

The Bulletin *of the University of* **Minnesota**

General Information
for the Year 1929-1930



Vol. XXXII *No. 12* *March 11 1929*

Entered at the post-office in Minneapolis as second-class matter
Minneapolis, Minnesota

Accepted for mailing at special rate of postage provided for in section 1103,
Act of October 3, 1917, authorized July 12, 1918

The Bulletin of the University of Minnesota is issued as often as twice a month during the university year.

The Bulletin comprises—

The reports of the president and of the Board of Regents, the bulletin of general information, the annual announcements of the individual colleges of the University, announcements of special courses of instruction, and reports of university officers.

These bulletins will be sent gratuitously to all persons who apply for them. The applicant should state specifically which bulletin or what information is desired. Address

The REGISTRAR,
University of Minnesota
Minneapolis, Minn.

Research Publications. Containing results of research work. Papers are published as separate monographs numbered in several series, or as individual monographs without series designation.

Current Problems Series. Containing papers of general interest in various lines of work.

Engineering Experiment Station Bulletins and Circulars. Reports concerning the research work of the station and occasional papers of special interest.

School of Mines and Metallurgy Experiment Station Bulletin. Containing results of investigations conducted by the station.

There is no free mailing list of these publications. Exchanges with institutions are arranged by the University Library. Correspondence concerning such exchanges should be addressed to the University Librarian, University of Minnesota, Minneapolis, Minn. The issue and sale of all these publications is under the control of the University of Minnesota Press. Requests for catalogs, for individual copies, or for any other copies not included in institutional exchanges should be addressed to the University of Minnesota Press, University of Minnesota, Minneapolis, Minn.

The LIBRARIAN,
University of Minnesota,
Minneapolis, Minn.

CONTENTS

	Page
Map of the main campus.....	between 4 and 5
Map of the farm campus.....	between 4 and 5
Introductory statement	6
Freshman Week	7
Notice to prospective students.....	8
University calendar	9-11
Organization of the University.....	12
The Board of Regents.....	13
Administrative officers	13
Courses and degrees.....	14-26
University state teacher's certificate.....	21
Degrees	23-24
University Library	24
The Students' Health Service.....	24-26
Military Science and Tactics.....	26
Admission	27-42
General requirements	27
Admission by certificate.....	27
Admission by examination	27
List of entrance subjects.....	28-29
Registration	29
Requirements of the individual colleges.....	29-38
College of Science, Literature, and the Arts.....	29
College of Engineering and Architecture and School of Chemistry	29-30
College of Agriculture, Forestry, and Home Economics....	31
Law School	31-32
Medical School	32-35
School of Nursing.....	34-35
College of Dentistry.....	35-36
School for Dental Hygienists.....	35-36
School of Mines and Metallurgy.....	36
College of Pharmacy	36
School of Chemistry.....	36
College of Education.....	37
School of Business Administration.....	37-38
Adult special students.....	38
Advanced standing	38-39
Accredited schools	39-42
Expenses	43-50
Fees	43-46
Living expenses	46-50
Self-support	48-49
Scholarships, loans, and prizes.....	51-68
Organizations and publications.....	69-72

1929						
JULY						
Su	Mo	Tu	W	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	..	..	..
..
AUGUST						
..	4	5	6	7	8	9
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
..
SEPTEMBER						
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	..	..	..	..	..
..
OCTOBER						
..	6	7	8	9	10	11
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	..	..
..
NOVEMBER						
..	3	4	5	6	7	8
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
..
DECEMBER						
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..
..

1930						
JANUARY						
Su	Mo	Tu	W	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	..
..
FEBRUARY						
..	2	3	4	5	6	7
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	..
..
MARCH						
..	2	3	4	5	6	7
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	..
..
APRIL						
..	6	7	8	9	10	11
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	..	..	..
..
MAY						
..	4	5	6	7	8	9
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
..
JUNE						
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	..	..	..	..	..
..

1930						
JULY						
Su	Mo	Tu	W	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	..	..
..
AUGUST						
..	3	4	5	6	7	8
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..
..
SEPTEMBER						
..	7	8	9	10	11	12
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	..	..	..	..
..
OCTOBER						
..	5	6	7	8	9	10
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	..
..
NOVEMBER						
..	2	3	4	5	6	7
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	..	..	..	..	..	..
..
DECEMBER						
..	7	8	9	10	11	12
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	..	..	..
..

INTRODUCTORY STATEMENT

PURPOSE

The general information bulletin contains such material as will be helpful to the high school graduate or prospective student and his parents. In it is found the necessary information about the entrance requirements, living conditions, fees, university organization, etc.

It is sent out on request, for such help as it may give young men and women who are thinking of coming to the University. It is not designed to urge a college education on any or all who may receive it. It will serve its purpose if it helps in the thoughtful consideration that should be given by parents and high school graduates when they choose a college education from among the many opportunities for further training. It presents a certain type of training which should be considered in relation to other opportunities such as vocational and trade schools of the better kind, normal schools and teachers colleges, junior and private colleges, and extension courses and correspondence schools. The controlling factor in any decision should be the best interests of the individual and his capacity to make successful use of the opportunities offered by the University or by any of the agencies suggested above. The choice is often not an easy one. Perhaps the following suggestions may be helpful.

As the boy or girl approaches the period of responsible manhood or womanhood the kind of training in final preparation for life may often be clearly indicated by the character of the individual's high school work.

The first choice which the student has to make is that between a long period of studies and some immediate employment such as a mechanical trade, buying and selling, clerical work, and many others, perhaps preceded by a shorter period of special study or training.

The wise student will make his decision after an inventory of his own real interests and abilities and will in any case avoid a choice that does not open up to him opportunities to use to the fullest his abilities as they are or as they develop.

Generally speaking, those who like their high school studies and are successful in them are more likely to succeed in college studies. Of those who stand in the lowest one fourth of their high school classes very few are successful in college work. Most of these would do well to consider other types of training for a vocation in which they may be successful. Of those who stand in the highest one fourth of their high school classes about 80 per cent make satisfactory records in college. It is very unfortunate for those young people who have shown their aptitude for studies to be drawn into employment immediately after high school when most of them are capable of preparing for and assuming positions of high responsibility and honor in industrial and social life of state and nation. Given good health and the power of application, those who like their high school studies and stand high in them ought to make every effort to secure college training.

College work is very different from high school work. It deals with a higher order of studies and demands constant advancement to more difficult studies which require intellectual growth and expansion. The college conducts its work with a view to developing initiative, independent judgment, and responsibility in its students for the two reasons that the studies require these qualities and that the students are just becoming men and women and must assume the duties and obligations of men and women.

FRESHMAN WEEK

The University recognizes the need of giving its newly entering students an introduction to their work and to university life which is new and strange to many of them. For this purpose it is requiring freshmen to come to the University for part of the week before classes begin. This Freshman Week is devoted to efforts to help the freshman get a right start.

The period of September 25 to 28, inclusive, will be used by the freshman for the following duties:

- a. Making his living arrangements.
- b. Registration and paying his fees.
- c. Physical examinations.
- d. Psychological tests.
- e. Other tests or examinations which will enable the faculty to place him in the classes for which he is best fitted.
- f. Hearing lectures on such subjects as:
 1. The use of the library
 2. How to study.
- g. Making visits to acquaint himself with the University Library, scientific laboratories, and other points of interest in connection with his choice of studies and future occupations.
- h. Special exercises intended to acquaint him with the peculiar conditions or requirements of the college which he enters.
- i. Musical and social entertainments in the evenings arranged with the co-operation of the Student Council and the various religious bodies.

During the process of registration faculty advisers talk with all students, helping them to make the best selection of studies.

A committee on educational guidance maintains an office for conference with freshmen regarding their general vocational and educational problems.

Administrative officers, faculty, student government councils, upper class students, and organizations for religious work all co-operate to make Freshman Week a period during which the freshmen find themselves and learn how to go about their university work and how to profit by the opportunities for recreation and other activities in addition to their studies.

NOTICE THAT ATTENDANCE FROM SEPTEMBER 25 TO 28, INCLUSIVE, IS A REQUIREMENT.

It is recommended that as many as possible present themselves for registration on Monday, September 23, in order to avoid the inconvenience and delay incident to the congestion on the last day. All who have not completed the psychological and English tests must report on Monday, September 23.

NOTICE TO PROSPECTIVE STUDENTS



1. Credentials should be submitted as soon as possible after the close of the spring term, and in no case later than July 1.

2. Students who do not observe this regulation must expect to undergo the inconvenience of delay in being notified of their status.

3. This may lead to embarrassing results in the event that the candidate in question is not qualified for admission, as the time for removing deficiencies is thereby curtailed.

4. Whenever possible, credentials should be sent in directly by the proper official at the school last attended, and should not be presented in person by the student.

UNIVERSITY CALENDAR

1929-30

Fall Quarter

1929			
September	19	Thursday	Payment of fees closes, except for new students
September	23		Entrance examinations (for removal of entrance deficiencies)
September	23-24		Registration of all new students entering the freshman class
September	23-27		Examinations for removal of conditions Physical examinations
September	24-27		Registration period, ¹ College of Science, Literature, and the Arts, and Education
September	25-28		Freshman Week
September	26-27		Registration days ¹ for all colleges not included above
September	27	Friday	Payment of fees for new students closes
September	30	Monday	Fall quarter classes begin, 8:30 ² a.m. First semester extension classes ³ begin
October	17	Thursday	Senate meeting, 4:30 p.m.
November	6	Wednesday	Mid-quarter grades due
November	11	Monday	Armistice Day; a holiday
November	16	Saturday	Homecoming Day
November	28	Thursday	Thanksgiving Day; a holiday
December	5	Thursday	State Day Convocation
December	16-19		Final examination period
December	19	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	21	Saturday	Fall quarter ends, 5:20 p.m.
December	26	Thursday	Payment of fees closes for all students in residence fall quarter ⁴

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 45.

No student will be allowed to register in the University after one week from the beginning of the quarter excepting in unusual cases wherein special circumstances shall justify the appropriate committee of the college concerned permitting registration at a later date.

² First hour classes begin at 8:15 at University Farm.

³ This date does not refer to correspondence study courses, which may be started at any time during the year.

⁴ New students must pay fees on dates announced for registration.

Winter Quarter

1930			
January	3	Friday	Entrance examinations
January	3-4		Registration days for new students in all colleges
January	6	Monday	Registration closes at 12 m. Saturday
February	1	Saturday	Winter quarter classes begin 8:30 ² a.m.
February	3	Monday	First semester extension classes close
February	11	Tuesday	Second semester extension classes begin
February	11	Tuesday	Mid-quarter grade due
February	12	Wednesday	Lincoln's Birthday; a holiday
February	20	Thursday	Charter Day Convocation
			Senate meeting, 4:30 p.m.
February	22	Saturday	Washington's Birthday; a holiday
March	19-22		Final examination period
March	20	Thursday	Commencement Convocation
			Payment of fees closes for all students in residence winter quarter ¹
March	22	Saturday	Winter quarter ends, 5:20 p.m.

Spring Quarter

March	28	Friday	Entrance examinations
March	28-29		Registration day for new students in all colleges
			Registration closes at 12 m. Saturday
March	31	Monday	Spring quarter classes begin, 8:30 a.m. ²
April	18	Friday	Good Friday, a holiday
May	7	Wednesday	Mid-quarter grade due
May	15	Thursday	Cap and Gown Day Convocation
			Senate meeting, 4:30 p.m.
May	30	Friday	Memorial Day; a holiday
May	31	Saturday	Second semester extension classes close
June	8	Sunday	Baccalaureate service
June	9	Monday	Fifty-eighth annual commencement
June	11-14		Final examination period
June	14	Saturday	Spring quarter closes, 5:20 p.m.

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 45.

No student will be allowed to register in the University after one week from the beginning of the quarter excepting in unusual cases wherein special circumstances shall justify the appropriate committee of the college concerned permitting registration at a later date.

² First hour classes begin at 8:15 at University Farm.

CALENDAR

11

Summer Quarter

June	17-18		Registration, first term
June	19	Thursday	Classes begin, 8:00 a.m.
July	4	Friday	Independence Day; a holiday
July	26	Saturday	Registration and payment of fees for second term closes. First term closes
July	28	Monday	Second term classes begin
August	30	Saturday	Second term closes

Entrance Examinations

Entrance examinations for admission to the various colleges of the University will be conducted for students whose credentials do not meet the requirements.

Candidates wishing to take any of these examinations should notify the examiner in writing not later than September 1, December 1, or March 1.

For further information concerning these examinations see under "Admission by Examination," page 27.

ORGANIZATION OF THE UNIVERSITY

The University is organized in schools, colleges, and divisions as follows:

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

THE COLLEGE OF ENGINEERING AND ARCHITECTURE, including—

THE ENGINEERING EXPERIMENT STATION

THE DEPARTMENT OF AGRICULTURE, including—

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

THE SCHOOLS OF AGRICULTURE, including—

THE CENTRAL SCHOOL, UNIVERSITY FARM

THE NORTHWEST SCHOOL, CROOKSTON

THE WEST CENTRAL SCHOOL, MORRIS

THE NORTH CENTRAL SCHOOL, GRAND RAPIDS

THE AGRICULTURAL EXPERIMENT STATIONS, including—

THE STATE EXPERIMENT STATION, UNIVERSITY FARM

THE NORTHWEST EXPERIMENT STATION, CROOKSTON

THE NORTH CENTRAL EXPERIMENT STATION, GRAND RAPIDS

THE WEST CENTRAL EXPERIMENT STATION, MORRIS

THE NORTHEAST DEMONSTRATION FARM AND EXPERIMENT STATION, DULUTH

THE SOUTHEAST DEMONSTRATION FARM AND EXPERIMENT STATION, WASECA

THE FRUIT BREEDING FARM, ZUMBRA HEIGHTS

THE STATE TREE STATION, OWATONNA

THE FOREST EXPERIMENT STATIONS, ITASCA AND CLOQUET

THE AGRICULTURAL EXTENSION DIVISION

THE SHORT COURSES IN AGRICULTURE

THE LAW SCHOOL

THE MEDICAL SCHOOL, including—

THE SCHOOL OF NURSING

THE COLLEGE OF DENTISTRY, including—

THE SCHOOL FOR DENTAL HYGIENISTS

THE SCHOOL OF MINES AND METALLURGY, including—

MINNESOTA SCHOOL OF MINES AND METALLURGY EXPERIMENT STATION

THE COLLEGE OF PHARMACY

THE SCHOOL OF CHEMISTRY

THE COLLEGE OF EDUCATION, including—

THE UNIVERSITY HIGH SCHOOL

THE GRADUATE SCHOOL

THE SCHOOL OF BUSINESS ADMINISTRATION

THE UNIVERSITY EXTENSION SERVICE, including—

GENERAL EXTENSION DIVISION

AGRICULTURAL EXTENSION DIVISION

THE BOARD OF REGENTS

The Hon. Fred B. Snyder, Minneapolis, President of the Board	- 1928
The Hon. W. J. Mayo, Rochester	- - - - - 1931
The Hon. Bess M. Wilson, Minneapolis	- - - - - 1931
The Hon. George H. Partridge, Minneapolis	- - - - - 1932
The Hon. John G. Williams, Duluth	- - - - - 1933
The Hon. Egil Boeckmann, St. Paul	- - - - - 1933
The Hon. Julius A. Collier, Shakopee	- - - - - 1934
The Hon. Archie D. Wilson, Guthrie	- - - - - 1934
The Hon. J. E. G. Sundberg, Kennedy	- - - - - 1929
The Hon. Samuel E. Lewison, Canby	- - - - - 1933

ADMINISTRATIVE OFFICERS

Lotus Delta Coffman, Ph.D., LL.D., President
 James C. Lawrence, B.A., Assistant to the President
 Rodney M. West, B.A., Registrar
 William T. Middlebrook, B.A., M.C.S., Comptroller
 Frank K. Walter, M.A., M.L.S., Librarian
 Harold S. Diehl, M.A., M.D., Director of the Health Service
 John B. Johnston, Ph.D., Dean of the College of Science, Literature, and the Arts
 Ora Miner Leland, B.S., C.E., Dean of the College of Engineering and Architecture and of the School of Chemistry
 Walter C. Coffey, M.S., Dean and Director of the Department of Agriculture
 Edward M. Freeman, Ph.D., Dean of the College of Agriculture, Forestry, and Home Economics
 Everett Fraser, B.A., LL.B., Dean of the Law School
 Elias Potter Lyon, Ph.D., M.D., Dean of the Medical School
 William F. Lasby, B.S., D.D.S., F.A.C.D., Acting Dean of the College of Dentistry
 William R. Appleby, M.A., Dean of the School of Mines and Metallurgy
 Frederick J. Wulling, Ph.D., LL.M., Dean of the College of Pharmacy
 Melvin E. Haggerty, Ph.D., Dean of the College of Education
 Guy Stanton Ford, Ph.D., Dean of the Graduate School
 Russell A. Stevenson, Ph.D., Dean of the School of Business Administration
 Richard R. Price, M.A., Ed.D., Director of University Extension
 Anne D. Blitz, M.A., Dean of Women
 Edward E. Nicholson, M.A., Dean of Student Affairs
 Ernest B. Pierce, B.A., Field Secretary of the University and Secretary of the General Alumni Association

COURSES AND DEGREES

Brief summarized statements of the courses of study offered by the University of Minnesota, together with the degree to which each leads are listed below.

The University does not issue a complete catalog of courses in one volume but a full outline of each of these courses of study together with descriptions of the subject-matter courses which they include will be found in the announcement of the college or school in which the course of study is offered.

These announcements may be obtained by addressing The Registrar, University of Minnesota, Minneapolis, Minnesota.

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

General course of study leading to the degree of bachelor of arts.—The work is elective under certain limitations intended to secure a proper balance between breadth of foundation and liberal culture on the one hand and specialized training on the other.

Courses in Training for State and Federal Administration.—A five-year course leading to the degree of bachelor of arts at the end of the first four years. Students whose programs satisfy the requirements of the Graduate School may receive the degree of master of arts at the end of the fifth year.

Course in Training for Diplomatic and Consular Service.—A five-year course leading to the degree of bachelor of science at the end of the first four years. At the end of the fifth year students whose programs satisfy the requirements of the Graduate School may receive the degree of master of arts.

Course in Training for Hospital Library Service.—A five-year course including three years in this college, one year in an approved library school, and one year in special training in hospital library service.

Course in Training for Medical Technicians.—A four-year course including the two-year pre-medical course in this college and two years of work in the Medical School.

Course in Preventive Medicine and Public Health.—Students in this college may major in this field.

Course in Training for Social and Civic Work.—A five-year course, during the first four years of which the student secures a broad education with special attention to history, economics, political science, and sociology; the fifth year is devoted to technical subjects with professional training in social work. The degree of bachelor of science is given at the end of four years, and either a special certificate or the degree of master of arts upon the completion of the fifth year.

Course in Military Science and Tactics.—The instruction offered in the Reserve Officers' Training Corps is open to students of this college.

Course in Arts and Music.—A four-year course leading to the degree of bachelor of arts, in which the theoretical and practical work in music is

combined with the study of psychology, modern languages, English, literature, and history. The object is to provide a well-rounded cultural course for those who are preparing for professional work in music.

A four-year course leading to the degree of bachelor of music.

Combined courses in Arts and Medicine.—A seven-year course leading to the degrees of bachelor of science and doctor of medicine, and an eight-year course leading to the degrees of bachelor of arts and doctor of medicine.

Combined course in Arts and Law.—A six-year course leading to the degrees of bachelor of arts and bachelor of laws.

Combined course in Arts and Dentistry.—A seven-year course leading to the degrees of bachelor of arts and doctor of dental surgery.

Combined course in Arts and Nursing.—A five-year course leading to the degree of bachelor of science and a certificate in nursing. The first two years and a summer quarter are spent in the College of Science, Literature, and the Arts. The third and fourth years are spent in hospital work, and the fifth year in both hospital and class work.

Combined course in Arts and Architecture.—A six-year course in Arts and Architecture leading to the degrees of bachelor of science at the end of four years, bachelor of architecture at the end of the fifth year, and the Master's degree in architecture at the end of six years.

Combined course in Arts and Interior Decoration.—A four-year course leading to the degree of bachelor of interior decoration. The third and fourth years are spent in the College of Engineering and Architecture.

Pre-professional training.—In this college is given also the academic work required for admission to the Medical School, the Law School, the College of Dentistry, the School of Business Administration, the College of Education, and various non-professional subjects required in other schools and colleges of the University.

NOTE.—Students who have met the entrance requirements but whose high school record combined with the psychological tests and other information show that they will be unable to carry a regular course, will be permitted to take certain studies of general informational, cultural, or vocational character. Any student who shows sufficient ability in these studies may continue in them or may register as a candidate for a degree. A student in a regular course who does not profit by his opportunities may be transferred to this group until he demonstrates his ability and willingness to do work of an acceptable grade.

COLLEGE OF ENGINEERING AND ARCHITECTURE
AND
SCHOOL OF CHEMISTRY

The College of Engineering and Architecture offers professional four-year courses of study in the following fields:

Aeronautical Engineering	Architecture
Civil Engineering	Architectural Engineering
Electrical Engineering	Landscape Architecture
Mechanical Engineering	Interior Decoration
Agricultural Engineering (in co-operation with the College of Agriculture, Forestry, and Home Economics)	

The School of Chemistry offers professional four-year courses of study in

Chemistry

Chemical Engineering

Each of these courses leads to the Bachelor's degree in the corresponding field (as bachelor of aeronautical engineering or bachelor of chemistry). Optional groups of electives are available in some of the courses for students who desire to devote special attention to certain branches, such as *Engineering Administration*.

The four-year course in Chemistry is designed for those who wish to become professional chemists or teachers of chemistry.

The course in Chemical Engineering leads to the degree of bachelor of chemical engineering at the end of four years and to the Master's degree in chemical engineering at the end of the fifth year, which is taken in the Graduate School. It aims to give the student a broad foundation in chemistry and allied sciences and professional preparation in chemical engineering.

The Engineering Pre-business Course requires the first two years of work in the College of Engineering and Architecture. This is followed by two years in the School of Business Administration upon the completion of which the degree of bachelor of business administration is conferred.

The first two years of the course in *Interior Decoration* are taken in the College of Science, Literature, and the Arts, and the last two years in the College of Engineering and Architecture.

Work is also offered in the Graduate School leading to the Master's degree in the appropriate branch of engineering, architecture, or chemistry, or to the Doctor's degree.

The professional degree of aeronautical, agricultural, architectural, chemical, civil, electrical, or mechanical engineer will be conferred upon those who have received the Bachelor's degree in the corresponding field of engineering when they have completed the equivalent of one additional year's college work in that field, and four years of approved engineering experience in positions of responsibility, and have presented a satisfactory professional thesis. Graduates of this university may be granted permission to pursue the year of graduate study in absentia under the direction of the faculty. It is recommended, however, that this year be spent in residence at this or some other university and that the Master's degree be obtained in this manner. There are many advantages in taking this year of study immediately following graduation from the four-year course, thus making a five-year course leading to the Master's degree. Then after four years of approved experience and the preparation of the thesis, the professional degree may be obtained. This procedure is especially recommended to those students whose undergraduate work is of high grade and who desire additional preparation for the higher positions which require strong character and leadership. Candidates for the professional degrees register in the Graduate School.

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

The College of Agriculture, Forestry, and Home Economics offers four-year courses in Agriculture, Forestry, and Home Economics, leading to the degree of bachelor of science.

The work in Agriculture includes general courses in agriculture, agricultural education, agricultural economics, agricultural engineering, agronomy, farm management, dairy husbandry, dairy products, animal husbandry, and horticulture; also a course in extension work, and special courses in such sciences as agricultural biochemistry, agricultural economics, entomology, plant pathology, dairy husbandry, and soils. A course in agricultural business is also offered in co-operation with the School of Business Administration. An engineering course leading to the degree of bachelor of agricultural engineering is offered in co-operation with the College of Engineering and Architecture. While no special course in fur farming is yet offered, courses basic to this industry and helpful to it are available.

In Forestry are included courses in general forestry, commercial lumbering, forest by-products, and forest sciences. A part of the work is given at the Cloquet Forest Experiment Station and at Itasca State Park, where well-equipped demonstration forests are available for use as laboratories.

The work in Home Economics includes a general course, courses in foods and nutrition, textiles and clothing, and a teachers' course in the general field of home economics; special teachers' courses in textiles and clothing, in foods and home management, and in related arts; a course for dietitians, a course for extension workers, and a course for institutional managers.

Graduate work is offered in special lines of agriculture, forestry, and home economics. For the most part the special problems are correlated with the investigational work of the agricultural experiment station and its branches.

Schools of Agriculture offer three-year courses, giving special training in farm life and home economics, adapted especially to the needs and opportunities of farm boys and farm girls. The Central School is at University Farm, St. Paul; the Northwest School, at Crookston; the West Central School, at Morris; and the North Central School, at Grand Rapids.

Short courses offer opportunity for the study of a great variety of subjects related to agriculture, to industries based on agriculture, to home economics, and to rural life.

Farmers' and Homemakers' Week, in January, offers instruction in regular classes in agriculture and home economics and gives opportunity for conferences of many important agricultural organizations of the state, which hold their annual meetings at University Farm in the course of the week.

Other short courses of the year are an Advanced Creamery Operators' Course of two weeks and an Ice Cream Makers' Course of one week, in November and December; a Creamery Operators' Course of six weeks in January and February; a Boys' and Girls' Short Course of one week in

April; a Horticultural Short Course of three weeks in February; a Bee-keepers' Course of four days in May; an Editors' Short Course of two days in May; a Short Course in Veterinary Medicine in July; and a Short Course in Home Nursing in the fall and early winter.

The Experiment Station provides facilities for investigation of the numerous and varied problems involved in the agricultural industry. The results of these investigations contribute largely to the subject-matter included in the courses of instruction given in the College of Agriculture, Forestry, and Home Economics, in the School of Agriculture, and to that used by the extension specialists in their work among farmers. The experiment station organization also offers some research advantages to students taking advanced work in the Graduate School. The main or Central Station is located at the University Farm, St. Paul, with branch stations at Crookston, Morris, Grand Rapids, Waseca, and Duluth, and forestry experiment stations at Cloquet and Itasca.

The Agricultural Extension Service of the University Department of Agriculture carries to the farmers and homemakers of the state the information made available by the research divisions of the University and the United States Department of Agriculture, and the experience of successful farm practice. This is done through county extension workers, and organized local rural leadership, demonstrations, lectures, institutes, contests, bulletins, farm papers, correspondence, and personal visits.

LAW SCHOOL

The Law School offers a three-year course leading to the degree of bachelor of laws. The so-called "case system" method of teaching law, approved by the leading law schools of the country, is employed. The school unites with the College of Science, Literature, and the Arts in offering a combined six-year course in Arts and Law, leading to the degrees of bachelor of arts and bachelor of laws, in which the first year work in law is counted as the equivalent of a year's work toward the academic degree.

A course leading to the degree of master of laws may be taken under the direction of the Graduate School. Candidates must have completed two years of college work, and the work required for the first law degree in a school which is a member of the Association of American Law Schools.

MEDICAL SCHOOL

The Medical School offers a five-year course, leading to the degree of doctor of medicine. This course comprises two years in the scientific or pre-clinical department of the school, two years chiefly in its practical or clinical departments, and one year in a hospital internship or in advanced laboratory study or research. All students are required to secure the degree of bachelor of science or of bachelor of arts before beginning the second clinical (senior medical) year. To this end the College of Science, Literature, and the Arts and the Medical School unite in offering the following courses of study:

1. A combined course, leading to the degrees of bachelor of science and doctor of medicine, consisting of (a) two years of work in the College of Science, Literature, and the Arts, including certain required subjects (see pages 32-35), (b) four years in the Medical School, and (c) one year of internship or advanced scientific study.

2. A combined course, leading to the degree of bachelor of arts and doctor of medicine, consisting of (a) three years of properly selected work in the College of Science, Literature, and the Arts, including the required subjects noted, and (b) four years in the Medical School, and (c) one year of internship or advanced scientific study.

In both cases the degree of bachelor of medicine is granted at the end of four years' acceptable work in the Medical School and before the one year of required internship.

The degree of bachelor of arts or bachelor of science from other recognized universities or colleges will be accepted as fulfilling the requirement of the bachelor of science degree before the degree of doctor of medicine is granted.

Graduate and research work are offered to qualified students. (See page 21.)

The School of Nursing is conducted in connection with the Medical School. It makes use of the facilities of the University Hospital, the Minneapolis General Hospital, the Miller Hospital, St. Paul, and the Northern Pacific Hospital, St. Paul. It offers a three-year course leading to the degree of graduate in nursing. A combined five-year course in Arts and Nursing is offered by the College of Science, Literature, and the Arts and the School of Nursing, leading to the degrees of bachelor of science and graduate in nursing. The first five quarters are spent in the Arts College, the third and fourth years in hospital work, and the fifth year in both hospital and class work. A similar course in Nursing Education is offered by the College of Education and the School of Nursing.

Graduates of approved three-year schools of nursing who fulfill university admission requirements may become candidates for the degree of bachelor of science in nursing education. Graduate nurses interested in nursing education should consult the director of the School of Nursing.

A Course in Public Health Nursing is conducted in the Medical School under the Department of Preventive Medicine and Public Health with the assistance of the Departments of Education and Psychology, and a number of social service organizations. These, together with the Hennepin County Model Practice Field, provide ample opportunities for field work. (See special circular.) The Public Health Nursing Course is open to graduate nurses.

Courses for medical technicians are offered by the Medical School with the co-operation of the College of Science, Literature, and the Arts.

The Course in Embalming, offered by the General Extension Division with the co-operation of the Medical School, the School of Chemistry, and the State Board of Health, is a twenty-four weeks' course of study, given annually in the winter and spring quarters. On the successful completion

of the work joint examinations are conducted by the State Board of Health and the University. Those who pass are granted a certificate by the University and are also accepted by the board as having passed the examination for an embalmer's license.

Short courses for physicians are offered from time to time by the medical faculty under the administration of the Extension Division.

COLLEGE OF DENTISTRY

The College of Dentistry offers a three-year course of study leading to the degree of doctor of dental surgery. This course requires as a prerequisite the completion of two full years of pre-dental work in the College of Science, Literature, and the Arts.

The School for Dental Hygienists.—This course consists of two years' work in the College of Dentistry, leading to the degree of graduate dental hygienist.

Graduate work is open in certain fields of dentistry to students having a baccalaureate or dental degree. (See page 21.)

Extension courses.—Courses in Crown and Bridge Work, Oral Surgery, Orthodontia, and Prosthetic Dentistry will be conducted by the General Extension Division, for the benefit of dental practitioners. A detailed description of these courses with the dates of opening and closing may be obtained by addressing the General Extension Division.

SCHOOL OF MINES AND METALLURGY

The School of Mines and Metallurgy offers four regular four-year courses, namely, Mining Engineering, Mining Engineering (specializing in geology), Petroleum Engineering, and Metallurgy, leading to the degrees of engineer of mines, engineer of mines (in geology), engineer of mines (in petroleum), and metallurgical engineer, respectively. They are designed to prepare men to enter their profession with a thoro grounding in mathematics, in the sciences, and in the fundamental principles of mining engineering and metallurgy.

COLLEGE OF PHARMACY

The College of Pharmacy offers a four-year course, leading to the degree of bachelor of science in pharmacy. Students not wishing to complete the requirements for a degree, but who wish to prepare themselves for the examinations given by the State Board of Pharmacy, will find the subjects required for such an examination arranged so they may be completed in three years. Such students may become candidates for the B.S. in pharmacy at any time after entrance by completing the equivalent of one full year of college work in the College of Science, Literature, and the Arts, or in a college of similar standing, the year's work to include a minimum of forty-five credits which must include at least nine credits of rhetoric, ten credits of a modern language, and eight credits of physics. The remaining eighteen credits may be electives. Students may elect zoology in place of college physics.

SCHOOL OF CHEMISTRY

(See p. 15 with College of Engineering and Architecture)

COLLEGE OF EDUCATION

The College of Education offers the professional courses for the training of superintendents, principals, supervisors, teachers of academic high school subjects, and teachers of special subjects in the elementary and high schools and teachers of education in teachers colleges. Special two-, four-, and five-year curricula leading to the university teacher's certificate are offered in the following subjects: academic high school subjects, administration and supervision, agricultural education, art education, commercial education, educational and vocational guidance, elementary education, home economics education, natural science, nursery school and kindergarten education, nursing education, occupational therapy, physical education for men, physical education for women, public school music, school health work, school psychologists, social studies, teaching of sub-normal children, industrial education, and visiting teachers.

The university teacher's certificate by state law authorized students to teach in the public schools of Minnesota for two years from date of issue. After that time, upon satisfactory evidence of the student's successful teaching experience, the certificate may be made permanent by the endorsement of the commissioner of education and the president of the University.

GRADUATE SCHOOL

The Graduate School gathers into a single organization and unites for the purpose of administration all the activities of the University in all its schools and colleges in so far as they relate to advanced instruction offered for the second or higher degrees, namely, master of arts, master of science, electrical engineer, mechanical engineer, civil engineer, chemical engineer, and doctor of philosophy. The privileges of this school are in general open to all who have received Bachelor's degrees from reputable colleges and universities, based on courses substantially equivalent to those at this University.

Graduate work in medicine is maintained jointly by the Medical School and the Mayo Foundation for Medical Education and Research (see special bulletin). The degree of bachelor of science (or equivalent) and doctor of medicine and one year of intern service in an acceptable hospital are prerequisite for admission to the clinical departments. Properly qualified college students may be admitted to the medical laboratory departments (Anatomy, Physiology, Bacteriology, Biophysics, Pharmacology, and Pathology) without the medical degree and internship. A number of fellowships and scholarships are provided for selected students undertaking graduate courses in chosen specialties in medicine (see page 52). These courses cover a period of three years and lead to the degree of master of science or of doctor of philosophy in the various fields.

Graduate work in certain problems related to dentistry is offered to qualified students in the fundamental or laboratory departments mentioned

above. Clinical material and opportunities to supplement this research are available from the Dental Clinic, the Medical Dispensary, and the University Hospitals.

SCHOOL OF BUSINESS ADMINISTRATION

The School of Business Administration offers a two-year course leading to the degree of bachelor of business administration. This course requires as a prerequisite the completion of two years of work in the College of Science, Literature, and the Arts in which certain pre-business courses are prescribed.

In addition to the general course in business, several specialized sequences are offered. Among them are courses in Accounting, Advertising, Agricultural Business, Finance, Insurance, Merchandising, Foreign Trade, Personnel Management, Industrial Administration, Real Estate, Traffic and Transportation, Secretarial Work, and Statistics. In each of these a sequence of courses has been arranged which enables the student to obtain the professional training essential for entrance into the specialized field. Instruction is directed toward the broader aspects of the business professions rather than detailed drill in various technical processes. The business courses are combined with a sufficient amount of instruction in other fields to afford a well-rounded university education.

A limited number of positions are available to students in the senior year to supplement the university training. Students selected for these positions are employed by accounting firms, financial institutions, or other business concerns on a full time basis for one term. Employment under these conditions affords an excellent opportunity for laboratory experience. The positions available have been selected by the faculty with special consideration as to the educational value of the work. University credit is allowed for work which has been successfully carried under proper supervision.

Students who have completed the course of study required for the degree of bachelor of business administration at this university or the equivalent degree at any other institution of recognized standing may enroll in the Graduate School and become candidates for the degree of master of science.

UNIVERSITY SUMMER SESSION

The University Summer Session is organized for two terms, one of six weeks and one of five weeks, from June to September, under the authority of the Board of Regents as a regular part of the University. Courses in the College of Science, Literature, and the Arts, Agriculture, Forestry, and Home Economics, Education, Engineering and Architecture, Chemistry, Medicine, Dentistry, Law, and Business Administration, with special attention given to graduate work, are offered. These courses are in the main, regular courses, the same as are offered during the academic year, but wherever necessary, are adapted to meet the needs of students in the Summer Session.

SPECIAL COURSES

In practically all of the colleges, students of mature age and adequate preparation are permitted to pursue, under the direction of the faculty, one or two distinct lines of study.

UNIVERSITY EXTENSION

All extension work of the University of Minnesota has been established as an organic unit of the University under the title of Extension Service. The Extension Service is organized in two divisions, each under its own director, the General Extension Division and the Agricultural Extension Division.

The work of the Agricultural Extension Division is indicated on page 18.

The General Extension Division conducts extension classes and correspondence courses in collegiate, business, and engineering subjects; provides communities with faculty lectures and lyceum courses of popular lectures, concerts, and entertainments; lends lantern slides and films for visual instruction; maintains a Municipal Reference Bureau; holds annual short courses in merchandising, medicine, dentistry, embalming, banking, citizenship, and social service; offers guidance for the development of community organizations; and gives advice to schools and other organizations on the selection and production of plays. Bulletins of extension classes and of correspondence and lecture courses may be had upon request. Address the General Extension Division.

DEGREES

The Board of Regents will confer the degree appropriate to the course pursued under the following conditions:

1. *Curriculum requirements.*—Certification by the registrar of the completion of all requirements of the course of study as outlined in the college announcement, or its equivalent as determined by the faculty of the college offering the course.

2. *Recommendation of the faculty.*

3. *Residence requirement.*—Advanced standing will be allowed on certification from other recognized institutions and may be obtained also by examination held before a committee of the faculty appointed for that purpose provided that the following minimum requirement for residence at the University of Minnesota has been met.

The student must earn at least one year's credit in residence in this University. If the term of residence is only one year, that year must be the senior year; and in any case he must spend two quarters of the senior year in residence. In addition, special residence requirements must be met in several of the schools and colleges. See individual announcements.

4. *Attendance at commencement.*—All candidates for degrees are required to be present at commencement exercises provided that the candidate's work is completed at the end of a quarter when such exercises are held.

A student who fails to attend shall not receive his diploma until the expiration of one year, unless in the meantime he attends commencement

exercises or unless excused from such attendance by the dean of the college and the president of the University.

THE UNIVERSITY LIBRARY

The University Library comprises all the collections of books belonging to the University. It now contains about 550,000 volumes.

The University Library Building contains not only the former general collection but several of the important college and departmental collections formerly housed outside of the General Library.

In addition to the General Library, branches are maintained in the Department of Agriculture, the Colleges of Education, Engineering and Architecture, and the Schools of Chemistry, Law, and Mines and Metallurgy. Small collections of books constantly in use in departmental work are deposited in many important departments of the University.

The service of the University Library to the University is twofold: (1) to supply the books and references used in connection with the courses of instruction, for graduate and faculty research, and for outside cultural reading; and (2) to help students to use them with a minimum of time and effort and a maximum of profit. A course in the use of books and libraries, open to freshmen and sophomores, is conducted for this purpose.

The Division of Library Instruction with a full year of professional training in librarianship has a separate organization but is under the direction of the university librarian and closely affiliated in its work with the University.

The *Library Handbook*, copies of which may be had gratis upon application at the library, contains information essential to the proper use of the library. It should be read carefully by every student.

Registration automatically entitles students to the privileges of the library.

The reference librarian and assistants are at all times ready to aid students in familiarizing themselves with the library and in directing them in the use of the various catalogs and indexes.

THE STUDENTS' HEALTH SERVICE

Through the Students' Health Service the University makes available to any student physical examinations, health consultations, and medical attention. General service is provided free of charge, but for services which are specialized and individual in character, such as dentistry, X-rays, board and laundry in the student hospital, out-patient calls, minor surgery, etc., special fees are charged. No student, however, will be denied service because of inability to pay these fees. Major surgical operations or prolonged medical care ordinarily are secured through private physicians selected by the students or their families, but may be arranged for through the University Hospital upon the established basis for the admission of patients to this hospital.

On the main campus the offices of the Health Service and the Students' Hospital and Dispensary are located in Pillsbury Hall. On the Uni-

versity Farm campus the hospital and dispensary are located in the Health Service Building. The services of the hospital and dispensary are available at all hours of the day and night. Physicians of the Health Service are in attendance daily. The telephone call for the Health Service on the main campus is University of Minnesota (Dinsmore 2760); for the one on the University Farm campus, Nestor 2881.

The facilities of the dispensary, medical and dental, are such that any number of students can be given attention in a day. The normal capacity of the two hospitals is one hundred beds. In emergencies, this capacity can be increased. Ample provisions are made for the isolation of communicable diseases.

The Health Service has been established for the purpose of safeguarding the health of students. Its aims are (1) to help each student entering the University of Minnesota to possess a healthy, vigorous, active, and harmoniously developed body, thereby contributing much to his success while in college and in later life; (2) to reduce to the very minimum the prodigious academic and economic loss due to indisposition and illness of students. Positive health is its goal.

There are four main lines to the activities of the University Health Service: (1) personal attention, (2) dental hygiene, (3) sanitation, and (4) education.

1. *Personal division.*—This division is concerned with the physical examinations of students. A complete record of the physical condition of each student is made and filed. From this record can be determined, in a large measure, what procedure is essential to keep the student in the best physical condition during his academic life. The following are some of the phases of the work in the personal division:

a. Provisions for maintaining the health of normal, physically sound students; co-operation with the Department of Physical Education regarding physical exercise; education along lines of right living; safeguarding of environment.

b. Protection of the physically sound students from communicable diseases that are continually creeping into the University; early detection and isolation of all cases of communicable diseases—tuberculosis, diphtheria, scarlet fever, measles, typhoid fever, smallpox, mumps, etc.

c. Provision for the care and treatment of such cases of communicable diseases; isolation hospital.

d. Treatment and professional care of all students who are ill or in need of medical advice or treatment. For extended care by the Health Service it is necessary that the student enter the students' hospital. To this hospital any student may be admitted upon the recommendation of a staff physician. To all patients in the hospital the staff will furnish medical and nursing services.

e. Reconstruction and reclamation; corrections of defects, advice, and treatment of all subnormals.

2. *Dental hygiene.*—As a part of his entrance physical examination each student is given a complete dental examination by a member of the dental

staff, and advised regarding the condition of his teeth. During the year, students at any time may receive dental consultation and, if they so desire, they may obtain expert dental treatment and care on a cost basis.

3. *Division of sanitation.*—The student's environment should be made as hygienic as possible. Hence, this division concerns itself with the sanitary conditions both on and off the campus.

4. *Education.*—Every student in the University is made familiar with the fundamentals of both personal and public hygiene. Through personal conferences on this subject, daily bulletins, exhibits, public lectures, etc., education in hygiene and right living is conducted.

MILITARY SCIENCE AND TACTICS

REQUIRED WORK

All physically fit male students are required to take instruction in military science for three hours each week during the first two undergraduate years of their courses. Previous instruction in this subject at other institutions under an officer of the regular army detailed as professor of military science and tactics exempts the student from so much of this work as the length of his prior training justifies in each case. All students taking this course are given the instruction prescribed for the Basic Course, Senior Division, Reserve Officers' Training Corps. No credits are allowed for this work.

ELECTIVE WORK

Any student legally eligible for enrolment who has completed the Basic Course Senior Division R.O.T.C., or other military work announced as equivalent thereto, may register for and be enrolled in the Advanced Course, Senior Division, R.O.T.C., provided the professor of military science and tactics and the president of the University, respectively, recommend and approve such enrolment in each case.

Students enrolled in the Advanced Course receive from the government a fixed sum a day as commutation of rations while pursuing this course; they are required to sign an agreement to continue in the course during their time at the University (not to exceed two years), and to attend such summer training camps as are prescribed by the secretary of war, all expenses incident to training camp attendance being borne by the government.

Students who pass successfully the Advanced Course are, upon the recommendation of the president of the University and the professor of military science and tactics, eligible for appointment as reserve officers of the army in the lowest grade of the branch of the service of which they are members.

The Advanced Course embraces five departments: infantry, coast (heavy) artillery, signal corps, medical and dental corps, in any one of which the student may be enrolled.

Three credits per quarter will be allowed for work in the advanced R.O.T.C. courses with a maximum of 18 quarter credits for the two-year course. The application of these credits toward any degree offered by the University is subject to determination by the college concerned.

ADMISSION

GENERAL REQUIREMENTS

Admission to the schools and colleges of the University which accept students directly from the high school is either by certificate or examination. These methods are described below.

ADMISSION BY CERTIFICATE

The applicant must present a certificate of graduation from an accredited preparatory school, or certificates showing that he has passed examinations in high school subjects as given by the Minnesota State Board, or corresponding examinations in another state provided these examinations are recognized by the state university in that state. Certificates representing examinations given by the College Entrance Board or the New York Regents are likewise accepted.

Graduates of senior high schools must present twelve units of work, at least nine of which must be from Groups A, B, C, D, E, (see page 28). These nine units must include a major of three units, and two minors of two units each, or preferably two majors and one minor, of which either one major or one minor must be from Group A. In Groups B and D applicants may present a maximum of one unit of work from grades below the senior high school as fulfilling one of these requirements. This unit, however, may not be counted in the twelve which are required. In addition to these requirements, applicants must fulfill such others as the particular college which they desire to enter may specify. See Requirements of Individual Colleges, pages 29-38.

Graduates of four-year high school courses, and candidates who offer state board or other examination certificates must present evidence to show that they have completed sufficient work in the last three years of their course to satisfy the requirements specified for graduates of senior high schools.

ADMISSION BY EXAMINATION

Applicants for admission to the University who are high school graduates, or who are at least nineteen years of age and are unable to meet the requirements for entrance by certificate will be admitted provisionally and subject to one year of satisfactory work at the University, upon passing the following tests:

- (a) College aptitude test
- (b) Test of proficiency in English
- (c) Such special placement tests as the school or college to which the candidate desires admission, may prescribe.

Applicants failing to pass tests (b) or (c) may apply for a subsequent examination at any scheduled date on payment of a fee of five dollars. Those failing to pass test (a) may enter only upon satisfactorily meeting the entrance requirements by the certificate method.

LIST OF ENTRANCE SUBJECTS

Below is shown the minimum and maximum number of units in any one subject that will be accepted by the various colleges of the University. The term "unit" means not less than five recitations of forty minutes each week for a school year of thirty-six weeks. In manual subjects and kindred courses it means the equivalent of ten recitation periods a week for thirty-six weeks.

Group A: English

Composition and literature one to three units

Group B: Foreign languages

French, one, two, three, or four units

German, one, two, three, or four units

Greek, one, two, three, or four units

Latin, one, two, three, or four units

Scandinavian languages, one two, three, or four units

Spanish, one, two, three, or four units

Requirements for a major in this group, three units in one language; for a minor, two units in one language.

Group C: History and social sciences

History—

American, one-half or one unit

English, one-half or one unit

European, one or two units

Social sciences—

American government, one-half or one unit

Commercial geography, one-half or one unit

Elementary economics, one-half unit

History of commerce, one-half or one unit

Sociology, one-half unit

Requirements for a major in this group include at least two units in history; for a minor, at least one unit in history.

Group D: Mathematics

Elementary algebra, one unit

Plane geometry, one unit

Unified mathematics, two units

Higher algebra, one-half or one unit.

Solid geometry, one-half unit

Trigonometry, one-half unit

Group E: Natural sciences

Astronomy, one-half unit

Biology, one unit

Botany, one-half or one unit

Chemistry, one unit

Geology, one-half unit

Physics, one unit

Physiology, one-half unit

Zoology, one-half or one unit

For a major or minor in this group not more than two half-unit courses may be included.

Group F: Vocational and miscellaneous subjects

The three units which are not required to be in Groups A, B, C, D, E, may be in work which the superintendent certifies as being of acceptable nature and as having been counted toward the applicant's graduation.

REGISTRATION

The applicant for admission should request the principal or superintendent to forward to the examiner at the University a complete transcript of his high school or preparatory school record showing the number of weeks and hours a week spent upon each study, with the grades received, and the year during which each subject was pursued. Credential blanks prepared by the University must be used. These blanks may be secured upon application at the registrar's office. Upon receipt of the credentials at the University the examiner will notify the applicant with regard to his admission and the registrar will send directions for registration.

REQUIREMENTS OF INDIVIDUAL COLLEGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

I. Admission by Certificate

(a) Major in Group A.

(b) Minor in Group D.

Note that one unit in the minor may be counted from work below the tenth grade in accordance with the regulation on page 27.

II. Admission by Examination

In accordance with the regulation printed on page 27, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

Adult special students.—See statement on page 38.

COLLEGE OF ENGINEERING AND ARCHITECTURE AND SCHOOL OF CHEMISTRY

Courses in Aeronautical, Agricultural, Architectural, Chemical, Civil, Electrical, and Mechanical Engineering; Architecture, Landscape Architecture, Chemistry, and Engineering Pre-business.

I. Admission by Certificate

(a) Major in Group D or A (preferably D).

(b) Minor in Group A or D (preferably A).

(c) Minor in Group E, B, or C (preferably E, in chemistry and physics).

Students who do not present a major (3 units) in mathematics, including *higher algebra and solid geometry*, will be required to take these subjects in their first quarter at the University without credit. This will usually necessitate their attending summer sessions to complete the work of the freshman year.

Students entering the School of Chemistry who do not present *chemistry* for admission will be required to take a preliminary course in inorganic chemistry, Course 6, without credit, unless they qualify for admission to or transfer to Course 9.

NOTE.—Beginning in the fall of 1930, chemistry, 1 unit, will be required for admission to the School of Chemistry.

Recommendations.—All students entering these colleges are urged to include in their high school courses mathematics, 3 units; English, 3 units; chemistry; physics; Latin, 2 units; German or French, 2 units; ancient modern, and American history; and American government or civics. French is desirable for students in architecture. German is important for students entering the School of Chemistry, where those who present two units of German for admission may replace the first year of required college German by elective work.

Course in Interior Decoration

Students in Interior Decoration spend the first two years in the College of Science, Literature, and the Arts and must meet the admission requirements for that college.

For admission to the College of Engineering and Architecture in the third year, the student must present the following credits: Freshman English (15 credits); Mathematics, Trigonometry (4 or 5 credits); French (0 to 20 credits); History 11-12-13 (10 credits); Architecture 21-22-23 (6 credits); Architecture 31-32-33 (15 credits); Architecture 61-62-63 (6 credits), and Chemistry 1-2-3 or 4-5 (8 to 12 credits), or Physics 3 and 4 and any of the continuations, 23 and 24, 33 and 34, 43 and 44 (8 credits).

If, including these credits, the student does not present a total of 90 credits and 90 honor points, he must secure enough credits and honor points to make this total, after admission to the College of Engineering and Architecture and in addition to the 102 credits required in the last two years of the course.

II. Admission by Examination

In accordance with the regulation printed on page 27 the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English, (c) test in mathematics, including arithmetic, elementary algebra, and plane geometry.

Adult special students.—See statement on page 38.

Time of admission.—The regular time to enter the college is in September. However, students will be admitted at the beginning of the winter quarter in January; then by attending the following Summer Session it is possible to complete most of the work of the freshman year. Admission at the opening of the spring quarter is not recommended unless the student can present advanced credit from some other college.

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

I. Admission by Certificate

(a) Subject to the general regulations governing their selection (see page 27), majors and minors may be presented from the Groups A, B, C, D, and E.

(b) Students intending to enter any course in Forestry or the course in Agricultural Sciences must present at least a minor in Group D and one unit in Group E.

(c) For entrance to the course leading to the degree of bachelor of agricultural engineering, see requirements of the College of Engineering and Architecture.

Recommendations—

(1) For all students intending to enter any work in the college: Students entering with a unit of high school chemistry are permitted to take a two quarters' course of five credits each in general chemistry in the college instead of a three quarters' course of five credits each. Students presenting a unit of high school physics are not required to take an elementary course in college physics.

(2) For all students intending to enter any course in Agriculture: Every prospective student in Agriculture is urged to obtain at least six months' practical experience on a farm before entering college. Those whose farm experience credentials are not satisfactory will be examined as to their familiarity with farm practices and farm experience or such experience as the committee may consider equivalent will be required during the college course in accordance with the results of these examinations. It is also recommended that major and minors be taken in Groups A, D, and E.

(3) For all students intending to enter any course in Forestry: It is recommended that major and minors be taken in Groups A, D, and E.

II. Admission by Examination

In accordance with the regulation printed on page 27 the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

Schools of Agriculture

The schools are not of collegiate grade. For further information see special bulletins.

LAW SCHOOL

Regular Students

Students desiring to enter the Law School must first complete two full years (not less than ninety quarter [sixty semester] credits) of collegiate work in Science, Literature, and the Arts with an average of one honor point for each credit at this or some other university or college of equal rank. In explanation of this requirement it may be noted that on the basis

of A, B, C, and D as passing grades, A gives three honor points for each credit; B, two points; C, one point; and D, no point. It is impossible, therefore, for applicants with grades of only C and D to secure admission. (See Admission to the College of Science, Literature, and the Arts, page 29.) Such candidates may be admitted upon presenting their credentials to the examiner. The faculty of the Law School urges candidates to secure a degree, or to take at least three years of college work before entering the Law School. (See page 18.)

A special pre-legal course is offered by the College of Science, Literature, and the Arts covering those subjects which are particularly desirable as preliminary to the study of law.

The faculty of the Law School recommends that prospective law students devote the major portion of their time while in high school to the study of the following subjects: English, Latin, history, science, political science, and economics.

Special Students

Applicants who are twenty-three years of age and have preliminary education sufficient to entitle them to admission to the College of Science, Literature, and the Arts, may, upon furnishing satisfactory evidence of their ability to pursue the law course with profit to themselves and without hindrance to the regular students at the discretion of the faculty, be admitted to the Law School as special students. Such special students are not candidates for a degree.

MEDICAL SCHOOL

On account of the limited capacity of the school, not more than one hundred beginning freshman medical students will be accepted for the fall quarter and forty for the winter quarter. Applicants will be selected on the basis of scholarship, character, and general fitness. The entire number of fall quarter freshmen will be chosen early in July. All accepted applicants will receive a bill for a ten-dollar preliminary fee. This must be paid within ten days, in order to hold a place in the limited registration. The above fee is not returnable should the student fail to enter. Other qualifications being equal, residents of Minnesota will be given preference when the selection of candidates is made.

Applicants for admission must present records covering two years of academic collegiate work¹ which years are defined as including not less than ninety quarter (sixty semester) credits which must show a number of honor points at least equal to the total number of credits. In explanation of this requirement it may be noted that on the basis of A, B, C, and D as passing grades, A gives three honor points for each credit; B, two points; C, one point; and D, no point. Therefore, a student's marks must average C or higher in order to admit to the Medical School. Those having a high ratio of honor points to total credits will be given preference.

¹ For admission to the pre-medical college course see admission requirements of the College of Science, Literature, and the Arts.

An applicant must also average C or better, as determined by the honor point method, on his combined records in the required subjects, i.e., zoology, chemistry, physics, and rhetoric.

The pre-medical academic college credits must include the following:

1. Rhetoric, nine quarters (six semester) credits. At Minnesota this requirement is met by English 4-5-6 or by Rhetoric A-B-C (15 credits).

2. Chemistry, twenty quarter (thirteen and one-third semester) credits, including general chemistry, qualitative analysis, quantitative analysis, and organic chemistry with laboratory work. At Minnesota, Inorganic Chemistry 4-5 or (1-2-3) 11, Analytical Chemistry 7, and Organic Chemistry 1-2 are necessary. Students are advised also to take chemistry in high school.¹

3. Physics: twelve quarter (eight semester) credits, covering mechanics, sound, heat, light, electricity and magnetism, with the proper laboratory work. At Minnesota, Courses 3 and 4, 23 and 24, 33 and 34, 43 and 44 (a total of sixteen credits) meet the requirements. Students are advised to complete them all but, if desired, Course 35 may be substituted for 33 and 34.

See bulletin of the College of Science, Literature, and the Arts for description of these courses and statement of prerequisites.

4. Zoology, twelve quarter (eight semester) credits, including proper laboratory work. At Minnesota, Zoology 5-6-7 meets this requirement.

5. Foreign language, sufficient high school or college training to insure a reading knowledge of French or German medical literature. For French this requirement is fulfilled (a) by passing any two of Courses 8, 9, 10 (Scientific French) at Minnesota or by presenting acceptable credits covering similar work done elsewhere; (b) by passing an examination; the usual minimum preparation demanded for admission to this examination is fifteen credits of French. For German the language requirement is fulfilled (a) by passing Course 31-32 (Medical German) at Minnesota or by presenting acceptable credits covering similar work done elsewhere; (b) by passing an examination in Scientific German; the usual minimum preparation for admission to this examination is two years of German.

6. Pre-medical students are advised to secure preparation in some or all of the following subjects: Latin (high school or college), mathematics (including calculus), psychology, sociology, drawing, and comparative anatomy.

Applicants whose pre-medical academic work has been taken elsewhere than at the University of Minnesota must present to the examiner certified credentials of both high school and college work, showing subjects, credits, and grades.

Modified Admission Requirements

The foregoing regulations governing the quality and amount of pre-medical training required for admission to the Medical School will be enforced in all cases upon those who present the minimum amount of work. In cases of mature and superior students, especially such as have

¹ While the minimum requirement in chemistry is defined as 18 credits, the arrangement of courses in many institutions is such that students are obliged to take more. An excellent preparation in chemistry is essential in modern medicine.

taken degrees and have made special progress along some line (even tho it may not have been closely related to medicine), concessions may be made. Cases under this paragraph will be considered individually and upon petition.

It should be borne in mind that no student can pursue the medical course to advantage without some knowledge of biology, chemistry, and physics.

Bachelor's Degree

The degree of bachelor or doctor of medicine is conferred only upon those who have received the degree of bachelor of arts or bachelor of science from this or some other recognized university or college or who have done work equivalent to that required for such degree in this University. Combined courses offered by the College of Science, Literature, and the Arts and the Medical School lead to these degrees (see pages 15 and 18.)

Special Students

Physicians and other graduates who would profit by the work may be admitted as special students. Such students are not candidates for a degree.

Unclassed Students

By unclassified students is meant (a) those undergraduate medical students who may be candidates for the bachelor of medicine or doctor of medicine degrees but who on account of deficiencies cannot receive legal time credit for attendance, and (b) those undergraduates who are not candidates for a degree of bachelor of medicine or doctor of medicine but who are permitted to register for courses in the Medical School.

Irregular Students

By an irregular student is meant one who is entitled to time credit toward the M.B. and M.D. degrees but who is not carrying a regular program.

Physical Condition

Physical examinations at specified intervals are required of all medical students, together with such tests and vaccinations as will protect them from avoidable communicable diseases. Students may be excluded who are deemed physically unfit for the medical course.

School of Nursing

I. Admission by Certificate

Applicants for admission to the School of Nursing should be graduates of an approved high school and must present the minimum entrance requirements of one major and two minors as described on page 27.

II. Admission by Examination

In accordance with the regulation printed on page 27 the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

Those wishing to enter the School of Nursing should file their applications with Miss Marion L. Vannier, 103 Millard Hall, and their creden-

tials with the university examiner. Applicants must be not less than eighteen nor more than thirty-five years of age. They must submit satisfactory evidence of physical and mental fitness and of good character and pass a satisfactory general physical examination by the school physician.

Because of limited facilities for clinical experience in the hospital it is necessary to limit the number of students that may be accepted. Final acceptance is made by the enrollment committee and selection is made on the basis of scholarship, character, and general fitness.

COLLEGE OF DENTISTRY

Students desiring to enter the College of Dentistry must first complete two full years (not less than ninety quarter or sixty semester credits) of collegiate work in Science, Literature, and the Arts at this or some other university or college of equal rank.

The minimum requirements for admission include nine quarter (six semester) credits in English (rhetoric); twelve quarter (eight semester) credits in zoology; twenty quarter (thirteen and one-third semester) credits in chemistry (including general inorganic, qualitative, organic); four quarter (two and two-thirds semester) credits in mathematics; eight quarter (five and one-third semester) credits in physics; six quarter (four semester) credits each in mechanical engineering and drawing; six quarter (four semester) credits in psychology; and enough additional credits to make a total of at least ninety quarter (sixty semester) credits.

At Minnesota the pre-dental requirements are met by the following two-year course of study provided high school chemistry and higher algebra are presented for admission, (if these are not presented, Chemistry 1-2-3 is required instead of Chemistry 4-5; and Mathematics 3 must be taken as a prerequisite to 4 or 6); Zoology 5-6-7 (12 credits); Inorganic Chemistry 4-5, 11, Organic Chemistry 6-7 (20 credits); Mathematics 4 (4 credits) or Mathematics 6 (5 credits); Physics 3-4 and one of 23-24, 33-34, 43-44 (8 credits); Freshman English A-B-C (15 credits) or Composition for Technical Students 4-5-6 (9 credits); Drawing 41-42-43 (6 credits); Mechanical Engineering 11-12-13 (6 credits); Psychology 1-2 (6 credits). Electives to make a total of ninety quarter credits.

Those whose pre-dental work has been taken elsewhere than at the University of Minnesota must present to the examiner certified credentials of both preparatory and college work showing the subjects completed, credits, and grades.

Students preparing for admission to the College of Dentistry are advised to follow this arrangement as closely as possible.

School for Dental Hygienists

The requirement for admission to the School for Dental Hygienists is graduation from an approved high school or other preparatory school on the accredited list, and the applicant must present the minimum requirements of one major and two minors as prescribed on page 27. Applicants must not be over 35 years of age.

All accepted applicants must pay a preliminary fee within ten days of notification of acceptance, in order to hold a place in the class. This fee is not returnable in case the student fails to enter.

SCHOOL OF MINES AND METALLURGY

I. Admission by Certificate

- (a) Major or minor in Group A.
- (b) Major or minor in Group D.

