIS

331. Seminar in Elementary School Curriculum—Study and reports on specific problems in the field of curriculum construction and curriculum reorganization. Prerequisite: Ed C 211 or equivalent. *Cr* 3. MRS. BISHOP

332. Seminar in Secondary School Curriculum—Study and reports on specific problems in the fields of curriculum construction and curriculum reorganization. Prerequisite: Ed C 221, C 224 and C 233 or equivalent; a basic course in the curriculum field or a year of teaching experience. *Cr* 3.
MR. BISHOP

341. Seminar in Supervision—Problems related to the improvement of instruction. In general, the problems studied will be determined by the needs of the class. Prerequisite: Ed L 210, 311, 321 or equivalent. *Cr* 3.
MR. PORTER-SHIRLEY, MR. VROOMAN

342. Seminar in School Administration—Problems related to the operation and control of the school. Prerequisite: Ed L 210 and L 311, or L 321, or equivalent. *Cr* 3. MR. PORTER-SHIRLEY, MR. VROOMAN

343. Seminar—The Superintendent—Study and reports on specific problems in the field of high school superintendency. Prerequisite: master's degree in administration. *Cr* 3. MR. PORTER-SHIRLEY

351. Seminar in Measurement and Evaluation—The use of measurement and evaluation in problems of improvement of instruction, pupil counseling and guidance and research in education. Prerequisite: Ed A 320, or equivalent. *Cr* 3.
MR. PRESCOTT, MR. OHNMACHT

361. Seminar in Guidance—Study of current problems in guidance and the development of individual projects in guidance activities. Prerequisite: Ed A 251, or equivalent. *Cr* 3. MR. MURO

362. Advanced Seminar in Counseling, Guidance, and Student Personnel Administration—A seminar designed to afford the doctoral student an opportunity to make an intensive study of research literature and to explore and clarify his philosophy and goals within the total field of counseling, guidance and student personnel administration. Open only to doctoral students. *Cr* 3.
MR. APOSTAL, MR. FREEMAN, MR. MURO, MR. SANFORD, MISS ZINK

365. Seminar in Self-Actualization — Lectures, discussions, and directed readings pertaining to the nature of creativity, psychological health, human potentialities, and self-fulfillment. *Cr* 3.

366. Advanced Seminar in Human Development—A study of continuity and dynamics of human development through all life stages. Implications for teachers, counselors, and student personnel workers will be emphasized. Prerequisite: 18 credits in behavioral sciences. *Cr* 3. MR. FREEMAN

373. Seminar in Business Education (Administration and Supervision—Problems related to administration and supervision in business education. Prerequisite: Ed V 271, V 272 and V 275. *Cr* 3.

391. Graduate Apprenticeship—Apprenticeship training available in such areas as administration, supervision and guidance. A minimum of 30 clock hours of work is required for each hour of credit. Prerequisite: permission of instructor and adviser to graduate students. *Cr* 2-6.
MR. PORTER-SHIRLEY, MR. SANFORD, MISS ZINK, MR. MURO

392. Field Observation in Guidance—Familiarization with guidance programs through CCTV observation and visits to selected schools. Study of community agencies as referral sources in guidance. Prerequisite: permission of instructor. *Cr* 2.

395. Educational Research—Evaluation of selected examples of research in education, with special attention to appropriateness of design to the stated purpose of the study; the selection and presentation of a research problem with special attention to its design and to studies related to it. This course is required of CAS candidates for the principalship and for those superintendents enrolled in the CAS program prior to September 1, 1965. *Cr* 3.

MR. PRESCOTT, MR. OHNMACHT

396. Doctoral Seminar in Education—Doctoral students present doctoral thesis proposals to faculty and students for criticism. Required before approval of students' dissertation title may be obtained from his advisory committee. Open only to doctoral students. *No credit.* STAFF

397. Advanced Educational Research I—An integration of research theory and methodology, measurement theory, and statistics. Development of hypotheses, principles of research design, sampling techniques, and methods of analyzing data will be considered. Concepts from measurement theory and statistics necessary for sound research design are included. Students are expected to participate in the solution of research problems. Required of master of science, master of arts, and doctoral candidates. *Cr* 6. MR. PRESCOTT

398. Advanced Educational Research II—A continuation and extension of Ed G 397 in which more sophisticated research designs—particularly experimental—are considered. Principles underlying construction and use of instruments for purposes of measurement in research will be continued. Multivariate analysis, analysis of variance and covariance, and nonparametric methods will be introduced as they apply to the solution of educational research problems. Specific topics emphasized will reflect the particular needs of students planning doctoral dissertations. Required of doctoral candidates. Prerequisite: Ed G 397. *Cr* 3-6.

399. Graduate Thesis—Required of candidates for the master of arts or master of science degree. *Cr* 6. *Time arranged.* STAFF

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. NICHOLS

130. Trends in Elementary Education—Current and emerging practices in organization, curriculum and teaching in the elementary school. Discussion of the philosophy of elementary education, various types of grouping, evaluation, instructional materials and the utilization of new media for teaching and learning. Prerequisite: Ed B 2, or equivalent course. *Cr* 3.

251. 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. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or equivalent. *Cr* 3. MR. EMERICK

261. Comparative Education—An analysis of the forces that create differences between national systems of education. England, France, U.S.S.R. and the

United States are studied specifically. Prerequisite: Ed B 2, Ed B 3, and Ed B 4 or equivalent. *Cr* 3. MR. NICHOLS

362. Philosophy of Education—Contributions of philosophers to modern education: An analysis of principles and practices of schools in relation to ideals as contributed by the philosophers. Prerequisite: Ed B 2, Ed B 3, and Ed B 4 or equivalent. *Cr* 3. MRS. BISHOP

School Leadership (Ed L)

210. School Administration and Supervision—Nature and scope of democratic administration and supervision of the public schools, including selected problems in areas such as personnel policies, finance, public relations, evaluation techniques, and supervisory practices. Prerequisite: Ed B 2, Ed B 3, and Ed B 4. *Cr* 3. MR. PORTER-SHIRLEY, MR. BISHOP, MR. VROOMAN

230. Public Relations—Practical application of techniques and approaches in the development of a desirable public relations program for schools; an evaluation of reporting practices, and the participatory process in working with lay citizens of a community. Prerequisite: Ed L 210 or equivalent. *Cr* 3.

231. School Law—A study of the legal bases of public education in the state of Maine. Prerequisite: Ed B 2, Ed B 3 and Ed B 4 or equivalent. *Cr* 3.

311. The Elementary School Principalship—Organization and administration of the elementary school, with special emphasis upon the duties of the elementary school principal. Prerequisite: Ed L 210, or equivalent. *Cr* 3.
MR. NICHOLS, MR. VROOMAN

321. The Secondary School Principalship—Organization and administration of the secondary school, with special emphasis upon the duties of the secondary school principal. Prerequisite: Ed L 210, or equivalent. *Cr* 3.
MR. NICHOLS, MR. BISHOP

330. School Finance and Business Management—Making and presenting school budget proposals; purchasing and accounting; administering the school budget; legal requirements of budgetary practices. Prerequisite: master's degree with emphasis in school administration *and* permission of the adviser to graduate students in Education. *Cr* 3. MR. PORTER-SHIRLEY

340. Housing the School Program—Population and building surveys; construction and maintenance of school buildings; legal aspects of schoolhouse building. Prerequisite: master's degree with emphasis in school administration *and* permission of the adviser to graduate students in Education. *Cr* 3.
MR. PORTER-SHIRLEY

350. School Personnel Management — Recruitment, assignment and in-service training of teachers; techniques of job analysis and evaluation; leave, tenure and salary policies, staff participation in management. Prerequisite: master's degree with emphasis in school administration *and* permission of the adviser to graduate students in Education. *Cr* 3.
MR. VROOMAN, MR. PORTER-SHIRLEY

351. Theory of Administration—The theory and principles of educational leadership. An advanced course. Prerequisite: MEd. with emphasis in school administration and permission of adviser to graduate students in Education. *Cr* 3.
MR. NICHOLS, MR. VROOMAN

360. Educational Surveys of the School System—Nature, source and analysis of information basic to planning and operating the local school system; patterns for organizing local systems into larger units; methods of informing the

community of the purposes of the survey; procedures for implementing the survey recommendations; and techniques for keeping the survey results up to date. Prerequisite: master's degree with emphasis in school administration *and* permission of the adviser to graduate students in Education. *Cr* 3.

MR. PORTER-SHIRLEY, MR. BISHOP, MR. VROOMAN

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: Ed B 2 or equivalent. *Cr* 2-3.

MRS. BOYCE, MISS JARDINE

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: Ed B 2 or equivalent. *Cr* 2-3. MRS. BOYCE, MISS JARDINE, MR. LOWELL, MR. ROBERTS

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: Ed B 2 or equivalent. *Cr* 2-3. MRS. BOYCE

115. Teaching 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: Ed B 2 or equivalent. *Cr* 2-3. 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: Ed B 2 or equivalent. *Cr* 2-3. MR. DAVIS

117. Teaching Literature in the Elementary School—Methods of teaching, selection and organization of the materials for literature in the elementary school. Special emphasis will be given to the problem of providing for individual needs. Prerequisite: Ed B 2, or equivalent. *Cr* 3. MR. MACCAMPBELL

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: Ed B 2, or equivalent. *Cr* 3.

MR. SUPPLE

140. Teaching Reading in the Secondary School—Appraisal of reading achievement and needs; teaching reading and study skills in the content areas; survey of reading programs in the junior-senior high school. Prerequisite: Ed B 2 or equivalent. *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: Ed B 2 or equivalent. *Cr* 3. MR. SUPPLE

142. Teaching Science in the Secondary School—Methods and materials in the teaching of science; development of the science curriculum, and equipment, supplies, and supplementary materials for science teaching in the secondary schools. Prerequisite: Ed B 2 or equivalent. *Cr* 3. MR. DAVIS

143. Teaching Geography in the Secondary School—Materials, methods, devices, activities, and appropriate background information to the program of

teaching geography in the school. Prerequisite: Ed B 2, or equivalent. *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 equivalent. *Cr* 3.
MR. CAUGHRAN, MR. ROBERTS

151. Newer Practices in Arithmetic—Objectives, materials and procedures for the improvement of teaching fundamentals of arithmetic; an arithmetic readiness program, a sensible drill load, and the development of meaningful problem units. Prerequisite: Ed M 114 or equivalent. *Cr* 3. MRS. BOYCE

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 equivalent. *Cr* 3. MRS. BISHOP

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. Prerequisite: Ed B 2, Ed B 3 and Ed B 4, or equivalent. *Cr* 8.
MR. PORTER-SHIRLEY, MR. RANKIN, MR. SOULE, MISS JARDINE, MRS. BOYCE, MR. JACOBS, MR. LEWIS, MR. FREEMAN, MR. O'NEIL

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 are required. Prerequisite: Ed B 2, Ed B 3 and Ed B 4, or equivalent. *Cr* 6.
MR. PORTER-SHIRLEY, MR. RANKIN, MR. MYERS, MR. NICHOLS, MR. LINDLOF, MR. DAVIS, MRS. BOYCE, MR. VROOMAN, MR. SOULE, MR. RHOADES, MR. CROXFORD, MR. JACOBS, MR. LEWIS, MISS JARDINE, MR. FREEMAN, MR. CHRONISTER, MR. O'NEIL

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. Prerequisite: Ed B 2, Ed B 3 and Ed B 4, or equivalent. *Cr* 8.
MR. PORTER-SHIRLEY, MR. RANKIN, MRS. BOYCE, MR. SOULE, MISS JARDINE, MR. JACOBS, MR. LEWIS, MR. FREEMAN

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. Prerequisite: Ed B 2, Ed B 3 and Ed B 4, or equivalent. *Cr* 6.
MR. PORTER-SHIRLEY, MRS. BOYCE, MR. RANKIN, MR. MYERS, MR. DAVIS, MR. VROOMAN, MR. SOULE, MR. RHOADES, MR. CROXFORD, MR. LINDLOF, MISS JARDINE, MR. NICHOLS, MR. JACOBS, MR. LEWIS, MR. FREEMAN

215. Newer Practices in Social Studies in the Elementary School — A study of the literature, research, materials, and emerging curriculum practices in the social studies program in the elementary schools. An advanced course. Prerequisite: Ed M 115 or equivalent. *Cr* 3. MR. SUPPLE

230. Advanced Study in Language Arts—Intensive study of literature, re-

search, and current practices in the teaching of the language arts. Primarily for thesis candidates. Prerequisite: consent of instructor. *Cr* 3. MR. ROBERTS

241. Newer Practices in Social Studies in the Secondary School—A study of the literature, research, materials, and emerging curriculum practices in the social studies program in the secondary schools. An advanced course. Prerequisite: Ed M 141 or equivalent. *Cr* 3. MR. SUPPLE

253. Remedial Reading—Diagnosis and correction, methods, materials and procedures for corrective work. Corrective work with an individual or group. Prerequisite: Ed M 140, or Ed M 150 or equivalent. *Cr* 3.

MR. CAUGHRAN, MR. ROBERTS

269. Clinical Practices in Reading—Practice in diagnosing and correcting reading deficiencies in elementary and secondary school children. Prerequisite: Ed M 253 or equivalent. *Cr* 6. MR. CAUGHRAN, MR. ROBERTS, MR. LOWELL

270. Methods of Teaching the Retarded Child—Methods, materials, and techniques in teaching retarded children at the special class level. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or equivalent. *Cr* 3.

272. The Education of the Superior Child—Deals with characteristics, identification, educational provisions, adjustment and guidance of superior students. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or equivalent. *Cr* 3.

MRS. BISHOP

280. Institute for Teachers of Disadvantaged Youth—A special program designed to increase the competence of teachers of disadvantaged youth. Classroom instruction in sociology of rural poverty, learning problems and processes in culturally disadvantaged youth, and methods of teaching disadvantaged youth. Laboratory work in new instructional aids and media. Field work with disadvantaged youth. Seminar discussions. *Cr* 6. MR. LINDLOF

301. Diagnosis in Reading—Theory, demonstration, and practice in the diagnosis and appraisal of factors in reading and related areas. Emphasis is on the construction and use of teacher-made measuring instruments designed to appraise word perception, vocabulary, and comprehensive skills, and other facets of reading performance. Prerequisite: Ed A 320 or its equivalent; Ed M 253, Ed M 269 or equivalent. *Cr* 3. MR. ROBERTS

320. Theories of Teaching—A study of the major theoretical formulations concerned with rationalizing teacher behavior. Several theories will be compared and their utility in generating research evaluated. Prerequisite: Ed B 4, a special methods course or equivalent. *Cr* 3. MR. DAVIS

357. Education Practicum (Activity) — Intensive supervised practice in applying professional skills to such activities as counseling, group work, individual appraisal, language arts instruction, supervision, testing. The activity will be selected by the student with the consent of his advisory committee. Prerequisite: consent of instructor. *Cr* 3.

(Note: The activity will be designated in parenthesis as part of the course title at the time of registration.)

Vocational (Ed V)

271. Improvement of Instruction in the Vocational Business Subjects—An advanced course covering methods, selection of instructional materials and curriculum building in vocational business subjects. Enrollment open only to experienced teachers of business education. *Cr* 3.

272. Improvement of Instruction in the Non-vocational Business Subjects

—An advanced course covering methods, selection of instructional materials and curriculum building in non-vocational business subjects. Enrollment open only to experienced teachers of business education. *Cr* 3.

275. Business Education Curriculum—This course deals with the curricula in business education for various levels and types of schools. The student learns how to evaluate present programs and to make recommendations for needed changes. *Cr* 3.

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.

110. Workshop for Critic Teachers—A workshop concerning the nature and scope of the activities of the critic teacher who serves in the University of Maine student teaching program. Issues and problems in the supervision of student teachers will be studied. *Cr* 3. MRS. BISHOP, MR. RHOADES

162. Workshop in Elementary Education (Music)—This workshop is conducted for music teachers and supervisors of music, elementary classroom teachers with no prior experience in teaching music, and administrators. Daily sessions include singing, dancing, listening, use of percussion instruments, piano, autoharp, instrumental and vocal ensembles, and junior high school music. Cooperative planning by students and staff insures a program best suited to meet individual needs and interests. *Cr* 3.

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 emphasized. *Cr* 3.

172. Workshop in Secondary Education (Music)—This workshop is conducted for music teachers and supervisors of music, secondary classroom teachers with no prior experience in teaching music, and administrators. Daily sessions include singing, dancing, listening, use of percussion instruments, piano, autoharp, instrumental and vocal ensembles, and junior high school music. Cooperative planning by students and staff insures a program best suited to meet individual needs and interests. *Cr* 3.

173. Workshop in Conservation Education—Same as course 163 except for secondary school teachers. *Cr* 3.

181. Educational Travel—Europe—A project involving study of and visits to places and institutions in Europe which have made major contributions to our cultural heritage. The tour will emphasize Great Britain and Italy with shorter visits to Paris, Switzerland, Austria, Germany, Denmark, and Norway. Areas of each country have been selected for a specific purpose to visit and should offer the tour member a reasonable insight into the sources of our own culture. *Cr* 6.
MR. PORTER-SHIRLEY

182. Educational Travel—United States—A summer session study tour of historic sites and scenic wonders of the United States with shorter visits to Canada and Mexico. This course will provide for study and research in the social, economic, historical and geographic aspects of the areas visited. The primary objective of the work is to expand the student's understanding and appreciation of the geography and the history of the United States and neighboring countries. *Cr* 6.

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, MR. SOULE

271. Institute on the Education of the Mentally Retarded—This workshop will give special attention to problems of teaching the language arts, and of adjusting other areas of the curriculum to the needs of the retarded child. The unit-experience approach to teaching will be considered. Prerequisite: consent of instructor. *Cr* 3.

276. Workshop for Teachers of Emotionally Disturbed Children—This workshop is designed to help teachers understand emotionally disturbed children in regular classroom settings and to help teachers acquire skill in dealing with such children. Lectures on the manifestations and causes of emotional disturbance will be supplemented by teaching demonstrations, laboratory periods, and seminar discussions of methods of teaching disturbed children. Admission with the approval of the State Department of Education. *Cr* 3.

398. Individual Study in Education (field of specialization)—Individual study will provide the doctoral student with the opportunity to increase his professional competence in various fields through independent readings and research. In consultation with his advisory committee the student will plan individual projects which enable him to gain needed competencies in such fields as counseling, guidance, language arts, student personnel. Prerequisite: permission of instructor. *Cr* 3-6.

(Note: The field will be designated in parenthesis as part of the course title at the time of registration.)

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.

COURSES TO BE OFFERED PERIODICALLY

(All courses are 3 credit hours except as noted by figure in parenthesis following course title)

Ed M—Methods

261. Institute in the Teaching of Reading in the Secondary School.
271. Observation and Practice in Special Class Education.
273. Problems in Teaching the Slow-Learning Child.

Ed X—General

121. National Training Laboratory in Human Relations Training.
122. National Training Laboratory in Personal Growth and Creative Expression.
123. National Training Laboratory in Conflict Management (Advanced).
124. Human Relations Factors in Guidance.
125. National Training Laboratory for Community Leaders.
126. N.T.L. for Educational Leaders (Advanced).
127. National Training Laboratories for Leadership in Higher Education.
128. National Training Laboratories Internship on Educational Change (5).
129. National Training Laboratory for School Administrators.
130. National Training Laboratories Internship on Organizational Behavior (5).

(The foregoing are offered in cooperation with the National Training Laboratory, Bethel, Maine. Each course is offered at 3 credit hours unless otherwise noted in parenthesis.)

150. Aerospace Science Education Workshop.

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 physical education, a second major in an academic teaching area, and a minor in health recreation or an academic area. A bachelor of science in education is awarded graduates of this program.

Definite evidence of intellectual capacity, positive qualities of character and personality, good health, and reasonable proficiency in motor skills are the factors determining admission. Applicants who lack any of these qualities, which are considered essential for professional success in physical education, will be advised to enter some other field of study. Applicants are urged to present at least one unit in a laboratory science (chemistry, physics, or biology).

COURSES OF INSTRUCTION (Pe)

PROFESSORS RANKIN, KLEINDIENST, AND WOODBURY; ASSOCIATE PROFESSORS BROWN, BUTTERFIELD, CASSIDY, MCCALL, SEZAK, SULLIVAN*, AND STYRNA; ASSISTANT PROFESSORS ABBOTT, MISS HAAS, MR. MICHIELLI, MISS SHAFFER, AND MR. STURGEON*; MISS JORDAN, MR. JORDAN, MR. LIVSEY, MR. MARTIN*, MR. PICKETT, MR. PHILBRICK, MR. RAND, AND MR. WALLACE

11, 12, 13, and 14. These are courses designed to develop skill in the various activities in which the physical education instructor must be proficient. These courses give a total of 6 credit hours through the freshman and sophomore years. Pe majors only. STAFF

61M-62M. Methods in Sports Activities (Men)—Designed to acquaint students with methods of organizing and administering intramural programs. Attention is given to individual and recreational activities, with stress placed on instruction, appreciation, and officiating. Pe majors only. *Rec* 2, *Cr* 2.
MR. WOODBURY

61W-62W. Methods in Sports Activities (Individual and Team Sports for Women)—Instruction and experience in teaching, techniques and progressions of individual and team sports and games. Activities include hockey, basketball, volleyball, softball, speedball, soccer, lacrosse, archery, tennis, badminton, bowling, golf, skiing, and fencing as well as recreational games. Prerequisite: Pe 11W and 12W. *Rec* 1, *Lab* 2, *Cr* 2.

63M. Coaching Football and Basketball (Men)—Practical instruction in football and basketball for men preparing to enter the coaching profession. Pe majors, Jr. class standing. *Rec* 2, *Cr* 2. MR. WESTERMAN, MR. MCCALL

63W. Methods in Modern Dance (Women)—Designed for students preparing to teach modern dance. Stresses the teaching of techniques in rhythmical activities and dance composition. Open to physical education majors, others by special permission only. Prerequisite: Pe 14W. *Rec* 3, *Cr* 2. MISS CASSIDY

64M. Coaching Track and Baseball (Men)—Devoted to a study of the mechanics of running, jumping, and weight throwing, with discussions of different styles involved; also a study of approved methods in coaching baseball in all its

* University of Maine in Portland.

phases. Pe majors, Jr. class standing. *Rec* 2, *Cr* 3.
MR. STYRNA, MR. BUTTERFIELD

64W. Methods in Intramurals and School Recreation (Women)—Interpretation, instruction and experiences in organizing and administering the intramural and school recreation programs. *Rec* 1, *Lab* 2, *Cr* 2, MRS. PERKINS

73. Athletic Training—Methods necessary to the conditioning of athletes, care in injuries and injury prevention. Diagnosis, prescription, diet, massage, taping, first aid, etc. Pe majors, Jr. class standing. *Rec* 1, *Lab* 2, *Cr* 2.

124. Advanced Instructor's Course in First Aid—Provides an advanced consideration of first aid subject matter, methods, techniques, and teaching devices. This course also considers the need for civil defense and disaster procedures in a nuclear age. Completion of the course qualifies one for the instructor's certificate. *Cr* 3. MISS BROWN

140. Outdoor Education and Recreation Education—School camping, conservation education, and integration of the school curriculum with the out-of-doors including practical experience. Current practices in the use of the out-of-doors as adjunct to modern school recreation programs. *Cr* 3. MISS KLEINDIENST

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. MISS BROWN

148. Field Experience—Supervised experience in conducting recreation programs in camp, community, social agency or institution situations. *Cr* 3-6. STAFF

150. Camp Leadership—Designed for the training of camp counselors. The course consists of lectures, discussions, practice, and participation in the varied activities of camping. In addition to the regular two hours per week in the classroom, field trips will be arranged. Pe majors only. *Cr* 2. MR. SEZAK

156. Physical Education Activities and Program Planning for Elementary Schools—Understanding and analysis of skills, progressions, curriculum development, and elements that make activities interesting for children. Emphasis on imaginative use of facilities and equipment. Methods of presentation are given in rhythms, games, gymnastics. For physical education majors. *Cr* 2. MISS SHAFFER

169. Foundations of Recreation — Fundamental concepts, principles, and practices in the field of recreation. Historical background, significance of recreation in society today and professional opportunities. *Cr* 2. MISS BROWN

171. Philosophy and Principles of Physical Education—An interpretation of the scientific and philosophical foundations of physical education. Open to juniors who are preparing to teach physical education. Pe majors only. *Cr* 2.
MR. RANKIN

172. Tests and Measurements in Physical Education—A practical course in the use of objective measurements and statistical methods in physical education and athletics. Pe majors only. *Cr* 3. MISS KLIENDIENST

176. Kinesiology—Fundamentals of body mechanics and applied anatomy. *Cr* 3. MISS BROWN

177. Organization and Administration of Physical Education and Athletics—Administrative policies and procedures, legal aspects of physical education and athletics, budgets, evaluation and coordination of the several phases of physical education and athletics. Pe majors, Jr. class standing. *Cr* 2. MR. RANKIN

178. 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. Pe majors only. *Cr* 2. STAFF

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 SHAFFER

185. Recreation Leadership—Skills and practical experiences essential to the development of effective recreation leadership. Emphasis on the organization and administration of programs and selection of activities for various size groups and age levels. *Cr* 2. MR. SEZAK

255. Philosophy and Organization of Physical Education for Elementary Schools—Philosophy, planning and organization of the physical education program in the elementary school. Skills, progressions, and methods of presentation are included. *Cr* 3. MISS SHAFFER

265. Leadership Organization in the Intramural Programs—Principles, administration, organization, and supervision of intramural activities in the physical education program in elementary, junior and senior high schools. *Cr* 3. MR. WOODBURY

268. Protective Practices and Safety in Physical Education and Recreation—This course is designed to acquaint teachers and coaches with modern principles and practices in care, conditioning, and safety in physical education and athletic programs. Applied anatomy, physical examination, diet, taping, and first aid. *Cr* 3. MR. WOODBURY

270. Interpretations of Health, Physical Education and Recreation—For teachers, supervisors and administrators. The broad philosophical bases upon which the modern program of physical education is predicated. Biological, psychological, sociological, and educational implications in interpreting the functions of physical education in contemporary democratic society. *Cr* 3. MISS KLEINDIENST

274. Organization and Administration of Recreation Programs—Designed to acquaint students with the need, nature, and extent of recreational programs. Special consideration is given to the contribution of physical education to community recreation. *Cr* 3. MISS BROWN, MISS KLEINDIENST

275. Current Studies in the Administration of Health, Physical Education and Recreation—For administrative officers, as well as for teachers and directors, A study of modern trends in health, physical education, and recreation. Policies and procedures of administration. *Cr* 3. MR. RANKIN, MISS KLEINDIENST

276. Physiology of Activity—The study of physiological function as it relates to good use of the body in sports activity and posture. Cr 3. STAFF

279. Current Studies in the Administration of Athletics—For administrative officers as well as for the teachers and directors of physical education. Deals with the policies in the organization of the program and the method of administration to secure the best results. *Cr* 3. MR. RANKIN

281. Recreation in the American Community—Problems involved in organizing and administering community recreation, including school-community programs. Legal aspects, organization of a department and its program, budgeting and financing public relations, facilities and equipment, selection and supervision of staff. *Cr* 3. MISS KLEINDIENST, MISS BROWN

282. Adaptive and Corrective Physical Education—Instruction in methods of meeting the physical needs of children with certain physical defects. Causes and

corrections of faulty body mechanics, physical examination, methods for diagnosis of postural defects and program adaptation. *Cr* 3. STAFF

283. Administration of Elementary and Secondary School Health Programs—Designed to develop teacher competencies in improving the school health program. Principles of developing the program, home, school, and community resources and operation, solving health problems, evaluation of health materials. *Cr* 3. STAFF

284. Evaluative Procedures in Health, Physical Education, and Recreation—Familiarizes the student with the practical use and value of tests and measurements in health, physical education, and recreation. *Cr* 3. MISS KLEINDIENST

310. Seminar in Health, Physical Education, and Recreation—Limited to advanced students. Provides discussion and applications of methods and techniques of educational research to problems in health, physical education, and recreation. Each student is required to report upon research studies. *Cr* 3.

MR. RANKIN, MISS KLEINDIENST

398. Problems in Health, Physical Education and Recreation—Limited to advanced students. Contemporary problems in health, physical education, and recreation designed to broaden the student's understanding of principles and current practices as they relate to school programs. Students are required to isolate, describe, and seek solutions for problems related to these fields. *Cr* 1-3.

MR. RANKIN, MISS KLEINDIENST

COLLEGE OF LIFE SCIENCES AND AGRICULTURE

WINTHROP C. LIBBY, DEAN

Hitchner Hall

College of Life Sciences and Agriculture

The College of Life Sciences and Agriculture is composed of the School of Forestry, the School of Home Economics, and the Departments of Agricultural Business and Economics, Agricultural Engineering, Animal Science, Animal Pathology, Bacteriology, Biochemistry, Botany and Plant Pathology, Entomology, Food Science, and Plants and Soils.

While considerable variation in program requirements exists among units of the college, all have as common objectives: proficiency in a professional subject-matter field and broad, liberal training for effective citizenship.

The college offers programs leading to the bachelor of science degree in the following fields:

1. **Agricultural Business and Economics**
2. **Agricultural Engineering (Jointly with College of Technology)**
3. **Agricultural Mechanization**
4. **Animal Sciences**
5. **Bacteriology**
6. **Biochemistry**
7. **Biology**
8. **Botany**
9. **Entomology**
10. **Forestry and Wildlife Management**
11. **Home Economics**
12. **Plant and Soil Sciences**

In addition to the above, special programs in Agricultural Education, Dairy Manufacturing, and Food Processing are offered as 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 and to transfer to other specified New England universities for the remaining two years of professional training.

A two-year Pre-Veterinary curriculum is provided for those who wish to qualify for entrance into a regular college of veterinary medicine.

The Two-Year Technical Division offers associate-degree technical training to young men and women in Animal Technology, Laboratory Technology, Business Management, Food Service Management and Merchandising.

Freshman Year

Students admitted to degree programs of the College of Life Sciences and Agriculture will be enrolled in one of the following freshman programs:

Agricultural Business and Economics

FALL SEMESTER

		Subject	Credit Hours
Ab	47	Prin. of Agri. Economics	3
LSA	1	Orientation	0
Bt	1	General Botany	4
or Zo	3	Animal Biology	
Ch	1	Chemistry	4
or Bc	7	Chemistry	
Eh	1	Freshman Composition	3
Ms	3	College Algebra	2
Pe	1	Physical Education	0
			16

SPRING SEMESTER

		Subject	Credit Hours
Ab	24	Sociology of Rural Life	3
Eh	2	Freshman Composition	3
Ms	1	Trigonometry	2
Pe	2	Physical Education	0
S	2	Soils	3(4)
		Electives	6
			17(18)

Agricultural Engineering

FALL SEMESTER

		Subject	Credit Hours
LSA	1	Orientation	0
Ch	1	General Chemistry	4
Eh	1	Freshman Composition	3
Eg	1	Engineering Drawing	2
Gc	5	Orientation	0
Ms	12	Anal. Geom. & Cal.	4
Pe	1	Physical Education	0
Ps	1	General Physics	5
			18

SPRING SEMESTER

		Subject	Credit Hours
Ch	2	General Chemistry	4
Eh	2	Freshman Composition	3
Eg	2	Engineering Drawing	2
Ms	27	Calculus	4
Pe	2	Physical Education	0
Ps	2	General Physics	5
			18

Agricultural Mechanization

FALL SEMESTER

		Subject	Credit Hours
LSA	1	Orientation	0
Ab	41	World Food Supply	3
Ch	1	General Chemistry	4
Ec	1	Principles of Economics	3
Eg	1	Engineering Drawing	2
Eh	1	English Composition	3
Ms	1	Trigonometry	2
Pe	1	Physical Education	0
			17

SPRING SEMESTER

		Subject	Credit Hours
Ch	2	General Chemistry	4
Ec	2	Principles of Economics	3
Eg	2	Engineering Drawing	2
Eh	2	English Composition	3
Ms	3	Algebra	2
Pe	1	Physical Education	0
		Electives	3
			17

Animal Sciences—Plant and Soil Sciences

FALL SEMESTER			Credit Hours	SPRING SEMESTER			Credit Hours
		Subject				Subject	
LSA	1	Orientation	0	Ch	2	General Chemistry	4
Ch	1	General Chemistry	4	Eh	2	Freshman Composition	3
Eh	1	Freshman Composition	3	Ms	1*	Trigonometry	2
Ms	3*	College Algebra	2	Pe	2	Physical Education	0
Pe	1	Physical Education	0	S	2	Soils	4
Bt	1	General Botany	4	or Zo	4	Animal Biology	
or Zo	3	Animal Biology				Electives	4
		Electives	4				
			17				17

* Ms 5 & 6 Ms 12 may be substituted

Biological Sciences

(Bacteriology-Biochemistry-Biology-Botany-Entomology)

FALL SEMESTER			Credit Hours	SPRING SEMESTER			Credit Hours
		Subject				Subject	
LSA	1	Orientation	0	Ch	2	General Chemistry	4
Ch	1	General Chemistry	4	Eh	2	Freshman Composition	3
Eh	1	Freshman Composition	3	*Ms	12	Anal. Geom. & Cal.	4
*Ms	1	Trigonometry	2	Pe	2	Physical Education	0
*Ms	3	College Algebra	2	Bt	2	Plant Kingdom	
Pe	1	Physical Education	0			or	4
Bt	1	General Botany		Zo	4	Animal Biology	
		or	4			Elective	2
Zo	3	Animal Biology					
		Elective	2				
			17				17

* Ms 5, 6, Elements of College Mathematics, may be substituted for Ms 1, 3 and 12 for those students who seek a degree in Botany or in Biology.

Forestry and Wildlife

FALL SEMESTER			Credit Hours	SPRING SEMESTER			Credit Hours
		Subject				Subject	
Bt	1	General Botany		Ch	2	General Chemistry	4
		or	4	Eh	2	Freshman Composition	3
Zo	3	Animal Biology		Eg	12	Forestry Drawing	2
Ch	1	General Chemistry	4	Fy	2	Introduction to Forestry	2
Eh	1	Freshman Composition	3	Ms	1	Trigonometry	2
Eg	1	Engineering Drawing	2	Pe	2	Physical Education	0
Fy	1	Introduction to Forestry	2	Zo	3	Animal Biology	
Ms	3	College Algebra	2			or	4
Pe	1	Physical Education	0	Bt	1	General Botany	
			17				17

Home Economics

(See Page 208)

PROGRAMS OF INSTRUCTION

Courses numbered 1-99 are for undergraduates; courses numbered 100-199 are also for undergraduates but may be taken for graduate credit with special permission; courses numbered 200-299 are for graduates but may be taken for undergraduate credit with special permission; courses numbered 300-399 are for graduates.

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.

Courses offered in 1966-67 and alternate years are indicated by the sign (‡) placed before the number of the course; courses offered in 1967-68 and alternate years are indicated by the sign (†) placed before the number of the course.

AGRICULTURAL BUSINESS AND ECONOMICS

PROFESSORS METZGER, PERRY, PLOCH, PULLEN, SAUNDERS*; ASSOCIATE PROFESSORS AIKEN, AYLING, CLARK, DELPHENDAHL, DUNHAM, KROFTA; ASSISTANT PROFESSORS HYATT, ROBINSON, WING

The Department of Agricultural Business and Economics offers a curriculum leading to the B.S. degree in agricultural business and economics, with emphasis in business management, marketing, resource economics, and rural sociology. 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 provide 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. In addition, economic training is complemented with a comprehensive, integrated program of courses in the life sciences, other social sciences, communication, 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.

The B.S. degree in agricultural business and economics requires satisfactory completion of at least 132 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:

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* On leave of absence

Curriculum for Agricultural Business and Economics

Required Courses		Credit Hours	Minimum Degree Hours Required
A. ORIENTATION			0
B. BASIC SCIENCES			21
Bc 7 or Ch 1	Fundamentals of Chemistry or General Chemistry	4	
Bt 1	General Botany	4	
Zo 3 or AnP 135	Animal Biology, or Anatomy of Domestic Animals	3	
Ms 1 & 3 or 5 & 6	Trigonometry and College Algebra or Elements of College Mathematics	4	
By 21	Introduction to Bacteriology	3	
	Electives	3	
C. COMMUNICATIONS			12
Eh 1 & Eh 2	Freshman Composition	6	
Eh 5	Technical Composition	2	
Sh 1	Fundamentals of Public Speaking	2	
* Sh 3	Advanced Public Speaking	2	
D. HUMANITIES AND SOCIAL SCIENCES			17
Py	Psychology	3	
Pl	Philosophy	3	
Gt 21 or 22	Current World Problems	3	
Gt 1	American Government	3	
Hy	History	3	
Eh	Literature	2	
E. LIFE SCIENCES AND AGRICULTURE			18
S 2	Soils	3	
An	Animal Science	3	
P	Plant Science	3	
	Electives in Life, Food or Agricultural Sciences	9	
F. BUSINESS AND ECONOMICS			18
Ec 1 & 2	Principles of Economics	6	
Ba 9	Principles of Accounting	3	
Ba 149	Business Economics	3	
	Electives (business and economics courses are required of Agricultural Business and Economics majors and sociology courses for Rural Sociology majors)	6	
G. AGRICULTURAL BUSINESS AND ECONOMICS			20
Ab 24	Sociology of Rural Life	3	
Ab 47	Principles of Agricultural Economics	3	
Ab 166	Food and Fiber Marketing	3	
Ab 169	Price Analysis & Forecasting	3	
Ab 193, 194	Seminar	2	
	Electives	6	
H. OTHER			3
Ms 19	Principles of Statistical Inference	3	
I. FREE ELECTIVES	Any course in the University for which the student is qualified.		23
Minimum Degree Hours Required for Graduation			**132**

* With permission of the student's adviser some course in a foreign language or in oral or written communication may be substituted.

Curriculum for Rural Sociology

Students who major in Rural Sociology take the same program as major students in Agricultural Business and Economics except for the requirements listed under section F (18 hours) and G (20 hours). The following 38 credit hours substitute for section F and G:

Ec 1	Principles of Economics	3
Ab 47	Principles of Agricultural Economics	3
Ab 24	Sociology of Rural Life	3
Ab 42	World Population Resources	3
Ab 129	The Individual and the Community	3
Ab 150	Human Factors in Resource Development	3
Ab 166	Food and Fiber Marketing	3
Ab 193, 194	Seminar	2
Py 2	General Psychology	3
Sy 3/4	Introduction to Sociology or Introduction to Anthropology	6
Ay 1/2	Electives (Sociology or Anthropology	3
		38

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.

Courses in Agricultural Business and Economics (Ab)

41. World Food Supply and Economic Development—Economic factors affecting supply of and demand for food in various regions of the world. Principles of economic growth and development. Economic development as means to alleviate the food deficit of emerging nations. *Rec* 3, *Cr* 3.

MR. DELPHENDAHL

47. Principles of Agricultural Economics—A study of economic principles applied to the business firm, with consideration given to production specialization, marketing, use of human and natural resources, and governmental policy. *Rec* 3, *Cr* 3. MR. DELPHENDAHL

†***151. Labor Utilization and Cost Analysis***—Labor as a factor in production, manufacturing, and distribution. The principles and procedures for improving operating efficiences. Problems will furnish practice in planning improved work methods and managerial procedures. *Rec* 2, *Lab* 2, *Cr* 3. MR. WING

154. Farm Business Management—Principles in making economic decisions on farm organization, soil management, crop and animal production, and use of resources on the farm; consideration of credit, records, and tax management. Prerequisite: Ab 47 *Rec* 3, *Lab* 2, *Cr* 4. MR. KROFTA

‡***159. Cooperative Business Organization and Management***—Legal framework, organization, finance, taxation, business analysis, and public relations of cooperative business and comparisons with private, partnership, and corporate businesses. Prerequisite: Ab 47. *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.

166. Food and Fiber Marketing—Economic principles applied to marketing structures, services and agencies; analysis of costs and efficiences; impact of

industry organization and government. Prerequisite: Ab 47. *Rec* 3, *Cr* 3.