Recommendations—

- (1) It is recommended that the major be offered either from Group D, mathematics or Group A, English. If it be in mathematics, it should include higher algebra, one-half unit, and solid geometry, one-half unit.

It is further recommended that all work in mathematics be taken in the senior high school.

Applicants deficient in higher algebra and plane geometry will be required to take a special course in mathematics during their freshman year.

- (2) It is recommended that the second minor requirement be offered from Group E, natural sciences, and include physics, one unit, and chemistry, one unit; or from Group B, foreign languages.

II. Admission by Examination

In accordance with the regulation printed on page 27, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

Adult special students.—See statement on page 38.

COLLEGE OF PHARMACY

I. Admission by Certificate

- (a) Major in Group A.
- (b) Minor in Group D.
- (c) One unit in Latin, Group B.
- (d) One unit in physics, Group E.

Students who have completed forty-five credits in the College of Science, Literature, and the Arts or in other accredited colleges of similar standing, including nine or ten credits in each of (1) rhetoric, (2) a modern language, (3) physics or zoology, will be admitted to the second-year class. These students must have completed at high school the equivalent of one year each of Latin and physics in addition to meeting the other entrance requirements of the College of Science, Literature, and the Arts.

II. Admission by Examination

In accordance with the regulation printed on page 27, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

SCHOOL OF CHEMISTRY

Courses in Chemistry and Chemical Engineering

See page 15, with College of Engineering and Architecture.

COLLEGE OF EDUCATION

II. Admission by Certificate

- (a) Completion of a regular senior high school course.
- (b) For all courses of study excepting the special curricula to which freshmen are admitted (see page 21) the completion of two full years of college work (a minimum of 90 credits must have been earned with an average of one honor point per credit hour in all subjects pursued) in the College of Science, Literature, and the Arts at this or some other college or university of equal rank is required.
- (c) For all special curricula to which freshmen are admitted (see page 21) the certificate of senior high school graduation must show the completion of the following:
 - (1) Major in Group A.
 - (2) Minor in each of two of the Groups B, C, D, and E (except for the public school music curriculum for which a minor in Group D, mathematics, is required.)

III. Admission by Examination

In accordance with the regulation printed on page 27, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English, (c) for Public School Music Course: mathematics and music tests, (d) for Art Education Course: art test.

In explanation of the honor point requirement it may be noted that on the basis of A, B, C, and D as passing grades, A gives three honor points for each credit; B, two points; C, one point; and D, no point. It is impossible, therefore, for applicants with grades of only C and D to secure admission.

Graduation from advanced graduate normal courses (two years beyond the high school) is considered equivalent to (a) and (b), above.

Graduates of a five-year normal course, if individually recommended by the normal school president, are allowed sixty-three quarter credits and are admitted as unclassified students pending the completion of twenty-seven additional credits.

Graduates of the three-year course in the state teachers colleges of Minnesota may receive not more than one hundred thirteen quarter credits; credits earned in such three-year normal course shall be applied, in case they are deemed of equivalent merit, in the College of Education, to courses leading to certificates for supervisors in elementary grades, as principals in state graded schools, as teachers in junior high schools, or in normal school departments in high schools; students coming from such three-year course shall not receive certificates in high school subjects from the University without completing the prescribed courses of the University for such certificates.

SCHOOL OF BUSINESS ADMINISTRATION

Candidates for admission to the degree courses offered by this school must have completed the equivalent of the two-year pre-business course

given in the College of Science, Literature, and the Arts, the College of Agriculture, or the College of Engineering and Architecture of this University. (See admission to the College of Science, Literature, and the Arts, page 29; the College of Agriculture, page 31; the College of Engineering and Architecture, page 29.)

Permission to enter as special students may be obtained from the dean in case of mature business men and women, provided they are graduates of accredited high schools, with tested executive experience. If later, they decide to become candidates for a degree, such students must satisfy all the requirements for admission to the degree course.

ADULT SPECIAL STUDENTS

No student will be admitted to any school or college of the University who has not fully met the entrance requirements by one of the above methods, except applicants of mature age (24 years or older) and experience who may desire to pursue a special and limited course of study. Such candidates for admission must secure the approval of the college concerned for the work which they wish to pursue.

ADMISSION TO ADVANCED STANDING

I. From other colleges

This University accepts credits from all reputable colleges and universities toward advanced standing. Such credits are accepted as far as they represent courses equivalent to those offered in this institution. The certified record of courses taken in other institutions must be upon the official blank of the institution granting the certificate and should show:

- (a) The subject studied, the catalog course number, and the descriptive title.
- (b) The number of weeks and hours a week spent upon each subject.
- (c) The value of the course expressed in credits.
- (d) The result. The exact grades should be stated accompanied by an explanation of the marking system employed.
- (e) A list of the preparatory units presented upon entrance.
- (f) A letter or statement of honorable dismissal.

Applications for advanced standing should be made, if possible, at least one month before the time when the student expects to enter the University.

Upon receipt of the student's credentials the examiner will notify the applicant concerning his classification and the registrar will send directions for registration.

All statements concerning advanced standing and classification are provisional, subject to the satisfactory completion of one year's work at the University by the applicant.

Candidates wishing to gain advanced standing by examination are allowed examinations without charge, provided such be taken within six weeks after matriculation.

2. *From Minnesota teachers colleges.*

Graduates of the Advanced Graduate Course of a Minnesota state teachers college are admitted to the College of Science, Literature, and the Arts with one year (forty-five quarter credits) of advanced standing. Graduates of such advanced courses are admitted to the College of Education with an allowance of ninety quarter credits toward graduation.

Applicants for transfer from the third or fourth year of the degree course offered in Minnesota teachers colleges may receive credit for any part of their work in so far as such work is equivalent in subject-matter to courses in the particular college to which the student transfers.

Graduates of state teachers colleges will not be permitted to take the following courses at the University for credit: Psychology 1-2, Education 1.

State teachers colleges at the following places are recognized: Bemidji, Duluth, Mankato, Moorhead, St. Cloud, Winona.

3. *Junior colleges*

In accordance with the policy of the University to encourage able schools to give one or two years of college work, the University Senate has prescribed conditions under which such work may be recognized for advanced standing. Copies of the standards may be had upon inquiry at the registrar's office. The following schools in Minnesota have complied with the requirements:

Concordia College, St. Paul	Rochester Junior College
Duluth Junior College, Duluth (for one year's work)	St. John's University, Collegeville
Ely Junior College	St. Mary's Hall, Faribault (for one year's work)
Eveleth Junior College	St. Thomas College, St. Paul
Hibbing Junior College	St. Paul Luther College
Itasca Junior College, Coleraine	Virginia Junior College

LIST OF ACCREDITED PREPARATORY SCHOOLS

Graduates of the following Minnesota state high schools will be admitted to the University of Minnesota without conditions, provided their credentials satisfy the specific requirements of the college to which entrance is desired.

Ada	Appleton	Bemidji
Adams	Argyle	Benson
Adrian	Arlington	Bird Island
Aitkin	Atwater	Biwabik
Akeley	Aurora	Blackduck
Albert Lea	Austin	Blooming Prairie
Alden	Bagley	Bloomington
Alexandria	Barnesville	Blue Earth
Amboy	Barnum	Brainerd
Annandale	Baudette	Breckenridge
Anoka	Belle Plaine	Browns Valley

Buffalo	Farmington	Lakefield
Buhl	Fergus Falls	Lake Park
Caledonia	Fertile	Lamberton
Cambridge	Forest Lake	Lanesboro
Campbell	Fosston	Le Roy
Canby	Frazee	Le Sueur
Cannon Falls	Fulda	Le Sueur Center
Carlton	Gaylord	Lewiston
Cass Lake	Gilbert	Lindstrom-Center City
Chaska	Glencoe	Litchfield
Chatfield	Glenwood	Little Falls
Chisholm	Glyndon	Long Prairie
Clarkfield	Grand Meadow	Luverne
Cleveland	Grand Rapids	McIntosh
Cloquet	Granite Falls	Mabel
Cokato	Hallock	Madelia
Coleraine	Halstad	Madison
Greenway	Hancock	Mahnomen
Olcott	Harmony	Mankato
Comfrey	Hastings	Mantorville
Cottonwood	Hawley	Maple Lake
Crookston	Hayfield	Mapleton
Crosby-Ironton	Hector	Marshall
Cyrus	Henderson	Medford
Dassel	Hendricks	Melrose
Dawson	Herman	Milaca
Deer River	Heron Lake	Milroy
Delano	Hibbing	Minneapolis
Delavan	Hill City	Central
Detroit Lakes	Hinckley	Edison
Dodge Center	Hopkins	John Marshall
Duluth	Houston	North
Central	Hutchinson	Roosevelt
Denfeld	International Falls	South
Morgan Park	Ivanhoe	Washburn
Eagle Bend	Jackson	West
East Grand Forks	Janesville	Minneota
Elbow Lake	Jordan	Montevideo
Elk River	Kasota	Montgomery
Elmore	Kasson	Monticello
Ely	Keewatin	Moorhead
Eveleth	Kenyon	Moose Lake
Excelsior	Kerkhoven	Mora
Fairfax	Lake Benton	Morris
Fairmont	Lake City	Morristown
Faribault	Lake Crystal	Morton

ADMISSION

41

Motley	Red Wing	Stephen
Mound	Redwood Falls	Stewartville
Mountain Iron	Renville	Stillwater
Mountain Lake	Rochester	Thief River Falls
Murdock	Roseau	Thomson
Nashwauk	Royalton	Tower
New Prague	Rush City	Tracy
New Richland	Rushford	Two Harbors
New Ulm	St. Charles	Tyler
Nicollet	St. Cloud	Villard
Northfield	St. Francis	Virginia
North St. Paul	St. James	Wabasha
Norwood-Young America	St. Louis Park	Wadena
Olivia	St. Paul	Walker
Ortonville	Central	Warren
Osakis	Humboldt	Warroad
Owatonna	John A. Johnson	Waseca
Park Rapids	Mechanic Arts	Waterville
Paynesville	St. Peter	Wayzata
Pelican Rapids	Sandstone	Wells
Perham	Sauk Center	West Concord
Pine City	Sauk Rapids	Wheaton
Pine Island	Shakopee	White Bear
Pine River	Sherburn	Willmar
Pipestone	Slayton	Windom
Plainview	Sleepy Eye	Winnebago
Preston	South St. Paul	Winona
Princeton	Springfield	Winthrop
Proctor	Spring Grove	Worthington
Red Lake Falls	Spring Valley	Zumbrota
	Staples	

Graduates of the University High School and of the following private-schools will be admitted to the freshman class under the regulations governing the admission of high school graduates:

Adrian	Duluth
St. Adrian High School	Cathedral High School for Boys
Albert Lea	Cathedral High School for Girls
Luther Academy	Villa Sancta Scholastica
Austin	Faribault
Columbus High School	Bethlehem Academy
Collegeville	St. Mary's Hall
St. John's College	Shattuck Military Academy
Crookston	
Mount St. Benedict's Academy	

Fergus Falls	Rochester
Park Region Luther College	St. John's High School
Graceville	Rolling Stone
St. Mary's Academy	Holy Trinity School
Hutchinson	St. Cloud
Hutchinson Theological Seminary	Cathedral High School
Lake City	St. Joseph
McCahill Institute	Convent of St. Benedict
Little Falls	St. Paul
St. Francis High School	Bethel Academy
Maple Plain	Breck School
Maplewood Academy	College of St. Catherine
Minneapolis	(Derham Hall)
Academy, Augsburg Seminary	Cretin High School
Blake School for Boys	Oak Hill
De La Salle High School	St. Joseph Academy
Minnehaha Academy	St. Paul Academy
Minnesota College	St. Paul Institute Evening School
Northrop Collegiate Institute	St. Thomas College
St. Anthony High School	Summit School
St. Margaret's Academy	Visitation Convent
Moorhead	St. Peter
Concordia College	Academy, Gustavus Adolphus
Owatonna	College
Pillsbury Academy	Sleepy Eye
Phalen Park	St. Mary's School
Academy of the St. Paul Luther	Waseca
College	Sacred Heart High School
Red Wing	Winona
Academy of the Red Wing	Academy, St. Mary's College
Seminary	Cathedral High School
	Cotter High School

EXPENSES

FEES

The university year, extending from October to June, is divided into three terms called quarters. On the specified dates (See Calendar, pp. 9-11) prior to the opening of each quarter, the following fees are due from each student: (a) tuition, (b) incidental, and (c) such special fees and deposits as may be required.

Payment of fees cannot be deferred. Special attention is called to the paragraph on Penalty Fees (page 45) for further instruction on late registration and late payment of fees.

TUITION FEES

School or College	Quarter Fee		Credit Hour Fee*	
	Resi- dent	Non- resident	Resi- dent	Non- resident
College of Science, Literature, and the Arts..	\$20.00	\$30.00	\$1.75	\$2.50
College of Engineering and Architecture.....	30.00	40.00	2.50	3.25
College of Agriculture, Forestry, and Home Economics	20.00	30.00	1.50	2.25
Law School	40.00	50.00	3.75	4.75
Medical School	75.00	100.00	†3.25	†4.50
School of Nursing (preliminary course)..	25.00	25.00	†1.00	†1.00
Public Health Nursing.....	20.00	20.00		
Medical Technicians	30.00	40.00	†1.25	†1.75
College of Dentistry.....	60.00	70.00	†2.50	†3.00
Dental Nursing	25.00	25.00	2.00	2.00
School of Mines and Metallurgy.....	30.00	40.00	2.50	3.25
College of Pharmacy.....	35.00	45.00	1.50	2.00
School of Chemistry.....	30.00	40.00	2.50	3.25
College of Education.....	20.00	30.00	1.75	2.50
Graduate School	‡20.00	‡30.00	‡1.75	‡2.50
Clinical Medicine	75.00	100.00	†3.25	†4.50
School of Business Administration.....	30.00	40.00	2.75	3.75
Division of Library Instruction.....	40.00	45.00	3.00	3.00

* Students carrying less than the complete schedule of work may pay fees on a credit hour basis.

† In these colleges the prorating is on the basis of clock hours.

‡ All fellows, scholars, assistants, and instructors, and all members of the teaching staff and scientific bureaus or experiment stations when regularly enrolled as students in the Graduate School shall not be required to pay tuition fees.

Tuition fees for students of one college taking work in another.—Where a student of a given college or school elects courses in another, such courses being accepted by the college in which the student is registered as a part of its curriculum, the tuition shall be that of the college in which he is registered.¹

¹ A student paying full fees in a given college, electing courses in a lower fee college, shall pay no additional fees for the work so elected, but if electing in a higher fee college, may have the option of paying the pro rata fees of both or the full fees of the first and pro rata fees of the second.

If, at any time, such student desires credit for this course towards the degree offered by the second college, he shall pay such additional tuition as is required by the second college, charged in accordance with the schedule indicated above.

This is not to be interpreted as applying to students in such combination courses as Arts and Medicine, Arts and Dentistry, Arts and Business, etc., provided such students pay regular quarter fees for the full period of residence in the higher fee college.

Incidental fee.—An incidental fee of \$6 a quarter is charged each student (\$6.40 for Engineering and Architecture, Chemistry, Mines and Metallurgy) for which the student receives the privileges of the Minnesota Union or Shevlin Hall, the Health Service, the *Minnesota Daily* including the Official Daily Bulletin, the university post-office service, and the *University Address Book*.

Special students registered for six credit hours or less are charged this fee and are entitled to the above privileges only on request.

DEPOSIT FEES

General deposit.—At the student's first registration each year a deposit fee of five dollars (\$5) (Medicine, Dentistry, and Pharmacy, ten dollars) is required of each student to cover the following charges: locker rental, locker key deposit, case book deposit (Law School), laboratory breakages, drawing board rental (Architecture), library fines, or damage to university property.

The unused balance of the deposit fee will be returned *by mail* as soon as possible *after* the close of the school year in June. If, at any time during the college year, the charges against a student shall warrant a renewal of the deposit, an additional fee of five dollars (\$5) will be required.

Military deposit.—A military deposit of ten dollars (\$10) is required of all students taking military drill.

Laboratory deposit.—A laboratory deposit of five dollars (\$5) is also required of students registered for courses in chemistry to cover the cost of materials. The unused balance will be returned at the end of the course.

SPECIAL FEES

Music fee (in addition to tuition for those electing music)

Class fees—

Class lessons (three students in each class) two lessons per week	\$45.00 per quarter
One class and one individual lesson per week.....	55.00 per quarter
Two individual lessons per week.....	65.00 per quarter
One individual lesson per week.....	35.00 per quarter

Practice fees—

Organ	\$0.20 to \$0.40 per hour
Piano (six hours per week).....	\$5.00 per quarter
	(\$0.50 per quarter for each additional hour per week)

Practice teaching fee—

\$1.00 per credit hour

Laboratory fees—for individual courses. The amounts are specified in the course announcements.

Gymnasium fee (required of all men taking exercise courses in Physical Education)	\$1.50 a quarter
Gymnasium fee (required of all women taking three-hour gymnasium courses)	\$2.50 a quarter
Gymnasium fee (required of women taking two-hour gymnasium courses)	\$2.00 a quarter
(Maximum charge for one quarter is \$3.50)	

The following special items may be included:

Condition examination	\$1.00
Special examination for removal of condition, at other than set time ¹ ..	\$5.00
Examination on subjects taken out of class ¹	\$5.00
(No fee for such examination on first entering the University, if taken within the first six weeks.)	

Large diploma fee: any graduate may receive the large diploma on payment of the special fee of..... \$5.00

Duplicate copy of record: one copy of record will be issued to each student free of charge. Each additional copy will be issued only on payment of \$0.50
(Except during a registration period, when the fee is \$1.00)

Graduation fee \$10.00

PENALTY FEES

Registration penalties.—A penalty fee for late registration, late change of registration, or late payment of fees shall be \$2 and \$1 additional for each day of delay after classes begin, provided that no student shall pay more than \$10 of penalty in any given quarter.

Library fines.—All overnight books taken from the "Reserves" must be returned at 8:30 the following morning. If not returned at that hour a fine of twenty-five cents will be imposed, and an additional ten cents will be charged for every hour or fraction of an hour thereafter that the book is retained.

Books issued during the day for reading room use must be returned within two hours. If not returned promptly a fine of twenty-five cents for the first hour and ten cents additional for every hour or fraction of an hour thereafter that the book is overdue, will be charged. The two-hour limit will not be enforced between 6 p.m. and 10 p.m.

REFUNDS

Tuition.—Students who cancel their registration before the close of any quarter are entitled to refunds of the tuition fee on the following basis:

After Quarter Opens	Percentage of Refund
No attendance	100
Two days to one week.....	90
One week to two weeks.....	80
Two weeks to three weeks	70
Three weeks to four weeks.....	60
Four weeks to five weeks.....	50
Five weeks to six weeks.....	40

¹ Such an examination may be taken only upon approval of the appropriate committee.

No student who has been in attendance more than one half of the quarter shall receive any refund of tuition.

Locker rental.—Full rental fee for lockers may be refunded during the first two weeks of a quarter. After that time no deduction is made.

Incidental fee.—Students in any college of the University, with the exception of the College of Engineering and Architecture, the School of Mines and Metallurgy, and the School of Chemistry, who cancel their registration before the end of the quarter, are entitled to a refund of the incidental fee on the same basis as the refund for tuition, except that in no case will more than \$5 of the incidental fee be refunded. Students in the College of Engineering and Architecture, the School of Mines and Metallurgy, and the School of Chemistry will receive refunds of the incidental fee on the same basis, except that the extra forty cents of the incidental fee in these schools will be entirely refunded during the first two weeks of the quarter, and none of this extra forty cents will be refunded after the second week of the quarter.

LIVING EXPENSES

BOARD AND ROOM

GENERAL REGULATIONS

1. It is understood that a room is engaged for a complete quarter, unless otherwise arranged with the householder. Only when a student withdraws from the University is such student released from financial obligations.

2. It is understood that a room is automatically released at the conclusion of each quarter, but 10 days' notice must be given.

3. A deposit of \$5 is to be made to a householder when a room is engaged.

4. It is advisable to make separate arrangements for board and room.

5. Students are advised—when possible—to board where they room.

6. No rebate in room rent is allowed for absence.

7. Rebate in charges for board is made only if absence exceeds a week, or if arrangements have been made in advance with the householder. This rule applies to absence during vacations as well as to all other absences.

8. A special charge is made for meals served to guests, or for extra services to guests.

Women

Sanford Hall.—Sanford Hall, the dormitory residence for women students, is situated at 1100 University Avenue S.E., three blocks from the main entrance to the campus. Two hundred and fifty students may be accommodated. The building is modern in every way and is very comfortable and homelike.

The charge for board and a single room is \$135 per quarter. For occupants of double rooms the charge for board and room is \$125 per quarter. Board and room is to be paid \$60 the first month in advance, \$40 the first of the second month, and the balance the first day of the last month of the quarter. Fourth floor rooms are \$10 less per quarter. All applica-

tions for residence must be made for the entire school year. It is best to apply as early as possible. Applications will be considered in the order in which they are received.

Communications requesting residence or further information should be addressed to the house director, Sanford Hall.

Co-operative cottages.—Five co-operative cottages, each in charge of a chaperon, offer comfortable homes for about sixty women. By assisting with the work of the houses, the students are able to keep expenses under thirty dollars per month. In assigning students to these cottages, preference is given to women earning a part of their expenses. Application may be made to the manager of university cottages, Shevlin Hall.

Rooming houses.—About seventy-five houses are approved by the University as residences for women. Attention is called to the ruling of the Board of Regents that women students are not allowed to reside in any house which is not on the approved list except by special arrangement with the dean of women. Women students do not reside in any house where men are taken as roomers. All women students should bring at least three sheets, two pillow cases, and towels, all to be marked with the full name of owner. No electric light stronger than fifty watt is required in a student's room. No electric appliances are to be used except by permission of the householder. Room rent varies from ten (\$10) to fifteen dollars (\$15) a month for each student; board at the present time is from five (\$5) to eight dollars (\$8) a week.

Luncheon on the cafeteria plan is served at Shevlin Hall daily, with the exception of Sunday.

For further information and list of addresses, application may be made to the manager of university cottages, Shevlin Hall.

Men

A list of approved boarding and rooming houses may be had upon request at the manager's office of the Minnesota Union and at the Housing Bureau. Good double rooms for two men can be obtained within easy walking distance of the campus for from eighteen (\$18) to thirty dollars (\$30) per month. Good single rooms rent for from twelve (\$12) to eighteen dollars (\$18) per month. Board at the present time varies from five (\$5) to eight dollars (\$8) per week.

Minnesota Union.—At the Minnesota Union, the men's clubhouse on the campus, three meals a day are served on the cafeteria plan.

Men's cottages.—The University operates four houses where about forty men students can be accommodated. The charge for room and board is three hundred sixty dollars (\$360) for the university year, payable in nine installments. Men entering the cottages sign up for the year and will not be released until their places can be filled.

No application fees will be refunded to students leaving university houses before the end of the college year. Also, an additional charge of thirty dollars (\$30) for the year will be made for single rooms.

A fifth house, accommodating ten men, is operated as a dormitory only but board can be had, if desired, at the cottage dining hall. Room rentals run from ninety dollars (\$90) to one hundred thirty-five dollars (\$135) for the college year.

For each cottage there is provided a house mother who looks after the comfort and welfare of the men. The students live under a few self-made regulations. For further information, communicate with the manager of university cottages, Shevlin Hall.

SELF-SUPPORT

The Employment Bureau is maintained for the purpose of assisting both men and women students who seek employment, and of developing in all proper ways opportunities for self-help. Communications from students and graduates in regard to obtaining employment should be addressed to this bureau. Students or prospective students applying for the first time must appear at the office in person.

For the benefit of those who are without support of any kind it may be said that many students, with the aid of the money saved during the summer, are making all of their college expenses. A few are able to make their expenses during the college year, but this can be done only by students of unusual force and adaptability, or with exceptional opportunities. The majority of students must meet stern competition; must live economically; must guard their health while preserving a fair balance between time given to studies and to outside work.

It is not a good policy to begin life in a new community entirely without resources. In addition to tuition fees prospective students should have at least \$150 or the equivalent; and then it will be necessary for them to live very economically. Students who are eventually able to place themselves in self-supporting positions may have to try again and again, and meanwhile their living expenses will be accumulating. An adequate reserve fund under such conditions will enable them to continue their college work.

The Twin Cities offer many opportunities to the self-supporting student. Students are employed as clerks, stenographers, bookkeepers, cashiers, store clerks, drug clerks, salesmen, solicitors, telephone and telegraph operators, teachers, tutors, mechanics, musicians, waitresses and waiters, domestic workers, laborers, janitors, and in many other capacities, some of which are highly specialized. However, it must be remembered that there are usually more applicants than positions. For this reason a student, especially one who is new and unacquainted, may not be able to exercise much preference in work at first.

Applicants for employment should bear in mind that, while every effort is made to secure work for all who need it, the positions that come to this bureau cannot be assigned in the order in which applications are made. The places available are of so varied a nature that it would be impossible to assign them in order without regard to the ability and qualifications of different applicants. The employer must be given the best person for his particular position. This means that fitness must be the first consideration.

Applicants should also bear in mind that during the opening week of school there are many hundred students who apply to the Employment Bureau for work. It is manifestly impossible to place all of these students as soon as they apply and some students have to wait for days or weeks before they can secure work. The amount of work available varies with employment conditions.

It usually is not advisable for a student to make a sacrifice to come to the city before the opening of the school year in the hope that he can get a position before the other students arrive because much of the work for self-supporting students is created by the presence of the other students on the campus. Therefore, until the other students are here there are very few part time jobs available.

Those who find themselves without funds at the beginning of the college year can register in some of the evening extension classes and seek employment during the day rather than run the risk of not being able to finance themselves while carrying regular university work. By choosing extension courses for which university credit is allowed, students can make their future university work much easier and give themselves more time for outside work. The correspondence courses offered by the Extension Division are open to all. Students who can meet the usual requirements for college entrance are allowed university credit for most of these courses.

GENERAL EXPENSES—ESTIMATED

The following table gives an estimate of the expenses of the average student during his first year in college. The different columns give estimates for the different colleges. This estimate does not include expenses for clothing, railroad fare, and vacations.

ESTIMATED EXPENSES OF THE ORDINARY STUDENT DURING HIS FIRST YEAR IN COLLEGE

	Academic Agricul- ture, Forestry, Home Econ. Education	Business Admin- istration Pharmacy	Law	Mines and Metal- lurgy Eng. and Arch. Chemistry	Dentistry	Medicine
Incidental fee	\$ 18.00	\$ 18.00	\$ 18.00	\$ 19.20	\$ 18.00	\$ 18.00
*Deposit fee	5.00	5.00	5.00	5.00	10.00	10.00
Gym. suit (approx.) . .	8.00	8.00	8.00	8.00	8.00	8.00
Laundry	36.00	36.00	36.00	36.00	36.00	36.00
Room rent	90.00	90.00	90.00	90.00	90.00	90.00
Board	260.00	260.00	260.00	260.00	260.00	260.00
†Tuition	60.00	90.00	120.00	90.00	180.00	225.00
Incidentals	200.00	200.00	200.00	200.00	200.00	200.00
Books and instr'ts.	35.00	35.00	45.00	35.00	160.00	40.00
Total	\$712.00	\$742.00	\$782.00	\$743.20	\$662.00	\$887.00

* For students taking military drill, an additional deposit fee of ten dollars is required.

† An additional tuition fee of ten dollars per quarter (twenty-five dollars in the Medical School) is charged all students who are not residents of the state of Minnesota.

By reducing the amount spent for incidentals and by obtaining cheaper board and room many students will be able to live for less than the amount estimated in the above table. Likewise, other students will pay more for board, room, and incidentals, and will not be able to live for the amounts estimated. Below we give an estimate of the minimum, average, and liberal expenses of the freshman student during the college year. To live within the minimum amount a student must forego all luxuries and economize in every way possible. This estimate does not include expenses for clothing, railroad fare, and vacations.

	Minimum	Average	Liberal
Academic, Agriculture, Forestry, and Home Economics, and Education.....	\$502.00	\$709.00	\$923.00
Business Administration and Pharmacy...	531.00	739.00	953.00
Law	542.00	749.00	968.00
Engineering and Architecture, Chemistry, Mines and Metallurgy	562.00	739.00	998.00
Dentistry	756.00	959.00	1193.00
Medicine	631.00	839.00	1068.00

SCHOLARSHIPS, LOANS, PRIZES, AND MEDALS

GRADUATE FELLOWSHIPS AND SCHOLARSHIPS

Applications for these fellowships must be made on or before March 1. Blank applications can be obtained from the dean of the Graduate School.

American Petroleum Institute Research Fund in Chemistry

Through the National Research Council, the American Petroleum Institute, in 1926, provided the sum of \$4,500 annually for five years, to be used for fundamental research in the chemistry, physics, or geology of the hydrocarbons. The research is under the charge of the director of the School of Chemistry, and provides for one research fellowship and one research assistantship.

The Class of 1890 Fellowship

As a gift of the Class of 1890 the sum of \$250 a year is open to a graduate of the College of Science, Literature, and the Arts, or the College of Engineering and Architecture of the University of Minnesota who has shown distinguished ability and initiative as a student and who desires to make further preparation for public service.

Caleb Dorr Research Fellowships

The Caleb Dorr fellowships were founded by the bequest of the late Caleb Dorr. Their purpose is the encouragement of research in any field of agriculture. No services are required. Whole time during the academic year (9 months) must be given to graduate work. Fellowship amounts to \$500. Holder is exempt from all tuition fees. Awarded on basis of scholarship and prospect and promise of productive research.

The Albert Howard Scholarship

This scholarship, the annual income from \$4,000 (Riverside District, Colorado, bonds), \$240 a year, is awarded to graduates of the College of Science, Literature, and the Arts of the University of Minnesota.

The DuPont Fellowship in Chemistry

This fellowship, established by E. I. DuPont de Nemours and Company, yields \$750 annually. The holder devotes his entire time to graduate study and is not required to render any service to the University.

The Shevlin Fellowships

Four annual Shevlin fellowships of \$500 each are open to graduates of any acceptable college or university, one each in the Colleges of Agriculture, Chemistry, Medicine, and Science, Literature, and the Arts, respectively.

The Clara Ueland Fellowship

The income from \$10,000 is awarded annually to a recent woman graduate of any acceptable college or university for graduate study of problems of government and citizenship. Fellowship not available until 1930-31.

Fellowships, Assistantships, and Scholarships

The following fellowships, assistantships, and scholarships are open to graduates of any acceptable college or university. They carry stipends ranging from \$225 to \$1,200 with remission of tuition in the Graduate School. Applications may be made through the dean of the Graduate School on or before March 1.

Agriculture and Home Economics	30	assistants
Anthropology	2	assistants
Astronomy	1	assistant
Botany	6	teaching assistants
	6	assistants
Chemistry and Chemical Engineering	27	teaching assistants
Civil Engineering	1	teaching fellow
	4	research fellows
Economics	7	assistants
Education	7	assistants
Engineering, Electrical	4	teaching fellows
Engineering Experiment Station	5	research fellows
English	2	teaching assistants
	5	assistants
Geology and Mineralogy	2	assistants
German	2	teaching assistants
	2	assistants
History	6	teaching assistants
	2	assistants
Mathematics	1	teaching assistant
	3	assistants
Mechanical Engineering	3	research fellows
*Medicine and Surgery		
(1) Medical School	16	fellows
	17	assistants
(2) Mayo Foundation	226	fellows
(3) Miller Hospital Clinic	4	fellows
Philosophy	1	assistant
Physics	10	teaching assistants
	11	assistants
Pokegama Fellowship in Tuberculosis	1	fellow
Political Science	5	teaching assistants
	2	assistants
Psychology	6	teaching assistants
	1	assistant
Romance Languages	4	teaching assistants
	1	assistant
Scandinavian	1	assistant
Sociology	2	teaching assistants
	4	assistants
Zoology	1	teaching assistant
	8	assistants

* Special requirements. Address inquiries to the dean of the Graduate School.

The Board of Regents has recently established four graduate fellowships, one in the office of the comptroller, one in the office of the registrar, one in the office of the dean of women, and one in the office of the dean of student affairs. Each of these fellowships will require one half of the time of the student, one half of his time being given to such other work

as may be deemed advisable. The fellowships will cover a period of two academic years, or eighteen continuous months. They carry a stipend of \$1,200 for the two years, \$600 a year. The appointments will be made by the president on the recommendation of the comptroller, the registrar, the dean of women, and the dean of student affairs, respectively.

UNDERGRADUATE SCHOLARSHIPS

The Agricultural Faculty Women's Club Scholarship

The Agricultural Faculty Women's Club offers a scholarship of \$100, which is available to students of the Division of Home Economics. In awarding this, the character, the scholarship, and the need of the applicant will be considered. Preference will be given to students in the junior and senior classes. Applications for this scholarship may be made to the chief of the Division of Home Economics.

The Alpha Zeta Scholarship

The active chapter of Alpha Zeta offers a scholarship of \$50. Award is made, without application, to that male student of good moral character, who shall have attained the highest average scholastic record while a student in the freshman class in the College of Agriculture, Forestry, and Home Economics. Scholarship is granted with the understanding that the recipient will continue to pursue his work in agriculture or forestry in this college. Awards made through regular channels provided by faculty.

The American Legion Auxiliary Scholarship

The American Legion Auxiliary established a scholarship of \$100 a year, for three years, beginning 1927-28, the award to go to some woman student majoring in sociology with special service among the foreign born.

Henry Webb Brewster Scholarship

This scholarship of \$250 is donated by Mrs. Florence A. Brewster in honor of her husband, the late Henry Webb Brewster, formerly principal of the Central School of Agriculture, University of Minnesota. It is open to students in the College of Agriculture, Forestry, and Home Economics under the following conditions as stated by the donor: "The beneficiaries must be young men or young women who are and must continue of exemplary moral character and of temperate and industrious habits. They must be such as by trial and examination shall evince and maintain a habit and aptitude for study and improvement. Any student who shall fail to come or cease to be within the above conditions shall forfeit all claims to the benefits of these scholarships. It is my preference that such scholarships be awarded to needy students who would otherwise be unable to gain educational advantages."

The Mrs. Elbert L. Carpenter Scholarship

Through the generosity of Mrs. Elbert L. Carpenter, a scholarship of \$100 annually is available for a young woman of high scholarship and fine character. Applications may be made to the dean of women before May 1.

The Mrs. George C. Christian Scholarship

Through the generosity of Mrs. George C. Christian, a scholarship amounting to \$100 annually is available for young women of high scholarship and fine character. Application may be made to the dean of women before May 1.

Coffman Foundation Scholarship

The Coffman Foundation for the promotion of scholarship and research in education offers the sum of \$100 to a graduate of the College of Education in encouragement of graduate work in education. Application should be made to the dean of the College of Education not later than May 1.

The money becomes available at the time the winning candidate is pursuing graduate work, a period of three years being allowed in which advantage of the award may be taken.

The Nina Morais Cohen Scholarship

The Nina Morais Cohen Scholarship of \$125, given by the Council of Jewish Women, is awarded annually to a woman student of Jewish descent. Applications may be made to the dean of women before May 1.

Delta Sigma Psi Scholarships

Two scholarships of \$100 each are offered annually by Delta Sigma Psi, honorary Norwegian culture fraternity. The applicants must have at least 25 university credits or their equivalent in Norse and promise to continue the study of Norse so as to earn nine additional credits after applying for the scholarship. Applications must be made to the secretary not later than May 1.

Caleb Dorr College Scholarships and Medals

Donated by the late Caleb Dorr of Minneapolis, Minnesota. Awarded to students in the College of Agriculture, Forestry, and Home Economics on the basis of scholastic record in college. Sophomore scholarships: two of \$100 each, one for men and one for women. Junior scholarships: two of \$100 each, one for men and one for women. Senior scholarships: gold medals, one for men and one for women.

Special grants: Awarded to students of the college who have maintained a creditable scholastic record in college and who have made a significant achievement in necessary self-support. Amounts and distribution determined by special faculty committee.

Caleb Dorr Freshman College Scholarships

Open to entering freshmen in the College of Agriculture, Forestry, and Home Economics. Donated by the late Caleb Dorr, of Minneapolis, Minnesota. Awarded to graduates of (a) high schools of Minnesota and (b) schools of agriculture of the University of Minnesota, on the basis of scholarship and achievement in self-support during high school course and on need for financial assistance, objectives and aims in college course, and qualifications for public service and leadership.

- (a) 5 scholarships for high school graduates..... \$100 each
 (b) 2 scholarships for School of Agriculture graduates \$100 each

The Mrs. George P. Douglas Scholarship

Through the generosity of Mrs. George P. Douglas, a scholarship amounting to \$100 annually is available for young women of high scholarship and fine character. Application may be made to the dean of women before May 1.

Everywoman's Progressive Council Scholarship

Everywoman's Progressive Council offers annually one scholarship of \$50 to a negro woman student of high scholarship and fine character. Application may be made to the dean of women before May 1.

The Faculty Women's Club Scholarship

The Student Section of the Faculty Women's Club offers annually a scholarship of \$150 to be awarded to some woman student. Applications may be made to the dean of women before May 1.

The Fairchild Scholarship

The Fairchild Scholarship, amounting to \$300, is awarded to that first year student in any of the colleges holding membership in the American Association of Colleges of Pharmacy who has had two years of drug store experience, is a high school graduate, and who passes the best competitive examination to be conducted by, or under the auspices of, a committee made up of members appointed jointly by the American Pharmaceutical Association, the American Association of Colleges of Pharmacy, and the National Association of Boards of Pharmacy. Fuller particulars may be had from the dean of the college.

Samuel B. Green Scholarship

Through the generosity of Mrs. Samuel B. Green the income from \$1,000 will be available annually for a scholarship to be awarded to a senior in Forestry having the highest scholastic record.

Home Economics Association Scholarship

The Home Economics Association of the College of Agriculture, Forestry, and Home Economics offers a scholarship of \$50 to students in the Division of Home Economics. Any student in the division is eligible. The scholarship is awarded on the following basis: spirit of service, financial need, professional attitude, character, and an honor point ratio of 1.5 or above, and ideals and standards consistent with those set up by the Division of Home Economics. The award is in the hands of a faculty committee from the Division of Home Economics. Applications may be made to the chief of the Division of Home Economics.

The Johnson Foundation Scholarships

The trustees of the Edward M. and Effie R. Johnson Foundation have donated a fund of \$12,000, the income of which is available annually for undergraduate scholarships. The scholarships are open to either men or women in any college of the University. Holders of the scholarships must be in the third or fourth year of work beyond the high school and must

have been in residence in the University of Minnesota at least one year. The student's record in his studies, his success in other activities, his interests, and his personal qualities will be taken into account in making awards. The purpose is to encourage scholarship and thoroughness of training in students who appear capable of unusual service or leadership.

Whether one or more scholarships shall be awarded each year will depend upon the qualifications of available candidates.

The awards will be made by the Board of Regents upon recommendation of a committee of the faculty appointed by the president. Nominations should be sent to the dean of the college in which the student is enrolled.

Law Alumni Association Scholarship

A scholarship of \$150, awarded to the student of the senior class who has made the most meritorious record in his work and on the *Minnesota Law Review* up to the time of the award. It is paid in quarterly installments by the treasurer of the Law Alumni Association.

Law Faculty Scholarships

Law faculty scholarships of \$150 each are awarded to students in the senior class of the Law School who have done meritorious work in their classes and on the *Minnesota Law Review* up to the date of the award.

The Moses Marston Scholarship in English

This scholarship of \$75 is to be used to further English study, and is awarded by the English Department as a recognition of special capacity for literary and linguistic studies.

The Minneapolis Advertising Club Scholarship

The Minneapolis Advertising Club awards annually in June a scholarship of \$100 to a senior student in the School of Business Administration on vote of a committee consisting of the dean of the School of Business Administration, two other faculty members appointed by the dean, and the president and secretary of the Minneapolis Advertising Club.

The Minneapolis College Women's Club Scholarship

The Minneapolis College Women's Club offers annually one scholarship of \$200, preference being given to women in the junior or senior class. Application may be made to the dean of women before May 1.

The Minnesota Grand Army of the Republic and Women's Relief Corps Scholarship and Loan Fund

A gift of \$100 from the Department of Minnesota Woman's Relief Corps, Auxiliary to the Grand Army of the Republic, for a scholarship and loan fund for a student in the College of Science, Literature, and the Arts, preference to be given to a descendant of a member of the Grand Army of the Republic.

Minnesota Law Review Scholarship

A scholarship of \$150 awarded to a student in the senior class who has done meritorious work in his classes and on the *Minnesota Law Review* up to the date of the award.

Minnesota State Pharmaceutical Association Scholarship

A scholarship amounting to \$105 in cash is awarded annually by the Minnesota State Pharmaceutical Association to the student, a citizen of the United States and a resident of Minnesota for at least five years, who has earned the highest general rating in the work of the first two years in the College of Pharmacy. If such student should discontinue attendance at the college, the said sum is to be awarded to the student next highest in standing who meets the other requirements.

Mu Phi Epsilon Scholarship

Gift of \$50 from the Phi Beta Chapter of Mu Phi Epsilon Sorority for the establishment of an annual scholarship for junior and senior women music students.

La Verne Noyes Scholarships

Under the will of Mr. La Verne Noyes there was established a number of scholarships for ex-service men or their direct dependents to assist them in obtaining a college education. The funds for these scholarships were placed in the hands of a board of trustees. Beginning with the year 1928-29 five of these scholarships were granted to Minnesota. The scholarship covers the tuition fee in the college in which the appointee is registered.

The P. E. O. Scholarship

The P. E. O. organization gives annually a scholarship of \$100 to some woman student of high scholarship and fine character. Applications may be made to the dean of women before May 1.

The George H. Partridge Scholarships

Through the generosity of Mr. George H. Partridge five scholarships of \$100 each are available annually for young woman of high scholarship and fine character. Application may be made to the dean of women before May 1.

Captain DeWitt Jennings Payne Memorial Scholarships

Under the will of the late Olive Payne Stover, of Chicago, the University was given securities amounting to \$15,615.24. This bequest was for the purpose of establishing one or more scholarships in the Department of English. Only the income is to be used.

The Phi Upsilon Omicron Scholarship in Home Economics

The Twin City chapter of Phi Upsilon Omicron offers a scholarship of \$50 which is available to students of the Division of Home Economics. Any student in the division will be eligible but preference will be given to freshmen and sophomores. The award will be in the hands of a faculty committee; applications may be made to the chief of the Division of Home Economics.

Pullman Company Scholarships

These are awarded to the University of Minnesota on the basis of prizes taken by stock at the International Show held annually in Chicago.

They become the permanent property of the University. The scholarships are awarded in the form of loans to students. When the loans are paid back, the money becomes again available for award to other students of agricultural courses. For information consult the head of the Division of Animal Husbandry.

St. Paul College Club Scholarships

The St. Paul College Club offers annually several scholarships of \$150 each to women students. Applications may be made to the dean of women before May 1.

University Concert Band Scholarships

Twenty-seven scholarships of \$35 each and eight scholarships of \$50 each are available for members of the university concert band.

The W. S. G. A. Scholarships

The Women's Self-Government Association of the University offers annually several scholarships of \$100 and \$150, preference being given to women of the junior or senior class. In 1926-27 fifteen such scholarships were awarded and in 1927-28, eighteen were awarded. Applications may be made to the dean of women before May 1.

The Woman's Club Scholarship

The Woman's Club of Minneapolis gives annually a scholarship of \$300 to be awarded to some woman student; \$150 is given by the Arts and Letters Section, and \$150 by the Home and Education Section. Applications may be made to the dean of women before May 1.

LOAN FUNDS

Unless otherwise stated, all applications for loans should be made to the dean of student affairs. No student is eligible to borrow from any university loan fund until he has completed two quarters' work at the University of Minnesota.

General Student Loan Fund

A loan fund open to all students in the University of Minnesota that come under the requirements established by the Board of Regents. This fund has been built up by small contributions from alumni who have been benefited in their student days and have taken this means of building up a loan fund to show their appreciation.

Agricultural Faculty Women's Club Loan Fund

The Agricultural Faculty Women's Club has established a \$500 loan fund for the use of undergraduate and graduate students in the home economics course. The fund will be governed by the university rules and regulations for loan funds.

Mary Dwight Akers Loan Fund for Forestry Students

Established by Emily Speechley Whitacre, of St. Paul, Minnesota, "in recognition of the interest and work of the Fourth District, Minnesota

Federation of Women's Clubs, in conservation and reforestation, and especially of the effective work of Mrs. C. N. Akers, chairman of the Outdoor Life Committee of that organization, and with a hearty appreciation of the work which the students and faculty of the Forestry Department of the University of Minnesota are doing in the cause of forestry and conservation," and "to assist worthy and needy students in the study of Forestry, and to establish a permanent memorial to the great work of the Outdoor Life Committee, Fourth District Minnesota Federation of Women's Clubs." The amount of this loan fund is \$4,000.

Argosy Club Loan Fund

Gift of \$225 from the Argosy Club of Minneapolis for a loan fund to be administered in accordance with the usual policies and regulations of the University. Both the interest and the principal may be used for loan purposes.

Class of 1902 Loan Fund

Gift of \$2,300.23 from the Class of 1902 for the establishment of a loan fund for worthy students, preferably those in the junior and senior classes.

The Cosmopolitan Club Loan Fund

The Cosmopolitan Club of the University has established a small loan fund to be used for short time emergency loans to foreign students at the University.

The Cosmopolitan Club Loan Scholarship

The Cosmopolitan Club of Merriam Park, St. Paul, offers a loan scholarship of \$100 to a woman of high scholarship and fine character. Applications may be made to the dean of women before May 1.

Dad's Day Loan Fund

Due to the generosity and interest in the University of Minnesota on the part of the dads attending the last two annual Dad's Day dinners, money was collected and donated to the University to be used as a loan fund for needy students, subject to the regulations adopted by the Board of Regents governing the administration of loan funds.

The Daughters of the American Revolution Loan Scholarship

The Daughters of the American Revolution, St. Anthony Chapter, offers a loan scholarship of \$100 to a woman of high scholarship and fine character. Applications may be made to the dean of women before May 1.

Caleb Dorr Loan Fund

A loan fund open to students in the College of Agriculture, Forestry, and Home Economics, contributed by the late Caleb Dorr, of Minneapolis. The amount is variable and the conditions of the loan are similar to other loan funds.

The Elliot Trust Fund

The annual income from this fund of \$5,000 established by the will of the late Mrs. Mary H. Elliot, is loaned without interest to students in the

School of Mines and Metallurgy. The financial needs of the applicant, his scholarship, moral character, enthusiasm shown in his work, and promise of usefulness in the profession will be taken into consideration.

Engineers Bookstore Loan Fund

The Engineers Bookstore of the University of Minnesota has established a loan fund of \$1,000, primarily for the use of students in the College of Engineering and Architecture, the School of Chemistry, and the School of Mines and Metallurgy.

Faculty Women's Club Loan Fund

This fund was established by Mrs. George Edgar Vincent and the Faculty Women's Club, and is periodically increased by contributions from the Faculty Women's Club. Small loans from this fund are available for women students of high scholarship and fine character. Applications may be made to the dean of women at any time.

The Gilfillan Trust Fund

The annual income from this fund of \$50,000, established by Judge John B. Gilfillan, of Minneapolis, is available as a loan to worthy students of the University who are residents of Minnesota.

The Home Economics Self-Government Association Loan Fund

The sum of \$250 is available for small emergency loans to women in the Division of Home Economics whose character and scholarship recommend them for assistance. Applications may be made to the dean of women at any time.

Horton Art Scholarship and Loan Fund

Annual income from \$1,000, donated by Edith Lee Horton as a memorial to her father, Dr. William Dixon Horton, is available for loans or scholarships to junior and senior students in art classes.

Edward M. and Effie R. Johnson Foundation Loan Fund for Girls

A gift of \$5,000 from the above foundation was received, the income of which is to be used as a loan fund for girls. The loans must be approved by the dean of women.

Jessie S. Ladd Loan Fund

The Minneapolis Alumnae Club has established a small loan fund known as the Jessie S. Ladd Loan Fund to be used for assisting women students. This loan fund is used as an emergency loan fund for short time loans to students. Applications may be made to the dean of women at any time.

Law Alumni Loan Fund

A sum has been provided by the alumni of the Law School for loans to law students. Loans are made in sums not exceeding \$200. Preference is given to students on the Editorial Board of the *Minnesota Law Review*.

The John Lind Loan Fund

A fund of \$7,000 has been established by John Lind, the income of which is to be used for loans to deserving crippled students. This money may be loaned, at the discretion of the governing authorities, without interest.

F. D. Lindquist Loan Fund

The sum of \$500 is available as a loan to students in the School of Business Administration in need of financial assistance.

The Ludden Estate Loan Fund

The annual income from this fund of approximately \$15,000, established by the will of the late John D. Ludden, of St. Paul, is available for loans to any student of the University of Minnesota.

The Ludden Real Estate Loan Fund

An annual income, derived from real estate willed to the University by the late John D. Ludden, of St. Paul, is available for loans to any student of the University of Minnesota.

Ariel Macnaughton Play Production Fund

A fund of \$100 known as the Ariel Macnaughton Play Production Class Fund, available, all or in part, as a loan for any dramatic purpose, to an organization or individual, with condition that it must be returned to the University at the close of the school year following the loan. Decisions upon the loan are to be made upon recommendation by instructor in dramatics.

Merchants National Bank of St. Paul Loan Fund

A gift of \$200 was received from the Merchants National Bank of St. Paul, Minnesota, to be used as a loan fund for needy students.

The Minneapolis College Women's Club Loan Fund

The College Women's Club of Minneapolis has established a small loan fund to be used for assisting women students. This loan fund is used as an emergency loan fund for short time loans to students. Applications may be made to the dean of women at any time.

The Minneapolis Colony of New England Women Loan Scholarship

A loan scholarship of \$100 is available annually for a woman student of New England birth or ancestry who is a member of the junior or senior class. Applications, accompanied by testimonials, may be made to the dean of women before May 1.

Minneapolis District Dental Society—Woman's Auxiliary—Loan Fund

A loan fund of \$500 to assist needy and worthy students who are registered in the College of Dentistry, and who are American citizens and residents of Minnesota.

The Minneapolis Pathfinders' Loan Club

The Pathfinders' Club of Minneapolis has established a small loan fund to be used for assisting women students. This loan fund is used as an emergency loan fund for short time loans to students. Applications may be made to the dean of women at any time.

The Minnesota Federation of Women's Clubs Loan Scholarships

The Minnesota Federation of Women's Clubs has charge of the three loan scholarships which provide money to be loaned to young women who are residents of Minnesota, the sum borrowed not to exceed \$250. These loan scholarships are as follows:

- (a) The Lydia Phillips Williams Memorial Scholarship, to be loaned to a woman student in any department of any college of the state.
- (b) The Professor Maria Sanford Scholarship, to be loaned to a woman student in some college of the University of Minnesota.
- (c) The Annabelle Collins Coe Scholarship, to be loaned to a woman student at the University of Minnesota or in any college of the state.

Minnesota State Organization for Public Health Nursing Loan Fund

The sum of \$500 has been donated from the Minnesota Organization for Public Health Nursing to be available for loan fund purposes for deserving and needy students in Public Health Nursing.

Dr. Nellie Welch Nelson Home Economics Student Loan Fund

Gift from the Fourth District of the Minnesota Federation of Women's Clubs for the establishment of the Dr. Nellie Welch Nelson Home Economics Student Loan Fund. The principal and interest are to be available for loans to girls in the Department of Home Economics under the usual conditions governing the use of university student loan funds.

Professional Sorority Council Loan Fund

Income from sum of \$200 to be used as loans to needy women students, preference given to senior girls. An advisory committee consisting of one member from each sorority together with a faculty adviser recommend the candidate for the loan.

St. Paul Alumnae Loan Fund

The alumnae of St. Paul have established a small loan fund to be used for assisting women students. This loan fund is used as an emergency loan fund for short time loans to students. Applications may be made to the dean of women at any time.

Juniata Shepperd Loan Fund

Gift of \$208.74 to be known as the Juniata Shepperd Loan Fund. The principal and income to be used for loans. Women students needing financial aid in the School and College of Agriculture and graduates in the Division of Home Economics are eligible.

Max Toltz Loan Fund

Through the American Society of Mechanical Engineers, members of the University of Minnesota student chapter of the society have access to a loan fund established by a gift of \$15,000 from Major Max Toltz, of St. Paul. Applications should be made through the head of the Department of Mechanical Engineering.

Eighth Ward Woman's Christian Temperance Union Loan Fund

A gift of \$100 was made by the above organization to establish a loan fund. The money is to be repaid by the borrowers within two years after graduation.

PRIZES

Alpha Alpha Gamma Prize in Architecture

An annual prize of \$15 in books is provided by the Alpha Alpha Gamma Sorority, to be awarded to the author of the design placed first in a designated competition consisting of one of the regular long problems in the sophomore course in design in the School of Architecture.

Alpha Chi Sigma Twin City Alumni Prize in Chemistry

The Twin City Alumni Association of Alpha Chi Sigma Fraternity offers an annual prize of books to the value of \$10 to that male sophomore in the School of Chemistry having the highest scholastic average at the end of the winter quarter.

Alpha Kappa Gamma Prize in Dental Hygiene

The active chapter of Alpha Kappa Gamma Sorority offers an annual prize of ten dollars (\$10) in gold to the girl graduating from the School for Dental Hygienists, who presents the highest scholastic average, having completed her entire course at the University of Minnesota.

American Institute of Architects, the Minnesota Chapter, Prizes

The Minnesota Chapter of the American Institute of Architects contributes annually two prizes of books to the value of \$50 and \$25 to the students attaining the two highest general averages in the work of the junior year of the course in architecture.

American Society of Civil Engineers, Northwestern Section, Prizes

The Northwestern Section of the American Society of Civil Engineers offers two prizes of \$25 and \$15 awarded annually to two upper class students in the course in civil engineering on the basis of competition or scholarship or both.

American Society of Mechanical Engineers Prize

The American Society of Mechanical Engineers offers an annual prize of \$50, open to members of the University of Minnesota student chapter of the society, for the best original paper adjudged from the standpoint of applicability, value as a contribution to mechanical engineering literature.

completeness, originality of manner, and conciseness. Papers must be submitted before June 30.

Colbert Ralph Bennett Prize

An annual prize of \$25 will be awarded to the regularly enrolled student in the College of Engineering and Architecture who produces and submits the best piece of imaginative writing. Manuscripts are to be the students' original creative work, and must not have been submitted elsewhere. One story, one play, or one long poem or group of shorter poems may be submitted by each contestant. Entries must be deposited in the office of the dean, College of Engineering and Architecture, on or before April 15.

The William Jennings Bryan Prize

A prize of \$50 will be awarded every fourth year to the writer of the best essay upon a topic in political science to be announced. The essay, which is limited to 10,000 words, must be handed to one of the instructors in political science by May 1. The next award will be made in 1930.

Chi Omega Prize

The Chi Omega prize of \$25 is awarded annually to the woman student who has excelled in social work in the Department of Sociology. All senior women following the training course for social and civic work or one of the sequences of applied sociology are eligible for consideration. The award is made on the basis of academic standing plus personality, judged not only by instructors in the courses, but by the supervisors in social agencies who direct the practical work.

The '89 Memorial Prize in History

A prize of \$50 each year is given for the best thesis in history, written from the sources, by a member of the graduating class.

Class of 1911 Memorial Trust Fund Prize

A prize of \$40 has been provided by the alumni of the Class of 1911 for an annual contest to encourage original dramatic writing. Plays must be submitted by March 1.

The Rollins E. Cutts Prize in Surgery

The income from \$500 is awarded in the form of a gold medal to that members of the senior class of the Medical School who presents the best thesis showing original work upon a surgical subject.

Gideon Memorial Prize

The Gideon Memorial Fund of \$500 was raised by members of the State Horticultural Society and presented to the University of Minnesota in 1908 in honor of Peter M. Gideon, Excelsior, the originator of the Wealthy apple (with the stipulation that the income from this fund be used for a prize in some annual competition open to students in horticulture. The annual income from the investment of this capital amounts to \$25, payable \$12.50 semiannually in May and November. This competition has,

taken the form of papers prepared on some horticultural subject and delivered at the annual meeting of the State Horticultural Society. In odd numbered years the competition is open to college students and in even numbered years to the students of the School of Agriculture. Arrangements for contests are in charge of the Division of Horticulture.

The William A. French Prizes in Interior Decoration

Mr. William A. French, of Minneapolis, has established two annual prizes of \$15 and \$10, respectively, for a design competition open to seniors in the course in interior decoration.

Harris Political Science Prizes

Two prizes of \$150 and \$100 are given annually by Professor N. D. Harris, of Evanston, Illinois, to the writers of the two best essays upon certain specified subjects in the field of state and local government, foreign politics, or foreign relations. The contest is open to undergraduate men in Indiana, Illinois, Minnesota, Iowa, Michigan, and Wisconsin.

Jacobson Graduate Prize

David L. Jacobson will offer a fifty-dollar gold medal to the student who graduates with the highest general average rating from the post graduate course in pharmacy leading to the degree of master of science in pharmacy.

Lambda Alpha Psi Prize

Lambda Alpha Psi, the honorary language society, in order to encourage independent work in languages and literature among the undergraduates of the University, offers an annual prize of \$25 for the best essay in this field.

H. P. Linner Prizes

Gift of \$200 from Dr. H. P. Linner for three prizes—first, \$100; second, \$60; and third, \$40, to be awarded annually upon the recommendation of the Department of Scandinavian Languages for exceptional progress in the study of the Swedish language, for general scholarship, and for character and extra-curricular activities in promoting Swedish cultural interests at the University of Minnesota.

The Frank O. Lowden Prizes

The annual income from \$3,000 is given as two prizes of \$100 and \$50 to the winners of first and second places in the contest of the Northern Oratorical League. The members of this league are the University of Michigan, Northwestern University, the University of Wisconsin, the University of Iowa, the University of Illinois, and the University of Minnesota.

Ludden Prizes

Three prizes of \$50, \$30, and \$20 to the winners of the first three places in the Freshman-Sophomore Oratorical Contest are provided from the Ludden Real Estate Loan Fund.

Magney and Tusler Prizes in Architecture

Two annual prizes of \$20 and \$10, respectively, are provided by Magney and Tusler, architects, of Minnesota. They will be awarded to the authors of the designs placed first and second in a sketch competition, the subject of which pertains to civic beautification.

The Minneapolis Surgical Society Prize Essay Contest

The Minneapolis Surgical Society offers each year two prizes of \$75 and \$25, respectively, for the best essay on any subject in the field of clinical surgery, subject to the following conditions:

(1) The competition is open to (a) any medical student at the University of Minnesota working for a degree of bachelor or doctor of medicine; (b) any interne at a Minneapolis hospital.

(2) The essays, to receive consideration, must be in the hands of the secretary of the Minneapolis Surgical Society not later than March 1 of the year for which they are entered. Students graduating in December may send in their essays to be considered the following March.

(3) The Minneapolis Surgical Society through its Committee of Awards may reject any or all essays and may withhold the prize entirely in any year, if no sufficiently meritorious essays are presented.

(4) The prize winning essays are to be read before the Minneapolis Surgical Society at its April meeting and are to be published as the "Minneapolis Surgical Society Prize Essays."

(5) The judging and supervision of the prize essay contest each year will be entirely in the hands of the council of the society acting as a "Committee of Awards."

The Minnesota Quarterly Award

The Minnesota Quarterly offers two prizes of \$15, one for the best prose article published in the magazine during the year, and the other for the best poem. These prizes must not be awarded to members of the editorial board.

Minnesota Society of Internal Medicine Prize

Gift of \$50 from the Minnesota Society of Internal Medicine for a prize for the most meritorious thesis by an undergraduate medical student upon a subject in physiology which is closely related to clinical medicine.

The Moorman Prize in Architecture

Mr. A. Moorman, of St. Paul, contributes an annual prize for excellence in senior architectural design as determined by a competition and the award of a committee of judges. The prize consists of a sum of money sufficient to cover the traveling expenses of the recipient on a trip to study notable examples of architecture in this country.

Charles Lathrop Pack Foundation Forestry Prizes

Gift of \$2,000 from Charles Lathrop Pack of which the income is to be used for two prizes for the best essays or other evidence of accomplished

work in the interests of public co-operation and public appreciation of forestry. Open to all undergraduates specializing in forestry.

The Frank H. Peavey Prize

This prize of \$100 is divided equally among the members of the team winning the annual freshman-sophomore debate.

Phi Lambda Upsilon Prize in Chemistry

Phi Lambda Upsilon, national honorary chemical fraternity, offers an annual prize of \$15 to that male sophomore student registered in the School of Chemistry, or specializing in agricultural biochemistry, who shall have the highest scholastic standing up to the beginning of the spring quarter, as certified by the registrar upon a prescribed basis.

The John S. Pillsbury Prizes

Three prizes of \$100, \$50, and \$25, respectively, are awarded annually to the winners of the first three places in the Pillsbury Oratorical Contest. The winner of the first prize becomes the representative of the University in the annual contest of the Northern Oratorical League.

Louise M. Powell Prize

A gift of \$50 annually from the Alumnae Association of the School of Nursing for the establishment of the Louise M. Powell Prize of \$25 to be awarded at the March and June commencements to the student in the School of Nursing of the University of Minnesota who has attained the highest degree of efficiency in practical work.

A. D. Wilson Prize

This is the income from a fund of \$322.30 contributed by friends of A. D. Wilson, awarded financially to the student in the College of Agriculture, Forestry, and Home Economics who submits the best essay on co-operation in agriculture.

MEDALS

The Alumni Weekly Gold Medal

This medal is awarded annually on the recommendation of the faculty members of the Senate Committee on Debate and Oratory to that member of the graduating class who has made the best record in public speaking during his college course. In the absence of a suitable candidate, the committee may withhold the award.

The American Institute of Architects' Medal

This medal is awarded annually by the American Institute of Architects to the senior in each of the leading architectural colleges of the United States who has the highest scholastic standing throughout his course.

The Conference Medal

The Conference Medal is awarded each year by the Intercollegiate Conference Athletic Association to the man, graduating in the senior class of each conference university, who, through a course of four scholastic years' residence in the same university, has the highest degree of achievement in his athletic, as well as in his scholastic work.

Farmstead, Stock and Home Medal

Farmstead, Stock and Home, a farm journal published in Minneapolis, offers a medal in the form of a watch fob to each student standing highest in judging dairy cattle, beef cattle, horses, swine, and sheep.

Lehn and Fink Gold Medal

Messrs. Lehn and Fink, of New York City, award annually a gold medal to that student in the College of Pharmacy who graduates with the highest general average rating.

Scarab Medal in Architecture

The Scarab Fraternity provides an annual silver medal, to be awarded to the student winning first place in a designated design competition in the regular work of the junior year in the course in architecture.

The Tomhave Medal

Provided by W. H. Tomhave, alumnus of the College of Agriculture (Class of 1907). Awarded to the student who proves himself the most proficient in judging all classes of livestock. For conditions of competition, see the head of the Division of Animal Husbandry.

The W.S.G.A. Award

The W.S.G.A. Scholarship tablet is inscribed annually with the name of that young woman who has attained the highest average during her first college year.

ORGANIZATIONS AND PUBLICATIONS

SELF-GOVERNMENT ORGANIZATIONS

The Minnesota Union was organized in the spring of 1908 "to promote the best interest and welfare of the University of Minnesota, and comradeship among its members, and to erect and maintain a suitable clubhouse for such purpose. All men students of the University are active members of the Union. The membership fee is included in the incidental fee paid each quarter. The legislature gave the Chemistry Building for the use of the Union and appropriated \$17,500 for remodeling.

The dining room, operated on the cafeteria plan, serves three meals a day at practically actual cost. Students are advised to ascertain the Union prices for board before making arrangements elsewhere.

The Minnesota Union maintains for the convenience of its members, a pool and billiard room, smoking rooms, writing and study rooms, barber shop, game rooms, private dining rooms for students and faculty luncheons, and a ballroom.

The Union gives periodical social activities in the nature of an open house. Reservations for rooms are made through the manager or through the Information Bureau.

The Women's Self-Government Association is open to all women students of the University. Its purpose is to create a sense of unity and fellowship among the women, to promote and maintain the highest standards of university life, and to regulate all matters of student conduct not falling under the jurisdiction of the faculty. Headquarters are in Shevlin Hall. Members of the association will be in readiness during the opening days to meet new students and to serve them in every way possible.

The *All-University Council* is composed of the presidents of the college councils who shall be members of the senior class. In colleges having a total of 400 students of which 30 per cent or more are women there shall be two representatives, one man and one woman. Its function is mainly that of a student self-governing body, representing the student body in matters affecting student interest, controlling their activities to a large extent, and endeavoring to unify the spirit and promote the best possible welfare of the University.

College councils.—Most colleges of the University have their own councils articulating with the All-University Council and have similar functions.

MISCELLANEOUS ORGANIZATIONS

There are at the University more than two hundred student organizations representing religious, ethical, literary, scientific, technical, dramatic, athletic, social, and other activities.

PUBLICATIONS

The *Bulletin* of the University of Minnesota includes the reports of the president and of the Board of Regents, the bulletin of general information, the annual announcement of individual colleges of the University, announcements of special courses of instruction, reports of officers, etc.

The University Press.—The University of Minnesota Press, established by the Board of Regents in 1925, publishes and distribute all books, monographs, reports, or other publications issued for sale by the University. The following series of research publications are issued at irregular intervals: Social Science Monographs, Publications of the Bureau for Research in Government, Monographs, Studies, and Reports in Education, Child Welfare Monographs, Language and Literature Series, Biological Sciences Series (including Minnesota Studies in Plant Science), Bulletins of the Minnesota Geological Survey, Studies in Engineering, Bibliography Series, Syllabus Series.

A complete catalog of the University of Minnesota Press will be furnished by the Press upon request.

The Minnesota Daily, the university newspaper, is published five times each week during the university year by the Minnesota Daily Association. Its staff is composed entirely of students.

The Official Daily Bulletin, published in *The Minnesota Daily*, is the official organ of the administration. It contains announcements of meetings of regents, of faculties, of committees, and notices of importance to every department of the University.

The Gopher, the senior annual, is a book published annually by the senior class of the University.

The Minnesota Alumni Weekly, issued each Wednesday during the university year, is published in the interests of alumni and the University.

Minnesota Chats is a monthly publication of general university character designed to carry to the Minnesota public the more interesting problems and achievements of the state's principal educational institution. It is sent without charge to those who ask to be placed on its lists.

The Minnesota Quarterly, a literary magazine, is published three times during the university year, by a student editorial board of five members. It is devoted to the publication of the best literary work done by the students of the University.

The Bulletin of the Engineering Experiment Station is devoted to reports and announcements regarding the activities of the station and the various investigations carried on under its auspices.

The Techno-Log is issued monthly during the academic year by students in the College of Engineering and Architecture, the School of Chemistry, and the School of Mines and Metallurgy. It is devoted to articles on engineering subjects and to alumni news.

The Minnesota Mentor is issued three times a year by students in the College of Education. It is devoted to matters of interest to undergraduate and graduate students in education.

The Gopher Business News is a quarterly magazine published by the students of the School of Business Administration. It is devoted to articles on business and to news of general interest to the student body and alumni of the school.

Agricultural Experiment Station Bulletins give the results of experiments carried on at University Farm and at the branch stations at Crookston, Morris, Grand Rapids, Duluth, Waseca, Cloquet, and Zumbra Heights, as rapidly as such work is completed or as soon as conclusions of economic value are reached. At least four bulletins are published annually; usually the number is much larger. An *Annual Report* of the station and branch stations summarizes the work accomplished from year to year.

The Minnesota Farmers' Library, Special Bulletins, and Circulars, are a series of popular pamphlets issued by the Agricultural Extension Division, to inform farmers and others interested as to methods tried out at the Experiment Station and its branches, or elsewhere under the direction of the station staff, and approved as good practice in Minnesota.

The News Letter is a weekly clip sheet containing items of news and agricultural information for reprinting in the newspapers of the state.

The Extension Service News is a monthly publication intended as a medium for the exchange of news among those connected with the agricultural extension activities in the state.

The Minnesota Potato Letter is a monthly printed statement, issued through the potato marketing season, to keep potato growers and others informed of the trend of the market.

The Visitor is a news letter issued monthly by the Division of Agricultural Education of the College of Agriculture, Forestry, and Home Economics, for teachers of agriculture, superintendents of schools, and students of education under the division named.

The Gopher Countryman is a monthly magazine published by the students of the College of Agriculture, Forestry, and Home Economics, for the publication of matters of interest to students and alumni and faculty.

The News of the School of Agriculture is a monthly newspaper issued by the Central School of Agriculture as a means of keeping students and alumni informed of the activities of the school and its students.

The Agrarian is a book published annually by the senior class of the Central School of Agriculture.

The Northwest Monthly is a small paper published to report activities at the Northwest School and Station at Crookston.

The West Central School News is a quarterly, four-page newspaper, giving reports of the activities of the West Central School of Agriculture and the Experiment Station, Morris.

The Red River Aggie is a book published annually by the Northwest School of Agriculture.

The Moccasin is a book published annually by the West Central School of Agriculture.

Minnesota Law Review.—A legal magazine published monthly, December to June, inclusive, by the faculty and students of the Law School. It is the official journal of the Minnesota State Bar Association.

School of Mines and Metallurgy Experiment Station Bulletins contain reports of investigations conducted by the State Mines Experiment Station.

Bulletins of the Minnesota Geological Survey include reports of work done in Minnesota by the Minnesota Survey in co-operation with the United States Geological Survey; also, preliminary reports published independently by the Minnesota Survey in order to prevent loss by delaying the use of information of economic value. The most recent reports are: *Surface Formations and Agricultural Conditions of Northwestern, of Northeastern, and of Southern Minnesota*; *Preliminary Reports on the Clays and Shales of Minnesota, Geology and Ore Deposits of the Cuyuna Iron Range, and Peat Deposits in Minnesota*; *Report on the Magnetite Deposits of the Eastern Mesabi Range*; *Foundry Sands of Minnesota*; *A Contribution to the Geology of the Mesabi Range*; *A Guidebook to Minnesota Trunk Highway No. 1*; *The Geology and Magnetite Deposits of Northern St. Louis County*. These are for sale by the University Press. A complete list will be sent on request.

The Bulletin *of the University of* **Minnesota**

*The College of Science, Literature, and
the Arts*

Part I

Announcement of Courses for the Years
1929-1931



Vol. XXXII No. 19 April 24 1929

*Entered at the post-office in Minneapolis as second-class matter
Minneapolis, Minnesota*

*Accepted for mailing at special rate of postage provided for in section 1103,
Act of October 3, 1917, authorized July 12, 1918*

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

FACULTY

ADMINISTRATION

Lotus Delta Coffman, Ph.D., LL.D., President
William Watts Folwell, LL.D., President Emeritus
John B. Johnston, Ph.D., Dean, Professor of Neurology
John F. Downey, M.A., C.E., LL.D., Dean Emeritus
Edward E. Nicholson, M.A., Dean of Student Affairs
Joseph M. Thomas, Ph.D., Assistant Dean for the Senior College and Professor of English
William H. Bussey, Ph.D., Assistant Dean for the Junior College and Professor of Mathematics
Royal R. Shumway, B.A., Assistant Dean for Students' Work and Associate Professor of Mathematics

ANTHROPOLOGY

Albert Ernest Jenks, Ph.D., Professor and Chairman
Wilson D. Wallis, Ph.D., Professor

ARCHITECTURE

See the bulletin of the College of Engineering and Architecture.

ASTRONOMY

William O. Beal, Ph.D., Assistant Professor and Chairman
Francis P. Leavenworth,¹ M.A., Professor Emeritus
Clifford Crump, Ph.D., Professor

BACTERIOLOGY

See the bulletin of the Medical School.

BOTANY

J. Arthur Harris, Ph.D., Professor and Head
William S. Cooper, Ph.D., Professor
Carl O. Rosendahl, Ph.D., Professor
Josephine E. Tilden, M.S., Professor
George O. Burr, Ph.D., Associate Professor
Frederic K. Butters, Ph.D., Associate Professor
Rodney B. Harvey, Ph.D., Associate Professor
Ned L. Huff, M.A., Assistant Professor
Ethel Sue Horton, M.A., Instructor
Neil Hotchkiss, M.A., Instructor
Ethel M. Mygrant, M.S., Instructor

¹ Died, November 14, 1928.

Henry Oosting, M.S., Instructor
 Abraham Stoesz, M.A., Instructor
 Vernon Young, M.A., Instructor
 Martin L. Grant, B.A., Teaching Assistant
 Borghild Gunstad, B.S., Teaching Assistant
 Helen Foot, B.A., Assistant
 John W. Moore, B.S., Assistant
 Robert A. Phillips, Assistant
 Anna L. Sommer, Ph.D., Assistant
 Marion Wilder, B.S., Assistant
 Esther M. Wilson, B.A., Assistant

CHEMISTRY

See the bulletin of the School of Chemistry.

AGRICULTURAL BIOCHEMISTRY

See the bulletin of the College of Agriculture, Forestry, and Home Economics.

COMPARATIVE LITERATURE

Oscar W. Firkins, M.A., Professor

COMPARATIVE PHILOLOGY

Frederick Klaeber,¹ Ph.D., Litt.D., Professor and Head

DRAWING AND DESCRIPTIVE GEOMETRY

See the bulletin of the College of Engineering and Architecture.

ECONOMICS

See the bulletin of the School of Business Administration.

ENGLISH

Cecil A. Moore, Ph.D., Professor and Chairman
 Joseph W. Beach, Ph.D., Professor
 Martin B. Ruud, Ph.D., Professor
 Elmer E. Stoll,¹ Ph.D., Professor
 Joseph M. Thomas, Ph.D., Professor
 J. Douglas Bush, Ph.D., Associate Professor
 G. Tremaine McDowell, Ph.D., Associate Professor
 Elizabeth Atkins, Ph.D., Assistant Professor
 Muriel B. Carr,¹ Ph.D., Assistant Professor
 William P. Dunn, Ph.D., Assistant Professor
 L. Burtron Hessler, Ph.D., Assistant Professor
 James T. Hillhouse, Ph.D., Assistant Professor
 Elizabeth Jackson, Ph.D., Assistant Professor
 Charles W. Nichols, Ph.D., Assistant Professor

¹ Absent on leave, 1929-30.

Anna H. Phelan, Ph.D., Assistant Professor
 Emerson G. Sutcliffe,¹ Ph.D., Assistant Professor
 Francis S. Appel, M.A., Instructor
 Amy E. Armstrong, M.A., Instructor
 Herbert C. Behm, M.A., Instructor
 Fred S. Beers, B.A., Instructor
 Harold E. Briggs, M.A., Instructor
 Joseph A. Burns, M.A., Instructor
 Ruth Christie, M.A., Instructor
 John E. Davis, M.A., Instructor
 Lucille Curtis Deinard, M.A., Instructor
 Frances K. del Plaine, M.A., Instructor
 James M. Edmunds, M.A., Instructor
 Margaret Gable, M.A., Instructor
 Adah Grandy, B.L., Instructor
 Clifford Haga, B.A., Instructor
 Hoffman R. Hays, M.A., Instructor
 Harry D. Hoey, M.A., Instructor
 Frank M. Hursley, M.A., Instructor
 Charles Kerby-Miller, Ph.B., Instructor
 Winifred Lynskey, M.A., Instructor
 Jesse A. McFadyen, Ph.D., Instructor
 Edward Mallam, M.A., Instructor
 James T. Petri, B.A., Instructor
 Harlow C. Richardson, B.A., Instructor
 Isobel Spencer, M.A., Instructor
 Edgar W. Weaver, B.A., Instructor
 Allan E. Woodall, M.A., Instructor
 Ellsworth Barnard, B.S., Assistant
 Luther Becklund, B.A., Assistant
 Maurine Boie, B.A., Assistant
 Marvin Cragun, B.A., Assistant
 Miriam Deinard, B.A., Assistant
 John H. Jacobson, B.A., Assistant
 Frank L. Johnson, B.A., Assistant
 Elizabeth Kerr, M.A., Assistant
 Celia Knight, B.A., Assistant
 Edward L. McAdam, B.A., Assistant
 Izetta Robb, B.A., Assistant
 Hazel Ward, B.A., Assistant

ENTOMOLOGY AND ECONOMIC ZOOLOGY

See the bulletin of the College of Agriculture, Forestry, and Home Economics.

¹ Resigned, June 30, 1928.

FACULTY

5

FINE ARTS

Everard M. Upjohn, M.A., Assistant Professor

GEOGRAPHY

Darrell H. Davis, Ph.D., Professor and Head
Ralph H. Brown, Ph.D., Assistant Professor
Richard Hartshorne, Ph.D., Assistant Professor
Samuel N. Dicken, B.A., Instructor
Joseph R. Schwendeman, M.A., Instructor
Ethel V. Nelson, B.S., Assistant

GEOLOGY AND MINERALOGY

William H. Emmons, Ph.D., Professor and Head
Frank F. Grout, Ph.D., Professor
Clinton R. Stauffer, Ph.D., Professor
John W. Gruner, Ph.D., Associate Professor
George M. Schwartz, Ph.D., Associate Professor
George A. Thiel, Ph.D., Associate Professor
George R. Downs, B.A., Instructor
Carl E. Dutton, M.A., Instructor
Francis J. Pettijohn, M.A., Instructor
George R. Bergquist, Assistant
Fred Foreman, B.Sc., Assistant
Ralph E. Hockenson, B.A., Assistant
Hugh Kendall, M.A., Assistant
Francis G. Wells, B.S., Assistant

GERMAN

Samuel Kroesch, Ph.D., Professor and Chairman
Oscar C. Burkhard, Ph.D., Professor
Carl Schlenker,¹ B.A., Professor
George F. Lussky, Ph.D., Associate Professor
James Davies, Ph.D., Assistant Professor
Frederick L. Pfeiffer, Ph.D., Assistant Professor
Karl Ermisch, Ph.D., Instructor
Alvin E. Prottengeier, B.A., Instructor
Harry Velten, M.A., Instructor
Gina Wangsness, B.A., Instructor
Einar L. Berston, B.A., Teaching Assistant
Bertha M. Bertsch, B.A., Teaching Assistant
Charles A. Carlton, B.A., Teaching Assistant
Fred Gerstung, B.A., Teaching Assistant
Otto Herzog, M.A., Teaching Assistant
Marie Matt, B.A., Teaching Assistant

¹ Died, November 26, 1928.

GREEK

Charles A. Savage, Ph.D., Professor and Chairman
 John Corrin Hutchinson, B.A., Professor Emeritus
 Ethelyn Miller, B.A., Teaching Assistant

HISTORY

Guy Stanton Ford, Ph.D., Professor and Chairman
 Solon J. Buck, Ph.D., Professor
 Herbert Heaton, M.A., M.Com., Litt.D., Professor
 August C. Krey, Ph.D., Professor
 Lester B. Shippee, Ph.D., Professor
 Albert B. White, Ph.D., Professor
 Theodore Blegen, Ph.D., Associate Professor
 George M. Stephenson, Ph.D., Associate Professor
 Ernest S. Osgood, Ph.D., Assistant Professor
 Lawrence D. Steefel,¹ Ph.D., Assistant Professor
 Faith Thompson, Ph.D., Assistant Professor
 Alice F. Tyler, Ph.D., Assistant Professor
 Edward L. Harvey, M.A., Professorial Lecturer
 Olwen Kendall, M.A., Lecturer
 Gilbert N. Tucker, M.A., Instructor
 David H. Willson, Ph.D., Instructor
 Isabel R. Abbott, M.A., Teaching Assistant
 Einar J. Anderson, M.A., Teaching Assistant
 Jean R. Barnes, M.A., Teaching Assistant
 Harold Blinn, B.A., Teaching Assistant
 Verne E. Chatelaine, M.A., Teaching Assistant
 Geraldine Doheny, B.A., Teaching Assistant
 Gertrude Doxey, B.A., Teaching Assistant
 Harold Fink, B.S., Teaching Assistant
 Frank H. Heck, B.A., Teaching Assistant
 Herman Kahn, B.A., Teaching Assistant
 Edward M. Kane, B.S., Teaching Assistant
 Bernice LaFollette, B.S., Teaching Assistant
 Charles Lindsay, M.A., Teaching Assistant
 Horace T. Morse, B.A., Teaching Assistant
 Herman R. Muelder, B.S., Teaching Assistant
 Victor E. Pinkham, B.A., Teaching Assistant
 Cairns K. Smith, B.A., Teaching Assistant
 Mary A. Stites, M.A., Teaching Assistant
 Garland M. Taylor, B.A., Teaching Assistant
 Hellen D. Asher, M.A., Assistant
 Thomas E. Ennis, M.A., Assistant

¹ Absent on leave, 1929-30.

HOME ECONOMICS

See the bulletin of the College of Agriculture, Forestry, and Home Economics.

HUMAN ANATOMY

See the bulletin of the Medical School.

HUMAN PHYSIOLOGY

See the bulletin of the Medical School.

JOURNALISM

E. Marion Johnson,¹ M.A., Professor and Chairman
Thomas E. Steward, B.A., Assistant Professor
Robert W. Desmond, B.A., Instructor
Fred L. Kildow, B.A., Instructor
Kenneth Jacobson, B.A., Instructor
Bruce McCoy, B.A., Instructor
James Sutherland, B.A., Teaching Assistant

LATIN

Joseph B. Pike, M.A., Professor and Head
Robert V. Cram, Ph.D., Assistant Professor
Emily A. Babcock, M.A., Instructor

LIBRARY METHODS

Frank K. Walter, M.A., M.L.S., Professor
Ina T. Firkins, B.L., Associate Professor
Lura C. Hutchinson, B.A., Assistant Professor
Harold Russell, B.A., B.L.S., Assistant Professor
Clara F. Baldwin, B.A., Instructor
Della McGregor, B.A., Instructor
Harriet A. Wood, B.A., Instructor

MATHEMATICS

Raymond W. Brink, Ph.D., Professor and Chairman
William H. Bussey, Ph.D., Professor
William L. Hart, Ph.D., Professor
Dunham Jackson, Ph.D., Professor
Royal R. Shumway, B.A., Associate Professor
Anthony L. Underhill, Ph.D., Associate Professor
S. Elizabeth Carlson, Ph.D., Assistant Professor
Gladys E. C. Gibbens, Ph.D., Assistant Professor
James M. Earl, Ph.D., Instructor
Ella A. M. Thorp, B.A., Instructor
Borghild Gunstad, B.S., Teaching Assistant
Paul G. Hoel, B.A., Teaching Assistant

¹ Resigned, June 30, 1929.

Earl E. Mickelson, M.A., Teaching Assistant
 Cecil Phipps, Ph.D., Teaching Assistant
 Harry A. Pool, M.A., Teaching Assistant
 Myron Rosskopf, B.A., Teaching Assistant

MECHANICAL ENGINEERING

See the bulletin of the College of Engineering and Architecture.

MILITARY SCIENCE AND TACTICS

John H. Hester, Major, Infantry, Professor and Head,
 Kent Nelson, Colonel, Medical Corps, Assistant Professor and Head of
 the Medical Corps Unit
 Willis Shippam, Major, Coast Artillery, Assistant Professor and Head of
 the Coast Artillery Corps Unit
 Earl L. Hering, Major, Dental Corps, Assistant Professor and Head of
 the Dental Corps Unit
 Frederick S. Matthews, Captain, Infantry, Assistant Professor
 Don F. Pratt, Captain, Infantry, Assistant Professor
 Porter P. Wiggins, Captain, Infantry, Assistant Professor
 William G. Walker, Captain, Infantry, Assistant Professor
 Murray T. Davenport, Captain, Infantry, Assistant Professor
 Richard A. Ericson, First Lieutenant, Coast Artillery Corps, Assistant
 Professor
 Vincent J. Conrad, First Lieutenant, Infantry, Assistant Professor
 Harlan N. Hartness, First Lieutenant, Infantry, Assistant Professor
 John F. Cassidy, First Lieutenant, Coast Artillery Corps, Assistant Professor
 Roy W. Minckler, First Lieutenant, Signal Corps, Assistant Professor
 Alfred Brandt, Master Sergeant, Infantry, Instructor
 Harry E. Strider, Master Sergeant, Signal Corps, Instructor
 Aubrey R. Dunkum, Technical Sergeant, Coast Artillery Corps, Instructor
 John Coop, Sergeant, Infantry, Instructor
 Ernest R. Mylk, Sergeant, Coast Artillery Corps, Instructor

MUSIC

Carlyle M. Scott, Professor and Chairman
 Donald N. Ferguson,¹ M.A., Professor
 Earle G. Killeen, M.M., Professor
 Gertrude Hull, Associate Professor
 William Lindsay, Associate Professor
 George H. Fairclough, F.A.G.O., M.Mus., Assistant Professor
 Blanche Kendall, Assistant Professor of Piano
 Gertrude Reeves, Assistant Professor
 Clyde Stephens, Assistant Professor of Piano
 Harold Ayres, Instructor in Violin
 Corrine F. Bowen, Instructor in Voice
 Alexander Duvoir, Instructor in Oboe

¹ Absent on leave, 1929-30.

Johan Egilsrud, B.S., Instructor
 Christian Erck, Instructor in Cello
 William Faetkenhauer, Instructor in Tympani
 Roger Gauthier, Instructor in Oboe
 Yvonne Gauthier, Instructor in Cello
 Georges Grisez, Instructor in Clarinet
 Harrison W. Johnson, Instructor in Piano
 Harry Larusson, Instructor in Trumpet
 Ernest Liegl, Instructor in Flute
 Richard Lindenhahn, Instructor in French Horn
 Engelbert Roentgen, Instructor in Cello
 Karl Scheurer, Instructor in Violin
 Miles Sery, Instructor in Trumpet
 Agnes R. Snyder, Instructor in Voice
 Gilbert Stinson, Instructor in Saxophone
 Robert Swanson, Instructor in Bassoon
 Kate M. Twichell, Instructor in Piano
 Mary Malcolm, B.S., Assistant

ORIENTATION

Richard M. Elliott, Ph.D., Professor of Psychology
 Edward H. Sirich, Ph.D., Professor of Romance Languages
 J. William Buchta, Ph.D., Associate Professor of Physics
 Frederic K. Butters, Ph.D., Associate Professor of Botany
 George A. Thiel, Ph.D., Associate Professor of Geology
 Richard Hartshorne, Ph.D., Assistant Professor of Geography
 Mary J. S. Kuypers, Ph.D., Instructor

PHILOSOPHY

Norman Wilde, Ph.D., Professor and Head
 David F. Swenson,¹ B.S., Professor
 George P. Conger, Ph.D., Associate Professor
 Alward E. Brown, Ph.D., Instructor
 Netta Wilson, B.A., Assistant

PHYSICAL EDUCATION FOR MEN

See the bulletin of the College of Education.

PHYSICAL EDUCATION FOR WOMEN

See the bulletin of the College of Education.

PHYSICS

Henry A. Erikson, Ph.D., Professor and Chairman
 Edward U. Condon, Ph.D., Professor of Theoretical Physics
 Louallen F. Miller, Ph.D., Professor
 John T. Tate, Ph.D., Professor

¹ Absent on leave, 1929-30.

Anthony Zeleny, Ph.D., Professor
 J. William Buchta, Ph.D., Associate Professor
 Joseph Valasek, Ph.D., Associate Professor
 John H. Van Vleck,¹ Ph.D., Associate Professor
 Arthur J. Ahearn, B.A., Teaching Assistant
 Walker Bleakney, B.S., Teaching Assistant
 Marvin Falgatter, B.A., Teaching Assistant
 Lawrence Hafstad, B.S., Teaching Assistant
 Clarence Hahlstrom, B.A., Teaching Assistant
 William B. Haliday, B.A., Teaching Assistant
 Sigmund Hammer, B.A., Teaching Assistant
 Allan Hemmingway, B.A., Teaching Assistant
 Floyd Leidal, B.S., Teaching Assistant
 John Liska, B.A., Teaching Assistant
 William W. Lozier, B.A., Teaching Assistant
 Herbert Nelson, B.S., Teaching Assistant
 Paul Nurnberger, B.A., Teaching Assistant
 Kenneth Ogle, M.A., Teaching Assistant
 Floyd Ostensen, M.S., Teaching Assistant
 Ralph R. Palmer, B.A., Teaching Assistant
 Lawrence T. Sachtleben, B.S., Teaching Assistant
 Philip T. Smith, B.A., Teaching Assistant
 Wilfred W. Wetzel, B.A., Teaching Assistant

PLANT PATHOLOGY

See the bulletin of the College of Agriculture, Forestry, and Home Economics.

POLITICAL SCIENCE

William Anderson, Ph.D., Professor and Chairman
 Cephas D. Allin,² LL.B., M.A., Professor
 Morris B. Lambie, Ph.D., Professor
 Harold S. Quigley,³ Ph.D., Professor
 Jeremiah S. Young, Ph.D., Professor
 Oliver P. Field, M.A., S.J.D., Associate Professor
 Harold F. Kumm,¹ M.A., S.J.D., Associate Professor
 Herman C. Beyle,¹ Ph.D., Assistant Professor
 Lennox Mills, Ph.D., Assistant Professor
 Allan F. Saunders, Ph.D., Assistant Professor
 Castle M. Brown., J.D., Ph.B., Lecturer
 John P. Dalzell, B.A., LL.B., Lecturer
 Benjamin Palmer, M.A., LL.B., Lecturer
 Joseph R. Starr, M.A., Instructor

¹ Resigned, June 30, 1928.

² Died, October 22, 1927.

³ Absent on leave, winter quarter, 1929-30.

Paul Christopherson, B.A., Teaching Assistant
 Franklin Gray, B.A., B.C.L., Teaching Assistant
 Edwin Hetland, M.A., Teaching Assistant
 Edwin O. Stene, B.A., Teaching Assistant
 Harold E. Verrall, B.A., LL.B., Teaching Assistant
 Ambrose Fuller, B.A., LL.B., Assistant
 Frank W. Hanft, LL.B., Assistant
 Dorothy Houston, B.A., Assistant
 Francis J. Putnam, B.A., Assistant
 Lloyd Wilford, LL.B., Assistant

PREVENTIVE MEDICINE AND PUBLIC HEALTH

See the bulletin of the Medical School.

PSYCHOLOGY

Richard M. Elliott, Ph.D., Professor and Chairman
 Donald G. Paterson, M.A., Professor
 Charles Bird, Ph.D., Associate Professor
 Edna Heidbreder, Ph.D., Associate Professor
 Arthur G. Bills,¹ Ph.D., Assistant Professor
 William Heron, Ph.D., Assistant Professor
 Kate Hevner, Ph.D., Assistant Professor
 Miles Tinker, Ph.D., Assistant Professor
 Howard Longstaff, M.A., Lecturer
 Harold C. Carter, M.A., Instructor
 Walter G. McAllister, B.A., Instructor
 Marion Myer, Ph.D., Instructor
 Gaige Paulsen, B.A., Instructor
 Peter Schellenberg, B.A., Instructor
 Florence Armstrong, B.A., Teaching Assistant
 Mildred Burlingame, M.A., Teaching Assistant
 Lewis E. Drake, B.A., Teaching Assistant
 Chester Garvey, M.A., Teaching Assistant
 Verona Green, B.A., Teaching Assistant
 Roger Loucks, B.S., Teaching Assistant
 Eunice Matheson, B.A., Teaching Assistant
 I. Emerick Peterson, B.S., Teaching Assistant
 Edward A. Rundquist, B.A., Teaching Assistant
 Keith Sward, B.A., Teaching Assistant
 David Turtleaub, M.A., Teaching Assistant
 Ruth M. Warnke, B.A., Teaching Assistant

ROMANCE LANGUAGES

Everett W. Olmsted, Ph.D., Litt.D., Professor and Head
 Francis B. Barton, Docteur l'Université de Paris, Professor
 Irville C. LeCompte, Ph.D., Professor

Ruth S. Phelps,¹ Ph.D., Professor
 Colbert Searles, Ph.D., Professor
 Edward H. Sirich, Ph.D., Professor
 Carlos V. Arjona, Ph.D., Associate Professor
 Herbert E. Cleifton, Ph.D., Assistant Professor
 Jay K. Ditchy, Ph.D.,² Assistant Professor
 William L. Fichter,² Ph.D., Assistant Professor
 Jules T. Frelin, B.A., Assistant Professor
 Alexander H. Krappe,² Ph.D., Assistant Professor
 Paul Morand,³ Licencie ès Lettres, Assistant Professor
 Elizabeth Nissen, Ph.D., Assistant Professor
 Jean Boyer, Licencie ès Lettres, Professorial Lecturer
 Solomon Delson, Ph.B., Professorial Lecturer
 George P. Borglum, B.S., Instructor
 Emmert Brackney, M.A., Instructor
 Marguerite Guinotte, M.A., Brevet Superieur, Certificat d'Aptitude Peda-
 gogique, Instructor
 Clinton C. Humiston, B.S., Instructor
 Mabel C. Johnson, M.A., Instructor
 Emilio Le Fort, M.A., Instructor
 James McDowell, M.A., Instructor
 Channing MacFadon, M.A., Instructor
 John H. Owens, M.A., Instructor
 Robert E. Pike, B.A., Instructor
 Anne Blegen, B.A., Teaching Assistant
 Olive Felt, B.A., Teaching Assistant
 Grace Speelman, B.S., Teaching Assistant

SCANDINAVIAN

Gisle C. Bothne,⁴ M.A., Professor
 Andrew A. Stomberg, M.S., Professor
 Alfred M. Carlson, B.A., Instructor
 Thorvald B. Madsen, M.A., Instructor
 Ruth G. Westerlund, B.S., Assistant

SOCIOLOGY AND SOCIAL WORK

F. Stuart Chapin,⁵ Ph.D., Professor, Chairman, and Director of the Training
 Course for Social and Civic Work
 Pitirim A. Sorokin, Dr. of Soc., Professor
 Edwin H. Sutherland,⁶ Ph.D., Professor and Acting Chairman
 Malcolm Willey, Ph.D., Professor
 Robert W. Murchie, Ph.D., Associate Professor

¹ Resigned, December 31, 1928.

² Resigned, June 30, 1928.

³ Resigned, November 15, 1928.

⁴ Retired, June 30, 1929.

⁵ Resigned, June 30, 1929.

⁶ Absent on leave, 1929-30.

FACULTY

13

Carle C. Zimmerman, Ph.D., Associate Professor
Ross L. Finney, Ph.D., Assistant Professor
Elizabeth G. Gardiner, B.S., Assistant Professor
Gustave A. Lundquist, Ph.D., Assistant Professor
Mildred D. Mudgett, Ph.D., Assistant Professor
Joanna C. Colcord, M.S., Professorial Lecturer
Otto F. Bradley, B.A., Lecturer
Monica K. Doyle, B.A., Lecturer
Alice Leahy, M.A., Lecturer
Belle Mead, M.A., Lecturer
Pearl C. Salsberry, B.A., Lecturer
Edwin F. Waite, B.A., LL.M., Lecturer
Mary P. Wheeler, Lecturer
Irene Barnes, M.A., Instructor
Anne Culligan, B.A., Instructor
Marion Day, B.A., Instructor
Anne Fenlason, M.A., Instructor
Irwin A. Hammer, B.A., Instructor
Frank Harris, M.A., Instructor
Amaretta B. Jones, B.A., R.N., Instructor
Paul H. Landis, M.A., Instructor
Elio Monachesi, M.A., Instructor
Edward A. Taylor, M.A., Instructor
George B. Vold, M.A., Instructor
C. Arnold Anderson, B.A., Teaching Assistant
Conrad Taeuber, B.A., Teaching Assistant
Robert W. Hankins, B.A., Assistant
Edgar A. Schuler, B.A., Assistant

SPEECH

Frank M. Rarig, M.A., Professor and Chairman
Bryng Bryngelson, M.A., Assistant Professor
F. Lincoln D. Holmes, Ph.D., Assistant Professor
Wayne L. Morse,¹ M.A., Assistant Professor
Edward Staadt, B.A., Assistant Professor
Howard Gilkinson, M.A., Instructor
Melba Hurd, B.A., Instructor
Franklin H. Knower, M.A., Instructor
O. W. Rush, B.A., Teaching Assistant
Verna Steele, B.S., Teaching Assistant
Elizabeth Gilliland, B.A., Assistant

ZOOLOGY

William A. Riley, Ph.D., Professor and Head
Royal N. Chapman, Ph.D., Professor
Dwight E. Minnich, Ph.D., Professor

¹ Resigned, June 30, 1929.

Henry F. Nachtrieb, B.S., Professor Emeritus
Thomas S. Roberts, M.D., Professor
Charles P. Sigerfoos,¹ Ph.D., Professor
Jerry Wodsedalek, Ph.D., Professor
Adolph Ringoen, Ph.D., Associate Professor
Ralph Dawson, M.A., Assistant Professor
Maynard S. Johnson, Ph.D., Assistant Professor
Clarence Mickel, Ph.D., Assistant Professor
Heman Ibsen, Ph.D., Professorial Lecturer
Alexander Weinstein, Ph.D., Professorial Lecturer
John A. Cederstrom, Ph.B., Instructor
Robert N. McCormick, M.S., Instructor
Ethel Slider, B.S., Instructor
Whiteford L. Baker, B.S., Teaching Assistant
Donald C. Boughton, B.S., Teaching Assistant
Reed O. Christenson, B.S., Teaching Assistant
Selma Crow, B.S., Teaching Assistant
Fannie Harmon, M.A., Teaching Assistant
Alexander C. Hodson, B.S., Teaching Assistant
William B. Owen, B.A., Teaching Assistant
Reginald Ozburn, B.S., Teaching Assistant
George M. Ruggles, B.S., Teaching Assistant
Wayland A. Sands, B.S., Teaching Assistant
John Stanley, B.S., Teaching Assistant
William C. Stehr, B.S., Teaching Assistant
Franklin G. Wallace, B.A., Teaching Assistant
Charlotte Dawley, M.S., Assistant
Gertrude Fink, B.A., Assistant
Emily P. Fried, Ph.D., Assistant
Byron Hall, B.A., Assistant
Grace E. Jones, Assistant
Solomon Loewen, B.A., Assistant
Wilson McGrath, B.S., Assistant
Rosel Seashore, B.A., Assistant
Robert E. Wall, M.S., Assistant

¹ Absent on leave, 1929-30.

GENERAL INFORMATION

1. *Admission to the freshman year.*—Students are admitted to this college either by certificate from an accredited secondary school or by examination. For details concerning the requirements in either case consult the bulletin of general information, pages 27 to 29.

2. *Examination in English.*—All students registering for English A-B-C or Composition 4-5-6 are required to take a series of tests in English. Any student in either course who fails to pass this examination will be required to register with the Extension Division for subfreshman composition for as many quarters as may be necessary. During this time he can be registered in this college for not more than fourteen credits.

On the basis of these tests students will be further divided into three groups: (1) those of whom no further work in English is required; (2) those who will be allowed to register for English A-B-C; (3) those who will be restricted to a three-credit course in composition.

3. *Exemption from requirement in English.*—Those students who meet certain standards of competence in the tests mentioned above will be exempted from required work in English. These students may register for any courses in English, Composition, or Speech, for which the only prerequisite is English A-B-C or Composition 4-5-6.

4. *Adult special students.*—Persons of maturity (at least 24 years of age) who desire to pursue a special and limited course of study may be admitted by the Students' Work Committee as adult special students. The registration of such students will be under the control of the committee.

Application for registration as an adult special student should be made not later than September 15, December 15, or March 15, depending upon the quarter the candidate desires to enter the college.

5. *Admission to advanced standing.*—Attention is called to the following rules governing students entering this college with advanced standing from some other institution.

- a. Credits of advanced standing are provisional and are finally adjusted upon the following basis: Any student who, after one year's residence, has failures in nine credits or more shall lose all advanced credit except in those courses which have been continued in this college with a grade of at least C. Credits forfeited in this way can be recovered only by special examination.
- b. A student entering with advanced standing must earn an average of one honor point per credit for all work in this college counted for graduation or for admission to the Senior College.
- c. A student admitted to the Senior College and failing to meet this requirement may be excluded from the Senior College at any time after the first quarter.

6. *Examinations for advanced standing.*—Any student upon first registration at the University may, with the approval of the Students' Work Committee, be allowed without charge to take examinations for advanced

standing in subjects in which the student declares himself to be prepared. Such examinations must be taken within the first six weeks of residence.

7. *Examinations for credit.*—Credit for work done outside of class may be obtained by taking special examinations. Application should be made to the assistant dean for students' work.

8. No student may receive by means of such an examination, more than 12 credits in one department, or more than a total of 18 credits, toward graduation.

9. No credit in beginning language courses may be gained by special examination.

10. *Registration.*—Students are required to register on the days announced in the university calendar. Only in very exceptional circumstances will a student be allowed to register thereafter, and no student will be enrolled after the first week of the quarter. (See also section 13, Penalty Fees.)

11. No student will receive credit for work for which he is not properly registered.

12. *Fees.*—Tuition fee (per quarter)

Residents of Minnesota.....	\$20.00
Non-residents	30.00
Credit hour tuition fee (unclassified students, auditors, and others carrying less than full work)	
Residents of Minnesota.....	1.75
Non-residents	2.50
Incidental fee (per quarter).....	6.00
Deposit ¹ (first quarter only).....	5.00
Military deposit (required of all students taking military drill)	10.00
Special fees	
Examination for removal of condition.....	1.00
Examination for credit (after the first quarter in residence)	5.00
Special examination	5.00
Laboratory deposit (required of students registered for courses in chemistry)	5.00
Graduation fee	10.00
Music fees (in addition to tuition) for those electing music	
Class fees per quarter	
Class lessons (three students in each class) two hours per week	45.00
One class and one individual lesson per week.....	55.00
Two individual lessons per week (one-half hour).....	65.00
One individual lesson per week.....	35.00
Practice fees	
Organ (per hour).....	0.20 to 0.40
Piano ² (per quarter).....	5.00
(\$.50 per quarter for each additional hour per week)	

¹ Such charges as may be incurred for lockers, library penalties, laboratory breakage, etc., will be deducted from the amount of this deposit and the balance will be refunded by mail some time after the close of the college year.

² Six hours per week.

13. *Penalty fees.*—The penalty fee for late registration, late change of registration, or late payment of fees is two dollars (\$2), with one dollar (\$1) additional for each day of delay after classes begin, provided that no student shall pay more than twelve dollars (\$12) of penalty in any given quarter.

14. *Auditors.*—Under certain conditions stated below students may be enrolled as auditors and may hear lectures and class discussions regularly without being required to do the work of the course. No regular student may be admitted to classes as an auditor until his senior year.

15. Any mature person not a regular student may be admitted as an auditor to any course under the following regulations:

- a. He shall secure the written approval of the dean and of the instructor in charge of the course.
- b. He shall present such approval to the registrar and pay the usual fee charged for regular membership in such a course. See section 12.

16. Attendance as an auditor does not entitle one to credit or to admission to regular examinations in the course.

17. Any senior whose high scholastic standing enables him to carry a small program may register as an auditor under the same regulations.

18. *Grades.*—Four grades, A, B, C, and D, are given for work of varying degrees of merit. The grade D permits a student to register for continuation or dependent courses; and work completed with this grade is counted toward graduation when combined with work of A or B grade in other courses. The grade C indicates work of a quality acceptable for graduation; the grades B and A are given for work of higher degrees of excellence.

Work of inferior grade is marked E (condition) or F (failure). Work which is of at least D grade but, because of circumstances beyond the student's control, not complete, may be marked I (incomplete).

19. *Credits and honor points* are used for convenience in indicating amount and quality of work.

Amount of work is expressed in *credits*. Each credit demands on the average three hours a week of a student's time; that is, one recitation with two hours of preparation, or three hours of laboratory work.

Quality of work is indicated by *honor points*. Honor points are assigned to the various grades on the assumption that work of a quality acceptable for graduation is graded at least C. (See section 18.) Each credit with the grade of C carries one honor point; each credit with the grade of B, two honor points; each credit with the grade of A, three honor points. The grade of D carries no honor points. The grade of F carries minus one honor point per credit. The penalty cannot be removed by repeating the course with a passing grade.

A student who maintains an average of one honor point per credit is proceeding normally to fulfill the requirements for graduation or for admission to the professional schools. By maintaining an average better than C,

a student is able to reduce the amount of work which he is required to complete. (See sections 34 to 36.)

20. *The grade I (incomplete)* cannot be given when the work not completed represents more than one fourth of the quarter's work.

21. An *incomplete* not removed before the end of the first month of the student's next quarter in college becomes a *condition*. The Students' Work Committee may, in special cases, extend this time limit.

22. *The grade E (condition)* is a temporary grade, representing a deficiency which may be removed without repeating the course. A student who has received a condition in a course may register for the continuation or dependent course the following quarter.

23. *Removal of conditions*.—Conditions may be removed by additional work and an examination or, in certain cases, by satisfactory work in the next quarter of the course.

24. In English (courses in composition), Geology, German, Geography, Greek, History, Journalism, Latin, Library Instruction, Music, Physical Education for Women, Physics, Political Science, Scandinavian, Speech, and Zoology, conditions may sometimes be removed by passing a continuation course with a grade of C or better, in which case the grade of the first quarter will be recorded as D. A student who desires to remove a condition in this way must obtain the approval of the department, and must notify the registrar's office of his intention within the first week of the quarter. No student who has already failed in the condition examination is permitted to remove the condition by this second method.

25. In the following departments, conditions may be removed only by examination: Anthropology, Architecture, Astronomy, Botany, Chemistry, Comparative Literature, Comparative Philology, Drawing, Economics, English (courses in literature), Fine Arts, Mathematics, Orientation, Philosophy, Physical Education for Men, Psychology, Romance Languages, and Sociology.

26. The permanent grade resulting from the removal of a condition may in no case be higher than C.

27. Examinations for the removal of conditions incurred during the fall and winter quarters are given during the first thirty days of the succeeding quarter. Examinations for the removal of conditions incurred during the spring quarter are given the week before the opening of the fall quarter.

28. A student who desires to take a condition examination must notify the registrar in writing at least three days before the date scheduled for the examination. Any student failing to give such notice will not be allowed to take the examination.

29. A condition not made up within one quarter of residence becomes a failure subject to the rules governing failures.

30. *The grade F (failure)* represents a deficiency so serious that the student must repeat the course in order to obtain credit therein.

31. A student receiving a failure in any course shall not be allowed to pursue the continuation of that course the following quarter.

32. Any student receiving a failure in a course which is required in his curriculum must repeat the course the next time it is offered.

33. No course for which a student has received credit may be repeated by him to raise his grade.

34. *Quality credit.*—For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.

35. This regulation applies only to the total number of credits required. It does not apply to other specific requirements of the student's curriculum. It is in force as regards (a) admission to the Senior College, the College of Education, and the School of Business Administration, (b) graduation from the general course and from the special courses leading to the degrees of bachelor of arts and bachelor of science, and (c) the work done *in this college* in the following combined arts and professional courses: Arts and Law, Arts and Medicine, Science and Medicine, and Arts and Nursing.

36. This regulation is based on the well-known fact that students of high scholarship have accomplished more than those who have poorer records. Students of higher attainment are thus given the opportunity of completing the work for the B.A. degree in less than four years and entering earlier on their graduate work. Seniors with high scholastic standing are allowed the privilege of visiting classes¹ and of reading under direction; and students who are handicapped by outside work or poor health can thus carry less than full work and still make a normal advance toward graduation.

37. *Junior and Senior colleges.*—The Junior College, consisting of the first two years, offers instruction in the fundamental branches which are required in preparation for the courses leading to the degrees B.A. and B.S., and for the professional schools. It is expected also that its courses of study will offer preparation for various vocations or will provide a general education for those who do not complete a longer course.

The Senior College, consisting of the third and fourth years, is concerned primarily with the advanced instruction leading to the Bachelor's degrees.

Each college is under the general direction of an assistant dean. See directory of Administrative and Departmental Offices in Part II of this bulletin.

38. Students who are candidates for a degree are listed as freshmen when they have less than 39 credits; as sophomores when they have 39 credits or more. Students in the Senior College are registered as juniors until they have earned 130 credits, and as seniors thereafter.

39. The college distinguishes between junior college courses, intended primarily for freshmen and sophomores, and senior college courses, intended primarily for juniors and seniors.

40. Senior college courses appear in the announcement as open to "juniors and seniors" or to "juniors, seniors, and graduates." The prerequisites for these courses are governed by the following rule: If the prerequisite courses are open to freshmen in their first and second quarters, they must amount

¹ See sections 15 and 17.

to at least fifteen credits; if not, they must amount to at least ten credits. (Certain courses restricted to juniors and seniors are not senior college courses in this sense. Every such course is specially marked in the program.)

41. Senior college courses may be taken by sophomores who have had one honor point per credit in their previous work, and have completed with a grade of C the prerequisites for the courses desired; but courses which carry graduate credit may not be taken earlier than the third quarter of the student's sophomore year.

42. *Election of subjects in other colleges or schools.*—In the senior year, any student registered in the College of Science, Literature, and the Arts may elect not to exceed 6 credits per quarter in any other college or school of this University, provided that (1) the courses are indicated by the dean of the college or school in question and approved by the Advisory Committee of this college as suitable for such election; and (2) no duplication of subject occurs. Courses so taken are counted toward the bachelor of arts degree on the same terms as those taken in the College of Science, Literature, and the Arts.

By resolution of the Board of Regents students in any college electing work in any other college must complete the work so elected before they are allowed to come up for the degree for which they are candidates.

Seniors desiring further information regarding courses open should consult the assistant dean for the Senior College.

43. *Faculty advisers for students in the Junior College.*—The junior college office (106 Folwell Hall) is open daily throughout the year to students who wish information or advice. Any student is invited to call at this office and make an appointment to meet an adviser. The dean of the college, the assistant deans, and several faculty advisers are ready to consult with students about any matter that pertains to their college work.

The selection of studies, methods of study, the selection of a vocation and how to prepare for it, living conditions, outside activities, difficulties in adjusting themselves to the conditions and requirements of college life and work, arrangement of courses of study to meet special needs, special opportunities and facilities for those students whose superior native gifts enable them to accomplish more or to go more rapidly than the average, are some of the problems upon which students are constantly seeking advice. In general the desire of the advisers is to help the individual student to make the most of his opportunities while in college.

The faculty advisers of the whole University are organized into a body of advisers who will make the information and experience gained in all colleges available for the benefit of the students of each college.

44. *In the Senior College.*—When the student has chosen his major subject, he is assigned by the department in charge of that subject to a major adviser who has oversight of all his scholastic work in the Senior College.

GENERAL REGULATIONS

Note.—*Students are held individually responsible for the information contained in these pages. Failure to read and understand these regulations will not exempt a student from whatever penalties he may incur.*

1. *Number of credit hours.*—Students must elect at least 13 credits (exclusive of physical education) of work a quarter. To take less than that number, a student must secure permission from the Students' Work Committee.

2. Students ordinarily may not elect more than 17 credits (exclusive of physical education). After two quarters of residence a student may register for 18 credits provided he has an average of $1\frac{1}{2}$ honor points per credit for the two quarters *previous to the time of registration*, and no condition or failure for the quarter immediately preceding registration. A student carrying 18 credits may be required to revise his program if his work shows a serious decline.

3. *Extension and correspondence courses.*—No student enrolled in the college will be allowed to carry work in the Extension Division without permission of the Students' Work Committee. No student may enroll for an extension course if this would increase his credits beyond the maximum allowed.

4. Credits received in University Extension courses are counted as credits in this college only after the student has completed one year of work in the college.

5. *Course in practical music.*—Courses in practical music are ordinarily not open to freshmen and sophomores except those working for a major in music.

After one quarter's residence with satisfactory work, any student carrying a regular schedule in this college may, with the permission of the assistant dean for students' work, take courses in practical music in the Extension Division without credit. This privilege may be withdrawn whenever the student falls below grade in any of his work.

6. *Physical education.*—All men are required to complete Physical Education 1-2-3 or its equivalent. This work should be done in the freshman year. All women are required to complete Physical Education 1-2-3 and three quarters of work in courses open to sophomores. This work should be finished before the beginning of the junior year.

Men entering with forty-five credits of advanced standing are excused from Physical Education 1-2-3. Women entering with advanced standing should consult the head of the department.

7. Physical education may be postponed only by petition. After two quarters of postponement, no petitions will be approved, and this requirement will take precedence over requirements in other departments.

8. *Military drill.*—All men are required to register for military drill during their first two years and to complete satisfactorily six quarters of drill.

A student must register for military drill every quarter until the requirement is completed, unless excused by the dean of student affairs. No other office has authority to permit a student to postpone drill.

Students entering with 90 credits of advanced standing are not required to drill. Students with 45 credits, or with more than 45 credits but less than 90 credits, of advanced standing must complete three quarters of drill.

9. *Afternoon work.*—All freshmen and sophomores are required to elect approximately one third of their work in the afternoon.

10. *Residence.*—To secure a degree from this college a student must earn at least 45 credits in residence at this college. If the term of residence is only one year, the year must be the senior year; and in any case, a student must spend two "quarters" of his senior year in residence.

11. *Habitual bad English.*—Any student who either in speaking or in writing, habitually uses bad English shall be reported by his instructor to the dean with all available evidence. If the dean considers this evidence sufficient, he will require the student to take without credit such further work in composition as the chairman of the Department of English may specify.

12. *Changes in registration.*—After classes have begun, no changes in registration other than necessary changes, may be made without permission of the Students' Work Committee.

13. No student may drop out of class without permission of the Students' Work Committee. Students are warned that failure to obey the regulation in this paragraph is likely to result in their exclusion from college.

14. When a student's registration in any subject is cancelled at his own request within the first two weeks of any quarter, no standing is recorded. After that time a record of his work is obtained from his instructor. Work of the grade of D or higher will be cancelled without grade; work below the grade of D will be recorded as "dropped with the grade of F."

15. If a student is in any doubt regarding his registration or desires to make any change in it, he should consult his major adviser, the assistant dean of his college, or the chairman of the Students' Work Committee.

16. *Absences.*—No unexcused absences are to be regarded as legitimate. Both tardiness and absence are dealt with by the individual instructor on the assumption that each student is expected to do the full work of the class.

17. *Penalties for excessive absence.*—Any junior college student who has unexcused absences (in no case less than two) equal to the number of credits in the course, will be dropped from the class with a record of failure in the course.

Any senior college student whose absences in any course exceed one sixth of the scheduled recitations of the course, will not be admitted to the final examination in that course without permission of the Students' Work Committee. Any student thus excluded will receive a failure for the course.

18. A student absent for any reason whatsoever is expected to do the full work of the course. He must make up work lost through delay in registration as in the case of any other absences.

19. *Excuses.*—Absences can be excused only by the assistant dean for students' work. A student absent because of illness should secure a statement from the Health Service, if he has been under its care, or from some responsible person who had knowledge of his illness. A student absent for any other reason should secure from some person in a position to know the facts a statement as to the need of absence. (Women may secure such statements from the dean of women.)

These statements need not be presented to the assistant dean for students' work, until the instructor notifies the student that he has accumulated sufficient absences to bring the case under the regulation.

20. *Delinquent students.*—Continued residence in the college is conditioned upon reasonable success in the student's work. Any student who does not make satisfactory progress in the course in which he is registered may be placed on probation by the Students' Work Committee.

21. No student is considered to have a wholly satisfactory standing who fails to secure in the course of any year the normal advance of one honor point for each credit for which he is registered.

22. *Probation.*—A student in the Junior College will be placed on probation if at the close of any quarter or at the time of the midquarter report he is below passing grade in fifty per cent of his work. A student in the Senior College will be placed on probation if he is below passing grade in forty per cent of his work.

23. A student on probation is in serious danger of being excluded from college if his work does not show immediate and rapid improvement. Subject to the regulations hereinafter stated, the condition and length of the probation are determined by the Students' Work Committee.

24. With the exception of students who refuse to take a serious interest in their work, no student will be excluded from college until he has been on probation at least six weeks.

25. The period of probation continues not more than two quarters. It may be extended if the committee is convinced that failure to show marked improvement is due to causes (other than incapacity) over which the student has no control, and that these causes may reasonably be expected to disappear.

26. Students excluded from this college shall be recorded as (a) transferred, (b) discontinued, or (c) dropped.

a. *Transferred.*—Students whose attitude toward their work is satisfactory, but who evidently are pursuing the wrong course, may be transferred to another college at the close of any quarter with the approval of the two colleges concerned and the dean of student affairs.

b. *Discontinued.*—Students who are apparently pursuing the right course, but have been handicapped by conditions over which they have no control (ill health, necessary outside work, etc.) may be required to discontinue their registration until the committee is satisfied that the conditions under which they work are bettered. When such discontinuance takes place, at any time other than the

end of the quarter, the courses for which the student is registered are recorded as cancelled without grade.

- c. *Dropped*.—Students who have clearly shown by their records that they are irresponsible, and who have failed to meet the terms of their probation, shall be dropped.

27. *Readmission*.—Students excluded from college shall be allowed to return only with the permission of the Students' Work Committee.

- a. Students classified as discontinued must present evidence that the conditions which hindered their work have been remedied.
- b. Students who have been dropped may be required to remain out of college until the term of the next year corresponding to that in which the delinquency occurred. Such students must present satisfactory evidence that they have been employed in an occupation demanding intelligence and responsibility, or have successfully pursued subjects of an approved character. At the time when the student is dropped the Students' Work Committee will inform him what type of studies will be accepted for readmission.

28. The cancellation of a student's registration, of his own accord, will not affect his status as a delinquent student or the terms of his readmission. When a student leaves college he will be notified by the registrar's office of his status under these regulations.

29. Students who return under the provision of section 27 will be registered on probation. Such students may be dropped at any time that their work is unsatisfactory to the Students' Work Committee.

30. *Eligibility*.—A student who is ineligible because of a condition may become eligible by removing the condition.

A student who is ineligible because of failure in a course required for graduation may become eligible (a) by repeating the course with a passing grade, or (b) by earning an average of one honor point per credit on a program of at least fifteen credits during the quarter immediately preceding participation. The two terms of a Summer Session may count as a quarter for this purpose.

A student who is ineligible because of a failure in a course not required for graduation may become eligible by either of the above methods or by completing one full year of work.

31. *Senior examinations*.—The grade of a senior about to graduate will be determined by an instructor without special final examination, provided that the student's work in the course is C or above, one week previous to the date upon which senior grades are due, and provided that, at the beginning of his last quarter, the student had an average of at least one honor point per credit hour. Otherwise, the student will be given a special final examination.

32. *Petitions*.—A student who wishes exception made to any rule of the college should present his request in writing to the Students' Work Committee. Petition blanks may be obtained at 219 Administration Building or 106 Folwell Hall.

Every student who desires to be heard in regard to his petition, will be given such an opportunity by the committee.

COURSES OF STUDY

A student may, while registered in the College of Science, Literature, and the Arts, pursue one of the following courses.¹ These curricula are subject to revision by action of the faculties of the colleges concerned. For revised statements for the year 1930-31, it will be necessary to consult Part II of the bulletin for that year.

Courses given within this college:

1. A general course leading to the degree of bachelor of arts.
2. Special courses leading to the degree of bachelor of arts.
 - a. General Course with a major in music.
 - b. Course in Training for Diplomatic and Consular Service.
3. Special courses leading to the degree of bachelor of science.
 - a. Course in Library Training.
 - b. Course in Hospital Library Service.
 - c. Course for Medical Technicians.
 - d. Course in Public Health Training.
 - e. Course in Social and Civic Work.
4. Courses preparing for admission to the School of Business Administration, College of Dentistry, College of Education, the course in Interior Architecture in the College of Engineering and Architecture, the Law School, and the College of Pharmacy.
5. A four-year course leading to the degree either of bachelor of arts or of bachelor of science with special training in military science and tactics.

Combined arts and professional courses:

6. A seven-year course leading to the degrees of bachelor of science, bachelor of medicine, and doctor of medicine.
7. A six-year course leading to the degrees of bachelor of arts, bachelor of architecture, and master of architecture.
8. A six-year course leading to the degrees of bachelor of arts and bachelor of laws.
9. An eight-year course leading to the degrees of bachelor of arts, bachelor of medicine, and doctor of medicine.
10. A five-year course leading to the degrees of bachelor of science and graduate in nursing.

Note.—During the first two years of any course of study, men are required to complete three quarters of physical education and six quarters of military drill; women are required to complete six quarters of physical education.

I. GENERAL COURSE LEADING TO THE DEGREE OF BACHELOR OF ARTS

GENERAL REQUIREMENTS

1. The student must earn 183 credits and 183 honor points, or a smaller number of credits determined as follows: for every five honor points in excess of one honor point per credit, the number 183 is diminished by one.

¹ Students in Art Education, Physical Education, Public School Music, and certain other special courses, register in the College of Education in their freshman year.

Any student who fails to complete the requirements for graduation within a normal period will, in order to complete the work, be required to continue in the Senior College for one or more university sessions. During this period he will be required to carry at least thirteen credit hours of work and to secure an average of one honor point per credit.

A student entering with advanced standing from some other institution must secure a total of 183 credits, and an average of one honor point per credit for the work done in this college. For every five honor points earned in this college in excess of one honor point per credit, the number 183 is diminished by one.

2. The student may not receive credit for beginning courses (two quarters, 10 credits) in more than one of the foreign languages, exclusive of Greek and Italian, except upon petition.

3. Not later than the end of his sophomore year, each student must elect the department in which he intends to do his major work. He will then be assigned to a major adviser by that department.

CLASSIFICATION OF STUDIES

Because of the large numbers of students who fail in their attempt to carry college courses leading to the Bachelor's degree or professional training, and because in a large percentage of cases the lack of aptitude for such college training can be clearly understood before entrance, the college has selected certain courses from which those who, for any reason, can remain only a short time in college should make their elections. As compared with other college studies, these courses deal less with specialized knowledge and require less technical skill, while they contribute more directly to the general information and culture which will have value for such students. Some of these courses have a definite interest in relation to certain vocations or occupations. The courses are all of standard college grade and may be taken by any student for full college credit. Some of them are courses which are required in certain regular curricula.

A special list of studies has been selected as a means of meeting the existing situation. Persons who have very low aptitude for college work gain little from the study of foreign languages, laboratory exercises in science, or the more technical or specialized courses intended for those who will complete their college training. Such students of low aptitude will, therefore, be limited to these general courses of informational, cultural, and vocational character. They will be exempt from the requirements of the regular curricula.

In doing this, the college is not setting up in any permanent way a new type of training for those who have not the aptitude for its proper field of work. The arrangement is intended to meet an emergency. It is a step toward the definition of an intelligent public policy regarding those high school graduates who have leisure and the desire for further school opportunities, but who have not the qualifications necessary to profit by the type of training appropriately offered in this college.