‡***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: Ab 47. *Rec* 2, *Lab* 2, *Cr* 3. MR. DUNHAM

‡***169. 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: Ab 47, Ec 1 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: Ab 47. *Rec* 3, *Lab* 1, *Cr* 3.
MR. DELPHENDAHL

†***172. 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: Ab 171 or permission. *Rec* 3, *Lab* 1. *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: Ab 47. *Rec* 3, *Cr* 3. MR. DELPHENDAHL

193. 194. Seminar—Discussion of current economic problems. Prerequisite: seniors and graduates. *Rec* 1, *Cr* 1. MR. METZGER

199. Problems and Readings—Analysis of and readings on current problems in agricultural business and economics, and rural sociology. Prerequisite: permission of instructor. *Rec* 2, *Cr* 2. STAFF

204. Marketing Theory and Concepts—Economic theory underlying the policies of marketing firms; the details of current marketing problems and current market practices for selected commodities. Prerequisite: Ab 166. *Cr* 3.

207. 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: Ec 1 & 2, Ms 19 or permission. *Cr* 3.
MR. KROFTA

259. Research Methods in Agricultural Business and 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. *Cr* 3. STAFF

399. Graduate Thesis—*Cr Ar.* STAFF

Courses in Rural Sociology (Ab/Sy)

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

‡***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, program planning and development are stressed. Community project. Prerequisite: Ab/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: Ab 24/Sy 4 or permission. *Rec* 3, *Cr* 3. MR. PLOCH

Graduate Work in Agricultural Business and Economics

The degree of master of science in agricultural business and economics is offered with an opportunity for specialization in food distribution and marketing, agricultural business management, resource development, and rural sociology.

Students may select a minor area of study in a related subject matter field. Candidates will be encouraged to enroll in graduate level courses in the College of Business Administration and in the Department of Mathematics.

AGRICULTURAL ENGINEERING

PROFESSORS SMITH, RHOADS; ASSOCIATE PROFESSORS KLINGE, ROWE, WILLIAMS; ASSISTANT PROFESSORS HUFF, SOULE*

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 curriculum in Agricultural Engineering is a joint responsibility of the College of Technology and the College of Life Sciences and Agriculture, and provides training in the fundamentals of engineering and their application to agriculture.

The work of agricultural engineers falls in four major areas—agricultural power and machinery, electric power and processing, farm structures, and soil and water control. Examples of the many types of positions held by graduates of this curriculum are: design, field testing, sales and service with industrial and agricultural equipment concerns, building material manufacturers, electric power companies, trade associations, and food processing plants; research and development work with government agencies; teaching, research, and extension work with colleges and experiment stations; advisory and managerial posts in connection with mechanized agricultural development here and abroad; field engineers on large farm enterprises; private business such as a consulting practice or equipment dealerships.

This degree requires satisfactory completion of at least 141 degree hours at

* On leave of absence 1966-67

an accumulative grade point average ot not less than 1.80 in a course of study which conforms to the following curriculum:

Agricultural Engineering Curriculum

Freshman Year. See Page 175.

Sophomore Year

FALL SEMESTER

		Subject	Hours Rec	Lab	Cr
AE	55	Mats. in Agr. Eng.	2	2	3
Ce	5	Surveying	2	3	3
Eg	3	Descriptive Geometry	0	4	2
Gc	7	Computer Programming for engineers	1	2	2
Me	50	Statics	3	0	3
Ms	28	Anal. Geom. & Cal.	4	0	4
		*Elective			1
					18

SPRING SEMESTER

		Subject	Hours Rec	Lab	Cr
AE	82	Introduction to Agr. Eng.	1	2	2
Bt	1	General Botany	2	4	4
Me	33	Thermodynamics	3	0	3
Me	52	Dynamics	3	0	3
Ms	29	Cal. & Diff. Eq.	4	0	4
		*Elective			2
					18

Junior Year

			Rec	Lab	Cr
AE	169	Agr. Processing	2	3	3
Ce	26	Hydraulics	3	3	4
Ee	41	Elem. Circuits	3	0	3
Me	23	Kinematics	3	0	3
Me	51	Strength of Mats.	4	0	4
		*Elective			1
					18

			Rec	Lab	Cr
AE	167	Agr. Power	2	3	3
S	2	Soils	3	0	3
Ce	52	Struct. Anal. & Des.	4	0	4
Eh	5	Tech. Composition	2	0	2
Sh	1	Speech	2	0	2
		*Elective			4
					18

Senior Year

			Rec	Lab	Cr
Ab	47	Agr. Economics	3	0	3
AE	160	Agr. Machinery	2	3	3
AE	165	Soil Water Eng.	3	3	4
AE	180	Seminar	1	0	1
AE	183	Spec. Prob. in Agr. Eng.			1
		*Electives			5
					17

			Rec	Lab	Cr
AE	163	Farm Structure Des.	2	3	3
		*Electives			13
					16

* 18 hours of elective credit must be in humanity-social science electives as specified for other engineering curricula except that three hours should be in Ab/Sy courses; sufficient additional elective credit must be in College of Life Sciences and Agriculture subjects to make a total of 40 credits.

LSA Orientation; Gc 5/6 Orientation; AE 79 Seminar; AE 80 Senior Seminar or AE 81 Departmental Seminar are required.

Students transferring to University of Maine from the University of Massachusetts or Rhode Island under the Regional Program should check the bulletins for those institutions for the first two years in Agricultural Engineering.

Graduate Work in Agricultural Engineering

The degree of master of science (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.

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 businesses either as field representatives of industrial concerns or as management personnel on mechanized production units.

Graduates of this type of curriculum are working 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 132 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:

Agricultural Mechanization Curriculum

Freshman Year. See Page 175.

Sophomore Year

FALL SEMESTER				SPRING SEMESTER			
Ab	151	Labor Utiliz. & Cost Anal.	3	AE	36	Farm Power	3
AE	20	Prin. of Agr. Mech.	3	MS	19	Prin. of Statistical Inf.	3
Ba	9	Prin. of Accounting	3	Ps	6	Essentials of Physics	5
Bt	1	General Botany	4	Sh	1	Public Speaking	2
Ms	17	Math. Theory of Invest.	3			Elective*	4
			16				17

Junior Year

Ab	24	Sociology of Rural Life	3	AE	32	Farm Struc. & Equip.	3
AE	31	Field Machinery Manage.	3	Eh	5	Tech. Composition	2
AE	35	Soil Water Control	3	S	2	Soils	3
AnP	35	Anatomy of Domestic Animals	3			Electives*	8
		Electives*	4				
			16				16

Senior Year

AE	83	Spec. Problems in A.E.	1	AE	84	Spec. Problems in A.E.	3
AE	134	Instrumentation	3	AE		Electrification	3
FS	101	Food Proc. Industry	3			Electives*	11
		Electives*	9				
			16				17

* Electives must include:

(a) at least 6 credit hours from courses listed in the catalog under Art, English, Foreign Languages and Classics, History and Government, Music and Philosophy.

(b) at least 7 credit hours of biological science courses.

(c) at least 9 credit hours of major field supporting courses. (Any course in the Department of Agricultural Business and Economics or College of Business Administration for which the student is qualified.)

(d) at least 9 credit hours of production related courses in the College of Life Sciences and Agriculture.

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. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

31. Field Machinery Management—Development of machinery systems for integrating farm field operations into food and fiber production processes; selection and use of machines and applications of power to these field operations. *Rec* 2, *Lab* 2, *Cr* 3. MR. ROWE

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. *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. SMITH

‡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. Forestry Power—The selection and application of power equipment in forestry activities. The construction, operation, and maintenance of internal combustion engines and related equipment. Open to students outside of Forestry. *Rec* 2, *Lab* 2, *Cr* 3. MR. SMITH

Courses numbered 50-99 and 151 or above are intended primarily for the professional Agricultural Engineering curriculum.

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 3 or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. HUFF

79. Seminar—Recent literature, developments and problems in the field of Agricultural Engineering. *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* 1. MR. SMITH

81. Departmental Seminar—Presentation and discussion of current development and problems which 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. SMITH

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. ROWE

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: Ce 52. *Rec* 2, *Lab* 3, *Cr* 3. MR. WILLIAMS

†***164. Instruments and Control Systems***—Theory and use of instruments for measuring and controlling such factors as temperature, moisture content, and fluid flow. Use of strain guages. Prerequisite: Ps 2 and Ms 28 or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

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 5, and 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. SMITH

169. Agricultural Process Engineering—Unit operations and their applications as related to agricultural processing and processing equipment. Prerequisite: Me 33 and Ce 26 (may be taken concurrently). *Rec* 2, *Lab* 3, *Cr* 3. MR. RHOADS

380. Graduate Seminar—*Rec* 1, *Cr* 1. STAFF

383/384. Problems in Agricultural Engineering—*Cr Ar.* STAFF

399. Graduate Thesis—*Cr Ar.* STAFF

ANIMAL PATHOLOGY (AnP)

PROFESSORS WITTER, CHUTE; ASSOCIATE PROFESSORS PAYNE, O'MEARA, GERSHMAN

The Animal Pathology offerings serve primarily as supporting courses for studies in the Animal Sciences and in the Wildlife Management curriculum. They also serve as elective opportunities for agricultural science and agricultural engineering students as well as for majors in the Department of Zoology.

This department also administers the Two-Year Pre-Veterinary curriculum.

135. Anatomy of Domestic Animals—Comparative anatomy of domestic mammals and birds, emphasizing histological features and those parts of the body of major physiological importance and those involved in meat cutting and common diseases. *Rec* 2, *Lab* 2, *Cr* 3. MR. WITTER, MR. CHUTE, MR. PAYNE

136. Physiology of Domestic Animals—Special emphasis is placed on comparative features, especially of the circulatory, respiratory, digestive, and urogenital systems of domestic animals and birds. Prerequisite: AnP 135 or equivalent. *Rec* 3, *Cr* 3. MR. PAYNE

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: AnP 136 or permission. *Rec* 3, *Cr* 3.
MR. WITTER, MR. PAYNE

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, with special emphasis on the areas which are commonly associated with infertility and disease. Offered during spring of even years. Prerequisite: AnP 35, AnP 36 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, emphasizing preventive and control measures and practice in autopsy techniques. Wildlife majors. *Rec* 2, *Lab* 2, *Cr* 3. MR. WITTER

151. 152. Problems in Animal Pathology—*Cr Ar.*
MR. WITTER, MR. CHUTE, MR. PAYNE

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: AnP 35, 36, Zo 51, Bc 60 or equivalent courses. *Rec* 2, *Lab* 2, *Cr* 3.
MR. CHUTE, MR. WITTER, MR. PAYNE

ANIMAL SCIENCES

PROFESSORS POULTON*, BIRD, DICKEY, GERRY, LEONARD; ASSOCIATE PROFESSORS BRUGMAN, HARRIS, HOOVER; ASSISTANT PROFESSORS APGAR, COCK; INSTRUCTOR NICHOLSON; LECTURERS FOX, SAWIN

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.

Superior students should consider continuing their studies at the graduate level. The Department of Animal Sciences offers the master of science degree in animal nutrition, animal physiology, and animal breeding. The doctor of philosophy degree can be earned in animal nutrition.

* On leave of absence 1966-67.

Curriculum for the B.S. Degree in Animal Sciences

		Credit Hours	Minimum Degree Hours Required
A. ORIENTATION			0
B. BASIC SCIENCES			30
Ch 1-2	General Chemistry	8	
Zo 3-4	Animal Biology	8	
	Mathematics	4	
At least 10 additional hours of basic science credits should be elected from the following:			
Bc 1-2	Organic and Biochemistry	8	
AnP 135-136 or Zo 133, Zo 177	Anatomy and Physiology	6 or 8	
By 21 or By 27	Bacteriology	3 or 5	
Ps 1a-2a	General Physics	8	
C. ANIMAL SCIENCES			28
An 5	Animal Science	3	
An 155 and An 156	Nutrition	6	
An 160	Animal Genetics and Breeding	3	
An 182 or An 170 or An 172	Advanced Physiology	3	
Electives in Animal Science		12	
D. AGRICULTURAL AND LIFE SCIENCES			20
The student may elect 20 hours in the agricultural and life sciences. At least one course should be selected from each of four subject-matter areas offered in the college.			
E. COMMUNICATION			10
Eh 1-2	Freshman Composition	6	
Eh 5	Technical Composition	2	
Sh 1	Fundamentals of Public Speaking	2	
F. HUMANITIES AND SOCIAL SCIENCES			10
Not less than two hours from each of the following groups:			
a. Literature, Philosophy, and Fine Arts			
b. Economics, Sociology, and Psychology			
c. History and Government			
G. FREE ELECTIVES			34
Any course in the University for which the student is qualified.			
Minimum Degree Hours for Graduation			**132**

Courses in Animal Sciences (An)

5. 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. POULTON, MR. COCK

6. 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. COCK

19. 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

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 tech-

niques of dairy cattle management. Prerequisite: An 5. *Rec* 2, *Lab* 2, *Cr* 3.
MR. LEONARD

48. Livestock Management — The selection, beeding, feeding, care and management of beef cattle, sheep, and swine. Prerequisite: An 5. *Rec* 3, *Lab* 2, *Cr* 4. MR. BRUGMAN

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

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

153. 154. Problems in Dairy Science—Prerequisite: permission. *Cr Ar.*
STAFF

155. Animal Nutrition—Principles of nutrition, methods of experimentation and discussion of nutritional balances. Prerequisite: Zo 4, Ch 2. *Cr* 3.
MR. DICKEY

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: An 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: An 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. POULTON 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 2. *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, AnP 136. *Rec* 3, *Lab* 2, *Cr* 4. MR. POULTON

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 3. *Rec* 3, *Lab* 2, *Cr* 4.

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: AnP 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

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: An 155. *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: An 155, 212. *Rec* 2, *Lab* 2, *Cr* 3. MR. COCK

218. Population Genetics—Application of genetic and biometric principles to the characteristics of populations. Prerequisite: An 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—Experimental procedures in animal research, principles of setting up experiments, analysis and interpretation of data, and methods of reporting results. Prerequisite: S 171. *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: An 155. *Cr* 3. MR. BLANBERG

363. 364. Graduate Seminar in Animal Science—*Cr* 1. MR. POULTON 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 187. 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.

BACTERIOLOGY

PROFESSORS RADKE AND WHITEHILL; ASSOCIATE PROFESSORS BAIN, BUCK; LECTURER WAYMOUTH

The Bacteriology 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 bacteriology are prepared for a 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 Bacteriology offers a master of science degree; a doctor of philosophy degree can be earned in the plant science field.

Curriculum Leading to a Bachelor of Science Degree in Bacteriology

Freshman Year. See Page 176.

Sophomore Year

FALL SEMESTER			Hours			SPRING SEMESTER			Hours		
Subject			Rec	Lab	Cr	Subject			Rec	Lab	Cr
By	127	General Bacteriology	3	0	3	By	136	Determinative Bact.	2	4	4
By	128	General Bacteriology Lab	0	4	2	Ch	140	Quant. Analysis	2	6	4
Ch	151	Organic Chemistry	3	0	3	Ch	152	Organic Chemistry	3	0	3
Ch	161	Organic Chemistry	0	4	2	Ch	162	Organic Chemistry Lab	0	4	2
Sh	1	Public Speaking	2	0	2			Elective			4
		Elective			5						
					17						17

Junior Year

			Rec	Lab	Cr				Rec	Lab	Cr
By	153	Bacterial Physiology	2	4	4	By	152	Pathogenic Bact. and Serology	2	4	4
Ps	1a	General Physics	2	4	4	Ps	2a	General Physics	2	4	4
		Elective			9			Elective			9
					17						17

Senior Year

FALL SEMESTER			Hours			SPRING SEMESTER			Hours		
Subject			Rec	Lab	Cr	Subject			Rec	Lab	Cr
Bc	61	Physiological Chem.	3	3	4	Bc	64	Biochem. Lab. Methods	0	6	3
By	187	Seminar in Bact.			1	By	176	Virology & Tissue Culture	2	4	4
		Elective			12	By	188	Seminar in Bact.			1
								Elective			9
					17						17

Courses in Bacteriology (By)

21. Introduction to Bacteriology — 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.
MR. BAIN

21a. Bacteriology for Nurses—School of Nursing students only. A laboratory and demonstration course to supplement certain areas of course By 21. Emphasis on the visualization of bacteria; the transmission, reproduction and control of infectious agents. *Lab* 2, *Cr* 1. MR. BAIN

23. Bacteriology for Nurses (3-yr.)—An elementary course in bacteriology, as it applies to nursing. Emphasis on sanitation, infection, and resistance, and bacteriology of infectious diseases. *Rec* 2, *Lab* 2, *Cr* 3. MR. WHITEHILL

127. General Bacteriology—A study of microorganisms with emphasis on their phylogenetic relationships to other forms of life. The physiological reactions associated with the metabolic activities of the single cells are discussed. Certain beneficial and harmful activities of microorganisms are presented and how these activities affect man. Prerequisites: Ch 2. *Rec* 2, *Cr* 3. MR. BUCK

128. Laboratory for General Bacteriology—A laboratory study of microorganisms to teach the basic procedures for staining, isolation and study of microscopic forms. Specific experiments are presented pertaining to the ability of micro-

organisms to grow in various substrates and the end-products of metabolism are studied. The applied phases of water, food, milk and sewage microbiology also are presented. Prerequisite: By 127. *Lab* 4, *Cr* 2. MR. BUCK AND STAFF

30. Fundamentals of Public Health—General consideration of the relationship between the health of the individual and environment. Prerequisite: By 21 or 127. *Lab* 4, *Cr* 4. MR. WHITEHILL

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: By 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: By 128. *Rec* 2, *Lab* 4, *Cr* 4. MR. BUCK

153. Bacterial Physiology—A study of the properties and behaviors of bacteria with respect to their chemical and physical requirements for life and reproduction. Prerequisite: By 128, Ch 152. *Rec* 2, *Lab* 2, *Cr* 4. MR. BAIN

171. Food Microbiology—Relation of microorganisms to food production; role of bacteria in the preparation of food, methods of food preservation, and sanitation; control of food-borne diseases and intoxication. Prerequisite: By 128. *Rec* 2. *Lab* 4, *Cr* 4.

176. Virology and Tissue Culture—An introductory course in the study of viruses, emphasizing their nature, methods of cultivation, mode of transmission, and classification. Prerequisite: By 152 or taken in conjunction. *Rec* 2, *Lab* 4, *Cr* 4. MR. BUCK

187. 188. Seminar—Preparation and presentation of papers dealing with current research and development in the field of bacteriology. *Cr* 1. STAFF

192. Problems in Bacteriology—A laboratory and conference course for students desiring to pursue some particular line of bacteriological investigation. Open only to students who have necessary prerequisites or permission of instructor. *Cr Ar.* STAFF

399. Graduate Thesis—*Cr Ar.* MR. BAIN, MR. BUCK, MR. WHITEHILL

BIOCHEMISTRY

PROFESSOR RADKE; ASSOCIATE PROFESSOR DEHAAS; ASSISTANT PROFESSOR SMITH

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 good 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.

Curriculum Leading to a Bachelor of Science Degree in Biochemistry

Freshman Year. See Page 176.

Sophomore Year

FALL SEMESTER			Hours			SPRING SEMESTER			Hours		
Subject			Rec	Lab	Cr	Subject			Rec	Lab	Cr
Ch	151	Organic Chemistry	3	0	3	Ch	140	Quant. Analysis	2	6	4
Ch	161	Organic Chem. Lab.	0	4	2	Ch	152	Organic Chemistry	3	0	3
Ms	27	Calculus	4	0	4	Ch	162	Org. Chem. Lab.	0	4	2
		Elective			7	Sh	1	Public Speaking	2	0	2
								Elective			4
					16						15

Junior Year

			Rec	Lab	Cr				Rec	Lab	Cr
Bc	161	Physiol. Chemistry	3	3	4	Bc	164	Biochem. Lab. Meth.	0	8	4
By	127	General Bacteriology	3	0	3	Eh	5	Tech. Composition	2	0	2
By	128	General Bacteriology	0	4	2	Ps	2	General Physics	4	2	5
Ps	1	General Physics	4	2	5			Elective			6
		Elective			3						
					17						17

Senior Year

			Rec	Lab	Cr				Rec	Lab	Cr
Be	171	Seminar	1	0	1	Bc	158	Physical Biochem.	3	3	4
Bc	191	Biochem. Research	0	6	3	Bc	172	Seminar	1	0	1
An	186	Bioassay	1	4	3	Bc	192	Biochem. Research	0	6	3
		Elective			13			Elective			9
					17						17

Courses in Biochemistry (Bc)

1. Organic Chemistry — Hydrocarbons, alcohols, acids, ketones, aldehydes, esters, amines, and amides. Prerequisite Ch 1 and 2. *Rec* 3, *Lab* 2, *Cr* 4.
MR. RADKE

2. Biochemistry—H-ion concentration; the properties, digestion, metabolism, and excretion of carbohydrates, fats and proteins; enzymes, vitamins, soil, fertilizers, pesticides. Prerequisite: Bc 1. *Rec* 3, *Lab* 2, *Cr* 4. MR. RADKE

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. MISS SMITH

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. DEHAAS

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. DEHAAS

158. 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. Physiological Chemistry—The physiological utilization of the carbohydrates, fats, and proteins and the role of enzymes, hormones, and vitamins. Prerequisite: Ch 151 and 152. *Rec* 3, *Lab* 3, *Cr* 4.

164. Biochemical Laboratory Methods—Chromatography, electrophoresis, tracer techniques, manometry, and other procedures employed in biological research. Prerequisite: Bc 161 or instructor's permission. *Lab* 8, *Cr* 4.

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 161. *Rec* 3, *Cr* 3.

‡225. Proteins and Enzymes—A comprehensive study of the structure and properties of proteins with special emphasis on their catalytic activity. Prerequisite: Bc 161. *Rec* 3, *Cr* 3. MR. RADKE

†231. Vitamins and Hormones—The chemistry and biological activity of the regulators of living systems. Prerequisite: Bc 161. *Rec* 3, *Cr* 3. MR. DEHAAS

†Bc 234. Plant Biochemistry—The biochemistry of photosynthesis, respiration and other metabolic processes in plants including growth regulators and essential elements. Prerequisite: Bc 161 or permission. *Rec* 3, *Cr* 3. MISS SMITH

399. Graduate Thesis— *Cr Ar.* MR. DEHAAS, MR. RADKE, MISS SMITH

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.

Students preparing to teach high school biology will find this program appropriate. So will persons preparing for careers in medicine, marine biology, or for work with U.S. fisheries. 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, research at the university level, in government or in biology based industries.

The curriculum in Biology is an interdepartmental offering in the College of Life Sciences and Agriculture administered by a committee representing the Departments of Bacteriology, Biochemistry, Botany and Entomology.

Freshman Year. See Page 176.

Curriculum Leading to the B.S. Degree in Biology

		Credit Hours	Minimum Degree Hours Required
A. BIOLOGICAL AND PHYSICAL SCIENCES			69
Ch 1-2	General Chemistry	8	
Ms 1, 3, 12 or Ms 5, 6	Trigonometry, College Algebra & Analytic Geometry & Calculus / Elements of College Mathematics	6 or 8	
Ps 1a-2a	General Physics	8	
Bt 1-2	General Botany	8	
Zo 3-4	Animal Biology	8	
En 26	General Entomology	4	
By 127	General Bacteriology	3	
By 128	General Bacteriology Lab	2	
Bc 1-2 or Ch 151 152	Organic and Biochemistry / Organic Chemistry	8 or 10	
Ch 161-162	Organic Chemistry Lab.		
Bt 145, Zo 163	Genetics	3	
By 136, Bt 154 / En 140, Bt 159	Taxonomy	4	
Bc 161, Bt 153 / By 153, Zo 177	Physiology	4	
Bt 135, En 151 / Zo 133	Anatomy	4	
B. COMMUNICATIONS			10
Eh 1-2	Freshman Composition	6	
Eh 5, 7, 8, 19	Composition	2 or 3	
Sh 1, Sh 31	Speech	2	
C. HUMANITIES AND SOCIAL SCIENCES			10
Not less than two hours from each of the following groups:			
a. Literature, Philosophy, and Fine Arts			
b. Economics, Sociology, and Psychology			
c. History and Government			
D. FRESHMAN ORIENTATION			0
E. PHYSICAL EDUCATION			0
F. ELECTIVES			43
Minimum Degree Hours for Graduation			**132**

BOTANY AND PLANT PATHOLOGY

PROFESSORS CAMPANA, COOPER, RICHARDS; ASSISTANT PROFESSORS MCINTYRE, NEUBAUER

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. Majors interested in graduate study in plant physiology, plant pathology, or genetics should take mathematics through calculus (Ms 12), organic chemistry through Ch 152, German and statistics. Botany majors interested in general biology should take Animal Biology (Zo 3 & 4), Comparative Anatomy (Zo 133) and Animal Physiology (Zo 177) as electives.

Freshman Year. See Page 176.

Sophomore Year

FALL SEMESTER

		Subject	Hours Rec	Lab	Cr
Bt	135	Plant Anatomy	2	3	3
†Ec	1	Prin. of Economics	3	0	3
Bc	1	Organic Chemistry	3	2	4
		or			
Ch	151	Organic Chemistry	3	0	3
Ch	161	Organic Chemistry Lab	0	4	2
†Gm	1	El. German	5	0	4
		Elective			2
					16 or 17

SPRING SEMESTER

		Subject	Hours Rec	Lab	Cr
S	2	Soils	3	0	3
†Ec	2	Prin. of Economics	3	0	3
Bt	154	Taxonomy of Vascular Plants	2	4	4
†Gm	2	El. German	5	0	4
		Elective			4
					18

Junior Year

		Subject	Hours Rec	Lab	Cr
Bt	145	Genetics	3	0	3
En	26	Intro. Entomology	2	4	4
Eh	7	Sec. Yr. Composition	3	0	3
†Gm	3	Intermed. German	3	0	3
Ps	1a	General Physics	2	4	4
					17

		Subject	Hours Rec	Lab	Cr
†S	171	Experimental Design	3	2	4
†Bt	130	Ecology	3	0	3
Eh	8	Sec. Yr. Composition	3	0	3
†Gm	4	Intermed. German	3	0	3
Ps	2a	General Physics	2	4	4
					17

Senior Year

		Subject	Hours Rec	Lab	Cr
Bt	153	Plant Physiology	2	4	4
†Bt	159	General Mycology	2	4	4
†Bt	161	Botany Seminar	1	0	1
By	127	General Bacteriology	3	0	3
By	128	General Bacteriology Lab	0	4	2
†Py	1	General Psychology	2	2	3
					17

		Subject	Hours Rec	Lab	Cr
Bt	156	Plant Pathology	2	4	4
†Bt	162	Botany Seminar	1	0	1
†Gt	1	Amer. Government	3	0	3
†Pl	35	Logic	3	0	3
†Py	2	General Psychology	2	2	3
		Elective			3
					17

† Suggested electives; other courses may be submitted at discretion of student and adviser.

Courses in Botany (Bt)

1. General Botany—An introduction to the structure, function and ecology of plants, with a brief study of plant evolution. Open to students of all colleges. *Rec* 3, *Lab* 2, *Cr* 4. STAFF

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* 2, *Lab* 4, *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

130. Plant Ecology—Concepts and principles of plant community study with a brief survey of the vegetation of North America. Laboratory and field exercises stress systematic observations for quantitative analysis. Open to juniors, seniors, and graduates. Prerequisite: Bt 1 and permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. COOPER

135. Plant Anatomy—Structure of woody and herbaceous plants. Prerequisite: Bt 1. *Lec* 2, *Rec* 1, *Lab* 2. MR. NEUBAUER

145. Genetics—Principles of genetics. Prerequisite: one year of biology. Open to juniors and seniors. *Rec* 3, *Cr* 3. MR. NEUBAUER

Courses for Undergraduates and Graduates

47. 48. 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

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.

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.

120.* Structure of Plants Used by Man—A course designed to familiarize elementary and secondary school teachers with the structure of our common economics 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.

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 be taken to collect and study plants in various habitats. Additional requirements will be stipulated for graduate credit. *Rec* 3, *Cr* 3. MR. RICHARDS

131.* Plants and Environment—The dynamic aspects of the environmental relationships of plants. *Rec* 3, *Cr* 3. MR. COOPER

132* Life Processes in Plants—A study of the fundamental life processes involved in the growth and reproduction of flowering plants. *Rec* 3, *Cr* 3. MR. COOPER

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

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* Permission of instructor required.

150. Histological Technique—Methods and technique in the preparation of microscopic sections of plant material. *Rec* 1, *Lab* 6, *Cr* 3. MR. NEUBAUER

151. Plant Biology—A field course in botany designed to be of value in both elementary and secondary schools. The classwork will be given primarily in the field. All the major groups of plants will be covered with special attention to their type of habitat and plant relations. Student projects for use in their own classrooms will be encouraged. *Rec* 3, *Cr* 3. MR. COOPER

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

‡***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. STAFF

161. 162. Seminar—Literature reviews. Techniques, procedures and results in botanical research. *Rec* 1, *Cr* 1. STAFF

201. 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

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 153. *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 35 or equivalent. *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

307/308. Problems in Botany—*Cr* Ar. STAFF

399. Graduate Thesis—*Cr Ar.* STAFF

ENTOMOLOGY

PROFESSORS SIMPSON, BOULANGER, DIMOND;
ASSISTANT PROFESSORS OSGOOD, STORCH

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 Dept of Zoology.

Curriculum Leading to a Bachelor of Science Degree in Entomology

Freshman Year. See Page 176.

Sophomore Year

FALL SEMESTER

		Subject	Hours Rec	Lab	Cr
Bc	1	Organic Chemistry	3	2	4
		or			
Ch	31	Qual. Anal. Inorgan. Chem.	2	6	
Bt	1	General Botany	2	4	4
En	26	Introd. Entomology	2	4	4
		Elective			5
					17

SPRING SEMESTER

		Subject	Hours Rec	Lab	Cr
Bc	2	Biochemistry	3	2	4
		or			
Ch	140	Quant. Analysis	2	6	
Bt	154	Taxonomy of Vasc. Plants	2	4	4
En	140	El. Tax. of Insects	2	4	4
		Elective			5
					17

Junior Year

		Subject	Hours Rec	Lab	Cr
Bt	145	Genetics *	3	0	3
En	151	Morph. of Insects			
		or			
En	153	Adv. Taxon. of Insects	2	4	4
Ps	1a	General Physics	2	4	4
Zo	153	Invertebrate Zoology	2	4	4
		Elective			2
					17

		Subject	Hours Rec	Lab	Cr
Eh	5	Tech. Composition	2	0	2
Sh	1	Public Speaking	2	0	2
Ps	2a	General Physics	2	4	4
Zo	158	Parasitology	2	4	4
		Elective			5
					17

* May Substitute Zo 163 Principles of Genetics

Senior Year

FALL SEMESTER		Hours Rec	Lab	Cr	SPRING SEMESTER		Hours Rec	Lab	Cr
By	127 General Bacteriology	3	0	3	Bt 156	Plant Pathology	2	4	4
By	128 General Bacteriology Lab	0	4	2	En 148	Prob. in Entomology	0	4	2
En	149 Economic Entom.	2	2	3		Elective			11
En	151 Morph. of Insects or								
En	153 Adv. Taxon. of Insects	2	4	4					
	Elective			5					
				17					17

Courses in Entomology (En)

26. Introductory Entomology—Fundamental principles of insect life and the relations 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. *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. *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

61. 62. Seminar—A study of the literature and techniques of entomology. *Rec* 1, *Cr* 1. 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 22 or 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—Considerations of the various methods used in the control of important pests of orchard, garden, and farm. Prerequisite: En 26. *Rec* 2, *Lab* 2, *Cr* 3. MR. BOULANGER

‡151. 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

†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

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 151 and 153 or permission. *Rec* 1, *Lab* 4, *Cr* 3. MR. BOULANGER

211. Insect Ecology—A study of factors governing distribution and abundance of insect populations in nature. Life-table approach to ecological studies

using native forest insects as examples. Outside readings. Prerequisite: En 151 and 153 or permission. *Rec* 1, *Lab* 2, *Cr* 2. MR. DIMOND

213. Entomological Literature and Rules of Nomenclature—Use of indices to the entomological literature and the major research journals. Each student will be required to prepare a hypothetical revision or monograph of a genus or some other small group of insects. Prerequisite: En 151 and 153. *Rec* 1, *Cr* 1. STAFF

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. Physiology and Behavior of Insects—Assigned readings from text and from current research publications. Classroom demonstrations and individual laboratory problems illustrating phases of insect physiology or behavior. Prerequisite: En 151 and Bc 2. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

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

FOOD SCIENCE

PROFESSOR HIGHLANDS AND ASSOCIATE PROFESSOR HOGAN

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

281. 282. Problems in Food Science—Enrollment by permission. *Cr Ar.*

MR. HIGHLANDS AND STAFF

The School of Forestry

DIRECTOR NUTTING; ASSISTANT DIRECTOR CORCORAN; PROFESSORS BAKER, COULTER, MENDALL, YOUNG; ASSOCIATE PROFESSORS BEYER, GRIFFIN, PLUMMER, RANDALL, SCHEMNITZ, SHOTTAFER; ASSISTANT PROFESSOR SCHOMAKER; INSTRUCTOR ROBBINS

Two curricula with seven sequences are offered in the School of Forestry. They have a common freshman year. The objectives are: (1) to train students in the theories and techniques for positions in forest land management, forest product harvesting, manufacture and sale, and game management; (2) to prepare qualifying students for graduate work; (3) to provide a broad education for effective citizenship.

Graduation requirements in the School of Forestry 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 sequence selected; (3) an accumulative average of not less than 1.80.

FORESTRY

The sequence in Forestry offer students an opportunity to qualify for a degree in forestry, membership in the Society of American Foresters, 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, an eight week's camp near Princeton, Maine (Indian Township), is required.

Students are accepted for graduate work in the fields of forest economics, management, recreation, silviculture, utilization, and wood science leading to the degree of master of science in forestry.

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 eight 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.

A graduate program in wildlife is offered by he University 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 sponsor the advancement, organization, and operation of wildlife research, education, extension, and demonstration programs. Graduate students in Wildlife Management are under the supervision of the unit leader.

SCHOOL OF FORESTRY

Curricula and Sequences

Students in forestry and wildlife have seven sequences from which to choose their program.

Forest Management
Forest Utilization
Forest Science (Tree Growing)
Forest Science (Wood Technology)
General Forestry
Wildlife Science
Wildlife Management

Freshman Year

A common freshman year program is recommended for all students in the School of Forestry (See page 176). 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 64 credit hours of core courses:

		Hours Required	Fresh.	Soph.	Jr.	Senior
Ch 1 & 2	Chemistry	8	8			
Bt 1	Botany	4	4			
Bt 33	Dendrology or					
Bt 154	Taxonomy	4		4		
Ps 6	Physics	5		5		
Ms 1 & 3	Math	4	4			
Zo 3	Zoology	4	4			
Eh 1 & 2	Freshman Composition	6	6			
Eh 5	Technical Composition	2			2	
Sh 1	Speech	2		2		
	Literature or Fine Arts	2		2		
	History or Government	2		2		
Ec 1 & 2	Economics	6		6		
Eg 1	Engineering Graphics	2	2			
Ce 5	Surveying	3		3		
Fy 1 & 2	Introduction to Forestry	4	4			
Fy 4 & 5	Mensuration	6		6		
Fy 60	Seminar	1				1
	Total	65	32	30	2	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	2
Fy	134	Timber Management	3
Fy	144	Forest Economics	3
		Spring Trip	1
		Summer Camp	8
			27

All Wildlife Sequences

			Credit Hours
S	3	Forest Soils	3
Bt	130	Plant Ecology	3
Bt	154	Vascular Plants	4
Fy	19	Wildlife Ecology	2
Fy	127 & 128	Game Management	6
Zo	153	Invertebrate Zoology	4
			22

Forestry Management Sequence

			Credit Hours
S	3	Forest Soils	3
Bt	153	Plant Physiology	4
Bt	156	Forest Pathology	4
Eg	12	Forestry Drawing	2
Ba	9	Accounting	3
Fy	6	Forestry Photogrammetry	3
Fy	10	Forest Planting	2
Fy	11	Forest Fire Control	2
Fy	13	Harvesting Timber Crops	2
Fy	20	Forest Administration	2
Fy	142	Forest Policy	2
Fy	143	Forest Valuation	2
Gy	6	Geology for Engineers	3

Forest Utilization Sequence

			Credit Hours
Bt	35	Plant Anatomy	4
Eg	12	Forestry Drawing	2
Ba	9	Accounting	3
Fy	11	Fire Control	2
Fy	13	Timber Harvesting	2
Fy	14	Forest Products	3
Fy	15	Lumber Mfg.	2
Fy	16	Wood Identification	1
Fy	20	Forest Administration	2
Fy	142	Forest Policy	2
Fy	143	Forest Valuation	2
Fy	112	Wood Tech. Lab.	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	Timber Harvesting	2
Fy	14	Forest Products	3
Fy	20	Forest Administration	3
Fy	142	Forest Policy	3
Gy	6	Geology for Engineers	3
Ms	12	Anal. Geom. & Calculus	4
Ps	1 & 2	Physics	10

Forest Science—Wood Technology Sequence

			Credit Hours
Bt	135	Plant Anatomy	4
Bt	156	Forest Pathology	4
Fy	13	Timber Harvesting	2
Fy	14	Forest Products	3
Fy	16	Wood Identification	1
Ms	12	Anal. Geom. & Calculus	4
Ps	1 & 2	Physics	10

General Forestry Sequence

	Credit Hours
Botany, Geology, Soils	6
Forestry	15

Wildlife Science Sequence

			Credit Hours
AnP	144	Disease & Parasite Cont.	3
En	26	General Entomology	4
Fy	6	Photogrammetry	3
Fy	8	Silviculture	3
Fy	35	Timber Management	3
Fy	41s	Summer Camp	8
Fy	144	Forest Economics	2
Zo	132	Ichthyology	4
Zo	139	Mammalogy	3
Zo	160	Ornithology	4
Zo	171	Fish Management	4

Wildlife Management Sequence

			Credit Hours
En	26	General Entomology	4
Gy	6	Geology for Engineers	3
Zo	160	Ornithology	4
Zo	139	Mammalogy	3
Zo	153	Invertebrate Zoology	4
Fy	7 or 8	Silvics	3
Ps	1a	General Physics	4
Ps	2a	General Physics	4

Courses in the School of Forestry (Fy)

1. Introduction to Forestry—Instruments and techniques for field measurements—orientation. Required of freshmen in the School of Forestry. *Rec* 1, *Lab* 3, *Cr* 2. STAFF

2. Introduction to Forestry—A survey of the fields of forestry and wildlife conservation. Required of freshmen in the School of Forestry. *Rec* 2, *Cr* 2. STAFF

4. Forest Sampling Methods — 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. YOUNG & MR. ROBBINS

5. Forest Mensuration—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. ROBBINS

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. ROBBINS

7. Silvics—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. MR. RANDALL

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

14. Forest Products—Forest products other than logs and lumber. Importance, methods of manufacture, and utilization. Importance of forest industries, problems, and trends. *Rec* 2, *Lab* 3, *Cr* 3. MR. BEYER

15. Lumber Manufacture—Milling and marketing problems of the lumber industry in America. *Rec* 2, *Cr* 2. MR. BAKER

16. Wood Identification—Identification and classification of the commercial woods of the United States based on simple lens inspection and gross characteristics. *Lab* 2, *Cr* 1. MR. BAKER

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. Wildlife Ecology—Geographic and ecologic distribution of game birds and mammals. Ecologic principles of game management. *Rec* 2, *Cr* 2. MR. COULTER

19s. Wildlife Ecology—Field problems in forest-wildlife ecology. Recognition, measurement, analysis and interpretation of problems in forest-wildlife relationships. Forty-four hours at camp for one week. *Cr* 1. MR. SCHEMNITZ

20. Forest Administration—Problems in the administration of national, state, and private forests. Defining and attaining objectives. The personal element in forestry. Methods of organizing, staffing, and equipping forestry enterprises. *Rec* 2, *Cr* 2. MR. RANDALL

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. MR. RANDALL

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

45. 46. Special Problems—Original investigation in advanced 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 man-

agement of natural resources. The social aspects of resources management. Open to juniors and seniors. *Rec* 2, *Cr* 2. MR. BEYER AND STAFF

53. Forest Recreation Management — Methods of evaluation, planning, and development of wildlands for recreation. Importance, problems, and trends. Public and private programs and policies. School of Forestry students or by permission of instructor. Two Saturday field trips required. *Rec* 2, *Cr* 2.
MR. BEYER AND STAFF

60. Seminar—Reviews of literature. Current problems in forestry and conservation. *Rec* 1, *Cr* 1. MR. NUTTING, MR. SCHEMNITZ

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 33 and 35 (may take concurrently). Without *lab*: *Rec* 2, *Cr* 2; with lab; *Rec* 2, *Lab* 2, *Cr* 3. (Lab required of Forest Utilization majors). MR. BAKER

125. Wood Technology II—Advanced wood physics and mechanics. 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 with lab. *Rec* 3, *Cr* 3.
MR. SHOTTAFER

126. Analysis in Forest Utilization—Study of 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. Game Biology—The principles of game biology and a consideration of the principles of game management based on the biological characteristics of wildlife. Seniors. *Rec* 2, *Lab* 3, *Cr* 3. MR. SCHEMNITZ

128. Game Management—The principles of game management. A consideration of the technical methods of wildlife investigations in relation to land management. Seniors. *Rec* 2, *Lab* 3, *Cr* 3. MR. SCHEMNITZ

129. Research Methods in Forest Utilization—Laboratory methods of evaluating wood, wood based, and related materials. Introduction to standard evaluation techniques and concepts of evaluation design. Review of pertinent laboratory equipment and its applications. Prerequisite: Fy 4, Fy 112, Fy 125. *Rec* 1, *Lab* 4, *Cr* 3. MR. SHOTTAFER & STAFF

134. Timber Management—The organization of forest properties for sustained yield of timber products. Calculation of the annual cut and preparation of timber management plans. Forestry juniors. *Rec* 3, *Cr* 3. MR. RANDALL

142. Forest Policy—Forest policy in selected countries in comparison with our own. Development of federal, state, and private forest policies in U.S. Current problems of land ownership and use. Juniors and seniors. *Rec* 2, *Cr* 2.
MR. RANDALL

143. Forest Valuation—Methods of appraising the value of standing timber, forest land and growing stock as a means of controlling the forestry investment. Damage appraisal and effects of taxation. Forestry seniors. *Rec* 2, *Cr* 2.
MR. RANDALL

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 & 2. *Lab* 2, *Cr* 3. MR. CORCORAN

171. Production Analysis in Forestry—Introduction to concepts and procedures used in the evaluation of timber production and forest product manufacturing with emphasis on study organization, work measurement, job evaluation, cost control, and schematic models. Forestry 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 with emphasis on inventory control, allocation methods, replacement models, waiting-line analysis, sequencing, simulation, and competitive strategies. Forestry 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

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 Mensuration—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

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

303. 304. Forest Management Problems—*Cr Ar.* MR. RANDALL

305. 306. Game Management Problems—*Cr Ar.* MR. MENDALL

307. 308. Silviculture Problems—*Cr Ar.* MR. GRIFFIN

311. 312. Research Problems in Forest Economics—*Cr Ar.* MR. CORCORAN

313. 314. Forest Recreation Problems—*Cr Ar.* STAFF

399. Graduate Thesis—*Cr Ar.* STAFF

Forestry Summer Camp

41s. Practice of Forestry — 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-four hours a week for eight weeks. *Cr* 8. MR. RANDALL AND STAFF

School of Home Economics

ACTING DIRECTOR THORNBURY; PROFESSORS MILES, RICE; ASSISTANT PROFESSORS BORQUE, CAMPBELL, SCHOMAKER, WATTS; INSTRUCTORS DALTON, HOUGHTON HUTCHINSON, YOUNG; LECTURER OLIVER

Home Economics 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 in home economics. 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; 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 home economics courses and related subjects in other divisions of the University.