The courses at present included in this list¹ are

Botany 1	History 1-2
Chemistry, Inorganic, 1-2-3 and 4-5	How To Study 1
Composition 4-5-6	Library Methods 1
Drawing 41-42-43, 44	Mathematics 3, 4, 5, and 8
Economics 1, 2, 3	Mechanical Engineering 11-12-13
English A-B-C	Music
Geography 1-2	Zoology 8-9
Geology 8	

Students may be reclassified on the basis of their record in the first two quarters. Any student who shows sufficient ability in these courses may continue in further courses for vocational training or may register as a candidate for a degree if he wishes to do so. A student who has freedom of election from the first, but does not profit by his opportunities, may find himself limited to the above list of studies until he demonstrates his ability and willingness to do work of an acceptable grade. Of course, this announcement in no way changes or relaxes the rules regarding delinquency in studies.

JUNIOR COLLEGE

1. For admission to the Senior College² the student must have completed the following work in the Junior College or the equivalent in another recognized institution.

- A. 15 credits in English (English A-B-C) or 9 credits in composition (Composition 4-5-6), or exemption from the requirement. All students are required to take a placement test before registering for any course in English or composition.
- B. Foreign language, 0 to 20 credits, according to the following schedule:³

<i>Amount Presented for Entrance</i>	<i>Amount Required in Junior College</i>
Four years of one language	None
Three years of one language	5 credits in same language
Two years of one language	10 credits in same language
One year of one language	15 credits in same language
Less than a year of one language	20 credits in one language

- C. 10 credits in one of the social sciences: anthropology, economics, geography, history, political science, sociology.
- D. 10 credits in one of the natural sciences: astronomy, botany, chemistry, geology, human physiology, physics, psychology (including laboratory), zoology.

2. Every student should plan to begin the work specified in the preceding paragraph early enough to provide for the completing of these

¹ Other freshman courses are marked in the program as requiring a certificate of aptitude.

² See also requirements for admission to the Senior College in courses leading to the degree of B.S.

³ Not required in the Social and Civic Course.

requirements before the end of his sophomore year. Failure to do this will delay his admission to the Senior College.

3. In addition the student must secure the necessary preparation for a senior college major sequence in one subject.

4. During the junior college years all men must complete three quarters of physical education and six quarters of military drill. All women must complete six quarters of physical education.

5. The student must earn a total of 93 credits with an average of one honor point per credit, or a smaller number of credits determined as follows: For every five honor points in excess of one honor point per credit, the number 93 is diminished by one.

A student entering with advanced standing from some other institution must secure a total of 93 credits, and an average of one honor point per credit for the work done in this college. For every five honor points earned in this college, in excess of one honor point per credit, the number 93 is diminished by one.

SENIOR COLLEGE

Requirements.—1. A major sequence, 27 to 36 credits. Each student must complete a coherent and progressive sequence of courses, known as a major sequence, which shall include, as specified by the department which offers it, from 27 to 36 credits in senior college courses. Such major sequences are offered by the following departments: Anthropology, Architecture, Astronomy, Bacteriology, Botany, Chemistry, Economics, English, Geography, Geology and Mineralogy, German, Greek, History, Human Physiology, Journalism, Latin, Mathematics, Music, Philosophy, Physics, Political Science, Psychology, Romance Languages, Sociology, Zoology. The courses constituting a major sequence in any department are announced in the program.

A student must maintain an average of one honor point per credit in the work of the major sequence.

2. A minor sequence, 9 credits. A student must secure in some department other than his major department and in addition to his major sequence 9 credits in senior college courses.

HONORS COURSE PLAN

A student who has met all the requirements for admission to the Senior College may be enrolled for the Honors Course upon the approval of the department in which he wishes to pursue his major study.

Each student enrolled in the Honors Course will be put under the immediate direction of a member of his major department of professorial rank who shall be known as his tutor.

A student enrolled in the Honors Course may be a candidate for graduation honors. The tutors will co-operate with the Committee on Honors in arranging comprehensive examinations and in the evaluation of theses.

A part of the student's senior college work will consist of reading or other individual studies done under the direction of his tutor. Work

done in this way will be accepted as a substitute for a part or the whole of the major sequence and of the elective work of the usual curriculum.

A student electing this plan will be governed by the announcement of his major department and the direction of his tutor as to number of courses, attendance at classes, and general methods to be pursued.

The requirements for the minor study are not modified by this plan at present.

When the tutors of a department report at the end of any quarter that a student is not making satisfactory progress in the Honors Course, the student will be registered as a candidate in the regular course. In this case the tutors will report blanket credits equivalent to the work actually done. The student can then arrange to complete his major sequence either in the same department or in another.

For the year 1929-30 Honors Courses are offered by the Departments of Anthropology, English, History, Political Science, Psychology, Sociology, and Zoology.

GRADUATION HONORS¹

The degree B.A. may be awarded *cum laude*, *magna cum laude*, or *summa cum laude* upon the recommendation of the Committee on Honors.

Honors are awarded only to students who have a scholastic record of two honor points per credit in all work carried. A student who has this record will be awarded the degree B.A. *cum laude*.

Students wishing to become candidates for the higher honors (*magna cum laude*, *summa cum laude*) must signify their intention not later than the beginning of the third quarter before graduation. Students are admitted as candidates upon the recommendation of the major department with the approval of the Committee on Honors. The committee will not admit as a candidate a student who has limited his senior college work to the minimum requirements in major and minor subjects. The purpose of granting honors is to secure scholarly ideals and achievements, and the candidate is expected to show his interest and ideals in his election of studies.

With the approval of the Committee on Honors the candidate may pursue a course of reading in addition to the required major and minor studies and in lieu of any or all elective courses. Near the close of the senior year the candidate will take a special examination which may touch upon any part of the field of his college course. In this comprehensive examination the candidate should show (a) an acquaintance with the chief literature and sources of information in the fields studied, and (b) an ability to discuss with intelligence and clear reasoning, questions or problems upon which he has had opportunity to secure the necessary information. Such questions may be new to the student. The object is to test the student's ability to bring facts and theories to bear upon problems presented in the examination. The examination should be a test not of memory but of assimilation, of culture, and of power to command or use

¹ Students who enter with advanced standing are eligible to become candidates for honors if they will have earned 75 credits of work in residence before graduation.

the knowledge which courses of study have put within the student's reach. Candidates who pass this examination will, upon recommendation of the committee, be awarded the degree B.A. *magna cum laude*.

A candidate whose standing in the comprehensive examination is satisfactory and who in addition presents an acceptable critical paper, a piece of creative work, or a thesis embodying the results of original research will, upon recommendation of the committee be awarded the degree B.A. *summa cum laude*. The preparation of the paper should be begun early in the senior year.

The degree B.S. *cum laude* will be awarded to students who have an average of two honor points per credit in all their work.

Students may be accepted as candidates for the higher honors in courses leading to the B.S. degree and in combined arts and professional courses provided they present an equivalent of the work required for graduation honors in the General Course.

CREDIT IN THE GRADUATE SCHOOL

A student lacking not more than nine credits toward graduation may, upon petition, receive graduate credit for a limited amount of work taken as an undergraduate. No graduate credit will be given unless the student has made previous arrangement with the Graduate School. Courses taken for graduate credit will not carry credit toward the Bachelor's degree.

With the permission of the assistant dean for the Senior College, undergraduates lacking not more than nine credits toward graduation may be registered also in the Graduate School. Permission will be granted only in exceptional cases.

II. SPECIAL COURSES LEADING TO THE DEGREE OF BACHELOR OF ARTS

A. GENERAL COURSE WITH A MAJOR IN MUSIC

For the specific requirements of this course, see the program of the Department of Music, in this bulletin.

B. COURSE IN TRAINING FOR DIPLOMATIC AND CONSULAR SERVICE

For the specific requirements of this course, see the program of the Department of Political Science, in Part II of this bulletin.

III. COURSES LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

Students in these courses who complete the work with an average of two honor points per credit will receive the degree B.S. *cum laude*. Candidates for the higher honors may be accepted if they offer an equivalent of the work required for graduation honors in the General Course. See page 29.

A. COURSE IN LIBRARY TRAINING

For a special course in library training, leading to the degree of bachelor of science, a student must complete satisfactorily three years of

academic work, including the requirements for admission to the Senior College. During the fourth year he will take not less than 45 credits in library methods. During the four years, the student must secure 183 credits and 183 honor points. (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.) For specific information see the bulletin of the Division of Library Instruction.

B. COURSE IN HOSPITAL LIBRARY SERVICE

For the specific requirements of this course, see the special bulletin of the Division of Library Instruction obtainable at the office of the registrar.

C. COURSE FOR MEDICAL TECHNICIANS

A four-year course in medical technology is offered by the College of Science, Literature, and the Arts and the Medical School.

With the rapid increase of laboratories in hospitals, clinics, and medical schools, medical technology offers a splendid field for women at the present time. Men, as a rule, are not advised to take the course.

The satisfactory completion of the prescribed course leads to the degree of bachelor of science. During the first two years, the student is registered in this college and must earn 93 credits with an average of one honor point per credit.* The required courses are listed below. High school physics is a prerequisite, but may be taken at the School of Agriculture after admission.

- | | |
|--|---|
| 1. English A-B-C, Composition 4-5-6, or exemption from requirement | 5. Organic Chemistry 1-2 |
| 2. Zoology 5-6-7 or 1-2 | 6. Mathematics 4 or 6 |
| 3. Inorganic Chemistry 1-2-3 or 4-5; 11 | 7. A reading knowledge of scientific French or German |
| 4. Analytical Chemistry 7 | |

For the work in the Medical School consult the special bulletin.

Practical work in the various tests required in laboratory work is taken at the University Hospital and covers from two to three quarters.

Further information may be obtained by addressing Dr. W. A. O'Brien at the University Hospital.

D. COURSE IN PUBLIC HEALTH TRAINING

For the specific requirements of this course, see the special bulletin obtainable at the office of the registrar.

E. COURSE IN SOCIAL AND CIVIC WORK¹

This course is organized in response to a demand for distinctive pre-technical training for professional service. For the senior year specialization is afforded in case work, medical social work, and rural social work. Preparation in group work for leaders of Boy Scouts, Girl Scouts, Camp-fire, and Girl Reserve groups, is also provided. Satisfactory completion of the four-year course leads to the degree of bachelor of science.

* For the requirements in physical education and military drill, see p. 25.

¹ No requirement in foreign language.

The organization of the course of study aims to give the undergraduate the fundamentals of a broad modern education with considerable emphasis upon biology, history, economics, political science, psychology, and language. To this end all intensive specialization is reserved for the fourth and graduate years of study.

It is recommended that students who register in this course come to the Department of Sociology for advising. A special bulletin is prepared for students in this course, and this bulletin should be consulted for a statement of recommended elective courses.

For admission to the Senior College the student must earn 93 credits with an average of one honor point per credit. During the four years, he must secure 183 credits and 183 honor points. (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.)

During the junior college years all men must complete three quarters of physical education and six quarters of military drill. All women must complete six quarters of physical education.

First and Second Years, Junior College

Common basic foundation

REQUIRED

English A-B-C or Composition 4-5-6
or exemption from requirement
Sociology 1, 6, 45, 49
Economics 6-7
Political Science 1, 11¹
Psychology 1-2
Zoology 1-2²
Human Physiology 1³ or 4³

Third Year, Senior College

Concentrated sociological study and training, in which students become familiarized with the three chief techniques of social work: case work, group work, research.

REQUIRED

Sociology 52, 53,² 55, 60, 70, 71,
90 (simultaneously with 52), 91
Preventive Medicine 50 or 53³
Home Economics 70, Child Welfare
40 and 130
or
Child Welfare 40, 60, 120
or
Economics 161; 162 or 164

¹ Elective for students preparing for medical social work.

² Three quarters of botany may be substituted for Zoology 1-2 by students in group work.

³ Required of students preparing for medical social work.

Fourth Year, Senior College

Professional specialization by election of grouped requirements.

a. *Case work*: Sociology 92, 100 or 120, 119, 128, 130, 134, 135, 153-154; Economics 161; Political Science 169.

b. *Group work*: Sociology 71, 100 or 101, 122-123, 126, 128, 134, 153-154; Preventive Medicine 60; and Economics 161 or Physical Education for Women 43-44-45.

c. *Medical social work*: Sociology 100 or 119, 133, 138-139, 153-154; Preventive Medicine 57, 60, 61, 73; Psychology 144-145.

d. *Rural social work*: Sociology 101, 110, 112, 114, 153-154; Preventive Medicine 60; Agricultural Education 154.

Fifth Year

Graduate professional study: Sociology 121, 122-123, 130, 133, 134, 138-139, 140, 141, 153-154-155, 200-201-202, 203-204-205, 206-207-208, 215-216-217, 218-219-220, 221-222-223; with a suggested minor in anthropology, economics, education, psychology, political science, or preventive medicine and public health. See Graduate School bulletin for course in Medical Social Work.

IV. COURSES PREPARING FOR ADMISSION TO THE PROFESSIONAL SCHOOLS

A. PRE-BUSINESS COURSE

To be eligible for admission to the School of Business Administration, the student must present 93 credits earned in a recognized college or university with one honor point per credit, or a smaller number of credits to be determined as follows: For every five honor points in excess of one honor point per credit the number 93 is diminished by one.

The credits for admission shall be earned in the following groups:

A. Required Credits¹:

1. Nine credits in Freshman Composition (Composition 4-5-6) or exemption from requirement.
2. Ten credits in mathematics or in *one* of the following laboratory sciences: botany, chemistry, physics, zoology.
3. Ten credits in *one* of the following social sciences: geography, history, political science, sociology.
4. Ten credits in the Principles of Economics. (This requirement may be satisfied by the completion of Economics 6-7 or the equivalent. The student will consult a pre-business adviser concerning an equivalent.)

B. Elective Credits:

Sufficient elective credits to complete the minimum number required for admission, (normally fifty-four credits). The attention of the student is called to the two following groups of subjects to which part of the elective time should be devoted:

1. Courses required for graduation from the School of Business Administration and recommended for pre-business students. These courses are prerequisites for certain required courses in the School of Business Administration:

Economics 3, (Mechanism of Exchange)

Economics 14, (Elements of Statistics)

Economics 25-26,² (Principles of Accounting)

¹ For the requirements in physical education and military drill, see p. 25.

² Students who have had a high school course or experience in bookkeeping will be admitted to Economics 25 upon passing a placement test. For other students Economics 20 is prerequisite to Economics 25.

Students who do not elect the above courses during the freshman and sophomore years will be required to take Business Administration 57, 63, and 70, during the first quarter in residence in the School of Business Administration.

2. Courses required as prerequisites to courses in certain sequences in the School of Business Administration and recommended for all students:
 - a. Psychology 1-2, (General Psychology). This course is a prerequisite for courses in Advertising, Foreign Trade, Merchandising, Personnel Management, Insurance, and Real Estate.
 - b. Mathematics 8 or 47 and 20. (Commerce Algebra or Pre-statistical Mathematics and Mathematics of Investment). Required of students who take the accounting, insurance, or finance sequence.

B. PRE-DENTAL COURSE

The pre-dental course, required for admission to the College of Dentistry, consists of two years of prescribed work, during which the students are registered in this college and subject to its regulations.¹ The required courses are listed below. It is desirable that students should have had chemistry and higher algebra in high school.

- | | |
|---|---|
| 1. Zoology 5-6-7 | 6. Drawing 41-42-43 ² |
| 2. Inorganic Chemistry 1-2-3 or 4-5, and 11 | 7. Mechanical Engineering 11-12-13 ² |
| 3. Organic Chemistry 6-7 | 8. English A-B-C or Composition 4-5-6 or exemption from requirement |
| 4. Mathematics 4 or 3-4 or 6 | 9. Psychology 1-2 ² |
| 5. Physics 3 and 4, and one of the combinations 23 and 24, 33 and 34, 43 and 44 | 10. Electives to make a total of 93 |

NOTE.—Students who have had no chemistry in high school are advised to take Inorganic Chemistry 11 in the summer of their first year.

C. GENERAL COURSE PRELIMINARY TO THE COLLEGE OF EDUCATION

All students who expect to receive the teacher's certificate from the University of Minnesota at the end of a four-year college course must register in the College of Education beginning with their junior year. They should enroll as pre-education students as early in their course as possible. Advisers for pre-education students will be members of the faculty of the College of Education.

At the time of entering the College of Education each student must present a statement from the Students' Health Service showing the results of a recent physical and health examination.

In meeting the specific requirements outlined below the student must earn at least 90 credits with an average grade of "C" in all work carried.

1. The ninety credits indicated above must be earned in the following groups of college courses:

Group A English

Group B Foreign Languages: German, Greek, Latin, Romance Languages, Scandinavian

Group C Social Sciences: Anthropology, Economics, Geography, History, Political Science, Sociology

Group D Natural Sciences: Astronomy, Botany, Chemistry, Geology and Mineralogy, Human Physiology, Physics, Psychology, Zoology

Group E Mathematics

¹ For the requirements in physical education and military drill, see p. 23.

² The faculty may accept electives for these courses.

Group F Journalism, Philosophy, Fine Arts, or such courses in other colleges or departments of the University as are approved by the College of Education

2. Within the general requirements listed above the student during his high school and junior college years must have completed the following minimum work in English and must offer at least 20 credits to be chosen from among the courses in two of the major groups designated as B, C, and D.

IF TAKEN	IN HIGH SCHOOL	IN COLLEGE
A. English	3 years	and 9 credits in composition
B. Language	3 years in one language	or 20 credits in one language
	or	
	2 years in one language	and 10 credits in one language
	or	
	1 year in one language	and 15 credits in one language
C. Social Science	2 years	or 10 credits
D. Natural Science	2 years	or 10 credits

NOTE.—In lieu of the specific course requirements indicated in the language group a student may elect a comprehensive examination in an elected language to be conducted by a committee appointed by the dean of the College of Education.

3. Within the total credits stipulated under No. 1 a student must meet, in fields of study which are represented in prevailing high school curricula, the following requirement: at least 15 credits in a major field and at least 10 credits in each of two minor fields. The purpose of this requirement is to prepare the student for the study of the advanced courses necessary to the completion of satisfactory teaching majors and minors.

Apart from the specialized curricula, majors and minors are offered separately in the following fields: English; German, Latin, Romance languages, Scandinavian; geography, history, political science; botany, chemistry, physics, zoology; mathematics.

4. The student must have completed six credits in General Psychology.
5. In the cases of certain specialized curricula described in the bulletin of the College of Education the above requirements may be modified in details. Students preparing to qualify in one of these curricula should consult the College of Education bulletin.
6. At the time of entrance to the College of Education the student will be given a general examination designed to show his capacities to pursue professional curricula in education.
7. In the freshman and sophomore years, men must complete three quarters of physical education and six quarters of military drill; women must complete six quarters of physical education. Five credits, to be counted toward graduation from the College of Education, will be granted for the completion of the requirement in physical education.

D. COURSE PRELIMINARY TO TRAINING IN INTERIOR ARCHITECTURE IN THE COLLEGE OF ENGINEERING AND ARCHITECTURE

This course offers to students of the College of Science, Literature, and the Arts the opportunity to prepare themselves for certain lines of work such as domestic architecture and interior architecture and decoration without taking the full technical course in Architecture.

During the first two years, the student is registered in this college. He must complete the requirements stated below and must earn 93 credits and 93 honor points.* At the beginning of his course, he should consult the School of Architecture regarding electives.

During the third and fourth years, the student registers in the College of Engineering and Architecture and upon the satisfactory completion of the prescribed work, amounting to 102 additional credits, receives the degree of bachelor of interior architecture. (See bulletin of the College of Engineering and Architecture.)

COURSES REQUIRED IN THE FIRST TWO YEARS	CREDITS
English A-B-C or Composition 4-5-6 or exemption from requirement	0 to 15
Mathematics 4 or 6 (with prerequisite).....	4 to 10
French (see Junior College Requirements, page 5).....	0 to 20
History 11-12-13	10
Physics 3 and 4 and 23 and 24, 33 and 34, or 43 and 44.....	8
or	
Inorganic Chemistry 1-2-3 or 4-5.....	8 to 12
Architecture 21-22-23	6
Architecture 31-32-33	15
Architecture 61-62-63	6

FOR THOSE WHO ENTER WITH TWO YEARS OF FRENCH

Freshman Year

FALL	Credits	WINTER	Credits	SPRING	Credits
Freshman English	5	Freshman English	5	Freshman English	5
Mathematics	5	French	5	French	5
Electives	5	Elective or math.	4 or 5	Elective	5

Sophomore Year

	Credits
Architecture 21-22-23	6
Architecture 31-32-33	15
Architecture 61-62-63	6
History 11-12-13	10
Chemistry or physics	8 to 12
Electives to complete a total of 93 for the two years.	

E. GENERAL COURSE PRELIMINARY TO THE LAW SCHOOL

This course is designed to satisfy the requirements for admission to the Law School, which are 93 academic credits and an average of one honor point for each credit earned up to the time of admission. Excess honor points do not reduce the number of credits required.

* For the requirements in physical education and military drill, see p. 25.

Pre-legal students are regularly registered in the Junior College, subject to the requirements of the General Course.* (See pp. 27 and 28.)

The following course is recommended by the faculty of the Law School as the best available under these rules:

1. Latin, 0 to 20 credits
2. English A-B-C or Composition 4-5-6 or exemption from requirement
3. Natural science, 10 credits
4. Political Science 1
5. Philosophy 2 and 51-52
6. History 4-5 and 33
7. Economics 6-7

Other subjects recommended for pre-legal students are Psychology 1-2; Speech 41-42-43 or 45-46, 55-56-57; Economics 54, 55, 103-104, 154, 160, 164; History 116-117-118; Philosophy 1, 3, 124, and 129; Political Science 2, 11, 15, 105-106, 145, 181, and 187.

The faculty of the Law School strongly advises students to complete the whole or at least three years of the Arts course before entering upon the study of law. Attention is called to the combined six-year course in Arts and Law, on page 41.

F. PRE-PHARMACY COURSE

For recommendations for one year's work preliminary to the College of Pharmacy, consult the bulletin of that college.

V. MILITARY SCIENCE AND TACTICS

Credit for advanced military science.—Students who have completed the Basic Course, R.O.T.C., and are selected for advanced work by the professor of military science and tactics, and who sign an agreement with the government to continue this work for the remainder of their college course (not to exceed two years) and to attend one summer training camp, are eligible for the Advanced Course, R.O.T.C., prescribed in War Department regulations.

The faculty will recommend for graduation, in any of its courses of study¹ leading to the degree of bachelor of arts or bachelor of science, any student who has satisfactorily completed the work of the Advanced Course, R.O.T.C., and has completed 177 college credits, with 177 honor points, including all other specific requirements for graduation.

Students enrolled in the Advanced Course, R.O.T.C., are furnished with a special uniform and receive from the government a fixed allowance per day while enrolled in this course, except during the period in which they are actually at a training camp, when they are paid at the rate prescribed for the seventh grade in the army.

All students who complete the Advanced Course, R.O.T.C., will, if recommended by the professor of military science and tactics and the president of the University, be commissioned in the Officers' Reserve Corps of the United States Army.

* For the requirements in physical education and military drill, see p. 25.

¹ Taken wholly in this college.

Special course for students of military science.—The degree of bachelor of science will be given to students who complete the following course.

JUNIOR COLLEGE

- I. A total of 93 credits with an average of one honor point per credit.*
 - a. English A-B-C or Composition 4-5-6 or exemption from requirement
 - b. History 1-2.
 - c. Zoology 1-2, Psychology 1-2, Chemistry, 10 credits.
2. Preparation for a major sequence in history, political science, or mathematics.

SENIOR COLLEGE

1. For the completion of the Advanced R.O.T.C. Course as now given, a total of..... 12 credits
2. Bacteriology 41 5 credits
3. Preventive Medicine 50, 53..... 6 credits
4. One of the following (in senior college courses)
 - a. History, including 101-102, 156..... 21 credits
 - b. Political Science, including 101-102, 181-182..... 21 credits
 - c. Mathematics including 50, 51, 52..... 21 credits
 - d. Additional electives to make a total of 183 credits and 183 honor points.

The quality credit rule applies to this course in so far as the number of elective credits is concerned.

VI. SEVEN-YEAR COURSE IN SCIENCE AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF SCIENCE, BACHELOR OF MEDICINE, AND DOCTOR OF MEDICINE¹

During the first two years the student is registered in the College of Science, Literature, and the Arts. He is expected to complete the courses listed below and must secure 93 credits with an average of one honor point per credit.* (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.)

Composition 4-5-6 or exemption from requirement.

Zoology 5-6-7 (1-2, 10 credits, will be accepted).

Inorganic Chemistry 11, Analytical Chemistry 7, and Organic Chemistry 1-2, with the elementary courses prerequisite to them.

Physics 3 and 4, 23 and 24, 33, 43 and 44. Course 34 optional.

French or German sufficient to secure a reading knowledge. Students may meet this requirement by passing two quarters' work in Scientific French (French 8-9-10), or Medical German (German 31-32), or by taking special examinations after completing 15 credits of French or two college years of German. This examination is conducted by the department concerned.

* For the requirements in physical education and military drill, see p. 25.

¹ Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.S. degree in a combined course.

The following subjects are recommended as electives: advanced zoology, (such as comparative anatomy), physics, chemistry, freehand drawing, Latin, higher mathematics and statistics, psychology, and sociology. With the approval of the Students' Work Committee of the Medical School and the assistant dean for students' work in the College of Science, Literature, and the Arts, a pre-medical student may take one subject in the Medical School in any quarter.

For admission to the Medical School, a candidate's record must show a number of honor points equal to the total number of credits in the required subjects of zoology, chemistry, physics, and composition; also a number of honor points equal to the total number of credits in all subjects; and the student must be accepted by the Medical School under the limited registration regulation of that school. A student applying for admission must have satisfied all requirements before July 1.

PROGRAM FOR THOSE WHO ENTER IN THE FALL WITHOUT LANGUAGE
AND WITHOUT HIGHER ALGEBRA

First Year

Inorganic Chemistry 1-2-3, or 4-5 and 11
French 1-2-3 or German 1-2-3
Mathematics 3 and 4, and Physics 3 and 4
Zoology 5-6-7 (or 1-2)

Second Year

Inorganic Chemistry 11, if not already completed
Analytical Chemistry 7
Organic Chemistry 1-2
French 8-9 or 9-10; or German 4 or 30 and 31-32
Physics 23 and 24, 33, 34 (optional), 43 and 44
Composition 4-5-6, or elective for those exempted from requirement

NOTE.—Students who have had no chemistry in high school are advised to take Inorganic Chemistry 11 in the summer of their first year.

PROGRAM FOR THOSE WHO ENTER IN THE FALL WITH TWO YEARS OF
EITHER FRENCH OR GERMAN

First Year

Inorganic Chemistry 1-2-3 or 4-5 and 11
French 3 and 9-10, or German 30 and 31-32
Mathematics 3 and 4, and Physics 3 and 4
or
Mathematics 4 and Physics 3, 4, 43, and 44
Zoology 5-6-7 (or 1-2)

Second Year

Inorganic Chemistry 11, if not already completed
Analytical Chemistry 7
Organic Chemistry 1-2
Physics to complete the requirement of four quarters. See above.
Composition 4-5-6, or elective for those exempted from requirement

The work during the third and fourth years is taken in the Medical School and is credited toward the degree of bachelor of science. To secure

this degree, a student must have 183 credits and 183 honor points, and must have completed the first two years of the medical course in accordance with the standards of the Medical School.

Students who have completed elsewhere two or more years of collegiate or university work which includes the required subjects specified above and which is in other respects the full equivalent of the two years of academic work required in this seven-year combined course, will be awarded the degree of bachelor of science on recommendation of the faculty of the College of Science, Literature, and the Arts, provided they meet the scholarship requirements stated above. The credit value of work done elsewhere will be determined by the Students' Work Committee of the College of Science, Literature, and the Arts, but such credits will not become effective until the student has completed, with the required standing, two full years of work in the Medical School of the University of Minnesota.

The foregoing regulations governing the quality and amount of pre-medical training required for admission to the Medical School will be enforced for those who present the minimum amount of work. In cases of mature and superior students, especially such as have taken degrees and have made special progress along some line, (even tho it may not have been closely related to medicine), concessions may be made. Cases under this paragraph will be considered individually and upon petition.

It should be borne in mind that no student can pursue the medical course to advantage without knowledge of biology, chemistry, and physics.

VII. SIX-YEAR COURSE IN ARTS AND ARCHITECTURE¹

This course is designed to combine with the full technical course in Architecture the broad cultural training recognized as most desirable in preparation for the practice of this profession. The course leads to the degrees of bachelor of arts at the end of four years, bachelor of architecture at the end of five years, and master of architecture at the end of six years.

Students wishing to elect this course should consult the School of Architecture. For the first two years the requirements are the same as those laid down in the course in Interior Architecture, page 35 of this bulletin, except that the student will register in Mathematics 11, 12, and 13 (College of Engineering and Architecture) and complete these courses by the end of his sophomore year.

During the first four years of this course the student is registered in the College of Science, Literature, and the Arts. He must complete the requirements for admission to the Senior College, and is subject to the regulations governing other students in this college.

¹ Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.A. degree in a combined course.

VIII. SIX-YEAR COURSE IN ARTS AND LAW, LEADING TO
THE DEGREES OF BACHELOR OF ARTS
AND BACHELOR OF LAWS¹

The work of the first three years of this course is done in the College of Science, Literature, and the Arts. The student must complete the requirements for admission to the Senior College in the General Course, and is subject to all the regulations which govern the work of other Arts students. During these three years the student must secure at least 138 credits and an average of one honor point per credit for all credits earned.* (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.) During his third year the student will elect work in this college subject to the approval of the dean of the Law School and the assistant dean for the Senior College. The first year of the course in the Law School, when completed with the standing required by that college for graduation, counts as the equivalent of the fourth year (45 credits) of the Arts course.

IX. EIGHT-YEAR COURSE IN ARTS AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF ARTS, BACHELOR OF MEDICINE, AND DOCTOR OF MEDICINE¹

During the first three years of this course, the student does his work in the College of Science, Literature, and the Arts, subject to the regulations governing the other students of the college, and must secure at least 138 credits, with an average of one honor point per credit for all credits earned.* (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.) He must complete the requirements for admission to the Senior College in the General Course and also the work in zoology, chemistry, physics, and foreign language, prescribed for the seven-year course in Science and Medicine (p. 38).²

During his third year, the student elects work in this college subject to the approval of the director of the professional course and the assistant dean for the Senior College. The first year of the course in the Medical School, when completed with the standards required by that school, counts as the equivalent of the fourth year (45 credits) of the Arts course.

For admission to the Medical School, a student's record must show a number of honor points equal to the number of credits in the required subjects of English or composition, chemistry, physics, and zoology; and also a number of honor points equal to the total number of credits and the student must be accepted by the Medical School under the limited registration regulations of that school.

* For the requirements in physical education and military drill, see p. 25.

¹ Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.A. degree in a combined course.

² For recommended electives and the restrictions governing them, see p. 39.

X. FIVE-YEAR COURSE IN ARTS AND NURSING OR NURSING EDUCATION, LEADING TO THE DEGREES OF BACHELOR OF SCIENCE AND GRADUATE IN NURSING¹

During the first 5 quarters in this course the student is registered in the College of Science, Literature, and the Arts.² This period is followed by 10 quarters during which the student is registered in the University School of Nursing. The last 3 quarters of the fifth year are devoted to elective work in the University, in preparation either for teaching and supervision in schools of nursing¹ or for public health nursing.

The student must earn an average of one honor point per credit in the work of the Junior College.

The student is required to earn 138 credits and 138 honor points in courses which regularly carry credit in the College of Science, Literature, and the Arts. The satisfactory completion of the required professional work is accepted as the equivalent of the senior year in this college.

Students should consult Miss Vannier before registering.

First Year

1. English A-B-C or Composition 4-5-6 or exemption from requirement
2. Botany, three quarters
3. Inorganic Chemistry, 10 credits (Inorganic Chemistry 6-7 or 9-10 or 1-2-3 or 4-5 and 11)
4. Anatomy 3
5. Electives to make a total of 45

Second Year, Fall and Winter Quarters³

6. Zoology 1-2
7. Psychology 1-2
8. History, 10 credits
9. Composition 11-12, or 18-19
or
Speech 41-42

Third and Fourth Years

See bulletin of the School of Nursing.

Fifth Year

During their last three quarters students register in this college¹ and take work subject to the approval of the director of the Public Health Nursing Course and the assistant dean for the Senior College.

1. Sociology, 10 credits
2. Preventive Medicine and Public Health, 15 credits of theoretical work and 14 credits of practical work
3. Child Welfare 40 or Sociology 60
4. Electives to make a total of 138

¹ Students in Nursing Education register in the College of Education in their fifth year and receive their degree from that college. See bulletin of the College of Education.

² Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.S. degree in a combined course.

³ In the spring quarter students register in the School of Nursing for Human Physiology 2 or 4, Educational Psychology 55, Bacteriology 41, History of Nursing, Theory of Dietetics, and Lettering.

DESCRIPTION OF COURSES

EXPLANATIONS

A *dagger* (†) indicates that all quarters of the course must be completed before credit is received for any quarter.

Course numbers.—Junior college courses (primarily for freshmen and sophomores, are numbered from 1 to 49. Senior college courses are numbered as follows: courses primarily for juniors and seniors, from 50 to 99; for juniors, seniors, and graduates, from 100 to 199; for graduates only, from 200 up. This system is not uniformly followed by departments in other colleges than Science, Literature, and the Arts.

ANTHROPOLOGY

- 41. Introduction to Anthropology. The early history of man.
- 53. Cultural Anthropology. Technology and industry.
- 54. Cultural Anthropology. Social organization of primitive peoples.
- 56. Primitive Science. Concepts of man and nature in primitive culture.
- 62. Ethnology. Racial and cultural groups and contacts.
- 80. American Indian. Ethnology of the New World.
- 106. Types of Prehistoric Men and Cultures. Problems of chronology and distribution.
- 108. Philippine Peoples. Ethnology of the Philippines.
- 110. Physical Anthropology. The physical types of man, prehistoric and contemporary.
- 112. The American Negro. The physical types. Problems and methods of interracial adjustments.
- 113. Peoples of Europe. Racial and cultural characteristics.
- 114. The American People. Distinguishing physical and mental characteristics of the old American.
- 121. Advanced Physical Anthropology. A critical study of problems in physical anthropology. Based on 110.
- 122, 123, 124. Problems in Anthropology. Advanced work with individual guidance. Also, honors course—Anthropological Backgrounds of the Social Sciences, on recommendation of their advisers. Credits to be arranged.
- 161. Primitive Religion. Religious concepts and practices of primitive peoples. Theories of the evolution of religion. Primitive eschatology.
- 204, 205, 206. Consult Graduate School bulletin.

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE JUNIOR COLLEGE COURSES

- 21-22†-23. Freehand Drawing.
- 31-32†-33. Elements of Architecture
- 37-38-39. Architectural Design.
- 61-62-63. Projections, Shades, and Shadows and Perspective.
- 81. Stage Design.

SENIOR COLLEGE COURSES

- 14-15-16. Architectural History (Ancient and Renaissance).
 17-18-19. Architectural History (Medieval and Modern).
 34-35-36. Architectural Design.
 51-52-53. Building Construction.
 74-75-76. Freehand Drawing. For students in Interior Decoration.
 84-85-86. Modeling. An elementary course in clay modeling. Ornament, heads, and animals from casts and from life.
 90-91-92. Illustration. Design of illustration as applied to the printed page. Magazine illustration, posters, and books.
 93-94-95. Hand Print Processes. Making and printing wood engravings, etchings, dry-points, and lithographs.
 134-135-136. Interior Decoration Design.
 163. History of Sculpture and Painting.
 182-183-184. Decoration and Allied Arts.

For additional courses, see bulletin of the College of Engineering and Architecture.

ASTRONOMY

- 11.¹ Descriptive Astronomy. Lectures and recitations on the general principles and fundamental facts of astronomy. Illustrated by lantern slides, simple problems, naked eye and telescopic observations. Laboratory work.
 51. General Astronomy. A survey course covering the fundamental facts and principles of astronomy. Similar to Course 11 but intended for senior college students.
 52. Astrophysics. A descriptive study of the principles of spectroscopy and their applications to astronomy.
 53. Stellar Astronomy. Special emphasis upon the distribution, organization, and evolution of the heavenly bodies.
 62. Field Astronomy. Elements of practical astronomy. Field work with the surveyor's transit and the sextant for determining latitude, clock error, longitude, and azimuth.
 101-102-103. Practical Astronomy. Theory and use of astronomical instruments in determining time, latitude, longitude, positions of heavenly bodies; astronomical photography, with measures of plates; study of the method of least squares.
 111-112-113. Celestial Mechanics. Analytical study of the motion of two bodies. General view of the theory of perturbations.
 140. Method of Least Squares. The combination and adjustment of observations and the discussion of their precision as applied especially to engineering, physics, astronomy, and psychology.

¹ This course does not satisfy the junior college requirement for science.

BACTERIOLOGY AND IMMUNOLOGY
MEDICAL SCHOOL

41. General Bacteriology.
101. Special Bacteriology for Medical Students.
103. Special Bacteriology for Students of Agriculture.
114. Molds, Yeasts, and Actinomycetes.
116. Immunity.
117. Pathogenic Protozoa.
118. Morphology and Taxonomy of Bacteria.
119. Bacteriological Chemistry.
120. Bacteriological Chemistry (continued).
121. Industrial Bacteriology.
122. Industrial Bacteriology (continued).
- 150-151. Advanced Bacteriology.
201. Research in Bacteriology. Consult Graduate School bulletin.
203. Seminar in Bacteriology. Consult Graduate School bulletin.

BOTANY

1. General Botany. Lectures and quizzes.
2. Elementary General Morphology of Plants. A survey of the plant kingdom; structure, life histories, and evolution of plants.
5. Elementary Plant Histology.
7. Taxonomy of Flowering Plants. A general study of the classification and relationships of flowering plants.
12. General Morphology of Algae. Structure, evolution, and classification of the algae.
13. General Morphology of Fungi.
21. Elementary Ecology. An introductory course in the study of plants in relation to their environment.
22. Elementary Plant Physiology. An introductory course giving a general survey of plant functions.
23. General Morphology of Bryophytes and Pteridophytes. Structure, evolution, and classification of liverworts, mosses, and ferns.
51. Histological Methods. Training in the technique of preparing plant material for microscopic study.
63. General Morphology of Gymnosperms and Angiosperms. Structure, evolution, and classification of seed plants.
101. Elementary Biometry. An introduction to the mathematical analysis of biological data.
108. Morphology and Taxonomy of Pteridophytes. An intensive study of lycopods, ferns, and their allies; their structure, history, and classification.
110. Morphology and Taxonomy of Gymnosperms. An intensive study of cycads, conifers, and their allies; their structure, history, and classification.
- 113-114-115. Advanced Taxonomy of Flowering Plants. Special attention is given to the taxonomy of difficult natural groups of angiosperms. in-

- volving systematic principles and practice, rules of nomenclature, and systems of classification.
118. Cytology. A study of the origin, development, structure, and functions of the plant cell and its various constituents.
- 125, 126. Morphology and Taxonomy of Marine Algae. Advanced studies in selected groups. Either course may be taken separately.
127. Anatomy of Vascular Plants. A study of the microscopic structure of vascular plants with particular attention to the development and evolution of the vascular system in the root, stem, and leaf.
131. Field Ecology. A survey of the local plant communities and successions followed by a written report, and by a study of the general principles of plant association and succession.
132. Ecological Anatomy. The individual plant and its parts as related to environment; special plant forms and structure, their causes and significance.
133. Plant Geography of North America. Preliminary discussion of the principles of plant distributions followed by a detailed study of the vegetation regions of North America.
134. Research Methods in Ecology. Theory and practice of instrumental study of the habitat and of precise investigation of community and succession.
140. General Plant Physiology. Advance survey of the whole field of plant physiology.
141. Physical Phases of Plant Physiology. Elements of biophysics applied to plants and their environment.
142. Plant Metabolism. The synthesis of plant food, its transformation and utilization by the plant.
143. Plant Metabolism and Growth. A continuation of Course 142 dealing with respiration, growth, and movement.
144. Plant Microchemistry. A study of the localization of materials of physiological importance in the plant and their relation to physiological processes.
- 145, 146, 147. Advanced Biometry. Theory and practical exercises in the statistical analysis of biological data.
- 149, 150, 151. Freshwater Algae. A general survey based on studies in field and laboratory. Designed for teachers and research workers who wish to acquire a practical knowledge of the algae. Problems and reports. Any course may be taken separately.

PLANT PATHOLOGY AND BOTANY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS
INTRODUCTORY COURSES

1. Plant Pathology.
- 7-8. Weeds and Grasses.
9. Weeds and Seed Testing.
10. Forest Pathology.
12. Seed Problems.

ADVANCED COURSES

- 105-106-107. Mycology.
- 110. Principles of Pathology.
- 111. Diseases of Cereal Crops.
- 112. Diseases of Field Crops.
- 113. Diseases of Vegetable Crops.
- 114. Advanced Forest Pathology.
- 116. Pathologic Histology.
- 117. Diseases of Forage and Fiber Crops.
- 118. Bacterial Diseases.

INORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

- 1-2†-3. General Inorganic Chemistry.
- 4-5.† General Inorganic Chemistry.
- 6-7†-8. General Inorganic Chemistry.
- 9-10.† General Inorganic Chemistry.
- 11. Qualitative Chemical Analysis.
- 12-13.† Qualitative Chemical Analysis.
- 101. History of Chemistry.
- 102. Advanced Qualitative Chemical Analysis.
- 103-104-105. Advanced Inorganic Chemistry.
- 106-107-108. Inorganic Chemistry of the Rare Elements.

ANALYTIC CHEMISTRY

SCHOOL OF CHEMISTRY

- 1-2. Quantitative Analysis.
- 7. Quantitative Analysis.
- 123-124-125. Advanced Analytical Chemistry.
- 131. Application of Indicators.
- 132, 133. Electrometric Measurements and Titrations.
- 134. Seminar: Modern Problems in Analytical Chemistry.

ORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

- 1-2.† Elementary Organic Chemistry.
- 51-52-53. Organic Chemistry.
- 101-102-103. Advanced Organic Chemistry.
- 111. Reagents in Organic Chemistry.
- 113. The Aliphatic Compounds.
- 115. The Heterocyclic Compounds.
- 116. The Terpenes.
- 122. The Aromatic Compounds.
- 123. Dyes.
- 137. Advanced Organic Chemistry Laboratory.
- 139. Advanced Organic Chemistry Laboratory.

PHYSICAL CHEMISTRY
SCHOOL OF CHEMISTRY

- 101-102-103. Physical Chemistry.
110. Physical Chemistry.
116-117-118. Advanced Physical Chemistry.
129. Principles of Colloidal Chemistry.
130. Application of Colloidal Chemistry.
131-132-133. Colloid Chemistry Laboratory.
144. Magnetochemistry.
161-162. Radioactivity.
164. Radioactivity Laboratory.

TECHNOLOGICAL CHEMISTRY
SCHOOL OF CHEMISTRY

- 100-101-102. Food Analysis.

AGRICULTURAL BIOCHEMISTRY

See bulletin of the College of Agriculture, Forestry, and Home Economics.

CHILD WELFARE

40. Child Training. Emphasis on the pre-school child.
60. Modern Aspects of Child Study. A survey of the nursery school, parental education, kindergarten and Montessori movements, child health and mental hygiene, and the development of research organizations.
80. Child Psychology. A survey of child development with special reference to the young child.
90. Physical Development of the Young Child. The physical growth and development of the young child in its anatomical, physiological, and functional aspects.
120. Health Care of the Young Child. A course in the physical care, illnesses, prevention of disease, and health problems of the young child.
130. The Development of the Young Child. An advanced course dealing with the development of the pre-school child from the anatomical, physiological, psychological, educational, and social aspects.
133-134†-135. Observational and Experimental Methods in the Study of the Development of Young Children. A study of the various methods and techniques such as growth records, mental tests, ratings, controlled observations, etc., used in the experimental study of the young child. Practical exercises and problems on institute records and data.
170. Parental Education in Child Care and Training. A consideration of the content and methods used in courses and study groups for parents in the care and training of young children. Lectures, discussions, and reports.
173-174† Technique and Practice of Parental Education. Field work in the technique of organizing and conducting parental study groups and courses for the study of the young child.

- 190-191.† Mental Examination of Pre-School Children. A study of the methods used in testing young children together with practice in such testing.
- 230-231-232. Seminar in the Development of the Young Child. Consult Graduate School Bulletin.
- 233-234-235. Research in the Development of the Young Child. Consult Graduate School Bulletin.
- 250-251-252. Seminar in Nursery School Education. Consult Graduate School Bulletin.

COMPARATIVE LITERATURE

- 101-102-103.† Drama. An outline of the history of drama, including the drama of today. Lectures and readings.
- 105-106-107.† Principles of Criticism. Lectures and readings.
110. The International Romantic Movement in Europe (1775-1825).
203. The Arthurian Legend. Consult Graduate School bulletin.
206. French and English Literary Criticism: from the sixteenth century to the present time. Consult Graduate School bulletin.

COMPARATIVE PHILOLOGY

- 101-102.† General Introduction to the Science of Language. Prerequisites, one of the following groups: (1) five years' foreign language; four may be in high school and one in college; (2) two years' foreign language in college; (3) four credits Old English.
103. Universal Language. Comparison of important languages, grammatically and lexically. Movement for creation of an international language. Consideration of Volapük, Esperanto, Ido, etc.
105. The Life of Words. Etymology and semasiology. Growth of vocabulary; change of words in form and meaning.
108. Comparative Phonetics. A study of speech sounds and the nature of their production with special reference to English, French, and German. Open to students of the modern languages. Identical with German 108.
- 109-110-111.† History of the German Language. Lectures, discussions, assigned readings. This course is identical with German 109-110-111.
- 141-142-143.† Historical Grammar of the English Language. I. Sounds and spelling. II. Accidence and syntax.
- 202-203-204. Gothic. Consult Graduate School bulletin.
- 209-210-211. Old High German. Consult Graduate School bulletin.

DRAWING AND DESCRIPTIVE GEOMETRY
COLLEGE OF ENGINEERING AND ARCHITECTURE

- 41-42-43. Technical Drawing.
44. Lettering.
45. Alphabets.
64. The Graphic Arts: Introduction.
65. The Graphic Arts: Printing and Layouts.
66. The Graphic Arts: Processes.

ECONOMICS

SCHOOL OF BUSINESS ADMINISTRATION

NOTE.—The following courses in other departments may carry credit also in this department:

Agricultural Economics 126, 130, 131, 135, 171.

History 80, 81 82, 83, 84, 113, 114, 115, 116, 117, 118, 169.

Political Science 51-52-53, 105, 157, 158, 159.

1. Business Organization: Marketing. An introduction to the economics of marketing, including descriptions of (1) the marketing processes, (2) produce exchanges and speculation on these exchanges, (3) co-operative marketing institutions, (4) market areas. The operation of supply and demand in marketing.
2. Business Organization: Production. Description of Industrial Organization. An elementary treatment of the economic principles involved in production.
3. The Mechanism of Exchange. An elementary course in money and banking. The basic principles of money and a description of each of the various types of financial institutions, its functions and its relation to the whole economic organization.
4. Principles of Economics. A course in the fundamental principles of economics which is intended to serve as a foundation for advanced courses in business administration.
- 6-7.† Principles of Economics—General Course. For students beginning economics, who have not taken Economics 1 and 2. An intensive study of a standard text on the principles of economics, supplemented by lectures, and followed by readings on current economic problems.
14. Elements of Statistics. Elementary concepts in statistical methods; averages, ratios, errors, sampling, index numbers, graphic representation, collection of material.
20. Elements of Accounting. The fundamental principles underlying book-keeping and accounting. Sufficient practice in technical processes will be given to serve as a background for more advanced work. Preparation and analysis of statements.
- 25-26. Principles of Accounting. A course following Economics 20 presenting the principles underlying the accounting statements, the accounts, principles of valuation, depreciation, preparation, and analysis of statements.
- 32-33-34.¹ Secretarial Training: Typewriting. A thoro knowledge of typing technique is acquired and a study made of business forms.
37. Secretarial Training: Elementary Shorthand.
- 38-39.†¹ Secretarial Training: Shorthand. This course consists of a thoro study of the fundamental principles of shorthand, at the same time stressing the acquisition of a high rate of speed.

¹ Does not carry credit except for admission to the secretarial course and the course in commercial education.

- 40-41-42.¹ Secretarial Training: Dictation I, II. Economics 30-31 required as a prerequisite. A dictation and transcription course involving the application of the knowledge acquired in the previous courses.
54. Accounting Survey I. One-quarter course covering the fundamental principles of accounting without making a study of the technical processes involved. Statement construction and analysis, income determination, valuation of assets, depreciation, intangibles, the corporate balance sheet, capital stock, bonds.
55. Accounting Survey II. The applications of accounting to social and public problems such as: statement analysis and auditing from the investor's viewpoint, cost problems, accounting as an instrument of social control over public utilities and governmental operations.
85. Economics of Marketing. A general course dealing with (1) the market functions, (2) the organization of marketing enterprises, (3) measures of efficiency in marketing, (4) the manager's administration of marketing.
- 103-104.† Value and Distribution. An advanced course in economic theory, prices and costs; the value theory. The distribution of wealth; causes and effects of inequality. The distribution of income; inequality; rent, wages, interest, and profits.
105. History of Economic Ideas—The Classical Economists. The development of the doctrines of classical economics by English and French writers from 1750 to 1850. Economic and political influences giving rise to doctrines of population, distribution, governmental interference.
106. History of Economic Ideas. —The Critics of the Classical Economists. Leading critics of the classical school of economics are studied, especially such critics as (1) Karl Marx and Henry George who emphasized the dynamic aspects of economic life, (2) the nationalistic school, (3) the historical school, and (4) the modern institutionalists.
108. Marketing Organization: Agricultural Products. The principles of organization of the market and of marketing enterprises applied especially to farm products. (Not open to those taking the agricultural business course of study.)
- 113-114. Theory of Statistics. An advanced course in statistical analysis, covering averages, dispersion, simple and multiple correlation, and the theory of sampling. A brief consideration of the theory of index numbers.
124. Comparative Banking—British Systems. A study of the existing financial institutions of the various members of the British Empire with regard to development, functions, methods, and problems. Constant comparison is made with the American system.
125. Comparative Banking—European Systems. Similar to Course 124, except that five of the continental systems will be studied instead of the British systems.
127. Comparative Banking—South American Systems.

¹ Does not carry credit except for admission to the secretarial course and the course in commercial education.

141. Monetary and Banking Policy. An advanced course in money and banking. Banking policy viewed from the social viewpoint, with primary reference to the problems of the Federal Reserve system. Selected problems in monetary policy; monetary reconstruction and monetary reform.
149. Business Cycles. Analysis of factors involved in business fluctuations. Comparison of theories of the causes of prosperity and depression. Introduction to the statistical data and methods of business forecasting.
154. Public Utilities. A general survey of the economic characteristics and the legal position of public utilities. Special emphasis on methods of public regulation, valuation, and control of finances.
160. The Modern Corporation. A survey of the simpler financial activities and of the social problems of the corporate form of business organization.
161. Labor Problems and Trade Unionism. A discussion of employment; hours; wages; extent and strongholds of unionism; open and closed shops; collective bargaining; industrial unrest; government regulation of labor disputes.
162. Labor Movements. An interpretation of leading labor movements in Europe and the United States during the last century.
163. Economic Aspects of Population and Immigration. Population and immigration trends, economic interpretations of these trends with probable forecasts. Various population theories are studied.
164. Labor Legislation and Social Insurance. A course dealing with the economic aspects of labor legislation, including minimum wage laws; hours legislation; factory acts; accident, health, old age, and unemployment insurance; mothers' pensions.
166. Contemporary Economic Problems. A survey of current problems including monetary stabilization, reparations, international debts and the Dawes Plan, foreign investments and economic imperialism, international cartels and tariff barriers, international wage levels, population and immigration movements.
170. Land Economics. Land as a factor in production; rural and urban utilization; rents and land values; land classification; land exchange; colonization.
172. Economics of Transportation.
176. Commercial Policies. Theory of international commerce; protective tariffs, free trade, reciprocity, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign politics, and other governmental and organized efforts to affect trade. American problems emphasized.
- 191-192. Public Finance. Public expenditures, revenues, and debts. Special attention is given to tax principles, practices, and burdens.
193. State and Local Taxation. Main problems of state and local finance and proposed solutions thereof.

ENGLISH

COURSES IN ENGLISH

- A-B-C. Freshman English. The study of the fundamental principles of composition; training in the art of writing; classics of English literature.
- 21-22-23.¹ Introduction to English Literature.
- 31-32.† Development of the English Novel. Principles and personalities in the evolution of the English novel. Written reports on selected novels.
33. The Later English Novel.
51. Spenser. The forms and literary influences in the Elizabethan period illustrated in the poetry of Edmund Spenser, with brief readings from the minor poems and extended study of *The Faerie Queene*.
53. Seventeenth-Century Lyrists. The tradition of the Elizabethan lyric traced in the work of the metaphysical and cavalier schools of poetry.
- 55-56.† Shakespeare.
- 58-59.† Nineteenth-Century Prose. The more important prose of the nineteenth century, not including fiction.
61. American Pronunciation. A study of the sounds of present day English, with particular reference to American usage.
62. Milton, with some consideration of his contemporaries.
63. American Usage. A study of the forms and syntax of present day English, with particular reference to American English.
69. Browning and Tennyson. Most of the time will be spent on Browning.
70. Masterpieces of Elizabethan Drama. Elizabethan dramatic art aside from Shakespeare's. Special attention to the art of the chief writers—Marlowe, Jonson, Beaumont and Fletcher, Webster, and Massinger.
- 73-74.† American Literature.
75. Chaucer. Reading of tales from the Canterbury collection, with introduction dealing with the grammar and literary forms of fourteenth-century English.
- 77-78.† Classic Myths and the Classic Tradition in English Poetry. Some ancient literature (in translation), and representative poets from Chaucer to the present.
- 81-82.† Survey of Middle English.
- 86-87.† Forms of English Verse.
100. Old English. Old English prose and poetry. The relation to modern English is particularly emphasized.
101. Introduction to Middle English. An outline of Middle English grammar, including the interpretation of selected texts.
102. Old English Poetry.
103. Beowulf. An introduction to the Old English poem, with reading of considerable portions of the text.
- 105-106.† Eighteenth-Century Poetry. From Pope to Burns, with special reference to the rise and growth of romanticism.

¹ Students must take two consecutive quarters to receive credit.

- 107-108.† Eighteenth-Century Prose. Special study of fiction and the essay.
- 109-110.† The Romantic Poets of the Nineteenth Century. From Wordsworth to Keats.
- 111-112.† Seventeenth-Century Prose. General survey of the prose of the century to 1660. History 4-5 is desirable as preparation for this course.
- 123-124-125.† The Technique of the Novel. Special studies in novels of the late nineteenth and twentieth centuries with particular regard to structure.
- 126-127.† Drama, 1660 to 1880.
129. Modern Drama. Contemporary drama from 1870 to the present.
133. The English and Scottish Popular Ballads. A study of a large number of traditional ballads, English and foreign, and of ballad style and origins.
136. Advanced Shakespeare. Shakespeare's development traced to the end. A careful analysis of four plays. Problems in the interpretation of Shakespeare's dramatic methods.
140. Advanced Chaucer. The more important poems (except those read in Course 75). The treatment will be primarily literary and historical, linguistic proficiency being presumed.
- 141-142-143.† Historical Grammar of the English Language. This course is identical with Comparative Philology 141-142-143.
- 146-147.† The Metrical Romances. The more important Middle English romances of the non-Arthurian cycles.
- 148-149.† The Arthurian Romances. An introduction to the great stories of love and chivalry connected with King Arthur and the Round Table.
150. Victorian Poetry. The poetry of the Victorian era, aside from Browning's and Tennyson's. The principal names are: Matthew Arnold, the Rossettis, FitzGerald, Morris, Swinburne, and Meredith.
151. Recent Poetry. Poetry in England and America since the death of Queen Victoria. The main tradition and tendencies now prevailing.
- 152-153.† Pre-Elizabethan Drama. The late Medieval and the Renaissance drama, moralities, interludes, and farces up through the earlier years of the Elizabethan period.
- 154-155. The American Novel. The history of the American novel from the beginning to the present.
156. The American Drama.
- 157-158.† Elizabethan Non-Dramatic Literature. Renaissance background; lyric and narrative poetry, prose fiction, pamphlets, translations, critical essays.
159. Colonial Literature in America. A study of early American literature (1608 to 1785).
160. History of the English Language.
162. Restoration Literature.
164. Dante in English. The same as Italian 164.
- 171-172-173. Honors Course.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

201. Old English.
 202-203. Old English Poetry.
 208. Piers the Plowman.
 209-210-211. Seminary in Middle English Lyric.
 213-214-215. Seminary in Eighteenth-Century Drama.
 217-218-219. Seminary in Restoration Drama.
 220-221-222. Seminary in Medieval Drama.
 225-226-227. Seminary in Elizabethan Drama.
 228-229-230. Seminary in Eighteenth-Century Novel.
 231-232-233. Shakespeare's Tragic and Comic Art.
 234-235-236. Seminary in Middle English Alliterative Poetry.
 237-238-239. Seminary in Chaucer.
 240-241-242. Seminary in *The Canterbury Tales*.

COURSES IN COMPOSITION

- A-B-C Freshman English. The study of the fundamental principles of composition; training in the art of writing; the classics of English literature.
 4-5-6. Freshman Composition. Practical training in the art of writing; the principles of structure, and analysis of specimens of good prose.
 10. Organization of Source Material.
 11-12.† Description and Narration.
 18-19.† Types of Writing. Advanced exposition, first quarter; description and narration, second quarter. Intended for students who do not plan to take advanced work in narrative writing.
 20. Informal Exposition. Description and narration as methods of exposition; the informal essay.
 31. Technical Writing. (See bulletin of the College of Engineering.)
 67-68.† Imitative Writing. The principles of structure, diction, and style, which underlie the work of leading English writers; application of these principles in both imitative and original composition. Number of students limited to twenty-five.
 69-70-71.† Short-Story Writing. The technique of the short story accompanied by constructive work in story writing. Number of students limited to twenty-five.
 111-112-113. Essay Writing. Practice in writing didactic, biographical, critical, and informal essays. Analysis of a considerable body of modern essays.
 119-120-121. Seminary in Writing. Open to advanced students who write with facility and who desire personal direction. Criticism of manuscripts submitted.

THE FINE ARTS

In the courses in the history of art the lectures will be illustrated by lantern slides and the student will prepare his work by means of reference reading and the study of photographs. Courses 1 and 2 are intended to

offer a general survey of the history of art from the earliest times to the present. They will be followed by more special and intensive courses as students are ready for them.

1. History of Ancient and Early Christian Art. Egyptian architecture, sculpture, and painting, the art of Mesopotamia and prehistoric Greece, Greek sculpture, classical and Christian architecture.
2. History of Medieval, Renaissance, and Modern Art. In the study of the middle ages, stress will be laid upon architecture. In the Renaissance the emphasis will be placed on painting.
10. History of Medieval Art. This course will pay particular attention to the architecture and sculpture of the Gothic cathedrals.

GEOGRAPHY

- 1-2.† Introduction to Human Geography. An introductory study of man's distribution and economic activities.
11. Human Geography. A study of the factors of the physical environment and their limiting effect on human activities.
41. Geography of Commercial Production. The principal commodities of world trade, with reference to areas of production and consumption and the geographic elements in their production.
43. Political Geography. The natural environment in its relation to man's political activities and organizations.
71. Geography of North America. A systematic study of the United States, Canada, and Mexico, with special reference to industrial and commercial opportunities and the distribution of activities of the population.
101. Geography of Europe. A study of the various European countries and their development as influenced by the physical setting.
102. Trade Routes and Trade Centers. Major land and ocean routes, the nature of the traffic, ports and interior trade centers, their location and significance.
110. Geography of South America. A study of the major geographic regions of South America with emphasis upon the economic activities and their geographic basis.
111. Cartography. The construction and use of maps and graphs.
120. Geography of Asia. Areal differentiation in the major geographic regions of Asia. Special consideration of China, Japan, and India.
133. Climatology. Weather and climate in their relation to man and his activities.
235. Geography of Minnesota. A regional economic study of the state. The basis for the existing development and the problems of the idle lands will receive special consideration. The principal cities will be studied as sites for industry and commerce.
241. Field Course in Geography. A consideration of the problems of field work, illustrated by field trips.
- 251-252-253. Seminar in Geography. A survey of current literature with reports and discussions on assigned topics.
301. Research Problems in Geography. Consult Graduate School bulletin.