A minimum of 128 semester hours is required for graduation at an accumulative grade point average of 1.80.

CURRICULUM FOR B.S. IN HOME ECONOMICS

All students are required to take the following 36 hours:

Communications — 8 hours

Eh 1,2—Freshman English
Sp 1 —Fundamentals of Public Speaking or
Sp 31 —Voice and Diction

Physical Sciences — 8 hours

To be selected from botany, geology, chemistry, entomology physics, bacteriology or zoology. One year of this work must be basic courses in laboratory science.

Social Sciences — 12 hours

Py 1 and 2, are required and others to be selected from sociology, psychology, history, government, economics or modern society.

Humanities 8 hours

Philosophy, art, literature and music.

(Must represent two fields)

Requirements in pre-professional and professional sequence, and electives to make a total of the required 128 hours.

Additional Required Courses in Professional Sequences:

I. FOOD AND NUTRITION SEQUENCES:

(Science requirements depend on option)

Option A—Dietetic Interns*

Fn	43	Exp. Foods	4
Fn	152	Human Nutrition	3
Fn	155	Nutr. Abnormal Cond.	3
Fn	61	Quantity Food & Food	6
	62	Service Management	
Fn	63	Food Service Admin. & Cost Control	2
Hm	93	Household Equip.	3
Ba	9	Accounting	3
Py	111	Bus. & Ind. Psych.	3
Py	117	Edu. Psych.	3
		Total	30

* Approved by American Dietetics 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 semester at the Merrill-Palmer Institute in Detroit, Michigan.

A. *Child Development*

Basic Core

			Cr. Hrs.
Cf	2	Patterns of Interpersonal Behavior (nursery school lab experiences)	3
Cf	3	The Preschool Child	3
Cf	4	The Young School Child	3
Cf	109	Special Problems in Child Dev.	1
Cf	111	Family Relationships	3
Cf	260	Seminar in Child Dev.	3
Fn	41	Intro. to Food & Nutrition	3
Hm	185	The Family's Financial Problems	3
		Total	22

Elementary School Teachers

Ed	B2	The American School	3
Ed	B3	The Growth-Learning Process	3
Ed	B4	The Teaching Process	3
Ed	M14	Teaching Arithmetic	2
Ed	M15	Teaching Social Science	2
Ed	M16	Teaching Science	2
Ed	M30	Teaching Language Arts	3
Ed	M190	Student Teaching	8

Subject concentration (if psychology, only 8) of 24 hours.

Cf	153	The Younger Child in Home and in School	3

Electives (must include 4 hours in art and 3 in music)

Total 33

Nursery School Teachers

In addition to Cf courses and appropriate courses in education listed under Elementary School Teacher's program, courses may include:

			Cr. Hrs.
Py	117	Educational Psychology	3
Py	123	Psychology of Childhood	3
Py	126	Psychology of the Retarded Child	3
Py	127	Psychology of the Superior Child	3
Py	128	Psychology of the Exceptional Child	3
Py	130	Social Psychology	3
Py	132	Mental Hygiene	3
Py	133	Abnormal Psychology	3
Py	321	Individual Psychology Testing	4
Ay	1/2	Intro to Anthropology	6
Sy	129	The Individual and the Community	3
Cf	155	The Adolescent and His Family	3
Electives (must include 4 hours in art or design and 3 hours in music)			
		Total	35

(Students preparing for this profession are encouraged to spend one semester at the Eliot-Pearson School, an affiliate of Tufts University in Boston)

Social Service Workers

Cd	31	Design	3
Hm	81	Home Management	3
Hm	191	Housing	3
Hm	82	Management in Homes	3
Cd	21	Clothing	2
Py	117	Educational Psychology	3
Py	123	Psychology of Childhood	3
Py	130	Social Hygiene	3
Py	132	Mental Hygiene	3
Ay	1/2	Intro. to Anthropology	6
Sy	3/4	Intro. to Sociology	3-6
Sy	113	Social Disorganization	3
Sy	24/126	Soc. of Rural & Urban Life	3-6
Sw	150/151	Social Welfare	3-6
Sw	152	Social Work as a Profession	3
Sw	154/155	Field Experience	2-4
Sy	129	Individual and the Community	3
		Electives	21

Electives

B. *Home Economics Education*

Home Economics Teachers in Secondary Schools (80 hours)

			Cr. Hrs.
Cf	2	Patterns of Interpersonal Behavior	3
Cf	3	The Pre-school Child	3
Cf	111	Family Relationships	3
Cd	21	Dress & Cons. Behavior	2
Cd	22	Principles of Clothing Construction	(3)
	and/or		
Cd	124	Creativity in Clothing Construction	3
Cd	25	Textiles	2
Cd	31	Design	3
Cd	128	Seminar: Dress in Human Development	2
Cd	192	Interior Design & Home Furnishings	3
Fn	42	Family Food Management	3
Fn	43	Principles of Food Preparation	4
Fn	152	Human Nutrition	3
Hm	81	Home Management	3
Hm	82	Management in Families	3
Hm	185	Family's Financial Problems	3
Hm	93	Household Equipment	3
Hm	191	Housing	3
He	71	Techniques in Teaching Home Economics	2
He	72	Curriculum Dev. in Home Economics	3
He	73	Supervised Student Teaching	8
He	170	Senior Seminar	1
EdB	2	The American School	3
Ed/Py		Elective	3
He	176	Adult Education	2
He	180	Evaluation	3
Py	117	Educ. Psychology	3
Py	124	Psychology of Adolescence	2

C. *Consumer Service* (45 hrs.)

Option: Clothing & Home Furnishings

			Cr. Hrs.
Cd	21	Dress & Consumer Behavior	2
Cd	24	Creativity in Clothing Construction	3
Cd	25	Textiles	2
Cd	26	History, Market & Analysis of Clothing	3
Cd	31	Design	1-2
Cd	139	Special Problems in Interiors	1-2
Cd	192	Int. Design & Home Furnishings	3
		Electives (clothing & design)	
He	71	Tech. in Teaching Home Ec.	2
He	170	Senior Seminar	1
He	176	Adult Education	2
Hm	191	Housing	3
		Electives (9 must be from one group)	13

1. Economics, business psych., & socio.
2. Eh 5, Eh 19, Sh 22, Sh 177, Jr. 31, 32, He 72
3. At 1, 2, Eg 1, 2, Ps 31, EdC 34, & Sh 15

Option: Design & Textiles

			Cr. Hrs.
Cd	21	Dress & Consumer Behavior	2
Cd	25	Textiles	2
Cd	31	Design	3
Cd	32	Creative Design	2
Cd	33	Applied Textile Design	2
Cd	38	Special Problems in Design	1-3
		Electives (Design & History of Art)	
He	176	Adult Education	2
		Electives (same as clothing option)	13

Option: Food & Equipment

			Cr. Hrs.
Fn	41	Intro. to Foods & Nutrition	3
Fn	42	Family Food Management	3
Fn	43	Experimental Foods	4
Fn	152	Human Nutrition	3
Ps	3	Desc. Physics	3
Hm	93	Household Equipment	3
		Electives (Food & Nutr.)	5
He	71	Tech. in Teaching Home Ec.	2
He	176	Adult Education	2
		Electives (same as clothing option)	13

COURSES IN THE SCHOOL OF HOME ECONOMICS

Child Development and Family Relationships (Cf)

2. Patterns of Interpersonal Behavior—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. *Rec* 2, *Lab* 2, *Cr* 3. Open to freshmen. MISS MILES, MRS. OLIVER

3. The Preschool Child—Development of children from infancy through the preschool years and factors affecting it with 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. MISS MILES, MRS. OLIVER

4. 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. MISS MILES

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

Clothing and Design (Cd)

21. Dress and Consumer Behavior—Integrative approach to economic, technical, personal, and social aspects of dress and textiles in relation to individual development and family welfare. *Rec* 1, *Lab* 2, *Cr* 2. MISS CAMPBELL

22. Principles of Clothing Construction—Principles involved in clothing construction with application to garments; practice in communication of principles

for teaching. Prerequisite or parallel: Cd 21 or permission. *Rec* 1, *Lab* 4, *Cr* 3.
MISS CAMPBELL

†***25. Textiles***—Fibers, yarns, fabrications, finishes, labels; end-uses in home and clothing. Consumer education and protection. Prerequisite: Bc 7 and Cd 21 or permission. *Rec* 2, *Cr* 2. MISS CAMPBELL

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. WATTS

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. WATTS

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. WATTS

39. Special Problems in Interiors—*Cr* 1-3. MR. WATTS

‡***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 CAMPBELL

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. Prerequisite: Cd 21 or permission. *Rec* 2, *Cr* 2.
MISS CAMPBELL

129. Special Problems in Clothing and Textiles—*Cr* 1 to 3.
MISS CAMPBELL

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. Prerequisite: Cd 31, Hm 191, or permission. *Rec* 1-2, *Lab* 2, *Cr* 2-3. MR. WATTS

Food and Nutrition (Fn)

41. Introduction to Food and Nutrition—Study of human nutritional needs with emphasis on the selection of food to meet these needs, considering economy of time and money. *Rec* 3, *Cr* 3. MISS THORNBURY

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* 3, *Lab*, *Cr* 3 STAFF

43. Experimental Foods—An experimental approach to the preparation of foods with emphasis on the scientific interpretation of results. Prerequisite: Fn 42 and Bc 8 or equivalent. *Rec* 1, *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. MISS BOURQUE

53. Applied Nutrition—Application of the principles of nutrition to the preparation of dietaries for normal individuals of all ages. Prerequisite: Bc 8 or equivalent and Fn 41 or 52. For four-year nursing students. *Lab* 4, *Cr* 1.
MISS YOUNG

61/62. Quantity Food and Food Service Management—Principles of

food production and management that underlie service of high quality, nutritious food in quantity; sanitation; menu planning; recipe standardization and preparation; use of institution equipment. Objectives of varied types of food services. Prerequisite; F 43, *Rec* 1, *Lab* 6, *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* 1, *Lab* 3-6, *Cr* 2-3. 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 BOURQUE

†***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. MISS THORNBURY

258. Seminar in Nutrition—Reports and discussions of recent developments in nutrition and related fields, with special attention to critical analysis. Prerequisite: Fn 52 or equivalent. *Rec* 1-2, *Cr* 1-2. MISS THORNBURY

259. 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. MRS. HOUGHTON

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. MRS. HOUGHTON

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 six weeks. Prerequisite: He 72. *Cr* 8. MRS. HOUGHTON

‡***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* 2, *Cr* 2. MRS. HOUGHTON

†***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. MRS. HOUGHTON

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.

191. Housing—Physical, social and emotional aspects of the housing environment. Floor plan principles in relation to family life cycle. Local government controls; national problems in housing. Prerequisite: Junior standing. *Rec* 2, *Lab Cr* 3.

93. Household Equipment—Elementary principles of physics applied to the performance of equipment. The equipment's function and the operator's responsibility in the performance of a task. Prerequisite: junior standing. *Rec.* 2, *Lab* 2, *Cr* 3.

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

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)

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 Family—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

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.

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.

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 standing. *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 student. 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 personnel 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 with emphasis on their significance for professional home economists. 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; adaptation 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 developmental levels, in several subject areas,

according to objectives of programs. Experimentation 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 invitational 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.

HONORS PROGRAM

PROFESSORS BOULANGER, HOGAN, SIMPSON; ASSOCIATE PROFESSOR GERSHMAN

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, Associate Professor W.M. Bain.

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 of the liberal arts and the 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 registered 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.

Further information concerning the availability of other Honors Courses may be obtained from the Secretary of the College Honors Committee.

PLANT AND SOIL SCIENCES

PROFESSORS STRUCHTEMEYER, BROWN, GAUSMAN, TREVETT; ASSOCIATE PROFESSORS CARPENTER, CLAPP, HEPLER, HUTCHINSON, KENDER, H. MURPHY; MR. LITTLEFIELD; EXTENSION SPECIALISTS ABDALLA, HOLYOKE; COLLABORATOR EPSTEIN

The curriculum in Plant and Soil Sciences has been organized to provide a well balanced educational program for students interested in the study of plants and soils. The program will provide students with a fundamental knowledge of the basic sciences, in addition to a training in the fundamental principles of soils, plants and ornamental horticulture and landscaping.

Students with a primary interest in soils can get specialized training in soil management, conservation, chemistry, physics, and classification. Those with a primary interest in plants can obtain training in forages, vegetables, fruits, potatoes, floriculture, ornamental horticulture, and landscaping.

Proper selection of course work will qualify B.S. graduates for careers in teaching at the college and secondary school levels, extension work, commercial production activities in the various commodity areas listed, service activities for industry, Soil Conservation Service and other government agencies, landscape planning, and many other related fields.

Students who are well qualified and interested in advanced study should plan for this early in their college course. Advanced work at the master's or Ph.D. level is available and is encouraged for qualified individuals.

Curriculum for Plant and Soil Sciences

Required Courses		Credit Hours	Minimum Degree Hours Required
A. Orientation			0
B. Basic Sciences			35
Ch 1 & Ch 2	General Chemistry	8	
Bc 1 & Bc 2	Organic and Biochemistry	8	
Bt 1	General Botany	4	
Bt 153	Plant Physiology	4	
	Mathematics	4	
	Electives	7	
C. Plants and Soils			30
S 2	Soils	3	
S 51	Soil Fertility	3	
S 154	Soil-Plant Relations	3	
P 166 or P 202	Plant Propagation / Plant Breeding	3	
P 163 or P 169	Pomology / Vegetable Production	3	
	Electives	15	
D. Life Science and Agricultural Electives			20
E. Communications			10
Eh 1 & Eh 2	Freshman Composition	6	
Eh 5	Technical Composition	2	
Sh 1	Fundamentals of Public Speaking	2	

F. Humanities and Social Sciences 10

Not less than two hours from each of the following groups:

a. Literature, Philosophy, and Fine Arts
b. Economics, Sociology, and Psychology
c. History and Government

G. Free Electives 27

Any course in the University for which the student is qualified.

Minimum Degree Hours for Graduation **132**

Soils Courses (S)

2. Soils—A study of the chemical, physical and biological properties of soil. Also considers origin, management, and the 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 Soils—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

21. Earth Science—Comprehensive study of the effects of natural forces on soil, atmosphere, climate, oceans, and land forms. *Rec* 3, *Cr* 3. MR. MURPHY

†***50. Soil and Water Conservation***—Management of our soil and water resources in accordance with need and capabilities of the land. Prerequisite: S 2 or S 3. *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

‡***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. STRUCHTEMEYER

‡***154. Soil and 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. GAUSMAN

†***156. Soil Physics***—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. GAUSMAN

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 transformations 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 40. *Rec* 2, *Lab* 4, *Cr* 4. MR. GAUSMAN

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. GAUSMAN

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

163. Pomology—Principles and practices in pomology as related to the basic sciences. The culture of all fruits with particular emphasis given to those of commercial importance in Maine. Prerequisite: S 2 and Bt 53. *Rec* 3, *Lab* 3, *Cr* 4. MR. KENDER

164. Principles of Forage Management—Soil and climatic factors in the selection and use of forage crops. Physiological effects of defoliation, fertilization and other management practices. Biochemical aspects of forage harvesting and preservation. Prerequisite: S 2. *Rec* 3, *Cr* 3. MR. BROWN

‡***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. KENDER

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 and either P 30, P 163, P 164 or P 169. *Rec* 2, *Lab* 2, *Cr* 3. MR. KENDER

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

169. Principles of Vegetable Production—Principles and practices in the production of potatoes and other important vegetable crops. Cultural procedures will be related to basic information on growth and development. Prerequisite: S 2 and Bt 153. *Rec* 3, *Lab* 2, *Cr* 4. MR. MURPHY

173/174 Seminar—Review of literature, problems, and research as related to the areas of plants and soils. *Rec* 1, *Cr* 1. STAFF

†***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. KENDER

202. Plant Breeding—Improvement of plants through hybridization and selection. Genetic principles as related to breeding methods will be discussed. Prerequisite: Bt 145. *Rec* 3, *Cr* 3. MR. HEPLER

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 the home grounds. *Rec* 2, *Lab* 2, *Cr* 3. MR. CLAPP

‡***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. MR. CLAPP

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. Agrostology*—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. MR. CLAPP

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.

Two-Year Pre-Agricultural Education Curriculum

First Year

FALL SEMESTER				SPRING SEMESTER			
Course			Credit Hours	Course			Credit Hours
LSA	1	Orientation	0	Ch	2	Gen. Chemistry	4
An	5	Animal Science	3	Eh	2	Freshman Comp.	3
Bt	1	Gen. Botany	4	Pe	1	Physical Education	0
Ch	1	Gen. Chemistry	4	P	1	Horticulture	3
Eh	1	Freshman Comp.	3	S	2	Soils	4
Pe	1	Physical Education	0	Zo	3	Animal Biology	4
Sh	1	Public Speaking	2				
			16				18

Second Year

			16				18
AE	36	Farm Power	3	AE	32	Farm Struct. & Equip.	3
An	19	Livestock Feeding	3	#Ms	1	Trigonometry	2
Ec	1	Prin. of Economics	3	Py	2	Gen. Psychology	3
#Ms	3	College Algebra	2	P	4	Crop Science	3
Py	1	Gen. Psychology	3	Elective		(humanities)	3
Elective		(Ab 47 or En 26 or humanities)	3 (4)	Elective		(En 26 or Ps 6 or humanities)	3 (5)
			17 (18)				17 (19)

Ms 1 and Ms 3 are not 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. However, a special two-year Pre-Veterinary curriculum is provided for those who wish to qualify for entrance into a regular college of veterinary medicine. Adjustments in the selection of courses can be made to fit special requirements of particular veterinary colleges. This program is supervised by the department of Animal Pathology. Pre-vet students who fail to qualify for veterinary college or who desire to change their course can transfer to degree curricula within the college.

Two-Year Pre-Veterinary Curriculum

Freshman Year

FALL SEMESTER			Credit Hours	SPRING SEMESTER			Credit Hours
Subject				Subject			
LSA	1	Orientation	0	Bc	2	General Botany	4
An	5	Animal Science	3			or	
Ch	1	General Chemistry	4	Zo	4	General Zoology	
Eh	1	Freshman Composition	3	Ch	2	General Chemistry	4
My	1	Modern Society	3	Eh	2	Freshman Composition	3
		or		My	2	Modern Society	3
Ay	1	Anthropology				or	
Pe	1	Phy. Education	0	Ay	2	Anthropology	
Zo	3	General Zoology	4	Pe	2	Phy. Education	0
						Elective from Humanities (Hist., Music, Art, Lit., Phil.)	3
			17				17

Sophomore Year

FALL SEMESTER			Credit Hours	SPRING SEMESTER			Credit Hours
Subject				Subject			
AnP	135	Anatomy of Domestic Animals	3	Be	2	Biochemistry	4
Bc	1	Organic Chemistry	4	Ch	41	Quant. Analysis	3
Hy	3	U. S. History	3			or	
Ms	3	College Algebra	2			Elective in Agri.	
Pe	3	Phy. Education	0	Ms	1	Trigonometry	2
Ps	1a	General Physics	4	Pe	4	Phy. Education	0
Sh	1	Public Speaking	2	Ps	2a	General Physics	4
				Sh	9	Parliamentary Procedure	1
						Elective from Humanities (Hist., Art, Lit., Phil.)	3
			18				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

A cooperative agreement with the University of Massachusetts offers an opportunity for students to secure training in the field of Food Processing. A basic two-year program may be completed 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 of the course at the Massachusetts resident tuition rate. The first two years of the program at Maine are supervised by the Department of Bacteriology.

GENERAL COURSES

INTERDISCIPLINARY COURSES OFFERED BY THE COLLEGE OF LIFE SCIENCES AND AGRICULTURE

LSA 1. General Lectures—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.

Mhe. 50. Man and His Environment—Effect of the biological and physical environment on life and man. Restricted to seniors in practice teaching, taken concurrently with Pl 70 and Sy 5ed for one-half semester. *Rec* 6, *Cr* 3.

MR. COOPER, MR. BUCK, MR. DIMOND, MR. HUTCHINSON

TWO-YEAR TECHNICAL DIVISION COLLEGE OF LIFE SCIENCES AND AGRICULTURE

ASSOCIATE DEAN WINSTON E. PULLEN

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 a preparatory course for four-year professional curricula and students are discouraged from entering the program with this objective. However, a transfer precedure 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 in applied 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 72 credit hours earned at an accumulative grade average of at least 1.80.

Five curricula are offered covering a variety of fields of study.

All students are required to take the basic core curriculum of general education subjects along with the technical subjects in a particular program of study.

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	Orientation	1
7/13 AE*	Math. I - II	6
1 Eh-2 Eh	English Composition	6
2 Gt	State & Local Government	3
3 Gt	Current World Affairs	2
Pe 1-Pe 2	Physical Education	0
1 Sh	Oral Communication	3
		21

* Students passing a preliminary examination will be excused from 7 AE Math I).

I. Business Management Curricula

These curricula provide concentrated and practical training in preparation for business management careers in food and fiber industries and associated businesses. Students will be prepared for managerial positions in food stores and other types of retail establishments, for plant foremen, and other supervisory roles in food processing, wholesaling and distributing businesses, and for a variety of other types of employment in sales, service, and management work.

Tradespeople and business executives are utilized in many classes as guest discussion leaders to provide a more meaningful learning experience. Case studies are used to provide problem-solving situations for practical experience in common management problems.

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 year.

1) *Agricultural Business Management*—provides technical training in farm technology and in business management for employment opportunities with farm-related business enterprises.

2) *Food Industry Management*—training includes the basic principles of business management plus the essentials of food technology and prepares for employment opportunities with firms engaged in food processing, packaging, wholesaling, and retailing.

related work such as with Soil Conservation Service, as breeding technicians, DHIR field men, and in farm sales and service businesses.

The *Animal Technology* program provides technical training and experience for careers in breeding and management of dairy cattle, beef cattle, pleasure horses, poultry, sheep and swine. Additional career opportunities exist in related sales and service industries.

ANIMAL TECHNOLOGY

First Year

FALL SEMESTER						SPRING SEMESTER					
	Subject	Hours					Subject	Hours			
		Rec	Lab	Cr				Rec	Lab	Cr
1	LSA	Orientation	1	0	1	13	AE	Math. II	3	0	3
7	AE*	Math. 1	3	0	3	2	An	Animal Production	2	2	3
1	An	Dairy Cattle	2	2	3	6	An	Animal Feeding	2	2	3
3	An	Animal Selection	1	3	2	2	Eh	English Composition	3	0	3
5	An	Milk Composition and Testing	2	2	3	2	P	Soils & Fertilizers	3	2	4
1	Eh	English Composition	3	0	3	Pe	2	Physical Education	2	0	0
Pe	1	Physical Education	2	0	0			Electives			2
		Electives			6						
					18						18

* Students passing a preliminary examination will be excused from 7 AE Math I.

Second Year

			Rec	Lab	Cr				Rec	Lab	Cr
12	An	Repr. & Breeding Mgt.	2	2	3	3	Ab	Farm Management	2	2	3
5	AnP	Livestock Diseases	3	0	3	4	An	Animal Breeding	2	2	3
3	Gt	Curr. World Affairs	2	0	2	2	Gt	State & Local Gov't.	3	0	3
1	Sh	Oral Communication	3	0	3	3	P	Forage Management	2	2	3
		Electives			7			Electives			6
					18						18

III. Laboratory Technology Curriculum

This course of 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 laboratorv clinical work.

LABORATORY TECHNOLOGY

First Year

FALL SEMESTER					SPRING SEMESTER				
	Subject	Hours				Subject	Hours		
		Rec	Lab	Cr			Rec	Lab	Cr
1 LSA	Orientation	1	0	1	13 AE	Math. II	3	0	3
7 AE*	Math. I	3	0	3	6 An	Animal Feeding	2	2	3
1 Eh	English Composition	3	0	3	10 An	Anatomy & Physiology	3	0	3
9 An	Anat. & Physiology	3	0	3	16 An	Lab. Animal Handling	0	4	2
14 An	Lab. Animal Care	3	0	3	2 By	Bacteriology	3	2	4
Pe 1	Physical Education	2	0	0	2 Eh	English Composition	3	0	3
	Electives			5	Pe 2	Physical Education	2	0	0
				18					18

* Students passing preliminary examination will be excused from Math I.

Second Year

		Rec	Lab	Cr			Rec	Lab	Cr
5 Bc	Animal Biochemistry	3	2	4	4 An	Animal Breeding	2	2	3
12 An	Reprod. and Breeding	2	2	3	20 AnP	Clinical Lab. Prac.	2	4	4
9 AnP	Animal Diseases	3	0	3	2 Gt	Government	3	0	3
16 AE	Work Simplification	2	2	3	1 Sh	Oral Communication	3	0	3
3 Gt	Curr. World Affairs	2	0	2		Electives			5
	Electives			3					
				18					18

IV. 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.

			Req'd Hrs.
A. Basic Core Curriculum			18 (21)
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			11
2 Ab	Intro. to Economics	3	
8 Ab	Principles of Accounting	3	
16 Ae	Work Simplification	3	
20 Ab	Managing the Business Firm	2	
D. Sociology			5
6 Ab	Dynamics of Human Behavior	3	
E. Food Technology & Handling			10
8 An	Meat & Meat Products	3	
2 Bc	Food Chemistry	4	
2 By	Food Bacteriology & Sanitation	3	
F. Electives			13 (10)
	Total		72

V. 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.

			Req'd Hrs.
A. Basic Core Curriculum			18
B. Technical Home Furnishings and Clothing			18
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	2	
8 Cd	Fashion Merchandising	3	
C. Business and Economics			13
2 Ab	Introduction to Economics	3	
4 Ab	Principles of Marketing	4	
8 Ab	Principles of Accounting	3	
10 Ab	Sales Promotion	3	
D. Sociology			5
6 Ab	Dynamics of Human Behavior	3	
7 Ab	Sociology and the Individual	2	
E. Electives			18 (15)
	Total		72

TWO-YEAR TECHNICAL COURSE DESCRIPTIONS

AGRICULTURAL BUSINESS AND ECONOMICS

2 Ab. Introduction to 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, finance, credit and pricing. *Rec* 3, *Cr* 3. MR. ROBINSON

3 Ab. Farm Management—Managing the farm business for optimum returns; economic guides to decision making; ways of starting in farming; decisions as to size, production rates, labor and machinery, enterprise selection, and farm organization; application to specific farm. *Rec* 2, *Lab* 2, *Cr* 3. MR. CLARK

4 Ab. Principles of Marketing—A study of marketing and the basic activities involved in this function of modern business. Covers the environmental setting for marketing decision-making, and the decision-making process itself, including gathering and analysis of marketing information, market measurement, market organization, products, prices, channels of distribution, and market strategy. *Rec* 3, *Cr* 3. MR. WING

†5 Ab. Potato Marketing—Varieties, market grades, maintenance of quality, containers, storage, transportation, consumer preferences, wholesale and retail sales of potatoes. *Rec* 3, *Cr* 3. MR. ROBINSON

6 Ab. 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 Ab. 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.

8 Ab. Accounting Principles—The balance sheet and income statements and their preparation. Deals with systematic recording, classifying, analyzing and interpretation of business transactions. Emphasis is on comprehension of available financial data and potential use in management decisions. *Rec* 2, *Lab* 2, *Cr* 3.

MR. WING

10 Ab. Sales Promotion—The use of advertising in food marketing. Case studies are used to determine those situations in which advertising may be profitably employed. The principles and techniques of selling will be considered. Also, consideration will be given to the development of merchandising and service policies and to the training of sales and service personnel. *Rec* 3, *Cr* 3.

MR. ROBINSON

12 Ab. Introduction to Statistics—The nature of statistics, effective uses of statistics, and the art of organizing and interpreting data. Topics such as charts, graphs, distributions, sampling variability, indexes, and time series will be studied. MR. ROBINSON

15 Ab. Seminar—Special reports and discussions by students, faculty, and representatives from various industry interests will be included on subjects, not covered in other courses. *Rec* 1, *Cr* 1. MR. ROBINSON

18 Ab. Placement Training—Provides "on-the-job" training in production, manufacturing, distribution or retailing. Experience will be gained in merchandising, record keeping, warehousing, managing, etc. Work is to be under supervision of employer and University of Maine. Prerequisite: fall semester average of 2.0 or better. *Cr* 4. MR. DUNHAM

20 Ab. Managing the Business Firm—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 concepts of managerial economics are presented in light of the needs of a firm. *Rec* 3, *Cr* 3. MR. ROBINSON

24 Ab. 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, facility layout procedures, merchandising, price policies, sales promotion, and advertising will be used. Firm visits. (Lab fee $5.00.) Prerequisite: 4 Ab. *Rec* 2, *Lab* 4, *Cr* 4. MR. DUNHAM

28 Ab. Interpretation of Financial Records—Topics studied include payrolls, taxes, partnerships, corporations, cost systems, and budgeting. Emphasis is on the analysis of financial statements for use by management. Prerequisite: 8 Ab. *Rec* 2, *Lab* 2, *Cr* 3. MR. DUNHAM

AGRICULTURAL ENGINEERING

1 AE. Shop—Care, use and fitting of shop tools; functional and ornamental metal working; soldering, introduction to gas and electric welding, woodworking, painting, finishing and refinishing. *Rec* 1, *Lab* 3, *Cr* 2. MR. SOULE

3 AE. Advanced Shop—Advanced welding practices and machinery repair. Prerequisite: Course 1-AE. *Lab* 4, *Cr* 2. MR. SOULE

5 AE. Engines and Tractors—The construction, principles, and maintenance of spark ignition and diesel engines for farm tractors and related equipment. Use of repair tools. Choice and use of tractors for optimum field performance. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

6 AE. Agricultural Drawing—Blueprint reading, preparing drawings, sketches, layouts and flow charts with particular reference to buildings used in farm production, processing retail sales. *Lab* 4, *Cr* 2. MR. ROWE

7 AE. Math I—Basic mathematical operations and algebra. Solutions of problems associated with business and production. *Rec* 3, *Cr* 3. STAFF

8 AE. Farm Machinery—The principles, operation, adjustment, service, selection, and management of farm machinery. Laboratory work includes adjustment, test, and calibration of field machines. *Rec* 2, *Lab* 2, *Cr* 3. MR. ROWE

9 AE. 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 AE. 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 AE. 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 AE. Utilities—Selection, care and use of water and sewage disposal systems. *Rec* 2, *Lab* 2, *Cr* 3. MR. RHOADS

13 AE. Math II—Applied mathematics. Use of graphical and statistical methods, slide rules and other mechanical aids in the solution of problems in business, mechanics, agricultural production and institutional management. *Rec* 3, *Cr* 3. STAFF

15 AE. 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 AE. 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 PATHOLOGY

5 AnP. Livestock Diseases—Principles of hygiene and sanitation applied to the prevention and control of the common diseases of dairy cattle. *Rec* 3, *Cr* 3. MR. PAYNE

9 AnP. Laboratory Animal Diseases—Principles of disease prevention and control as they apply to common laboratory rodents, carnivores, primates, and birds. *Rec* 3, *Cr* 3. MR. PAYNE

20 AnP. Clinical Laboratory Practices—A descriptive and laboratory course in clinical and necropsy procedures, including microscopic techniques, parasitologic, urine, hematologic, bacterial, viral, fungal, fertility, and organ function examinations. *Rec* 2, *Lab* 4, *Cr* 4.

MR. PAYNE, MR. O'MEARA AND MR. GERSHMAN

ANIMAL SCIENCES

1 An. 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. *Rec* 2, *Lab* 2, *Cr* 3.

2 An. 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 An. Animal Selection—A study of the principles of animal selection. *Rec* 1, *Lab* 2, *Cr* 2. MR. POULTON

4 An. Animal Breeding—Animal genetics, systems of breeding and principles of selecting farm and laboratory animals. *Rec* 3, *Cr* 3. MR. DICKEY

5 An. 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 An. 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. *Rec* 2, *Lab* 2, *Cr* 3.

7 An. 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 An. 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 An. Anatomy and Physiology of Animals—A descriptive course covering the structure and function of the various tissues, organs, and systems of common laboratory and domestic animals. *Rec* 3, *Cr* 3. MR. HARRIS

12 An. 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 An. 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

16 An. 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. MR. POULTON

†***19 An. 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.

21, 22 An. Problems in Animal and Poultry Production—*Cr Ar.* STAFF

HOME ECONOMICS

1 Fn. Nutrition in Human Development—Basic nutrition knowledge interpreted in light of the contributions good nutritional practices can make to the welfare of the individual and the community. *Rec* 3, *Cr* 3. MISS YOUNG

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. Prerequisite: 1 Fn. *Rec* 1, *Lab* 4, *Cr* 3. MISS YOUNG

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. MISS YOUNG

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 affect 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 to 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. MR. WATTS

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* 2. MR. WATTS

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. STAFF

PLANT AND SOIL SCIENCES

1 P. Potato Production—Production of potatoes for seed, tablestock and processing. *Rec* 2, *Lab* 2, *Cr* 3. MR. MURPHY

2 P. 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

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

†***4 P. Fruit Production***—A cultural study of tree fruits and small fruits including apples, blueberries, raspberries and strawberries; also methods of harvest, post harvest handling, marketing, and utilization. *Rec* 2, *Lab* 2, *Cr* 3. MR. ABDALLA

‡***5 P. Vegetable Growing***—Cultural practices for the major vegetable crops of both the home garden and the market garden. *Rec* 2, *Lab* 2, *Cr* 3. MR. HEPLER

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. MR. CLAPP

‡***8 P. Turf Management***—Care of lawns, golf courses, and other turfed areas. Seeding, fertilizing, mowing, weeding, and insect and disease control. *Rec* 2, *Cr* 2. MR. HOLYOKE

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. ABDALLA

10 P. Storage and Handling of Potatoes—A study of the principles of potato storage and post harvest handling of potatoes into and out of storage areas and to market. *Rec* 3, *Cr* 3. MR. MURPHY

11 P. Crop Science—A general survey course of the important field crops grown in Maine with special emphasis on the principles of adaptation, culture, and use. *Rec* 3, *Cr* 3. MR. MURPHY

13 P. Conservation—Principles of soil and water management in relation to land capabilities and need. *Rec* 3, *Cr* 3. MR. STRUCHTEMEYER

* Courses will be taught only at Aroostook State Teachers College.

SERVICE COURSES IN THE COLLEGE OF LIFE SCIENCES AND AGRICULTURE

1 LSA. Orientation and Social Usage—Understanding the University; adjusting to an academic environment; providing guidelines for accepting responsibilities in business and social situations. *Rec* 1, *Cr* 1. MR. PULLEN AND MRS. HUTCHINSON

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

2 Bt. Potato Diseases and Insects—An objective course on diseases and insects affecting production, marketing, and utilization of potatoes as food or seed stock. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

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. BOULANGER

1 Fy. 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. MR. PLUMMER

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. MR. HOBBS

2 Eh. English Composition—A continuation of 1 Eh with particular emphasis given to expository writing. *Rec* 3, *Cr* 3. MR. HOBBS

2 Gt. 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. DOW

3 Gt. Current World Affairs—A survey of current national and international affairs with particular attention to American foreign policies. *Rec* 2, *Cr* 2.

1 Sh. Oral Communication—Principles of effective oral communication, with 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. MR. COOK

Top to bottom from left: Memorial Gymnasium, Physics Building, Boardman Hall Addition; right, Barrows Hall.

Learning use of computers

COLLEGE OF TECHNOLOGY

THOMAS H. CURRY, DEAN

Boardman Hall

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
  - Highway Engineering
  - Sanitary Engineering
  - Structural Engineering
  - Public Management
- Electrical Engineering
- Engineering Physics
- Mechanical Engineering
  - Fluid and Solid Mechanics
  - Thermal Science and Heat Power
  - Mechanical Design
  - Environmental Design and Control
- Pulp and Paper Technology

By special arrangement, a five-year Pulp and Paper Program is available with options in management or computor applications in conjunction with any of the above curricula or the Forestry curriculum.

For Agricultural Engineering see page 241.

For information on the two-year programs in Engineering Technology see page 273.

The freshman year is common to all engineering curricula and chemistry.