GEOLOGY

- 1-2.† General Geology (Dynamic and Historical). A synoptical treatment of the materials of the earth and of geologic processes, together with a study of the history of the earth and its inhabitants as recorded in the rocks.
- 1-3.† General Geology (Dynamic and Economic). A synoptical treatment of the materials of the earth and the origin, distribution, and occurrence of metals, non-metals, coal, and petroleum.
4. Geology of Minnesota. The physical geography and geologic history of Minnesota. The relations of industrial development to geologic features.
8. Introductory Geology. A course designed especially for students who want a short introductory course as an elective. Principles of earth sculpture; topographic changes and their causative agents; dynamic, structural, and historical geology.
11. Elements of Paleontology. An introduction to the study of fossil organisms. Lectures supplemented by laboratory work and field excursions.
15. Minerals and Rocks. An outline study of general principles of petrography; classification of minerals and rocks and practice in their identification.
- 23-24.† Elements of Mineralogy. The crystal systems; morphological, physical, and chemical characters of minerals; occurrence, genesis, and use of minerals; classification and description of common minerals, rock minerals, and common rocks. Determinative work in laboratory, blowpipe analysis, sight identification.
27. Outlines of Mineralogy. A course designed especially for teachers. Methods of identification of minerals, laboratory practice, conferences, reference reading.
29. General Physiography. Principles of earth sculpture; modification of surface features by interactions of earth movements, volcanic activity, and the work of streams, glaciers, wind, etc.
49. Physiography of the United States. The development of the surface features of the United States as affected by the rock structure and geologic history. Description and genetic analysis.
61. Blowpipe Analysis. The determination of minerals by systematic blowpipe analysis.
67. Mineralogy of Chemical Materials. Methods of mineralogy; identification of the chief commercial minerals; the world's supply. Laboratory work.
73. Economic Geology. Study of non-metallic minerals of economic value, and discussion of geologic guides to prospecting for these deposits.
85. Field Work. About two weeks in June are spent in geologic mapping of selected areas in the iron districts of Minnesota. Involves preparation of geologic maps and written reports.
- 91-92-93. Index Fossils of North America. A study of fossils and their uses in correlation. A course intended primarily for mining geologists.

101. Sedimentation. The origin of sedimentary rocks and their primary structures; interpretation of sediments in relation to paleogeography. Lectures and assigned readings.
- 102-103. Micropaleontology. The study and classification of Foraminifera, diatoms, and other small fossil organisms, and their use for purposes of correlation.
105. Rock Study. The occurrence and genesis of rocks; their mineral and chemical composition and classification; their structure, texture, and alteration.
106. Petrography. The study of rocks by optical methods.
- 107-108-109. Paleontologic Practice. The collection, preparation, and study of materials, with a view to gaining a working knowledge of groups of fossils and the use of literature. Three credit hours of laboratory work.
111. Ore Deposits. The nature, distribution, and genesis of ore deposits; relations of ore deposits to geologic structure; the deformation and superficial alteration of ore deposits.
112. Geology of Petroleum. The nature, origin, and distribution of petroleum. Discussion of the oil fields of the world.
113. Problems in Ore Deposits. Field excursions, map work, lectures on field and laboratory methods.
121. Crystallography. Study of crystal models and space groups. Crystal drawings and measurements. Projections and mathematical calculations.
- 124-125. Structural and Metamorphic Geology. A study of the principles and application of structural geology. The conditions, processes, and results of metamorphism.
127. Geology of the Lake Superior Region. Structure and correlation of districts. Interpretation of field notes and survey reports. Practical problems.
- 131-132-133. Advanced Petrology. Advanced optical methods. Criteria for rapid identification of minerals and rocks. The uses of schedules and tables. Standard rock types. Regional and genetic studies. Petrographic reports.
137. Testing Economic Minerals. Methods of determining quality of mineral deposits, described and illustrated by laboratory tests of coal, clay, oil, building stone, and metallic ores.
- 140-141. Applied Petrography. Determination of ores and gangue minerals. Microscopic studies of paragenesis. Practical problems in mining and geology, settled by microscopic and optical examination.
- 144-145. Interpretation of Geologic Maps. Study and problems in construction and interpretation of geologic maps; recognition of structural and stratigraphic relations. Geology 124 should precede or accompany this course.
149. Methods of Field Geology. General methods of field work necessary for Course 150.
150. Field Geology. Detailed, systematic work conforming with official surveys. Geologic maps, structure sections, reports; paragenesis of

- ores and their relations to geologic structures. Field for 1930, Black Hills, South Dakota. May 1 to June 15.
- 151-152-153. Advanced General Geology. Geologic processes and their results; development of the North American continent.
161. Crystal Structure. Study of point groups and space groups. Diffraction of X-rays by crystals. Interpretation of powder and Laue diagrams.
- 166-167. Mineralography. Methods of studying opaque minerals and the application of the methods to problems in ore genesis and history.

GRADUATE COURSES

211. Advanced Paleontology.
214. Seminar in Ore Deposits.
215. Geology and Ore Deposits of the Western Hemisphere.
216. Geology and Ore Deposits of the Eastern Hemisphere.
220. Glacial Geology.
241. Field Course in Geology.
- 243-244. Research Course in Geology.
246. Pre-Cambrian Geology.
- 251-252. Original Problems.
- 253-254. Research Course in Ore Deposits.
- 263-264. Research Course in Petrology.

GERMAN

1. Beginning A.
2. Beginning B. Continuation of Course A.
3. Beginning C. Selected texts from modern writers.
4. Intermediate German. Modern narrative prose.
- 24-25-26.† Beginning German for Chemists.
27. Elementary Chemical German.
- 28-29.† Advanced Chemical German. Selected readings in Chemical German.
- 30-31-32.† Medical German. Reading from general works on physiology, anatomy, and bacteriology.
- 50-51-52.† Composition. Aims to develop grammatical correctness. Translations from English selections. Essay writing on assigned subjects.
- 56-57.† Essay Writing. Syntax, structure, and style; criticism of essays on assigned subjects.
62. Nineteenth-Century Prose. Readings from modern novelists.
63. Modern Drama.
64. Classic Drama.
65. Survey of German Literature through the Reformation Period.
66. Survey of German Literature of the Eighteenth Century.
67. Survey of German Literature of the Nineteenth Century.
77. Goethe's *Faust*, Part I. Reading and interpretation of the text; genesis of the work; the Faust legends, Faust books, puppet plays, Marlowe's *Faustus*.

108. Comparative Phonetics. A study of speech sounds, and the nature of their production with special reference to English, French, and German. Identical with Comparative Philology 108. Open to students of the modern languages.
- 109-110-111.† History of the German Language. Lectures, discussions, assigned readings. Identical with Comparative Philology 109-110-111.
- 115-116-117.† Middle High German Literature: The Nibelungenlied, the Court Epic, the Minnesong.
- 140-141-142.† Early New High German Literature, 1500-1700. German Literature from the Reformation and the Renaissance to the beginning of the modern High German classical period.
- 143-144-145.† The Classical Period. The literary period from the birth of Gottsched (1700) to the death of Goethe (1832).
- 153-154-155.† Studies in German Literature of the Nineteenth Century. Subject for 1929-30: The Drama of Kleist, Grillparzer, and Hebbel.
- 160-161-162.† Lyric Poetry of the Eighteenth and Nineteenth Centuries.
- 163-164-165.† German and English Literary Relations in the Sixteenth, Seventeenth, and Eighteenth Centuries.
- 215-216-217.† Middle High German. Consult Graduate bulletin.

GREEK

- 1-2†-3. Beginning Greek. Grammar, composition, word formation, oral exercises, and selected readings in simple prose and verse.
14. History: Herodotus. Selected readings, syntax, irregular verbs, dialectical forms.
15. History and Epic: Herodotus and Homer. Selected readings; syntax, irregular verbs, dialectical forms.
16. Epic Poetry: Homer. Selections from the *Iliad* or *Odyssey*; scansion, mythology, dialectical forms.
17. Greek Sources of English (Everyday Greek). A brief course in Greek sources of English words. The practical purpose is to enable students to trace the origin and feel the force of English words derived from Greek, and especially of scientific terms.
51. Philosophy. Plato's *Apology*, or selections from other dialogs of Plato and from Xenophon's *Memorabilia*.
52. Oratory. Selections from Lysias and Demosthenes; study of the principles of Greek rhetoric and Greek oratory.
53. Dramatic Poetry. One play of Euripides; introductory course in the drama.
- 61-62-63. Advanced Greek Composition. Translation into Greek of selected passages of English prose, with review of important principles of syntax.
99. The New Testament. Especially intended for those who are preparing for the ministry, or for some other form of religious work. Alternates with Course 108.

- 105. Lyric Poetry. Selections from the elegiac, iambic, lyric, and bucolic poets.
- 106. Advanced Drama. Aeschylus, Sophocles, or Aristophanes. Special attention given to the development of the drama, and to the literary form and dramatic representation of the plays read.
- 107. Advanced Prose. Selections from Plutarch or Lucian. Alternates with Course 106.
- 108. Advanced Epic Poetry. A course of rapid readings in the *Iliad* or the *Odyssey*.

COURSES FOR WHICH NO KNOWLEDGE OF GREEK IS REQUIRED

- 42. Greek Sculpture. Lectures, textbook work, assigned readings; stereopticon illustrations of the famous temples, statues, friezes, reliefs, and monuments of Greece.
- 43. Greek Drama. Reading and interpretation of representative Greek plays; lectures dealing with the origin, growth, character, and influence of the Greek drama; stereopticon illustrations. Students taking this course may not receive credit for Course 44 without permission.
- 44. Greek Literature and Life. Lectures, textbook work, illustrative and assigned readings; stereopticon views. Recommended to those who intend to teach Greek, Latin, English, or ancient history.
- 45. Greek Mythology. Lectures, textbook work, and illustrative readings, supplemented by occasional stereopticon views. Recommended to those specializing in languages, literature, or philosophy.

HISTORY

JUNIOR COLLEGE COURSES

- 1-2.† The Modern World.
- 4-5.† England to 1815.
- 6. England since 1815.
- 7-8.† American History. The national period to 1877.
- 9. Recent American History. The national period after 1877.
- 11-12-13.† Medieval History through the Reformation. Primarily for music and architecture students, but open to others who have ten credits in the social science group.
- 14-15-16. Foundations of Modern Europe to 1648.
- 17. Europe in the Middle Ages.
- 33. English Legal Institutions.

SENIOR COLLEGE COURSES

American History

- 90-91. History of Minnesota.
- 112. History of American Immigration.
- 122. American Colonies in the 17th Century.
- 125-126.† American Diplomatic History. A survey of the development of the foreign policy of the United States.

129. Civil War and Reconstruction.
 141. The West in American History to 1815.
 142. The West in American History, 1815-65.
 144. American Political Parties. A study of the origin, organization, and activity of political parties, considering in some detail important presidential campaigns.
 149. American Colonies in the Eighteenth Century.
 152. Select Topics in the History of the West to 1815.
 153. The West in American Politics since 1865.
 154. Select Topics in the History of Minnesota. Students will be expected to use material in the library of the Minnesota Historical Society, St. Paul.
 156. Select Topics in the Reconstruction Period.
 166. Select Topics in the History of Immigration.
 168. Topics in American Foreign Relations.
 171. Topics in Recent American History.
 208-209-210.† Seminar in American History. Consult Graduate School bulletin.

Ancient History

103. Political History of Greece.
 105. History of Rome.
 133. Ancient Civilization of the Near East. Egypt, Mesopotamia, Israel, and neighboring lands. Archeological discovery and history.
 134. Greek and Roman Civilization I. A comparative study of social life, thought, and religion.
 135. Greek and Roman Civilization II. Economic aspects: agriculture, manufactures, commerce, slavery. Towns and public works. Ancient exploration, trade routes, travel, and colonization.

Economic History

- 80-81.‡ Introduction to Economic History. Outline of general economic development; industrial revolution in England and America; changes in transportation and exchange. Chief historical changes in land, capital, enterprise, and labor.
 82,83,84.¹ Economic History of the United States. Colonial period; early national, period since 1860.
 113,114,115. Economic History of Europe since 1750.
 116,117,118. Economic History of Europe, 1300-1750.
 169. Economic History of the United States since the Civil War.

English History

121. English Backgrounds and the American Colonies.
 162. The Beginnings of Parliament.
 183. The Stuart Period.
 184. Topics in Modern English History.

See also 113, 114, 115 and 116, 117, 118 under Economic History.

¹ This course may be taken by quarters, credit being given for any part.

European History

- 101-102.† The French Revolution and Napoleonic Era.
104. The Near East: Modern. Rise and decline of Ottoman Empire. Development of the Balkan States. Action of the great powers in the Near East.
- 106-107-108. Europe, 1815-1914. Reading knowledge of French and German desirable.
111. European Backgrounds of American Immigration.
119. The Renaissance and the Reformation.
120. Medieval Civilization.
123. European Expansion to 1815. The period of the great discoveries. Foundation of the European empires in America, Asia, and Africa. The old colonial system. The struggle for empire.
124. European Expansion since 1815. The expansion and development of British dominion in India. Russian expansion in Central Asia and Siberia. The partition of Africa. Imperialism and the reaction of the non-European peoples.
127. Feudal Institutions.
128. Rise of Nationalism in Europe. A study of the growth of central government and the influences which led to the formation of nations to 1600.
130. Introduction to the History of Russia. Survey of the history of the Russian people and the development of the Russian state. As far as time permits, attention will be paid to foreign affairs and to the development of Poland. Reading knowledge of French and German desired.
- 131-132.† France under Louis XIV and Louis XV. Reading knowledge of French desirable.
- 157-158-159. Topics in European History since 1815. Reading knowledge of French or German required.
164. Studies in the Crusades. Reading knowledge of at least high school Latin required.
- 201-202-203. Historical Bibliography and Criticism. Consult Graduate School bulletin.

See also 113, 114, 115 and 116, 117, 118 under Economic History.

Honors Course

197-198-199. Honors Course.

NOTE.—The following courses carry credit also in this department: Political Science 153-154 and 191-192.

HOME ECONOMICS

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

3. Textiles.
4. Textiles.
11. Clothing Planning and Construction A.

- 13. Clothing Planning and Construction B.
- 15. Clothing Problems.
- 17. Advanced Clothing.
- 50. Color and Design I.
- 51. Color and Design II.
- 53. Advanced Design.
- 56. Applications of Color and Design.
- 70. Nutrition Survey.
- 80. Foods and Cookery.
- 83. Food Management.
- 115. Clothing Economics.
- 131. Home Management: House Planning and Equipment.
- 150. Art History and Appreciation.

HOW TO STUDY

- 1. How to Study. Intensive study of principles underlying academic work, such as budgeting time, efficient reading, recitation methods, and organization of knowledge. Practice in the skills involved.

HUMAN ANATOMY

MEDICAL SCHOOL

For Course 3, Elementary Anatomy, primarily for nurses, see Nursing School program.

Students in this college may elect other courses in human anatomy (see Medical School program) only by arrangement with the head of the Department of Anatomy.

HUMAN PHYSIOLOGY

MEDICAL SCHOOL

- 4. Human Physiology. A brief course for academic and home economic students. Lectures and laboratory work.
- 57.¹ Physiologic Chemistry. Intermediate course.
- 59.¹ Human Physiology. Intermediate course.
- 100-101. Physiologic Chemistry. Inorganic, carbohydrate, fat, protein and heat metabolism.
- 103. Physiology of Muscle, Nerve, Blood, Circulation, Respiration, Digestion.
- 104. Physiology of the Nervous System and Special Senses, Metabolism, Nutrition, and Excretion.
- 113. Problems in Physiology. Arranged by instructors with qualified students. Each student will be assigned a topic for special laboratory

¹ Courses 57, 59 constitute a sequence recommended for students who wish a knowledge of human physiology, but who do not desire the detailed consideration given in Courses 100-101, 103, and 104. A student cannot receive credit for both of these sequences.

- study, leading in some cases to original investigation. Conferences and reading. May be taken one or more quarters.
131. Advanced Physiology of Muscle, Blood, Circulation, and Digestion. Alterations due to physiologic conditions. Special laboratory work.
153. Problems in Physiologic Chemistry. Course arranged by instructors with qualified students for special work. May be taken one or more quarters.
- 155,156,157. Pathological Chemistry. Blood chemistry of diabetes and nephritis. Basal metabolism, deficiency diseases.
163. Metabolism. Lectures and laboratory work on special phases of metabolism.

NOTE.—For other courses, see Medical School bulletin.

JOURNALISM

5. The American Newspaper. A survey of the history, organization, and methods of contemporary journalism, followed by an analysis of the relations of newspapers to their readers.
13. Introduction to Reporting.
- 14-15.† Newspaper Reporting and Correspondence. Students are required to cover one news assignment each week for a Minneapolis or St. Paul newspaper.
17. Newspaper Reference Library. A study of the use of journalistic reference material and of newspaper filing methods.
41. Principles of Editing. A condensed course in copy reading, proofreading and make-up.
- 51-52.† Copy Reading and Newspaper Make-up.
- 55.¹ Advertising Typography.
- 56.¹ Newspaper Typography.
- 57.¹ Magazine Typography.
58. Advanced Typography.
- 60-61†-62. The Community Newspaper. A comprehensive analysis of the problems of editors and publishers of country weeklies and small city dailies.
65. Women's Departments. Study of departmental work on newspapers and magazines and an analysis of the editorial positions usually occupied by women.
69. The Writing of Special Articles.
- 70-71.† Trade and Technical Journals. An analysis of the editorial requirements and services rendered by specialized periodicals and house organs.
- 73-74.† Newspaper and Magazine Articles. Lectures and practice in gathering and preparing material for special magazine and newspaper articles.
75. Law of the Press. A study of the legal rights and duties of newspapers and magazines.
76. Critical Writing.

¹ Students may not receive credit for more than one quarter of 55, 56, 57.

- 78. Press Relations. A study of the news problems of social and educational activities and institutions.
- 82. Supervision of School Publications.
- 95. Editorial Administration. An intensive study of the editorial organization of the newspaper and the duties of the editorial executives.
- 96. Financial Writing. Practical instruction in the methods by which financial reporters and editors cover the activities and interests of modern business, finance, and stock and commodity exchanges.
- 100. Analysis of News Interests. A study of the principles of journalistic research and of the methods used to measure and evaluate reader interest.
- 101. The Reporting of Public Affairs.
- 104. Editorial Writing.
- 110. History of American Journalism.
- 111. Foreign News Sources. A comparison of American journalism with that of other countries and a study of the news gathering agencies of the world.
- 112. Current Newspaper Problems.
- 130-131-132.† The Press and Public Opinion.
- 190-191-192. Topics in Journalism. Original research.

LATIN

JUNIOR COLLEGE COURSES

- 1-2.† Beginning Latin. Ten weeks are spent in mastering inflections; the remainder of the course is devoted to reading easy Latin prose and the study of elementary syntax.
- 3. Caesar. Selections from the Gallic Wars are read. Elementary Latin composition is taken in connection. Students entering with one year of Latin may select this course.
- 11. Virgil: Books I and II of the *Aeneid*. Includes also practice in Latin composition. A continuation of Course 3. Students entering the first quarter with two years' preparation in Latin may select Course 11.
- 12. Virgil: Books III and IV of the *Aeneid*. Includes also practice in Latin composition. Students entering the second quarter with two years of Latin may select Course 12.
- 13. Selections from the Works of Ovid. Students entering the third quarter with two years of Latin may select Course 13.
- 21. Selections from Latin Authors.
- 22. Selections and Survey of Roman Literature.
- 23. Plautus and Terence. One play each of Plautus and Terence with a study of the beginnings of Roman drama. Students entering the third quarter with four years' preparation in Latin may select Course 23.

SENIOR COLLEGE COURSES

- 51. Pliny's Letters. Selected letters of Pliny the Younger with a study of Roman society in his time.
- 52. Horace's Satires and Epistles.

53. Suetonius. Selected Lives of the Caesars.
62. Horace's Odes and Epodes. Alternates with Course 52.
63. Apuleius. Alternates with Course 53.
71. Cicero's *De Amicitia* and *De Senectute*. Alternates with Course 51.
73. Advanced Grammar and Composition.
121. Advanced Virgil. Selections from the Eclogues and Georgics and from Books VIII to XII of the *Aeneid*. Alternates with Course 131.
122. Cicero's Letters.
123. Medieval Latin. Selections from Beeson's *Primer of Medieval Latin*.
131. Juvenal. Selected satires. Alternates with Course 121.
132. Seneca's Epistles. Alternates with Course 122.
133. Vulgar Latin. Lectures on vulgar Latin; selections from Petronius and Gregory of Tours. Alternates with Course 123.
- 145.¹ Roman Tragedy.
- 146.¹ Roman Comedy.
- 147.¹ The Histories of Tacitus.
- 154.¹ The Elegiac Poets.
- 201-202-203. Tacitus. Graduate seminar.
- 211-212-213. Lucretius. Graduate seminar.
- 221-222-223. Cicero's Philosophical Works. Graduate seminar.
- 231-232-233. Cicero's Rhetorical Works. Graduate seminar.
- 241-242-243. Graduate Seminar. Introduction to classical philology with special attention to the principles of textual criticism, epigraphy, and historical Latin grammar.

LIBRARY METHODS

1. Use of Books and Libraries.

NOTE.—For professional courses in Library Instruction, consult the bulletin of the Division of Library Instruction.

MATHEMATICS

- 3.² Higher Algebra, Short Course. A review and a collegiate treatment of the topics of elementary algebra for those who have had one year of elementary algebra. Not open to those who presented higher algebra for entrance.
- 4.² College Algebra and Trigonometry. Selected topics in algebra and trigonometry with special reference to preparation for the first course in physics.
5. Higher Algebra. A review and a collegiate treatment of the topics of elementary algebra for those who have had one year of elementary algebra. Not open to those who presented higher algebra for entrance.

¹ 145, 146, 147, 154 are offered in successive summers.

² For pre-medical and pre-dental students, and others who desire only the mathematics necessary in the first course in physics.

- 6.¹ Trigonometry. Logarithms and plane trigonometry.
- 7.¹ College Algebra. Quadratic equations, equations in the quadratic form, simultaneous quadratic equations, graphical representation, progressions, mathematical induction, the binomial theorem, permutations, combinations, probability, determinants, and the theory of equations.
- 8.¹ Commerce Algebra. Logarithms and selected topics in college algebra. A preparatory course for Mathematics of Investment, designed primarily for pre-business students.
20. The Mathematics of Investment. First principles of the mathematical theory of interest, annuities, amortization, valuation of bonds, sinking funds and depreciation.
21. Elements of the Mathematics of Life Insurance.
30. Analytic Geometry. The elements of plane analytic geometry including the geometry of the conic sections, with a brief introduction to solid analytic geometry.
- 47,48,49.¹ Mathematics for Students of Statistics. Topics in college algebra, trigonometry, analytic geometry, and calculus most useful for students of statistics. Intended for students desiring rapid preparation for the Mathematical Theory of Statistics (Course 121-122-123), or other work in mathematical statistics.
50. Calculus I. Differential calculus.
51. Calculus II. Integral calculus.
52. Calculus III. Selected topics in differential and integral calculus with special reference to infinite series, partial differentiation, multiple integrals, and applications of the calculus.
60. Synthetic Metric Geometry. The modern developments of Euclidean geometry, with a detailed study of some of the more modern geometry of the triangle and the circle.
62. Theory of Equations I.
63. Theory of Equations II.
70. History of Elementary Mathematics. A brief course in the history of arithmetic, algebra, and geometry intended primarily for those who are preparing to teach high school mathematics.
71. Solid Analytic Geometry.
- 102-103-104. Advanced Analytic and Synthetic Geometry.
106. Differential Equations.
- 107-108. Advanced Calculus. Selected topics in advanced differential and integral calculus.
- 115-116-117. Differential Geometry.
- 118-119-120. Vector Analysis.

¹ Courses 6 and 8 involve some duplication; any student who has taken one of them may take the other for 4 credits. Course 47 involves some duplication of material with Courses 6, 7, and 8. A student who has taken 6, 7, or 8 may take 47 only with special permission and for reduced credit. No student may receive credit for both Courses 7 and 8. Students who elect mathematics to meet the requirements of 10 credits in mathematics or laboratory science in the pre-business course should take Courses 5 and 8 or 5 and 47 if they have not had high school higher algebra and Courses 8 and 20 or 47 and 48 if they have had high school higher algebra.

- 121-122-123. The Mathematical Theory of Statistics. Frequency curves, averages, measures of dispersion, ordinary and partial correlation, theory of probability and the method of least squares, theory of sampling, construction and smoothing of tables, curve fitting, analysis of time series.
140. The Method of Least Squares. The same as Astronomy 140.
- 144-145-146. Topics in Mathematical Analysis. A study of mathematical questions arising in connection with certain problems of mathematical physics; developments in series; the properties of solutions of Laplace's equation.

Some of the courses listed in the bulletin of the Graduate School are open to properly qualified juniors and seniors. For more information consult the chairman of the Department of Mathematics.

MECHANICAL ENGINEERING

COLLEGE OF ENGINEERING AND ARCHITECTURE

11. Pattern Practice.¹
12. Foundry Practice.¹
13. Forge Practice.¹

MILITARY SCIENCE AND TACTICS

- 1-2-3. First Year Basic Course R.O.T.C. Infantry. Practical and theoretical instruction in school of soldier, squad, and company; rifle marksmanship, military hygiene and first aid; military courtesy; physical drill; equipment; ceremonies.
- 4-5-6. Second Year Basic Course R.O.T.C. Infantry. Practical instruction in school of the platoon and company; command and leadership; scouting and patrolling; automatic rifle; musketry; interior guard duty.
- 51-52-53. First Year Advanced Course R.O.T.C. Infantry. Military field engineering; combat principles; military sketching and map reading; machine gun; command and leadership.
- 54-55-56. Second Year Advanced Course R.O.T.C. Infantry. 37 mm. gun; 3" trench mortar; administration; military history and national defense act; combat principles; military law; rules of land warfare; command and leadership.

MUSIC

- 1-2-3.† Harmony. The study of chords, their construction, relations, and progressions. Written exercises on bases, the harmonization of given melodies.
- 4-5-6.† Counterpoint. Strict counterpoint up to eight parts; free contrapuntal harmonization of chorales and composition of smaller contrapuntal forms as inventions.

¹ For description, see bulletin of the College of Engineering and Architecture.

- 7-8-9. Ear Training.
10. Organ.
11. Piano.
12. Voice.
13. Violin.
14. Viola.
15. Cello.
16. Double Bass.
17. Flute.
18. Oboe.
19. Clarinet.
20. Bassoon.
21. Trumpet.
22. French Horn.
23. Trombone.
24. Tuba.
25. Percussion.
26. Harp.
- 40-41-42. Orchestra.
- 43-44-45. University Chorus.
- 100-101-102. Composition-Orchestration. For those specializing in theory. May be taken only with the consent of the instructor.
- 103-104-105. Analysis. The analysis of musical works as regards their formal construction; subdivisions of themes into phrases, sections, and motives. Symphonies to be presented by the local orchestra are among the compositions used in this course.
- 106-107-108.† History of Music. Some account of primitive systems and of the early Christian modal and harmonic developments, leading to a general survey of musical literature from Bach to the present time.
- 109-110-111.† Bach and Beethoven, Wagner and Brahms. Critical study of selections from master works of the four greatest composers. Biographical readings, topics, and analyses, giving historical and literary background to culminate periods in composition.
- 112-113-114. Ensemble. Section 1. (For students of piano, violin, organ, etc.) Chamber music, duos, trios, and quartets and other larger combinations for strings and wind instruments. Section 2. (For voice students.) Oratorio and opera.
- 115-116-117. Advanced Ensemble. Section 1. (For students of piano, organ, violin, etc.) Chamber music continued. Section 2. (For voice students.) Offers to groups made up of students from all voice ensemble classes, practical experience in scenes from opera.
- 121-122-123. Romantic Movement. An analytical course covering the romantic movement, with illustrations by the instructor. Papers assigned during the year.
- 124-125-126. Advanced Harmony. Harmony 1-2-3 prerequisite. A course designed to develop more freedom in expression and in musical effect. Especial attention given to modulations.
- 127-128-129. Advanced Composition.
- 201-202-203. Basis of Musical Expression. Consult Graduate School bulletin.

ORIENTATION

- 1-2.† Orientation. A course intended to orient the student in the world of nature, of man, and of organized society; and to arouse in him a consciousness of his relationships and realization of his responsibilities.

PHILOSOPHY

1. Problems of Philosophy. A survey course in philosophy, in which the main fields of investigation are mapped out, the permanent problems indicated, and the chief methods employed in their solution discussed.
2. Logic. The nature of knowledge, the laws of reasoning, the principles and methods of scientific proof.
3. Ethics. The principles of morals; sketch of the historical development of morality followed by an analysis of its meaning, and of its basis in human nature.
10. Science and Religion. Religious problems as affected by the results of modern science.
50. Ancient Philosophy. An introduction to philosophy through a study of typical world views: Greek, Roman, early Christian.
51. Medieval and Renaissance Philosophy. The beginning of the modern scientific view of the world.
52. Modern Philosophy. Sketch of the development of philosophy from the Renaissance to the present.
100. History of Religions. A comparative survey of primitive, national, and personal religions. Readings in sacred scriptures and in oriental philosophies and literatures.
101. Psychology of Religion. The organization of mental life in emotions, sentiments, and values. Studies in the psychology of conversion, faith, healing, mysticism, etc.
102. Philosophy of Religion. A critical discussion of esthetic, ethical, and religious attitudes toward life.
103. Esthetics. An introduction to the history and theory of esthetics, psychological analysis of beauty, and a discussion of the arts.
104. History of Esthetic Theory. A survey of the chief esthetic theories of ancient and modern thinkers.
- 108-109-110. History of Ethics. A survey of the chief ideals of conduct and theories of life from Socrates to the present day.
115. Contemporary Philosophy. Critical discussion of the various forms of present day idealism, naturalism, pragmatism, and realism.
120. Scandinavian Philosophy. The philosophical thought of the nineteenth century in Scandinavian countries, including a comparative study of Boström and Kierkegaard.
124. Political and Social Ethics. The fundamental aspects of society and the state, considered from the point of view of ethics.
129. The Development of Political Thought. The state in modern political philosophy; its nature, basis, and authority. Individualism and socialism in the eighteenth and nineteenth centuries.
- 135-136. The Philosophy of Plato. The reading and discussion of the principal dialogs with a view to understanding the problem and method of Greek philosophy as illustrated in the writings of Plato.
141. Metaphysics. A study of the problem of the unity of the sciences.

- 147-148. Advanced Logic. Different topics from year to year, including the organization of the sciences, the presuppositions of knowledge, recent mathematical and symbolic logic, and the pragmatic theory of logic.
- 151-152. Modern Idealism. Discussions of the place of mind in the world, based upon the works of philosophers from Kant to Royce.
- 161-162-163. Seminar in Philosophy.

PHYSICAL EDUCATION FOR MEN

- 1, 2, 3. Freshman Physical Education. Mass activities, corrective exercise, swimming, athletics, and games.
- 7, 8, 9. Advanced Leaders. One hour of instruction; two hours leading squads in Physical Education 1, 2, 3 or 16, 17, 18 under supervision.
- 13, 14, 15. Corrective Work. By petition in place of Physical Education 1, 2, 3.
- 16, 17, 18. Drill Substitution. By petition as substitution for military science.

PHYSICAL EDUCATION FOR WOMEN

- 1-2-3. Freshman Physical Education. Apparatus and floor work, orthopedic exercise, folk dancing, sports. Individual health consultations.
4. Preliminary Hygiene. One lecture a week. The most essential aspects of the care of personal health.
- 7-8. Sophomore Gymnastics. Fundamental gymnastics based on the German, Swedish, and Danish systems. The exercises include work for flexibility, strength, and co-ordination, apparatus work.
9. Sophomore Archery. Suitable in strength for girls in Individual Gymnastics.
- 10-11-12. Sophomore Orthopedic and Individual Gymnastics. For those who need more individual supervision than is possible in other classes.
- 13-14-15. Sophomore Interpretive Dancing. An art and a phase of physical education designed to develop a sense of beauty and body control through rhythmic movements prompted by the imagination.
- 16-17. Sophomore Games and Folk Dancing. Suitable in strength for C-D girls. Conducted outdoors when weather permits.
18. Tennis.
19. Sophomore Hockey.
20. Sophomore Basket-Ball.
21. Sophomore Baseball.
- 22-23. Sophomore Elementary Swimming. Course 22, elementary; 23, low intermediate.
24. Sophomore Horseback Riding. Lessons for beginning and advanced classes under competent instruction, supervised by a member of the Department of Physical Education for Women.
- 25-26. Sophomore Intermediate Swimming. Wide range of strokes, elementary diving.

27. Sophomore Golf. The fall quarter is open to students who know the rudiments of golf, and the spring quarter is open only to beginners in golf.
- 28-29. Sophomore Advanced Swimming. Advanced strokes and diving, life saving.
30. Sophomore Life Saving and Water Sports.
31. Sophomore Skating. Practice and technique of fundamental strokes.
- 41, 42. Individual Projects in Physical Activity. Two periods of exercise in a course chosen by the student; one period of conference; individual study of a problem of health.
- 43-44-45.† Theory and Function of Play. Graded games, and folk dances for school and playground, two hours. A consideration of nature and function of play and practical conduct of playground one hour.¹
- 66-67-68. Interpretive Dancing. Similar to 13-14-15. Three hours.¹
- 69-70-71. Advanced Interpretive Dancing. Two hours of dancing. Written work and prescribed reading.¹

ACTIVITIES FOR WHICH NO REGISTRATION IS REQUIRED

- Elective Sports. Hockey and volley ball in the fall, basket-ball and ice hockey in the winter, baseball, track, and swimming in the spring.
- General Swimming. For beginners and advanced swimmers and divers.

PHYSICS

INTRODUCTORY COURSES

3. Elements of Mechanics. First part of general course, 3, 23, 33, 43. Course 4 should be taken in conjunction with this course. Three lectures, one quiz hour a week.
4. Elements of Mechanics Laboratory. The laboratory part supplementing Course 3. One two-hour session in the laboratory a week.
9. Acoustics. A study of the principles of sound. A course designed primarily for the students in the Department of Music. Open also to other students. Three lectures a week.
23. Heat. Course 24 should be taken in conjunction with this course. Three lectures, one quiz hour a week.
24. Heat Laboratory. The laboratory part supplementing Course 23. One two-hour session in the laboratory a week.
33. Optics. Course 34 should be taken in conjunction with this course. Three lectures, one quiz hour a week. Course 33 will satisfy the pre-medical requirement in optics.
34. Optics Laboratory. The laboratory part supplementing Course 33. One two-hour session in the laboratory a week.
43. Electricity. Course 44 should be taken in conjunction with this course. Three lectures, one quiz hour a week.
44. Electricity Laboratory. The laboratory part supplementing Course 43. One two-hour session in the laboratory a week.

¹ If taken for no credit, no reading or written work will be required.

INTERMEDIATE COURSES

52. Laboratory Arts. Designed to acquaint students with the methods used in glass blowing, silvering, etching metal to glass seals, making quartz fibers, soldering, spinning, spot welding, etc., as a preparation for general experimental work.
- 101-103-105. Theoretical Physics. An analytical survey of fundamental principles of mechanics, sound, heat, light, electricity, and magnetism, designed to supplement the general courses and to prepare students for more specialized graduate courses. Five lectures a week.
104. Precision Mechanics. Standard methods of precise measurements of length, mass, and time.
- 114-116-118. Elementary Physical Investigation. The experimental or theoretical study of physical phenomena the nature or laws of which are not as yet understood.
- 115-117-119. Problem Course. A study of the fundamental principles and standard methods involved in the mathematical analysis of physical problems. Three lectures a week.
124. Pyrometry. An experimental and theoretical study of high temperature measurements. One lecture, two three-hour sessions in the laboratory a week.
126. Advanced Heat. A theoretical and experimental study of heat phenomena. One lecture and two three-hour sessions in the laboratory a week.
134. Experimental Optics. Special experimental work in spectrometry, optical instruments, photometry, absorption, polarized light. Two three-hour laboratory periods a week.
136. Spectrum Analysis. An experimental course dealing with the measurement of wave lengths, intensities, and absorption coefficients in the infra-red, visible, and ultra-violet regions of the spectrum. Two three-hour laboratory periods each week.
144. Electricity Measurements. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux. Three two-hour laboratory periods a week.
146. Advanced Electricity Measurements. Standard measurements of the various electricity quantities including the use of precision instruments. A continuation of Course 44. Three two-hour periods a week.
148. Radioactivity. An analytical study of the theories and methods of investigation supplemented by laboratory technique. Those pursuing this course should continue with Chemistry 151, Radiochemistry.
150. Conduction through Gases. An analytical study of the theories and methods of investigation, supplemented by laboratory technique.
152. X-Rays. A study of the production and nature of X-rays. Three lectures a week.

POLITICAL SCIENCE

1. American National Government.
- A-B. Introduction to Government and Politics. A gateway course. Government considered as a process. Illustrative material drawn from both American and foreign principles and practice.
2. American State Government.
3. Comparative European Government.
11. Municipal Government in the United States.
15. Elements of Political Science. The nature of the state, the forms and functions of government, the principles of politics.
25. World Politics. A study of the foreign policies and international relations of the leading European powers today.
- 51-52-53.† Business Law. Principles governing ordinary business transactions.
- 81-82-83.† Readings for Honors. Junior course.
- 91-92-93.† Readings for Honors. Senior course.
- 101-102.† Constitutional Law. I. Constitutional basis of federal-state relations; interstate relations; powers of the national government; inter-relations of national government departments. II. Government and the individual; citizenship and suffrage; constitutional protection of the individual and his property.
103. State Constitutional Law. Characteristics, adoption, and amendment of state constitutions; organization, powers, and relations of the major departments; suffrage and elections; the state bills of rights.
104. Problems in State Government. Special attention to Minnesota government, coupled with an intensive comparative study of one major activity in a number of states.
- 105-106.† American Constitutional Development. Topical and chronological study of the constitutional development of the United States as a federal state: colonial origins; the first state constitutions; formation of the federal constitution; organization of the new government, and the expansion of national powers by amendment, usage, judicial interpretation, the exercise of a quasi-police power, and federal aid to the states.
107. Recent Social Legislation. Governmental powers and methods used for social legislation, both state and federal; peace and security; safety and health; public morals; semi-social economic relations, social advertising, minimum wage, city planning, police power restrictions on use of private property.
108. Legislative Power and Methods. Source and scope of the legislative power; methods used by legislative bodies; current political questions; formulation and defense of legislative bills.
109. Government and Business. Governmental powers; restraint of trade and manipulation of prices; protection of debtors; business affected with a public interest; combinations of laborers; corporations; compulsory benefits; conservation of natural wealth; vested rights; confiscatory legislation.
111. Law of Public Utilities. See bulletin of Law School.

113. Administrative Law. The nature and scope of administrative law with special reference to the law of officers and special administrative tribunals.
116. Municipal Powers and Functions. A study of the constitutional status; the common law attributes; the creation, alteration, and dissolution; the organization, officers, and procedure; the corporate and governmental powers; and the expanding functions of municipal corporations.
119. Jurisprudence. (See Law School program.)
- 131-132.† Principles of Public Administration. Source of the administrative power; administrative areas; the budget; personnel; purchasing; organization; public service as a career.
133. Problems of Public Administration. Special problems relating to education, finance, safety, health, welfare, commerce, labor, and conservation of natural resources.
137. Municipal Administration. Administrative organization, personnel, and finance; planning, public works, safety, sanitation; utilities.
- 145-146.† Comparative Federal Government. Analysis of the federal elements found in such foreign governments as Canada, Australia, Germany, and Switzerland, to evaluate American practice.
- 149-150.† Government and Politics of the British Empire. Organization, working, and international status of the Imperial and Dominion governments.
- 153-154.† Far Eastern Government and Politics. The constitutional development of Japan and China; government, parties, and political problems.
- 161-162.† Current Political Thought. A study of present-day schools of political thought and their reactions against nineteenth century ideas of the state, state functions, representative government, and democracy.
163. American Political Ideas. Intensive study, biographically or topically, of selected theoretical aspects of American political life.
165. Development of Political Thought. (See Philosophy 129.)
169. Problems of Democracy. An examination of a few key problems of a democratic society—individual and class differences, opinion, dictatorships, expert knowledge, and leadership.
171. Political Psychology. A biological and psychological approach to political theories and problems. The political significance of individual differences in intellect and temperament in relation to belief, propaganda, and public opinion.
175. Political Parties. The nature, function, organization, and methods of political parties; legal control of parties and elections; public opinion as a factor in popular government.
- 181-182.† International Law. Nature, sources, and sanction of international law. The laws of peace, war, and neutrality.
183. International Organization. Systems of international relations, international administrative organizations, and political guarantees of the past, with a detailed study of the League of Nations.

184. Problems in International Law. Intensive study of the solution of selected international controversies by national and international courts, arbitration tribunals, and diplomatic conferences.
- 187-188.† American Diplomatic History. The history, principles, and policies of American diplomacy.
189. American Foreign Relations. Such topics as the Monroe Doctrine, freedom of the seas, the "open door," arbitration, and disarmament will be considered with particular reference to the future policy of the United States.
- 191-192.† Far Eastern Diplomacy. The international relations of China from the earliest period; early contacts between Japan and China; the policy of exclusion gradually overcome by western powers; the opening of the Far East in the nineteenth century; the "open door" policy; the contemporary situation.
193. Problems of the Pacific. Intensive study of selected problems, varying from year to year, in the political and constitutional developments, or in the foreign relations, of Far Eastern countries.
195. Colonization. The economic and political factors in colonization; forms of government, commercial policies, and mandates.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

- 201-202-203.† Seminar in Public Law.
- 211-212-213.† Seminar in Modern Government and Political Theory.
- 221-222-223.† Seminar in Local Government and Administration.
- 231-232-233.† Seminar in International Relations.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

MEDICAL SCHOOL

2. First Aid.
3. Personal Hygiene and Elementary Sanitation. Elementary principles of normal body function; predisposing and actual causes of disease; ways in which disease may be avoided.
50. Public and Personal Health. Discusses the causes of diseases and of physical defects and presents the fundamental principles and working methods of health conservation and disease prevention. Lectures, demonstrations, discussions, inspection trips, and directed readings.
52. Health Care of the Family.
53. Elements of Preventive Medicine. Susceptibility, resistance, and immunity to disease; methods of spread and prevention of communicable and degenerative diseases; protection of food, water, and milk; school health work; vital statistics.
57. Health of Infant and Pre-School Child. Growth and development of baby and young child. Care and feeding of normal child. Prevention and correction of physical defects. Demonstration of infant clinics.

58. Maternal and Child Hygiene.
59. Social Hygiene.
60. Tuberculosis and Its Control.
61. Mental Hygiene.
62. Principles of Public Health Nursing.
63. Special Fields in Public Health Nursing.
64. Field Practice in Infant Welfare Nursing.
65. Field Practice in School Nursing.
66. Field Practice in County Nursing.
67. Field Practice in a Tuberculosis Sanatorium.
68. Field Practice in Visiting Nursing.
70. Home Nursing and Child Care.
73. Occupational Hygiene and Disease.
80. Health Supervision of the School Child.
102. Sanitation.
103. Public Health Bacteriology.
106. Public Health Administration.
107. Sanitary Surveys.
200. Research. Consult Graduate School bulletin.

PSYCHOLOGY

- 1-2.† General Psychology. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences.
3. Psychology Applied to Daily Life. The applications of psychology to selected problems in medicine, law, education, sociology, and daily life.
- 4-5.† Introductory Laboratory Psychology. Simple experiments providing the beginner illustrative material and training in the methods of laboratory psychology. Required for all advanced courses in general psychology. Four laboratory hours per week.
7. Introductory Laboratory Psychology. Identical with 4-5 combined. Eight laboratory hours per week.
9. Introduction to Animal Psychology. An account of the evolution of instinct, habit, and intelligence in animals. The application of animal studies to problems of human psychology. Lectures, demonstrations, and reading on assigned topics.
15. Psychology of Sensation. Vision, audition, taste and smell, and sensations arising from the skin and internal organs. Sensory acuity and defects. The dependence of sensory qualities upon sense organs and conditions of stimulation.
56. Psychology of Advertising. Psychological analysis of advertising. Intensive study of national and local advertising from the standpoint of attention, association, memory, desire, and action. Assigned readings, observation, experiments, reports.
- 101-102†-103. Experimental Psychology. The theory and technique of the leading methods of experimental investigation in human psychology.

- Individual minor research problems in the second and third quarters. One lecture, four laboratory hours per week.
108. Systems of Psychology. A comparative study of the problems, methods, and viewpoints of modern systems of psychology.
 109. Readings in Psychology. Intensive study of selected topics such as attention, perception, imagination, thinking. For properly qualified students with special interests.
 - 114-115.† Human Behavior. An analysis of the development and organization of human behavior. Consciousness or mind, as a property of the living body, is discussed in its dependence upon response.
 124. Psychology of Learning. A study of the literature and experiments of memory and habit formation. Lectures, readings, and reports.
 - 125-126†-127. Psychology of Individual Differences. Experimental and statistical study. Influence of sex, race, immediate ancestry, environment, maturity in causation of individual differences. Investigation of definite problems and analysis of results. Individual minor research problems in third quarter.
 130. Vocational Psychology. Psychology of individual differences in intelligence, aptitudes, interests, and training, with special reference to vocational guidance.
 137. Psychology of Learning. A continuation of 124.
 140. Social Psychology. A critical study of the experimental investigations of group behavior including the social significance of instinct, habit, imitation, suggestibility, and personality traits.
 141. Political Psychology. A biological and psychological approach to political theories and problems. The political significance of individual differences in intellect and temperament in relation to belief, propaganda, and public opinion.
 - 144-145.† Abnormal Psychology. Normal and abnormal behavior contrasted. Varieties of maladjustment as illustrated in criminality, deficiency, fanaticism, and insanity. Stress will be laid on the inadequacies of personality as shown in everyday life.
 - 151-152†-153. Animal Psychology. Vertebrate behavior is emphasized. A critical study of the literature and the relationship between animal and human psychology. Individual investigation of special problem in second and third quarters.
 160. Psychology in Personnel Work. Psychology as applied to the selection and retention of a stabilized personnel. The standardized interview; principles and technique of employment tests; methods of judging character qualities; the rating scale; personnel classification methods.
 168. Perception of Space. An intensive study of visual, auditory, and somesthetic space perception. Lectures, readings, and a special report or investigation.
 172. Reaction Time. The factors which influence reaction time. The significance of reaction time as a measure of complicated neuromuscular activity. Lectures, readings, and a special report or investigation.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

- 200-201-202.† History of Psychology I. Origin and Development of Scientific Psychology.
 203-204-205.† History of Psychology II. Psychology in America.
 206-207-208. Research in Animal Behavior.
 210-211-212. Research Problems.
 215-216-217.† Seminar in Psychology.
 220-221-222.† Journal Club in Contemporary Trends in Psychology.
 230. Advanced Differential Psychology.

ROMANCE LANGUAGES

FRENCH

- 1-2.† Beginning French.
 3-4. Intermediate French.
 8-9-10. Scientific French. (Pre-medical students.)
 20. Oral and Written French.
 21-22-23.† Survey of French Literature. An outline of the history of French literature from 1600 to the present.
 24-25.† Survey of French Literature. Same as 21-22-23.
 49. French Pronunciation. The essentials of French pronunciation and diction. A rapid survey and intensive drill designed as an introduction to the French conversation courses.
 53. French Composition.
 54-55. French Conversation.
 62. Practical French Phonetics. Organs of speech. Alphabet of the International Phonetic Association. Articulation of sounds. Ear training. (With the aid of sound charts and phonographic records.)
 63. Advanced French Composition.
 64-65. Advanced French Conversation.
 80-81-82. French Literature: Nineteenth Century. First quarter: romantic poetry and novel; second quarter: romantic drama and realistic novel; third quarter: drama and poetry after 1850. The course is conducted entirely in French.
 100. French Oral Diction. Practical and theoretical study of spoken French.
 103-104-105.† French Syntax and Composition. Studies in characteristic problems of French syntax especially for prospective teachers.
 115. French Literature: Seventeenth Century. Formation of the classic ideal; the salons, the Academy, Descartes; Malherbe, Pascal, Corneille.
 116. French Literature: Seventeenth Century. Molière, Racine, and LaFontaine.
 117. French Literature: Seventeenth Century. Moral and didactic literature: Boileau, La Rochefoucauld, Bossuet, Mme. de Sévigné, the quarrel of the Ancients and the Moderns.
 118-119-120. French Literature: Eighteenth Century. First quarter: beginnings of the philosophic movement, Bayle, Montesquieu, Diderot; second quarter: Voltaire; third quarter: Rousseau, the theater, the novel.

- 121-122-123. French Literature: Sixteenth Century. First quarter: the Rhetoriqueurs, Marot, Rabelais; second quarter, the Pleiade; third quarter: Montaigne, Amyot.
- 145-146. Explication de Textes. An intensive, critical study of selected French masterpieces. The course is conducted in French.
- 150-151-152. French Dramatic Literature. A study of the development of dramatic literature in France from the classical period to the present time.
153. Contemporary French Lyric Poetry.
157. Contemporary French Novel. Bourget, Loti, France, etc.
- 171-172-173.† History of the French Language. Lectures and illustrative texts giving the development of the French language from its origins to the nineteenth century. Especially intended for those who are going to teach French.
- 174-175-176. Contemporary French Novel and Drama. Lectures in French.

ITALIAN

- 1-2.† Beginning Italian.
- 3-4. Intermediate Italian.
70. Survey of Italian Literature.
71. Modern Poetry (Leopardi, Carducci). Alternates with 72.
72. Modern Drama (Giacosa, Bracco, Pirandello). Alternates with 71.
73. Boccaccio. Alternates with 74.
74. Petrarch. Alternates with 73.
- 159-160. Dante: the *Divina Comedia*. Alternates with 161-162.
- 161-162. The Sixteenth Century. Reading of texts and study of literary influences. Alternates with 159-160.
164. Dante in English. Lectures, reading and discussion of the *New Life* and parts of the *Divine Comedy*.

SPANISH

- 1-2.† Beginning Spanish.
- 3-4. Intermediate Spanish.
20. Oral and Written Spanish.
30. Spanish Commercial Correspondence.
53. Spanish Composition.
- 54-55. Spanish Conversation.
60. Advanced Spanish Composition.
- 61-62. Advanced Spanish Conversation.
- 65-66-67.† Survey of Spanish Literature. An outline of the history of Spanish literature from 1500 to the present day.
- 68-69.† Survey of Spanish Literature. Same as 65-66-67.
- 70-71. Latin American Culture and Development. Contemporary conditions as seen in the newspapers and other periodical literature of Latin America.
- 110-111-112. Spanish Literature: Nineteenth Century. First quarter: drama; second quarter: the novel; third quarter: poetry.

- 115-116-117. Spanish Literature: Seventeenth Century. First quarter: drama; second quarter: the novel; third quarter: lyric and epic poetry. Alternates with 156-157-158.
141. The Modern Spanish Novel.
150. Modern Spanish Drama. Contemporary dramatists.
- 156-157-158. Spanish Literature: Sixteenth Century. First quarter: drama; second quarter: Cervantes and the novel; third quarter: poetry and the mystics. Alternates with 115-116-117.
- 174-175-176. Lectures in Spanish: Twentieth-Century Literature. First quarter: drama; second quarter: the novel; third quarter: poetry.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

- 201-202-203. Old French Phonology and Morphology.
- 204-205-206. Readings in Old French Literature.
- 207-208-209. Old Provençal.
- 222-223-224. Seminar in Modern French Literature.
- 230-231-232. Research Methods and Material.
- 241-242-243. Old Spanish Philology.
- 244-245-246. Old Spanish Literature.
- 250-251-252. Spanish Seminar.
- 259-260-261. Research in Romance Languages.

SCANDINAVIAN

- 1-2. Beginning Norwegian. Grammar, composition, select readings in easy prose and poetry.
3. Intermediate Norwegian. Grammar, composition, conversation, elementary history of literature, and select works of modern authors.
- 4-5. Advanced Norwegian (Survey). Prose and poetry.
- 7-8. Beginning Swedish. Grammar, composition, conversation, reading of selected prose texts.
9. Intermediate Swedish. Reading selected works in prose and verse.
- 10-11. Advanced Swedish (Survey). Brief survey of the history of Swedish literature, reading of Tegner's *Frithiofs Saga*, Runeberg's *Fänrik Ståls Sägner*, and selected texts in Swedish history.
12. Ancient and Medieval Scandinavian History. The antiquities of Scandinavian formation of states, the viking expeditions, medieval culture. Knowledge of Scandinavian not required.
45. Scandinavian Mythology. Lectures, textbook, and illustrated reading. Knowledge of Scandinavian not required.
- 101-102-103. Modern Norwegian Literature. Norwegian literature from 1814 to the present day.
- 104-105. Modern Scandinavian History. Religious, political, and economic changes in the north, military enterprises, growth and liberalism, material progress. Knowledge of Scandinavian not required.
- 107-108-109. Modern Swedish Literature. The Swedish novel. Study of a selected list of Swedish classics.
110. Ibsen. Lectures, reading, and interpretation.

- 111-112-113. Old Norse (Icelandic). Grammar and reading. Gunnlaug's *Saga Ormstungu*.
114. Strindberg. Lectures, reading, interpretation.
117. Earlier Norwegian Literature. History of literature. Saga period. Norwegian and Danish folk songs. Holberg. Oplysningstiden.
- 130-131-132. Danish Literature of the Nineteenth Century. From Oehlen-schläger to the end of the century.
- 134-135. The Landsmaal Movement and Literature. From Aasen to Garborg.
136. Björnson. A study of his activity as a central figure in modern Norway.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

- 201-202-203. Seminar in History of Scandinavian Languages.
- 209-210. Seminar in Modern Swedish Languages and Literature.
- 215-216-217. Seminar in Modern Norwegian Literature.

SOCIOLOGY

1. Introduction to Sociology. A study of the culture of the group. An objective analysis of culture with special attention to social change. Survey of culture patterns, cultural processes, and social interaction.
6. Social Interaction. An examination into the basis and forms of social interaction and social relationships, with detailed attention to some of the fundamental behavior patterns of contemporary society.
14. Rural Sociology. A study of rural and urban relationships. The principles of sociology applied to the position of an agricultural class in an industrial society; the contributions and obligations of farmers to the larger society and vice versa.
45. Social Statistics. Statistical method applied to the quantitative study of population and problems of group living. Especially designed to give social workers and public health officers the training necessary to carry on their work successfully.
49. The Occurrence of the Socially Inadequate. The significance of the socially inadequate in contemporary and industrial societies and the description of the methods used in their care.
52. Elementary Case Work. The methods of case work as applied to the treatment of the socially inadequate.
53. Elements of Criminology. The causes and treatment of crime from the point of view of processes of social interaction.
55. Housing Problems. An examination of housing evils and their causes; the various movements for the prevention or improvement of bad housing; town and city planning; garden cities. Lectures, readings, field work, and essay.
60. Social Protection of the Child. Study of social obligations to the child; development of the child saving movement in the United States; infant and child mortality, recreation, education; courts, institutions, societies, and other public efforts for the child.

70. Group Work in the Community. Activities and problems of the settlement worker, especially the technique of organizing and directing boys' and girls' clubs.
71. Elementary Field Training in Group Work.
90. Elementary Field Training in Case Work. Designed to give first-hand knowledge of the conditions out of which dependency develops, by field work with a social service agency.
91. Elementary Field Training in Case Work. Designed for students who have taken 90, and aiming to give practice in the methods of treatment outlined in Course 52.
92. Elementary Field Training in Case Work. Field work on special research problems, principally in the field of child welfare, depending upon proficiency attained in 90 and 91.
100. Social Psychology. The social attitudes; their development and modification under social pressure; the interactions of individuals and groups.
101. Social Organization. The organization and structure of social groups; the basic social processes of differentiation, stratification, and mobility. Integration and disintegration of social groups and institutions. Essentials of social dynamics.
102. Social Control. An examination of the concept historically, and a re-statement in cultural terms, with consideration of the extent to which the individual is passively controlled by his culture and the extent to which he can reshape it.
103. Sociology of Conflict. Types of social conflict and their rôle in social life.
110. Rural Organization. A study of social organization as it affects living conditions in small towns and rural districts. Especially designed for rural social workers and specialists in rural sociology or agricultural economics.
112. The Rural Social Survey. A course dealing with the methods and content of rural social research. All methods of investigation are analyzed. Especially designed for those interested in social research under Purnell or similar funds.
114. Rural Social Institutions. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. Lectures, discussions, reports.
116. The Newspaper As a Social Institution. A study of the social rôle of the newspaper in the United States, with special reference to the social changes that have influenced the press, and the corresponding influences of the press upon social life.
119. The Family. The evolution of the family; development of family unity or disunity; the rôles of the several members of the family; methods of investigation of the family.
120. Social Progress. A history of the theories of progress and a critique of the idea of progress.
121. Advanced Statistical Methods. The analysis and interpretation of social data by application of the theory of errors, the theory of prob-

- ability, the theory of sampling, partial correlation, and the analysis of time series.
- 122-123. *Methods of Social Investigation*. The nature of scientific method; the problems of sociology; specific methods of investigation of social phenomena.
126. *The Technique of Leadership in Group Work*. An advanced course for prospective executives in settlements and program agencies.
128. *Principles of Administration Applied to Social Work*. A technical study of methods of organizing charitable agencies, of financing them, and of making the public aware of their work. Lectures and practice work.
130. *Advanced Case Work*. The method of case work in some special applications to specific problems presented by the socially inadequate; conducted by case conferences and case studies.
132. *Juvenile Courts and Probation*. Primarily a course in probation practice work, but prefaced by lectures on the social and legal aspects of the juvenile courts and probation.
133. *Social Case Work in Health Problems*. A course open only to students who are properly grounded in case work.
134. *Legal Protection of the Child*. A study of the relation of law to child welfare. A survey of existing children's protective legislation, of its administration and its future development.
135. *Field Practice in Legal Protection of the Child*. Designed to meet the individual needs of students in the course on Legal Protection of the Child.
- 138-139. *Mental Case Work*. A study of the intellectual and emotional factors in human adjustment and their significance in case work.
140. *History of Social Theory*. A rapid survey of the leading social theories from the time of the Greeks with special reference to the more recent development of sociology. The theories are related to their social backgrounds.
141. *Contemporary Social Theory*. An intensive study of developments in the social theory of the late nineteenth and twentieth centuries.
152. *Seminar*. Problems of institutional administration.
- 153-154-155. *Advanced Field Training in Group or Case Work*. May be taken in specialized fields of child welfare and medical, as well as family, work.
158. *The Sociology of Revolution*.
160. *Population Problems*.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

- 200-201-202. *Seminar in Applied Sociology*.
- 203-204-205. *Seminar in Social Theory*.
- 206-207-208. *Seminar: Statistical Theory in Relation to Social Theory and Practice*.
- 209-210-211. *Seminar: Social Evolution: The Cultural Approach to Sociology*.

- 215-216-217. Seminar in Rural Sociology.
 218-219-220. Seminar in Social Work.
 221-222-223. Graduate Field Training in Group or Case Work.

SPEECH

- 41-42†-43. Fundamentals of Speech. A study of speech as applied in social adaptation of the individual and in his control of his environment. Emotional problems. Technique of body and voice. Mechanisms of thought. Oral reading and original speeches.
- 45-46. Fundamentals of Speech. A 10-credit course identical in subject-matter with 41-42-43.
51. Advanced Public Speaking. Speeches on public questions. Analysis and outlining. Methods of reasoning. Adaptation of material to audience.
- 55-56-57.† Argumentation and Debating. Analysis, gathering of evidence, briefing. Critical study of models, including Lincoln-Douglas debates.
61. Speech Correction. An introduction to the correction of speech disorders. Speech defects as symptoms of maladjustment and organic malformations. Case histories. The vocal mechanism. Examination of the literature of the field.
67. Phonetics. The study of English speech sounds, as they occur separately and in connected speech. Strong and weak forms, stress, assimilation. Practice in ear training.
- 71-72-73. Elements of Play Production. Elementary principles of make-up and acting. History of the theater. Reading of plays. Knowledge and use of stage equipment. Organization and management of the production staff.
- 81-82-83. Interpretative Reading. Literature as an art form. Esthetic theory of interpretation and oral reading. Critical appreciation of authors. Action and voice. Practice in reading essays, prose narratives, lyric and narrative poems, and plays as vehicles of distinct modes of experience.
- 91-92-93. Stagecraft and Direction. The translation of the writer's meanings into the symbols of the acted drama. Atmosphere, tempo, contrast, climax. The connotation of selected properties. Management of a production from the selection of the play to the presentation.
97. Intercollegiate Oratory and Debate. The question for intercollegiate debate studied and briefed, and frequent practice debates held.
- 101-102.† Advanced Speech Composition. Structure and oral style. Psychology of persuasion. Briefing. Critical study of models. Written speeches. Reports.
105. Theory of Reading and Acting. The forms of literature; literature regarded as an art; psychology of creative imagination; speech elements in literature; technique governing use of auditory and visual symbols. Collateral readings, speech problems, reports, term papers.
- 121-122.† Advanced Speech Problems. Factors determining the behavior of speakers and audiences.

- 141-142-143. Introduction to Laboratory Research. The study of vocal sound, methods of analysis and synthesis. The study of hearing. Experimental methods applied in individual research projects. Readings, reports, experiments.
- 162-163. Advanced Speech Correction. The physiological and psychological aspects of organic and functional speech problems. Theories of stuttering. Diagnoses, case histories, and treatment of speech cases. Observation of clinical diagnosis and treatment.
- 207-208-209. Seminar in Orators. A critical study of the great English and American orators. One historical period each quarter.
- 261-262-263. Seminar in Speech Correction. A study and critical analysis of current literature in the field of speech pathology. Each student works out a short thesis problem in connection with his studies in speech correction. Studies in new theories and clinical procedures. Specific cases presented for group study.
- 291-292-293. Research and Thesis. (For graduate students engaged in thesis projects.)

ZOOLOGY

NOTE.—Credit is given for acceptable work done at any approved sea-side laboratory.