Freshman Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours			Subject			Hours		
			Rec	Lab	Cr				Rec	Lab	Cr
Ch	1	Gen. Chemistry	3	3	4	Ch	2	Gen. Chemistry	3	3	4
Eh	1	Freshman Comp.	3	0	3	Eh	2	Freshman Comp.	3	0	3
Eg	1	Engineering Drawing	0	4	2	Eg	2	Engineering Drawing	0	4	2
Ms	12	Anal. Geom. & Cal.	4	0	4	Ms	27	Calculus	4	0	4
Pe	1	Physical Education	0	2	0	Pe	2	Physical Education	0	2	0
Ps	1	General Physics	4	2	5	Ps	2	General Physics	4	2	5
Gc	5	Orientation	1	0	0	Gc	6	Orientation	1	0	0

For information on advanced placement, see page 35.

GRADUATION REQUIREMENTS

(Common to all curricula in the College of Technology)

1. a) Passing grades in all courses required by the major department.
   b) A minimum of 141 degree hours for students taking Ms 12, 27, 28, and 29; for all others 143 degree hours. Degree hours shall not be

granted for basic Military Science, Mt 1, 2, 3, and 4, or for the advanced ROTC courses, Mt 5, 6, 7, and 8. Degree hour credit is not allowed for courses in which a grade of E is received.

c) An accumulative average of 1.80.

2. Passing grades in the following courses:

a) Graphics: Eg 1 and 2, or equivalent.

b) Languages: Eh 1 and 2, or equivalent, Sh 1, Eh 5, or equivalent.

c) Mathematics: Ms 12, 27, 28, and 29 or equivalent.

d) Science: Ch 1 and 2, Ps 1 and 2, or equivalent.

e) Physical Education, two semesters. Veterans may be excused.

3. Passing grades in a minimum of six credit hours in each of the two categories listed, and a minimum of 18 credit hours total.

I. Social Sciences

Any course for which the student can qualify may be taken from those listed in the catalog under Business and Economics, Modern Society, Psychology, and Sociology and Anthropology, excepting courses in accounting, industrial management, finance and personnel administration.

II. Humanities

Any course for which the student can qualify may be taken from those listed in the catalog under Art, English, Foreign Languages and Classics, History and Government, Music, and Philosophy. Humanities credit may not be given for Gm 13 & 14, (Scientific German) or English Composition. No more than three credits will be accepted in applied music (band, chorus, instrumental or voice music lessons). Courses of a cultural and nontechnical 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.

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 for 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 Graduate Study.) Candidates must complete, without credit, any undergraduate courses which may be prerequisite to courses included in the programs 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.

Honors Program

The honors courses listed on pages 85-86 are available to students in the College of Technology. The University Honors Program is described on page 28. In the freshman year Hr 41 will replace Eh 1; Hr 45 will replace Eh 2. In the sophomore year Hr 47 and Hr 48 may be applied to the social sciences or humanities 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 1-99 are for undergraduates. Courses numbered 300-399 are for graduates. Courses numbered 100-199 are for undergraduates but may be taken for graduate credit with approval of the student's committee. Courses numbered 200-299 are for graduate students, but advanced undergraduate and fifth-year students may take courses in this series if they are qualifed in the opinion of the department offering the instruction.

One number is used for a course which is given 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.

Courses offered in 1966-67 and alternate years are indicated by the sign (‡) placed before the number of the course; courses offered in 1967-68 and alternate years are indicated by the sign (†) placed before the number of the course.

AGRICULTURAL ENGINEERING

PROFESSORS SMITH, RHOADS; ASSOCIATE PROFESSORS KLINGE, ROWE, WILLIAMS; ASSISTANT PROFESSORS HUFF AND SOULE*

The curriculum in Agricultural Engineering is a joint responsibility of the College of Technology and the College of Life Sciences and Agriculture. It provides training to the fundamentals of engineering and their application to agriculture.

The work of agricultural engineers falls in four major areas: agricultural power and machinery, electric power and processing, farm structures, and soil and water control. Examples of the many types of positions held by graduates of this curriculum are: design, field testing, or sales and service with industrial or agricultural equipment concerns, building material manufacturers, electric power companies, trade associations, and food processing plants; research and development work with government agencies; teaching, research, and extension work with colleges and experiment stations; advisory and managerial posts in connection with mechanized agricultural development here and abroad; field engineers on large farm enterprises; private business such as a consulting practice or equipment dealerships.

Graduate Work in Agricultural Engineering

The degree of master of science (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.

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* On leave of absence 1966-67

Agricultural Engineering Curriculum

Freshman Year. See Page 175.

Sophomore Year

FALL SEMESTER			Hours			SPRING SEMESTER			Hours		
		Subject	Rec	Lab	Cr			Subject	Rec	Lab	Cr
AE	55	Mats. in Agr. Eng	2	2	3	AE	82	Introd. to A.E.	1	2	2
Ce	5	Surveying	2	3	3	Bt	1	General Botany	2	4	4
Eg	3	Descriptive Geometry	0	4	2	Me	33	Thermodynamic	3	0	3
Gc	7	Computer Programming	1	2	2	Me	52	Dynamics	3	0	3
Me	50	Statics	3	0	3	Ms	29	Cal. & Diff. Eq.	4	0	4
Ms	28	Anal. Geom. & Calc.	4	0	4			*Elective			2
		*Elective			1						
					18						18

Junior Year

			Rec	Lab	Cr				Rec	Lab	Cr
AE	169	Agr. Processing	2	3	3	AE	167	Agric. Power	2	3	3
Ce	26	Hydraulics	2	3	3	S	2	Soils	3	0	3
Ee	41	Elem. Circuits	3	0	3	Ce	52	Struct. Anal. & Des.	4	0	4
Me	23	Kinematics	3	0	3	Eh	5	Tech. Composition	2	0	2
Me	51	Strength of Mats.	4	0	4	Sh	1	Speech	2	0	2
		*Elective			2			*Elective			4
					18						18

Senior Year

			Rec	Lab	Cr				Rec	Lab	Cr
Ab	47	Agr. Economics	3	0	3	AE	163	Farm Structure Des.	2	3	3
AE	160	Agr. Machinery	2	3	3			*Electives			13
AE	165	Soil Water Eng.	3	3	4						16
AE	180	Seminar	1	0	1						
AE	183	Spec. Prob. in A.E.			1						
		*Electives			5						
					17						

* 18 hours of elective credit must be in humanity-social science electives as specified for other engineering curricula except that three hours should be in Ab/Sy courses; sufficient additional elective credit must be in College of Life Sciences and Agriculture subjects to make a total of 40 credits.

LSA Orientation; Gc 5, 6 Orientation; AE 79 Seminar; AE 80 Senior Seminar or AE 81 Departmental Seminar is required each semester.

Students transferring to University of Maine from the Universities of Massachusetts or Rhode Island under the Regional Program should check the bulletins for those institutions for the first two years in Agricultural Engineering.

Courses in Agricultural Engineering. See Page 184

CHEMICAL ENGINEERING

(including Pulp and Paper Technology)

PROFESSORS BOBALEK, A. CHASE, DURST, ZIEMINSKI; ASSOCIATE PROFESSORS BOCKUS, GORHAM; R. CHASE, ELTON; IBM LECTURER MUMME; INSTRUCTOR FOLSTER

The Chemical Engineering curriculum is designed to provide the education necessary to prepare for successful living in the modern world for students who wish to undertake 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 basic training in chemistry, the curriculum in the sophomore and junior years includes all the fundamental courses in the Chemistry curriculum. 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 the last three years in logical sequence. The great majority of the course work in the senior year is made up of these professional courses. Necessary basic knowledge of electrical and mechanical engineering is provided by courses in the appropriate departments. 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 intend to enter 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 identical with the general Chemical Engineering curriculum. This curriculum leads to the bachelor of science degree in pulp and technology. It is possible for certain students, 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 program with emphasis on courses in management or computer applications available to students who expect to enter the field of production of pulp and paper. This curriculum contains the required courses of the four-year curricula in Chemical Engineering and Pulp and Paper Technology. It also includes selected courses in economics and business administration or courses in computer technology and instrumentation. It leads to the degree of bachelor of science in chemical engineering and a certificate indicative of the curriculum.

Graduate Work in Chemical Engineering

Candidates for the degree of master of science 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 20 hours of professional courses and 10 hours of investigation and 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.

Graduate work leading to the master of science degree is also offered in the Pulp and Paper Division. Candidates who complete the five-year program in Pulp and Paper may receive graduate credit for 20 hours of suitable courses taken in the fifth year.

Graduate courses are also available that lead to the doctor of philosophy degree in chemical engineering.

CURRICULUM IN CHEMICAL ENGINEERING

Freshman Year. See Page 238.

Sophomore Year

FALL SEMESTER			Hours			SPRING SEMESTER			Hours		
Subject			Rec or Comp	Lab	Cr	Subject			Rec or Comp	Lab	Cr
Ch	41	Quantitative Anal.	2	3	3	Ch	152	Organic Chemistry	3	0	3
Ch	151	Organic Chemistry	3	0	3	Ch	162	Organic Lab.	0	4	2
Ch	161	Organic Lab.	0	4	2	ChE	2	Fund. of Chem. Eng.	2	4	4
ChE	1	Fund. of Chem. Eng.	2	4	4	*Gc	7	Comp. Prog. for Eng.	1	2	2
Ms	28	Calcuus	4	0	4	Ms	29	Calculus	4	0	4
								Hum. Elective	—	—	—

Junior Year

			Rec or Comp	Lab	Cr				Rec or Comp	Lab	Cr
Ch	171	Physical Chemistry	2	6	5	Ch	172	Physical Chemistry	2	6	5
ChE	37	Intro. to Thermodynamics	3	0	3	ChE	165	Elem. of Chem. Eng.	3	0	3
ChE	164	Elem. of Chem. Eng.	3	0	3	ChE	181	Chem. Eng. Lab.	1	4	3
Me	55	Statics and Strength of Mat.	3	0	3	Me	52	Applied Mechanics	3	0	3
		Hum. Elective	—	—	—	Sh	1	Public Speaking	2	0	2
								Hum. Elective	—	—	—

* Recommended elective.

Senior Year

			Rec or Comp	Lab	Cr				Rec or Comp	Lab	Cr
ChE	177	Chem. Process Industries	3	0	3	ChE	178	Chem. Process Industries	3	0	3
ChE	182	Chem Eng. Lab.	1	4	3	ChE	194	Chem. Eng. Thermodynamics	3	0	3
ChE	196	Process Control and Instrumentation	3	0	3	*ChE	199	Thesis	0	4	2
*ChE	199	Thesis	0	2	1	*ChE	168	Kinetics	3	0	3
Ee	41	Electric Circuits	3	0	3	Ee	42	Electric Mach; or	1½	1½	2
		Hum. Elective	—	—	—	Ee	43	Electronics	1½	1½	2
Eh	5	Technical Comp.	2	0	2			Hum. Elective	—	—	—

* Recommended elective.

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.

Senior Year

FALL SEMESTER			Hours			SPRING SEMESTER			Hours		
Subject			Rec or Comp	Lab	Cr	Subject			Rec or Comp	Lab	Cr
Ee	41	Electric Circuits	3	0	3	ChE	181	Chem. Eng. Lab.	1	4	3
Eh	5	Technical Comp.	2	0	2	Ee	42	Electric Mach; or	1½	1½	2
Pa	165	Pulp Technology	3	0	3	Ee	43	Electronics	1½	1½	2
Pa	173	Pulp Manufacture and Testing	0	8	4	Pa	166	Paper Technology	3	0	3
Pa	189	Pulp & Paper Mill Inspections	0	4	2	Pa	172	Pulp & Paper Equipment	3	0	3
*Pa	199	Thesis	0	2	1	Pa	174	Paper Manufacture and Testing	0	8	4
		Hum. Elective	—	—	—	*Pa	199	Thesis	0	4	2

* Recommended elective.

CURRICULUM IN FIVE-YEAR PULP AND PAPER OPTIONS

Freshman Year. See Page 238.

Sophomore and Junior Years: Identical with Chemical Engineering

COMPUTER

Senior Year

			Rec or Comp	Lab	Cr				Rec or Comp	Lab	Cr
ChE	177	Chem. Process Industries	3	0	3	ChE	178	Chem. Process Industries	3	0	3
ChE	182	Chem. Eng. Lab	1	4	3	ChE	194	Chem. Eng. Thermodynamics	3	0	3
Ee	41	Electric Circuits	3	0	3	Ee	42/43	Electric Mach; or Electronics	1½	1½	2
Pa	165	Pulp Technology	3	0	3	ChE	150	Analog Computer Programming	2	2	3
ChE	151	Digital Computer & Data Processing Technology	2	2	3	Pa	166	Paper Technology	3	0	3
ChE	196	Process Control & Instrumentation	3	0	3	ChE	242	Process Dynamics	3	0	3
Eh	5	Technical Composition	2	0	2						

Fifth Year

FALL SEMESTER Subject			Hours Rec	Lab or Comp	Cr	SPRING SEMESTER Subject			Hours Rec	Lab or Comp	Cr
Pa	173	Pulp Manufacture and Testing	0	8	4	Pa	174	Pulp Manufacture and Testing	0	8	4
*Pa	189	Pulp and Paper Mill Inspection	0	4	2	*Pa	172	Pulp and Paper Mill Equipment	3	0	3
ChE	168	Chem. Eng. Kinetics	3	0	3	Ms	19 or 31	Statistics	3	0	3
ChE	152	Special Problems in Computer Programming	2	2	3	Pa	295	Seminar	1	0	½
Pa	295	Seminar	1	0	½	Pa	199	Thesis	0	4	2
Pa	199	Thesis	0	2	1	ChE	153	Special Topics in Systems Analysis	3	0	3
		Hum. Elective	—	—	—						

* Either one of these courses meets the requirements.

MANAGEMENT

Senior Year

			Lab Rec	or Comp	Cr				Lab Rec	or Comp	Cr
Ba	9	Prin. of Accounting I	3	0	3	ChE	178	Chem. Process Industries	3	0	3
ChE	177	Chem. Process Industries	3	0	3	ChE	194	Chem. Eng. Thermodynamics	3	0	3
ChE	182	Chem. Eng. Lab	1	4	3	Ee	42	Electric Mach. or	1½	1½	2
Ee	41	Electric Circuits	3	0	3	Ee	43	Electronics	1½	1½	2
Ee	33	Labor Economics	3	0	3	Eh	5	Technical Comp.	2	0	2
Pa	165	Pulp Technology	3	0	3	Pa	166	Paper Technology	3	0	3
		Hum. Elective	—	—	—			Hum. Elective	—	—	—

Fifth Year

			Lab Rec	or Comp	Cr				Lab Rec	or Comp	Cr
Ba	151	Business Finance I	3	0	3	Ba	30	The Legal Env. Bus.	3	0	3
ChE	196	Process Control and Instrumentation	3	0	3	Ms	19	Statistics or	3	0	3
Pa	184	Paper Mill Mgt.	3	0	3	Ms	31	Math. Statistics	3	0	3
Pa	173	Pulp Manufacture and Testing	0	8	4	Pa	172	Pulp & Paper Mill Equipment	3	0	3
Pa	189	Pulp and Paper Mill Inspection	0	4	2	Pa	174	Paper Manufacture and Testing	0	8	4
Pa	295	Seminar	1	0	½	Pa	295	Seminar	1	0	½
Pa	199	Thesis	0	2	1	Pa	199	Thesis	1	0	½
		Hum. Elective	—	—	—			Elective	—	—	—

Courses in Chemical Engineering

(In each laboratory course a breakage card is required.)

1; 2. Fundamentals of Chemical Engineering — A quantitative correlation of basic concepts of chemistry, physics, and mathematics necessary for the analysis of problems in chemical engineering operations and processes. Prerequisite: Ch 2. *Rec* 2, *Lab* 4, *Cr* 4. MR. FOLSTER, MR. GORHAM

33. Stoichiometry — Application of the principles of heat and material

balances to the solution of problems in combustion and industrial chemistry. Transfer students only. Prerequisite: Ch 2. *Rec* 3, *Cr* 3.

37. Introduction to Thermodynamics—Development of the first law of thermodynamics and its application to engineering problems of both the batch and the flow type. Consideration of the second law. Prerequisite: Ch 2; Ms 29. *Rec* 3, *Cr* 3. MR. ELTON

150. Analog Computer Programming—Solutions to differential equations and partial differential equations. Boundary value problems, initial condition problems. Analysis of simple processes. Simulation of process control components. Plant simulation. Prerequisite: Ms 150. *Rec* 2, *Lab* 2, *Cr* 3. MR. MUMME

151. Digital Computer and Data Processing Technology — Analysis of current digital computer programming languages. Fundamentals of I.B.M. 1620/1710 machine language. Symbolic Programming System (S.P.S.) for the I.B.M. 1620/1710 computer system. Techniques of processing data and numerical methods utilizing engineering examples. Prerequisite: Ms 29. *Rec* 2, *Lab* 2, *Cr* 3. MR. R. CHASE

152. Special Problems in Computer Programming—Lecture, demonstrations, and laboratory practice in use of analog and digital computers in simulation, design, and control of unit operations, processes, and systems. Prerequisite: ChE 150, ChE 151. *Rec* 2, *Lab* 2, *Cr* 3. MR. MUMME

153. Special Topics in Systems Analysis—Fundamentals of model theory; search techniques and methods of process optimization; stability of linear and non-linear systems; statistical methods applied to experimental design and to evolutionary operation of process. Prerequisite: ChE 150, ChE 151, ChE 196. *Rec* 3, *Cr* 3. MR. MUMME

164; 165. Elements of Chemical Engineering—Basic principles of the unit operations and their application to engineering problems. Prerequisite: Ms 29, and either ChE 2 or ChE 33. *Rec* 3, *Cr* 3. MR. A. J. CHASE, MR. ELTON

168. Chemical Engineering Kinetics—Kinetics of homogeneous reactions and solid catalytic reactions. Heat and mass transfer in, and design of, reactors. Prerequisite: ChE 165. *Rec* 3, *Cr* 3. MR. ELTON

170. Chemical Engineering of Pulp and Paper Manufacture—An advanced course in those unit operations of particular importance in the manufacture of pulp and paper; e.g., flow of fluids heat transfer, absorption, evaporation, drying, etc. Prerequisite: Ch 172; ChE 165. *Rec* 3, *Cr* 3. STAFF

177/178. 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

181/182. 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 164 for 181, ChE 165 for 182. *Rec* 1, *Lab* 4, *Cr* 3. MR. DURST

187. 188. Chemical Engineering Mill Practice—Group investigations of the operation of commercial equipment in neighboring industrial plants. Open only to seniors and graduate students. *Time and credit arranged.* MR. DURST

194. Chemical Engineering Thermodynamics—Development and quantitative application of the second law of thermodynamics. Considerations of heat engines, the concept of availability, chemical equilibrium, etc. Prerequisite: ChE 37, 165. *Rec* 3, *Cr* 3. MR. DURST

196. Process Control and Instrumentation—Techniques employed by proc-

ess engineers for the control of unit operations and chemical processes. Control theory, operating principles and application of industrial instruments, principles and methods of automatic control. Prerequisite: ChE 37, *Rec* 3, *Cr* 3.

MR. GORHAM

199. Undergraduate Thesis—Original investigation of a chemical engineering problem, and reporting of the results. Open only to seniors. *Cr Ar.*

THE CHEMICAL ENGINEERING STAFF

Graduate Course

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.
231. Kinetics and Catalysis—*Rec* 4, *Cr* 4.
242. Process Dynamics and Control—*Rec* 3, *Cr* 3.
330. Advanced Chemical Engineering Thermodynamics—*Rec* 3, *Cr* 3.
350. Transport Phenomena—Energy Transport—*Rec* 3, *Cr* 3.
351. Transport Phenomena—Mass Transport—*Rec* 3, *Cr* 3.
352. Transport Phenomena—Momentum Transport—*Rec* 3, *Cr* 3.
360-365. Advanced Unit Operations—*Rec* 1, *Lab* 4, *Cr* 3.
395. Graduate Seminar—*Rec* 1, *Cr* ½.
399. Graduate Thesis—*Cr Ar.*

Courses in Pulp and Paper Technology

40s Summer Mill Practice—The obtaining of practical mill experience is encouraged of students who have completed their junior year and contemplate senior work in pulp and paper technology. *Cr* 2. STAFF

165. Pulp Technology—A course in the manufacture of various kinds of wood pulps and the chemistry involved in present-day pulp making. Prerequisite: Ch 2. *Rec* 3, *Cr* 3. MR. BOCKUS

166. Paper Technology—A course in the processes of manufacturing paper. Prerequisite: Pa 165. *Rec* 3, *Cr* 3. MR. BOCKUS

172. Pulp and Paper Equipment—A lecture and recitation course involving the description, and production calculations, of pulping, stock preparation, stock flow, paper information, power plant, and auxiliary equipment. Prerequisite: Pa 165. *Rec* 3, *Cr* 3. MR. GORHAM

173. Pulp Manufacture and Testing—A laboratory course involving the production and testing of chemical and semi-chemical wood pulps. Prerequisite: Ch 140, Pa 165 (can be taken simultaneously). *Lab* 8, *Cr* 4.

MR. BOCKUS, MR. GORHAM

174. Paper Manufacture and Testing—A laboratory course in the manufacture of paper, including beating, jordaning, sizing, etc., and physical, chemical, and microscopical testing. Prerequisite: Ch 140, Pa 166 (can be taken simultaneously). *Lab* 8, *Cr* 4. MR. A. J. CHASE, MR. BOCKUS

184. Pulp and Paper Mill Management—The operating departments of a paper mill are discussed from the standpoint of their function and management at various levels. *Rec* 3, *Cr* 3. MR. BOBALEK

189. Pulp and Paper Mill Inspection—Mill visits involving the observa-

tion of operations in various types of pulp and paper plants. *Lab* 4, *Cr* 2. This course requires a laboratory fee of approximately $20. MR. CHASE

199. Undergraduate Thesis—Original investigation of a pulp and paper problem and reporting of the results. Open only to seniors. *Cr Ar.*

Graduate Courses

295. Graduate Seminar—*Rec* 1, *Cr* ½.
399. Graduate Thesis—*Cr Ar.*

CHEMISTRY

PROFESSORS BEAMESDERFER, BOGAN, BRAUNSTEIN, DOUGLASS, DUNLAP, MARTIN, WOLFHAGEN; ASSOCIATE PROFESSOR GEORGITIS; ASSISTANT PROFESSORS GREEN, RUSS; MR. HILL, MR. HILTON, MR. TRIPP, MRS. WOLFHAGEN

The Chemistry curriculum is designed to give the student a thorough understanding of the fundamental nature of all material substances, the changes they undergo and the laws governing such changes. It also aims to develop skill in those laboratory techniques required to synthesize and to analyze substances and to study their properties.

Because a knowledge of chemistry is fundamental to successful work in so many fields, the Chemistry curriculum affords an unusual opportunity for a wide choice of electives so that the Chemistry major may adapt his program to his individual interests and future needs. The curriculum leading to American Chemical Society certification prepares the student, upon graduation, for employment in chemical production and control, research, or for graduate study in chemistry. The proper choice of electives will enable the student to enter the related fields of industrial management, technical sales and service, or teaching, and will qualify him for admission to medical school. Students interested in any of these fields may obtain from the Chemistry Department specimen curricula showing recommended elective sequences.

Students intending to major in Chemistry who have a special interest in mathematics, physics, nuclear science, geology, or the biological sciences may also obtain specimen curricula designed to help them attain their educational goals.

The Chemistry major student, in order to qualify for certification to the American Chemical Society Committee on Professional Training, must complete courses 1, 2, 31, 140, 151, 152, 154, 161, 162, 164, 171, 172, 185, 190. Additional requirements include one year of physics, a reading knowledge of German, mathematics through differential and integral calculus and 16-18 hours of non-specialized courses other than physical sciences, exclusive of German and freshman English.

Superior students should seriously consider continuing their studies at the graduate level and should plan on meeting only minimum ACS requirements so that they can include in the undergraduate program a second language, advanced mathematics, and advanced physics.

For Chemistry courses in the Summer Session, see the Summer Session Bulletin.

For a description of courses in biochemistry, see the list of courses given by the Department of Biochemistry.

GRADUATE WORK IN CHEMISTRY

The Department of Chemistry offers a program of study and research leading to the M.S. and Ph.D. degrees. The general requirements for advanced degrees are described in the general section of the Graduate School Catalog. Specific requirements for admission to advanced study in Chemistry and information about the programs of study offered are given in the Chemistry section of the catalog.

CHEMISTRY CURRICULUM

Freshman Year. See Page 238

Sophomore Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours			Subject			Hours		
			Rec	Lab	Cr				Rec	Lab	Cr
Ch	31	Qualitative Analysis and Inorganic Chem.	2	6	4	Ch	140	Quantitative Anal.	2	6	4
Ch	151	Organic Chemistry Lecture	3	0	3	Ch	152	Organic Chemistry Lecture	3	0	3
Ch	161	Organic Chemistry Laboratory	0	4	2	Ch	162	Organic Chemistry Laboratory	0	4	2
Ms	28	Anal. Geometry and Calculus	4	0	4	Ms	29	Calculus and Differential Equations	4	0	4
		Elective			3	Sh	1	Public Speaking	2	0	2
		Economics, Sociology or Psychology						Elective			3
								Economics, Sociology or Psychology			

Junior Year

			Rec	Lab or Comp	Cr				Rec	Lab or Comp	Cr
Ch	171	Physical Chemistry	3	5	5	Ch	172	Physical Chemistry	3	5	5
Gm	11	Scientific German (Elementary)	3	0	3	*Ch	190	Intermediate Organic Chemistry Lab.	1	4	3
		Hum. Elective			3	Gm	12	Scientific German (Elementary)	3	0	3
		Other Electives			7-8			Hum. Elective			3
								Other Electives			3-4

Senior Year

*Ch	164	Int. Quant. Anal.	2	6	4	*Ch	154	Adv. Inorganic Chemistry	3	0	3
*Ch	185	Chem. Literature	2	0	2	Eh	5	Technical Comp.	2	0	2
Gm	13	Scientific German (Intermediate)	3	0	3			Other Electives			12-13
		*Hum. Elective			3						
		Other Electives			5-6						

* For American Chemical Society certification.

CHEMISTRY CURRICULUM

Courses in Chemistry (Ch)

1/2. General Chemistry—The principles of general chemistry, Ch 2 is largely devoted to an introduction to the elements of qualitative analysis. *Rec* 3, *Lab* 3, *Cr* 4. STAFF

2A. General Chemistry—Open, by special examination, to students who have excellent preparation in chemistry. Covers in one semester the essential

topics of General Chemistry and, if completed satisfactorily, meets the Ch 1,2 requirement. Admission carries 4 hours of provisional advanced standing credit conditioned on the student's earning A or B grade. *Rec* 3, *Lab* 3, *Cr* 4.

MR. DOUGLASS

31. Qualitative Analysis and Inorganic Chemistry — An introductory course in inorganic chemistry and a systematic study of the principles of analysis of the common ions. Prerequisite: Ch 2, *Rec* 2, *Lab* 6, *Cr* 4. MR. RUSS

41. Quantitative Analysis—Same course as Ch 140 except that fewer laboratory determinations are made. Prerequisite: Ch 2. *Rec* 2, *Lab* 3, *Cr* 3.

MR. HILL

84. Metallurgy—A theoretical and descriptive course dealing with ferrous and non-ferrous metals and emphasizing the theory of binary alloys. Prerequisite: Ch 2. *Rec* 3, *Cr* 3. MR. MARTIN

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. CHEMISTRY STAFF

140*. Quantitative Analysis—An introductory course illustrating the fundamental principles of gravimetric and volumetric analysis. Prerequisite: Ch 2. *Rec* 2, *Lab* 6, *Cr* 4. MR. BOGAN

151*/152*. Organic Chemistry Lecture—An introduction to the chemistry of carbon compounds. Prerequisite: Ch 2. *Rec* 3, *Cr* 3. MR. DOUGLASS

154. Advanced Inorganic Chemistry—Advanced theoretical and descriptive inorganic chemistry emphasizing periodic relationships. Prerequisite: Ch 2, 31 and 140. Corequisite: Ch 172. *Rec.* 3, *Cr* 3. MR. RUSS

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. MR. DOUGLASS

164. Intermediate Quantitative Analysis—A continuation of Ch 140, involving some of the more difficult volumetric and gravimetric methods, with considerable emphasis upon instrumental methods of analysis. Prerequisite: Ch 140 and 172. *Rec* 2, *Lab* 6, *Cr* 4. MR. BOGAN

171*/172*. Physical Chemistry—A detailed study of fundamental principles of chemistry and their applications. Prerequisite: Ch 140 or 41, Ps 2, and Ms 29. *Rec* 3, *Comp* 1, *Lab* 4, *Cr* 5. MR. DUNLAP

179. Advanced Physical Chemistry Laboratory—An advanced laboratory course with emphasis on the use of physico-chemical methods. Prerequisite: Ch 172. *Lab* 6 *or* 8, *Cr* 3 *or* 4. STAFF

180. Radiochemistry—Chemical aspects of nuclear properties and processes. Application of techniques involving radioactivity to chemical problems. Prerequisite: Ch 172. *Rec* 1, *Lab* 4, *Cr* 3. MR. BRAUSTEIN

185. Chemical Literature—A study of methods for searching the chemical literature. Prerequisite: Ch 152 and Elementary German. *Rec* 2, *Cr* 2.

MR. MARTIN

190. Intermediate Organic Chemistry Laboratory—An introduction to the isolation, indentification and semi-micro scale preparation of organic compounds. Prerequisite: Ch 152; Ch 162. *Rec* 1, *Lab* 4, *Cr* 3. STAFF

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* Not for graduate students in chemistry and chemical engineering. For others, graduate credit with approval of the student's adviser.

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.
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 WADLIN, GORRILL, SPROUL, VIESSMAN; ASSOCIATE PROFESSORS GREENWOOD, HAMILTON, KESHAVAN, TAYLOR; ASSISTANT PROFESSORS FURBER, NIGHTINGALE*, WILSON; MR. FENTON

The Civil Engineering curriculum has been revised to provide a broader understanding of engineering problems in general and at the same time provide for greater specialization in several branches of Civil Engineering and in the field of public management. While the new curriculum is broad enough to qualify graduates with the bachelor of science degree to start in any field of Civil Engineering, special emphasis is placed upon Highway Engineering, Sanitary Engineering, and Structural Engineering. While graduates with the bachelor of science degree go directly into Town Management, the Public Management option specifically prepares graduates for a fifth year in the Department of History and Government, 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 assume an administrative position in his chosen field.

Graduate Work in Civil Engineering

Graduate programs are well established in the fields of public management, sanitary engineering, highway engineering 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 about 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.

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* On leave 1966-1967

CIVIL ENGINEERING CURRICULUM

Freshman Year. See Page 238

Sophomore Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours			Subject			Hours		
			Rec	Lab	Cr				Rec	Lab	Cr
Ce	5	Surveying	2	3	3	Ce	10	Curves & Earthwork	2	0	2
Gc	7	Computer Program	1	2	2	Eg	3	Descriptive Geometry	0	4	2
Ee	41	Elec. Circuits	3	0	3	Gy	6	Geology for Engineers	2	3	3
Ms	28	Calculus	4	0	4	Ms	29	Calculus	4	0	4
Sh	1	Public Speaking	2	0	2	Me	50	Mechanics (Statics)	3	0	3
		Hum. Elective	—	—	3			Hum. Elective	—	—	3

Junior Year

			Rec	Lab	Cr				Rec	Lab	Cr
Ce	26	Hydraulics	3	3	4	Ce	20	Materials	3	3	4
Ce	29	Intro. Highway Eng.	3	0	3	Ce	30	Transportation Engineering	2	0	2
Ce	31	Intro. San. Eng.	3	0	3	Ce	32	Sanitary Eng. Design	2	3	3
Eh	5	Tech. Composition	2	0	2	Ce	52	Struct. Analysis & Design	4	0	4
Me	51	Strength of Materials	4	0	4	Me	52	Dynamics	3	0	3
Ms	150	Diff. Equations	3	0	3			Hum. Elective	—	—	3
		Hum. Elective	—	—	3						

Senior Year

			Rec	Lab	Cr				Rec	Lab	Cr
Ce	58	Structural Theory	3	0	3	Ce	57	Reinf. Concrete	3	0	3
Me	33	Thermodynamics	3	0	3	Ce	61	Eng. Relations	3	0	3
		Hum. Elective	—	—	3			Hum. Elective	—	—	3
		Senior Option	—	—	9			Senior Option	—	—	9

Highway Option

Ce	63	Hwy. Adm. Traffic	3	0	3	Ce	69	Struct. Highway Materials	1	6	3
Ce	65	Soil Mechanics	2	3	3	Ce	72	Highway Engineering	3	0	3
Ce	68	Highway Eng.	3	0	3	Ce	176	Soils Engineering	3	0	3

Structural Option

Ce	59	Structural Design	0	9	3	Ce	60	Structural Design	0	9	3
Ce	65	Soil Mechanics	2	3	3	Ce	176	Soils Engineering	3	0	3
Ms	150	Diff. Equations	3	0	3	Ce	92	Indeterminate Structures	3	0	3

Sanitary Option

By	27	Gen. Bacteriology	3	4	5	Ce	34	Sanitary Engineering	2	6	4
Ce	171	Sanitary Eng.	2	3	3	Ce	174	Sanitary Engineering	2	3	3
						Ms	19	Statistics	3	0	3

Public Management Option

The Public Management Option is designed to give the civil engineering student some of the basic tools of governmental 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 master's degree in public management in the College of Arts and Sciences. The following courses are recommended:

			Hours
Ec	1/2	Principles of Economics	6
Gt	1/2	Introduction to Government	6
Gt	7.8	Maine Government	2
Gt	33	The American City	3
Gt	34	Municipal Administration	3
Gt	40	Community Planning	2
Gt	51	Public Administration	3
Gt	52	Administrative Law	3
Gt	195	Municipal Internship*	3

* (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. Prerequisite: Ms 1. *Rec* 2, *Lab* 3, *Cr* 3.

10. Curves and Earthwork—The geometry of simple, compound, and reverse circular curves, transition curves, vertical curves, and earthwork. Prerequisite: Ce 5. *Rec* 2, *Cr* 2.

20. Materials—The properties of materials which are significant in building and highway construction and how they are determined. The selection of materials to fulfill given requirements. Prerequisite: Me 51. *Rec* 3, *Lab* 3, *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, *Lab* 3, *Cr* 4.

29. Introduction to Highway Engineering—The principles, current practice and research involved in the planning, design, construction, and operation of various types of highway systems, including traffic engineering, drainage systems, subgrade structures and design of base courses. Prerequisite: Ce 10. *Rec* 3, *Cr* 3.

30. Transportation Engineering—The history and development of transportation systems, their components, means of propulsion, limitations, operating characteristics, terminal requirements and the economic comparison and planning of the various systems. Prerequisite: Ce 29 or consent of instructor. *Rec* 2, *Cr* 2.

31. Introduction to Sanitary Engineering—Methods and applications of engineering principles involved in providing sewers and sewage treatment, swimming pools, stream pollution programs, garbage and waste disposal, and safe and sanitary water and food supply. Prerequisite: Ce 5. *Rec* 3, *Cr* 3.

32. Sanitary Engineering Design—Study and design problems involved in providing municipal water supplies, sewers, sewage treatment and stream pollution control. Prerequisite: Ce 31 and Ce 26. *Rec* 3, *Cr* 3.

34. Sanitary Engineering—Principles, techniques, and interpretation of quanitative analytical chemical theory and tests as related to water, sewage and industrial wastes. Prerequisite: Ce 31. *Rec* 2, *Lab* 6, *Cr* 4.

52. Structural Analysis and Design — The determination of maximum stresses and strains, the proportioning of members and the design of connections, for beams, girders, and trusses. Prerequisite: Me 51. *Rec* 4, *Cr* 4.

57. Reinforced Concrete—The theory underlying the design of plain and reinforced concrete structures such as buildings, retaining walls, footings and short span bridges. Prerequisite: Ce 52. *Rec* 3, *Cr* 3.

58. Structural Theory—Determination of stresses due to unsymmetrical bending. Development and use of moment distribution, shear center, and shear flow. Special topics on section kerns, combined stresses, S-polygon, and plastic design theory. Prerequisite: Ce 52. *Rec* 3, *Cr* 3.

59; 60. Structural Design—The designing and detailing of steel and reinforced concrete structures. Prerequisite: Ce 52. *Lab* 9, *Cr* 3.

61. Engineering Relations—Business phases of engineering. The ethical and legal relations among the parties affected by the making of an engineering contract. Specifications for elementary portions of engineering works. Prerequisite: Ce 20 and 52. *Rec* 3, *Cr* 3.

63. Highway Administration and Traffic Engineering—The various functions a state highway department has to perform; organization to carry out these functions; financing of highways; traffic studies and geometric designs to control and to handle traffic. Prerequisite: Ce 29. *Rec* 3, *Cr* 3.

65. Soil Mechanics — The fundamental physical properties of soils and their effect on the solution of common problems that arise in practical engineering design and construction. 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 29. Rec 3, Cr 3.

69. Structural and Highway Materials—Methods of testing, characteristics of and specifications for the materials commonly used for highway purposes; design of mixes. Prerequisite: Me 51. *Rec* 1, *Lab* 6, *Cr* 3.

72. Highway Engineering — Various highway problems; rights of way; traffic engineering; drainage; high type pavements and maintenance. Prerequisite: Ce 68. *Rec* 3, *Cr* 3.

99. Thesis—The study of and report upon some original investigation or 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* 2, *Cr* 2.

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* 2, *Cr* 2.

170. Soils Laboratory—The technique of performing the routine types of soil tests. Prerequisite: Ce 65. *Lab* 6, *Cr* 2.

171. Sanitary Engineering—Sewerage and the theory and design of sewage disposal works, followed by brief studies of municipal and rural sanitation. Prerequisite: Ce. 32, *Rec* 2, *Lab* 3, *Cr* 3.

174. Sanitary Engineering—Continuation of study begun in Ce 171 of rural and municipal sanitation, followed by study of water purification and design of water treatment plants. Prerequisite: Ce 171. *Rec* 2, *Lab* 3, *Cr* 3.

176. Soils Engineering—The methods of treating certain foundation problems to which soil mechanics provides a solution. 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 31. *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 momen distribution. Prerequisite: Ce 52. *Rec* 3, *Cr* 3.

Graduate Courses

200. City and Regional Planning—*Rec* 2, *Lab* 2, *Cr* 3.
240. Radiological Health—*Rec, Lab* 3, *Cr* 3.
300. Traffic Planning I—*Rec* 3, *Cr* 3.
301. Traffic Planning II—*Rec* 3, *Cr* 3.
303. Urban Transportation Planning—*Rec* 3, *Lab* 3, *Cr* 4.
320. Water Treatment Theory—*Rec* 3, *Cr* 3.
321. Sanitary Eng. Lab—*Rec* 2, *Lab* 6, *Cr* 4.
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. 351. 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.
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.
399. Graduate Thesis

ELECTRICAL ENGINEERING

PROFESSORS ARMINGTON, LIBBEY, PARSONS, SHIELDS, TURNER; ASSOCIATE PROFESSORS BROWN, CROSBY, SHEPPARD, YOUNG; ASSISTANT PROFESSORS BEESON, EDE,* HAMILTON, WHITNEY

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 of electrical engineering.

Central to the curriculum are integrated course sequences in circuit and network analysis, solid-state and vacuum electronics, fundamentals of electrical machinery, electromagnetic fields, and communication theory. Opportunity is provided in the senior year for each student to elect courses in electro-acoustics, 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 heat transfer, and properties of materials, the curriculum provides a sound educational base for graduate study as well as for employment in any of the broad spectrum of job opportunities in the electrical and related industries.

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* On leave 1966-67

Special Programs in Electrical Engineering

A special one-year post-baccalaureate program leading to a certificate in power systems engineering provides advanced training for graduates who would enter electric utility engineering.

Another 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 238.

Sophomore Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours Rec or Comp	Lab	Cr	Subject			Hours Rec or Comp	Lab	Cr
Ee	1	Basic Cct. Anal. I	4	3	5	Ee	2	Basic Cct. Anal. II	2	2	3
Eh	15	Masterpcs. of Lit.*	3	0	3	Ee	12	Basic Elec. Lab.	1	3	2
Gc	7	Computer Program	1	2	2	Ms	29	Calculus	4	0	4
Ms	28	Analyt. & Calculus	4	0	4	Me	52	Applied Mechanics	3	0	3
Me	55	Statics & Strength	3	0	3	Ps	36	Mod. Phys. for Eng.	3	0	3
Sh	1	Public Speaking	2	0	2			Hum. Elective			3

* Any other Literature course which is offered by the Department of English and for which the student can qualify may be substituted.

Junior Year

			Rec or Comp	Lab	Cr				Rec or Comp	Lab	Cr
Ee	3	Inter. Cct. Anal. I	2	2	3	Ee	4	Inter. Cct. Anal. II	2	2	3
Ee	13	Electronics I	3	3	4	Ee	14	Electronics II	3	3	4
Ee	23	Electric Machines	3	3	4	Ee	25	AC Machinery	3	3	4
Ee	31	Elem. of Commun.	3	0	3	Eh	5	Technical Comp.	2	0	2
Ms	150	Ordinary Diff. Eq.	3	0	3	Me	33	Thermodynamics I	3	0	3
		Hum. Elective			3			Hum. Elective			3

Senior Year

			Rec or Comp	Lab	Cr				Rec or Comp	Lab	Cr
Ee	150	E-M Fields	3	0	3	Me	62	Heat & Fluid Flow	3	0	3
Ee	161	Electronics III	3	3	4			Hum. Elective			3
		Hum. Elective**			3			Tech. Electives			9
		Tech. Elective***			6						

**This Humanities elective may be moved to the spring semester to allow two two-course technical elective sequences.

***Technical electives include upper-level Electrical Engineering courses, Ms 152, and Ms 153. Certain other mathematics, physics and engineering courses may be substituted with special permission. Each student's selection of four technical electives must be approved by his advisor during preregistration in the spring semester of his junior year.

POST-BACCALAUREATE PROGRAM IN POWER SYSTEMS ENGINEERING

A minimum of 30 credits is required beyond the bachelor's degree. Students having met the objectives of one or more required courses as undergraduates will substitute an equal number of credits of elective courses. Students holding engineering degrees other than electrical may be required to schedule one or more prerequisite courses for non-certificate credit.

FALL SEMESTER

Required Courses

Subject			Hours Rec or Comp	Lab	Cr
Ee	157	Elec. Power Systems	3	4	5
Ee	159	Appl. of Computers	3	0	3
Ee	194	Engineering Admin.	3	0	3

Elective Courses

Ba	130	Legal Envir. of Bus.	3	0	3
Ee	171	Servomechanisms	2	3	3
Ee	222	Transients I	2	0	2
Ee	240	Commun. Networks I	2	0	2
Ee	271	Modern Control Theory	3	0	3
Ms	19	Statistical Infer.	3	0	3
		or			
Ms	130	Math. Statistics	3	0	3
Ps	170	Nuclear Physics	2	3	3

SPRING SEMESTER

Required Courses

Subject			Hours Rec or Comp	Lab	Cr
Ee	235	Advanced Pwr. Syst.	3	0	3
Ee	237	Protection	3	0	3
Ee	198	MHD and other Sources	3	0	3

Elective Courses

Ec	168	Soc. Control of Bus.	3	0	3
Ee	151	Network Analysis	3	0	3
Ee	173	Indus. Elec. Control	3	0	3
Ee	180	Computer Systems	3	0	3
Ee	191	Illum. Engineering	2½	1	3
Ee	223	Transients II	3	0	3
Ee	241	Commun. Network II	3	0	3
Ee	272	Non-Linear Control	3	0	3
Me	86	Power Plants	3	0	3

PULP AND PAPER COMPUTER OPTION IN ELECTRICAL ENGINEERING

Five-Year Program

The first three years of this program are the same as the regular Electrical Engineering program.

Senior Year

			Rec or Comp	Lab	Cr
ChE	150	Analog Computation	2	2	3
Ee	150	E-M Fields	3	0	3
Ee	161	Electronics III	3	3	4
		Hum. Elective			
		Tech. Elective			

			Rec or Comp	Lab	Cr
ChE	151	Digital Computation	2	2	3
Ch	41	Quant. Analysis	2	3	3
Ee	171	Servomechanisms	2	3	3
Ee	194	Engineering Admin.	3	0	3
Me	62	Heat & Fluid Flow	3	0	3
		Hum. Elective			

Fifth Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours Rec or Comp	Lab	Cr	Subject			Hours Rec or Comp	Lab	Cr
Ba	9	Prin. of Acctg.	3	0	3	ChE	153	Adv. Systems Anal.	1	2	3
ChE	152	Analog-Dig. System	0	4	3	ChE	242	Process Dynamics	3	0	3
Pa	165	Pulp Technology*	1	2	3	Pa	166	Paper Technology*	1	2	3
Pa	172	P&P Mill Equip.	1	2	3	Pa	174	Paper Mfr. & Testing	0	8	4
		or				Pa	199	Thesis			2
Pa	189	P&P Mill Inpect.	0	4	2	Pa	295	Seminar	1	0	½
Pa	173	Pulp Mfr. & Testing	0	8	4						
Pa	199	Thesis			1						
Pa	295	Seminar	1	0	½						

* To strengthen the fifth year it is recommended that Pa 165 and Pa 166 be scheduled in the senior year either as overload or by delaying two technical or humanities electives until the fifth year. This will delay the awarding of the B.S. degree.

PULP AND PAPER MANAGEMENT OPTION IN ELECTRICAL ENGINEERING

Five-Year Program

The first three years of this program are the same as the regular Electrical Engineering program.

Senior Year

			Lab	Rec or Comp	Cr				Lab	Rec or Comp	Cr
Ec	1	Economics	3	0	3	Ec	2	Economics	3	0	3
Ee	150	E-M Fields	3	0	3	Ee	194	Engineering Admin.	3	0	3
Ee	161	Electronics III	3	3	4	Me	62	Heat & Fluid Flow	1	2	3
Pa	165	Pulp Technology	1	2	3	Pa	166	Paper Technology	1	2	3
		Tech. Elective						Tech. Electives			

Fifth Year

			Lab	Rec or Comp	Cr				Lab	Rec or Comp	Cr
Ba	9	Prin. of Accounting	3	0	3	Ba	162	Indus. Relations	3	0	3
Ba	151	Business Finance	3	0	3	Ch	41	Quant. Analysis	2	3	3
Pa	173	Pulp Mfr. & Testing	0	8	4	Pa	172	P&P Mill Equip.	1	2	3
Pa	184	Paper Mill Mgt.	1	2	3	Pa	174	Paper Mfr. & Testing	0	8	4
Pa	189	P&P Mill Inspect.	0	4	2	Pa	199	Thesis			2
Pa	199	Thesis			1	Pa	295	Seminar	1	0	½
Pa	295	Seminar	1	0	½						

Courses in Electrical Engineering (Ee)

Starting with the fall semester of 1964 several course descriptions have been modified and many courses have been renumbered. Their previous numbers are listed for reference in the 1965 catalog.

Lower Level Courses

Circuits, Fields and Systems

1. Basic Circuit Analysis I—Basic laws and theorems of electric circuits; writing and complete solution of differential equations for first-order circuits with various drives. Prerequisite: Ps 2 and Ms 27. *Rec* 4, *Comp* or *Lab* 3, *Cr* 5.

2. Basic Circuit Analysis II—Writing and complete solution of differential equations for second-order electric curcuits with various drives; phasor solution of single phase a-c circuits. Prerequisite: Ee 1. *Rec* 3, *Cr* 3.

3. Intermediate Circuit Analysis I—The complex frequency plane and its application. Fourier analysis and elementary two-port networks. Prerequisite: Ee 2 or 47, Concurrent Ms 150. *Rec* 2, *Comp* or *Lab* 2, *Cr* 3.

4. Intermediate Circuit Analysis II—The study of low frequency transmission lines, Laplace transforms and the Fourier integral. Prerequisite: Ee 3, Ms 150. *Rec* 2, *Comp* or *Lab* 2, *Cr* 3.

Materials, Electronic Devices and Electronics

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—Electron ballistics; conduction in metals and semiconductors; emission; physics of electron devices; piecewise linear equivalent circuits of devices; rectifiers. Prerequisite: Ee 12, Ps 36, Ee 3 required concurrently. *Rec* 3, *Lab* 3, *Cr* 4.

14. Electronics II—Continuation of Ee 13: time and frequency domain analysis of electronic circuits; pulse and steady-state response of audio, video and tuned amplifiers; power amplifiers; feedback. Prerequisite: Ee 13, *Rec* 3, *Lab* 3, *Cr* 4.

Energy Conversion, Machines, and Control

23. Introduction to Electric Machines—Introductory study of magnetic fields and circuits with application to machines, transformers, and magnetic amplifiers. The theory, construction, operating characteristics, and the elements of control of d-c motors and generators. Introduction to polyphase circuits. Prerequisite: Ee 2. *Rec* 3, *Comp* or *Lab* 3, *Cr* 4.

25. Alternating Current Machinery—Theory, construction, and operating characteristics of alternating-current motors, generators, transformers, and rectifiers. Utilization of polyphase power. Prerequisite: Ee 3 and 23. *Rec* 3, *Lab* 3, *Cr* 4.

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 circuit 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 a-c power systems and machines for students majoring in fields other than Electrical Engineering. Prerequisite: Ee 41, *Rec* 1-½, *Lab* 1-½, *Cr* 2.

43. Electronics—An introduction to electronic devices and circuits for students majoring in fields other than Electrical Engineering. Prerequisite: Ee 41. *Rec* 1-½, *Lab* 1-½, *Cr* 2.

44. D-C Machines and Control Systems—An introduction to the theory and operating characteristics of d-c machines, typical applications of d-c machines in control systems. Prerequisite: Ee 43. *Rec* 1-½, *Lab* 1-½, *Cr* 2.

45. Electronic Instrumentation and Industrial Control — Principles of electric and electronic instruments and their applications, and an introduction to industrial control. Prerequisite: Ee 43, *Rec* 1-½, *Lab* 1-½, *Cr* 2.

47. Introduction to Electric Circuits—Introduction to transient and steady-state response of electric circuits. Ohm's Law, Kirchoff's Laws, phasor representation, loop and node equations, mutual inductance, network theorems. Portions of Ee 1 and 2, arranged to meet the needs of Engineering Physics students. Prerequisite: Ps 18, concurrent Ms 150. *Rec* 4, *Comp* 2, *Cr* 5.

98. 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 department, 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.

Upper Level Courses

Circuits, Fields, and Systems

150. Electromagnetic Fields—Solution of static electric and static magnetic field problems by the methods of vector analysis; boundary value conditions; derixation of Maxwell's equations; introduction to time-varying electromagnetic fields. Prerequisite: Ms 151. *Rec* 3, *Cr* 3.

151. Network Analysis—Two and four terminal networks; image parameters and filters; insertion loss and phase shift. Design and analysis of ladder filters; constant K and M-derived sections; matrices and determinants; network topology; network equilibrium equations. Derivation of cascading matrix and other methods. Prerequisite: Ee 4. *Rec* 3, *Cr* 3.

153. Microwave Transmission—High frequency lossy and lossless lines; propagation of waves in free space; antennas; wave guides. Prerequisite: Ee 150. *Rec* 1, *Comp* 4, *Cr* 3.

155. Electric Power Transmission—Line constants, high and EHV transmission calculations, distributed parameters, ABCD constants, circle diagrams. Prerequisite: Ee 3, 23. *Rec* 2, *Comp or Lab* 3, *Cr* 3.

156. Electric Power Systems—Power limits, steady-state and transient stability, traveling waves and reflections, symmetrical component theory and its application to faulted conditions. Prerequisite: Ee 25 and 155. *Rec* 2, *Comp or Lab* 2, *Cr* 3.

157. Electric Power Systems and Transmission—Introduction to current practice in the generation, transmission, and distribution of electric power, with emphasis on the technical problems of long lines and system networks. Prerequisite: Ee 25, *Rec* 3, *Comp or Lab* 4, *Cr* 5.

159. Application of Computers in Power System Analysis—Digital computer and network analyzer application to power system analysis with emphasis on matrix methods of solution of power system networks. Prerequisite or concurrent: Ee 156 or 157. *Rec* 3; *Cr* 3.

Materials, Electronic Devices and Electronics

161. Electronics III—Continuation of Ee 14; sinusoidal and nonsinusoidal oscillators: wave generation and shaping; modulation and demodulation circuitry. Prerequisite: Ee 14. *Rec* 3, *Lab* 3, *Cr* 4.

164. Electronics and Communication Laboratory—Measurements at radio, video, UHF, and microwave frequencies; generation and amplification of sinusoidal and nonsinusodial waves; noise measurements; waveshaping; modulation and demodulation. Prerequisite: Ee 161. *Rec* 1, *Lab* 4, *Cr* 3.

Energy Conversion, Machines, and Control

171. Servomechanism Fundamentals—Analysis of feedback control systems with emphasis on servo systems using LaPlace transformations, root locus, Nyquist, Bode and Nichols techniques. Introduction to design of compensating networks. Prerequisite: Ee 3, 23 and Ms 150, 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 25, *Rec* 3, *Cr* 3.

Communication, Information Theory, and Computer Theory

180. Analog and Digital Computer Systems—Basic analog computer elements, scale changing for machine equations, special analog elements; introduction to logical design of digital data processing systems, Boolean algebra, codes, switching networks, circuits for logical operation and binary arithmetic, general computer organization and control. Prerequisite: Ms 150, and Ee 14 or 43, *Rec* 3, *Cr* 3.

183. Probabilistic Methods in Electrical Engineering—The elements of probability theory including both the discrete and continuous cases with particular emphasis on the application to problems in electrical communication. Prerequisite: Ee 4, Ms 150. *Rec* 3, *Cr* 3.

184. Communication Systems—Time and frequency domain representations of signals, energy density, translation, sampling, noise and noise figure, modulation, elements of probability, and information theory, signal flow graphs. Prerequisite: Ee 4 and 161. *Rec* 3, *Cr* 3.

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 3 or 41. *Rec* 2-½, *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: Ee 31. *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 department, be taken more than once. Prerequisite: consent of the department. *Cr* 1-3.

Graduate Courses

222/223. Transients in Linear Systems—Ee 222: *Rec* 2, *Cr* 2; Ee 223: *Rec* 3, *Cr* 3.

235/236. Advanced Electric Power Systems—*Rec* 3, *Cr* 3.

237. Power System Protection and Relaying—*Rec* 3, *Cr* 3.

240/241. Communication Networks—Ee 240: *Rec* 2, *Cr* 2; Ee 241: *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.

267/268. Circuit Laboratory—*Lab* 4, *Cr* 2.

271. Modern Control Theory—*Rec* 3, *Cr* 3.

272. Non-Linear Control Systems—*Rec* 3, *Cr* 3.

280/281. Statistical Communication Theory—*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.

GENERAL ENGINEERING

PROFESSOR MCNEARY; ASSOCIATE PROFESSOR WESTFALL; ASSISTANT PROFESSORS DESCHANES, METCALF; MR. KEENE, MR. RIVIERE

Engineering Graphics (Eg)

The Department of General Engineering does not have major students, but offers service courses to students majoring in other curricula, principally Technology and Forestry.

The conceptions and computations of engineers and all other persons engaged in design must be put down eventually on paper in a form intelligible to the craftsman who is to do the actual construction. Making drawings for this form of communication is the most familiar phase of engineering graphics. All technology students, and many students from other colleges in the University who have an interest in design, take the basic courses in engineering drawing.

Another phase of engineering graphics concerns itself with problem-solving

rather than the delineation of objects for manufacture or construction. Descriptive geometry and nomography are two sciences that fall in this category.

1/2. Engineering Drawing—Creative exercises in instrumental drawing, multi-view drawing, freehand technical sketching, and lettering. Course 2 introduces instrumental and freehand pictorial drawing, and concludes with the preparation of working drawings for elementary design problems 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: Course 1, *Rec & Lab* 4, *Cr* 2. STAFF

5. Architectural Drawing—The preparation of floor plans, elevations, sections, and pictorial renderings of homes and small buildings. Prerequisite: Course 1. *Rec & Lab* 4, *Cr* 2. MR. WESTFALL

12. Forestry Drawing—A further study of orthographic and pictorial drawings with applied problems in wood utilization, topographical drawing, and other fields related to forestry. Prerequisite: Course 1. *Rec & Lab* 4, *Cr* 2.
MR. WESTFALL

150. Nomography—The construction of graphical representations of equations which must be solved repeatedly. Prerequisite: Eg 1, Ms 27. *Rec* 1, *Lab* 2, *Cr* 2. MR. MCNEARY

General Courses (Gc)

5/6. Orientation—A series of meetings involving lectures, discussions and the like with frequent use of audio-visual material to acquaint Technology freshmen with the nature of engineering and science. *Cr* 0. MR. MCNEARY

7. Computer Programming for Engineers—Elements of digital and analog computer programming. Basic and Format Fortran, numerical analysis techniques, and elements of analog scaling are included. Prerequisite: Ms 28 (may be taken concurrently). *Rec* 1, *Lab* 2, *Cr* 2. MR. MCNEARY

ENGINEERING PHYSICS

PROFESSORS BENNETT, BISCOE, AND KRUEGER; ASSOCIATE PROFESSORS CARR, COFFIN, TODD, WYLIE, AND THOMAS; ASSISTANT PROFESSORS BROWNSTEIN, HARMON AND ROCHMORE; MR. ANDERSON, MR. LITTLEFIELD

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 strong elective minor, consisting of 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 is also 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 in physics are given on page 104 and in the catalog of the Graduate School.

Freshman Year. See Page 238.

Sophomore Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours	Lab Rec or Comp	Cr	Subject			Hours	Lab Rec or Comp	Cr
*Ec	1	Prin. of Economics or other Hum. Elective I	3	0	3	*Ec	2	Prin. of Economics or other Hum. Elective I	3	0	3
*Gm	11	Scientific German (Elem.) or other Hum. Elective II	3	0	3	Gc	7	Computer Programming	1	2	2
Me	7	Machine Tool Lab.	1	2	1½	*Gm	12	Scientific German (Elem. or other) Hum. Elective II	3	0	3
Ms	28	Calculus	4	0	4	Ms	29	Calculus	4	0	4
Ps	17	Intermed. Physics	2	4	4	Ps	18	Intermed. Physics	2	4	4
Sh	1	Public Speaking	2	0	2						

Junior Year

				Lab Rec or Comp	Cr					Lab Rec or Comp	Cr
Ms	55	Statics & Str. of Mat.	3	0	3	Eh	5	Technical Comp.	2	0	2
Ms	150	Ord. Diff. Eq.	3	0	3	Me	152	App. Mech. Dyn.	3	0	3
Ps	153	Elec. Meas.	0	4	2	Ms	151	Vectors & Matrices	3	0	3
Ps	155	Elec. and Mag.	3	0	3	Ps	172	Optics	3	0	3
		Hum. Elective	3	0	3	Ps	176	Phys. Meas.	0	4	2
								Hum. Elective	3	0	3
†Technical Electives (choose one field)					—	†Technical Electives (choose one field)					—
†ChE	1	Fun. Chem. Eng.	2	4	4	†ChE	2	Fund. Chem. Eng.	2	4	4
†Ch	171	Physical Chemistry	2	6	5	†Ch	172	Physical Chemistry	2	6	5
†Ee	47	Elec. Circuit Anal.	4	2	5	†Ee	3	Interm. Circuit Anal.	2	2	3
†Me	33	Thermodynamics	3	0	3	†Me	62	Heat Transf. & Fluid Flow	3	0	3

Senior Year

		Rec	Lab or Comp	Cr
Ee 47	Elec. Circuit Anal.	4	2	5
**Ms 152	Introd. Complex Variables	3	0	3
Ps 169	Modern Physics	3	0	3
*Ps 170	Nuclear Physics	2	1	3
Ps 181	Advanced Lab	0	6	3
*Ps 191	Math. Physics I	3	0	3
Ps 198a	Seminar	1	0	½
†Technical Electives (same field as chosen in junior year)				
†ChE 164	Elem. Chem. Eng.	3	0	3
†Ch 151	Organic Chem. Lec.	3	0	3
†Ee 13	Electronics	3	3	4
†Me 59	Fluid Mechanics	3	0	3

		Rec	Lab or Comp	Cr
**Ch 84	Metallurgy	3	0	3
**Ee 3	Interm. Circuit Anal.	2	2	3
**Ms 153	Partial Diff. Eq.	3	0	3
Ps 162	Heat and Thermo	3	0	3
Ps 182	Advanced Lab	0	6	3
*Ps 186	Intro Quantum Mechanics	2	0	2
*Ps 192	Math. Physics II	3	0	3
Ps 198b	Seminar	1	0	½
†Technical Electives (same field as chosen in junior year)				
†ChE 165	Elem. Chem. Eng.	3	0	3
†Ch 152	Organic Chem. Lec.	3	0	3
†Ee 14	Electronics	3	3	4
†Me 84	Industrial Management	3	0	3

* The asterisk designates courses which are *recommended* electives. Approved substitutions can be made. See page 239 for Humanity requirements in Bands I and II. It is expected that during the junior and senior years a normal registration will be from 18 to 20 hours each semester.

Students who may continue with graduate work will do well to take at least one year of German. Students planning to take Physical Chemistry as part of the "minor" should elect Ch 41 in the sophomore year.

†Under Technical Electives the student is expected to complete in the junior and senior years an informal "minor" consisting of approximately 12 hours (usually 4 but no less than 3 semester courses) in a given field of engineering or science. In a given field it is recommended that a sequence of courses be followed, commencing with the course listed under Technical Electives in the junior year. Students choosing the field of Electrical Engineering may count the required courses Ee 47 and Ee 3 as technical electives. Students choosing the field of Mechanical Engineering should try to include some mechanical laboratory work in the senior year.

**The double asterisk designates courses which are *required* unless approved substitutions are made in the same area.

Courses in Engineering Physics. See Page 265.

MECHANICAL ENGINEERING

PROFESSORS SULLIVAN, HILL, LYMAN; ASSOCIATE PROFESSORS CLIFFORD, SCHNEIDER, MOSKOWITZ, WEBSTER, CLARK, CHAPMAN; ASSISTANT PROFESSORS GRANT, HOPKINS, SUCEC, LEE; MR. KLAVUHN, MR. HALL

The Mechanical Engineering curriculum uses the foundation of mathematics, physics, chemistry, the humanities, and engineering science to prepare the student for 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 Pulp and Paper Management Option and a Pulp and Paper Computer Option are offered in collaboration with the Chemical Engineering Department.

Both of these five-year programs include all courses required in the Mechanical Engineering curriculum and lead to the degree of bachelor of science in Mechanical Engineering and a certificate indicating completion of the particular option in Pulp and Paper.

Graduate Work in Mechanical Engineering

The department offers programs leading to the degree of master of science in Mechanical Engineering. The course of study and thesis investigation may be chosen in any of the department's fields.

Freshman Year. See Page 238.

Sophomore Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours Rec or Comp	Lab Rec or Comp	Cr	Subject			Hours Rec or Comp	Lab Rec or Comp	Cr
Eg	3	Desc. Geometr	0	4	2	Me	33	Thermodynamics I	3	0	3
Ms	28	Calculus	4	0	4	Ms	29	Calculus	4	0	4
Ee	41	Elementar Circuits	3	0	3	Ee	43	Electronics I	1½	1½	2
Sh	1	Pub. Speaking	2	0	2	Me	52	Appl. Mechanics, Dynamics	3	0	3
Me	50	Appl. Mechanics. Statics	3	0	3			Hum. Elective			3
		Hum. Elective			3	Gc	7	Comp. Programming	1	2	2

Junior Year

Me	23	Kinematics	3	0	3	Me	24	Mechanical Design I	2	3	3
Me	34	Thermodynamics II	3	0	3	Me	59	Fluid Mechanics	3	0	3
Me	7	Mfg. Process I	1	2	1½	Me	8	Mfg. Process II	1	2	1½
Me	37	Mechanical Lab.	0	3	1½	Me	38	Mechanical Lab.	0	3	1½
Me	51	Strength of Materials	4	0	4	Me	21	Engr. Mats. & Metall.	3	0	3
Ms	130	Math. Statistics	3	0	3	Ms	150	Ord. Diff. Equations	3	0	3
Ms	151	Intro. to Matrices & Vector Anal.	3	0	3	Eh	5	Technical Comp.	2	0	2

Senior Year

			Lab Rec or Comp		Cr				Lab Rec or Comp		Cr
Me	160	Heat Transfer	3	0	3	Ee	42	Electric Machinery	1½	1½	2
Me	164	Mech. Vibrations	3	0	3	Me	72	Mechanical Lab	0	3	1½
Me	187	Mechanical Design II	1	3	2	Me	99	Seminar	1	0	1
Me	71	Mechanical Lab.	0	3	1½			Hum. Electives			6
		Hum. Electives			6			Technical Electives			6
		Technical Electives			3						

M. E. Technical Electives

			Lab Rec or Comp		Cr				Lab Rec or Comp		Cr
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	156	Theory of Elasticity	3	0	3	Me	190	Adv. Thermodynamics	3	0	3
Me	157	Adv. Dynamics	3	0	3	Me	191	Heat & Vent. Systems	3	0	3
Me	158	Adv. St. of Materials	3	0	3	Me	192	Aerodynamics	3	0	3
Me	167	Direct Energy Conversion	3	0	3	Me	193	I. C. Engines	3	0	3
Me	181	Turbomachinery	3	0	3	Me	195	Gas Dynamics I	3	0	3
Me	186	Power Plants	3	0	3	Me	196	Air Condg. & Refrig.	3	0	3

PULP AND PAPER MANAGEMENT AND COMPUTER OPTIONS IN MECHANICAL ENGINEERING

The first three years of these programs are the same as the regular Mechanical Engineering program, including all specified courses through the junior year with the additional requirements of Ec 1/2, Principles of Economics.

Senior Year

FALL SEMESTER Subject			Hours Rec	Lab or Comp	Cr	SPRING SEMESTER Subject			Hours Rec	Lab Lab	Cr
Me	160	Heat Transfer	3	0	3	Me	186	Power Plants	3	0	3
Me	71	Mechanical Lab	0	3	1½	Me	72	Mechanical Lab	0	3	1½
Me	187	Mechanical Design II	1	3	2	Ee	42	Electric Machinery	1½	1½	2
Ch	41	Quant. Analysis	2	3	3	Pa	166	Paper Technology	3	0	3
Pa	165	Pulp Technology	3	0	3			Hum. Elective			3
Me	164	Mech. Vibrations	3	0	3						

Management Option

Ba	130	Leg. Env. Business	3	0	3	Ba	9	Prin. of Accounting I	3	0	3

Computer Option

ChE	150	Analog. Comp.	2	2	3	ChE	151	Digital Comp.	2	2	3
						ChE	242	Process Dynamics	3	0	3

Fifth Year

Pa	173	Pulp Mfg. & Test	0	8	4	Pa	172	Pulp & Paper Equip.	3	0	3
Pa	99	Thesis	0	2	1	Pa	174	Paper Mfg. & Testing	0	8	4
Pa	295	Seminar	1	0	½	Pa	295	Seminar	1	0	½
		Hum. Elective			6	Pa	199	Thesis	0	4	2
								Tech. Elective			3

Management Option

Ba	51	Business Finance 1	3	0	3	Me	84	Industrial Mgmt.	3	0	3
Pa	184	Mgt. & Operation of Paper Mills	3	0	3						
Pa	189	Pulp & Paper Mill Insp.	0	4	2						

Computer Option

ChE	152	Special Problems in Computer Programming	2	2	3	ChE	153	Special Topics in System Analysis	3	0	3
		Tech. Electives			3			Hum. Elective			3

Courses in Mechanical Engineering (Me)

7/8. Manufacturing 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* 1½.

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. Engineering Materials and Metallurgy — 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.

23. Kinematics—Introduction to vector kinematics, analysis of displacements, velocities, and accelerations in modern machines, and introduction to synthesis and creative design solution of unique kinematic problems. Prerequisite: Me 52. *Rec* 3, *Cr* 3.

24. Mechanical Design I—Analysis of machine elements, stress concentration, fatigue, factor of safety. Introduction to creative synthesis and economic design. Prerequisite: Me 23, 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, applications to compressors, internal combustion engines and turbines. Prerequisite: Me 33. *Rec* 3. *Cr* 3.

37/38. Mechanical Laboratory—An introduction to laboratory techniques, instrumentation and calibration of equipment. Application of thermodynamics, mechanics of materials, fluid mechanics, and metallurgy. Prerequisite: M. E. junior. *Lab* 3, *Cr* 1-½.

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 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.

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 28. *Rec* 3, *Cr* 3.

59. Fluid Mechanics—Fluid statics, kinematics, Bernoulli equation, momentum, free-surface flow, viscosity, pipe friction, dimensional analysis and similtude, and an introduction to compressible flow. Prerequisite: Ms 52 and Ms 151. *Rec* 3, *Cr* 3.

62. Heat Transfer and Fluid 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 experimental investigations in the thermal science and solid and

fluid mechanics area. Individual student project investigations. Prerequisite: M. E. senior. *Lab* 3, *Cr* 1-1½.

84. Industrial Management—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 52 and 59. *Rec* 3, *Cr* 3.

99. Seminar—*Rec* 1, *Cr* 1.

101. Metallography—Structure, metallic bonding and properties of metals. Solidification alloying, and constitution diagrams. Deformation and annealing. Prerequisite: Me 21, Ms 150. *Lab* 6, *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: Ms 150 and 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. Applications. Prerequisite: Ms 150 and Me 52. *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 cylinder, stress concentrations, energy methods, and introduction to theory of elasticity. Prerequisite: Ms 29 and 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 to engineering problems via analytical, numerical, and graphical techniques. Prerequisite: Me 33, 59, and Ms 150. *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. Engineering applications. Prerequisite: Ms 150 and Me 52.

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 and Ms 150. *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 processes. Prerequisite: Me 34, *Rec* 2, *Comp.* 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 24. *Rec* 1, *Comp* 3, *Cr* 2.

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 52 and 187. *Rec* 3, *Cr* 3.

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* Not for graduate students in Mechanical Engineering. For others, graduate credit with approval of student's adviser.

189. Principles of Optimum Design and Reliability—Optimization of mechanical engineering systems, statistical treatment of systems breakdown, utilization of reliability theory in design. Prerequisite: Ms 130, Ms 150 and Me 187. *Rec* 3, *Cr* 3.

190. Advanced Thermodynamics — General thermodynamic relations for the pure substance, development of equation of state, real gas studies, the criteria of equilibrium, and an introduction to irreversible phenomena. 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 52 and 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 and 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. Generalized Classical Thermodynamics—*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. Theory of Deformation and Stress—*Rec* 3, *Cr* 3.
234. Advanced Vibrations—*Rec* 3, *Cr*.
235. 236. Mechanical Engineering Analysis—*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

Through this division of the college are offered two-year programs in civil engineering technology, electrical engineering technology, mechanical engineering technology, and chemical engineering (pulp and paper) technology.

The objective of the two-year programs is to provide an education to young people who are interested in technical employment but who do not want, or are not admissible to, the University's regular degree program in engineering. The two-year courses in engineering technology are not equivalent to work offered during the freshman and sophomore years of the B.S. degree programs. Rather the curricula in engineering technology differ in content, philosophy and objective from the four-year curricula.

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 will be considered for admission to the college's degree programs in engineering with the amount of transfer credit to be determined on an individual basis.

Chemical Engineering (Pulp & Paper) Technology

The objective of this program is to provide the student with the background of training and experience required for the successful handling of routine technical and laboratory assignments in the pulp and paper or allied industry. Specifically, it is expected that the graduate from this course will be well qualified to work in the testing and control laboratories as a technician, in the development and research laboratories as a laboratory assistant, or in production departments as an engineering aide.

The curriculum provides considerable training in the laboratory, with emphasis on the analytical and testing procedures most common to the pulp and paper industry. Courses in the basic sciences provide the student with the background necessary for an understanding of the pulp and paper making operations, the evaluation of laboratory data, and the solution to routine problems. Courses in English and speech are included so that the student may acquire an interest and some proficiency in the ability to communicate his ideas and the results of his work to others.

Chemical Engineering (Pulp & Paper) Technology

Curriculum

SEMESTER 1

		Subject	Rec	Lab	Cr
ChE	T1	Chem. Science	3	2	4
Eg	T1	Technical Drawing	0	4	2
Eh	T1	English Comp.	3	0	3
Ms	1	Algebra	2	0	2
Ms	3	Trigonometry	2	0	2
Pe	1	Physical Education	0	2	0
Ps	T7	Basic Physics	3	2	4
			13	10	17

SEMESTER 2

		Subject	Rec	Lab	Cr
ChE	T2	Chem. Science	3	0	3
ChE	T3	Analytical Chemistry	0	8	4
Eh	T2	English Comp.	3	0	3
Pa	T1	Pulp Technology	3	0	3
Pe	2	Physical Education	0	2	0
Ps	T8	Basic Physics	3	2	4
			12	12	17

SUMMER INTERNSHIP (MILL WORK)

SEMESTER 3

		Subject	Rec	Lab	Cr			Subject	Rec	Lab	Cr
ChE	T4	Elem. Chem. Eng.	3	0	3	2	Ab	Intro. to Economics	3	0	3
ChE	T5	Instru. Analysis	1	2	2	ChE	T7	Chem. Process Indus.	3	0	3
ChE	T6	Tech. Literature	2	0	2	ChE	T8	Eval. of Test Data	3	0	3
Pa	T2	Paper Technology	3	0	3	Pa	T4	Paper Testing	0	12	6
Pa	T3	Pulp Testing	0	12	6			Elective	3	0	3
Sh	1	Fund. of Public Speaking	2	0	2						
			11	14	18				12	12	18

Courses in Chemical Engineering (Pulp and Paper) Technology (ChE T)

1/2. Chemical Science—Principles of general chemistry with emphasis on the application of experimental aspects to the chemical industry. Equations for basic inorganic reactions will be stressed. An introduction to organic chemistry. *Rec* 3, *Comp* 2, *Cr* 4; *Rec* 3, *Cr* 3.

3. Analytical Chemistry—Laboratory techniques, training in use of apparatus. Preparation and adjustment of standard solutions, practice in methods of analysis of typical industrial chemicals. Prerequisite: ChE T 1. *Lab* 8, *Cr* 4.

4. Elementary Chemical Engineering — An introduction to the basic principles of the process industries. A quantitative and qualitative analysis of some typical process systems and equipment. Prerequisite: ChE T 2. *Rec* 3, *Cr* 3.

5. Instrumental Analysis—A course to familiarize the student with the purpose and use of various instruments encountered in the pulp and paper industry for measurement of temperature, pressure, liquid level, flow rates, and composition. Prerequisite: ChE T 3. *Lab* 2, *Cr* 2.

6. Technical Literature—A course to familiarize the student with use of the current pulp paper technical journals, bibliographies, abstracts, and handbooks. *Rec* 2, *Cr* 2.

7. Chemical Process Industries—The scope of the course includes the discussion of some selected chemical process industries. The processes are chosen on the basis of their importance in chemical industry and in the economy of the state of Maine. The course will comprise the production of sulfuric acid, ammonia, soda ash, sugar, starch, and natural and synthetic fibers. Problems will be discussed involving stoichiometric calculations and material and energy balances. Prerequisite: ChE T 4. *Rec* 3, *Cr* 3.

8. Evaluation of Test Data—An introduction to the presentation and evaluation of laboratory data with emphasis on graphical data presentation and control charts. *Rec* 3, *Cr* 3.

Pa T 1. Pulp Technology—A course in the manufacture of various kinds of wood pulp used in papermaking. Prerequisite: ChE T 1. *Rec* 3, *Cr* 3.

Pa T 2. Paper Technology—A course describing the processes for the manufacture of paper. Prerequisite: PaT-1, *Rec* 3, *Cr* 3.

Pa T 3. Pulp Testing—A laboratory course in physical and chemical testing of the commonly used commercial pulps. Prerequisite: Pa T-1, *Lab* 12, *Cr* 6.

Pa T 4. Paper Testing—A laboratory course covering some of the operations and processes used in making paper, and including the methods used to test the physical properties of paper. Prerequisite: PaT 1,2, and 3. *Lab* 12, *Cr* 6.

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	Rec	Lab	Cr
Ce	T1	Plane Surveying	3	6	5
Eg	T1	Techncal Drawing	0	4	2
Eh	T1	English Comp.	3	0	3
Ms	T2	Basic Mathematics	3	0	3
Pe	1	Physical Education	0	2	0
Ps	T7	Basic Physics	3	2	4
			12	14	17

SEMESTER 2

		Subject	Rec	Lab	Cr
Ce	T2	Adv. & Geodetic Surveying	2	3	3
Ce	T11	Structural Mech.	3	0	3
Eg	T2	Technical Drawing	0	4	2
Eh	T2	English Comp.	3	0	3
Ms	T4	Basic Mathematics	3	0	3
Pe	2	Physical Education	0	2	0
Ps	T8	Basic Physics	3	2	4
			14	11	18

SUMMER INTERNSHIP REQUIRED WITH HIGHWAY DEPARTMENT OR CONTRACTOR OR CONSULTANT

SEMESTER 3

		Subject	Rec	Lab	Cr
2	Ab	Intro. to Economics	3	0	3
Ce	T3	Hwy. & Bld. Surv.	2	6	4
Ce	T12	Struct. Design	3	3	4
Ce	T21	Material Props. & Testing	1	6	3
Ce	T30	Hwy. Operations	3	3	4
			12	18	18

SEMESTER 4

		Subject	Rec	Lab	Cr
6	Ab	Dynamics of Human Behavior	3	0	3
Ce	T13	Struct. Design	3	3	4
Ce	T22	Material Props. & Testing	1	6	3
Ce	T31	Const. Engineering	3	3	4
Ce	T40	Civil Engr. Mgmt.	3	0	3
			13	12	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* 3, *Lab* 6, *Cr* 5.

2. Advanced and Geodetic Surveying—Curves and earthwork computation and field layout. Property surveys and legal aspects. Astronomical observations, triangulation, and precise leveling using precision surveying instruments. Prerequisite: CeT 1. *Rec* 2, *Lab* 3, *Cr* 3.

3. Highway and Building Surveys—Computation and layout of buildings, bridges, pipelines, canals and highways for line and grade. Reconnaissance, location, construction, and final quantity surveys together with appropriate mapping are undertaken. *Rec* 2, *Lab* 6, *Cr* 4.

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.

21, 22. Material Properties and Testing—The study and testing of the properties of materials used in the construction of civil engineering works. Timber, steel, concrete, soil aggregates, and bituminous materials are tested. Their selection and application to specific purposes are emphasized. *Rec* 1, *Lab* 6, *Cr* 3.

30. Highway Operations—The fundamentals of highway, street and intersection design and layout are studied. Data collection methods relating to traffic volumes and distribution, traffic survey techniques, traffic operations in work areas and temporary routines are treated. Consideration of drainage requirements and pavement sufficiency studies related to highway design criteria. Administrative, right-of-way, maintenance and financing problems are discussed. *Rec* 3, *Lab* 3, *Cr* 4.

31. Construction Engineering—Studies of the use, performance and economics of light and heavy construction equipment. Performances and rates of production for various skilled labor trades. Field trips will be taken to study construction practices. *Rec* 3, *Lab* 3, *Cr* 4.

40. Civil Engineering Management—A study of office and field practice from beginning to end of the construction of a major civil engineering project. Contracts and specifications, labor relations, professional ethics and practice, accounting and reporting procedures, and legal aspects will be included. *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 ground work 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. 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 industrial practices.