INTRODUCTORY COURSES

- 1-2.† General Zoology. Structure, physiology, embryology, classification, and evolution of animals. Textbook, lectures, laboratory, and quizzes.
- 5-6-7.† General Zoology. Similar to 1-2, for pre-medical and pre-dental students.
- 8-9. Survey Course.
- 14-15-16.† General Zoology. Similar to 1-2, with the spring quarter devoted to the Arthropoda, principally the Insecta. (For students of Agriculture and Forestry.)
- 17-18.† General Zoology. A brief course for students in Home Economics.
21. Introduction to General Physiology.
22. General Ecology. Considers the relationships of animals to the inorganic and organic factors of the environment. Lectures, assigned reading, laboratory, and field work.
23. Introductory Entomology. General characters, classification, and habits of insects.
24. Introductory Animal Parasitology. An elementary course, dealing with the parasitic Protozoa, worms, and arthropods, and their relation to diseases of man and animals.
25. Introductory Histology. A brief course on the structure of the cell, tissues, and organs. Lectures, laboratory.
26. Comparative Anatomy. A comparative study of the gross anatomy of vertebrates.
27. Technique. Elements of microscopical technique.

INTERMEDIATE AND ADVANCED COURSES

- 37-38-39.† General Entomology. Elements of entomology leading up to discussion of the principles of taxonomy and their application to the classification of insects.
- 46-47.† Ornithology. Lectures, laboratory, and field work. Field glasses and handbook required.
75. Nature Study. Especially for the fitting of teachers for the secondary schools.
107. Protozoology. Lectures, references, and laboratory work on the structure and life histories of Protozoa.
- 109-110-111. Experimental Zoology. A survey of animal behavior from the physiological viewpoint. Lectures, laboratory, reading.
- 117-118-119. Ecology of Insects. Lectures, assigned reading, laboratory, and field work.
120. Advanced Ecology. Similar to Course 117-118-119 with special field work.
- 125-126-127. Advanced Entomology. Morphology and classification of insects, and lectures on the history of entomology.
- 139-140.† Histology and Development of Insects. Lectures and laboratory work.
- 144-145-146. Animal Parasites and Parasitism. The second quarter of the course is devoted primarily to the relation of insects to diseases of man and animals.
- 148-149-150.† Histology and Organology. Comparative study of the microscopic structure of tissues and organs. Textbook, lectures, laboratory.
- 181-182. Embryology. A survey of the principles of animal development dealing with fundamental invertebrate and vertebrate types. Lectures, reference, and laboratory work.
183. Genetics and Eugenics. Facts and theories of heredity and application to man. Textbook, lectures, and demonstrations.
- 197-198-199. Problems. Advanced work in some special line.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

- 201-204. Research in Entomology.
- 217-218-219. Experimental Zoology.
- 229-232. Research in Animal Histology.
- 233-236. Research in Vertebrate Connective Tissue with Special Reference to the Cellular Elements.
- 237-240. Research in Vertebrate Hematology.
- 245-248. Comparative Neurology.
- 249-252. Research in Neurology.
- 261-264. Animal Parasitology.
- 205-208, 209-212, 265-268. See Entomology and Economic Zoology.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

The courses in this department are closely correlated with those of the Department of Zoology. Courses 37-38-39, 117-118-119, 125-126-127, 139-140, 144-145-146 are offered under these numbers in both departments. In addition the following courses in entomology and economic zoology are available:

- 3. Economic Entomology.
- 4. Economic Vertebrate Zoology.
- 8. Varieties and Habits of Fur Bearing Animals.
- 150. Insecticides and Their Action.
- 197. Introduction to Research.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

- 201-204. Research in Entomology.
- 205-208. Research in Economic Entomology.
- 209-212. Research in Economic Vertebrate Zoology.
- 265-268. Research in Insecticides.
- 217-218-219, 229-232, 233-236, 237-240, 245-248, 249-252, 261-264. See Zoology.

INDEX

	Pages		Pages
Absences	22	Delinquent students	23
Admission		Dentistry	
to advanced standing	15	Pre-Dental course	34
to freshman year	15*	Description of courses	43
to Senior College	27	Diplomatic and Consular Service, course in training for	30
Adult special students	15	Discontinued students	23
Advanced standing		Drawing and Descriptive Geometry	49
admission to	15	Dropped students	24
examinations for	15	Economics	50
Advisers for students		Education, College of, preliminary course	34
in Junior College	20	Eighteen hours, registration for ...	21
in Senior College	20	Eligibility	24
Afternoon work	22	English	53
Agricultural Biochemistry	48	examinations in	15
Anatomy, Human	64	exemption from requirement ...	15
Anthropology	43	habitual bad English	22
Architecture	43	Entomology and Economic Zoology	89
Architecture, six-year course in Arts and	40	Examinations	
Astronomy	44	English	15
Auditors	17	for advanced standing	15
Bachelor of arts		for credit	16
general course leading to	25	Excuses	23
special courses leading to	30	Extension courses	21
Bachelor of science, special courses leading to	30	Faculty	2
Bacteriology and Immunology	45	Faculty advisers for students	20
Biochemistry, Agricultural	48	Failures, rules governing	18
Botany	45	Fees	16
Business Administration		Fine Arts	55
Pre-Business course	33	French	80
Certificate of aptitude	27, n	General course leading to a B.A. degree	25
Changes in registration	22	General information	15
Chemistry	47	General regulations	21
Child Welfare	48	Geography	56
Classification of studies	26	Geology and Mineralogy	57
Combined arts and professional courses	38 ff	German	59
Comparative Literature	49	Grades	17
Comparative Philology	49	condition	18
Composition	55	failure	18
Conditions, removal of	18	incomplete	18
Correspondence and Extension courses	21	Graduate School, credit in	30
Course numbers	43	Graduation honors	29
Courses of study	25	Greek	60
Credit		History	61
examinations for	16	Home Economics	63
in Graduate School	30	Honor points	
Credits		credits and	17
and honor points	17	definition of	17
definition of	17	Honors, graduation	29
quality	19		

INDEX

91

Pages	Pages		
Honors course plan	28	Physics	73
Hospital Library Service, course in training for	31	Physiology, Human	64
Hours, number of	21	Plant Pathology and Botany	46
How to study	64	Political Science	75
Human Anatomy	64	Pre-Business course	33
Human Physiology	64	Pre-Dental course	34
Incompletes	18	Pre-Legal course	36
Interior Architecture, course preliminary to	36	Pre-Medical course	38
Italian	81	Pre-Pharmacy course	37
Journalism	65	Preventive Medicine and Public Health	77
Junior and Senior colleges	19	Probation	23
Junior College	27	Psychology	78
advisers in	20	Public Health	77
Latin	66	course in	31
Law, six-year course in Arts and	41	Quality credits	19
pre-legal course	36	Readmission	24
Library Methods	67	Registration	16
Library Training, course in	30	changes in	22
Mathematics	67	penalty fees	16
Mechanical Engineering	69	Residence requirement	22
Medical Technicians, course for	31	Romance Languages	80
Medicine, Arts and	41	Scandinavian	82
Science and	38	Senior College	19
Military Science and Tactics	69	admission to	27
credit for Advanced	37	advisers in	20
requirements	21	requirements	28
special course for students of ..	37	senior college advisers	20
Music	69	senior college courses	19
courses in practical music	21	election by sophomores	20
fees	16	Senior examinations	24
in extension	21	Shop Practice. <i>See</i> Mechanical Engineering.	
Music, general course with major in	30	Social and Civic Work, course in ..	31
Nursing, five-year course in Arts and	42	Sociology	83
Orientation	70	Spanish	81
Penalty fees	16	Special courses leading to the degree of bachelor of arts	30
Petitions	24	of bachelor of science	30
Philosophy	71	Special fees	16
Physical Education for Men	21, 72	Special students, adult	15
Physical Education for Women ..	21, 72	Speech	86
Physical Education requirements ..	21	Subjects in other colleges, election of	20
		Transferred students	23
		Tuition	16
		Zoology	87

The Bulletin *of the University of* **Minnesota**

*The College of Science, Literature,
and the Arts*

Part II

Announcement of Program for the Year
1929 -1930



Vol. XXXII No. 19 April 24 1929

*Entered at the post-office in Minneapolis as second-class matter
Minneapolis, Minnesota*

*Accepted for mailing at special rate of postage provided for in section 1103,
Act of October 3, 1917, authorized July 12, 1918*

COURSES OF STUDY

A student may, while registered in the College of Science, Literature, and the Arts, pursue one of the following courses.¹ These curricula are subject to revision by action of the faculties of the colleges concerned.

Courses given within this college:

1. A general course leading to the degree of bachelor of arts.
2. Special courses leading to the degree of bachelor of arts.
 - a. General Course with a major in music.
 - b. Course in Training for Diplomatic and Consular Service.
3. Special courses leading to the degree of bachelor of science.
 - a. Course in Library Training.
 - b. Course in Hospital Library Service.
 - c. Course for Medical Technicians.
 - d. Course in Public Health Training.
 - e. Course in Social and Civic Work.
4. Courses preparing for admission to the School of Business Administration, College of Dentistry, College of Education, the course in Interior Architecture in the College of Engineering and Architecture, the Law School, and the College of Pharmacy.
5. A four-year course leading to the degree either of bachelor of arts or of bachelor of science with special training in military science and tactics.

Combined arts and professional courses:

6. A seven-year course leading to the degrees of bachelor of science, bachelor of medicine, and doctor of medicine.
7. A six-year course leading to the degrees of bachelor of arts, bachelor of architecture, and master of architecture.
8. A six-year course leading to the degrees of bachelor of arts and bachelor of laws.
9. An eight-year course leading to the degrees of bachelor of arts, bachelor of medicine, and doctor of medicine.
10. A five-year course leading to the degrees of bachelor of science and graduate in nursing.

NOTE.—During the first two years of any course of study, men are required to complete three quarters of physical education and six quarters of military drill; women are required to complete six quarters of physical education.

¹ Students in Art Education, Physical Education, Public School Music, and certain other special courses, register in the College of Education in their freshman year.

I. GENERAL COURSE LEADING TO THE DEGREE OF BACHELOR OF ARTS

GENERAL REQUIREMENTS

1. The student must earn 183 credits and 183 honor points, or a smaller number of credits determined as follows: for every five honor points in excess of one honor point per credit, the number 183 is diminished by one.

Any student who fails to complete the requirements for graduation within a normal period will, in order to complete the work, be required to continue in the Senior College for one or more university sessions. During this period he will be required to carry at least thirteen credit hours of work and to secure an average of one honor point per credit.

A student entering with advanced standing from some other institution must secure a total of 183 credits, and an average of one honor point per credit for the work done in this college. For every five honor points earned in this college in excess of one honor point per credit, the number 183 is diminished by one.

2. The student may not receive credit for beginning courses (two quarters, 10 credits) in more than one of the foreign languages, exclusive of Greek and Italian, except upon petition.

3. Not later than the end of his sophomore year, each student must elect the department in which he intends to do his major work. He will then be assigned to a major adviser by that department.

CLASSIFICATION OF STUDIES

Because of the large numbers of students who fail in their attempt to carry college courses leading to the Bachelor's degree or professional training, and because in a large percentage of cases the lack of aptitude for such college training can be clearly understood before entrance, the college has selected certain courses from which those who, for any reason, can remain only a short time in college should make their elections. As compared with other college studies, these courses deal less with specialized knowledge and require less technical skill, while they contribute more directly to the general information and culture which will have value for such students. Some of these courses have a definite interest in relation to certain vocations or occupations. The courses are all of standard college grade and may be taken by any student for full college credit. Some of them are courses which are required in certain regular curricula.

A special list of studies has been selected as a means of meeting the existing situation. Persons who have very low aptitude for college work gain little from the study of foreign languages, laboratory exercises in science, or the more technical or specialized courses intended for those who will complete their college training. Such students of low aptitude will, therefore, be limited to these general courses of informational, cultural, and vocational character. They will be exempt from the requirements of the regular curricula.

In doing this, the college is not setting up in any permanent way a new type of training for those who have not the aptitude for its proper field of work. The arrangement is intended to meet an emergency. It is a step toward the definition of an intelligent public policy regarding those high school graduates who have leisure and the desire for further school opportunities, but who have not the qualifications necessary to profit by the type of training appropriately offered in this college.

The courses at present included in this list¹ are

Botany 1	History 1-2
Chemistry, Inorganic, 1-2-3 and 4-5	How To Study 1
Composition 4-5-6	Library Methods 1
Drawing 41-42-43, 44	Mathematics 3, 4, 5, and 8
Economics 1, 2, 3	Mechanical Engineering 11-12-13
English A-B-C	Music
Geography 1-2	Zoology 8-9
Geology 8	

Students may be reclassified on the basis of their record in the first two quarters. Any student who shows sufficient ability in these courses may continue in further courses for vocational training or may register as a candidate for a degree if he wishes to do so. A student who has freedom of election from the first, but does not profit by his opportunities, may find himself limited to the above list of studies until he demonstrates his ability and willingness to do work of an acceptable grade. Of course, this announcement in no way changes or relaxes the rules regarding delinquency in studies.

JUNIOR COLLEGE

1. For admission to the Senior College² the student must have completed the following work in the Junior College or the equivalent in another recognized institution.

- A. 15 credits in English (English A-B-C) or 9 credits in composition (Composition 4-5-6), or exemption from the requirement. All students are required to take a placement test before registering for any course in English or composition.
- B. Foreign language, 0 to 20 credits, according to the following schedule:³

<i>Amount Presented for Entrance</i>	<i>Amount Required in Junior College</i>
Four years of one language	None
Three years of one language	5 credits in same language
Two years of one language	10 credits in same language
One year of one language	15 credits in same language
Less than a year of one language	20 credits in one language

¹ Other freshman courses are marked in the program as requiring a certificate of aptitude.

² See also requirements for admission to the Senior College in courses leading to the degree of B.S.

³ Not required in the Social and Civic Course.

C. 10 credits in one of the social sciences: anthropology, economics, geography, history, political science, sociology.

D. 10 credits in one of the natural sciences: astronomy, botany, chemistry, geology, human physiology, physics, psychology (including laboratory), zoology.

2. Every student should plan to begin the work specified in the preceding paragraph early enough to provide for the completing of these requirements before the end of his sophomore year. Failure to do this will delay his admission to the Senior College.

3. In addition the student must secure the necessary preparation for a senior college major sequence in one subject.

4. During the junior college years all men must complete three quarters of physical education and six quarters of military drill. All women must complete six quarters of physical education.

5. The student must earn a total of 93 credits with an average of one honor point per credit, or a smaller number of credits determined as follows: For every five honor points in excess of one honor point per credit, the number 93 is diminished by one.

A student entering with advanced standing from some other institution must secure a total of 93 credits, and an average of one honor point per credit for the work done in this college. For every five honor points earned in this college, in excess of one honor point per credit, the number 93 is diminished by one.

SENIOR COLLEGE

Requirements.—1. A major sequence, 27 to 36 credits. Each student must complete a coherent and progressive sequence of courses, known as a major sequence, which shall include, as specified by the department which offers it, from 27 to 36 credits in senior college courses. Such major sequences are offered by the following departments: Anthropology, Architecture, Astronomy, Bacteriology, Botany, Chemistry, Economics, English, Geography, Geology and Mineralogy, German, Greek, History, Human Physiology, Journalism, Latin, Mathematics, Music, Philosophy, Physics, Political Science, Psycho'ogy, Romance Languages, Sociology, Zoology. The courses constituting a major sequence in any department are announced in the program.

A student must maintain an average of one honor point per credit in the work of the major sequence.

2. A minor sequence, 9 credits. A student must secure in some department other than his major department and in addition to his major sequence 9 credits in senior college courses.

HONORS COURSE PLAN

A student who has met all the requirements for admission to the Senior College may be enrolled for the Honors Course upon the approval of the department in which he wishes to pursue his major study.

Each student enrolled in the Honors Course will be put under the immediate direction of a member of his major department of professorial rank who shall be known as his tutor.

A student enrolled in the Honors Course may be a candidate for graduation honors. The tutors will co-operate with the Committee on Honors in arranging comprehensive examinations and in the evaluation of theses.

A part of the student's senior college work will consist of reading or other individual studies done under the direction of his tutor. Work done in this way will be accepted as a substitute for a part or the whole of the major sequence and of the elective work of the usual curriculum.

A student electing this plan will be governed by the announcement of his major department and the direction of his tutor as to number of courses, attendance at classes, and general methods to be pursued.

The requirements for the minor study are not modified by this plan at present.

When the tutors of a department report at the end of any quarter that a student is not making satisfactory progress in the Honors Course, the student will be registered as a candidate in the regular course. In this case the tutors will report blanket credits equivalent to the work actually done. The student can then arrange to complete his major sequence either in the same department or in another.

For the year 1929-30 Honors Courses are offered by the Departments of Anthropology, English, History, Political Science, Psychology, Sociology, and Zoology.

GRADUATION HONORS¹

The degree B.A. may be awarded *cum laude*, *magna cum laude*, or *summa cum laude* upon the recommendation of the Committee on Honors.

Honors are awarded only to students who have a scholastic record of two honor points per credit in all work carried. A student who has this record will be awarded the degree B.A. *cum laude*.

Students wishing to become candidates for the higher honors (*magna cum laude*, *summa cum laude*) must signify their intention not later than the beginning of the third quarter before graduation. Students are admitted as candidates upon the recommendation of the major department with the approval of the Committee on Honors. The committee will not admit as a candidate a student who has limited his senior college work to the minimum requirements in major and minor subjects. The purpose of granting honors is to secure scholarly ideals and achievements, and the candidate is expected to show his interest and ideals in his election of studies.

With the approval of the Committee on Honors the candidate may pursue a course of reading in addition to the required major and minor studies and in lieu of any or all elective courses. Near the close of the senior year the candidate will take a special examination which may touch

¹ Students who enter with advanced standing are eligible to become candidates for honors if they will have earned 75 credits of work in residence before graduation.

upon any part of the field of his college course. In this comprehensive examination the candidate should show (a) an acquaintance with the chief literature and sources of information in the fields studied, and (b) an ability to discuss with intelligence and clear reasoning, questions or problems upon which he has had opportunity to secure the necessary information. Such questions may be new to the student. The object is to test the student's ability to bring facts and theories to bear upon problems presented in the examination. The examination should be a test not of memory but of assimilation, of culture, and of power to command or use the knowledge which courses of study have put within the student's reach. Candidates who pass this examination will, upon recommendation of the committee, be awarded the degree B.A. *magna cum laude*.

A candidate whose standing in the comprehensive examination is satisfactory and who in addition presents an acceptable critical paper, a piece of creative work, or a thesis embodying the results of original research will, upon recommendation of the committee be awarded the degree B.A. *summa cum laude*. The preparation of the paper should be begun early in the senior year.

The degree B.S. *cum laude* will be awarded to students who have an average of two honor points per credit in all their work.

Students may be accepted as candidates for the higher honors in courses leading to the B.S. degree and in combined arts and professional courses provided they present an equivalent of the work required for graduation honors in the General Course.

CREDIT IN THE GRADUATE SCHOOL

A student lacking not more than nine credits toward graduation may, upon petition, receive graduate credit for a limited amount of work taken as an undergraduate. No graduate credit will be given unless the student has made previous arrangement with the Graduate School. Courses taken for graduate credit will not carry credit toward the Bachelor's degree.

With the permission of the assistant dean for the Senior College, undergraduates lacking not more than nine credits toward graduation may be registered also in the Graduate School. Permission will be granted only in exceptional cases.

II. SPECIAL COURSES LEADING TO THE DEGREE OF BACHELOR OF ARTS

A. GENERAL COURSE WITH A MAJOR IN MUSIC

For the specific requirements of this course, see the program of the Department of Music, in this bulletin.

B. COURSE IN TRAINING FOR DIPLOMATIC AND CONSULAR SERVICE

For the specific requirements of this course, see the program of the Department of Political Science, in this bulletin.

III. COURSES LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

Students in these courses who complete the work with an average of two honor points per credit will receive the degree B.S. *cum laude*. Candidates for the higher honors may be accepted if they offer an equivalent of the work required for graduation honors in the General Course. See page 8.

A. COURSE IN LIBRARY TRAINING

For a special course in library training, leading to the degree of bachelor of science, a student must complete satisfactorily three years of academic work, including the requirements for admission to the Senior College. During the fourth year he will take not less than 45 credits in library methods. During the four years, the student must secure 183 credits and 183 honor points. (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.) For specific information see the bulletin of the Division of Library Instruction.

B. COURSE IN HOSPITAL LIBRARY SERVICE

For the specific requirements of this course, see the special bulletin of the Division of Library Instruction obtainable at the office of the registrar.

C. COURSE FOR MEDICAL TECHNICIANS

A four-year course in medical technology is offered by the College of Science, Literature, and the Arts and the Medical School.

With the rapid increase of laboratories in hospitals, clinics, and medical schools, medical technology offers a splendid field for women at the present time. Men, as a rule, are not advised to take the course.

The satisfactory completion of the prescribed course leads to the degree of bachelor of science. During the first two years, the student is registered in this college and must earn 93 credits with an average of one honor point per credit.* The required courses are listed below. High school physics is a prerequisite, but may be taken at the School of Agriculture after admission.

- | | |
|---|---|
| 1. English A-B-C, Composition 4-5-6, or exemption from requirement. | 5. Organic Chemistry 1-2 |
| 2. Zoology 5-6-7 or 1-2 | 6. Mathematics 4 or 6 |
| 3. Inorganic Chemistry 1-2-3 or 4-5; 11 | 7. A reading knowledge of scientific French or German |
| 4. Analytical Chemistry 7 | |

For the work in the Medical School consult the special bulletin.

Practical work in the various tests required in laboratory work is taken at the University Hospital and covers from two to three quarters.

Further information may be obtained by addressing Dr. W. A. O'Brien at the University Hospital.

* For the requirements in physical education and military drill, see p. 3.

D. COURSE IN PUBLIC HEALTH TRAINING

For the specific requirements of this course, see the special bulletin obtainable at the office of the registrar.

E. COURSE IN SOCIAL AND CIVIC WORK¹

This course is organized in response to a demand for distinctive pre-technical training for professional service. For the senior year specialization is afforded in case work, medical social work, and rural social work. Preparation in group work for leaders of Boy Scouts, Girl Scouts, Camp-fire, and Girl Reserve groups, is also provided. Satisfactory completion of the four-year course leads to the degree of bachelor of science.

The organization of the course of study aims to give the undergraduate the fundamentals of a broad modern education with considerable emphasis upon biology, history, economics, political science, psychology, and language. To this end all intensive specialization is reserved for the fourth and graduate years of study.

It is recommended that students who register in this course come to the Department of Sociology for advising. A special bulletin is prepared for students in this course, and this bulletin should be consulted for a statement of recommended elective courses.

For admission to the Senior College the student must earn 93 credits with an average of one honor point per credit. During the four years, he must secure 183 credits and 183 honor points. (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.)

During the junior college years all men must complete three quarters of physical education and six quarters of military drill. All women must complete six quarters of physical education.

First and Second Years, Junior College

Common basic foundation

REQUIRED

English A-B-C or Composition 4-5-6
or exemption from requirement
Sociology 1, 6, 45, 49
Economics 6-7
Political Science 1, 11²
Psychology 1-2
Zoology 1-2³
Human Physiology 1⁴ or 4¹

¹ No requirement in foreign language.

² Elective for students preparing for medical social work.

³ Three quarters of botany may be substituted for Zoology 1-2 by students in group work.

⁴ Required of students preparing for medical social work.

Third Year, Senior College

Concentrated sociological study and training, in which students become familiarized with the three chief techniques of social work: case work, group work, research.

REQUIRED

Sociology 52, 53,¹ 55, 60, 70, 71,
90 (simultaneously with 52), 91
Preventive Medicine 50 or 53²
Home Economics 70, Child Welfare
40 and 130
or
Child Welfare 40, 60, 120
or
Economics 161; 162 or 164

Fourth Year, Senior College

Professional specialization by election of grouped requirements.

a. *Case work*: Sociology 92, 100 or 120, 119, 128, 130, 134, 135, 153-154; Economics 161; Political Science 169.

b. *Group work*: Sociology 71, 100 or 101, 122-123, 126, 128, 134, 153-154; Preventive Medicine 60; and Economics 161 or Physical Education for Women 43-44-45.

c. *Medical social work*: Sociology 100 or 119, 133, 138-139, 153-154; Preventive Medicine 57, 60, 61, 73; Psychology 144-145.

d. *Rural social work*: Sociology 101, 110, 112, 114, 153-154; Preventive Medicine 60; Agricultural Education 154.

Fifth Year

Graduate professional study: Sociology 121, 122-123, 130, 133, 134, 138-139, 140, 141, 153-154-155, 200-201-202, 203-204-205, 206-207-208, 215-216-217, 218-219-220, 221-222-223; with a suggested minor in anthropology, economics, education, psychology, political science, or preventive medicine and public health. See Graduate School bulletin for course in Medical Social Work.

IV. COURSES PREPARING FOR ADMISSION TO THE PROFESSIONAL SCHOOLS

A. PRE-BUSINESS COURSE

To be eligible for admission to the School of Business Administration, the student must present 93 credits earned in a recognized college or university with one honor point per credit, or a smaller number of credits to be determined as follows: For every five honor points in excess of one honor point per credit the number 93 is diminished by one.

The credits for admission shall be earned in the following groups:

A. Required Credits³:

1. Nine credits in Freshman Composition (Composition 4-5-6) or exemption from requirement.
2. Ten credits in mathematics or in *one* of the following laboratory sciences: botany, chemistry, physics, zoology.
3. Ten credits in *one* of the following social sciences: geography, history, political science, sociology.
4. Ten credits in the Principles of Economics. (This requirement may be satisfied by the completion of Economics 6-7 or the equivalent. The student will consult a pre-business adviser concerning an equivalent.)

¹ Elective for students preparing for medical social work.

² Required of students preparing for medical social work.

³ For the requirements in physical education and military drill, see p. 3.

B. Elective Credits:

Sufficient elective credits to complete the minimum number required for admission, (normally fifty-four credits). The attention of the student is called to the two following groups of subjects to which part of the elective time should be devoted:

1. Courses required for graduation from the School of Business Administration and recommended for pre-business students. These courses are prerequisites for certain required courses in the School of Business Administration:

Economics 3, (Mechanism of Exchange)
Economics 14, (Elements of Statistics)
Economics 25-26,¹ (Principles of Accounting)

Students who do not elect the above courses during the freshman and sophomore years will be required to take Business Administration 57, 63, and 70, during the first quarter in residence in the School of Business Administration.

2. Courses required as prerequisites to courses in certain sequences in the School of Business Administration and recommended for all students:
 - a. Psychology 1-2, (General Psychology). This course is a prerequisite for courses in Advertising, Foreign Trade, Merchandising, Personnel Management, Insurance, and Real Estate.
 - b. Mathematics 8 or 47 and 20. (Commence Algebra or Pre-statistical Mathematics and Mathematics of Investment). Required of students who take the accounting, insurance, or finance sequence.

B. PRE-DENTAL COURSE

The pre-dental course, required for admission to the College of Dentistry, consists of two years of prescribed work, during which the students are registered in this college and subject to its regulations.* The required courses are listed below. It is desirable that students should have had chemistry and higher algebra in high school.

- | | |
|---|---|
| 1. Zoology 5-6-7 | 6. Drawing 41-42-43 ² |
| 2. Inorganic Chemistry 1-2-3 or 4-5, and 11 | 7. Mechanical Engineering 11-12-13 ² |
| 3. Organic Chemistry 6-7 | 8. English A-B-C or Composition 4-5-6 or exemption from requirement |
| 4. Mathematics 4 or 3-4 or 6 | 9. Psychology 1-2 ² |
| 5. Physics 3 and 4, and one of the combinations 23 and 24, 33 and 34, 43 and 44 | 10. Electives to make a total of 93 |

NOTE.—Students who have had no chemistry in high school are advised to take Inorganic Chemistry 11 in the summer of their first year.

C. GENERAL COURSE PRELIMINARY TO THE COLLEGE OF EDUCATION

All students who expect to receive the teacher's certificate from the University of Minnesota at the end of a four-year college course must register in the College of Education beginning with their junior year. They should enroll as pre-education students as early in their course as possible. Advisers for pre-education students will be members of the faculty of the College of Education.

At the time of entering the College of Education each student must present a statement from the Students' Health Service showing the results of a recent physical and health examination.

* For the requirements in physical education and military drill, see p. 3.

¹ Students who have had a high school course or experience in bookkeeping will be admitted to Economics 25 upon passing a placement test. For other students Economics 20 is prerequisite to Economics 25.

² The faculty may accept electives for these courses.

In meeting the specific requirements outlined below the student must earn at least 90 credits with an average grade of "C" in all work carried.

1. The ninety credits indicated above must be earned in the following groups of college courses:
 - Group A English
 - Group B Foreign Languages: German, Greek, Latin, Romance Languages, Scandinavian
 - Group C Social Sciences: Anthropology, Economics, Geography, History, Political Science, Sociology
 - Group D Natural Sciences: Astronomy, Botany, Chemistry, Geology and Mineralogy, Human Physiology, Physics, Psychology, Zoology
 - Group E Mathematics
 - Group F Journalism, Philosophy, Fine Arts, or such courses in other colleges or departments of the University as are approved by the College of Education
2. Within the general requirements listed above the student during his high school and junior college years must have completed the following minimum work in English and must offer at least 20 credits to be chosen from among the courses in two of the major groups designated as B, C, and D.

IF TAKEN	IN HIGH SCHOOL	IN COLLEGE
A. English	3 years	and 9 credits in composition
B. Language	3 years in one language	or 20 credits in one language
	or	
	2 years in one language	and 10 credits in one language
C. Social Science	or	
	1 year in one language	and 15 credits in one language
	2 years	or 10 credits
D. Natural Science	2 years	or 10 credits

NOTE.—In lieu of the specific course requirements indicated in the language group a student may elect a comprehensive examination in an elected language to be conducted by a committee appointed by the dean of the College of Education.

3. Within the total credits stipulated under No. 1 a student must meet, in fields of study which are represented in prevailing high school curricula, the following requirement: at least 15 credits in a major field and at least 10 credits in each of two minor fields. The purpose of this requirement is to prepare the student for the study of the advanced courses necessary to the completion of satisfactory teaching majors and minors.

Apart from the specialized curricula, majors and minors are offered separately in the following fields: English; German, Latin, Romance languages, Scandinavian; geography, history, political science; botany, chemistry, physics, zoology; mathematics.
4. The student must have completed six credits in General Psychology.
5. In the cases of certain specialized curricula described in the bulletin of the College of Education the above requirements may be modified in details. Students preparing to qualify in one of these curricula should consult the College of Education bulletin.
6. At the time of entrance to the College of Education the student will be given a general examination designed to show his capacities to pursue professional curricula in education.

7. In the freshman and sophomore years, men must complete three quarters of physical education and six quarters of military drill; women must complete six quarters of physical education. Five credits, to be counted toward graduation from the College of Education, will be granted for the completion of the requirement in physical education.

D. COURSE PRELIMINARY TO TRAINING IN INTERIOR ARCHITECTURE IN THE COLLEGE OF ENGINEERING AND ARCHITECTURE

This course offers to students of the College of Science, Literature, and the Arts the opportunity to prepare themselves for certain lines of work such as domestic architecture and interior architecture and decoration without taking the full technical course in Architecture.

During the first two years, the student is registered in this college. He must complete the requirements stated below and must earn 93 credits and 93 honor points.* At the beginning of his course, he should consult the School of Architecture regarding electives.

During the third and fourth years, the student registers in the College of Engineering and Architecture and upon the satisfactory completion of the prescribed work, amounting to 102 additional credits, receives the degree of bachelor of interior architecture. (See bulletin of the College of Engineering and Architecture.)

COURSES REQUIRED IN THE FIRST TWO YEARS	CREDITS
English A-B-C or Composition 4-5-6 or exemption from requirement	0 to 15
Mathematics 4 or 6 (with prerequisite).....	4 to 10
French (see Junior College Requirements, page 5).....	0 to 20
History 11-12-13	10
Physics 3 and 4 and 23 and 24, 33 and 34, or 43 and 44.....	8
or	
Inorganic Chemistry 1-2-3 or 4-5.....	8 to 12
Architecture 21-22-23	6
Architecture 31-32-33	15
Architecture 61-62-63	6

FOR THOSE WHO ENTER WITH TWO YEARS OF FRENCH

Freshman Year

FALL	Credits	WINTER	Credits	SPRING	Credits
Freshman English	5	Freshman English	5	Freshman English	5
Mathematics	5	French	5	French	5
Electives	5	Elective or math.	4 or 5	Elective	5

Sophomore Year

	Credits
Architecture 21-22-23	6
Architecture 31-32-33	15
Architecture 61-62-63	6
History 11-12-13	10
Chemistry or physics	8 to 12
Electives to complete a total of 90 for the two years.	

* For the requirements in physical education and military drill, see p. 3.

E. GENERAL COURSE PRELIMINARY TO THE LAW SCHOOL

This course is designed to satisfy the requirements for admission to the Law School, which are 93 academic credits and an average of one honor point for each credit earned up to the time of admission. Excess honor points do not reduce the number of credits required.

Pre-legal students are regularly registered in the Junior College, subject to the requirements of the General Course.* (See pp. 5 and 6.)

The following course is recommended by the faculty of the Law School as the best available under these rules:

1. Latin, 0 to 20 credits
2. English A-B-C or Composition 4-5-6 or exemption from requirement
3. Natural science, 10 credits
4. Political Science 1
5. Philosophy 2 and 51-52
6. History 4-5 and 33
7. Economics 6-7

Other subjects recommended for pre-legal students are Psychology 1-2; Speech 41-42-43 or 45-46, 55-56-57; Economics 54, 55, 103-104, 154, 160, 164; History 116-117-118; Philosophy 1, 3, 124, and 129; Political Science 2, 11, 15, 105-106, 145, 181, and 187.

The faculty of the Law School strongly advises students to complete the whole or at least three years of the Arts course before entering upon the study of law. Attention is called to the combined six-year course in Arts and Law, on page 19.

F. PRE-PHARMACY COURSE

For recommendations for one year's work preliminary to the College of Pharmacy, consult the bulletin of that college.

V. MILITARY SCIENCE AND TACTICS

Credit for advanced military science.—Students who have completed the Basic Course, R.O.T.C., and are selected for advanced work by the professor of military science and tactics, and who sign an agreement with the government to continue this work for the remainder of their college course (not to exceed two years) and to attend one summer training camp, are eligible for the Advanced Course, R.O.T.C., prescribed in War Department regulations.

The faculty will recommend for graduation, in any of its courses of study¹ leading to the degree of bachelor of arts or bachelor of science, any student who has satisfactorily completed the work of the Advanced Course, R.O.T.C., and has completed 177 college credits, with 177 honor points, including all other specific requirements for graduation.

Students enrolled in the Advanced Course, R.O.T.C., are furnished with a special uniform and receive from the government a fixed allowance per day while enrolled in this course, except during the period in which they are actually at a training camp, when they are paid at the rate prescribed for the seventh grade in the army.

* For the requirements in physical education and military drill, see p. 3.

¹ Taken wholly in this college.

All students who complete the Advanced Course, R.O.T.C., will, if recommended by the professor of military science and tactics and the president of the University, be commissioned in the Officers' Reserve Corps of the United States Army.

Special course for students of military science.—The degree of bachelor of science will be given to students who complete the following course.

JUNIOR COLLEGE

1. A total of 93 credits with an average of one honor point per credit.*
 - a. English A-B-C or Composition 4-5-6 or exemption from requirement.
 - b. History 1-2.
 - c. Zoology 1-2, Psychology 1-2, Chemistry, 10 credits.
2. Preparation for a major sequence in history, political science, or mathematics.

SENIOR COLLEGE

1. For the completion of the Advanced R.O.T.C. Course as now given, a total of..... 12 credits
2. Bacteriology 41 5 credits
3. Preventive Medicine 50, 53..... 6 credits
4. One of the following (in senior college courses)
 - a. History, including 101-102, 156..... 21 credits
 - b. Political Science, including 101-102, 181-182..... 21 credits
 - c. Mathematics including 50, 51, 52..... 21 credits
 - d. Additional electives to make a total of 183 credits and 183 honor points.

The quality credit rule applies to this course in so far as the number of elective credits is concerned.

VI. SEVEN-YEAR COURSE IN SCIENCE AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF SCIENCE, BACHELOR OF MEDICINE, AND DOCTOR OF MEDICINE¹

During the first two years the student is registered in the College of Science, Literature, and the Arts. He is expected to complete the courses listed below and must secure 93 credits with an average of one honor point per credit.* (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.)

Composition 4-5-6 or exemption from requirement.

Zoology 5-6-7 (1-2, 10 credits, will be accepted).

Inorganic Chemistry 11, Analytical Chemistry 7, and Organic Chemistry 1-2, with the elementary courses prerequisite to them.

Physics 3 and 4, 23 and 24, 33, 43 and 44. Course 34 optional.

* For the requirements in physical education and military drill, see p. 3.

¹ Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.S. degree in a combined course.

French or German sufficient to secure a reading knowledge. Students may meet this requirement by passing two quarters' work in Scientific French (French 8-9-10), or Medical German (German 31-32), or by taking special examinations after completing 15 credits of French or two college years of German. This examination is conducted by the department concerned.

The following subjects are recommended as electives: advanced zoology, (such as comparative anatomy), physics, chemistry, freehand drawing, Latin, higher mathematics and statistics, psychology, and sociology. With the approval of the Students' Work Committee of the Medical School and the assistant dean for students' work in the College of Science, Literature, and the Arts, a pre-medical student may take one subject in the Medical School in any quarter.

For admission to the Medical School, a candidate's record must show a number of honor points equal to the total number of credits in the required subjects of zoology, chemistry, physics, and composition; also a number of honor points equal to the total number of credits in all subjects; and the student must be accepted by the Medical School under the limited registration regulation of that school. A student applying for admission must have satisfied all requirements before July 1.

PROGRAM FOR THOSE WHO ENTER IN THE FALL WITHOUT LANGUAGE
AND WITHOUT HIGHER ALGEBRA

First Year

Inorganic Chemistry 1-2-3, or 4-5 and 11
French 1-2-3 or German 1-2-3
Mathematics 3 and 4, and Physics 3 and 4
Zoology 5-6-7 (or 1-2)

Second Year

Inorganic Chemistry 11, if not already completed
Analytical Chemistry 7
Organic Chemistry 1-2
French 8-9 or 9-10; or German 4 or 30 and 31-32
Physics 23 and 24, 33, 34 (optional), 43 and 44
Composition 4-5-6, or elective for those exempted from requirement

NOTE.—Students who have had no chemistry in high school are advised to take Inorganic Chemistry 11 in the summer of their first year.

PROGRAM FOR THOSE WHO ENTER IN THE FALL WITH TWO YEARS OF
EITHER FRENCH OR GERMAN

First Year

Inorganic Chemistry 1-2-3 or 4-5 and 11
French 3 and 9-10, or German 30 and 31-32
Mathematics 3 and 4, and Physics 3 and 4
or
Mathematics 4 and Physics 3, 4, 43, and 44
Zoology 5-6-7 (or 1-2)

Second Year

Inorganic Chemistry 11, if not already completed
Analytical Chemistry 7
Organic Chemistry 1-2
Physics to complete the requirement of four quarters. See above.
Composition 4-5-6, or elective for those exempted from requirement

The work during the third and fourth years is taken in the Medical School and is credited toward the degree of bachelor of science. To secure this degree, a student must have 183 credits and 183 honor points, and must have completed the first two years of the medical course in accordance with the standards of the Medical School.

Students who have completed elsewhere two or more years of collegiate or university work which includes the required subjects specified above and which is in other respects the full equivalent of the two years of academic work required in this seven-year combined course, will be awarded the degree of bachelor of science on recommendation of the faculty of the College of Science, Literature, and the Arts, provided they meet the scholarship requirements stated above. The credit value of work done elsewhere will be determined by the Students' Work Committee of the College of Science, Literature, and the Arts, but such credits will not become effective until the student has completed, with the required standing, two full years of work in the Medical School of the University of Minnesota.

The foregoing regulations governing the quality and amount of pre-medical training required for admission to the Medical School will be enforced for those who present the minimum amount of work. In cases of mature and superior students, especially such as have taken degrees and have made special progress along some line, (even tho it may not have been closely related to medicine), concessions may be made. Cases under this paragraph will be considered individually and upon petition.

It should be borne in mind that no student can pursue the medical course to advantage without knowledge of biology, chemistry, and physics.

VII. SIX-YEAR COURSE IN ARTS AND ARCHITECTURE¹

This course is designed to combine with the full technical course in Architecture the broad cultural training recognized as most desirable in preparation for the practice of this profession. The course leads to the degrees of bachelor of arts at the end of four years, bachelor of architecture at the end of five years, and master of architecture at the end of six years.

Students wishing to elect this course should consult the School of Architecture. For the first two years the requirements are the same as those laid down in the course in Interior Architecture, page 14 of this bulletin, except that the student will register in Mathematics 11, 12, and 13 (College of Engineering and Architecture) and complete these courses by the end of his sophomore year.

During the first four years of this course the student is registered in the College of Science, Literature, and the Arts. He must complete the requirements for admission to the Senior College, and is subject to the regulations governing other students in this college.

¹ Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.A. degree in a combined course.

VIII. SIX-YEAR COURSE IN ARTS AND LAW, LEADING TO
THE DEGREES OF BACHELOR OF ARTS
AND BACHELOR OF LAWS¹

The work of the first three years of this course is done in the College of Science, Literature, and the Arts. The student must complete the requirements for admission to the Senior College in the General Course, and is subject to all the regulations which govern the work of other Arts students. During these three years the student must secure at least 138 credits and an average of one honor point per credit for all credits earned.* (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.) During his third year the student will elect work in this college subject to the approval of the dean of the Law School and the assistant dean for the Senior College. The first year of the course in the Law School, when completed with the standing required by that college for graduation, counts as the equivalent of the fourth year (45 credits) of the Arts course.

IX. EIGHT-YEAR COURSE IN ARTS AND MEDICINE, LEAD-
ING TO THE DEGREES OF BACHELOR OF ARTS,
BACHELOR OF MEDICINE, AND
DOCTOR OF MEDICINE¹

During the first three years of this course, the student does his work in the College of Science, Literature, and the Arts, subject to the regulations governing the other students of the college, and must secure at least 138 credits, with an average of one honor point per credit for all credits earned.* (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.) He must complete the requirements for admission to the Senior College in the General Course and also the work in zoology, chemistry, physics, and foreign language, prescribed for the seven-year course in Science and Medicine (p. 16).²

During his third year, the student elects work in this college subject to the approval of the director of the professional course and the assistant dean for the Senior College. The first year of the course in the Medical School, when completed with the standards required by that school, counts as the equivalent of the fourth year (45 credits) of the Arts course.

For admission to the Medical School, a student's record must show a number of honor points equal to the number of credits in the required subjects of English or composition, chemistry, physics, and zoology; and also a number of honor points equal to the total number of credits and the student must be accepted by the Medical School under the limited regulations of that school.

* For the requirements in physical education and military drill, see p. 3.

¹ Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.A. degree in a combined course.

² For recommended electives and the restrictions governing them, see p. 17.

X. FIVE-YEAR COURSE IN ARTS AND NURSING OR NURSING EDUCATION, LEADING TO THE DEGREES OF BACHELOR OF SCIENCE AND GRADUATE IN NURSING¹

During the first 5 quarters in this course the student is registered in the College of Science, Literature, and the Arts.² This period is followed by 10 quarters during which the student is registered in the University School of Nursing. The last 3 quarters of the fifth year are devoted to elective work in the University, in preparation either for teaching and supervision in schools of nursing¹ or for public health nursing.

The student must earn an average of one honor point per credit in the work of the Junior College.

The student is required to earn 138 credits and 138 honor points in courses which regularly carry credit in the College of Science, Literature, and the Arts. The satisfactory completion of the required professional work is accepted as the equivalent of the senior year in this college.

Students should consult Miss Vannier before registering.

First Year

1. English A-B-C or Composition 4-5-6 or exemption from requirement
2. Botany, three quarters
3. Inorganic Chemistry, 10 credits (Inorganic Chemistry 6-7 or 9-10 or 1-2-3 or 4-5 and 11)
4. Anatomy 3
5. Electives to make a total of 45

Second Year, Fall and Winter Quarters³

6. Zoology 1-2
7. Psychology 1-2
8. History, 10 credits
9. Composition 11-12, or 18-19
or
Speech 41-42

Third and Fourth Years

See bulletin of the School of Nursing.

Fifth Year

During their last three quarters students register in this college¹ and take work subject to the approval of the director of the Public Health Nursing Course and the assistant dean for the Senior College.

1. Sociology, 10 credits
2. Preventive Medicine and Public Health, 15 credits of theoretical work and 14 credits of practical work
3. Child Welfare 40 or Sociology 60
4. Electives to make a total of 138

¹ Students in Nursing Education register in the College of Education in their fifth year and receive their degree from that college. See bulletin of the College of Education.

² Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.S. degree in a combined course.

³ In the spring quarter students register in the School of Nursing for Human Physiology 2 or 4, Educational Psychology 55, Bacteriology 41, History of Nursing, Theory of Dietetics, and Lettering.

DIRECTORY OF ADMINISTRATIVE AND DEPARTMENTAL OFFICES

J. B. Johnston, Dean of the College of Science, Literature, and the Arts.....	219Adm		
J. M. Thomas, Assistant Dean for the Senior College.....	219F		
W. H. Bussey, Assistant Dean for the Junior College.....	106F		
R. R. Shumway, Assistant Dean for Students' Work.....	219Adm		
Anthropology	11F	Human Physiology	215MH
Architecture	315E	Journalism	13P
Astronomy	123F	Latin	118F
Bacteriology	228MH	Library Methods	107Lib
Botany	209Bot	Mathematics	119F
Chemistry	127C	Mechanical Engineering	103ME
Child Welfare	204OLa	Military Science and Tactics..	105A
Comparative Literature	111F	Music	107Mu
Comparative Philology	216F	Orientation	228F
Drawing & Descriptive Geom- etry	208E	Philosophy	323F
Economics	113B	Physical Education for Men..	108A
English	219F	Physical Education for Women	101WGm
Fine Arts	101OPh	Physics	148Ph
Geography	101OL	Political Science	205OL
Geology and Mineralogy	108P	Preventive Medicine and Public Health	101bMH
German	211F	Psychology	112Psy
Greek	112F	Romance Languages	200F
History	102OL	Scandinavian	122F
Home Economics	214HE	Sociology	108OPh
How To Study.....	108Psy	Speech	309F
Human Anatomy	204IA	Zoology	308Z

EXPLANATIONS

Course numbering.—A course is designated by a department name, a number, and a letter. It has the same number in whatever quarter it is offered. The quarter is indicated by the letter (f, fall; w, winter; s, spring; su, summer).

Examples:

- 1f-2w, a two-quarter course given in the fall and winter.
- 1w-2s, the same course given in the winter and spring,
- 3f,w,s, a one-quarter course given each quarter.

Junior college courses (primarily for freshmen and sophomores) are numbered from 1 to 49. Senior college courses are numbered as follows: courses primarily for juniors and seniors, from 50 to 99; for juniors, seniors, and graduates, from 100 to 199; for graduates only, from 200 up. This system is not uniformly followed by departments in other colleges than Science, Literature, and the Arts.

Certain courses numbered under 50 are restricted to juniors and seniors. They are not technically senior college courses and cannot be used in major or minor sequences.

Statement of credits.—The number of credits stated for two- and three-quarter courses is the number for the entire course, not the number for each quarter.

Buildings.—A, Armory; Adm, Administration; Ad(F), Administration, University Farm; B, Business; Bot, Botany; C, Chemistry; CWI, Child Welfare Institute; D, Dentistry; E, Engineering; F, Folwell; G, Greenhouse; HE, Home Economics, University Farm; HH, Haecker Hall, University Farm; Lib, Library; ME, Mechanical Engineering; MH, Millard Hall; Mu, Music; OLa, Old Law; OL, Old Library; OPh, Old Physics; P, Pillsbury; Ph, Physics; Psy, Psychology; Pu, Publications; S, Stadium; SBH, State Board of Health; WGM, Women's Gymnasium; Z, Zoology.

OTHER ABBREVIATIONS AND SYMBOLS

I, II, III, etc. First hour (8:30 to 9:20), second hour (9:30 to 10:20), third hour (10:30 to 11:20), fourth hour (11:30 to 12:20), fifth hour (12:30 to 1:20), sixth hour (1:30 to 2:20), seventh hour (2:30 to 3:20), eighth hour (3:30 to 4:20), ninth hour (4:30 to 5:20).

(At the University Farm, first hour, 8:15 to 9:05; second hour, 9:15 to 10:05, etc., to 1:05; sixth hour, 1:30 to 2:20, etc.)

Ar.	To be arranged or assigned.
Aud.	Auditorium.
Cert. of apt.	Certificate of aptitude. See <i>Classification of Studies</i> , p. 5.
Cred.	Credits.
Lab.	Laboratory.
Lect.	Lecture.
MTWThFS	Monday, Tuesday, etc.
Prereq.	Prerequisite.
Rec.	Recitation.

A parenthetical statement after the title of each course gives the following information: the number of credits the course carries, the classes to whom it is open, and the courses prerequisite to it. *Abbreviated statement:* (5 cred.; jr., sr.; prereq., 6). *Expanded statement:* This course carries five credits, is open to juniors and seniors only, and has for a prerequisite, Course 6 in the same department.

ANTHROPOLOGY

Major Advisers

Professors Jenks and Wallis.

Major Sequence

Prerequisites: Course 41, with fifteen additional credits from the social sciences and fifteen credits from the biological sciences.

At least twenty-four credits selected from the following courses: 80, 106, 108, 110, 112, 113, 114, 121, 161; History 121, 166. In addition, Psychology 114-115 is required.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
41f	Introd. to Anthropology (5 cred.; soph., jr., sr.; prereq., 10 cred. sci. or soc. sci.)	VI	MTWThF	15F	Prof. Jenks
41w	Introd. to Anthropology (See 41f)	VII	MTWThF	15F	Prof. Wallis
41s	Introd. to Anthropology (See 41f)	II	MWThS	15F	Prof. Wallis
53f	Cultural Anthropology: Tech- nology	I	MWF	15F	Prof. Wallis
54w	(3 cred.; jr., sr.; prereq., 41) Cultural Anthropology: Social Organization	VIII	MWF	15F	Prof. Wallis
56f	(3 cred.; jr., sr.; prereq., 41) Primitive Science	II	MWF	15F	Prof. Wallis
62w	Ethnology	I	MWF	15F	Prof. Wallis
80s	(3 cred.; jr., sr.; prereq., 41) The American Indian	III	MWF	15F	Prof. Wallis
106f	Prehistoric Man	III	MWF	12F	Prof. Jenks
108	(3 cred.; jr., sr.; prereq., 41) <i>Philippine Peoples</i>	<i>Not offered</i>			
110f	(3 cred.; jr., sr.; prereq., 41) Physical Anthropology	III	TThS	12F	Prof. Wallis
112	(3 cred.; jr., sr.; prereq., 41) <i>The American Negro</i>	<i>Not offered</i>			
113	(3 cred.; jr., sr.; prereq., 41) <i>Peoples of Europe</i>	<i>Not offered</i>			
114f	(3 cred.; jr., sr.; prereq., 41) The American People.....	IV	MWF	15F	Prof. Jenks
121w	Advanced Phys. Anthropology...	Ar	Ar	12F	Prof. Wallis
122f, 123w, 124s	(3 cred.; jr., sr.; prereq., 110) Problems in Anthropology..... (Cred. ar.; jr., sr., grad.; pre- req., three courses. For honors course students, permission of instructor)	Ar	Ar	12F	Profs. Jenks and Wallis
161f	Primitive Religion	VI	MWF	12F	Prof. Wallis
	(3 cred.; jr., sr.; prereq., 41)				

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

Major Adviser

Professor Mann.

Major Sequence

Courses 34-35-36, 14-15-16, 17-18-19, 163, Architecture 182-183-184 or five credits in senior college courses in philosophy, history, or French. (Prerequisites: Courses 31-32-33, 61-62-63, and 10 credits in philosophy, history, or French.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Junior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
21f-22w†-23s	Freehand Drawing				
	(6 cred.; soph., jr., sr.; prereq., soph. standing)				
31f-32w†-33s	Elements of Architecture				
	(15 cred.; soph., jr.; prereq., soph. standing)				
31w-32s†-33su	Elements of Architecture				
	(See 31f-32w-33s)				
61f*	Projections				
	(2 cred.; soph.; prereq., Math. 3 or 5)				
62w	Shades and Shadows				
	(2 cred.; prereq., 61 or Draw. 41)				
63s	Perspective				
	(2 cred.; prereq., 61 or Draw. 41)				
81f	Stage Design				
	(2 cred.; jr., sr.; no prereq.)				
84-85-86f,w,s	Modeling				
	(6 cred.; jr., sr.; no prereq.)				

NOTE.—Consult the bulletin of the College of Engineering and Architecture for program of hours, days, buildings, and instructors.

Senior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
14f-15w-16s	History of Architecture				
	(6 cred.; jr., sr.; prereq., 31-32-33)				
17f-18w-19s	History of Architecture.....				
	(6 cred.; jr., sr.; prereq., 14-15-16)				
34-35-36f,w,s	Architectural Design				
	(12 cred.; jr., sr.; prereq., 31-32-33, 23, 61-62-63)				
37-38-39f,w,s	Architectural Design				
	(21 cred.; sr.; prereq., 34-35-36)				
51f-52w-53s	Building Construction				
	(6 cred.; jr., sr.; prereq., 31-32-33)				
74f-75w-76s	Freehand Drawing				
	(9 cred.; jr., sr., int. dec.; prereq., 23)				
90-91-92f,w,s	Illustration				
	(3 cred.; jr., sr.; prereq., 21-22-23 or equiv.)				
93-94-95f,w,s	Hand Print Process.....				
	(3 cred.; jr., sr.; prereq., 21-22-23 or equiv.)				
134-135-136f,w,s	Interior Decoration Design				
	(21 cred.; sr.; prereq., 34-35-36)				
163s	History of Sculpture and Painting				
	(2 cred.; jr., sr.; prereq., 14-15-16)				
182f-183w-184s	Decoration and Allied Arts.....				
	(9 cred.; sr.; prereq., 17-18-19)				

NOTE.—Consult the bulletin of the College of Engineering and Architecture for program of hours, days, buildings, and instructors, and for additional courses.

* Drawing 41 covers the same ground as Course 61 and may be substituted for it.

† The entire course must be completed before credit is received for any quarter.

ASTRONOMY

Major Sequence

Courses 51-52-53, 101-102-103, and Mathematics 50, 51, 52. (Prerequisites: Mathematics 5-6-7 or physical science and Mathematics 6.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
11f,w,s§	Descriptive Astronomy (5 cred.; 3d qtr. fr. with cert. of apt., soph., jr., sr.; no prereq.)	III	MTWFS	124F	Asst. Prof. Beal
51f	General Astronomy (3 cred.; jr., sr.; prereq., 15 cred. in bot., chem., geol., zool., math., or phys.)	II	MWF	124F	Asst. Prof. Beal
51w	General Astronomy (See 51f)	IV	MWF	124F	Asst. Prof. Beal
51s	General Astronomy (See 51f)	I	MWF	124F	Asst. Prof. Beal
52w	Astrophysics (3 cred.; jr., sr.; prereq., 51 or 11 and prereq. for 51)	II	MWF	124F	Asst. Prof. Beal
53s	Stellar Astronomy (3 cred.; jr., sr.; prereq., 52)	II	MWF	124F	Asst. Prof. Beal
62	Field Astronomy (3 cred.; jr., sr.; prereq., Astron. 11 or 51, and Math. 6, 7)	<i>Not offered</i>			
101f-102w-103s	Practical Astronomy (9 cred.; jr., sr., grad.; prereq., Astron. 11 or 51, and Math. 50)	Ar	Ar	123F	Asst. Prof. Beal
111f-112w-113s	Celestial Mechanics (9 cred.; sr., grad.; prereq., Math. 51)	Ar	Ar	123F	Asst. Prof. Beal
140	Method of Least Squares (3 cred.; sr., grad.; prereq., Math. 51)	<i>Not offered</i>			

BACTERIOLOGY

MEDICAL SCHOOL

Major Advisers

Professors Larson and Henrici; Associate Professor R. G. Green.

Major Sequences

Sequence A. For work in medical or public health bacteriology. Courses 101, 114, 116, 117, 119-120, 150-151. (Prerequisites: besides the necessary courses in this department, Zoology 144-145-146 and Human Physiology 100-101 or Agricultural Biochemistry 111-112.)

Sequence B. For work in industrial bacteriology. Courses 103, 114, 118, 119-120, 121-122, 150-151. (Prerequisites: besides the necessary courses in this department, Human Physiology 100-101 or Agricultural Biochemistry 111-112.)

§ Does not satisfy the junior college requirement for science.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
41f	General Bacteriology (5 cred.; soph., jr., sr.; prereq., chem. 10 cred. and zool. 8 cred.)				
	Sec. 1	VI, VII, VIII	MWF	MH	Ar
	2	VI, VII, VIII, IX	TTh	MH	Ar
	3	I, II, III	MWF		
41w	General Bacteriology (See 41f)				
	Sec. 1	VI, VII, VIII	MWF	MH	Ar
	2	I, II, III	MWF	MH	Ar
41s	General Bacteriology (See 41f)				
	Sec. 1	VI, VII, VIII	MWF	MH	Ar
	2	I, II, III	MWF	MH	Ar
101f	Special Bacteriology for Medical Students	I, II		ThS	MH
	(4 cred.; jr., sr.; prereq., 41)	I, II, III		T	
103w	Special Bacteriology for Students of Agriculture	I, II, III		TS	MH
	(5 cred.; jr., sr.; prereq., 41)	I, II		Th	
114s	Molds, Yeasts, and Actinomycetes (3 cred.; jr., sr.; prereq., 41)	VII, VIII		TTh	MH
116w	Immunity	VII, VIII		TTh	MH
	(3 cred.; jr., sr.; prereq., 101 or 103)				
117s	Pathogenic Protozoa	VII, VIII		TTh	MH
	(3 cred.; jr., sr.; prereq., 101 or 103)				
118w	Morphology and Taxonomy of Bacteria	VII, VIII		TTh	MH
	(3 cred.; jr., sr.; prereq., 41)				
119w-120s	Bacteriological Chemistry	VI, VII, VIII		TTh	MH
	(4 cred.; jr., sr.; prereq., 101 or 103; Hum. Physiol. 100-101, or Agr. Biochem. 111-112)				
121w	Industrial Bacteriology	I, II		TTh	MH
	(3 cred.; jr., sr., grad.; prereq., 41)				At
122s	Industrial Bacteriology continued (3 cred.; jr., sr., grad.; prereq., 41)	I, II		TTh	MH
150f-151w or 150w-151s	Advanced Bacteriology	VII, VIII		TTh	MH
	(Cred. ar.; jr., sr., grad.; pre- req., see instructor)				Ar

BOTANY

Major Advisers

Professors Harris, Rosendahl, and Tilden; Associate Professors Butters, Cooper, and Harvey; Assistant Professors Burr and Huff.

Major Sequences

A. In Morphology. (Prerequisite: 1, 2, 5, 7, 12, 21, 22, 23.) Courses 51, 63, 118, either 149, 150, or 151, and 15 credits from Courses 108, 110, 125, 126, 127, or Plant Pathology 105-106-107.

PROGRAM

B. In Taxonomy. (Prerequisite: 1, 2, 7, 12, 21, 23, and Geology 2 or 8.) Courses 101, 113, 114, 115, 127, 133, and 10 credits from 63, 108, 110, 125, 126, 149, 150, 151, or Plant Pathology 105-106-107.

C. In Physiology. (Prerequisite: 1, 5, 21, 22, and elementary inorganic chemistry.) Courses 140, 141, 142, 143, and 10 credits from 144 or biochemistry or organic chemistry.

D. In Ecology. (Prerequisite: 1, 2, 5, 7, 21, 22, and Geology 2 or 8.) Courses 131, 132, 133, 134, and 10 credits from 101, 113, 114, 115, 127, 149, 150, 151.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate consult the bulletin of the College of Education.

No.	Title	Hour	Day	Bldg.	Instructor
1f*	General Botany (4 cred.; all; no prereq.)	Lect. Sec. 1	III	TThS	BotAud Asst. Prof. Huff
		2	{ VI VI, VII	T Th	
	Quiz Sec. 1	II	T		
		2	III	M	
		3	III	W	
		4	V	T	
		5	VI	M	
		6	VII	T	
1w,s*	General Botany (See 1f)	Lect.	III	TThS	BotAud Asst. Prof. Huff
	Quiz Sec. 1	I	T		
		2	II	T	
		3	III	W	
2w,s	Elem. Gen. Morph. of Plants... (3 cred.; all; prereq., 1)		III, IV	MWF	1,4,5,8Bot Asst. Prof. Huff
5w	Elem. Plant Histology (3 cred.; all; prereq., 1)		VI, VII, VIII	TTh	1,4,5,8Bot Assoc. Prof. Butters
7f,s	Taxonomy of Flowering Plants... (3 cred.; all; prereq., 1)	Sec. 1	I, II	MWF	1,4,5,8Bot Prof. Rosendahl
		2	VI, VII, VIII	TTh	
12f,w,s	Morphology of Algae (3 cred.; all; prereq., 1)		I, II	TThS	1,4,5,8Bot Prof. Tilden
13	Morphology of Fungi..... (3 cred.; all; prereq., 1)		Not offered		
21f	Elementary Ecology (3 cred.; all; prereq., 1)		III, IV	MWF	1,4,5,8Bot Assoc. Prof. Cooper
21w,s	Elementary Ecology (See 21f)		VI, VII, VIII	TTh	1,4,5,8Bot Assoc. Prof. Cooper
22f,w,s	Elem. Plant Physiology (3 cred.; all; prereq., 1)	Lect.	VI	TTh	1,4,5,8Bot Asst. Prof. Burr
	Lab. Sec. 1	III, IV	TS		
		2	VII, VIII	TTh	
23w	Bryophytes and Pteridophytes... (3 cred.; all; prereq., 2 or 12)		VI, VII	MWF	1,4,5,8Bot Asst. Prof. Huff

* To complete the science requirement a student may elect any two of Courses 2, 5, 7, 12, 13, 21, 22.