Electrical Engineering Technology Curriculum

SEMESTER 1

Subject		Rec	Comp	Lab	Cr
Ee T11	Basic Electricity	2	0	3	3
Eg T1	Technical Drawing	0	0	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		Rec	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	2	0	0	2
		11	7	9	17

SEMESTER 3

Subject		Rec	Comp	Lab	Cr
EeT 33	Electronics	3	3	3	5
EeT 34	Eng. Materials	2	0	3	3
EeT 35	Elec. Machinery	3	3	3	5
EeT 37	Tech. of Elec. Measurement	1	0	6	3
EgT 4	Elec. and Electronic Drawing	0	0	4	2
		9	6	19	18

SEMESTER 4

Subject		Rec	Comp	Lab	Cr
Ee T43	Applied Electronics	3	0	3	4
Ee T45	Power Distribution, Illu. and Acoustics	3	3	3	4
Ee T46	Elec. Foremanship	3	0	0	3
Ee T47	Elec. Instrumentation & Control	3	0	3	4
Ee T48	Elec. Projects	0	0	6	2
		12	3	15	17

Courses in Electrical Engineering Technology (EeT)

11. Basic Electricity—A non-calculus introduction to the elementary concepts of electricity; charge, current, potential, resistance, magnetism, power and energy; and including laboratory use of instruments for making d-c circuit measurements. Prerequisite: MsT 2 Concurrent. *Rec* 2, *Comp or Lab* 3, *Cr* 3.

21. Basic Circuits—Continuation of EeT 11, constituting a non-calculus introduction to d-c networks and network theorems, magnetic circuits; 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 or Lab* 6, *Cr* 5.

22. Basic Methods of Technical Computations—Computation using logarithmic tables; natural and logarithmic trigonometric tables; common and natural logarithms; charge of base. Computations by use of the slide rule. Techniques in curve plotting; weighted averages. Problem solving organization. Prerequisite: MsT 4 concurrent. *Comp* 4, *Cr* 2.

30. Circuits, Machines, and Electronics for Mechanical Engineers—Electrical concepts and devices; elementary circuit analysis; fundamentals of AC and DC machinery; principles of electronic devices and circuits. Prerequisite: MsT 4, PsT 7; *Rec* 4, Comp or *Lab* 3, *Cr* 5.

33. Electronics—Basic physical principles of vacuum, gaseous, and solid state electronic devices. Analysis of rectification, amplification, signal generation, modulation, and detection. 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 thin films. *Rec* 2, *Lab* 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* 1, *Lab* 6, *Cr* 3.

43. Applied Electronics—Industrial and commercial electronic circuits and systems, including the cathode ray oscilloscope, radio and television, analog and digital computers, and process control. 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.

46. Electrical Foremanship—Practices and methods of modern management in planning, organizing, and controlling men and equipment. *Rec* 3, *Cr* 3.

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.

Mechanical Engineering Technology Curriculum

SEMESTER 1

		Subject	Rec	Lab	Cr
Eg	T1	Technical Drawing	0	4	2
Eh	T1	Engish Comp.	3	0	3
Me	T1	Orientation	1	0	0
Me	T5	Heat Treatment	1	2	2
Me	T7	Mach. Shop & Welding	1	4	3
Ms	T2	Basic Mathematics	3	0	3
Pe	1	Physical Education	0	2	0
Ps	T7	Basic Physics	3	2	4
			12	14	17

SEMESTER 2

		Subject	Rec	Lab	Cr
Eg	T2	Technical Drawing	0	4	2
Eh	T2	English Comp.	3	0	3
Me	T8	Machine Shop	1	3	2
Me	T33	Mechanical Tech.	3	0	3
Me	T50	Statics & Kinematics	4	0	4
Ms	T4	Basic Mathematics	3	0	3
Pe	2	Physical Education	0	2	0
			14	9	17

SEMESTER 3

		Subject	Rec	Lab	Cr
Ee	T30	Circuits, Machines and Electronics for M. E. Technicians	4	3	5
Eg	T3	Machine Drawing	0	4	2
Me	T11	Machine Shop	0	3	1
Me	T17	Dynamics	2	0	2
Me	T19	Strength of Materials	3	2	4
Me	T36	Heating, Air Cond. & Refrig.	3	2	4
			12	14	18

SEMESTER 4

		Subject	Rec	Lab	Cr
2	Ab	Intro. to Economics	3	0	3
Me	T34	Mech. Tech. Lab.	1	4	3
Me	T37	I. C. Engines	3	2	4
Me	T61	Mach. Des. & Tool Des.	2	4	4
Me	T70	Industrial Processes	3	3	4
			12	13	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 Shop and Welding—Fundamental shop measuring, care and use of hand tools, bench work, drill press, bench grinder, elementary operations on the engine lathe. Set-up and operation for oxyacetylene cutting, welding and brazing; electric are welding using both AC and DC. *Rec* 1, *Lab* 4, *Cr* 3.

8. Machine Shop—Advanced lathe work; threading, boring and use of lathe attachments. Introduction to construction and operation of millers, shapers, planers and surface grinders. Further work in welding. Prerequisite: MeT 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 Shop—Application of machining principles and welding techniques in individual and group projects. Layout and inspection processes including operation sheets and in process quality control. Design and manufacture of basic fixturing and inspection devices. *Lab* 3, *Cr* 1.

17. Dynamics—Kinetics of particles; translation, rotation and plane motion of rigid bodies; work and energy impulse and momentum. *Rec* 2, *Cr* 2.

19. Strength of Materials—Stress and strain in materials and bodies subject to tension compression torsion and flexure. Beam theory; deflection in prismatic members; columns; combined stresses. *Rec* 3, *Lab* 2, *Cr* 4.

33. Mechanical Technology—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 — Elementary thermodynamics, mechanical apparatus, power plant equipment; engineering calculations relative to heat, power, work mechanical and electrical energy, fluid mechanics, and heat transfer. *Rec* 1, *Lab* 4, *Cr* 3.

36. Heating, Air Conditioning, and Refrigeration — 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.

37. Internal Combustion Engines—Thermodynamics of engine cycles, design and operation of steam and internal combustion engines, steam and gas turbines and jet engines. Fuels and combustion, carburetion and injection, efficiencies, detonation and knock testing, cooling and lubrication. *Rec* 3, *Lab* 2, *Cr* 4.

50. Statics and Kinematics—The study of forces and rigid bodies in equilibrium, properties of areas and masses. The analysis of motion: linkages, cams, gear teeth and gear trains. Prerequisite: PsT 7. *Rec* 4, *Cr* 4.

61. Machine Design and Tool Design—The design of machine elements, theories of failure, fatigue and stress concentration. Design of jigs, fixtures, special tools and their relation to manufacturing methods and production efficiency. *Rec* 2, *Lab* 4, *Cr* 4.

70. Industrial Processes—A study of production problems associated with manufacturing. Job evaluation, quality control, cost accounting, plant and tool layout and engineering economy. *Rec* 3, *Lab* 3, *Cr* 4.

Service Courses for the Technical Institute Division

EgT 1/2. Technical Drawing—Exercises 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.

EgT 3. Machine Drawing—Aanlysis 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.

EgT 4. Electrical and Electronic Drawing—Electrical and electronic symbols; complete electric power and electronic diagrams. *Lab* 4, *Cr* 2.

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.

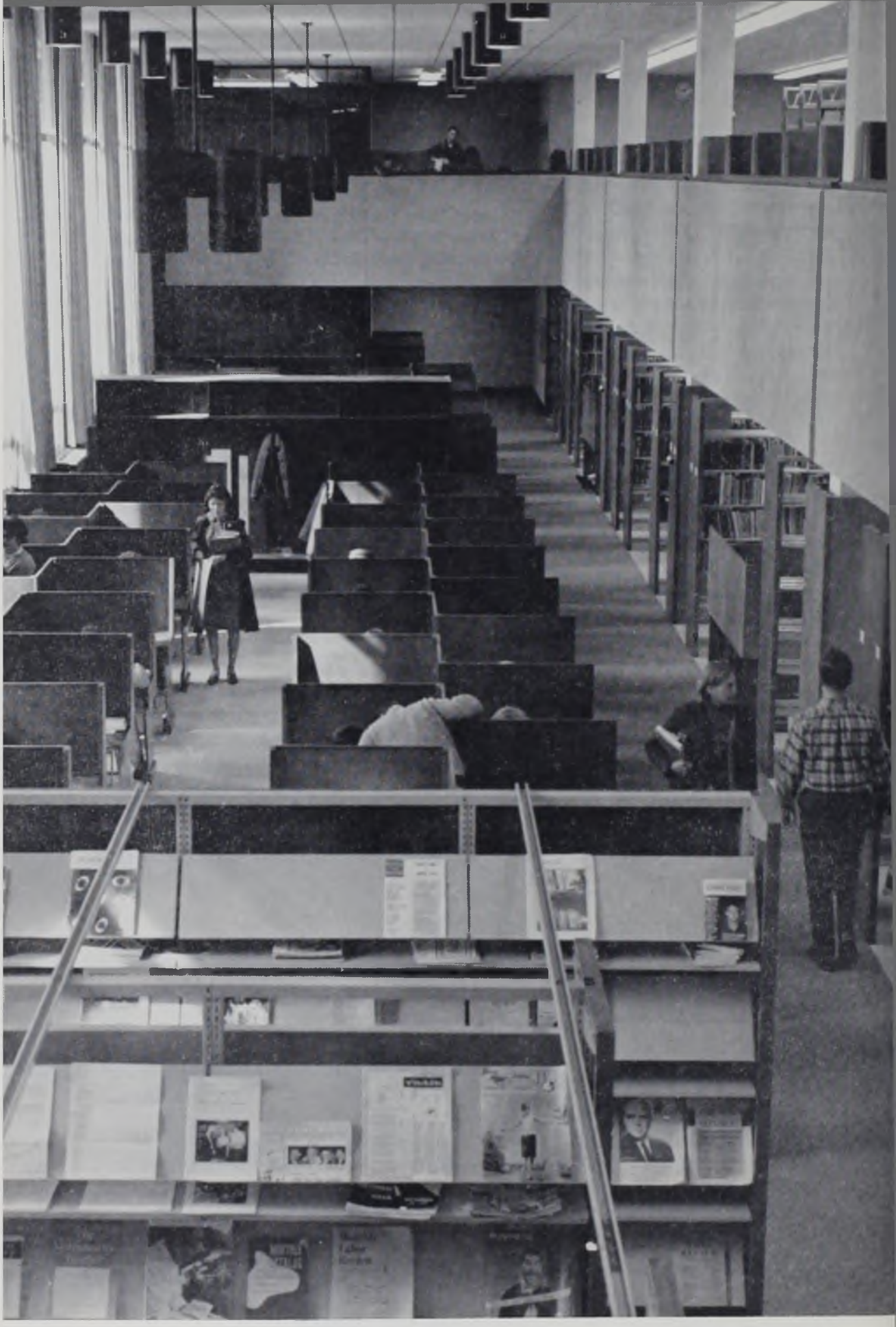
EhT 2. English Composition—A continuation of EhT 1 with particular emphasis given to expository writing. *Rec* 3, *Cr* 3.

MsT 2. Basic Mathematics—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. Basic Mathematics—Elements of analytical geometry and introductory calculus including the straight line, the circle, the conics, polar and parametric forms, differentiation and integration. *Rec* 3, *Cr* 3.

PsT 7/8. Basic Physics—An introduction to the basic concepts of mechanics, sound, heat, electricity, magnetism, modern physics and optics with illustrations taken from technical applications. Calculus is not used. *Lec with Dem* 1, *Rec* 2, *Lab* 2, *Cr* 4. MR. COFFIN AND STAFF



Library, University of Maine
Portland

UNIVERSITY OF MAINE IN PORTLAND

DAVID R. FINK, DEAN

Bonney Hall

University of Maine in Portland

Dean, David R. Fink, Jr.; *Associate Dean,* William L. Whiting; *Admissions*—Director, Alfred E. Clarke; *Bursar,* Harold M. Lawrence; *Continuing Education*—Assistant Director, Walter P. Fridinger; Short Course Coordinator, Raymond P. Kane; *Librarian,* Marjorie E. Duval; *Physical Plant*—Superintendent, Edward I. Salmon; *Public Information and Central Services* — Director, Bryant P. Jones; Information Specialist, Alvin D. Rogers; *Registrar,* Rebecca C. Larsen; *Student Affairs* — Director, Dorothy G. Dissell; Director of Student Union, George E. VanAmburg; Director of Testing and Counseling, Jane O. Sanborn; Director of Student Aid and Placement, Frederick E. Freise

The University of Maine in Portland is located near the center of the city on an 18-acre campus at the intersection of State Route 25 and U.S. Route 302. Present buildings include Luther I. Bonney Hall, with an attached two-story library wing, Payson Smith Hall, West Hall, East Hall, North Hall, a small gymnasium, and a cottage containing some of the faculty offices. Two other major buildings have already been authorized: a multi-purpose building which will provide expansion of the physical education program, and a science building to provide added scientific courses and laboratory facilities.

The Portland campus already provides a variety of scientific laboratories, a language laboratory, an engineering graphics room, a number of conference rooms, and specialized reading rooms. Other specialized rooms are available for music, art, and lecture-demonstrations in the physical sciences. The library is designed for maximum efficiency in individual study, with open stacks interspersed with private carrels.

ACADEMIC PROGRAM

The University of Maine in Portland is a full-fledged campus of the University, organized for commuting students and offering four-year degree programs in a number of areas of concentration, a graduate program in business administration, and a more limited variety of graduate courses in other areas of concentration.

Students currently starting their college work at the Portland campus may continue at Portland to complete University requirements for the degrees of associate in business administration, bachelor of science in business administration, bachelor of arts with concentration in English, French, mathematics, history and government, or sociology, bachelor of science in education with concentration in any of the appropriate academic areas previously listed for the teaching of secondary subjects, and master of business administration.

Freshmen intending to concentrate in other areas may complete at least one year of academic credits at Portland before moving to the Orono campus for more specialized work. In the same way, students who complete one or more semesters of satisfactory college work at Orono in any of the academic programs listed previously may make arrangements to continue their work at the Portland campus at the beginning of any semester.

Graduate students working for the degree of master of business administration may complete the entire program at Portland. Graduate students working for the degree of master of education may earn a maximum of 21 semester hours at Portland, six of which must be completed either through summer sessions conducted at Portland, University sponsored travel courses, or science education camps. Graduate students working for a master's degree in certain other areas may complete a maximum of 18 semester hours of work at Portland.

THE CONTINUING EDUCATION DIVISION

A center of the Continuing Education Division is located at the University of Maine in Portland. The Portland office of the Continuing Education Division administers the programs at York, Biddeford, Brunswick, Bath, and other communities, as well as a large variety of degree credit, non-degree credit, and special short courses on the Portland campus. For general information concerning the organization, purpose, and aims of the Continuing Education Division, please refer to pages 15, 39 and 309 of this catalog. Specific information relating to subjects and programs offered at the Portland center is available from the Assistant Director of Continuing Education, 96 Falmouth Street, Portland, Maine 04103.

THE COOPERATIVE EXTENSION SERVICE

Offices of the Cumberland County Extension staff and certain other specialists of the Cooperative Extension Service are located at the University of Maine in Portland. In addition to the types of programs described on page 39 of this catalog, the Cooperative Extension Service sponsors a number of non-credit short courses and seminars at the Portland campus.

UNIVERSITY POLICY ON HOUSING

The University of Maine in Portland is a commuter campus, and it is envisioned that unmarried students below legal age will live at home or with relatives. In instances where students, with the approval of their parents, decide to obtain student apartments or rooms, the University of Maine in Portland will not assume any responsibility with respect to locating or recommending facilities, resolving problems arising between tenants and landlords, or providing supervision over the use of such facilities. Students in this category, however, will be subject to University disciplinary action if their conduct reflects adversely upon themselves or UMP.

CAFETERIA FACILITIES ON THE PORTLAND CAMPUS

The serving counter of the cafeteria in Payson Smith Hall is open each day of regularly scheduled classes from before the opening of classes in the morning until early afternoon. Complete hot lunches are sold, as well as short order items. These facilities are supplemented by vending machines, which may be used whenever the building is open and which are stocked with a good variety of beverages and foods, including both refrigerated items and hot dishes.

UNIVERSITY STORES

The Portland campus building of the University Stores, West Hall, carries all required textbooks and supplemental materials, as well as several thousand college-level paperbacks and many other items of interest to the college student. The store is open to the public.

ADMISSION

Applications for admission and all inquiries concerning admission to the University of Maine in Portland should be addressed to the Director of Admissions, 96 Falmouth Street, Portland, Maine 04103. Application blanks should be filled out and returned promptly, together with the application fee of $10, which cannot be refunded, to the Director of Admissions, Wingate Hall, University of Maine, Orono, Maine 04473. Information for veterans may be procured on the Portland campus from the office of the Registrar, Payson Smith Hall, 96 Falmouth Street, Portland, Maine 04103.

The same requirements for admission prevail at both the Orono and Portland campuses of the University. Please see page 34 for these requirements for admission.

FINANCIAL INFORMATION

The student expenses outlined below are the anticipated charges for 1966-67. Changing costs may require an adjustment of these charges.

Tuition and Fees for the Academic Year

	Residents of Maine	Non-Residents of Maine
Regular Students		
Tuition	$400	$1,500
Special Students		
Tuition for *each semester hour*	$ 20	$ 50

Special Fees—A fee of $10 is required with the application for admission. This fee cannot be refunded.

When an applicant is notified that he has been accepted for admission, a deposit of $25 must be made, which will be applied toward the student's account when he registers. This deposit will be refunded if the applicant notifies the Director of Admissions of withdrawal prior to June 1. After that date the deposit is forfeited. A matriculation fee of $25 is required if a student is registering for the first time and must be paid as part of the first term bill. This fee is non-refundable.

A fee of $10 is charged for late registration.

Each student provides his own books and supplies, including a physical edu-

cation uniform. The annual cost varies from $90-$160. Students in laboratory courses are required to pay for apparatus broken or lost and for certain supplies.

Payment of Bills—Charges for tuition are due and payable on or before registration day for each semester. Full tuition will be charged for more than 10 semester hours.

Installment Program—Students whose circumstances are such that payment of their semester bills in full at the time of registration would work a real hardship will be permitted to use the following schedule:

Fall Semester

½ the total semester charge at registration
⅙ the total semester charge on October 1
⅙ the total semester charge on November 1
⅙ the total semester charge on December 1

Spring Semester

½ the total semester charge at registration
⅙ the total semester charge on March 1
⅙ the total semester charge on April 1
⅙ the total semester charge on May 1

For the 1966-1967 academic year no extra assessment will be made to students using the above deferment schedule, but if it is found that too many take advantage of its provisions it will become necessary in the future to make a service charge for its use.

Refunds—Students leaving the University before the end of a semester, if they are using the installment program, are not entitled to a refund of tuition because the timing of the payments is correlated with the charges. Those who have prepaid their semester charges will be refunded all the money they have prepaid in excess of the amounts specified by the installment program.

HEALTH SERVICE, ACCIDENT, AND SICKNESS INSURANCE

A limited health service will be offered at the University of Maine in Portland for the college year 1966-67. A graduate nurse will be on duty from 8:00 a.m. to 4:30 p.m. each day, Monday through Friday, to give first aid and assist in minor ailments.

Since the University of Maine in Portland does not offer infirmary services such as are available on the Orono campus, the University will carry accident insurance on each regularly enrolled student. This insurance will give compensation for accident coverage as listed in the master policy on file in the office of the dean. It will be effective for all students from the date of registration in September through final examinations for spring semester.

In addition to the accident insurance mentioned above, sickness insurance covering illness not caused by accident is available on a voluntary basis. A circular describing this insurance will be sent to each student. This is similar to the type of insurance offered on a voluntary basis to students at the Orono campus. Those desiring to purchase this sickness insurance will pay the full amount of the year's premium when registering for the fall semester.

PHYSICAL EXAMINATIONS

At the time of registration each student must present a report showing he has had a physical examination, preferably by the family physician. These reports are made on forms furnished by the University. A physical examination may be required of any student at any time during his attendance at the college.

Each year, through the cooperation of the Maine Department of Health and Welfare, chest X-rays are made available to all students without charge.

PHYSICAL EDUCATION FOR MEN

Prescribed courses in physical education are required of all non-veteran freshmen and sophomores.

PHYSICAL EDUCATION FOR WOMEN

The physical education requirement for freshman and sophomore women is waived on the Portland campus because of the lack of facilities. Women students continuing from Portland to the University of Maine in Orono are normally exempt from the physical education program by institution authorities to the following extent: Women transferring and accepted as juniors and seniors or for graduate work are not required to enroll in physical education; women transferring and accepted as sophomores are required to take one year of physical education; women transferring and accepted as freshmen are required to take physical education.

STUDENT ACTIVITIES

Students have a full calendar of activities during the year. All student activities, other than athletics, are organized under the leadership of the Student Senate, a group of elected student representatives who control the expenditure of student activity funds by chartered clubs and organizations.

Sophomore honor groups for men and women—Owls and Eagles—operate on the Portland campus as they do in Orono.

The Athletic Department of the University of Maine in Portland sponsors both freshman basketball and varsity basketball, as well as indoor track, outdoor track, cross-country, baseball, golf, and tennis teams.

The Physical Education Department supervises a growing program of intramural and sports activities.

Students are urged to organize new groups and ask for a charter from the Student Senate. Groups usually organized are as follows:

Art Club
Associated Women's Society
Business Club
Camera Club
Cheer Leaders
Chess Club
Circle K Club
International Relations Club
Intercollegiate Council
Inter-varsity Club
Literary Club
Newspaper
Owls and Eagles
Radio Forum
Ski Club
Spanish Club
Speech Club
Student Senate
Yearbook
Young Democrats
Young Republicans

STUDENT REGULATIONS

It is assumed that all students admitted to the University of Maine in Portland are willing to subscribe to the following: *The University expects from every student respect for order, morality, and the rights of others, and such sense of personal honor as is demanded of good citizens.* It reserves the right to dismiss any student whose conduct or academic standing is regarded by the administration and faculty to be unsatisfactory. (Please see the preceding section on the "University Policy on Housing" and the general information on page 26 for additional information.)

COURSES OF INSTRUCTION OFFERED AT PORTLAND

When a dash is used between the two numbers (e.g., 1-2), both semesters must be taken to obtain credit; when a diagonal 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.

The following abbreviations are used: Fresh — freshmen; Soph — sophomores; Jrs — juniors; Srs — seniors; per — permission.

Art

INSTRUCTOR BEARCE

(See page 66 for course descriptions)

				Credit
At	1/2	Free-hand Drawing and Sketching		2
At	5. 6	Art Appreciation and History		3
At	11/12	Advanced Freehand Drawing	(At 1/2)	2

Business and Economics

ASSOCIATE PROFESSORS DURGIN AND WATERS; ASSISTANT PROFESSORS ALPANDER, BAY, CHRISTOPHER, HALL, JAGOLINZER, MATSUSAKI, AND SMITH; LECTURERS CROBAUGH AND PLOWMAN; INSTRUCTORS ANDREWS, MILNE, AND MCKEIL

(See page 139 for course descriptions)

Ba	9/10	Principles of Accounting		3
Ba	23	Elements of Industrial Management	(Ec 1/2)	3
Ba	41/42	Intermediate Accounting	(Ba 9/10)	3
Ba	63	Marketing	(Ec 1/2)	3
Ba	130	130 The Legal Environment of Business	(Jrs and Srs)	3
Ba	145	Cost Accounting I	(Ba 9/10)	3
Ba	146	Cost Accounting II	(Ba 145)	3
Ba	147	Business Data Processing	(Ba 9)	3
Ba	148	Auditing	(Ba 41/42)	3
Ba	149	Business Economics	(Ec 1/2 and Ba 9)	3
Ba	151/152	Business Finance	(Ec 1/2 and Ba 9)	3
Ba	159/160	Business Management and Policy	(Ec 1/2. Ba 149, 151/152 and Ba 63)	3
Ba	161/162	Personnel Management	(Ec 1/2)	3
Ba	167	Sales Management	(Ba 63/64)	3

Ba	169	Marketing Research	(Ba 63 and Ms 19)	3
Ba	170	Managerial Marketing	(Ba 63/64 and Ms 19)	3
Ec	1/2	Principles of Economics		3
Ec	133/			
Ec	134	Labor Economics	(Ec 1/2)	3
Ec	168	Social Control of Business	(Ec 1/2)	3

TWO-YEAR BUSINESS PROGRAM

The University of Maine in Portland offers, in addition to the four-year undergraduate program in Business Administration, a two-year curriculum providing technical academic work in the field of Business Administration. Upon successful completion of the two-year curriculum, the student is awarded the degree of associate in business administration.

Any high school graduate may apply for admission to the two-year program. A college preparatory course is not required. Applicants should complete the regular University of Maine application form and specify the Associate in Business Administration program. Candidates must also complete the College Entrance Examination Board's general Scholastic Aptitude Test and the Strong Vocational Interest Test.

THE FRESHMAN YEAR

Students admitted to the associate degree program at the University of Maine in Portland pursue the following curriculum during the freshman year:

FALL SEMESTER			SPRING SEMESTER		
	Subject	**Hours**		**Subject**	**Hours**
*1 Ba	Business Mathematics	3	*2 Ba	Business Mathematics	3
*3 Ba	Business and Society	3	*4 Ba	Business and Society	3
9 Ba	Principles of Accounting	3	10 Ba	Principles of Accounting	3
1 Ec	Principles of Economics	3	2 Ec	Principles of Economics	3
1 Eh	Freshman Composition	3	2 Eh	Freshman Composition	3
Pe 1	Physical Education	0	Pe 2	Physical Education	0
		15			15

* Associate degree credit only.

THE SECOND YEAR

23 Ba	Elements of Industrial Management	3
63 Ba	Marketing	3
130 Ba	Legal Environment of Business	3
90 Ba	Human Relations in Business	3
Elect one of the following:		
41 Ba	Intermediate Accounting	3
151 Ba	Business Finance	3

24 Ba	Elements of Industrial Management	3
64 Ba	Marketing	3
147 Ba	Business Data Processing	3
19 Eh	Expository Writing	3
Continue first-semester elective:		
42 Ba	Intermediate Accounting	3
152 Ba	Business Finance	3

COURSES OF INSTRUCTION IN THE ASSOCIATE DEGREE PROGRAM

The following descriptions are limited to those courses taught by the faculty of business and economics in the two-year program. The courses taught by the faculty in English (1 Eh, 2 Eh, and 19 Eh) are similar in description to Eh 1, Eh 2, and Eh 19, except that 19 Eh is a 3-credit course.

1/2 Ba Business Mathematics—The first semester introduces the student

to the basic elements of algebra and geometry. The concepts of linear equations and systems are then developed which lead to the solution of business problems through the techniques of linear programming. Elements of the calculus and basis probability are then introduced as tools for business decision-making. *Cr* 3. (Associate degree credit only) MR. VANAMBURG

3/4 Ba Business and Society—An examination of the significant relationships which exist between business and the social, political, and economic environment of our society for the purpose of evaluating goals, values, ethics, and practices in the business world. *Cr* 3. (Associate degree credit only) MRS. MILNE

9 Ba Principles of Accounting I—An introductory course in accounting with emphasis on the basic accounting cycle, management use of accounting data construction and analysis of financial statements, asset valuation, and elementary cost analysis. *Cr* 3. MR. MCKEIL

10 Ba 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. MR. MCKEIL

23/24 Ba 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. *Cr* 3. MR. MCKEIL

41/42 Ba Intermediate Accounting—Principles in regard to the valuation and recording of working capital items and concurrent items; capital stock and surplus; statement analysis. Prerequisite: Ba 9, Ba 10. *Cr* 3. MR. HALL

63/64 Ba 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: Ec 1;2, Ba 9. *Cr* 3. MR. ANDREWS

151/152 Ba Business Finance—The first semester deals with the promotion, organization, and financing of the single proprietorship, partnership, and corporation. The second semester utilizes advanced cases and problems related to the theory and principles developed in the first semester. Prerequisite: Ec 1;2, Ba 9. *Cr* 3. MR. ANDREWS

130 Ba 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, its underlying conceptual framework from which legal rules and principles of business develop. Selected legal cases will be critically analyzed and discussed. *Cr* 3.

147 Ba Business Data Processing—The application of electronic data processing equipment to accounting systems. Basic principles of operation and programming. Selected case problems. Prerequisite: Ba 9, Ba 10. *Cr* 3. MR. CHRISTOPHER

1/2 Ec Principles of Economics—Analysis of the fundamental characteristics and institutions of modern economic society, including business and labor organization, national and international policies. *Cr* 3. MR. CHRISTOPHER

90 Ba Human Relations in Business—An introduction to the behavioral sciences, emphasizing typical behavioral problems faced in business both by employees and members of management. The laboratory method of teaching, involving the student in role playing and analyzing collected data, is supplemented with lectures, case analysis, and outside reading. *Cr* 3. MRS. MILNE

Chemistry

ASSISTANT PROFESSOR SOTTERY; STAFF ASSISTANT CINAMON

(See page 250 for course description)

Ch 1/2	General Chemistry	(Tech Forestry)	4

Classics

LECTURER DUCLOS

(See page 78 for course description)

Cl 1. 2	Greek and Latin Literature in English Translation	3

Education

ASSISTANT PROFESSORS RHOADES AND SOULE

(See page 156 for course descriptions)

Ed B2	The American School	3
Ed B3	The Growth-Learning Process	3
Ed B4	The Teaching Process	3

Engineering Graphics

ASSOCIATE PROFESSOR HOPKINSON; LECTURER MESSER

(See page 264 for course descriptions)

Eg 1/2	Engineering Drawing	2
Gc 5	Orientation	0

English

ASSOCIATE PROFESSORS BERNARD AND DISSELL; ASSISTANT PROFESSORS BURKE, COFFIN, JACKSON, JAQUES; INSTRUCTORS CLARK, DUCLOS, FERNALD, LEWISOHN; LECTURERS BEATLEY, HOLMES, AND ROLLINS

(See page 69 for course descriptions)

1/2	Eh	Freshman Composition (2-year Business)		3
19	Eh	Expository (2-year Business)		3
Eh	1/2	Freshman Composition		3
Eh	3. 4	English Literature	(Eh 1/2)	3
Eh	7. 8	Second Year Composition	(Eh 1/2)	3
Eh	15. 16	Masterpieces of English and American Literature	Eh 1/2)	3
Eh	19	Expository Writing	(Eh 1/2)	2
Eh	43	American Literature	(Eh 1/2)	3
Eh	149	The Science of Language	(Eh 1/2)	2
Eh	151	Old English	(Eh 1/2)	3
Eh	157. 158	Shakespeare	(6 Hrs. of Lit.)	3
Hr	41	Distinguished Freshman Seminar	(Per)	3
Hr	45	Honors Colloquium	(Per)	3
Hr	47. 48	Honors Group Tutorial	(Per)	3
Hr	50	Honors Seminar	(Per)	3
Hr	51. 52	Honors Reading	(Per)	3
Hr	53. 54	Honors Thesis	(Per)	3

Foreign Language

ASSOCIATE PROFESSOR CLARK; ASSISTANT PROFESSORS LEPELLEY, SCHWANAUER, VAN DE VELDE; LECTURER HERNANDEZ

(See page 73 for course descriptions)

Fr	1-2	Elementary French		4
Fr	3/4	Intermediate French		3
Fr	3a. 4a	Supplementary Oral French		1
Fr	7/8	French Conversation	(Fr 4 or Equiv.)	3
Fr	9. 10	Readings in French Literature	(4 Yrs. H. S. Fr; Fr 4 or Equiv.)	3
Fr	175. 176	French Literature of the First Half of the 19th Century		3
Fr	167/ 168	Advanced Grammar and Composition		2
Gm	1-2	Elementary German		4
Gm	3/4	Intermediate German	(Gm 2)	3
Gm	9. 10	Readings in German Literature	(Gm 4 or Equiv.)	3
Sp	1-2	Elementary Spanish		4
Sp	3/4	Intermediate Spanish	(Sp 2)	3

Geology

PROFESSOR JOSEPH M. TREFETHEN

(See page 79 for course descriptions)

Gy	1a	Physical Geology		3
Gy	2a	Historical Geology	(Gy 1. 1a)	

History and Government

ASSOCIATE PROFESSORS COLE AND PEASE; ASSISTANT PROFESSORS ALBEE, CONNICK, HUNT, JONES, KENDALL, AND PEIRCE

(See page 81 for course descriptions)

Gt	1/2	Introduction to Government		3
Gt	21. 22	Current World Problems		3
Gt	136	Communist Governments	(Gt 1/2)	3
Gt	156	Political Parties	(Gt 1)	3
Gt	187	International Law	(6 Hrs. Hy or Gt)	3
Gt	188	International Organization	(6 Hrs. Hy or Gt)	3
Hy	3. 4	United States History		3
Hy	5/6	History of Western Europe		3
Hy	111. 112	Europe Since 1870	(Hy 5/6)	3
Hy	115. 116	History of England	(6 Hours Hy)	3
Hy	167	Civil War and Reconstruction	(Hy 3)	3
Hy	172	Economic History of the United States	(No Freshmen)	3
Hy	173. 174	American Diplomatic History	(Hy 3. 4)	3

Music

LECTURER BRYANT

(See page 92 for course descriptions)

Mc	01. 02	University Singers	(Audition)	1
Mc	L3/L4	Understanding Music		2

Mathematics and Astronomy

ASSOCIATE PROFESSOR ROGERS; ASSISTANT PROFESSORS BROWN, CANTY, MAINVILLE; LECTURER LEWIS; INSTRUCTORS CHABOT AND FOSTER

(See page 88 for course descriptions)

As	9	Descriptive Astronomy		3
Ms	1	Trigonometry	(2 Yrs. H. S. Algebra)	2
Ms	3	College Algebra	(2 Yrs. H. S. Algebra)	2
Ms	5/6	Elements of College Mathematics	(2 Yrs. H. S. Algebra)	3
Ms	12	Analytic Geometry and Calculus	(3 ½ Yrs. H. S. Math)	4
Ms	19	Principles of Statistical Inference	(1 Yr. H. S. Algebra)	3
Ms	21	Elements of Set Theory		2
Ms	22	Elements of Real Number Theory	(Ms 21)	2
Ms	24	Introduction to Linear Algebra	(Ms 6 or 12)	3
Ms	27	Analytic Geometry and Calculus	(Ms 12)	4
Ms	28	Analytic Geometry and Calculus	(Ms 27)	4
Ms	29	Calculus Differential Equations	(Ms 28)	4
Ms	149	Mathematics for Teachers	(Ms 28)	3
Ms	164	College Geometry	(Ms 28)	3
Ms	165	Theory of Numbers	(Ms 28)	3
Ms	171/172	Higher Algebra	(Ms 28)	3
Ms	173/174	Advanced Calculus	(Ms 28)	3

Physical Education

ASSOCIATE PROFESSOR SULLIVAN; ASSISTANT PROFESSOR STURGEON; INSTRUCTOR MARTIN

(For course description see page 169)

Pe	1. 2	Physical Education	(Physically Qualified, Non-Veteran Freshman)	0

Physics

ASSISTANT PROFESSOR ARMENTROUT; INSTRUCTOR BLEASE

(See page 101 for course descriptions)

Ps	1/2	General Physics	(Open to Fresh.) (With Ms 12)	5
Ps	3	Descriptive Physics	(Open to Fresh.)	3

Psychology

PROFESSOR SALDANHA; ASSISTANT PROFESSOR SANBORN

(See page 99 for course descriptions)

Py	1/2	General Psychology	(No Fresh.)	3
Py	123	Psychology of Childhood	(Py 1/2)	3
Py	124	Psychology of Adolescence	(Py 1/2)	2
Py	151	Psychology of Motivation	(Py 1/2)	3
Py	155	Psychology of Learning	(Py 1/2)	3

Speech

(See page 121 for course descriptions)

ASSOCIATE PROFESSOR HANSEN; INSTRUCTOR EPSTEIN

Sh	1	Fundamentals of Public Speaking	(Open to Fresh.)	2
Sh	11	Theater Today	(Open to Fresh.)	2
Sh	17	Fundamentals of Acting	(Open to Fresh.)	2
Sh	31	Voice and Diction	(Open to Fresh.)	2
Sh	41	Fundamentals of Interpretation	(Open to Fresh.)	2

Sociology

ASSISTANT PROFESSORS BROMFIELD AND STEINMAN

(See page 115 for course descriptions)

Sy	3/4	Introduction to Sociology		3
Sy	110	Social Organization	(Sy 3/4 or Per)	3
Sy	113	Social Disorganization	(Sy 3/4 or Per)	3
Sy	120	Methods of Social Research	(Sy 3/4, Ms 19 or Per)	3
Sy	121	Juvenile Delinquency	(Sy 3/4 or Per)	3
Sy	123	Social Stratification	(Sy 3/4 or Per)	3
Sy	138	Race and Culture Conflict	(Sy 3/4 or Per)	3
Sy	160	Sociological Theory	(Sy 3/4 or Per)	3
Sy	161	History of Sociology	(Jrs. and Srs. with 2 Sy Courses)	3
Sw	150			
	151	Social Welfare	(Sy 3/4)	3

Zoology-Botany

ASSOCIATE PROFESSORS KERN AND NAJARIAN; STAFF ASSISTANT WINE

(See pages 127 and 194 for course descriptions)

Bt	1	General Botany	4
Zo	3	Animal Biology	4

GRADUATE SCHOOL

FRANKLIN P. EGGERT, DEAN

On the steps of Fogler Library

Graduate School

Programs of study leading to degrees of master of arts, master of arts in teaching, master of business administration, master of science, master of science in engineering, master of education, master of library service, doctor of education and doctor of philosophy are offered by the University. The Ph.D. degree is awarded in the fields of American history, animal nutrition, chemical engineering, chemistry, plant science, physics, clinical psychology, general-experimental psychology and zoology.

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.

Several scholarships of the value of a year's tuition are available to graduate students with outstanding undergraduate records. A number of departments require the services of graduate assistants, who devote part time to study while engaging in teaching or research duties.

A thesis usually is required of candidates for the M.A. and M.S. degrees, and is required for the Ph.D. degree and the D.Ed. degree.

All work for the M.A., M.S., M.B.A., and M.A.T. degrees must be completed within an eight-year period. The limit for the M.Ed., D.Ed., and Ph.D. degrees is 10 years.

The bulletin of the Graduate School, containing more detailed information concerning the graduate program, may be obtained from the Office of the Graduate School, 76 Fogler Library.

Students may not register for graduate degree credit until duly admitted to a program of graduate study at the University of Maine.

SCHOOL OF LAW, PORTLAND

EDWARD S. GODFREY, DEAN

A Speaker at the Law School

School of Law, Portland

DEAN, EDWARD S. GODFREY; *Resident Faculty* —PROFESSORS HARRY P. GLASSMAN, L. KINVIN WROTH, JOHN ANDREW SPANOGLE; ASSOCIATE PROFESSORS DONALD L. GARBRECHT (LIBRARIAN), DAVID J. HALPERIN, PIERCE B. HASLER ORLANDO E. DELOGU; LECTURERS CHARLES P. BARNES, JAMES R. FLAKER LEONARD M. NELSON, RICHARD E. POULOS

The University of Maine School of Law is located in Portland, Maine, at 68 High Street, about one mile from the undergraduate campus of the University of Maine in Portland. It is a full-time day school, offering a three-year program leading to the degree of bachelor of laws. With its rapidly growing library, containing over 60,000 volumes, the school serves as the chief center of teaching and research in law in northern New England. It is fully approved by the American Bar Association.

The School of Law provides sound preparation for entry into the legal profession. The instruction familiarizes the student with basic principles of law, their purposes and social origins, and the processes by which legal institutions grow. Programs of legal writing, drafting, and advocacy develop professional skills.

A law student's work consists primarily of independent study of assigned materials as groundwork for critical discussion under guidance of the professor. The classroom experience requires the student to apply, compare, and test legal ideas in varying fact situations. Precedents and authorities of many jurisdictions, as well as relevant materials drawn from other disciplines, are used as the basis for study. Although statutes and rules peculiar to Maine are noted, the course of study consists primarily of an investigation and analysis of legal processes and institutions.

A candidate for the law degree at the University of Maine must, by the time be begins his law study, hold a bachelor's degree from a college or university accredited by the appropriate regional association of colleges and secondary schools. Each applicant for admission is required to take the Law School Admission Test administered by the Educational Testing Service, Princeton, New Jersey. Information concerning admission requirements and other matters may be obtained from the Office of the Dean of the Law School. At the Orono campus of the University of Maine, information about the school may also be obtained from the Pre-Law Adviser, Professor Robert B. Thomson, East Annex.

MISCELLANEOUS

Main Lounge, Memorial Union

Military Science

PROFESSOR OF MILITARY SCIENCE (PMS) COLONEL GERETY; ASSOCIATE PROFESSOR LIEUTENANT COLONEL JOHNSON; ASSISTANT PROFESSORS MAJOR CALLAHAN CAPT. DAMOUR; INSTRUCTOR SERGEANT MAJOR WALMAN; CHIEF OF ADMINISTRATION STAFF SERGEANT HOFFMANN; SUPPLY SERGEANT, STAFF SERGEANT SPENCER

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 devolopment 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 duration of 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 subject must be the equivalent of 30 class hours for freshmen, 45 class hours for juniors, and 45 class hours for seniors.

FALL SEMESTER					SPRING SEMESTER				
	Subject	Hours				Subject	Hours		
		Rec	Lab*	Cr			Rec	Lab*	Cr
Mt 1	Military Science, Basic	1	1	0**	Mt 2	Military Science, Basic	1	1	0**
Mt 3	Military Science, Basic	2	1	0**	Mt 4	Military Science, Basic	2	1	0**
Mt 5	Military Science, Advanced	3	1	3	Mt 6	Military Science, Advanced	2	1	2
Mt 7	Military Science, Advanced	2	1	2	Mt 8	Military Science, Advanced	3	1	3

* Drill
** Grades included in College Accumulative

REQUIREMENTS

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 Science (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; and 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 an individual.

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 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 the six-week basic summer camp between Mt 4 and Mt 5. Credit for Mt 1, 2, 3 and 4.

ADDITIONAL COURSES

Flight Training—Army ROTC Flight Training is offered to selected senior ROTC participants as an extracurricular subject at no extra cost. Participants, upon completion of 35 hours ground instruction and 37½ hours in-flight instruction, 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 individuals 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.

ROTC Marching Band—Offered to all cadets who have musical ability for any instrument common to a marching band. Instruments are furnished without charge.

Enrollment—Basic Military Science cadets are issued modified officer-type uniforms free of charge for use at drill and other authorized training. 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 braids and strips to conform with uniforms worn by officers on active duty.

TWO-YEAR SCHOLARSHIP PROGRAM

The Department of Army offers a two-year scholarship to select sophomore cadets who have enrolled in the military program and in academic pursuits. This scholarship pays full tuition for two years, all text books and laboratory fees, plus $50 a month for two years.

Advanced Military Science cadets are paid a monetary allowance of $40 per month for 10 months of each year. For the six-week period of Summer Camp they receive $147.30 per month 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, U.S. Army Reserve. These officers receive a uniform allowance of $300 upon reporting for active duty to cover costs of necessary uniforms. These individuals are normally 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 Program normally are required to serve on active duty for a period of three and four years respectively.

Deferment—University Military Training and Service Act provides for the deferment of all Advanced Military Science ROTC members and those Basic Military Science ROTC members tentatively selected for enrollment in Mt 5 until completion or termination of the course of instruction.

OTHER ACTIVITIES

Pershing Rifles—Pershing Rifles is a National Honorary Military Society established in 1894. The objective of the Pershing Rifles is to encourage, preserve, and develop the highest ideals of the military profession and to promote the American way of life. Company M, 12th Regiment, at the University of Maine,

represents the University at several precision drill meets throughout the school year at various institutions. Pershing Rifles also receive extra field training in tactics, guerrilla warfare and marksmanship, and provide the University with color guards, trick drill performances and military guards on various occasions.

Scabbard and Blade—Scabbard and Blade is a National Military Honor Society composed of Advance Course Military students. The objectives of Scabbard and Blade are to develop the essential qualities of effective officers and to prepare the members as educated men to take a more active part and have a greater influence in the military affairs of the communities in which they reside.

Scabbard and Blade conducts field exercises to improve the proficiency of its members, conducts meetings with guest speakers and movies to better inform the members on military affairs, and sponsors the Annual Military Ball.

1st Maine Ranger Company—A limited membership organization open to all military students. Training is designed to provide the cadet with pride, confidence, self-determination, and the ability to lead, endure and succeed regardless of the odds or obstacles. Emphasis is placed on physical development and practical work supplemented by classroom theory. Among those subjects emphasized are patrolling, map reading, navigation, first aid, mountaineering and close order drill. A distinctive uniform is provided each member. The unit conducts at least one exercise monthly in the local area.

Physical Education and Athletics

Professors Rankin, Kleindienst and Woodbury; Associate Professors Cassidy, Westerman, Sezak, Brown, Butterfield, McCall, Styrna, and Sullivan*; Assistant Professors Shaffer, Abbott, and Hass; Mr. Rand, Mr. Jordan, Miss Jordan, Mr. Martin*, Mr. Sturgeon*, Mr. Philbrick, Mr. Pickett, Mr. Ellis, Mr. Livsey, and Mr. Wallace

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 exercise 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 in the Colleges of Arts and Sciences, Business Administration, Life Sciences and Agriculture and Technology. Physical Education is required of all freshmen and sophomores in the College of Education. These courses are designed to improve body control and strength, to stimulate the development of mental and physical alertness, to establish habits of regular exercise, 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.

All College of Education students, including those out for athletic teams, who have passed Pe 1 and are taking Pe 2, will take a physical proficiency test at the end of the spring term. Students passing this test will be given credit for Pe 3 and 4 requirements. Those not passing the test will register for Pe 3 the following fall.

* University of Maine in Portland.

The test will again be given to Pe 3 students, and those passing will be given credit for Pe 4. Any student still not passing will register for Pe 4. All courses must be passed to satisfy the graduation requirement. A student who is excused from Pe 2 for medical reasons will register for Pe 3 and take the test at the end of the semester. The foregoing will also apply for any student who is absent from the test for any reason.

Any student who has failed a Pe course because of lack of attendance will forfeit his right to take the physical proficiency test and must register for and pass all four semesters of the required course.

A prescribed uniform is required for all physical education classes, at the approximate cost of $9.

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 equivalents are required of all non-veteran freshmen. Outdoor and indoor games, calisthenics, tests, and intramural activities. *Two hours a week, no credit.*

Pe 3, 4. Physical Education—These courses or their equivalents are required of all non-veteran sophomores who have not passed the physical efficiency test. A continuation of courses 1 and 2. *Two hours a week, no credit.*

PHYSICAL EDUCATION FOR WOMEN

Physical education is required of all freshman women in the Colleges of Arts and Science, Life Sciences and Agriculture, Business Administration and Technology. Physical education is required of both freshman and sophomore women in the College of Education as a prerequisite for graduation. A regulation uniform is required for all students participating in activity classes. The Physical Education courses are designed to help develop and maintain physical health and general fitness through physical activity; mental health through skill in recreational activities which can provide release from tensions; social attributes which are attained in group activities; and understanding appreciation of the place which sports, dance, and wholesome recreation activities have in the good living.

In general, students select four of the following five areas of activity: Fundamentals of Gymnastics, Dance, Individual Sports, Team Sports, and Fitness and Conditioning. When medical examinations indicate need for restricted or adaptive programs, these will be prescribed according to individual needs. Such programs might include light or modified recreational activity, prescribed exercise programs, or corrective activity for postural and foot conditions.

Pe 1, 2. Physical Education—Required for freshmen. Activities are chosen from two of the following five areas: (1) Team Sports, (basketball, field hockey, volleyball, lacrosse); (2) Individual Sports (archery, badminton, fencing, golf,

riflery, roller skating, skiing, tennis); (3) Fundamentals of Gymnastics; (4) Dance (modern or folk); (5) Fitness and Conditioning. *Two hours a week. Cr* 0:

Pe 3, 4. Physical Education—These courses are required for sophomores. Activities are selected from areas not taken in Pe 1,2. *Two hours a week. Cr* 0.

Limited and Adaptive Physical Education Activities

Because of increased facilities and a re-evaluated program the Women's Department of Physical Education is able to offer a wide variety of mild to vigorous activities as well as special courses in adaptive work for women who have physical disabilities.

Limited Physical Education has reference to women with physical disabilities who will be allowed to plan a program of mild activity. Women with physical limitations will register for four semesters of physical education and will be permitted to follow an individualized program.

Adaptive Physical Education is provided for those women who are highly restricted and it enables them to follow a program of prescribed exercises.

INTERCOLLEGIATE ATHLETICS

As an integral part of the University's program of physical education, intercollegiate athletics 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 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: football, basketball, baseball, track, cross country, golf, tennis, winter sports, rifle, and sailing. 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 19.

Continuing Education Courses

The Continuing Education Division is a part of the University of Maine Extension Service. 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 additional function of the C.E.D. is to provide programs for recent high school graduates who wish to begin college study within a commuting distance of their homes. It is intended that students who begin their college studies in this manner will transfer to a campus for completion of their programs.

This 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 Continuing Education Division 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. An increasing 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 Continuing Education Division. 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 and Augusta. A C.E.D. office is also maintained in Lewiston. Extension agents or C.E.D. personnel will be able to advise students as to 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 and Orono campuses.

Community Centers

The 102nd Maine Legislature enacted an Emergency Educational Opportunity Program for the University of Maine to provide additional opportunities for the higher education of Maine youth. The program includes several activities which permit the University to expand its enrollment more rapidly than had been planned originally.

One aspect of the program is the establishment of four University of Maine centers throughout the state. The centers have been established on a cooperative basis, in the sense that the University and the local community combine to make physical facilities and academic offerings available.

In the fall of 1965, centers were opened in Augusta and in Lewiston-Auburn. The Augusta center is known as the University of Maine in Augusta, and the Lewiston-Auburn center is known as the University of Maine in Lewiston-Auburn.

Two other centers, one in Rockland and one in York, are to be opened in the fall of 1966.

The University of Maine in Augusta and the University of Maine in Lewiston-Auburn offer basic undergraduate programs at the freshman and sophomore levels. Students may pursue studies on a part-time or full-time basis, and are able to complete the equivalent of two years of university work.

Courses are offered during the late afternoon and evening hours as well as on Saturdays. Students wishing to apply for degree status at one of these centers should apply to the Director of Admissions at Orono, specifying the location for which the application is intended. Admission procedures and requirements are the same as those which apply to admission to any university program.

The University of Maine in Augusta and the University of Maine in Lewiston-Auburn offer a wide variety of courses sponsored by the Continuing Education Division, in addition to the freshman and sophomore programs.

Students seeking information about courses at the University of Maine in Augusta should contact Lloyd Jewett, administrator of the University's program there. His headquarters are at Cony High School.

Students wishing information about courses at the University of Maine in Lewiston-Auburn should contact Arnold Westerberg, program administrator. His office is Room 404, 145 Lisbon Street, Auburn.

Students desiring information about courses offered in Rockland should contact Mr. Westerberg at his address in Auburn.

Information about course offerings in York may be obtained from Walter Fridinger, Continuing Education Office, University of Maine, 96 Falmouth Street, Portland.

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.

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. State College graduates 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 Graduate Study.

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 calendar, pages 4 and 5). The bulletin describing courses offered during this period is issued about March 15. For further information concerning the program address Mark R. Shibles, Director of the Summer Session. Orono, Maine 04473.

Educational Television

The University of Maine owns and operates WMEB-TV, Channel 12, Orono; WMEM-TV, Channel 10, Presque Isle; and WMED-TV, Channel 13, Calais. These television stations, interconnected by microwave with WCBB, Augusta; WENH, Durham, N. H.; and WGBH-TV, Boston, Mass., maintain a regular schedule of programs for adults and for children, both for home and for in-school use.

Studios for the State of Maine ETV Network are located in Alumni Hall on the Orono campus. Here are facilities for the production of live, recorded and film programs. Programming on the network comes from three main sources: National Educational Television, the Eastern Educational Network, and the University of Maine. Of the locally produced programs, a number are presented in cooperation with other educational, cultural and public service organizations of the state.

An expanding closed circuit television system (CCTV) currently interconnects several classroom buildings with studios in the Education Building and Alumni Hall. A number of University courses are offered by television as the need to reach more and more students with quality instruction increases. The Orono elementary and high schools are a part of the CCTV system.

Both the network and closed circuit television operations offer students an excellent opportunity for part-time employment and training in the broadcast fields.

Personnel

EMERITI

ASHMAN, ROBERT IRVING; A.B., Cornell University, 1913; M.F., Yale, 1929; Sc.D., Maine, 1957; Professor Emeritus of Forestry.

BEVERLY, VERNE CURTIS; B.S., Maine, 1920; County Agent Emeritus.

BOARDMAN, HAROLD SHERBURNE; B.C.E., Maine, 1895; C.E., 1898; Eng.D., 1922; LL.D., Colby, 1927; Eng.D., Rhode Island, 1928; LL.D., Bates, 1929; President Emeritus.

BONNEY, LUTHER ISAAC; B.A., Bates, 1906; M.A. (Hon.), 1951; Sc.D., in Ed., Maine, 1959; Dean Emeritus, University of Maine in Portland.

BRANN, BERTRAND FRENCH; B.S., Maine, 1909; M.S., 1911; S.M., Massachusetts Institute of Technology, 1912; Professor Emeritus of Chemistry.

BRIWA, KATHRYN ELIZABETH; A.B., Vassar, 1915; M.A., Columbia, 1929; Ph.D., 1940; Nutrition Specialist Emerita.

BUZZELL, MARION STEPHANIE; B.A., Maine, 1914; M.A., 1915; Associate Professor Emerita of Romance Languages.

CLAYTON, MARY MORRIS; B.S., Columbia, 1918; M.S., Rochester, 1926; Ph.D., 1929; Nutritionist Emerita.

COMEGYS, ESTHER; B.A., Wellesley, 1921; M.A., University of Pennsylvania, 1926; Ph.D., Radcliffe, 1941; Associate Professor Emerita of Mathematics.

CORBETT, RALPH ASHTON; B.S., Maine, 1930; M.S., Wisconsin, 1949; Extension Dairy Specialist Emeritus.

CRABTREE, KENNETH GERARD; S.B., Massachusetts Institute of Technology 1923; P.E. (Maine); Professor Emeritus of Electrical Engineering.

CRANE, PERCY FREMONT; B.S., Bowdoin, 1917; Director of Admissions Emeritus.

CRAWFORD, JOHN RAYMOND; B.A., Culver-Stockton, 1924; M.A., State University of Iowa, 1929; Ph.D., 1931; Professor Emeritus of Education.

CREAMER, WALTER JOSEPH; B.S., Maine, 1918; E.E., 1921; B.A., 1923; Professor Emeritus of Communication Engineering.

CROSBY RUTH; A.B., Mount Holyoke, 1919; A.M., Radcliffe, 1920; Ph.D., 1929; Professor Emerita of English.

CROSSLAND, CHARLES EDWARD; B.S., Maine, 1917; LL.D., 1962; Vice President for Administration Emeritus.

DAY, CLARENCE; M.S., Maine, 1929; Extension Editor Emeritus.

DIRKS, CHARLES ORVILLE; B.S., Kansas State College, 1924; M.S., Iowa State College, 1925; Ph.D., Cornell University, 1935; Professor Emeritus of Entomology.

DOLLOFF, RICHARD CARLTON; B.S., Maine, 1927; M.S., Cornell University, 1950; County Agent Leader Emeritus.

DOTEN, HENRY LEROY; B.S., Maine, 1923; C.E., 1942; P.E. (Maine); Business Manager Emeritus.

EASTMAN, CHARLES LESLIE; B.S., Maine, 1922; Extension Agent Emeritus.

EVANS, WESTON SUMMER; B.S., Maine, 1918; M.S., 1923; Sc.D., 1962; P.E. (Maine); Dean of Technology Emeritus.

FOLSOM, DONALD; A.B., Nebraska, 1912; M.A., Minnesota, 1914; Ph.D., 1917; Plant Pathologist Emeritus.

FOSTER, FRANK CLIFTON; B.S., Colby, 1916; B.D., Union Theological Seminary, 1924; M.A., Columbia, 1924; Ph.D., 1933; Professor Emeritus of Education.

GANNETT, JAMES ADRIAN; B.S., Maine, 1908; M.A. (Hon.), 1928; Registrar Emeritus.

GREENE, PEARL STUART; B.A., Northwestern, 1909; B.S., Lewis Institute, 1914; A.M., Columbia, 1923; Professor Emerita of Home Economics.

HALL, HOWE WIGGINS; B.S., Maine, 1914; M.S., 1925; Assistant Professor Emeritus of Animal Husbandry.

HAUCK, ARTHUR ANDREW; 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; A.B., Oberlin, 1923; M.B.A., Harvard, 1925; D.C.S., 1930; Professor Emeritus of Business and Economics.

HITCHNER, ELMER REEVE; B.S., Pennsylvania State, 1915; M.S., 1916; Ph.D., Wisconsin, 1931; Professor Emeritus of Bacteriology.

HOWELL, CHARLES MANLEY; A.B., SWARTHMORE, 1919; M.S., Maine, 1922; P.E. (Maine); Professor Emeritus of Paper Technology.

HYLAND, FAY; B.S., Michigan State College, 1925; M.S., Maine, 1929; Sc.D., 1965; Professor Emeritus of Botany.

IBBOTSON, LOUIS TAPPE; A.B., Hamilton, 1922; B.L.S., New York State Library School, 1925; Librarian Emeritus.

JENNESS, LYLE CLAYTON; 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; B.S., Colby, 1927; Assistant Professor Emeritus of Mathematics, University of Maine in Portland.

JORDAN, MAYNARD FRED; B.A., Maine, 1916; M.A., 1921; Professor Emeritus of Astronomy.

LATHROP, FRANK HEIDTMAN; B.S., Clemson, 1913; M.S., Ohio State, 1915; Ph.D., 1923; Entomologist Emeritus.

LENGYEL, HELEN ANNA; Diploma, Sargent School for Physical Education, 1915; B.A., Maine, 1927; M.A., 1936; Professor Emerita of Physical Education.

LEVINSON, RONALD BARTLETT; A.B., Harvard, 1919; Ph.D., Chicago, 1924; L.H.D., Maine, 1962; Professor Emeritus of Philosophy.

LUCAS, WARREN STANHOPE; B.A., Maine, 1914; M.A., 1922; Professor Emeritus of Mathematics.

MERCHANT, CHARLES HENRY; B.S., Cornell University, 1920; M.S., 1922; Ph.D., 1928; Professor Emeritus of Agricultural Economics.

MONROE, MERNA MYRTHA; B.S., Iowa State, 1929; M.S., Kansas State, 1932; Associate Professor Emerita of Housing.

MUSGRAVE, MARGUERITE RUTH; B.S., Columbia, 1925; A.M., 1926; Lecturer Emerita in Design.

NASON, ESTELLE; B.S., Maine, 1922; Home Demonstration Agent Leader Emerita.

OTTO, CARL EVERETT; B.A., Cincinnati, 1916; M.A., 1920; Ph.D., 1922; Associate Professor Emeritus of Chemistry.

PRAGEMAN, IRVING HENRY; Ph.B., Yale, 1918; M.E., 1923; P.E. (Maine); Professor Emeritus of Mechanical Engineering.

SCHRUMPF, WILLIAM ERNEST; B.S., Maine, 1928; M.S., 1930; Associate Agricultural Economist Emeritus.

SHIBLES, LOANA SPEARIN; Castine Normal, 1926; Club Agent Emerita.

SMALL, GEORGE WILLIAM; 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; B.S., Maine, 1909; M.S., 1922; Ph.D., Rutgers, 1934; Professor Emeritus of Biochemistry.

SMYTH, JOHN ROBERT; B.S., Purdue, 1920; M.S., Kentucky, 1928; Professor Emeritus of Poultry Science.

SNYDER, MARY ELLA; A.B., Gooding College, 1919; M.S., Iowa State College, 1936; Associate Professor Emerita of Food and Nutrition.

SPARROW, THERON ALONZO; B.S., Maine, 1924; M.S., 1938; P.E. (Maine); Professor Emeritus of Mechanical Engineering.

STEINMETZ, FERDINAND HENRY; 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; B.S., Iowa State College, 1921; M.S., 1922; Ph.D., Minnesota, 1927; Professor Emerita of Home Economics.

SWIFT, HAROLD CLAYTON; B.S., Maine, 1918; M.S., 1923; Associate Professor Emeritus of Agricultural Engineering.

TALBOT, RICHARD FOSTER; B.S., Maine, 1907; Extension Dairy Specialist Emeritus.

TOBEY, ELMER ROBERT; B.S., Maine, 1911; M.S., 1917; Ch.E., 1920; Chemist Emeritus.

TURNER, ALBERT MORTON; A.B., Harvard, 1912; A.M., 1914; Ph.D., 1920; Professor Emeritus of English and Comparative Literature.

WALLACE, STANLEY MOORE; Diploma, New Haven School of Gymnastics, 1917; Professor Emeritus of Physical Education.

WATSON, HARRY DEXTER; B.S., Maine, 1920; M.S., 1929; P.E. (Maine); Professor Emeritus of Mechanical Engineering.

WEBSTER, FRED LOT; County Agent Emeritus.

WHITMORE, ALBERT AMES; B.S., Maine, 1906; M.A., 1917; Professor Emeritus of History.

WHITNEY, WALTER REGINALD; B.S., Bowdoin, 1923; A.M., Harvard, 1935; Professor Emeritus of English.

YOUNGS, FREDERICK SHAW; B.S., Maine, 1914; B.A., 1928; Treasurer Emeritus.

PERSONNEL*

(Dates in parentheses indicate year of initial appointment)

ABBOTT, BRADFORD NOVELLO (1965); B.S., Bates, 1963; M.A., Maine, 1964; Instructor in Mathematics.

ABBOTT, WALTER HICKS (1960; B.S, Maine, 1958; Assistant Professor of Physical Education and Assistant Football Coach.

ABDALLA, DENNIS ARTHUR (1962); B.S., University of Maryland, 1958; M.S., Clemson Agricultural College, 1962; Extension Blueberry Specialist, Cooperative Extension Service.

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* Officers of the University are listed on pages 7 and 8.

ADAMS, GRAHAM CLEVEARN (1966); A.B., University of North Carolina, 1961; M.A., Indiana University, 1966; Instructor in English.

AIKEN, JAMES BURRELL (1965); B.S. in Ed., Southern Illinois University, 1948; M.S. in Ed., 1951; Ed.D., Indiana University, 1963; Associate Professor of Community Development, Department of Agricultural Business and Economics.

ALBEE, PARKER BISHOP, JR. (1966); A.B., Dartmouth College, 1961; M.A., Duke University, 1964; Assistant Professor of History and Government, University of Maine in Portland.

ALBION, ROBERT G. (1966); A.B., Bowdoin, 1918; M.A., Harvard, 1920; Ph.D., Harvard, 1924; Professor of History.

ALLEN, KENNETH WILLIAM (1963); B.S., Wheaton College (Illinois), 1952; M.S., Maine, 1956; Ph.D., Rice University, 1959; Professor and Head, Department of Zoology.

ALMOND, GEORGE LEE (1964); B.S., Ohio State University, 1951; M.A., 1955; Ph.D., 1963; Professor of Business and Economics.

ALPANDER, GUVENC (1965); B.A., Middle East Technical University, Ankara, Turkey, 1962; M.P.A., Michigan State University, 1963; Assistant Professor of Business and Economics, University of Maine in Portland.

ALTENBERGER, RUSSELL ALBERT (1961); B.S., New York University, 1950; A.M., University of Pennsylvania, 1951; Associate Professor of Mathematics and Director of University Computing Center and Data Processing Center.

ANDERSON, CHARLES LOWELL (1955); B.A., University of Utah, 1949; M.A., 1951; Assistant Professor of English.

ANDERSON, JANET RAE (1966); B.A.E., Wayne State College, 1963; Instructor in Physical Education, Women's Division.

ANDERSON, WALLACE EUGENE (1966); A.B., Nebraska Wesleyan, 1964; Instructor in Physics.

ANDREWS, SAMUEL GEORGE (1966); B.S.B.A., Babson Institute, 1964; M.S., Maine, 1966; Instructor in Business Administration, University of Maine in Portland.

ANNIS, CECIL HEBERT, JR. (1964); B.S., Kansas State University, 1959; Extension Agent (Waldo County); Cooperative Extension Service.

ANTONITIS, JOSEPH JOHN (1950); A.B., Indiana 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; Assistant Professor of Animal Sciences.

APOSTAL, ROBERT ALEXANDER (1961); B.A., University of Minnesota, 1954; M.A., University of Missouri, 1956; Ph.D., 1959; Director of the University Testing and Counseling Service and Associate Professor of Education.

ARMENTROUT, CHARLES (1960); B.S., Maine, 1955; M.S., Wesleyan University, 1958; Assistant Professor of Physics, University of Maine in Portland.

ARMINGTON, RALPH ELMER (1961); B.S., Tufts University, 1940; M.S., New York University, 1942; E.E., Pennsylvania State University, 1953; Ph.D., University of Pittsburgh, 1957; P.E. (Pennsylvania); Professor and Head, Department of Electrical Engineering.

ARMS, CHADWICK CUMMINGS (1964); B.S., Vermont, 1951; M.S., 1960; Area Dairy Specialist, Cooperative Extension Service.

AYLING, ROBERT IAN (1965); L.Th., Melbourne College of Divinity, 1954; B.D., Berkeley Baptist Divinity School, 1956; Th.M., Harvard University, 1959; Th.D., Boston University, 1964; Associate Professor of Community Develop-

ment, Department of Agricultural Business and Economics and Director of Community Development Project, Cooperative Extension Service.

BAIER, LEE S. (1966); A.B., Reed College, 1948; M.A., Columbia University, 1952; Ph.D., 1965; Assistant Professor of English, University of Maine in Portland.

BAILEY, RUSSELL MANLEY (1931); B.S., Maine, 1928; Associate Professor of Genetics, Agricultural Experiment Station.

BAGGETT, DANA RICHARD (1965); B.A., Maine, 1955; M.G.A., University of Pennsylvania, 1959; Director, Bureau of Public Administration.

BAIN, WILLIAM MURRAY (1959); A.B., Indiana University, 1951; M.A., 1953; Ph.D., 1959; Associate Professor of Bacteriology.

BAKER, GREGORY (1935); B.S., Maine, 1924; M.F., Yale, 1939; Professor of Forestry.

BALDWIN, STUART DOUGLAS; B.S., State University of New York at Oswego, 1961; Instructor in Sociology.

BANKS, RONALD FILLMORE (1963); B.S., Gorham State Teachers College, 1956; M.A., Maine, 1958; Assistant Professor of History.

BARDEN, ALBERT ARNOLD, JR. (1946); A.B., Brown, 1932; Sc.M., 1934; Ph.D., Northwestern, 1941; Associate Professor of Zoology.

BARTLETT, MERRILL DAY (1958-59) (1961); B.A., Maine, 1952; M.A., 1958; Assistant Professor of Business and Economics; Assistant to the Dean, College of Business Administration.

BARUSHOK, JAMES WILLIAM (1956); B.S., Northwestern University, 1951; M.A., 1952; Associate Professor of Speech.

BATES, EDWIN HILL (1953); B.S., Maine, 1937; M.S., University of Wisconsin 1961; Associate Director, Cooperative Extension Service.

BATTICK, JOHN FRANCIS (1964); A.B., Boston University, 1958; A.M., 1959; Assistant Professor of History.

BAY, JOHN WILLIAM (1965); B.A., Saint Ambrose College, 1961; M.A., Boston College, 1964; Assistant Professor of Business and Economics; University of Maine in Portland.

BEAMESDERFER, JOHN WILLIAM (1947); B.S., Gettysburg College, 1932; M.S., University of Michigan, 1939; Ph.D., 1947; Professor and Head of Department of chemistry.

BEAN, EDWARD ELTON (1966); B.A., Bowdoin, 1960; M.A., Middlebury, 1966; Instructor in French.

BEARCE, JEANA DALE (1965); B.F.A., Washington University, 1951; M.A., New Mexico Highlands University, 1954; Instructor in Art, University of Maine in Portland.

BECK, ROBERT ERNEST; B.S.L., University of Minnesota, 1958; LL.B., 1960; Visiting Associate Professor of Law, School of Law, Portland.

BEESON, ROBERT EARL (1966); B.S., Iowa State University, 1961; M.S., 1964; Assistant Professor of Electrical Engineering.

BELL, HARRY ADELBERT (1956); B.S., Maine, 1949; Area Dairy Specialist, Cooperative Extension Service.

BELYEA, JEANNETTE CYNTHIA (1965); B.S., Farmington State Teachers College, 1961; Extension Agent (Waldo County), Cooperative Extension Service.

BELYEA, PAUL RAYMOND (1958); B.S., Maine, 1956; M.S., 1958; Assistant Professor of Biochemistry, Agricultural Experiment Station.

BENNER, MARK OSWALD (1965); B.S., Indiana State University, 1964; M.A., 1966; Instructor in Speech.

BENNETT, AUSTIN EDWARD (1963); B.S., in Ed., University of Connecticut, 1951, M.Ed., Colorado State University, 1962; University of Maine Coordinator for the New England Regional Center.

BENNETT, CLARENCE EDWIN (1934); Ph.B., Brown, 1923; Sc.M., 1924; Ph.D., 1930; Professor and Head, Department of Physics.

BENNETT, JACOB (1963); A.B., Boston University, 1949; M.A., Columbia University, 1949; Ph.D., Boston University, 1960; Associate Professor of English.

BENOIT, JOHN ROSAIRE (1966); B.S. in Ed., Maine, 1959; M.Ed., 1965; Assistant Director, Continuing Education Division (Aroostook) of the University of Maine Extension Service.

BENSON, DALE EDWARD (1966); B.A., Pacific Lutheran University, 1963; M.A., Maine, 1965; Temporary part-time Instructor in History.

BERNARD, JULES EUGENE (1963); B.A., Yale, 1934; M.A., 1936; Ph.D., 1937; Associate Professor of English, University of Maine in Portland.

BEYER, FRANK KEMP (1947); B.S., Cornell University, 1929; M.S., University of Wisconsin, 1930; Associate Professor of Forestry.

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; Assistant Professor of Education.

BISHOP, ISABEL MACPHERSON (1961); B.S. in Ed., Boston University, 1948; Ed.M., 1958; Ed.D., 1962; Associate Professor of Education.

BISHOP, JAMES JOSEPH (1966); B.A., Maine, 1961; M.A., Florida State University, 1965; Instructor in English.

BISSELL, LEWIS PROUTY (1949); B.S., New Hampshire, 1940; M.F., Yale, 1947; Forestry Specialist, 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; Associate Director for Continuing Education, University of Maine Extension Service.

BLAMBERG, DONALD LEE (1966); B.S., University of Maryland, 1954; M.S., 1956; Ph.D., 1960; Assistant Professor of Animal Sciences.

BLEASE, ALFRED DUDLEY (1963); B.S., Brown, 1961; M.S., Maine, 1965; Instructor in Physics, University of Maine in Portland.

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.

BOCKUS, CLAYTON TURNBULL (1960); B.S., Maine, 1927; P.E. (Maine); Associate Professor of Pulp and Paper Technology.

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BOLARIA, BHOPINDER SINGH (1965); B.A., Punjab University, India, 1955; M.A., 1958; M.A., Kansas State University, 1961; Assistant Professor of Sociology.

BOLDUC, MARCEL LIONEL (1966); B.A., St. Francis College, 1960; M.A., Middlebury, 1966; Instructor in French.

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; Assistant Professor of Geology.

BOST, JAMES STEPHEN (1962); A.B., University of Illinois, 1947; A.M., 1951; Ph.D., University of Indiana, 1961; Associate Professor of Speech.

BOULANGER, LEO WILFRED (1955); B.S., Providence College, 1951; M.S., Cornell University, 1954; Ph.D., 1957; Professor of Entomology.

BOURQUE, ANDRÉE MARIE (1966); B.Sc., Laval University, 1953; B.Ed., University of New Brunswick, 1961; Assistant Professor of Home Economics.

BOYCE, MARION (1959); B.S., Farmington State Teachers College, 1956; M.Ed., Maine, 1959; Assistant Professor of Education.

BRADBURY, HARRY EDWARD (1958); B.S., Maine, 1954; M.S., Rutgers, 1956; Assistant Professor of Biochemistry, Agricultural Experiment Station.

BRANCH, CHARLES F.; M.D., Vermont, 1923; Lecturer in Medical Technology; Central Maine General Hospital, Lewiston.

BRAUNSTEIN, JERRY (1954); B.S., College of City of New York, 1942; M.A., Wesleyan University, 1947; Ph.D., Northwestern University, 1951; Professor of Chemistry.

BRICKER, HERSCHEL LEONARD (1928); A.B., Coe, 1928; Professor of Speech.

BRIMMER, HARVEY HARTER, II (1963); A.B., University of Missouri, 1948; Assistant Professor of Philosophy.

BRIMMER, JACQUELINE DELOBEL (1964); Licence d'Anglais (licence d'enseignement), Université de Lille, France, 1935; Diplôme d'études supérieures, 1937; Instructor in French.

BROCKWAY, PHILIP JUDD (1935); B.A., Maine, 1931; M.A., 1940; Director of Placement.

BROMFIELD, SAMUEL (1965); B.A., City College of New York, 1957; M.A., Atlanta University, 1961; Assistant Professor of Sociology, University of Maine in Portland.

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, ELLA CORINNE (1962); B.S., University of Missouri, 1949; M.A., Montana State University, 1961; Associate Professor of Physical Education, Women's Division.

BROWN, LEROY C. (1960); B.S., Maine, 1941; Area Poultry Specialist, Cooperative Extension Service.

BROWN, WILLIAM ALLEN (1960); B.A., Bowdoin, 1954; M.A., Maine, 1959; Assistant Professor of Mathematics, University of Maine in Portland.

BROWNSTEIN, KENNETH ROBERT (1965); B.S., Rensselaer Polytechnic Institute, 1957; Ph.D., 1966; Assistant Professor of Physics.

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.

BRUSH, EDWARD NEWCOMB (1928); A.B., Vermont, 1925; A.M., Harvard, 1926; Ph.D., 1932; Professor of Psychology.

BRUSH, LILLIAN HATFIELD; B.A., Lake Forest College, 1923; M.A., University of Illinois, 1924; Ph.D., Cornell University, 1928; Lecturer in Psychology.

BRYANT, MARSHALL F.; Mus.B., Cincinnati Conservatory, 1926; Part-time Lecturer in Music, University of Maine in Portland.

BUCK, CHARLES ELON (1951); B.S., North Dakota State College, 1942; M.S., 1947; Ph.D., Ohio State University, 1951; Associate Professor of Bacteriology.

BURKE, L. MORRILL, JR. (1959); A.B., Bowdoin, 1949; M.A., University of Washington, 1951; Assistant Professor of English, University of Maine in Portland.

BURNHAM, JOHN PEREZ (1963); B.A., Maine, 1957; A.M., Clark University, 1958; M.S., Simmons College, 1963; Reference Librarian-Archivist, Raymond H. Fogler Library.

BUTTERFIELD, JOHN EVERETT (1955); B.S., Maine, 1953; Associate Professor of Physical Education, Assistant Coach of Football and Head Coach of Baseball.

BUTTON, LLOYD H., JR. (1954); B.S., Vermont, 1953; M.S., 1954; Area Dairy Specialist, Cooperative Extension Service.

CALLAHAN, JOSEPH J. (1965); Major, Corps of Engineers, United States Army; B.S., Allegheny College, 1950; Assistant Professor of Military Science.

CAMERON, DAWN L. (1966); B.S., Farmington State College, 1955; M.Ed., Maine, 1961; Instructor in Home Economics.

*CAMPANA, RICHARD JOHN (1958); B.S., University of Idaho, 1943; M.F., Yale, 1947; Ph.D., 1952; Professor of Botany and Head, Department of Botany and Plant Pathology.

CAMPBELL, HELEN DARE (1966); B.S., Berea College, 1964; M.S., Wisconsin, 1966; Assistant Professor of Textiles and Clothing, School of Home Economics.

CANTY, JOSEPH PATRICK (1959); B.S., United States Naval Academy, 1929; M.A., Maine, 1962; Assistant Professor of Mathematics, University of Maine in Portland.

CARLSON, CONSTANCE HEDIN (1962); A.B., Vassar, 1937; M.A., Maine, 1945; Assistant Professor of English.

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, 1943; Ph.D., 1954; Associate Professor of Physics.

CARROLL, BETTY ANN DENISEVICH (1964); B.S., Boston College School of Nursing, 1959; Instructor in Nursing.

CASSIDY, MARGARET EILEEN (1937); Diploma, Sargent School for 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.

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COFFIN, VICTOR HALFORD (1943); B.A., Maine, 1931; M.S., 1948; Associate Professor of Physics.

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COOK, ARLIN MILLER (1930-34) (1959); A.B., Western Reserve, 1927; M.A., Columbia, 1928; Associate Professor of Speech.

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CROSBY, GEORGE HOWARD (1955); B.A., Colby, 1936; Registrar.

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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.

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DODGE, CLAYTON WILLARD (1956); B.A., Maine, 1956; M.A., 1959; Assistant Professor of Mathematics.

DOLLARD, JOAN LINDA (1965); A.B., University of Michigan, 1960; A.M., 1963; Instructor in French (in Augusta).

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DONNINI, MARY WRIGHT (1955); B.S., Maine, 1938; Extension Agent (Cumberland County), Cooperative Extension Service.

DOTY, CHARLES STEWART (1964); B.A., Washburn Municipal University, 1950; M.A., University of Kansas, 1955; Ph.D., Ohio State University, 1964; Assistant Professor of History.

DOUGLASS, IRWIN BRUCE (1940); B.S., Monmouth College, 1926; Ph.D., Kansas, 1932; Sc.D., Monmouth College, 1958; Professor of Chemistry.

DOW, EDWARD FRENCH (1929); B.S., Bowdoin, 1925; A.M., Harvard, 1926; Ph.D., 1932; Professor of Government.

DOW, GEORGE FARRINGTON (1927); B.S., Maine, 1927; M.S., 1929; Ph.D., Cornell University, 1938; Director, Agricultural Experiment Station.

DOWE, PAUL JONES (1948); B.S., Maine, 1948; Extension Agent (Androscoggin-Sagadahoc Counties), Cooperative Extension Service.

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DUCLOS, ALBERT JOSEPH (1965); B.S. in Ed., Maine, 1963; M.A., 1965; Instructor in English, University of Maine in Portland.

DUCLOS, GLORIA LIVERMORE; A.B., Radcliffe, 1949; M.A., 1963; A.B., Oxford University, 1951; M.A., 1955; Lecturer in Classics, University of Maine in Portland.

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DUNLOP, JOHN WILSON (1962); B.A., Auburn University, 1960; General Manager, Educational Television Network.

DUNNING, CLEMENT STEVENS (1947); B.S., Maine, 1947; Extension Agent (Cumberland County), Cooperative Extension Service.

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DURST, RICHARD EDWARD (1949); B.S., Otterbein College, Westerville, Ohio, 1929; Ph.D., Ohio State, 1948; P.E. (Ohio, Maine); Professor of Chemical Engineering.

DUVAL, MARJORIE ANN (1962); B.Mus., New England Conservatory of Music, 1945; M.S., Simmons College, 1962; Librarian, University of Maine in Portland.

DVORAK, CHARLES F., JR. (1964); B.S., University of Connecticut, 1962; M.S., 1964; Youth Education Specialist, Cooperative Extension Service.

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EDWARDS, HERBERT JOSEPH (1947); B.A., Ohio State, 1923; A.M., Princeton, 1927; Ph.D., Ohio State, 1930; Professor of English.

EGGERT, FRANKLIN PAUL (1949); B.S., Cornell University, 1942; M.S., 1947; Ph.D., 1949; Professor of Horticulture; Dean of Graduate School; Director of Research.

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HALL, BRADFORD ALLYN (1962); B.A., Maine, 1955; M.Sc., Brown University, 1959; Assistant Professor of Geology.

HALL, DOUGLAS AREY (1965); B.A., Maine, 1959; Instructor in German.