No.	Title	Hour	Day	Bldg.	Instructor
51f	Histological Methods (5 cred.; jr., sr.; prereq., 15 cred.)	I, II	MTWThF	01Bot	Miss Wilson
63s	Gymnosperms and Angiosperms (3 cred.; jr., sr.; prereq., 15 cred. incl. 7 and 2 or 23)	III, IV	MWF	215Bot	Assoc. Prof. Butters
101f,w	Elementary Biometry (3 cred.; jr., sr., grad.; prereq., 18 cred., biol. sci.)	I, II	MWF	202Bot	Prof. Harris
108w	Peridophytes (5 cred.; sr., grad.; prereq., 18 cred. incl. 7 and 23)	Ar	Ar Ar		Assoc. Prof. Butters
110	<i>Gymnosperms</i> (5 cred.; sr., grad.; prereq., 18 cred. incl. 7 and 63)	<i>Not offered</i>			
113f-114w-115s*	Adv. Taxonomy of Flowering Plants (9 cred.; jr., sr., grad.; prereq., 15 cred. incl. 7)	VI, VII, VIII	TTh	215Bot	Prof. Rosen-dahl
118	<i>Cytology</i> (5 cred.; jr., sr., grad.; prereq., 18 cred.)	<i>Not offered</i>			
125s,126f*	Morphology and Taxonomy of Marine Algae (3 to 5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12, or consent of instructor)	Lect. III Lab. III, IV	Th TS	110Bot	Prof. Tilden
127s	Anatomy of Vascular Plants.... (5 cred.; jr., sr., grad.; prereq., 18 cred. incl. 5)	Lect. I Lab. Ar	MWF Ar	215Bot 214Bot	Assoc. Prof. Butters
131f	Field Ecology (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 21)	VI, VII, VIII	MWF	214Bot	Assoc. Prof. Cooper
132w	Ecological Anatomy (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 21)	VI, VII, VIII	MWF	214Bot	Assoc. Prof. Cooper
133	<i>Plant Geography of North America</i> (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 21)	<i>Not offered</i>			
134s	Research Methods in Ecology... (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 21)	VI, VII, VIII	MWF	214Bot	Assoc. Prof. Cooper
140	<i>General Plant Physiology</i> (5 cred.; jr., sr., grad.; prereq., 22, elem. inorg. chem.)	<i>Not offered</i>			
141f	Physical Phases of Plant Physiology (5 cred.; jr., sr.; prereq., qual. quant., org., and phys. chem.)	Lect. I Lab. II, III, IV	MWF MF	101Bot	Asst. Prof. Burr

* Any quarter may be taken separately.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
142w	Plant Metabolism	I	MWF	101Bot	Asst. Prof. Burr
	(5 cred.; sr., grad.; prereq., as for 141)	II, III, IV	MF		
143s	Plant Metabolism continued.....				
	(5 cred.; sr., grad.; prereq., as for 141)				
		Lect. I	MWF	101Bot	Asst. Prof. Burr
		Lab. II, III, IV	MF		
144s	Plant Microchemistry	Ar	Ar	Ar	Assoc. Prof. Harvey
	(5 cred.; sr., grad.; prereq., 22, 140, org. chem.)				
145f, 146w, 147s*	Advanced Biometry	III, IV	MWF	202Bot	Prof. Harris
	(9 cred.; sr., grad.; prereq., 101)				
149s, 150su, 151f*	Freshwater Algae	VI, VII, VIII	TTh	110Bot	Prof. Tilden
	(3 to 10 cred. per qtr.; jr., sr.; grad.; prereq., 15 cred. incl. 12, or consent of instructor)				

PLANT PATHOLOGY AND BOTANY

Students in this college may elect courses in Plant Pathology and Botany by arrangement with the department. See program of the College of Agriculture, Forestry, and Home Economics.

CHEMISTRY

SCHOOL OF CHEMISTRY

Major Advisers

Professors Hunter and Sneed.

Major Sequence

Analytical Chemistry 1-2; Organic Chemistry 51-52-53; Physical Chemistry 101-102-103. (Prerequisite: Inorganic Chemistry 12-13.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

NOTE.—Analytical Chemistry 1-2, and all courses numbered above 50 count as senior college courses.

* Any quarter may be taken separately.

INORGANIC CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†-3s	Gen. Inorg. Chemistry (pre-med. and pre-dent.) (12 cred.; pre-dent., pre-med.; no prereq.)				
	Lect.	VI	MWF	225C	Assoc. Prof. Reyerson
	Lab. Sec. 1	VI, VII, VIII	T	110C	Assoc. Prof. Reyerson and assts.
	Quiz Sec. 1	VIII	Th	ArC	Assoc. Prof. Reyerson and assts.
	Lab. Sec. 2	VI, VII, VIII	Th	110C	Assoc. Prof. Reyerson and assts.
	Quiz Sec. 2	VIII	T	ArC	Assoc. Prof. Reyerson and assts.
4f-5w†	Gen. Inorg. Chemistry (pre-med. and pre-dent.) (8 cred.; pre-dent., pre-med. only; prereq., entrance cred. in chem.)				
	Lect. or Lect.	II VI	TThS MWF	325C 100C	Asst. Prof. Stephens Asst. Prof. Stephens
	Lab. Sec. 1	VI, VII, VIII	T	210C	Asst. Prof. Stephens and assts.
	Quiz Sec. 1	VIII	Th	ArC	
	Lab. Sec. 2	VI, VII, VIII	Th	210C	Asst. Prof. Stephens and assts.
	Quiz Sec. 2	VIII	T	ArC	
6f-7w†-8s	Gen. Inorg. Chemistry (15 cred.; those entering without chem., fr. with cert. of apt., soph., jr., sr.; no prereq.)				
	Lect.	II	MWF	225C	Assoc. Prof. Cohen
	Lab.	I, II, III	ThS	210C	Assoc. Prof. Cohen and assts.
9f-10w†	Gen. Inorg. Chemistry (10 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., entr. cred. in chem.)				
	Lect.	II	MWF	100C	Prof. Sneed
	Lab.	I, II, III	ThS	290C	Ar

† Two quarters must be completed before credit is received for either quarter.

PROGRAM

31

No.	Title	Hour	Day	Bldg.	Instructor
9w-10s†*	Gen. Inorg. Chemistry (See 9f-10w)	Lect. III	MWF	100C	Assoc. Prof. Cohen
		Lab. VIII, IX	MWF	290C	Ar
11f	Qual. Chemical Anal. (pre-med. and pre-dent.) (4 cred.; pre-med. and pre-dent. only; prereq., 3 or 5)	Lect. IV	MWF	225C	Assoc. Prof. Cohen
		Lab. Sec. 1 VI, VII	MW	210C	Assoc. Prof. Cohen and assts.
	(Limit 25)	Lab. Sec. 2 VI, VII, VIII, IX	M	210C	Assoc. Prof. Cohen and assts.
	(Limit 25)	Lab. Sec. 3 VI, VII, VIII, IX	W	290C	
11s	Qual. Chemical Anal. (pre-med. and pre-dent.) (See 11f)	Lect. Sec. 1 II	TThS	325C	Asst. Prof. Stephens
		Lab. Sec. 1 VI, VII, VIII, IX	T	210C	Asst. Prof. Stephens and assts.
		Lect. Sec. 2 VI	MWF	100C	Asst. Prof. Stephens
		Lab. Sec. 2 VI, VII, VIII, IX	Th	210C	Asst. Prof. Stephens and assts.
12f-13w†	Qual. Chemical Analysis (10 cred.; all; prereq., 8 or 10)	Fall Lect. I	TThS	325C	Mr. Maynard
		Lab. VI, VII, VIII	MW	290C	
	Winter	Lect. VI	WF	215C	
		Lab. VII, VIII, IX	MWF	290C	
12s†	Qual. Chemical Anal. (See 12f-13w†)	Lect. II	MWF	100C	Prof. Sneed
		Lab. I, II, III	ThS	290C	Prof. Sneed and assts.
13f†	Qual. Chemical Anal. (See 12f-13w†)	Lect. VI	WF	490C	Ar
		Lab. VII, VIII, IX	WF	290C	
		VI, VII, VIII	M		
101s	History of Chemistry (2 cred.; sr., grad.; prereq., Org. Chem. 52)	Ar	Ar	Ar	Assoc. Prof. Cohen
102w	Adv. Qual. Chemical Anal. (2 or 3 cred.; jr., sr., grad.; prereq., Anal. Chem. 1, 2, Org. Chem. 52)	Ar	Ar	290C	Prof. Sneed

* Students who have failed in 1f or 6f may register for this course without further prerequisite.
 † Two quarters must be completed before credit is received for either quarter.

No.	Title	Hour	Day	Bldg.	Instructor
103f-104w-105s	Adv. Inorg. Chemistry (3 to 9 cred.; jr., sr., grad.; prereq., Anal. Chem. 1, 2, Org. Chem. 52)	IV	MWF	111C	Prof. Sneed
106f-107w-108s	Chemistry of the Rare Elements (3 cred.; jr., sr., grad.; prereq., quant. anal. or permission of instructor)	Ar	Ar	Ar	Ar

ANALYTICAL CHEMISTRY

1w-2s*	Quant. Analysis (10 cred.; soph., jr., sr.; prereq., Inorg. Chem. 12-13)	Lect. VI Quiz VI Rec. VI Lab. VII, VIII, IX	M W F MWF	325C 410C 315C 310C	Assoc. Prof. Geiger
7f	Quantitative Analysis (pre-med.) (4 cred.; pre-med. only; prereq., Inorg. Chem. 11 or 13)	Lect. (Secs. 1, 2) Rec. (limit 35) Sec. 1 Lab. Rec. (limit 35) Sec. 2 Lab. Lect. Sec. 3 Rec. Sec. 3 Lab.	VI VI VII, VIII, IX VI, VII VI VII, VIII, IX VI, VII VII VI VIII, IX VII, VIII, IX I, II, III or II, III, IV	M 325C W 315C F 310C F 315C MF 310C W 310C T 325C Th 325C T 310C Th 310C S } 310C S }	Assoc. Prof. Geiger Asst. Prof. Sarver
7w,s	Quantitative Analysis (See 7f)			For hours, see 7f, Sec. 3	
123f-124w-125s	Advanced Analytical Chemistry (3 cred. per qtr.; prereq., 1, 2, or 7)	Lect. VI Lab. VII, VIII, IX VI-IX	T T Th	315C 310C 310C	Asst. Prof. Sarver
131f	Application of Indicators (3 cred.; prereq., Anal. Chem. 1 and 2 and Phys. Chem. 101, 102, 103)	Lect. Ar Lab. Ar	Ar Ar	ArC ArC	Prof. Kolthoff Prof. Kolthoff
132w,s	Electrometric Titrations (3 cred.; prereq., Anal. Chem. 1 and 2 and Phys. Chem. 101, 102, 103)	Lect. Ar Lab. Ar	Ar Ar	ArC ArC	Prof. Kolthoff

* Course 2s may precede 1w, if desired.

ORGANIC CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Elem. Organic Chemistry (8 cred.; pre-dent., pre-med., prereq., Inorg. Chem. 11)				
	Lect. (all secs.)	I	MWF	100C	Asst. Prof. Lauer
	Lab. conference (all secs.)	II	Th	225C	Asst. Prof. Lauer
	Quiz (all secs.)	I	Th	Ar	Ar
	Lab. Sec. 1	I-IV	T	390C	
	2	VI-IX	M	390C	
	3	VI-IX	T	390C	
	4	VI-IX	W	390C	
1w-2s†	Elem. Organic Chemistry (See 1f-2w)				
	Lect.	IV	MWF	100C	Assoc. Prof. Smith
	Lab. conference	IV	T	100C	Assoc. Prof. Smith
	Quiz	V	T	Ar	
	Lab. Sec. 1	VI-IX	W	390C	
	2	VI-IX	Th	390C	
	3	VI-IX	F	390C	
	4	I-IV	S	390C	
1s†	Elem. Organic Chemistry (See 1f-2w)	For hours, see 1f-2w. limited to lab. secs.	Registration 1 and 4		Asst. Prof. Lauer
2†	Elem. Organic Chemistry (See 1f-2w)	For hours, see 1w-2s. limited to lab. secs.	Registration 3 and 4		Assoc. Prof. Smith
51f-52w†-53s	Organic Chemistry (10 or 15 cred.; jr., sr.; prereq., 15 cred. in college chem.)				
	Lect.	III	MWF	325C	Prof. Hunter
	Rec.	III	Th	111C	Asst. Prof. Lauer
	Lab.	VI, VII, VIII	TTh	390C	Asst. Prof. Lauer
101f-102w-103s	Advanced Organic Chemistry (3 cred. per qtr.; prereq., 53)	III	TThS	315C	Prof. Hunter

For advanced courses in Organic Chemistry, see bulletin of the School of Chemistry.

PHYSICAL CHEMISTRY

101f-102w-103s	Physical Chemistry (9, 12, or 15 cred.; jr., sr., grad.; prereq., 2 yrs. coll. chem., 1 yr. coll. phys.)				Prof. MacDougall
	Lect.	IV	MWF	325C	
	Lab.	VI, VII, VIII	F	15C, 117C	
	Rec.	IV	S	115C	
110f,w	Physical Chemistry (medic.) (4 cred.; pre-med. and biol. stu- dents; prereq., Org. Chem. 2)				
	Lect.	VI	TTh	225C	Ar
			F	325C	
	Lab. Sec. 1	I, II, III	MW	15C, 117C	
	2	VII, VIII, IX	TTh	117C, 15C	

† Two quarters must be completed before credit is received for either quarter.

No.	Title	Hour	Day	Bldg.	Instructor
116f-117w-118s	Adv. Physical Chem. (9 or 12 cred.; jr., sr., grad.; prereq., 103 and calculus)	Ar	Ar	Ar	Ar
129	<i>Prin. of Colloidal Chemistry</i> (2 cred.; sr., grad.; prereq., 102)	Not offered			
130s	Appl. of Colloidal Chemistry.... (2 cred.; sr., grad.; prereq., 102)	Ar	Ar	ArC	Assoc. Prof. Reyerson
131f-132w-133s	Colloid Chemistry Lab. (Cred. ar.; sr., grad.; prereq., 129 or 130)	Ar	Ar	Ar	Assoc. Prof. Reyerson
144s	Magnetochemistry (3 cred.; jr., sr., grad.; prereq., 103)	Ar	Ar	Ar	Ar
161f-162w	Radioactivity (2 cred. per qtr.; jr., sr., grad.; prereq., Phys. Chem. 103)	Ar	Ar	Ar	Prof. Lind
164f,w,s	Radioactivity Laboratory (Must be preceded or accom- panied by 161)	Ar	Ar	Ar	Prof. Lind

TECHNOLOGICAL CHEMISTRY

100f-101w-102s	Food Analysis (9 cred.; jr., sr., grad.; prereq., Anal. Chem. 1-2)	Lect.	III	F	215C	Asst. Prof. Stoppel
		Lab.	VI, VII, VIII	TF	217C	Asst. Prof. Stoppel

AGRICULTURAL BIOCHEMISTRY

Students in this college may elect courses in Agricultural Biochemistry by arrangement with the department. See program of the College of Agriculture, Forestry, and Home Economics.

CHILD WELFARE

No.	Title	Hour	Day	Bldg.	Instructor
40w*	Child Training (3 cred.; jr., sr.; prereq., Psy. 1-2)	IV and one hour ar	MW	202OLA	Assoc. Prof. Foster
60f	Modern Aspects of Child Study (2 cred.; jr., sr.; prereq., 6 cred. in psy. and 5 cred. in soc. sci.)	VI	TTh	202OLA	Assoc. Prof. McGinnis
80f	Child Psychology (3 cred.; jr., sr.; prereq., Psy. 1-2)	I	MWF	202OLA	Prof. Anderson
90w	Physical Development of the Young Child (2 cred.; jr., sr.; prereq., Zool. 1-2, Psy. 1-2)	V	T and ar	202OLA	Asst. Prof. Boyd
120s	Health Care of the Young Child (2 cred.; sr., grad.; prereq., 40 and 90 and permission of the instructor)	V	T and ar	202OLA	Asst. Prof. Boyd

* Offered fall and spring as Home Economics Education 40. Consult bulletin of the College of Agriculture, Forestry, and Home Economics.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
130s	The Development of the Young Child (3 cred.; sr., grad.; prereq., 12 cred. in psy. or equivalent, and permission of instructor)	I	TThS	202OLA	Prof. Anderson
133f-134w†-135s	Methods in Study of Development of Young Children..... (6 or 9 cred.; sr., grad.; prereq.; 10 cred. in psy. or ed. psy. incl. 4-5 or 7 and permission of instructor)	VI VI-VII	M WF	202OLA	Assoc. Prof. Goodenough
170f	Parental Education in Child Care and Training (3 cred.; sr., grad.; prereq., 40, 60, 80, or H.E. 34, 35, and 44, or 15 cred. in ed. or psy., or soc., or prev. med.)	IV	MWF	202OLA	Assoc. Prof. McGinnis
173w-174s†	Technique and Practice of Parental Education (6 cred.; sr., grad.; prereq., 170, and permission of instructor)	Ar	Ar	204OLA	Assoc. Prof. McGinnis
190w-191s†	Mental Examination of Pre-School Children (4 cred.; sr., grad.; prereq., Ed. Psy. 143-144-145 or 134-135-136 or equivalent, and permission of instructor)	II	TTh	202OLA	Assoc. Prof. Goodenough

COMPARATIVE LITERATURE

No.	Title	Hour	Day	Bldg.	Instructor
101f-102w-103s‡	Drama (9 cred.; jr., sr., grad.; prereq., jr. coll. requirement in Eng. and foreign lang.)	III	TThS	113F	Prof. Firkins
105f-106w-107s‡	Criticism (9 cred.; jr., sr., grad.; prereq., jr. coll. requirement in Eng. and foreign lang.)	VI	MWF	113F	Prof. Firkins
110w	Romantic Movement (3 cred.; jr., sr., grad.; prereq., permission of instructor)	II	TThS	113F	Prof. Firkins

COMPARATIVE PHILOLOGY

No.	Title	Hour	Day	Bldg.	Instructor
101-102†	<i>Science of Language</i> (4 cred.; jr., sr., grad.; prereq., see note)	<i>Not offered</i> (<i>except for graduates</i>)			
103	<i>Universal Language</i> (2 cred.; jr., sr., grad.; prereq., see note)	<i>Not offered</i>			
105	<i>Life of Words</i> (2 cred.; jr., sr., grad.; prereq., see note)	<i>Not offered</i>			

† Two quarters must be completed before credit is received for any quarter.

‡ The entire course must be completed before credit is received for any quarter.

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
108s	Comparative Phonetics (3 cred.; jr., sr., grad.; prereq., see note)	Ar	Ar	Ar	Prof. Kroesch
109-110-111†	History of German Lang. (6 cred.; jr., sr., grad.; prereq., see note)	Not offered			
141-142-143†	Hist. Gram. of Eng. Lang. (6 cred.; jr., sr., grad.; prereq., see note)	Not offered			

NOTE.—Prerequisite for all courses, one of the following groups: (1) five years' foreign language; four may be in high school and one in college; (2) two years' foreign language in college; (3) 4 credits in Old English.

DRAWING AND DESCRIPTIVE GEOMETRY

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
41-42-43f,w,s	Technical Drawing (6 cred.; all; no prereq.)			411C	Mr. Sheridan
	Sec. 1	I, II	MWF	(fall, winter)	
		I, II	TThS	(spring)	
	2	III, IV	MWF		
	3	VIII, IX	MWF		
44f,w,s	Lettering (1 cred.; all; no prereq.)				
	Sec. 1	IV	T	36EE	Asst. Profs. Schuck and Levens
	2	II	Th	237EE	Prof. Kirchner
45f,w,s	Alphabets (2 cred.; soph., jr., sr.; no pre- req.)	II	TTh	206E	
64f	The Graphic Arts: Introduction.. (2 cred.; jr., sr.; prereq., 15 cred. of econ.)	IV	MW	5E	Prof. Kirchner
65w	The Graphic Arts: Printing and Layouts (2 cred.; jr., sr.; prereq., 15 cred. of econ.)	IV	MW	5E	Prof. Kirchner
66s	The Graphic Arts: Processes.... (2 cred.; jr., sr.; prereq., 15 cred. of econ.)	IV	MW	5E	Prof. Kirchner

ECONOMICS

SCHOOL OF BUSINESS ADMINISTRATION

Major Advisers

Professor Garver; Assistant Professor Myers.

Major Sequence

Prerequisites: 3, 6-7; or 1, 3, 4; or 2, 3, 4. In addition the student is urged to earn at least 10 credits in History, Political Science, or Sociology.

The student majoring in Economics will take Courses 103-104, 141, 161; at least 12 credits from Group A (below); and additional credits elected from Groups A and B to make a total of 33 credits.

† The entire course must be completed before credit is received for any quarter.

Group A: 54, 55, 85, 149, 154, 160, 163, 172, 191-192.

Group B: 105, 106, 108, 113-114, 124, 125, 127, 162, 164, 166, 170, 176, 193.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

NOTE.—The following courses in other departments may carry credit also in this department:

Agricultural Economics 126, Economics of Consumption; 130, Prices of Farm Products; 131, Market Prices; 135, Methods of Forecasting Prices; 171, Land Tenure; History 80-81, Introduction to Economic History; 82, 83, 84, Economic History of the United States; 113-114-115, Economic History of Europe since 1750; 116-117-118, Economic History of Europe, 1300-1750; 169, Topics in Economic History; Political Science 51-52-53, Business Law; 195, Colonization; 107, Recent Social Legislation; 109, Government and Business; 111, Law of Public Utilities.

No.	Title	Hour	Day	Bldg.	Instructor
if	Business Organization: Marketing (5 cred.; fr. only; no prereq.) Lect.	IV	TS	150Ph	Prof. Vaile and others
	Div. I	IV	MWF	206OLa	
	Div. II Sec. 1	I	MWF	109B	
	2	I	MWF	110P	
	3	II	MWF	110P	
	4	II	TThS	109B	
	5	III	TThS	102B	
	6	III	TThS	109B	
	7	V	MWF	109B	
	8	VI	MWF	109B	
	9	VII	MWF	109B	
	10	VIII	MWF	109B	
1w	Business Organization: Marketing (See if) Lect.	IV	TS	202B	Prof. Vaile and others
	Sec. 1	I	MWF	303B	
	2	III	TThS	303B	
	3	V	MWF	303B	
	4	VI	MWF	209B	
1s	Business Organization: Marketing (See if) Lect.	IV	TS	202B	Prof. Vaile and others
	Sec. 1	II	TThS	209B	
	2	IV	MWF	303B	
2f	Business Organization: Production (5 cred.; fr. only; no prereq.) Lect.	III	Th	303B	Asst. Prof. Black and others
	Sec. 1	III	MWFS	3F	
	2	V	MTWF	6B	

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor	
2w	Business Organization: Production (See 2f)	Lect.	IV	T	150Ph	Asst. Prof. Black and others
		Sec. 1	I	MWFS	209OL	
		2	I	MWFS	206P	
		3	II	MWFS	102F	
		4	II	MWFS	5F	
		5	III	MWFS	206P	
		6	IV	MWFS	206P	
		7	V	MTWF	109B	
		8	VI	MWThF	5F	
		9	VII	MWThF	5F	
		10	VIII	MWThF	5F	
2s	Business Organization: Production (See 2f)	Lect.	III	W	OPhAud	Asst. Prof. Black and others
		Sec. 1	II	MWFS	2F	
		2	III	TThFS	4aOPh	
		3	V	MTWF	6B	
		4	VII	MWThF	6B	
3f	The Mechanism of Exchange.... (5 cred.; 3d qtr. fr., soph., jr., sr.; no prereq.)	Lect.	III	TTh	301F	Prof. Stehman and others
		Sec. 1	I	TThS	202B	
		2	III	MWF	109B	
		3	VI	MWF	102B	
3w	The Mechanism of Exchange.... (See 3f)	Lect.	III	TTh	301F	Prof. Stehman and others
		Sec. 1	I	TThS	303B	
		2	II	MWF	109B	
		3	V	MWF	6B	
		4	VI	MWF	4aOPh	
3s	The Mechanism of Exchange.... (See 3f)	Lect.	III	TTh	OLAud	Prof. Stehman and others
		Sec. 1	I	MWF	303B	
		2	I	MWF	209B	
		3	II	MWF	209OL	
		4	II	TThS	202B	
		5	III	MWF	221OL	
		6	IV	MWF	104OPh	
		7	IV	MWF	4aOPh	
		8	V	MWF	202B	
		9	V	MWF	303B	
		10	VI	MWF	209B	
		11	VI	MWF	102B	
		12	VII	MWF	303B	
		13	VII	MWF	2cOPh	
		14	VIII	MWF	109B	

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor	
4f	Principles of Economics..... (5 cred.; soph.; prereq., 1 or 2 and 3)	Lect.	II	Th	OPhAud	Prof. Hansen and others
		Sec. 1	I	TThFS	9F	
		2	II	MWFS	5F	
		3	III	TThFS	6F	
		4	IV	MWFS	104OPh	
		5	V	MTWF	209B	
		6	VII	MWThF	102B	
		7	VIII	MWThF	209B	
4w	Principles of Economics..... (See 4f)	Lect.	IV	T	303B	Prof. Hansen and others
		Sec. 1	II	MWFS	205F	
		2	III	TThFS	6B	
4s	Principles of Economics..... (See 4f)	Lect.	II	Th	301F	Prof. Hansen and others
		Sec. 1	II	MWFS	5F	
		2	IV	MWFS	111OL	
		3	V	MTWF	102B	
		4	VI	MWThF	104OPh	
6f-7w†	Principles of Economics—General Course..... (10 cred.; soph., jr., sr.; no prereq. Not open to students who have received credit in Econ. 4)	Lect.	III	W	OPhAud	Prof. Hansen and others
		Sec. 1	I	TThFS	5F	
		2	II	MWFS	4aOPh	
		3	IV	MWFS	5F	
		4	V	MTWF	102B	
		5	VI	MWThF	6B	
		6	VI	MWThF	104F(fall only)	
		7	VII	MWThF	6B	
6w-7s†	Principles of Economics—General Course..... (See 6f-7w)	Lect.	II	T	OPhAud	Prof. Hansen and others
		Sec. 1	I	TThFS	6B(w) 9F(s)	
		2	II	MWFS	303B(w) 25F(s)	
		3	IV	MWFS	6B	
		4	V	MTWF	209B	
6s†	Principles of Economics—General Course..... (First qtr. of 6-7. See 6f-7w)	Lect.	III	W	206OLa	Prof. Hansen and others
		Sec. 1	II	MWFS	200OLa	
		2	V	MTWF	109B	
		3	VI	MWThF	109B	
		4	VII	MWThF	6B	

† The entire course must be completed before credit is received for any quarter.

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
7†	Principles of Economics—General Course				Prof. Hansen and others
	(2d qtr. of 6-7. See 6f-7w)				
	Lect.	IV	T	206OLa	
	Sec. 1	II	MWFS	206P	
	2	IV	MWFS	6B	
	3	V	MTWF	202B	
14f	Elements of Statistics.....				Prof. Mudgett and others
	(5 cred.; soph., jr., sr.; prereq., 4 or 6-7)				
	Sec. 1	I	MWThFS	6B	
	2	II	MWThFS	303B	
	3	IV	MTWFS	302B	
	4	VI	MTWThF	303B	
14w	Elements of Statistics				Prof. Mudgett and others
	(See 14f)				
	Sec. 1	III	MTWFS	109B	
	2	IV	MTWFS	302B	
	3	VI	MTWThF	109B	
	4	VII	MTWThF	301B	
14s	Elements of Statistics.....				Prof. Mudgett and others
	(See 14f)				
	Sec. 1	I	MWThFS	6B	
	2	II	MWThFS	109B	
	3	III	MTWFS	6B	
	4	IV	MTWFS	301B	
	5	VI	MTWThF	301B	
	6	VII	MTWThF	301B	
20f*	Elements of Accounting.....				Assoc. Prof. Heilman and others
	(3 cred.; 3d qtr. fr., soph.; no prereq.)				
	Sec. 1	I	MWF	303B	
	2	II	TThS	6B	
	3	III	TThS	301B	
	4	IV	MWF	301B	
	5	VI	MWF	301B	
20w*	Elements of Accounting.....				Assoc. Prof. Heilman and others
	(See 20f)				
	Sec. 1	III	TThS	302B	
	2	III	MWF	302B	
	3	VI	MWF	301B	
20s*	Elements of Accounting.....				Assoc. Prof. Heilman and others
	(See 20f)				
	Sec. 1	I	MWF	301B	
	2	I	TThS	301B	
	3	II	MWF	301B	
	4	III	TThS	302B	
	5	IV	MWF	302B	
	6	V	MWF	302B	
	7	VI	MWF	302B	
	8	VII	MWF	302B	

† The entire course must be completed before credit is received for any quarter.

* Students who have had high school training or other experience in bookkeeping and who pass the placement test may be exempt from this course and admitted to Economics 25.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
25f-26w†‡	Principles of Accounting (6 cred.; soph., jr., sr.; prereq., 20 or placement test)				Assoc. Prof. Heilman and others
	Sec. 1	I	TThS	302B (fall only)	
	2	I	MWF	301B	
	3	I	TThS	301B	
	4	II	MWF	301B	
	5	VI	MWF	302B	
	6	VII	MWF	302B	
25w-26s†‡	Principles of Accounting (See 25f-26w)				Assoc. Prof. Heilman and others
	Sec. 1	I	TThS	302B	
	2	II	MWF	302B	
	3	III	MWF	301B	
	4	IV	MWF	301B (winter only)	
	5	VI	MWF	303B	
25s†‡	Principles of Accounting (First qtr. of 25-26. See 25f- 26w)				Assoc. Prof. Heilman and others
	Sec. 1	II	MWF	303B	
	2	III	TThS	303B	
26f†‡	Principles of Accounting (2d qtr. of 25-26, see 25f-26w)	III	MWF	301B	Assoc. Prof. Heilman and others
32f§-33w-34s*†	Secretarial Training: Typewriting (3 cred.; 3rd qtr. fresh., soph., jr.; no prereq.)	III V	TThS MW	1B	Miss Donaldson
32s*	Secretarial Training: Typewriting (First qtr. of 32-33-34, see 32f- 33w-34s)	IV	MTWFS	1B	Miss Donaldson
33f-34w*†	Secretarial Training: Typewriting (2nd and 3rd qtrs. of 32-33-34, see 32f-33w-34s)	I	MTWThF	1B	Miss Donaldson
34f*	Secretarial Training: Typewriting (3rd qtr. of 32-33-34, see 32f- 33w-34s)	VI	MTWThF	1B	Miss Donaldson
37f*	Secretarial Training: Elementary Shorthand (3 cred.; soph., jr.; prereq., 32)				
	Rec. Sec. 1	II	MWF	1B	
	(For pre-commercial education students only)				
	Sec. 2	III	MWF	1B	
	(For pre-secretarial students only)				
	Lab.	II	TThS	1B	Miss Donaldson
	(For both sections above)				
38w-39s*†	Secretarial Training: Shorthand (6 cred.; soph., jr.; prereq., 37)				
	Rec.	II	MWF	1B	Miss Donaldson
	Lab.	II	TThS	1B	

* Open for credit to pre-secretarial and pre-commercial education students only.

† The entire course must be completed before credit is received for any quarter.

‡ Open to pre-business students only.

§ Students may be exempt from this course and admitted to 33 by passing a placement test.

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
40f-41w-42s*†	Secretarial Training: Dictation... (9 cred.; soph., jr., sr.; prereq., 39)				
	Rec. Lab.	I VII	MWF TThF	104B 1B	
54f‡	Accounting Survey I..... (3 cred.; jr., sr.; prereq., 4 or 6-7)	III	TThS	104B	Miss Donaldson Assoc. Prof. Heilman and others
55w‡	Accounting Survey II..... (3 cred.; jr., sr.; prereq., 54)	III	TThS	104B	Assoc. Prof. Heilman and others
85w‡	Economics of Marketing..... (3 cred.; jr., sr.; prereq., 4 or 6-7)	I	TThS	102B	Prof. Vaile
103f-104w†‡	Value and Distribution..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including 4 or 6-7)	II	MWF	6B	Prof. Garver
105	<i>History of Economic Ideas (The Classical Economists)</i> (3 cred.; jr., sr., grad.; prereq., 101-102 or 103-104 or consent of instructor)	<i>Not offered</i>			
106s	<i>History of Economic Ideas (The Critics of the Classical Economists)</i> (3 cred.; jr., sr., grad.; prereq., 101-102 or 103-104 or consent of instructor)	VII	MWF	102B	Prof. Hansen
108w	Marketing Organization: Agricultural Products (3 cred.; jr., sr., grad.; prereq., 85. Not open to agr. bus. stud.)	VIII	MWF	109B	Prof. Price
113w-114s	Theory of Statistics (6 cred.; jr., sr., grad.; prereq., 14)	I	MWF	102B	Prof. Mudgett
124f	Comparative Banking, British Systems (3 cred.; jr., sr., grad.; prereq., 141)	III	MWF	104B	Asst. Prof. Myers
125w	Comparative Banking, European Systems (3 cred.; jr., sr., grad.; prereq., 141)	III	MWF	104B	Asst. Prof. Myers
127s	Comparative Banking, South American Systems (3 cred.; jr., sr., grad.; prereq., 141)	II	MWF	104B	Asst. Prof. Myers
141f	Monetary and Banking Policy... (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)				Assoc. Prof. Marget and others
	Sec. 1	I	MWF	102B	
	2	III	TThS	209B	
	3	IV	MWF	209B	
	4	VI	MWF	209B	

* Open for credit to pre-secretarial and pre-commercial education students only.

† The entire course must be completed before credit is received for any quarter.

‡ Not open to School of Business Administration students.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
141W	Monetary and Banking Policy... (See 141f)				Instructor Assoc. Prof. Marget and others
	Sec. 1	I	MWF	209B	
	2	II	TThS	6B	
	3	IV	MWF	209B	
141S	Monetary and Banking Policy... (See 141f)				Assoc. Prof. Marget and others
	Sec. 1	III	MWF	209B	
	2	VII	MWF	209B	
149f	Business Cycles (3 cred.; sr., grad.; prereq., 3 and 4 or 6-7)	VIII	MWF	202B	Asst. Prof. Myers
149W	Business Cycles (See 149f)				Assoc. Prof. Marget, Asst. Prof. Myers
	Sec. 1	I	MWF	109B	
	2	VIII	MWF	102B	
149S	Business Cycles (See 149f)	III	MWF	102B	Assoc. Prof. Marget
154f	Public Utilities (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Econ. 4 or 6-7)	III	TThS	202B	Prof. Garver
154W	Public Utilities (See 154f)	III	TThS	102B	Prof. Garver
154S	Public Utilities (See 154f)	III	TThS	102B	Prof. Garver
160w†	The Modern Corporation (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)	IV	MWF	102B	Prof. Stehman
161f	Labor Problems and Trade Unionism (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	IV	MWF	202B	Prof. Hansen
161W	Labor Problems and Trade Unionism (See 161f)	III	TThS	202B	Prof. Hansen
161S	Labor Problems and Trade Unionism (See 161f)	III	TThS	202B	Prof. Hansen
162W	Labor Movements (3 cred.; jr., sr., grad.; prereq., 161)	IV	MWF	202B	Prof. Hansen
163S	Economic Aspects of Population and Immigration (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	IV	MWF	202B	Prof. Hansen
164S	Labor Legislation and Social In- surance (3 cred.; jr., sr., grad.; prereq., 161)	III	TThS	209B	Asst. Prof. Stead

† Not open to School of Business Administration students.

No.	Title	Hour	Day	Bldg.	Instructor
166w	Contemporary Economic Problems (3 cred.; jr., sr., grad.; prereq. 20 cred. in soc. sci. including Econ. 4 or 6-7)	VII	MWF	102B	Prof. Hansen
170s	Land Economics (3 cred.; jr., sr., grad.; prereq. 20 cred. in soc. sci. including Econ. 4 or 6-7)	2:30-4:00	TTh	302HH	Asst. Prof. Black
172f*	Economics of Transportation.... (3 cred.; jr., sr., grad.; prereq. 20 cred. in soc. sci. including Econ. 4 or 6-7)	VIII	MWF	102B	
176f	Commercial Policies (3 cred.; jr., sr., grad.; prereq. 20 cred. in soc. sci. including Econ. 4 or 6-7)	I	MWF	202B	Prof. Blakey
176s	Commercial Policies (See 176f)	I	MWF	202B	Prof. Blakey
191f-192w†	Public Finance (6 cred.; jr., sr., grad.; prereq. 20 cred. in soc. sci. including Econ. 3 and 4 or 6-7)	III	MWF	209B	Prof. Blakey
193s	State and Local Taxation..... (3 cred.; jr., sr., grad.; prereq. 191-192)	III	MWF	104B	Prof. Blakey

ENGLISH

Major Advisers

Professors Beach, Moore, and Ruud; Assistant Professors Atkins, Carr, Dunn, and Hillhouse.

Major Sequences ‡

Prerequisites: Course 21-22 or 22-23.

Courses 55-56 and 75 and 21 additional credits, 9 of which are to be chosen from one of the groups below and 6 from each of two other groups. The Honors Course, 171-172-173, may be substituted for a part of or the whole of the above requirement of 21 credits in these groups.

Group A. Courses 61, 63, 81-82, 100, 101, 102, 103, 141-142-143, 160.

Group B. Courses 81-82, 100, 101, 102, 103, 133, 140, 146-147, 148-149, 152-153, 164.

Group C. Courses 51, 53, 62, 70, 77-78, 111-112, 133, 136, 152-153, 157-158.

Group D. Courses 73-74, 104, 105-106, 107-108, 126-127, 162.

Group E. Courses 58-59, 69, 73-74, 86-87, 102, 109-110, 123-124-125, 126-127, 129, 150, 151, 154-155.

Group F. Courses 61, 63, 73-74, 154-155, 156, 159.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

* Not open to School of Business Administration students.

† The entire course must be completed before credit is received for any quarter.

‡ Students who entered the Senior College prior to September, 1927, may if they so desire, complete their major sequences according to the statement in the program for 1926-27.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor	
Af-Bw-Cs 21f-22w-23s*	Freshman English Introduction to Literature..... (15 cred.; all; prereq.§)	See	Composition			
	Sec. 1	III	MTWFS	150Ph(f,w), 166Ph(s)	Prof. Thomas	
	2	VI	MTWThF	301F	Asst. Prof. Jackson	
31f-32w†	The English Novel (6 cred.; all; prereq.§)	VII	MWF	301F	Asst. Prof. Hillhouse	
33s	The Later English Novel..... (3 cred.; soph., jr., sr.; prereq.§)	VII	MWF	OPhAud	Prof. Beach	
51	Spenser (3 cred.; jr., sr.; prereq., 21-22 or 55-56)	Not offered				
53	Seventeenth-Century Lyristis (4 cred.; jr., sr.; prereq., 21-22, or 55-56)	Not offered				
55f-56w†	Shakespeare (6 cred.; jr., sr.; prereq.‡)	Sec. 1	I	TThS	204F	Assoc. Prof. Bush, Asst. Prof. Dunn
			VI	MWF	205F	Asst. Prof. Dunn
			VII	MWF	305F	Asst. Prof. Jackson
55w-56s†	Shakespeare (See 55f-56w)	Sec. 1	VI	MWF	303F	Asst. Prof. Hessler
		2	IV	MWF	204F	Asst. Prof. Hillhouse
55s†	Shakespeare (First qtr. of 55-56. See 55f-56w)	VI	MWF	205F	Asst. Prof. Nicnols	
58f-59w†	Nineteenth-Century Prose (6 cred.; jr., sr.; prereq., C or 23, or 31-32)	II	TThS	204F	Prof. Beach	
61	American Pronunciation (3 cred.; jr., sr., prereq.‡)	Not offered				
62f	Milton (4 cred.; jr., sr.; prereq., 21-22 or 55-56)	VII	MTWF	204F	Asst. Prof. Dunn	
62s	Milton (See 62f)	VII	MTWF	205F	Asst. Prof. Hessler	
63	American Usage (3 cred.; jr., sr.; prereq.‡)	Not offered				
69	Browning and Tennyson..... (4 cred.; jr., sr.; prereq.‡)	Not offered				

* Students may enter any quarter. Students must take two consecutive quarters to receive credit. Two quarters are required as prerequisite for a major sequence or for a teacher's certificate. Three quarters recommended. Limited to students with an average of 2/3 honor point per credit in their previous work, and to students exempt from English A-B-C.

† The entire course must be completed before credit is received for any quarter.

‡ English A-B-C, or Composition 4-5-6 and 6 additional credits, or 10 credits in 21-22-23.

§ English A-B-C, or Composition 4-5-6, or exemption from requirement.

No.	Title	Hour	Day	Bldg.	Instructor
70f	Elizabethan Drama (4 cred.; jr., sr.; prereq., 55-56)	VI	MTThF	204F	Asst. Prof. Hessler
73f-74w†	American Literature (6 cred.; jr., sr.; prereq.‡)	IV	MWF	301F	Asst. Prof. McDowell and Nichols
75f	Chaucer (4 cred.; jr., sr.; prereq.‡)				Prof. Ruud
		Sec. 1	II	MTWF	205F
		2	V	MTWF	204F
75s	Chaucer (See 75f)				Asst. Prof. Hillhouse
		Sec. 1	II	MTWF	205F
		2	V	MTWF	204F
77-78†	<i>Classic Myths and the Classic Tradition in English Poetry...</i>				<i>Not offered</i>
	(6 cred.; jr., sr.; prereq.‡)				
81-82†	<i>Survey of Middle English</i>				<i>Not offered</i>
	(6 cred.; jr., sr.; prereq.‡)				
86f-87w†	Forms of English Verse	II	TThS	303F	Asst. Prof. Nichols
	(6 cred.; jr., sr.; prereq.‡)				
100f	Old English	III	TThFS	306F	Prof. Ruud
	(4 cred.; jr., sr., grad.; prereq., 8 cred. above 50)				
101	<i>Middle English</i>				<i>Not offered</i>
	(2 cred.; jr., sr., grad.; prereq., 75 and 100)				
102w	Old English Poetry	II	MWF	204F	Prof. Ruud
	(3 cred.; jr., sr., grad.; prereq., 100)				
103s	Beowulf	VII, VIII	T	217F	Prof. Ruud
	(3 cred.; jr., sr., grad.; prereq., 100)	VII	Th		
105w-106s†	Eighteenth-Century Poetry	VII	MWF	204F	Prof. Moore
	(6 cred.; jr., sr., grad.; prereq., 8 credits above 50)				
107-108†	<i>Eighteenth-Century Prose</i>				<i>Not offered</i>
	(6 cred.; jr., sr., grad.; prereq., 8 credits above 50)				
109f-110w†	Romantic Poets	III	TThS	205F	Prof. Beach
	(6 cred.; jr., sr., grad.; prereq., 8 credits above 50)				
111f-112w†	Seventeenth-Century Prose	III	MWF	205F	Assoc. Prof. Bush
	(6 cred.; jr., sr., grad.; prereq., 8 credits above 50)				
123f-124w-125s†	Technique of the Novel	4:00 to 6:00	T	205F	Prof. Beach
	(9 cred.; sr., grad.; prereq., 8 credits above 50 and permis- sion of instructor)				
126-127†	<i>Drama, 1660-1880</i>				<i>Not offered</i>
	(6 cred.; jr., sr., grad.; prereq., 8 cred. above 50)				
129	<i>Modern Drama</i>				<i>Not offered</i>
	(4 cred.; jr., sr., grad.; prereq., 55-56)				

† The entire course must be completed before credit is received for any quarter.

‡ English A-B-C, or Composition 4-5-6 and 6 additional credits, or 10 credits in 21-22-23.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
133w	Ballads (3 cred.; jr., sr., grad.; prereq., 8 credits above 50)	I	MWF	204F	Prof. Ruud
136	<i>Advanced Shakespeare</i> (4 cred.; jr., sr., grad.; prereq., 55-56)	<i>Not offered</i>			
140s	Advanced Chaucer (4 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 75)	II	MTWF	204F	Prof. Ruud
141-142-143†	<i>Historical Grammar</i> (6 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 75 or 81-82)	<i>Not offered</i>			
146-147†	<i>Metrical Romances</i> (6 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 75 or 81-82)	<i>Not offered</i>			
148-149†	<i>Arthurian Romances</i> (6 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 75 or 81-82)	<i>Not offered</i>			
150	<i>Victorian Poetry</i> (4 cred.; jr., sr., grad.; prereq., 8 credits above 50)	<i>Not offered</i>			
151s	Recent Poetry (4 cred.; jr., sr., grad.; prereq., 8 credits above 50)	III	TWThF	204F	Prof. Beach
152w-153s†	Pre-Elizabethan Drama (6 cred.; jr., sr., grad.; prereq., 55-56)	III	TThS	302F	Assoc. Prof. Bush
154w-155s	American Novel (6 cred.; jr., sr., grad.; prereq., 73-74)	VI	MWF	204F	Asst. Prof. McDowell
156f	The American Drama (3 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 73-74)	IV	MWF	302F	Asst. Prof. Nichols
157-158†	<i>Elizabethan Non-Dramatic Literature</i> (6 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 51 or 70 or 55-56)	<i>Not offered</i>			
159s	Colonial Literature in America... (3 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 73-74)	IV	MWF	302F	Asst. Prof. Nichols
160	<i>History of English Language</i> (2 cred.; jr., sr., grad.; prereq., 100)	<i>Not offered</i>			
162f	Restoration Literature (4 cred.; jr., sr., grad.; prereq., 8 credits above 50)	IV	MTWF	204F	Prof. Moore
164s	Dante in English..... (See Italian 164s)				
171f-172w-173s	Honors Course (Credits arranged; 9 cred.; pre- req., permission of the depart- ment)	Ar	Ar	Ar	Asst. Profs. Dunn, Hessler, McDowell, Atkins

† The entire course must be completed before credit is received for any quarter.

COMPOSITION

Major Advisers

Professor Thomas; Assistant Professors Nichols and Phelan; Mrs. del Plaine.

Major Sequence

Prerequisites: Courses 11-12 or 18-19 and either 10 or 20; English 21-22 or 22-23. Courses 67-68 and 69-70-71, or 111-112-113, and 119-120-121, and 15 credits in English, 9 of which are to be chosen from Group E (p. 44) and 6 from some other group.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

IMPORTANT NOTE.—Freshman English is a 15-credit course consisting of 9 credits of literature and 6 credits of composition. Composition 4-5-6 is a 9-credit course in composition. Either course satisfies the requirement in English for graduation or for admission to the Senior College. Students may be required to register for Composition 4-5-6 if their standing in the placement tests of Freshman Week shows that they need the additional training in composition. Students who have already completed one or more quarters of Freshman English should consult the director of the course before registering.

No.	Title	Hour	Day	Bldg.	Instructor			
Af-Bw-Cs	Freshman English (15 cred.; all; prereq., placement test)	I	MWThFS	Ar	Ar			
		II	MWThFS					
		III	MTWFS					
		IV	MTWFS					
		V	MTWF					
		III	Th					
		VI	MTWThF					
		VII	MTWThF	(fall, winter)				
		VII	MWThF					
		V	T	(spring)				
Aw-Bs	Freshman English (2 qtrs. of A-B-C. See Af-Bw-Cs)	II	MWThFS	Ar	Ar			
		IV	MTWFS					
		VI	MTWThF					
Cf	Freshman English (3rd qtr. of A-B-C. See Af-Bw-Cs)	II	MWThFS	Ar	Ar			
		IV	MTWFS					
		VI	MTWThF					
4f-5w-6s	Freshman Composition (9 cred.; all; prereq., placement test)	Sec. 1	I	MWF	Ar	Ar		
		(Pre-med. only)	2	I	TThS			
		(Pre-med. only; no fresh.)	3	II	MWF			
		(Pre-med. only)	4	II	TThS			
		5	III	TThS				
		6	IV	MWF				
		7	V	MWF				
		8	VI	MWF				
		9	VII	MWF				
		4w-5s	Freshman Composition (2 qtrs. of 4-5-6. See 4f-5w-6s)	Sec. 1	II	TThS		
				2	V	MWF		
				3	V	MWF		

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
4s	Freshman Composition (First qtr. of 4-5-6. See 4f-5w-6s. For those only who have passed subfresh.)	Ar	Ar	Ar	
6f	Freshman Composition (3rd qtr. of 4-5-6. See 4f-5w-6s)	II	MWF	311F	Ar
10s	Organization of Source Material (3 cred.; soph., jr., sr.; prereq., A-B-C or 4-5-6 or exemption from requirement)	V	MWF	303F	Asst. Prof. Hillhouse
11f-12w††	Description; Narration (6 cred.; soph., jr., sr.; prereq., A-B-C, or 4-5-6 or exemption from requirement)				
	Sec. 1	II	MWF	303F	Mrs. del Plaine
	2	III	MWF	302F	Asst. Prof. Atkins
	3	IV	MWF	305F	Mrs. del Plaine
	4	V	MWF	304F	Miss Armstrong
	5	II	TThS	304F	Miss Gable
	6	III	TThS	304F	Asst. Prof. Hessler
	7	IV	MWF	213F	Miss Anderson
11w-12s††	Description; Narration (See 11f-12w)				
	Sec. 1	II	MWF	306F	Miss Christie
	2	IV	MWF	303F	Mr. Appel
	3	VI	MWF	304F	Miss Gable
11s	Description; Narration (First qtr. of 11-12. See 11f- 12w)	III	MWF	306F	Mrs. del Plaine
		V	MWF	302F	Ar
18f-19w††	Types of Writing..... (6 cred.; soph., jr., sr.; prereq., A-B-C or 4-5-6 or exemption from requirement)				
	Sec. 1	III	MWF	305F	Asst. Prof. Atkins
	2	V	MWF	303F	Miss Anderson
	3	VII	MWF	306F	Miss Armstrong
18w-19s††	Types of Writing..... (See 18f-19w)				
	Sec. 1	II	MWF	305F	Miss Armstrong
	2	VI	MWF	306F	Mrs. del Plaine
20f	Informal Exposition (3 cred.; soph., jr., sr.; prereq., 11-12 or 18-19)				
		II	MWF	305F	Miss Gable
20s	Informal Exposition (See 20f)				
	Sec. 1	II	MWF	303F	Mrs. del Plaine
	2	III	MWF	302F	Asst. Prof. Nichols
	3	V	MWF	304F	Asst. Prof. Atkins
	4	III	TThS	306F	Miss Gable
31w	Technical Writing Consult College of Engineering bulletin				

† The entire course must be completed before credit is received for any quarter.

†† A student registering for either 11-12 or 18-19 must bring with him a written memorandum from his instructor in Freshman English specifying which course in sophomore composition he should elect. No student may receive credit for both 11-12 and 18-19.

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
67f-68w†¶	Imitative Writing (6 cred.; jr., sr., not open to sophomores; prereq., average of B in two quarters of either 11-12, 10 or 20, or 18-19, 10 or 20)	IV	MWF	304F	Asst. Prof. Phelan
69f-70w-71s†	Short-Story Writing (6 cred.; jr., sr., not open to sophomores; prereq., average of B in two quarters of either 11-12, 10 or 20, or 18-19, 10 or 20)	VIII, IX	W	304F	Asst. Prof. Phelan
111f-112w-113s¶	Essay Writing (9 cred.; jr., sr., grad.; prereq., 11-12, or 18-19, and 10 or 20)	III	MWF	304F	Asst. Prof. Nichols
119f-120w-121s¶	Seminary in Writing (9 cred.; sr., grad.; prereq., 9 cred., sr. coll. courses, and permission of instructor)	VI, VII	Th	304F	Asst. Prof. Phelan

THE FINE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f	Ancient and Early Christian Art (3 cred.; soph., jr., sr.; no prereq.)	III	TThS	OPhAud	Asst. Prof. Upjohn
2w	Medieval, Renaissance, and Modern Art (3 cred.; soph., jr., sr.; prereq., 1)	III	TThS	OPhAud	Asst. Prof. Upjohn
10s	Medieval Art (3 cred.; soph., jr., sr.; prereq., 2 or permission of instructor)	III	TThS	OPhAud	Asst. Prof. Upjohn

GEOGRAPHY

Major Adviser

Professor Davis.

Major Sequence

Prerequisites: Courses 11 and 41, Geology 1-2 or 1-3 or 8 or 29, and Economics 6-7.

Twenty-seven credits from Geography 71, 101, 102, 110, 111, 120, 133, 235, 241, 251-252-253; Economics 85, 108, 172; Geology 73; History 82, 83, 84; Botany 131. At least 20 credits must be in Geography.

Modifications of this sequence will be permitted upon petition approved by the major adviser and assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

† The entire course must be completed before credit is received for any quarter.

¶ Students may not elect for credit two senior college courses to be taken simultaneously. This rule does not apply to Course 69-70-71.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Intro. to Human Geography... (10 cred.; fr.; no prereq.)				
	Lect.	II	MWF	103OL	Prof. Davis
	Sec. 1	I	WF	105OL	
	2	IV	TS	105OL	
	3	VI	TTh	103OL	
	4	VII	TTh	103OL	
11f	Human Geography (5 cred.; 3rd qtr. fr., soph., jr., sr.; no prereq.)	III	MTWFS	103OL	Asst. Prof. Brown
11w	Human Geography (See 11f)	III	MTWFS	103OL	Asst. Prof. Brown
11s	Human Geography (See 11f)				
	Sec. 1	I	MWThFS	103OL	Mr. Dicken
	2	II	MWThFS	103OL	Prof. Davis
	3	III	MTWFS	103OL	Asst. Prof. Brown
41f	Geography of Commercial Pro- duction (5 cred.; soph., jr., sr.; prereq., 5 cred. in geog., or 10 cred. in econ. or soc. or 15 cred. in hist.)	IV	MTWFS	103OL	Asst. Prof. Harts- horne
41w	Geography of Commercial Pro- duction (See 41f)	IV	MTWFS	103OL	Asst. Prof. Harts- horne
41s	Geography of Commercial Pro- duction (See 41f)	IV	MTWFS	103OL	Asst. Prof. Harts- horne
43f	Political Geography (5 cred.; soph., jr., sr.; prereq., 1-2, or 11, or 41, or 10 cred. in hist. or pol. sci.)	I	MWThFS	103OL	Asst. Prof. Harts- horne
71f	Geography of North America.... (3 cred.; jr., sr.; prereq., 11 or 41, or 20 cred. in soc. sci. incl. at least one course in geog.)	II	TThS	103OL	Asst. Prof. Brown
101s	Geography of Europe (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in geog.)	II	TThS	105OL	Mr. Dicken
102w	Trade Routes and Trade Centers (3 cred.; jr., sr., grad.; prereq., 41)	II	TThS	103OL	Asst. Prof. Harts- horne
110w	Geography of South America... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. to incl. 11 or 41)	I	TThS	103OL	Asst. Prof. Brown
111s	Cartography (3 cred.; jr., sr., grad.; prereq., 10 cred. in sen. col. work in geog., geol., hist., or other sub- ject in which the use of maps is necessary)	III	MWF	105OL	Asst. Prof. Harts- horne

No.	Title	Hour	Day	Bldg.	Instructor
120w	Geography of Asia (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. to incl. 11 or 41)	III	MWF	105OL	Prof. Davis
133s	Climatology (3 cred.; jr., sr., grad.; prereq., 11)	IV	MWF	105OL	Asst. Prof. Brown

NOTE.—Some of the courses listed in the Graduate School bulletin are open to properly qualified juniors and seniors. For further information consult the chairman of the department.

GEOLOGY AND MINERALOGY

Major Advisers

Professors Emmons (economic geology), Stauffer (general geology and paleontology), and Grout (mineralogy and petrography).

Major Sequences

No major sequence in geology should be undertaken without some course in chemistry. If not taken in high school, chemistry must be begun at the University in the fall or winter. Students majoring in geology are also required to take courses in drafting and surveying. (See College of Engineering bulletin.) Course 23 should be taken as early as possible. One field trip is required of all students majoring in geology.

Sequence A.* For general geology, federal and state surveys, etc. Courses 91-92-93, 111, 112, 121, 144-145 or 124-125, 151-152-153.

Sequence B.‡ For petroleum geologist. Courses 91-92-93, 101, 105, 112, 137, 144-145 or 124-125, 151-152-153.

Sequence C.* For mining geologist and mineralographer. Courses 111, 112, 113, 121, 137, 124-125, 144-145, 166-167.

Sequence D. For paleontologist. Courses 91-92-93, 105-106, 107-108-109, 151-152-153.

Sequence E.* For mineralogist. Courses 61, 105, 106, 111, 121, 131-132-133, 137, 166-167.

Sequence F.‡ For petrographer. Courses 105, 106, 111 and 112 or 124-125, 131-132-133, 140-141.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†§	General Geology (Dynamic and Historical) (10 cred.; fr. with cert. of apt., soph., jr., sr.; no prereq.)				
	Lect. Sec. 1	I	TThFS	210P	Assoc. Prof.
	Lab.	I, II	MW	212P	Thiel
		or			
	Lect. Sec. 2	VI, VII	MW		
	Lab.	VII	MTWTh	110P	Mr. Dutton
		VIII, IX	TTh	212P	

* Physics 3 required.

† The entire course must be completed before credit is received for any quarter.

‡ Trigonometry required.

§ For a three-quarter sequence, Course 2 may be followed by Course 3 or 4 or 11, and Course 3 or Course 2.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
1f-3w*†	General Geology (Dynamic and Economic) (10 cred.; fr. with cert. of apt., soph., jr., sr.; no prereq.)				
	Lect.	III	TThFS	110P	Prof. Emmons
	Lab.	III, IV or VI, VII	MW	212P (fall), 100P (winter)	
			TTh		
1w-2s*†	General Geology (Dynamic and Historical) (See 1f-2w)				
	Lect.	IV	MTWF	110P	Mr. Downs
	Lab.	VI, VII	TTh	212P	
1w-3s*†	General Geology (Dynamic and Economic) (See 1f-3w)				
	Lect.	II	MWFS	208P(w), 110P(s)	Prof. Emmons, Assoc. Prof. Thiel
	Lab.	I, II	TTh	212P	
1s*†	General Geology (Dynamic and Historical or Economic) (First qtr. of 1-2 or 1-3. See 1f-2w)				
	Lect.	III	MWThF	110P	Mr. Dutton
	Lab.	III, IV	TS	212P	
2f*†	General Geology (Dynamic and Historical) (2nd qtr. of 1-2. See 1f-2w)				
	Lect.	III	MWThF	206P	Mr. Downs
	Lab.	III, IV	TS	212P	
4s	Geology of Minnesota (5 cred.; all; prereq., 2 or 3)	IV	MTWFS	210P	Assoc. Prof. Thiel
8f†§	Introductory Geology (5 cred.; all; no prereq.)	II	MWThFS	210P	Assoc. Prof. Thiel
8w†§	Introductory Geology (See 8f)	IV	MTWFS	210P	Assoc. Prof. Thiel
8s†§	Introductory Geology (See 8f)	II	MWThFS	210P	Assoc. Prof. Thiel
11f	Elements of Paleontology (5 cred.; all; prereq., 1)				
	Lect.	II	MWF	105P	Prof. Stauffer
	Lab.	I-II	ThS		
15s¶	Minerals and Rocks (1 cred.; jr., sr.; prereq., 1 or 29)	Ar	Ar	100P	Asst. Prof. Gruner

* For a three-quarter sequence, Course 2 may be followed by Course 3 or 4 or 11, and Course 3 by Course 2.

† The entire course must be completed before credit is received for any quarter.

‡ Does not satisfy the junior college requirement for science. May be followed by Course 2 or 4 with instructor's permission.

§ Not open to students who have had 1 or 29.

¶ Does not count for a senior college course. Not open to sophomores. See Course Numbering.