HALL, MILLARD WAYNE (1966); B.E., Vanderbilt University, 1962; M.S., University of Illinois, 1963; Assistant Professor of Civil Engineering.

HALL, OWEN C. (1961); B.S., Portland University, 1956; C.P.A., Maine Society of Public Accountants; Assistant Professor of Business and Economics, University of Maine in Portland.

HALPERIN, DAVID JACOB (1966); B.S., Illinois Institute of Technology, 1949; M.S., Columbia University, 1950; J.D., Chicago-Kent College of Law, 1958; Associate Professor of Law, School of Law, Portland.

HAMILTON, BROOKS WITHAM (1952); A.B., Bates, 1941; Associate Professor and Head, Department 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; P.E. (Ohio), (Maine); Associate Professor of Civil Engineering.

HAMM, PHILLIP LORD (1952); B.S. in Ed., Maine, 1943; M.A., 1955; Associate Professor of Mathematics.

HAMMER, MAX; B.S., City College of New York, 1956; Ph.D., University of North Dakota, 1961; Lecturer in Psychology, part-time.

* HANKINS, JOHN ERSKINE (1956); B.A., University of South Carolina, 1924; M.A., 1925; Ph.D., Yale University, 1929; Professor of English.

HANNULA, THOMAS ANDREW (1966); B.S., University of Illinois, 1962; M.A., 1964; Assistant Professor of Mathematics.

HANSEN, EDWIN RUSSELL (1964); B.S., Tufts College, 1936; M.A., University of Denver, 1947; Ph.D., Cornell University, 1952; Associate Professor of Speech, University of Maine in Portland.

HARE, CLAYTON FREDERIC (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

HARMON, GERALD STEARNS (1953-56) (1962); B.A., Maine, 1953; M.S., 1956; Ph.D., Agricultural and Mechanical College of Texas, 1962; Assistant 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.

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., 1959; Associate Professor of Poultry Science.

HART, JOHN ROBERT; B.S., Notre Dame University, 1958; Part-time Instructor in Chemical Engineering (Technical Institute Program).

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.

HASBROUCK, SHERMAN ST. CLAIR (1966); B.A., Yale, 1950; M.P.A., The Maxwell School, Syracuse University, 1951; Master of Urban Studies, Yale, 1965; Director, Urban Renewal Technical Advisory Service, Cooperative Extension Service.

HASKELL, STUART PHELPS, JR. (1957-65) (1966); B.A., Maine, 1956; Business Manager of Intercollegiate Athletics.

HASLER, PIERCE BARNARD (1966); B.S., Washington University, 1963; J.D., 1965; Associate Professor of Law, School of Law, Portland.

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.

HAYES, KENNETH PHILBRICK (1965); B.A., Maine, 1960; M.A., Yale, 1963; Assistant Professor of Government.

HEADLEY, HERROLD EUGENE (1963); B.S., in Ed., Ohio State University, 1942; M.M., Indiana University, 1947; Ph.D., North Texas State College, 1959; Adelbert W. Sprague Professor of Music and Head, Department of Music.

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* On leave of absence, 1966-67.

HEIDORN, ROBERT DON (1963); B.A., Lawrence College, 1959; M.A. University of Illinois, 1960; Ph.D., 1963; Assistant Professor of Government.

HEILSBERG, CARL EDWARD; B.S., The American University 1943; M.Ed., Maine, 1952; Coordinator of Civilian Defense Project, University of Maine Extension Service.

HENDERSON, HERBERT JAMES, JR. (1963); A.B., Boston University, 1950; M.A., Columbia University, 1957; Ph.D., 1962; Associate Professor of History.

HENDERSON, JEROME DISQUE (1965); B.A., Hartwick College, 1962; M.A., Temple University, 1964; Instructor in Speech.

HEPLER, PAUL RAYMOND (1956); B.S. Michigan State College, 1948; M.S., University of Illinois, 1950; Ph.D., 1956; Associate Professor of Horticulture,

HERLAN, JAMES JOHN (1966); A.B., Yale, 1957; Instructor in French.

HERNANDEZ, ADELE BETANCOURT, Part-time Instructor in Spanish, University of Maine in Portland.

HIGHLANDS, MATTHEW EDWARD (1935-1946) (1947); B.A., Maine, 1928; S.M., Massachusetts Institute of Technology, 1934; Ph.D., University of Massachusetts, 1951; Professor and Head, Department 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 Assistant in Chemistry.

HILL, RICHARD CONRAD (1946); B.S., Syracuse, 1941; P.E. (Maine); Professor of Mechanical Engineering; Director, Technology Honors Program; Associate Director, Department of Industrial Cooperation.

HILTON, DONALD BERTRAM (1958); A.B., Boston University, 1955; M.S., Northeastern University, 1958; Instructor in Chemistry.

HOBBS, HARVILLE ELSTON (1966); B.A., Maine, 1962; M.A., 1964; Instructor in English.

HOBBS, SHIRLEY B. (1950); B.S., Farmington State Teachers College, 1929; Extension Agent (York County), Cooperative Extension Service.

HODKINS, LAURENCE WHITNEY (1954); B.S., Maine, 1950; Extension Agent (Kennebec County), Cooperative Extension Service.

HOFFMAN, JUDITH ANN (1965); B.A., Colby, 1961; M.A., Maine, 1965; Instructor in English.

HOGAN, JEANNE LEFEVRE; B.A., Douglass College, Rutgers University, 1944; Reference Librarian (part-time), Raymond H. Fogler Library.

HOGAN, JOHN M. (1961); B.Sc., Rutgers, 1941; Ph.D., 1949; Professor of Food Science, Agricultural Experiment Station.

HOLMES, EDWARD MORRIS (1956); A.B., Dartmouth, 1933; M Ed., Maine, 1954; A.M., Brown, 1956; Ph.D., 1962; Associate Professor of English.

HOLMES, JANE M. (1957); B.S., Simmons College, 1929; Head, Periodicals Division, Raymond H. Fogler Library.

HOLMES, THEODORE HENRY; B.A., Princeton, 1952; M.F.A., Iowa University, 1958; Lecturer in English, University of Maine in Portland.

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; Crops Specialist, Cooperative Extension Service.

HOMOLA, RICHARD LOUIS (1966); B.S., Muhlenberg College, 1956; M.S., University of Vermont, 1962; Assistant Professor of Botany.

HOOPER, ROGER BRAY (1964); A.B., Tufts University, 1950; M.A.L.S., Wesleyan University, 1960; M.A., Bowdoin, 1963; Assistant 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.

HOPKINSON, DAVID BRADFORD (1959); B.S., Maine, 1942; M.S., Vermont, 1949; M.E., Maine, 1961; P.E. (Maine); Associate Professor of Engineering Graphics; Assistant Director, Department of Industrial Cooperation, University of Maine in Portland.

HORAN, JAMES FRANCIS (1965); B.A., University of Connecticut, 1958; Assistant Professor of Government.

HOWD, FRANK HAWVER (1959); A.B., University of Rochester 1951; M.S., 1953; Ph.D., Washington State University, 1956; Associate Professor of Geology.

HUFF, EDWARD REMICK (1966); B.S., Maine, 1952; M.S., 1966; Assistant Professor of Agricultural Engineering.

HUFF, LOUISE N. (1958); B.S., Farmington State Teachers College, 1937; Extension Agent (Oxford County), Cooperative Extension Service.

HUNNEWELL, ALICE F. (1956); B.S., Maine, 1953; Extension Agent (Penobscot County), Cooperative Extension Service.

HUNT, HARRY DRAPER III (1965); B.A., Harvard, 1957; M.A., Columbia University, 1960; Assistant Professor of History, University of Maine in Portland.

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.

HUSSEY, NANCY TAYLOR (1965); B.S., Maine, 1964; Extension Agent (Somerset County), Cooperative Extension Service.

HUTCHINSON, FREDERICK EDWARD (1953); B.S., Maine, 1953; M.S., 1958; Associate Professor of Soils; Acting Head, Plant and Soil Sciences, 1966-67.

‡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; Instructor in Food Science, Agricultural Experiment Station.

IVES, EDWARD DAWSON (1955); A.B., Hamilton College, 1949; M.A., Columbia, 1950; Ph.D., Indiana University, 1962; Associate Professor of English.

JACKSON, GEORGE STUYVESANT (1958); A.B., Bowdoin, 1927; M.A., Harvard, 1931; Associate Professor of English, University of Maine in Portland.

JACOBS, RICHARD MORRIS (1963); B.A., Colorado State College, 1956; M.A., 1957; M.F.A., State University of Iowa, 1959; Ph.D., 1964; Assistant Professor of Music.

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* On leave of absence, 1966-67.

‡ On leave of absence, August 1, 1966-January 31, 1967.

JAEGER, GILBERT BEYER (1948); B.S., Cornell University, 1942; Area Poultry Specialist, Cooperative Extension Service.

JAGOLINZER, PHILIP (1966); B.A., Clark University, 1958; M.S., University of Rhode Island, 1960; Assistant Professor of Accounting, University of Maine in Portland.

JAQUES, JOHN FREDERICK (1957); A.B., Bowdoin, 1943; A.M., Columbia 1946; Assistant Professor of English, University of Maine in Portland.

JARDINE, AUTICE (1965); B.S., Maine, 1952; M.Ed., 1957; Assistant Professor of Education.

JEFFREY, WILLIAM HARTLEY (1946); A.B., Drew 1942; M.A., University of Michigan, 1944; Ph.D., University of Colorado, 1950; Professor and Head, Department of History.

JENSEN, CAROL NICOLINE (1965); B.A., Wartburg College, 1962; M.A., University of Nebraska, 1965; Instructor in Mathematics.

JEWELL, THOMAS ROBERT; B.S., Maine, 1962; Part-time Instructor in Botany.

JEWETT, LLOYD JAY (1956); B.S., Maine, 1956, M.S., 1959; Assistant Director, Continuing Education Division (Augusta).

JOHNSON, ARTHUR LLOYD; B.A., Kenyon College, 1955; M.A., Maine, 1966; Part-time Instructor in History.

JOHNSON, LAWRENCE, JR. (1964); Lieutenant Colonel, Artillery, United States Army; BGE, Municipal University of Omaha (Nebraska), 1963; Associate Professor of Military Science.

JOHNSON, RICHARD ANDREW (1963); B.S., Maine, 1954; M.S., 1960; Extension Agent (Piscataquis County), Cooperative Extension Service.

JOHNSTON, EDWARD FRANKLIN (1954); B.S., Maine, 1953; M.S., Pennsylvania State University, 1955; Associate Professor of Agricultural Business and Economics, Agricultural Experiment Station; Maine Potato Handling Research Center, Presque Isle.

JOHNSTONE, JOHN RODGER (1966); B.S.M.E., University of New Hampshire, 1957; Part-time Instructor in Chemical Engineering (Technical Institute Program).

JONES, BRYANT P. (1966); B.A., Maine, 1964; Director of Public Information and Central Services, University of Maine in Portland.

JONES, NELSON, BISHOP (1953); Ph.B., Brown, 1928; Director, Memorial Union.

JONES, RICHARD HARDY (1965); B.S., New Hampshire, 1948; M.A., 1954; Docteur de l'Universite de Strasbourg (France), 1953; Assistant Professor of Government, University of Maine in Portland.

JORDAN, BARBARA JEAN (1965); B.S., Colorado State University, 1964; Instructor in Physical Education, Women's Division.

JORDAN, WESLEY DINGLEY (1965); B.S., in Ed., Maine, 1963; Instructor in Physical Education and Head Athletic Trainer.

KANDUTSCH, ANDREW AUGUST; B.A., Ripon College, 1950; M.S., University of Wisconsin, 1952; Ph.D., 1954; Lecturer in Zoology.

KAPLAN, ARTHUR MARK (1958); B.A., Maine, 1949; M.A., Boston University, 1950; Ph.D., Cornell University, 1956; Professor and Head, Department of Psychology.

KEARNEY, HAROLD MORTON (1965); A.B., Colby, 1947; M.Ed., Boston University, 1959; Ed.D., 1962; Youth Education Specialist, Cooperative Extension Service.

KEENE, JAMES THURSTON (1960); B.S., Maine, 1960; Instructor in Engineering Graphics.

KEM, MARGARET ALICE (1966); B.A., University of Montana, 1964; M.A., 1966; Instructor in Mathematics.

† KENDALL, PHILIP WESLEY (1962); B.A., DePauw University, 1957; A.M., Boston University, 1960; Assistant Professor of History, University of Maine in Portland.

KENDER, WALTER JOHN (1962); B.S., Delaware Valley College, 1957; M.S., Rutgers, 1959; Ph.D., 1962; Associate Professor of Horticulture.

KERN, ABRAHAM K. (1959); A.B. Bowdoin, 1936; M.Ed., Maine, 1956; Associate Professor of Botany and Zoology, University of Maine in Portland.

KESHAVAN, KRISHNASWAMIENGAR (1963); B.S., University of Mysore (India), 1950; B.S., 1955; M.S., University of Iowa, 1960; Ph.D., Cornell University, 1963; Associate Professor of Civil Engineering.

KEYO, HOWARD ARTHUR (1946); B.S., Boston University, 1931; Director of Department of Public Information and Central Services.

KIMBALL, SPOFFORD HARRIS (1936); B.S., Denison, 1923; M.A., Pittsburgh, 1925; A.M., Harvard, 1929; Ph.D., 1932; Professor of Mathematics and Head, Department of Mathematics and Astronomy.

KITTRIDGE, CHARLES W. (1955); B.S., Maine, 1949; Agricultural Engineer, Cooperative Extension Service.

KLAVUHN, JOHN GUSTAVE (1964); B.S., University of Cincinnati, 1959; Instructor in Mechanical Engineering.

KLEINDIEST, VIOLA KATHRYN (1963); B.A., Denison University, 1942; B.S., Cornell University, 1949; M.A., New York University, 1950; Ed.D., 1957; Professor of Physical Education and Head of Women's Division, Department of Physcial Education and Athletics.

KLINGE, ALBERT FREDERICK (1965); B.S., Purdue University, 1952; M.S., 1955; Ph.D., University of California, 1965; Associate Professor of Agricultural Engineering.

KOEHN, DONALD ROBERT (1966); B.A., University of Illinois, 1952; M.A., University of Chicago, 1961; M.A., University of Illinois, 1966; Instructor in Philosophy.

KONTIO, RAE CLARK (1961); B.S., Maine, 1958; Extension Agent (Kennebec County), Cooperative Extension Service.

KROFTA, RAYMOND NORBERT (1966); B.S., University of Wisconsin, 1958; M.S., 1961; Ph.D., 1962; Associate Professor of Agricultural Business and 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; Assistant Professor of Psychology.

LADD, DORIS (1954); B.S., Maine, 1925; Extension Agent (Kennebec County), Cooperative Extension Service.

LAKE, SUSAN GLIDDEN (1965); B.S., University of Massachusetts, 1932; M.S., Cornell University, 1952; Home Management Specialist, Cooperative Extension Service.

LAMB, VIRGINIA S. (1958); B.S., Maine, 1928; Extension Agent (Cumberland County), Cooperative Extension Service.

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† On leave of absence, fall semester 1966-67.

LANE, JOHN MAURICE (1966); B.S., Maine, 1950; Rural Civil Defense Specialist, Cooperative Extension Service.

LARSEN, REBECCA CHESTER (1966); A.B., Colby, 1933; M.A., Western Reserve University, 1934; Registrar, University of Maine in Portland.

LAWRENCE, HAROLD MERRILL (1946); B.S., Boston University, 1940; Bursar, University of Maine in Portland.

LEACH, ROGER STANFORD (1963); B.S., Maine, 1952; M.S., Pennsylvania State University, 1954; Ph.D., 1956; Field Program Coordinator, Cooperative Extension Service.

LEMELIN, ROBERT ERNEST (1965); B.S., Southern Connecticut State College, 1959; M.A., University of Maryland, 1963; Instructor in English.

LEONARD, HERBERT ARTHUR (1939); B.S., Maine, 1939; M.S., Cornell University, 1950; Professor of Animal Sciences and Farm Manager.

LEPELLEY, EDITH (1965); Baccauaureat, Lycee de Jeunes Filles de Chartres (France), 1950; Licence es Lettres, University of Rennes (France), 1956; Assistant Professor of French, University of Maine in Portland.

LEWIS, JAMES (1959); B.S., Bowdoin College, 1915; Lecturer in Astronomy, University of Maine in Portland.

LEWIS, MICHAEL HOWARD (1966); B.S., State University College, New Paltz, New York, 1963; M.A., Michigan State University, 1964; Instructor in Art.

LEWISOHN, JAMES ELIAS (1965); A.B., Brandeis University, 1956; M.H.L., Jewish Theological Seminary, 1959; Instructor in English, University of Maine in Portland.

LIBBEY, WALDO MCCLURE (1944); B.S., Maine, 1943; S.M., Massachusetts Institute of Technology, 1951; 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; Dean of Agriculture; Dean, College of Life Sciences and Agriculture, and Professor of Agronomy; Director, Cooperative Extension Service; Director, University of Maine Extension Service.

LINDLOF, JOHN ALAN (1962); B.A., Yale, 1947; M.Ed., Temple University, 1953; M.Ed., 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, RONALD GEORGE (1965); A.B., Colby, 1960; M.S., University of Massachusetts, 1963; Instructor in Physics.

LIVESEY, WILLIAM (1966); B.S., Maine, 1962; Instructor in Physical Education, Head Coach of Soccer and Freshman Baseball Coach.

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; Assistant Professor of Education.

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; Documents Librarian (part-time), 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; Professor of Education, University Librarian.

*MacLauchlin, Robert Kerwin (1959); B.A., University of Massachusetts, 1954; M.Ed., Bridgewater State College, 1958; M.S., (Radio and Television), Syracuse University, 1959; Assistant Professor of Speech; Director of Programming, Maine Educational Television Network.

MacLean, Jean (1958); B.S., Boston University, 1930; B.N., Yale University School of Nursing, 1933; M.S., University of Chicago, 1948; M.A. (hon.), Yale University, 1954; Professor of Nursing and Director, School of Nursing.

McCall, Joseph Brian (1958); B.S. in Ed., Dayton University, 1949; M.A., Ohio State University, 1951; Associate Professor of Physical Education, Varsity Basketball Coach and Coach of Tennis.

McClure, Melvin Theodore (1965); B.A., Maine, 1957; M.S., University of Illinois, 1960; Assistant Professor of Business and Economics.

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.

McGuire, Francis Stephen (1946); B.S., Maine, 1931; Director of Physical Plant.

McIntyre, Gary Allen (1963); B.S., Oregon State College, 1960; Ph.D., 1964; Assistant Professor of Plant Pathology.

McKay, Edgar Burnham (1947); B.S., Colby, 1930; M.Ed., Maine, 1951; Associate Professor of Modern Society, Department of Sociology and Anthropology.

McKeil, Richard Lloyd (1965); B.A., Maine, 1959; M.S., 1965; Instructor in Business and Economics, University of Maine in Portland.

McNeary, Matthew (1937); B.S., Pennsylvania State, 1932; M.S., Maine, 1941; P.E. (Maine); Professor and Head of Department of Engineering Graphics.

Mainville, Waldeck Ernest, Jr. (1965); B.S., Maine, 1960; A.M., Bowdoin, 1964; Sp.Ed., Bowling Green State University, 1965; Assistant Professor of Mathematics, University of Maine in Portland.

Major, Charles Walter (1959); A.B., Dartmouth, 1948; M.S., University of Tennessee, 1954; Ph.D., 1957; Associate Professor of Zoology.

Major, Mary H.; A.B., North Georgia College, 1947; M.S., University of Tennessee, 1950; Part-time Instructor in Zoology.

Manlove, George Kendall (1950); A.B., Oberlin, 1936; M.A., 1946; Ph.D., Duke University, 1960; Associate Professor of English.

*Manzer, Franklin Edward (1958); B.S., Maine, 1955; Ph.D., Iowa State College, 1958; Professor of Plant Pathology, Agricultural Experiment Station.

Martin, Frederic Thurman (1934); Ch.E., Lehigh, 1925; Ph.D., Johns Hopkins, 1929; P.E. (Maine); Professor of Chemistry.

Martin, Thomas Andrew (1965); B.S. in Ed., Maine, 1963; Instructor in Physical Education, University of Maine in Portland.

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MATSUSAKI, HIROFUMI (1965); B.A., University of Tokyo, 1955; M.B.A., Michigan State University, 1961; Assistant Professor of Business and Economics, University of Maine in Portland.

MAWHINNEY, EUGENE ALBERTO (1948-49) (1959); B.S., Maine, 1947; M.A., 1949; Ph.D., University of Illinois, 1955; Professor of Political Science and Acting Head, Department of Political Science.

MENDALL, HOWARD LEWIS (1937); B.A., Maine, 1931; M.A., 1934; Professor of Game Management; Leader, Cooperative Wildlife Research Unit.

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; Instructor in Mathematics.

MERRY, EDWIN DONALD (1965); B.A., Colby, 1929; M.A., Trinity College, 1959; Instructor in English.

MESERVEY, RUTH (1945); B.A., 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; Assistant Professor of Mathematics.

METCALF, HENRY BEMIS (1964); B.S., Maine, 1956; M.S., Northeastern, 1964; Assistant Professor of Engineering Graphics.

METZGER, HOMER BASTIAN (1950); B.S., Pennsylvania State College, 1939; M.S., 1948; Ph.D., 1950; Professor and Head, Department of Agricultural Business and 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.

MICKEWICH, THOMAS; B.A., Maine, 1964; Part-time Instructor in Mathematics.

MILES, EDWIN KENNETH (1933); B.A., Lawrence, 1929; M.A., Northwestern, 1930; Ph.D., University of Pennsylvania, 1933; Professor of German.

MILES, KATHERINE ADELE (1946); B.A., Ohio State, 1925; B.S. in Education, 1925; M.A., 1927; Ph.D., University of Minnesota, 1945; Professor of Child Development.

MILNE, CHARLES MAITLAND (1966); B.S., University of Massachusetts, 1952; M.S., Purdue University, 1954; Associate Professor of Civil Engineering.

MINGER, RALPH ELDIN (1965); A.B., University of Southern California, 1949; Ph.D., 1958; Associate Professor of History.

MINKIN, CEDRIC (1966); B.A., Maine, 1962; Temporary Instructor in Animal Sciences.

MIXER, WILLIAM L. (1966); B.S., Portland State College (Oregon), 1944; M.A., Arizona State University, 1966; Instructor in Mathematics.

MONTVILLE, FRANCIS ELI (1961); B.S., University of Rhode Island, 1954; M.S., 1957; Extension Economist (Resource Development), Cooperative Extension Service.

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.

MOSER, THOMAS F. (1966); B.S., State University of New York, 1960; M.A., University of Michigan, 1962; Ph.D., 1965; Assistant Professor of English.

MOSHER, PAUL N. (1949); B.S., Maine, 1941; Potato Specialist, Cooperative Extension Service.

MOSKOWITZ, GORDON DAVID (1965); B.M.E., City College of New York, 1960; M.S.E., Princeton University, 1962; M.A., 1963; Ph.D., 1964; Associate Professor of Mechanical Engineering.

MOSS, GORDON ERVIN (1966); B.S., Brigham Young University, 1963; Instructor in Sociology.

MUMMÉ, KENNETH IRVING (1963); B.S., Lawrence College, 1954; M.S., Maine, 1966; International Business Machine Lecturer, Department 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.

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; Assistant Professor of Education.

MURPHY, ELIZABETH FLORENCE (1930); B.A., Maine, 1930; M.A., 1934; Associate Professor of Horticulture, Agricultural Experiment Station.

MURPHY, GRATTAN PATRICK (1965); B.S., Rockhurst College, 1957; M.S., St. Louis University, 1962; Assistant Professor of Mathematics.

MURPHY, HUGH JEROME (1950); B.S., Maine, 1948; M.S., 1950; Associate Professor of Agronomy.

MURPHY, KEVIN E. (1966); B.A., University of Wyoming, M.A., 1965; Instructor in Spanish.

MURRAY, FREDERIC WILLIAM (1962); B.A., University of New Mexico, 1959; Assistant Professor of Spanish.

MURRAY, JOSEPH MAGEE (1934); B.A., Maine, 1925; M.A., University of Michigan, 1927; Ph.D., 1929; Professor of Zoology.

MYER, GEORGE HENRY (1965); B.A., University of California (Santa Barbara), 1959; Ph.D., Yale University, 1965; Assistant Professor of Geology.

MYERS, FRANK WILLIAM (1957); B.A., Maine, 1935; M.Ed., 1947; Associate Professor of Education and Assistant Director of the Summer Session.

NADEL, EDWARD PHILIP (1961); B.A., Queens College, 1954; M.A., Northwestern University, 1958; Assistant Professor of Economics.

NAJARIAN, HAIG H. (1966); B.S., University of Massachusetts, 1948; M.A., Boston University, 1949; Ph.D., University of Michigan, 1953; Associate Professor of Biology.

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NEWALL, ROBERT HENRY (1965); A.B., University of Pennsylvania, 1945; A.M., 1948; Instructor in English.

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NICHOLS, JOHN WILSON (1954); B.A., Western Maryland College, 1948; M.A., University of Florida, 1949; Ph.D., 1954; Professor of Psychology.

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NOLDE, JOHN JACOB (1950); B.A., Cornell University, 1941; Ph.D., 1950; Dean, College of Art 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.

NUTTING, ALBERT DEANE (1931-48); (1958); B.S., Maine, 1927; Director, School of Forestry; Head, Department of Forestry, Agricultural Experiment Station.

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OSGOOD, EBEN AVERILL, JR. (1963); B.S., Maine, 1951; M.F., Duke University, 1956; Ph.D., University of Minnesota, 1962; Assistant Professor of Entomology.

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PLUMMER, BERNIE ELLIOTT, JR. (1925); M.S., Maine, 1924; M.S., 1925; Professor of Chemistry, Agricultural Experiment Station.

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ROWAN, MICHAEL EDWARD JOSEPH (1965); B.A., National University of Ireland, 1941; Higher Diploma in Education, 1942; M.S., Yale, 1959; Assistant Professor of Sociology.

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RYAN, CHARLES WILLIAM (1966); B.S., Slippery Rock State College, 1959; M.A., Colgate University, 1961; Ph.D., University of Toledo, 1966; Assistant Professor of Education.

SALDANHA, ESTELITA LONGUINHOS (1966); B.S., University of Nebraska, 1946; M.A., 1947; Ph.D., Cornell University, 1950; Professor of Psychology, University of Maine in Portland.

SANBORN, JANE OBERHOLTZER (1961); A.B., Wilson College, 1942; Ed.M., University of California, 1961; Ed.D., University of California at Los Angeles, 1961; Director of Testing and Counseling, and Assistant Professor of Psychology, University of Maine in Portland.

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SCHRIVER, EDWARD OSWALD; B.S., Gorham State Teachers College, 1954; M.Ed., Maine, 1955; B.D., Andover Newton, 1960; M.A., Maine, 1961; Part-time Instructor in History.

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STEWART, ALICE ROSE (1947); B.A., Maine, 1937; A.M., Radcliffe, 1938; Ph.D., 1946; Professor of History.

STEWART, JOHN EMMONS (1928); B.A., Maine, 1927; M.A., 1928; Professor of Mathematics, Dean of Men.

STILES, WARREN CRYDER (1962); B.S., Rutgers, 1954; M.S., 1955; Ph.D., Pennsylvania State University, 1958; Associate Professor of Pomology; Extension Fruit Specialist, Cooperative Extension Service.

STONE, WILLIAM FRANK (1966); B.A., Maine, 1956; M.A., University of Florida, 1961; Ph.D., 1963; Assistant Professor of Psychology.

STORCH, RICHARD HARRY (1965); B.A., Carleton College, 1959; M.S., University of Illinois, 1961; Ph.D., 1966; Assistant Professor of Entomology.

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† On leave of absence, fall semester 1966-67.

STRATTON, KENNETH G.; B.S., Maine, 1965; Part-time (temporary) Instructor in Plant and Soil Sciences.

*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 Plants and Soils.

STURGEON, RICHARD HOWARD (1962); B.S., Maine, 1960; Assistant Professor of Education, Coach of Basketball and Baseball, University of Maine in Portland.

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; Assistant Professor of Mechanical Engineering.

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SUPPLE, ROBERT VINCENT (1948); Ed.B., State University of New York, 1943; A.M., New York University, 1945; Ph.D., 1951; Professor of Education.

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TALBOT, FRANKLIN (1963); B.A., Maine, 1946; M.S., Columbia University, 1949; Cataloger, Library, University of Maine in Portland.

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TAYLOR, FRANK MELROY (1940); B.S., Lafayette College, 1928; C.E., 1937; M.S., Maine, 1951; P.E. (Maine); Associate Professor of Civil Engineering.

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THOMAS, HARRY S. (1956); B.S., Maine, 1943; M.S., Pennsylvania State, 1951; Associate Professor of Physics.

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THOMSON, ROBERT BRUCE (1947-1950) (1953); A.B., Harvard, 1932; LL.B., 1936; Associate Professor of Government.

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* On leave of absence, 1966-67.

† On leave of absence, fall semester, 1966-67.

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TODD, FRANK HAROLD (1946); B.S., Bowdoin, 1935; M.A., Maine, 1936; Associate Professor of Physics.

TOOLE, BEVERLY; A.B., Rockford College (Illinois), 1949; M.A., University of Illinois, 1951; Part-time Instructor in Mathematics.

TOOLE, JOHN WILLIAM (1959); A.B., Harvard, 1946; M.A., Maine, 1948; M.A., University of Illinois, 1951; Associate Professor of Mathematics.

TOWNSEND, RICHARD LEE (1966); B.A., Maine, 1965; Instructor in English.

TRAFFORD, DAVID WHITE (1947); B.A., Maine, 1939; M.A., Indiana University, 1940; Ph.D., 1947; Professor of History.

TREFETHEN, JOSEPH MUZZY (1938); A.B., Colby, 1931; M.S., University of Illinois, 1932; Ph.D., Wisconsin, 1935; Professor of Geology, University of Maine in Portland.

TREVETT, MOODY FRANCIS (1946); B.S., Massachusetts State, 1929; M.S., 1940; Professor of Agronomy.

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TRIPP, TERRANCE B. (1964); B.S., Maine, 1959; M.S., 1961; Instructor in Chemistry.

TRUBOV, HERMON (1962); B.F.A., Ohio University, 1947; M.A., Columbia University, 1948; Ph.D., Syracuse University, 1956; Associate Professor of Education.

TRYON, PHYLLIS ARLEEN (1965); B.S., Boston University, 1958; M.S.N., Yale, 1962; Assistant Professor of Nursing.

TURNER, WALTER WEEKS (1947); B.S., Massachusetts Institute of Technology, 1947; M.S., 1947; P.E. (Maine); Professor of Electrical Engineering.

VALLEAU, WILLIAM GRAY (1962); B.S., University of Kentucky, 1955; M.S., Rutgers University, 1962; Ph.D., 1963; Associate Professor of Zoology.

VANAMBURG, GEORGE EDWARD (1961); B.S., Portland University, 1956; Director of Student Center, University of Maine in Portland.

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VIGER, NORMAN JOHN (1966); B.S., Maine, 1966; Instructor in Engineering Graphics.

VIRTUE, CHARLES FRANKLIN (1946); B.A., University of Cincinnati, 1925; Ph.D., Yale, 1933; Professor of Philosophy.

VON WAHLDE, PETER HAROLD CAMPION (1966); B.A., Indiana University, 1957; M.A., 1958; Ph.D., 1966; Assistant Professor of History.

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VROOMAN, THEODORE HERBERT (1965); B.A., St. Lawrance University, 1942; M.Ed., 1947; Ed.D., Syracuse University, 1965; Assistant Professor of Education.

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WADLIN, GEORGE KNOWLTON, JR. (1948); B.S., Pennsylvania State, 1948; M.S., Maine, 1953; Ph.D., Carnegie Institute of Technology, 1959; P.E. (Maine); Professor and Head, Department of Civil Engineering.

WADSWORTH, RICHARD C.; A.B., Cornell University, 1926; M.D., University of Rochester School of Medicine and Dentistry, 1931; Lecturer in Medical Technology; Eastern Maine General Hospital, Bangor.

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WALMAN, THOMAS HAROLD (1963); Sergeant First Class, United States Army; Instructor in Military Science.

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WATTS, JAMES THOMPSON (1966); B.S., Pennsylvania State University, 1965; Assistant Professor of Design, School of Home Economics.

WAYMOUTH, CHARITY; B.Sc., University of London, 1936; Ph.D., University of Aberdeen, 1944; Lecturer, Department of Bacteriology.

WEATHERBEE, RITA ROSEIN; B.S., Simmons College, 1952; M.A., Maine, 1954; Part-time Instructor in Zoology.

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WENCE, MILFORD EDWARD (1937); B.A., State University of Iowa, 1933; M.A. 1934; Ph.D., 1937; Professor of English.

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WITTER, JOHN FRANKLIN (1932); B.S., Maryland, 1928; D.V.M., Michigan, 1932; Professor and Head, Department of Animal Pathology.

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WOOTTON, ALBERT GEORGE (1956); B.S., Rutgers, 1931; M.A., Columbia, 1951; Professor of Mathematics.

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WRATTEN, CRAIG CHARLES (1966); B.S., Bethany College, 1960; M.S., University of Wisconsin, 1962; Ph.D., 1965; Assistant Professor of Biochemistry.

WROTH, LAWRENCE KINVIN (1964); B.A., Yale University, 1954; LL.B., Harvard, 1960; Professor of Law, School of Law, Portland.

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YOUNG, EDWIN (1965); B.S. in Ed., Maine, 1940; M.A., 1942; Ph.D., University of Wisconsin, 1950; President.

YOUNG, HAROLD EDLE (1948); B.S., Maine, 1937; M.F., Duke, 1946; Ph.D., 1948; Professor of Forestry.

YOUNG, SUSAN EVELYN (1965); B.S., Maine, 1963; Certified by American Dietetic Association, 1964; Instructor in Institutional Management, School of Home Economics.

YU, LUCIA YA-MING (1963); B.A., Fu Jen University (Peiping, China), 1946; M.A., University of Iowa, 1949; Assistant Professor of Business and Economics.

YU, SHIH-CHENG (1959); B.A., Fu Jen University (Peiping, China), 1945; M.A., University of Iowa, 1949; Ph.D., 1952; Professor of Business and Economics.

ZIEGENBEIN, DON R. (1964); B.S., Babson Institute, 1961; M.B.A., 1962; Assistant Professor of Business and Economics.

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 Women; Professor of Education.

Summary of Student Enrollment

1965-66

	Portland Campus			Orono Campus			Grand
	Men	Women	Total	Men	Women	Total	Total
Graduates	—	—	—	354	79	433	433
Post Baccalaureate Certificates	—	—	—	3	—	3	3
Fifth Year	—	—	—	23	—	23	23
Seniors	40	19	59	668	367	1035	1094
Juniors	63	30	93	629	409	1038	1131
Sophomores	118	79	197	852	534	1386	1583
Freshmen	237	133	370	987	687	1674	2044
Specials	56	26	82	109	98	207	289
Three-Year Nurses	—	—	—	—	42	42	42
School of Law:							
First Year	35	1	36	—	—	—	36
Second Year	16	—	16	—	—	—	16
Third Year	6	—	6	—	—	—	6
Specials	2	—	2	—	—	—	2
Two-Year Courses:							
First Year	85	13	98	177	11	188	286
Second Year	—	—	—	50	—	50	50
Unclassified Degree Candidates	6	15	21	6	19	25	46
Audition	1	—	1	5	2	7	8
	665	316	981	3863	2248	6111	7092
Summer Session	—	—	—	1875	2000	3875	3875*
Grand Total (Omitting duplicates in Summer Session)	665	316	981	5273	3910	9183	10164

*Includes classes held in Portland and other places

Classification by Colleges

Graduates	—	—	—	357	79	436	436
College of Arts and Sciences	223	183	406	1131	1306	2437	2843
College of Bus. Administration	196	14	210	206	19	225	435
College of Educ.	94	111	205	504	635	1139	1344
School of Law	59	1	60	—	—	—	60
College of Life Sci. & Agri.	24	5	29	745	199	944	973
College of Tech.	69	2	71	920	10	930	1001
	665	316	981	3863	2248	6111	7092

Candidates for Degrees

Graduates	—	—	—	354	79	433	433
College of Arts and Sciences	191	169	360	1094	1203	2297	2657
College of Bus. Administration	189	14	203	201	15	216	419
College of Educ.	85	99	184	476	613	1089	1273
School of Law	56	1	57	—	—	—	57
College of Life Sci. & Agri..	22	5	27	724	187	911	938
College of Tech.	62	2	64	817	10	827	891
	605	290	895	3666	2107	5773	6668

Classification by Residence

	Regular Session		Summer Session	Total
	Portland	Orono		
Maine, by counties:				
Androscoggin	58	275	141	474
Aroostook	3	403	197	603
Cumberland	743	635	546	1924
Franklin	1	88	29	118
Hancock	—	193	109	302
Kennebec	7	447	157	611
Knox	2	167	74	243
Lincoln	2	78	48	128
Oxford	8	222	67	297
Penobscot	9	1361	569	1939
Piscataquis	1	116	77	194
Sagadahoc	25	95	44	164
Somerset	1	188	89	278
Waldo	—	144	97	241
Washington	5	112	85	202
York	91	334	137	562
	956	4858	2466	8280
Maine	956	4858	2466	8280
Massachusetts	3	501	81	585
New York	2	184	104	290
New Jersey	—	143	47	190
Connecticut	4	106	25	135
Pennsylvania	1	38	33	72
New Hampshire	1	30	30	61
Vermont	9	34	15	58
Illinois	—	10	35	45
Rhode Island	1	32	11	44
Ohio	—	15	20	35
Virginia	—	13	16	29
Maryland	1	11	10	22
California	—	8	9	17
Michigan	—	2	14	16
Florida	—	7	9	16
District of Columbia	—	5	6	11
Indiana	—	3	8	11
Texas	—	7	4	11
North Carolina	—	3	7	10

Wisconsin	—	6	4	10
Delaware	1	4	4	9
Minnesota	—	5	3	8
West Virginia	—	2	6	8
Tennessee	—	1	6	7
Missouri	—	1	5	6
South Carolina	—	1	4	5
Colorado	—	4	—	4
Iowa	—	—	3	3
Kentucky	—	—	3	3
New Mexico	—	1	2	3
Washington	—	3	—	3
Arizona	—	1	1	2
Georgia	—	—	2	2
Kansas	—	1	1	2
Montana	—	—	2	2
Nebraska	—	—	2	2
Oklahoma	—	2	—	2
Oregon	—	1	1	2
Utah	—	—	2	2
Alabama	—	—	1	1
Arkansas	—	1	—	1
Idaho	—	1	—	1
Louisiana	—	1	—	1
Mississippi	—	—	1	1
Nevada	—	1	—	1
North Dakota	—	1	—	1
Canada	—	16	51	67
India	—	6	2	8
Puerto Rico	—	—	5	5
Pakistan	—	4	—	4
Greece	—	3	—	3
Hawaii	—	—	3	3
Iran	—	3	—	3
Japan	—	2	1	3
Nigeria	—	3	—	3
Haiti	—	2	—	2
Holland	—	1	1	2
Mexico	—	1	1	2
South Rhodesia	—	1	1	2
Taiwan	—	2	—	2
Venezuela	—	1	1	2
Aden	—	1	—	1
Afghanistan	—	—	1	1
Algeria	—	1	—	1
Argentina	—	1	—	1
Belgium	—	1	—	1
Brazil	—	1	—	1
Colombia	—	1	—	1
Costa Rica	—	1	—	1
Ecuador	—	1	—	1
Ethiopia	—	1	—	1
Germany	—	1	—	1
Jordan	1	—	—	1
Korea	1	—	—	1
Norway	—	1	—	1
Santo Domingo	—	—	1	1
Somalia	—	1	—	1
Sweden	—	1	—	1
Thailand	—	—	1	1
Trinidad	—	1	—	1

Turkey	—	1	—	1
Uganda	—	1	—	1
Virgin Islands	—	1	—	1
Zambia	—	1	—	1
	981	6111	3072	10164

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