No.	Title	Hour	Day	Bldg.	Instructor
23w-24s†	Elements of Mineralogy..... (8 cred.; soph., jr., sr.; prereq., course in chem.)				
	(Winter) Lect.	II	WF	206P	Asst. Prof.
	Rec.	VII	T	210P	Gruner
	Lab. Sec. 1	VII, VIII	WF	100P	
	2	III, IV	TS	100P	
	(For other sections, see Mines bulletin)				
	(Spring) Lect.	II	MWF	206P	Asst. Prof.
	Rec.	IX	T		Gruner
	Lab. Sec. 1	VII, VIII	M	100P	
	2	VI, VII	T		
		III, IV	M		
		VII, VIII	F		
27s‡	Outlines of Mineralogy..... (1 cred.; jr., sr.; no prereq.)	Ar	Ar	100P	Asst. Prof. Gruner
29f‡‡	General Physiography	III	MTWFS	208P	Ar
49s	Physiography of the United States				
	(5 cred.; jr., sr.; prereq., 2 or 3)				
	Lect.	II	TThS	206P	Ar
	Lab.	Ar	Ar	Ar	
61f	Blowpipe Analysis	Consult	Mines	program	Asst. Prof. Gruner
	(3 cred.; jr., sr.; prereq., 24)				
67f	Mineralogy of Chemical Materials (3 cred.; jr., sr.; prereq., Chem., 5 cred.)	Consult	Chemistry	program	Asst. Prof. Gruner
73f	Economic Geology	VI	MWF	110P	Asst. Prof. Schwartz
	(3 cred.; jr., sr.; prereq., 24)				
85s	Field Work in Northern Minne- sota	Ar	Ar	Ar	Assoc. Prof. Thiel, Asst. Prof. Gruner
	(4 cred.; jr., sr.; prereq., 2, 3, or 11)				
91f-92w-93s	Index Fossils of North America (9 cred.; jr., sr.; prereq., 2, 3, or 11)				
	Lect.	I	F	105P	Prof. Stauffer
	Lab.	VI, VII	MW	105P	Prof. Stauffer
101f	Sedimentation	Ar	Ar	Ar	Ar
	(3 cred.; jr., sr., grad.; prereq., 24)				
102w-103s	Micropaleontology	II, III	TThS	103P	Prof. Stauffer
	(6 cred.; jr., sr., grad.; prereq., 11 or 91)				
105f	Rock Study				
	(3 cred.; jr., sr., grad.; prereq., 24)				
	Lect.	VI	TTh	110P	Prof. Grout
	Lab. Sec. 1	VII, VIII	T	200P	
	2	VII, VIII	Th	200P	

† The entire course must be completed before credit is received for any quarter.

‡ Not open to students who have had Geol. 1 or 8; may be followed by Course 2, 4, or 11.

‡‡ Does not count for a senior college course. Not open to sophomores. See Course Numbering, page 27.

§ Does not satisfy the junior college requirement for science.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
106w	Petrography (3 cred.; jr., sr., grad.; prereq., 105)	VII, VIII	TTh	200P	Prof. Grout
107f-108w-109s	Paleontologic Practice (9 cred.; jr., sr., grad.; prereq., 91-92-93)	Ar	Ar	105P	Prof. Stauffer
111f	Ore Deposits (3 cred.; sr., grad.; prereq., 2, 3, or 11, and 105)	I	TThS	110P	Prof. Emmons
112w	Geology of Petroleum..... (3 cred.; sr., grad.; prereq., 111)	I	TThS	110P	Prof. Emmons
113s	Prob. in Ore Deposits..... (3 cred.; sr., grad.; prereq., 112)	VI-IX	Th	Ar	Prof. Emmons
121f	Crystallography (3 cred.; jr., sr.; prereq., Math. 7 and Inorg. Chem. 6-7-8 or 9-10)	Ar	Ar	100P	Asst. Prof. Gruner
124w-125s	Struct. and Metamorphic Geol. . . (6 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 105)	VI (II)	MWF MTWThFS, spring, to May 1)	110P 208P	Asst. Prof. Schwartz
127f	Geol. of Lake Sup. Region..... (3 cred.; jr., sr., grad.; prereq., 124-125)	Ar	Ar	Ar	Assoc. Prof. Thiel
131f-132w-133s	Adv. Petrology (9 cred.; jr., sr., grad.; prereq., 106)				
	Lect.	III	TThS	200P	Prof. Grout
	Lab.	Ar	F	200P	
137w	Testing Econ. Minerals..... (3 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 105)				
	Lect.	VI	T	200P	Prof. Grout
	Lab.	VIII, IX	MW	200P	
140w-141s	Applied Petrography (6 cred.; jr., sr., grad.; prereq., 131)				
	Lect.	II	F	200P	Prof. Grout
	Lab.	I, II	MW		
144w-145s	Interp. of Geologic Maps..... (6 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 124)	VII, VIII, IX	TTh	Ar	Mr. Pettijohn
149s	Methods of Field Geology..... (No cred.; jr., sr., grad.; to be taken with 150; prereq., 2, 23-24, 106, 124-125)	Ar	Ar	Ar	Asst. Prof. Schwartz
150s	Field Geol. (Black Hills)..... (Cred. ar.; jr., sr., grad.; see members of department)	Ar	Ar	Ar	Prof. Emmons, Asst. Prof. Schwartz
151f-152w-153s	Adv. General Geology..... (9 cred.; jr., sr., grad.; prereq., 2, 3, or 11)	III	MWF	210P	Prof. Stauffer
161w	Crystal Structure (3 cred.; jr., sr., grad.; prereq., 121, elem. phys., and anal. geom.)	Ar	Ar	Ar	Asst. Prof. Gruner
166w-167s	Mineralogaphy (6 cred.; sr., grad.; prereq., 111, 131)	Ar	Ar	207P	Asst. Prof. Schwartz

GERMAN

Major Advisers

Professors Burkhard and Kroesch.

Major Sequence

Courses 50-51-52; any two quarters of 62, 63, 64; 65, 66, and 67; 15 additional credits from courses numbered above 50.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

Sequence of Courses

For academic students.—Without entrance German, 1, 2, 3, 4, 62 or 63, other courses numbered 50 or above. With one year entrance German, 2, 3, 4, 62 or 63, other courses numbered 50 or above. With two years entrance German, 3, 4, 62 or 63, other courses numbered 50 or above. With four years entrance German, 62 or 63, other courses numbered 50 or above.

For pre-medical students.—Without entrance German, 1, 2, 3, 30, 31-32. With one year entrance German, 2, 3, 4 or 30, 31-32. With two years entrance German, 3, 4 or 30, 31-32. With three years entrance German, 4 or 30, 31-32.

For chemists.—Without entrance German, 24-25-26, 27, 28-29. With two years entrance German, 27 or 3, 28-29. With more than two years entrance German, 28-29.

No. if*	Title	Hour	Day	Bldg.	Instructor
	Beginning A				
	(5 cred.; fr. with cert. of apt., soph., jr., sr.; no prereq.)				
	Sec. 1	I	MWThFS	207F	Ar
	2	I	MWThFS	209F	Ar
	3	I	MWThFS	209½F	Ar
	4	II	MWThFS	209½F	Ar
	5	III	MTWFS	212F	Ar
	6	IV	MTWFS	207F	Ar
	7	VI	MTWThF	207F	Ar
	8	VII	MTWThF	209½F	Ar
1w*	Beginning A				
	(See 1f)				
	Sec. 1	II	MWThFS	209F	Ar
	2	VII	MTWThF	207F	Ar
1s*	Beginning A				
	(See 1f)				
	Sec. 1	II	MWThFS	213F	Ar
	2	VI	MTWThF	209½F	Ar
2f*	Beginning B				
	(5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., 1 or one yr. prep. German)				
	Sec. 1	II	MWThFS	207F	Ar
	2	IV	MTWFS	113F	Ar

* Credit is usually not given for more than one beginning language. See paragraph 2, page 4.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
2w*	Beginning B (See 2f)				
	Sec. 1	I	MWThFS	207F	Ar
	2	I	MWThFS	209F	Ar
	3	I	MWThFS	209½F	Ar
	4	II	MWThFS	209½F	Ar
	5	III	MTWFS	212F	Ar
	6	IV	MTWFS	207F	Ar
	7	VI	MTWThF	207F	Ar
	8	VII	MTWThF	209½F	Ar
25*	Beginning B (See 2f)				
	Sec. 1	II	MWThFS	209F	Ar
	2	{ VII	MTThF	207F	Ar
		V	W		
.3f	Beginning C (5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., 2)				
	Sec. 1	IV	MTWFS	104F	Ar
	2	VII	MTWThF	209F	Ar
3w	Beginning C (See 3f)				
	Sec. 1	II	MWThFS	207F	Ar
	2	IV	MTThFS	113F	Ar
3s	Beginning C (See 3f)				
	Sec. 1	I	MWThFS	207F	Ar
	2	I	MWThFS	209F	Ar
	3	I	MWThFS	209½F	Ar
	4	II	MWThFS	209½F	Ar
	5	III	MTWFS	212F	Ar
	6	IV	MTWFS	207F	Ar
	7	VI	MTWThF	207F	Ar
	8	{ VII	MTThF	209½F	Ar
		V	W		
4f	Intermediate German (5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., 3)				
	Sec. 1	II	MWThFS	209F	Ar
	2	III	MTWFS	213F	Ar
	3	IV	MTWFS	212F	Ar
	4	VII	MTWThF	102F	Ar
4w	Intermediate German (See 4f)				
	Sec. 1	IV	MTWFS	104F	Ar
	2	VII	MTWThF	209F	Ar
4s	Intermediate German (See 4f)				
	Sec. 1	II	MWThFS	207F	Ar
	2	IV	MTWFS	113F	Ar
24f-25w-26s†	Begin. for Chemists..... (12 cred.; chemists, miners; no prereq.)				
	Sec. 1	IV	MTWF	209½F	Ar
	2	IV	MTWF	209F	Ar

* Credit is usually not given for more than one beginning language. See paragraph 2, page 4.

† The entire course must be completed before credit is received for any quarter.

27f	Elem. Chem. German..... (3 cred.; chemists, miners; pre- req., 26 or 2 yrs. prep. Ger- man)	Sec. 1 2	I I	MWF MWF	108F 212F	Ar Ar
28w-29s†	Adv. Chemical German..... (6 cred.; chemists, miners; pre- req., 27 or 4)	Sec. 1 2	II II	MWF MWF	226F 113F	Ar Ar
30f	Medical German (5 cred.; pre-med.; prereq., 3, or 3 yrs. prep. German)		I	MWThFS	102F	Ar
31f-32w†	Medical German (6 cred.; pre-med.; prereq., 4 or 30)		I	MWF	205F	Ar
31w-32s†	Medical German (See 31f-32w)	Sec. 1 2 3 4	I I I I	MWF MWF TThS TThS	212F 109F 205F 212F	Ar Ar Ar Ar
31s†	Medical German (1st qtr. of 31-32. See 31w-32s)		I	MWF	217F	Ar
32f†	Medical German (2nd qtr. of 31-32. See 31w-32s)		I	TThS	108F	Ar
50f-51w-52s†	Composition (6 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German)		IV	TS	213F	Asst. Prof. Lusky
56f-57w†	Essay Writing (6 cred.; jr., sr.; prereq., 52)		I	TThS	114F	Prof. Kroesch
62w‡	Nineteenth-Century Prose (5 cred.; jr., sr.; prereq., 4, or 4 yrs. prep. German)		III	MTWFS	209F	Prof. Kroesch
62s‡	Nineteenth-Century Prose (See 62w)		III	MTWFS	209F	Asst. Prof. Lusky
63f‡	Modern Drama (3 cred.; jr., sr.; prereq., 4 or 62)		IV	MWF	217F	Asst. Prof. Davies
64w	Classic Drama (3 cred.; jr., sr.; prereq., 4 or 62)		IV	MWF	217F	Asst. Prof. Davies
65f	Survey through Reformation.... (3 cred.; jr., sr.; prereq., 3 cred. above 60)		III	TThS	209½F	Prof. Kroesch
66w	Eighteenth-Century Survey (3 cred.; jr., sr.; prereq., 3 cred. above 60)		III	TThS	209½F	Prof. Burkhard
67s	Nineteenth-Century Survey (3 cred.; jr., sr.; prereq., 3 cred. above 60)		III	TThS	209½F	Prof. Burkhard
77s	Faust I (3 cred.; jr., sr.; prereq., 62 or 64 or 6 cred. above 60)		IV	MWF	217F	Prof. Burkhard
108s	Phonetics (3 cred.; sr., grad.; prereq., 9 senior college cred. in mod. lang.)		III	MWF	209½F	Prof. Kroesch

† The entire course must be completed before credit is received for any quarter.

‡ Students may not receive credit for both 62 and 63.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
109-110-111†	<i>Hist. of German Language</i> (9 cred.; sr., grad.; prereq., see statement under Comp. Phil.)	Not offered			
115f-116w-117s†	Middle High German Literature (9 cred.; sr., grad.; prereq., 65 and 11 credits above 60)	VIII, IX, X	Th	301Lib	Prof. Kroesch
140-141-142†	<i>Early New High German Literature, 1500-1700</i>	Not offered			
	(9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)				
143f-144w-145s†	The Classical Period..... (9 cred.; sr., grad.; prereq., 66 and 11 cred. above 60)	VIII, IX, X	W	301Lib	Asst. Prof. Lussy
153f-154w-155s†	Studies in German Literature of the Nineteenth Century—The Drama of Kleist, Grillparzer, and Hebbel	VIII, IX, X	T	301Lib	Prof. Burkhard
	(9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)				
160-161-162†	<i>Lyric Poetry</i>	Not offered			
	(9 cred.; sr., grad.; prereq., 66 or 67 and 11 cred. above 60)				
163f-164w-165s†	German and English Literary Relations, 16th, 17th, 18th Centuries	VIII, IX, X	M	301Lib	Asst. Prof. Davies
	(9 cred.; sr., grad.; prereq., 65 or 67 and 11 cred. above 60)				
200-201-202†	<i>Middle High German</i> (9 cred.; grad., sr. with completed major sequence)	Not offered			

GREEK

Major Adviser

Professor Savage.

Major Sequence

Prerequisite: Courses 14, 15, and 16 or their equivalent.

Courses 51, 52, 53, 105, 106 or 107, 108 or 99, and Latin 51, 52, 53, or History 133, 134, 135.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†-3s	Beginning Greek	IV	MTWFS	114F	Prof. Savage
	(15 cred.; fr. with cert. of apt., soph., jr., sr.; no prereq.)				
14f	History: Herodotus	III	TThS	108F	Ar
	(3 cred.; all; prereq., 1-2-3)				
15w	History and Epic: Herodotus and Homer	III	TThS	108F	Prof. Savage
	(3 cred.; all; prereq., 1-2-3)				
16s	Epic Poetry: Homer	III	TThS	108F	Ar
	(3 cred.; all; prereq., 14 or 15)				
17f,w	Greek Sources (Everyday Greek) (2 cred.; soph., jr., sr.; prereq., 1 yr. of any foreign language)	VIII	TTh	114F	Prof. Savage

† The entire course must be completed before credit is received for any quarter.

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
17s	Greek Sources (Everyday Greek) (See 17f,w)	I	TTh	114F	Ar
51f	Philosophy (3 cred.; jr., sr.; prereq., any two of 14, 15, and 16)	Ar	Ar	112F	Prof. Savage
52w	Oratory (3 cred.; jr., sr.; prereq., any two of 14, 15, and 16)	Ar	Ar	112F	Prof. Savage
53s	Dramatic Poetry (3 cred.; jr., sr.; prereq., 51 or 52)	Ar	Ar	112F	Prof. Savage
61-62†-63	<i>Advanced Greek Composition</i> (2 or 3 cred.; jr., sr.; prereq., 2 years of Greek)	<i>Not offered</i>			
99s§	New Testament (3 cred.; jr., sr.; prereq., 51 and 52)	Ar	Ar	112F	Ar
105f	Lyric Poetry (3 cred.; sr., grad.; prereq., 53)	Ar	Ar	112F	Prof. Savage
106w*	Advanced Drama (3 cred.; sr., grad.; prereq., 53 or 105)	Ar	Ar	112F	Prof. Savage
107w*	Advanced Prose (3 cred.; sr., grad.; prereq., 51- 52, or 51-53, or 52-53)	Ar	Ar	112F	Prof. Savage
108s§	Advanced Epic Poetry..... (3 cred.; sr., grad.; prereq., 105 or 106)	Ar	Ar	112F	Prof. Savage

Courses for Which No Knowledge of Greek Is Required

No.	Title	Hour	Day	Bldg.	Instructor
42s¶	Greek Sculpture (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Prof. Savage
43f¶†	Greek Drama (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Prof. Savage
44w¶†	Greek Literature and Life..... (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Prof. Savage
44s¶†	Greek Literature and Life..... (See 44w)	I	WF	114F	Prof. Savage
45f¶	Greek Mythology (2 cred.; jr., sr.; no prereq.)	I	WF	114F	Prof. Savage
45w¶	Greek Mythology (See 45f)	I	WF	114F	Prof. Savage

HISTORY

Major Advisers'

Professors Buck, Heaton, Krey, Shippee, and White; Assistant Professor Steefel.

General statement.—A student electing a major sequence in history will take a minimum of twenty-five credits in junior college courses in history and political science and a minimum of thirty credits in senior college courses in history distributed as indicated below.

* Courses 106 and 107 are offered alternately.

† Two quarters must be completed before credit is received for either quarter.

‡ Students may not get credit for both Courses 43 and 44 except by special permission.

§ Courses 108 and 99 are offered alternately.

¶ Does not count in a major or minor sequence. Not open to sophomores. (See Course Numbering, page 21.)

Students electing a major sequence in history will be expected to have taken History 1-2 or 4-5, also History 7-8 and Political Science 1, with an average grade of C.

Students who enter from other institutions, or who for acceptable reasons have not met these requirements, may be permitted by their advisers to make up during the junior year not more than 15 credits from the above courses.

Major Sequences

During the junior and senior years, students majoring in history will take at least one senior college course in each of three of the following fields: ancient, medieval, modern European, English, American, economic.

In addition, during the senior year the student will elect five credits from courses numbered 151 to 200.

During the junior and senior years, the student will elect additional courses in history from those numbered above 51 sufficient to make a total of at least 30 credits.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Honors Course

A limited number of qualified students, whose main interest lies in the field of American history, will be accepted for honors work. Candidates should consult Professor Shippee.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

NOTE.—The following courses in Political Science carry credit also in this department: 153-154, Far Eastern Government and Politics; 191-192, Far Eastern Diplomacy.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Modern World				
	(10 cred.; all; no prereq.)				
	Lect.	II	TThS	OLAud	Prof. Ford
	Secs.	I	MTh	2F	
		I	WS	2F	
		II	MW	2F	
		II	MW	209OL (fall)	
				211OL (winter)	
		III	MTh	2F	
		III	TF	2F	
		III	WS	2F	
		IV	MW	2F	
		IV	TF	2F	
		IV	TS	111OL	
		V	MW	2F	
		V	TF	2F	
		VI	MW	2F	
		VI	TTh	2F	
		VII	MW	2F	
		VII	TTh	2F	
		VIII	MW	2F	
		VIII	TTh	2F	

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
4f-5w†	England to 1815..... (10 cred.; fr. with cert. of apt., soph., jr., sr.; no prereq.)	Lect. VII Sec. 1 I	MW MWF	OLAud 112OL	Prof. White
		2 II	TThS	209OL (fall)	9F (winter)
		3 II	TThS	2F	
		4 III	TThS	209OL	
		5 VI	TThF	112OL	
		6 VII	TThF	113F	
		7 VII	TThF	6F	
		8 VII	TThF	9F	
45†	England to 1815..... (First qtr. of 4-5. See 4f-5w)	III	MTWFS	209OL	Prof. White
6s	England since 1815 (5 cred.; all; prereq., 10 cred.) (Limit 60 students)	II	MWThFS	221OL	Asst. Prof. Thompson
7f-8w†	American History (10 cred.; soph., jr., sr.; no prereq.)	Sec. 1 I 2 I 3 VII 4 VII	MWThFS MWThFS MTWThF MTWThF	211OL 200OLa 206OLa 211OL	Assoc. Prof. Stephenson, Dr. Osgood, Dr. Tyler
9s	Recent American History..... (5 cred.; soph., jr., sr.; prereq., 10 cred. in hist. or pol. sci.)	Sec. 1 I 2 I 3 VII	MWThFS MWThFS MTWThF	211OL 200OLa 211OL	Assoc. Prof. Stephenson, Dr. Osgood, Dr. Tyler
11f-12w-13s††	Medieval History (10 cred.; mu. and int. dec. only, no prereq.)	Lect. IV Sec. 1 IV* 2 IV*	MF W T	221OL 221OL 221OL	Asst. Prof. Thompson
14-15-16††	<i>Foundations of Modern Europe to 1648</i> (9 cred.; soph., jr., sr.; prereq., 10 cred. in hist.)				<i>Not offered</i>
17s‡	Europe in the Middle Ages..... (5 cred.; all; prereq., 10 cred. if taken by fr.)	II	MWThFS	3F	Ar
33s	English Legal Institutions..... (5 cred.; 3d qtr. fr., soph., jr., sr.; prereq., 4-5)	II	MWThFS	112OL	Prof. White
8of-81w†	Introduction to Economic History (6 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ., pol. sci. or sociol.)	II	TThS	221OL	Prof. Heaton

* In the spring quarter, an additional hour, to be arranged.

† The entire course must be completed before credit is received for any quarter.

‡ No student may receive credit for more than one of the following courses: 11-12-13, 14-15-16, 17, 16 of previous years.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
82	<i>Economic History of the United States: Colonial Period</i>	<i>Not offered</i>			
	(3 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ., pol. sci., or sociol.)				
83	<i>Economic History of the United States: Early National Period</i>	<i>Not offered</i>			
	(See 82)				
84	<i>Economic History of the United States since 1860</i>	<i>Not offered</i>			
	(See 82)				
90w-91s†	History of Minnesota	III	MWF	9F	Prof. Blegen
	(6 cred.; jr., sr.; prereq., 7-8*)				
101f-102w†	French Revolution: Napoleonic Era	I	TThS	111OL	Dr. Deutsch
	(6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci. incl. 10 cred. in hist.)				
103f	Pol. Hist.: Greece	IV	MTWFS	112OL	Asst. Prof. MacDonald
	(5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist. or major in Greek or Latin)				
104	<i>Near East: Modern</i>	<i>Not offered</i>			
	(3 cred.; jr., sr., grad.; prereq., 1-2 and 10 cred. in soc. sci.)				
105w	History of Rome	IV	MTWFS	112OL	Asst. Prof. MacDonald
	(5 cred.; jr., sr., grad.; prereq., as for 103)				
106f-107w-108s§	Europe, 1815-1914	VII	MWF	111OL	Dr. Deutsch
	(9 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci.)				
111w	European Background of American Immigration	VI	MWF	101F	Assoc. Prof. Stephenson
	(3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)				
112s	American Immigration	VI	MWF	211OL	Assoc. Prof. Stephenson
	(3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)				
113-114-115§	<i>Econ. Hist. of Europe since 1750</i>	<i>Not offered</i>			
	(9 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)				
116f-117w-118s§	<i>Econ. Hist. of Europe, 1300-1750</i>	III	TThS	221OL	Prof. Heaton
	(9 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)				
119s	Renaissance and Reformation....	III	MTWThF	112OL	Prof. Krey
	(5 cred.; jr., sr., grad.; prereq., 15 cred.)				

* May be taken at the same time.

† The entire course must be completed before credit is received for any quarter.

§ With the permission of the instructor, a student may enter the second or third quarter.

No.	Title	Hour	Day	Bldg.	Instructor
120f	Medieval Civilization (5 cred.; jr., sr., grad.; prereq., 15 cred.)	III	MTWThF	112OL	Prof. Krey
121w	English Backgrounds and American Colonization (5 cred.; jr., sr., grad.; prereq., 20 cred. in hist. or pol. sci.)	II	MWThFS	209OL	Prof. White
122	<i>American Colonies in the 17th Century</i> (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	<i>Not offered</i>			
123f	European Expansion to 1815.... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	IV	MWF	111OL	Dr. Willson
124w	European Expansion since 1815 (3 cred.; jr., sr., grad.; prereq., same as 123)	IV	MWF	111OL	Dr. Willson
125f-126w†	American Diplomatic History ... (6 cred.; jr., sr., grad.; prereq., 20 cred. in hist. and pol. sci. or 15 in hist. or pol. sci.)	III	MWF	211OL	Prof. Shippee
127	<i>Feudal Institutions</i> (5 cred.; jr., sr., grad.; prereq., 15 cred.)	<i>Not offered</i>			
128w	Rise of Nationalism in Europe (5 cred.; jr., sr., grad.; prereq., 15 cred.)	III	MTWThF	213F	Prof. Krey
129s	Civil War and Reconstruction... (3 cred.; jr., sr., grad.; prereq., 15 cred., incl. 7-8)	II	MWF	211OL	Dr. Tyler
130	<i>Introduction to the History of Russia</i> (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Hist. 1-2 or 14-15-16)	<i>Not offered</i>			
131-132†	<i>France under Louis XIV and Louis XV</i> (6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 in soc. sci. incl. 10 in hist.)	<i>Not offered</i>			
133f	Near East: Old Orient..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	VI	MTW	111OL	Asst. Prof. MacDonald
134w	Ancient Civilization: Greek and Roman I (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 103 or 105 or equiv., or major in Greek or Latin and consent of instr.)	VI	MTW	111OL	Asst. Prof. MacDonald

† The entire course must be completed before credit is received for any quarter.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
135S	Ancient Civilization: Greek and Roman II (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 103 or 105 or equiv., or major in 105 or equiv., or major in Greek or Latin and consent of instr.)	VI	MTW	111OL	Asst. Prof. MacDonald
136-137†	<i>Far Eastern Government and Politics</i> (See Political Science 153-154)	Not offered			
138f-139w†	Far Eastern Diplomacy	See	Political Science	191-192	
141f	West in Amer. Hist. to 1815.... (3 cred.; jr., sr., grad.; prereq., History 7-8* and 10 cred. in soc. sci. or 5 cred. in hist.)	III	TThS	211OL	Prof. Buck
142W	West in Amer. Hist., 1815-1865 (3 cred.; jr., sr., grad.; prereq., see 141)	III	TThS	211OL	Prof. Shippee
143S	West in American History since 1865	III	TThS	15F	Prof. Buck
	(3 cred.; jr., sr., grad.; prereq., see 141)				
144W	American Political Parties..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist. incl. 7-8 or equiv.)	II	MWF	221OL	Assoc. Prof. Stephenson
149S	American Colonies in the 18th Century	II	MWThFS	102F	Dr. Osgood
	(5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci., or 15 cred. in hist.)				
152	<i>Select Topics, West to 1815</i> (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8 or equiv.)	Not offered			
153	<i>Topics, West since 1865</i> (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8)	Not offered			
154W	Topics, Minnesota	VI, VII	WF	315Lib	Prof. Blegen
	(5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8)				
156	<i>U. S. Reconstruction</i> (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8)	Not offered			
157-158-159†	<i>Topics in Modern European History</i>	Not offered			
	(15 cred.; sr., grad.; prereq., 20 cred., French or German and consent of instr.)				
162	<i>Beginnings of Parliament</i> (Maximum of 5 cred.; sr., grad.; prereq., 20 cred., knowledge high school Latin)	Not offered			
164	<i>Studies in Crusades</i> (Maximum of 5 cred.; sr., grad.; prereq., 20 cred., knowledge high school Latin, consent of instr.)	Not offered			

* May be taken at the same time.

† The entire course must be completed before credit is received for any quarter.

‡ Students may enter any quarter.

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
166f	Topics, Hist. of Immigration.... (5 cred.; sr., grad.; prereq., 20 cred., consent of instr.)	VIII, IX	MW	315Lib	Assoc. Prof. Stephenson
168s	Topics, American Foreign Relations (5 cred.; sr., grad.; prereq., 20 cred. in hist. incl. 9, or 20 cred. in pol. sci., French or German, consent of instr.)	VIII, IX	TTh	339Lib	Prof. Shippee
169s	Topics in Economic History.... (3 cred.; sr., grad.; prereq., 20 cred. in hist. or econ.)	III	TThS	211OL	Prof. Heaton
171f	Topics in Recent American History (5 cred.; sr., grad.; prereq., 20 cred. incl. 9)	VIII, IX	WF	315Lib	Prof. Blegen
183s	Stuart Period (5 cred.; sr., grad.; prereq., 20 cred. incl. 4-5)	VIII, IX	MW	328Lib	Dr. Willson
184s	Topics in Modern English History (5 cred.; sr., grad.; prereq., 20 cred.)	VIII, IX	TTh	315Lib	Dr. Willson
197f-198w-199s	Honors Course	Consult Professor Shippee			

HOME ECONOMICS

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

NOTE.—Only courses with 15 credits prerequisite will count as senior college courses.

Junior College Courses

No.	Title	Hour	Day	Bldg.	Instructor	
3s	Textiles (5 cred.; all; no prereq.) (Limited to 24)	I, II	MTWThF	311,307HE	Miss Little	
4f	Textiles (Ed., S., L., & A.).... (3 cred.; not open to students in H.E.; no prereq.) (Limited to 24)	VI, VII	MWF	311,307HE	Assoc. Prof. Weller, Miss Little	
4s	Textiles (Ed., S. L. & A.)..... (See 4f) Sec. 1	VI, VII	MWF	307, 311HE	Assoc. Prof. Weller	
11f,s	(Limited to 24 each) 2	VI, VII	MWF	304HE	Miss Little	
	Clothing Planning and Construction A	I, II	MWF			
	(3 cred.; all; no prereq.) Sec. 1	I, II	MWF	304HE	Miss Little, Miss Gorham, Miss Sell	
	(Limited to 24) 2	I, II	TThS	304HE	Miss Little, Miss Gorham	
11w	Clothing Planning and Construction A	3	VI, VII, VIII	TTh	304HE	Miss Gorham, Miss Sell
11w	Clothing Planning and Construction A	Sec. 1	I, II	MWF	304HE	Miss Little
		(Limited to 24) 2	VI, VII, VIII	TTh	304HE	Miss Gorham

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor	
13f,s	Clothing Planning and Construction B (3 cred.; all; prereq., 3, 11, 51)					
	Sec. 1	III, IV	MWF	304HE	Miss Little	
	(Limited to 24)	2	I, II	MWF	305HE Miss Gorham	
15f,w	Clothing Problems (3 cred.; 3d qtr. fr., soph., jr.; prereq., 3, 51)	Lect.	II	S	313HE	Assoc. Prof. Weller, Miss Gorham
	(Limited to 30)	Lab.	VI, VII, VIII	Th		
15s	Clothing Problem (See 15f,w)	Lab.	VI, VII, VIII, IX	T	313HE	Miss Gorham
	(Limited to 30)	Lect.	VI, VII	Th		
50f,w	Color and Design I (3 cred.; no prereq.)	Sec. 1	I, II (f)	MWF	402HE	Miss Topp
	(Limited to 20)	2	III, IV (w)	MWF	402HE	Miss Segolson
		3	I, II	TThS	402HE	Miss Segolson
			III, IV (f)	MWF	402HE	Miss Segolson
50s	Color and Design I (See 50f)	Sec. 1	I, II	MWF	402HE	Miss Topp
		2	VI, VII	MWF	402HE	Miss Topp
51f	Color and Design II (3 cred.; prereq., 50)	Sec. 1	I, II	MWF	401HE	Miss V. Goldstein
	(Limited to 20 each)	2	I, II	TThS	401HE	Miss V. Goldstein
51w	Color and Design II (See 51f)	Sec. 1	III, IV	MWF	401HE	Miss V. Goldstein
	(Limited to 20 each)	2	I, II	TThS	401HE	Miss V. Goldstein
51s	Color and Design II (See 51f)	Sec. 1	VI, VII, VIII	TTh	402HE	Miss V. Goldstein
	(Limited to 20 each)	2	I, II	MWF	401HE	
53f	Advanced Design (3 cred.; soph., jr., sr.; prereq., 51 or 56)	Sec. 1	VI, VII	MWF	402HE	Miss Kendall
	(Limited to 20)	2	VI, VII	MWF		
53w	Advanced Design (See 53f)	Sec. 1	VI, VII	MWF	402HE	Miss Segolson
	(Limited to 20)	2	I, II	MWF	402HE	Assoc. Prof. H. Goldstein Miss Segolson
53s	Advanced Design (See 53f)		I, II	TThS	402HE	
56f	Applications of Color and Design (3 cred.; no prereq.)		VI, VII, VIII	TTh	402HE	Assoc. Prof. H. Goldstein
70f	Nutrition Survey (2 cred.; all; no prereq.)		IV	WF	203HE	Assoc. Prof. Biester
70w	Nutrition Survey (See 70f)		III	TTh	203HE	Miss Counts

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
70s	Nutrition Survey (See 70f)	VII	TTh	OPhAud	Miss Counts
80f	Foods and Cookery (5 cred.; prereq., Agr. Biochem. 3 and 4*) (Limited to 20)	I, II	MTWThF	209HE	Miss Hovlid
80w,s	Foods and Cookery..... (See 80f) (Limited to 20 each) Sec. 1	VI, VII	MTWThF	209HE	Miss Hovlid, Mrs. Niles
		2	III, IV	MTWFS	209HE Miss Hovlid, Mrs. Niles
83f,w	Food Management (3 cred.; soph., jr., sr.; prereq., 80 or 81) (Limited to 20)	III, IV	MWF	203,207HE	Mrs. Niles
83s	Food Management (See 83f,w) (Limited to 20 each) Sec. 1	III, IV	MWF	203,207HE	Mrs. Niles
		2	VI, VII, VIII	TTh	203,207HE Mrs. Niles
150f,w,s	Art History and Appreciation... (3 cred.; jr., sr.; prereq., per- mission of instructor)	VIII	MWF	313HE	Assoc. Prof. H. Goldstein

Senior College Courses

17w	Advanced Clothing (3 cred.; jr., sr.; prereq., 13. 53) (Limited to 24)	III, IV	MWF	305HE	Miss Gorham, Miss Carlotta Brown
17s	Advanced Clothing (See 17w) (Limited to 24)	I, II	TThS	305HE	Miss Gorham, Miss Carlotta Brown
115f,w	Clothing Economics (2 cred.; jr., sr.; prereq., 13, Econ. 6-7)	III	TTh	203HE	Assoc. Prof. Weller
131f	Home Management: House Plan- ning and Equipment (5 cred.; jr., sr.; prereq., 53) (Limited to 20)	III, IV	MTWFS	401HE	Asst. Prof. Morse
131w	Home Management: House Plan- ning and Equipment (See 131f) (Limited to 20)	VI, VII	MTWThF	401HE	Asst. Prof. Morse
131s	Home Management: House Plan- ning and Equipment (See 131f)	Sec. 1	III, IV	MTWFS	401HE Asst. Prof. Morse
	(Limited to 20)	2	VI, VII	MTWThF	401HE Asst. Prof. Morse

HOW TO STUDY

No.	Title	Hour	Day	Bldg.	Instructor
1f	How To Study (2 cred.; all; prereq., permission of instructor)				
		Sec. 1	I	MWF	104OPh Mr. Schellenberg
		2	II	MWF	104OPh Mr. Schellenberg
		3	VII	MWF	104OPh Assoc. Prof. Bird

* Course 80 may be taken parallel with Agricultural Biochemistry 4.

No.	Title	Hour	Day	Bldg.	Instructor	
1w	How To Study (See 1f)	Sec. 1	I	MWF	104OPh	Mr. Schellenberg
		2	II	MWF	104OPh	Assoc. Prof. Bird
1s	How To Study (See 1f)	Sec. 1	I	MWF	104OPh	Mr. Schellenberg
		2	II	MWF	104OPh	Mr. Schellenberg

HUMAN ANATOMY

MEDICAL SCHOOL

For complete list of courses, see bulletin of the Medical School.

Students in this college may elect other courses in human anatomy (see Medical School bulletin) only by arrangement with the head of the Department of Anatomy. 3f.s. Elementary Anatomy. Primarily for nurses.

HUMAN PHYSIOLOGY

MEDICAL SCHOOL

Major Advisers

Professors Scott, McClendon, and Stenstrom.

Major Sequences

Sequence A. Physiology. Courses 100-101; 103; 104; 6 credits in courses numbered 113 to 140, or Zoology 109-110.

Sequence B. Physiologic Chemistry. Courses 100-101; 103; 104; 6 credits in courses numbered 138 to 164, or suitable courses in agricultural biochemistry approved by the major adviser.

Sequence C. Biophysics. Courses will be arranged by Professor Stenstrom with interested students subject to the approval of the dean for the Senior College.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
4f,w,s	Human Physiology (4 cred.; all; prereq., 1 qtr. zool., 1 qtr. chem.) Lect., dem., or rec.	III, IV	MWF	301MH	Prof. Lyon, Asst. Prof. Greisheimer, Dr. King, and others
57f	Physiol. Chemistry (4 cred.; jr., sr.; prereq., Zool. 1-2 or 5-6-7; Inorg. Chem. 1-2-3 or 4-5)	Hours to be published later			
59s	Human Physiology (6 cred.; jr., sr.; prereq., Zool. 1-2 or 5-6-7; Inorg. Chem 1-2-3 or 4-5)	Hours to be published later			

No.	Title	Hour	Day	Bldg.	Instructor
100w-101s*	Physiol. Chemistry (10 cred.; jr., sr.; prereq., zool., org. chem., and physics)	IV	MWF	301MH	Prof. McClen- don and others
	Div. A† Lab.	I, II, III	TTh		
	B‡ Lab.	I, II, III	FS		
	C‡ Lab.	VI, VII, VIII	TTh		
103f*	Physiology of Muscles, etc. (8 cred.; jr., sr.; prereq., zool. and org. chem.)	Lect. II	MWThF		Prof. Scott, Lyon, Asst. Prof. Greis- heimer, Dr. King, and others
		VI	T		
	Rec. Sec. A	III	TTh		
	B	II	TS		
	Lab. Sec. A	VI, VII, VIII	M		
	B	III, IV, VI, VII, VIII	F W		
104w*	Physiol. of Nervous System, etc. (7 cred., lect. only, 4 cred.; jr., sr.; prereq., zool. and org. chem.)	Lect. IV III	MWF S	301MH	Prof. Lyons, Scott, and others
	Rec. Div. A	VI	M		
	B	II	T		
	Lab. Div. A	9-11 I, II	F S		
	R	9-11	MW		

For other courses see Medical School bulletin and programs.
All the above courses are repeated in the summer quarter.

JOURNALISM

Major Adviser

Professor Johnson.

Major Sequences

Prerequisites: Courses 5 or 13, 14-15, 17, and Composition 11-12 or 18-19. In addition to these prerequisites, the following junior college courses are recommended as providing, in most cases, the best foundation for a major in journalism: Political Science 1 and 25; Sociology 1; Psychology 1-2 and 4-5; 10 credits in history; 10 credits in economics.

Courses 51-52, 55 or 56 or 57, 69 or 73-74, 75, 104, 110, 112, and 9 additional credits to be chosen in conference with the adviser.

The additional credits will be arranged to prepare students for the following types of journalistic work: (1) metropolitan journalism—reporting, desk work, reference library work, financial writing, or press association work; (2) community journalism—editing and management; (3) journalism-advertising; (4) magazine editing—editorial direction and business management of trade, technical, and professional journals; (5) agricultural journalism—consult the bulletin of the College of Agriculture, Forestry, and Home Economics; (6) teacher training in journalism—consult the bulletin of the College of Education.

* Students may register for lectures without laboratory.

† Div. A, B, primarily for medics; C primarily for others.

PROGRAM

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

NOTE.—Sociology 116 and Agricultural Journalism 10, 11, 12 and 19 carry credit in the department.

No.	Title	Hour	Day	Bldg.	Instructor
5w	The American Newspaper..... (3 cred.; soph., jr., sr.; no pre-req.)	III	MWF	301F	Mr. Desmond
5s	The American Newspaper (See 5f)	I	MWF	301F	Prof. Johnson
13f	Introduction to Reporting..... (3 cred.; soph., jr., sr.; prereq., Eng. A-B-C, Comp. 4-5-6, or exemption)	I	MWF	206OLa	Mr. Desmond
14w-15s†	Newspaper Reporting and Correspondence (6 cred.; soph., jr., sr.; prereq., 5 or 13 or practical experience, and Comp. 11-12 or 18-19§)	I	MWF	206OLa	Mr. Desmond
17s‡	Newspaper Reference Library... (2 cred.; soph., jr., sr.; prereq., 14)	III	TTh	301F	Mr. Desmond
41w	Principles of Editing..... (3 cred.; jr., sr.; prereq., 13, and a professional or vocational major in colleges other than S. L. & A.)				
	Lect.	I	MW	10P	Mr. Kildow
	Lab. Sec. 1	VIII, IX	M	6P	
	2	I, II	T	6P	
	3	VII, VIII	Th	6P	
51f-52w†	Copy Reading and Newspaper Make-Up (6 cred.; jr., sr.; prereq., 15)				
	Lect.	III	TTh	10P	Mr. McClary
	Lab. Sec. 1	IV, V	M	6P	
	2	IV, V	T	6P	
	3	VIII, IX	W	6P	
	4	I, II	Th	6P	
	5	VII, VIII	F	6P	
55s‡	Advertising Typography (3 cred.; jr., sr.; prereq., 41 or 51)				
	Lect.	IV	T	10P	Ar
	Lab. Sec. 1	VIII, IX	MW	8P	
	2	I, II	TTh	8P	
	3	VI, VII	TTh	8P	
56w‡	Newspaper Typography (3 cred.; jr., sr.; prereq., 41 or 51)				
	Lect.	III	S	10P	Ar
	Lab. Sec. 1	VIII, IX	MF	8P	
	2	I, II	TS	8P	
	3	VI, VII	TTh	8P	
	4	IV, V	WF	8P	

† The entire course must be completed before credit is received for any quarter.

‡ No student may receive credit for both Journalism 17 and Library Methods 1.

§ May be taken at the same time.

¶ Credit will be allowed for only one quarter of Courses 55, 56, and 57.

No.	Title	Hour	Day	Bldg.	Instructor
57ff	Magazine Typography (3 cred.; jr., sr.; prereq., 41 or 51)	Lect. IV Lab. Sec. 1 VIII, IX 2 I, II	T MF TS	10P 8P 8P	Ar
58s	Advanced Typography (2 cred.; jr., sr.; prereq., 55, 56, or 57)	VIII, IX	TTh	8P	
60f-61w†-62s	The Community Newspaper..... (9 cred.; jr., sr.; prereq., 15)	I	MWF	10P	Mr. McCoy
65f	Women's Departments (3 cred.; jr., sr.; prereq., 15 or 69)	I	TThS	10P	Mr. Kildow
69s	The Writing of Special Articles (3 cred.; jr., sr.; prereq., 15 or 41)	I	MWF	206P	Mr. Kildow
70f-71w†	Trade and Technical Journals.. (6 cred.; jr., sr.; prereq., 15 or 69)	IV	MWF	10P	Prof. Johnson
73f-74w†	Newspaper and Magazine Articles (6 cred.; jr., sr.; prereq., 15 or 41)	VI	MWF	10P	Asst. Prof. Steward
75s	Law of the Press..... (3 cred.; jr., sr.; prereq., 52)	III	TThS	10P	Mr. McCoy
76f	Critical Writing (3 cred.; jr., sr.; prereq., 15 or 69)	III	TThS	6P	Mr. Desmond
78s	Press Relations (3 cred.; sr.; prereq., 69 or 73)	IV	MWF	10P	Asst. Prof. Steward
82s	Supervision of School Publications (3 cred.; jr., sr.; prereq., 41 or 51)	VIII	MWF	10P	Mr. Kildow
95	<i>Editorial Administration</i> (3 cred.; sr.; prereq., 52)	<i>Not offered</i>			
96s	Financial Writing (3 cred.; sr.; prereq., 69 or 73, and 20 credits in econ., or bus. adm.)	I	TThS	10P	Mr. McCoy
100f	Analysis of News Interests..... (3 cred.; sr., grad.; prereq., 69 or 73, and 20 cred. in soc. sci.)	II	TThS	10P	
101w	The Reporting of Public Affairs (3 cred.; sr., grad.; prereq., 52 and 10 cred. in pol. sci.)	II	TThS	10P	
104s	Editorial Writing (3 cred.; sr., grad.; prereq., 73, and 25 credits in soc. sci.)	II	TThS	10P	
110f	History of Journalism..... (3 cred.; jr., sr., grad.; prereq., 41 or 51, 10 cred in hist.)	II	MWF	10P	Prof. Johnson
111w	Foreign News Sources..... (3 cred.; jr., sr., grad.; prereq., 41 or 51 and a hist. or pol. sci. course in international relations)	II	MWF	10P	Prof. Johnson

† The entire course must be completed before credit is received for any quarter.

‡ Credit will be allowed for only one quarter of Courses 55, 56, and 57.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
112s	Current Newspaper Problems... (3 cred.; sr., grad.; prereq., 100 or 101 or 110)	II	MWF	10P	Prof. Johnson
130f-131w-132s†	The Press and Public Opinion.. (9 cred.; sr., grad.; prereq., 75 and 20 credits in soc., psy., and pol. sci.)	III	MWF	6P	
190f-191w-192s	Topics Course				
	(9 cred.; sr., grad.; prereq., 20 cred. and consent of instructor)				
	Seniors Sec. 1	VIII, IX	T	10P	Prof. Johnson
	Graduates 2	VIII, IX	Th	10P	

LATIN

Major Adviser

Professor Pike.

Major Sequence

Courses 51 or 71, 52 or 62, 53 or 63, and one of the following combinations: (a) 121, 122, 123, and 131, 132, 133, (b) 121, 122, 123 or 131, 132, 133 and Greek 51, 52, 53 or any two of the following: History 133, 134, 135 or History 103, 104, 105. (c) 131, 132, 133 and Greek 51, 52, 53 or any two of the following: History 133, 134, 135 or History 103, 104, 105.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

Students entering with one year of Latin will take 3, or 2 and 3. Students entering with two years of Latin will take any two of 11, 12, and 13 in their first year and any two of 21, 22, 23 in their second year. Students entering with three years of Latin will take any two of 21, 22, 23. Students entering with no Latin will take 1-2 and 3 in their first year; any two of 11, 12, and 13, in their second year; and any two of 21, 22, and 23 in their third year.

Junior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†‡	Beginning Latin	VI	MTWThF	109F	Asst. Prof. Cram, Mrs. Babcock
	(10 cred.; fr. with cert. of apt., soph., jr., sr.; no prereq.)				
3s	Caesar	VI	MTWThF	109F	Mrs. Babcock
	(5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., 1-2, or 1 yr. Latin)				
11f	Virgil I and II.....	III	MTWFS	109F	Asst. Prof. Cram, Mrs. Babcock
	(5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., 1-2, 3, or 2 yrs. Latin)				

† The entire course must be completed before credit is received for any quarter.

‡ Credit is usually not given for more than one beginning language. See paragraph 2, page 4.

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
12w	Virgil III and IV..... (5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., 1-2, 3, or 2 yrs. Latin)	III	MTWFS	109F	Asst. Prof. Cram, Mrs. Bab- cock
13s	Ovid (5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., 1-2, 3, or 2 yrs. Latin)	III	MTWFS	110F	Mrs. Babcock
21f	Selections (5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)	IV	MTWFS	109F	Prof. Pike
22w	Selections and Survey (5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)	IV	MTWFS	109F	Prof. Pike
23s	Plautus and Terence (5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)	IV	MTWFS	109F	Asst. Prof. Cram

Students entering winter quarter.—Students with one year of Latin may elect 2w. Students with two years of Latin may elect 12w. Students with three or four years of Latin may elect 22w.

Students entering spring quarter.—Students with one year of Latin may elect 3s. Students with two years of Latin may elect 13s. Students with three or four years of Latin may elect 23s.

Senior College Courses

51	<i>Pliny's Letters</i> (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	<i>Not offered</i>			
52w	Horace's Satires and Epistles.... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	109F	Asst. Prof. Cram
53	<i>Suetonius, Selected Lives</i> (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	<i>Not offered</i>			
62	<i>Horace Odes and Epodes</i> (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	<i>Not offered</i>			
63s	Apuleius (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	109F	Asst. Prof. Cram
71f	Cicero's De Amicitia and De Senectute (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	109F	Asst. Prof. Cram
73s	Advanced Grammar and Compo- sition* (3 cred.; jr., sr.; prereq., 51 and 52, or 71 and 62)	III	MWF	109F	Prof. Pike
121f	Advanced Virgil (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	II	MWF	109F	Prof. Pike

* Required of students who expect a teaching recommendation.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
122	<i>Cicero's Letters</i> (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	Not offered			
123	<i>Medieval Latin</i> (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	Not offered			
131	<i>Juvenal</i> (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	Not offered			
132W	Seneca's Epistles (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	II	MWF	109F	Prof. Pike
133S	Vulgar Latin (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	II	MWF	109F	Prof. Pike
201-202-203	<i>Grad. Seminar: Tacitus</i> (9 cred.)	Not offered			
211-212-213	<i>Grad. Seminar: Lucretius</i> (9 cred.)	Not offered			
221-222-223	<i>Graduate Seminar: Cicero's Phil. Works</i> (9 cred.)	Not offered			
231f-232w-233s	Graduate Seminar: Cicero's Rhetorical Works (9 cred.)	VIII, IX	T	314Lib	Prof. Pike
241f-242w-243s	Graduate Seminar: Introduction to Classical Philology (9 cred.)	VIII, IX	Th	314Lib	Asst. Prof. Cram

LIBRARY METHODS

NOTE.—For the special course in library training, see page 9. For program of professional courses in library instruction and for the course in hospital library service, consult the bulletin of the Division of Library Instruction.

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s*	Use of Books and Libraries..... (2 cred.; fresh., soph. only; no prereq.)				
	Sec. 1	II	MW	3Lib	Assoc. Prof. Firkins
	2	IV	MW	3Lib	Asst. Prof. Russell, Miss Moen
	3	VI	MW	5Lib	Miss Grondahl

* For students in College of Science, Literature, and the Arts. Others must obtain a special card from the junior college office.

MATHEMATICS

Major Advisers

Professors Brink, Hart, and Jackson; Associate Professor Underhill.

Major Sequence

Courses 50, 51, 52, 62; and either 15 additional credits in senior college courses, other than 70, or 6 additional credits in senior college courses, other than 70, and 10 credits of Physics 101-103-105.

(Prerequisite: Mathematics 30.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

Placement tests.—In each of Courses 3, 4, 5, 6, and 8, students who fail to pass certain tests will be dropped from the course during the first two weeks. A student who is dropped from Course 4, or 6, or 8 must complete Course 3 or 5 before taking any other course in Mathematics. A student dropped from Course 3 or 5 must pass Subfreshman Mathematics in the Extension Division before returning to Course 3 or 5.

Junior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
3f*	Higher Algebra, Short Course... (4 cred.; all; prereq., 1 yr. elem. alg.)	III	MTWF	133Ph	Ar
3w*	Higher Algebra, Short Course... (See 3f)				
	Sec. 1	II	MWThF	210P	Ar
	2 (agr. stud. only)	IV	MTWF	105F	Ar
4f*	Trigonometry, Short Course..... (4 cred.; all; prereq., 3 or 5 or prep. higher alg.)	II	MWThF	206OLa	Ar
4w*	Trigonometry, Short Course..... (See 4f)	III	MTWF	133Ph	Ar
4s*	Trigonometry, Short Course..... (See 4f)				
	Sec. 1	II	MWThF	166Ph	Ar
	2 (agr. stud. only)	IV	MTWF	104F	Ar
5f	Higher Algebra..... (5 cred.; all; prereq., 1 yr. elem. alg.)				
	Sec. 1	II	MWThFS	133Ph	Ar
	2	VI	MTWThF	133Ph	Ar
5w	Higher Algebra..... (See 5f)	VI	MTWThF	166Ph	Ar
5s	Higher Algebra..... (See 5f)	I	MWThFS	133Ph	Ar

* For pre-med. and pre-dent. students, and others who desire only the mathematics necessary in the first course in physics.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
6f¶	Trigonometry (5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., 3 or 5, or prep. higher algebra)	II	MWThFS	104F	Ar
6w¶	Trigonometry (See 6f)	VI	MTWThF	105F	Ar
6s¶	Trigonometry (See 6f)	IV	MTWFS	105F	Ar
7f¶	College Algebra (5 cred.; all; prereq., 6)	I	MWThFS	104F	Ar
7w¶	College Algebra (See 7f)	II	MWThFS	104F	Ar
7s¶	College Algebra (See 7f)	VI	MTWThF	104F	Ar
8f¶	Commerce Algebra (5 cred.; pre-bus. stud.; prereq., 5 or prep. high. alg.)	I	MWThFS	OPhAud	Ar
8w¶	Commerce Algebra (See 8f)	II	MWThFS	OPhAud	Ar
8s¶	Commerce Algebra (See 8f)	VI	MTWThF	105F	Ar
20w	Mathematics of Investment..... (5 cred.; all; prereq., 8 or 47, or 6 and 7)	I	MWThFS	OPhAud	Prof. Hart
20s	Mathematics of Investment..... (See 20w)	II	MWThFS	OPhAud	Prof. Hart
21s	Elements of the Mathematics of Life Insurance (3 cred.; all; prereq., 20)	I	MWF	104F	Prof. Hart
30f	Analytic Geometry (6 cred.; all; prereq., 6 and 7)	III	MTWThFS	104F	Ar
30w	Analytic Geometry (See 30f)	I	MTWThFS	104F	Ar
30s	Analytic Geometry (See 30f)	II	MTWThFS	104F	Ar
47f¶	Mathematics for Students of Sta- tistics I (5 cred.; soph., jr., sr.; prereq., 5 or prep. higher algebra)	I	MWThFS	105F	Prof. Brink
48w	Mathematics for Students of Sta- tistics II..... (5 cred.; soph., jr., sr.; prereq., 47, or 6 and 7, or 6 and 8)	I	MWThFS	105F	Prof. Brink
49s	Mathematics for Students of Sta- tistics III (3 cred.; soph., jr., sr.; prereq., 48)	I	MWF	105F	Prof. Brink

Senior College Courses

50f	Calculus I (5 cred.; jr., sr.; prereq., 30)	III	MTWFS	105F	Prof. Jackson
50w	Calculus I (See 50f)	III	MTWFS	104F	Ar

¶ Courses 6 and 8 involve some duplication of material; any student who has taken one of them may take the other for 4 credits. Course 47 involves some duplication of material with Courses 6, 7, and 8. A student who has taken 6, 7, or 8 may take 47 only with special permission and for reduced credit. No student may receive credit for both Courses 7 and 8.

Pre-business students who elect mathematics to meet the requirement of 10 credits in mathematics or laboratory science, should take 5 and 8 or 5 and 47 if they have not had high school higher algebra, and 8 and 20 or 47 and 48 if they have had high school higher algebra.

No.	Title	Hour	Day	Bldg.	Instructor
51w	Calculus II	III	MTWFS	105F	Prof. Jackson
	(5 cred.; jr., sr.; prereq., 50)				
51s	Calculus II	III	MTWFS	104F	Ar
	(See 51w)				
52f	Calculus III	II	MWThFS	101F	Assoc. Prof. Underhill
	(5 cred.; jr., sr.; prereq., 51)				
52s	Calculus III	III	MTWFS	105F	Prof. Jackson
	(See 52f)				
60s	Synthetic Metric Geometry.....	VI	MWF	102F	Asst. Prof. Gibbens
	(3 cred.; jr., sr.; prereq., 30)				
62w	Theory of Equations I.....	VII	MWF	101F	Prof. Bussey
	(3 cred.; jr., sr.; prereq., 50)				
63	<i>Theory of Equations II.....</i>	<i>Not offered</i>			
	(3 cred.; jr., sr.; prereq., 62)				
70	<i>Hist. of Elem. Math.....</i>	<i>Not offered</i>			
	(3 cred.; jr., sr.; prereq., 30)				
71s	Solid Analytic Geometry.....	VII	MWF	101F	Prof. Bussey
	(3 cred.; jr., sr.; prereq., 50)				
102-103-104	<i>Adv. Analytic and Synthetic Geometry</i>	<i>Not offered</i>			
	(9 cred.; jr., sr., grad.; prereq., 50)				
106f	Differential Equations	III	MWF	101F	Prof. Hart
	(3 cred.; jr., sr., grad.; prereq., 51)				
107w-108s	Advanced Calculus	III	MWF	101F	Prof. Hart
	(6 cred.; jr., sr., grad.; prereq., 52)				
115f-116w-117s	Differential Geometry	III	TThS	101F	Assoc. Prof. Underhill
	(9 cred.; jr., sr., grad.; prereq., 51)				
118f-119w-120s	Vector Analysis	Ar	Ar	Ar	Prof. Jackson
	(9 cred.; jr., sr., grad.; prereq., 51)				
121-122-123	<i>Math. Theory of Statistics.....</i>	<i>Not offered</i>			
	(9 cred.; jr., sr., grad.; prereq., 51 or 47,48,49)				
206-207-208	<i>Theory of Functions.....</i>	<i>Not offered</i>			
	(0 cred.; sr., grad.; prereq., 106, 107-108, or Math. and Mech. 151, 152-153*)				

NOTE.—Some of the courses listed in the Graduate School bulletin are open to properly qualified juniors and seniors. For more information consult the chairman of the Department of Mathematics.

MECHANICAL ENGINEERING

COLLEGE OF ENGINEERING AND ARCHITECTURE

NOTE.—Students will register for these courses in the order 11-12-13. They may be reassigned by the department as the enrolment demands. A student transferred to 12 for his first quarter will follow this by 13 and then 11; a student transferred to 13 for his first quarter will follow this by 11 and then 12.

No.	Title	Hour	Day	Bldg.	Instructor
11f,w,s, 12f,w,s					
13f,w,s	Elem. Shop Practice.....	VII, VIII, IX†	MW	ME(f,w)	Mr. Shipley
	(2 cred. per qtr.‡; pre-dent. only; no prereq.)		MF	(spring)	and others

* See bulletin of the College of Engineering.

† Students having conflicts with this program may register with one of the engineering or chemistry sections, with permission from Mr. Shipley.

‡ Does not carry credit except for pre-dental students.

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w	First Year Basic Course..... (No cred.; fr.; no prereq.)				
	Sec 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	IV	MWF	A	Ar
	4	V	MWF	A	Ar
	5	VI	MWF	A	Ar
	6	VII	MWF	A	Ar
	7	VIII	MWF	A	Ar
3s	First Year Basic Course..... (No cred.; fr.; no prereq.)	VII,VIII,IX	T or W	A	Ar
4f-5w	Second Year Basic Course..... (No cred.; soph.; prereq., 1-2-3)				
	Sec 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	IV	MWF	A	Ar
	4	V	MWF	A	Ar
	5	VI	MWF	A	Ar
	6	VII	MWF	A	Ar
	7	VIII	MWF	A	Ar
6s	Second Year Basic Course..... (No cred.; soph.; prereq., 1-2-3)	VII,VIII,IX	T or W	A	Ar
51f-52w	First Year Advanced Course..... (Cred.||; prereq., 4-5-6)	Total of five hours selected from the following:			
		II	MWF	A	Ar
		III	MWF	A	Ar
		VI	MWF	A	Ar
		VIII	MWF	A	Ar
		(One two-hour period to be arranged)			
53s	First Year Advanced Course.... (Cred.||; prereq., 4-5-6)	VII,VIII,IX	T or W	A	Ar
		(One two-hour period to be arranged)			
54f-55w	Second Year Advanced Course... (Cred.||; prereq., 51-52-53)	Total of five hours selected from the following:			
		II	MWF	A	Ar
		III	MWF	A	Ar
		VI	MWF	A	Ar
		VIII	MWF	A	Ar
		(One two-hour period to be arranged)			
56s	Second Year Advanced Course.. (Cred.||; prereq., 51-52-53)	VII,VIII,IX	T or W	A	Ar
		(One two-hour period to be arranged)			

MUSIC

NOTE.—Courses in music are not open to freshmen and sophomores except those working for a major in music. But under certain conditions, freshmen and sophomores are allowed to take practical music in the General Extension Division. See General Regulations, sec. 5.

Students may enter courses in practical music any quarter.

To secure the degree of bachelor of arts with a major in music, a student must fulfill the requirements of both the Junior and Senior Colleges as stated on pages 5 and 6,

|| For the amount of credit given for the work of the Advanced R.O.T.C., see page 15.

securing 144 credits in courses other than practical music (piano, voice, etc.). During the first two years he will register for English A-B-C or Composition 4-5-6,* foreign language, History 11-12-13, and Psychology 1-2 and 4-5 or 7, and the following courses in music: 1-2-3, 4-5-6, 7-8-9.

He must earn thirty-six credits in practical music, the number of credits in his major instrument to be determined by the department.‡

Major Advisers

Professors Scott, Ferguson, and Killeen.

Major Sequences

- A. Courses 103-104-105, 106-107-108, 109-110-111, 112-113-114, 121-122-123.
 B. Courses 106-107-108, 100-101-102, 109-110-111, 112-113-114, 124-125-126.
 C. Courses 86-87-88, 89-90-91, 106-107-108, 109-110-111, 112-113-114.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

NOTE.—Courses numbering from 10 to 26 inclusive carry either 2 or 4 credits per quarter and must be repeated until the practical music requirement has been met.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s†	Harmony (9 cred.; fr. mu.; no prereq.) Sec. 1 II 2 VI		MWF	103Mu	Prof. Scott Prof. Scott
1w-2s-3su	Harmony (See 1f-2w-3s)	III	MWF	103Mu	Miss Reeves
4f-5w-6s†	Counterpoint (6 cred.; soph. mu.; prereq., 1-2-3)	III	TTh	103Mu	Miss Malcolm
7f-8w-9s†	Ear Training (3 cred.; fr., soph. mu.; no pre- req.)	VI	TTh	Mu	Prof. Killeen, Asst. Prof. Reeves, Miss Ken- dall
10f,w,s	Organ	Ar	Ar	Mu	Ar
11f,w,s	Piano	Ar	Ar	Mu	Ar
12f,w,s	Voice	Ar	Ar	Mu	Ar
13f,w,s	Violin	Ar	Ar	Mu	Ar

* Unless exempted by placement tests. See Composition program.

† The entire course must be completed before credit is received for any quarter.

‡ Entrance requirements, according to instrument selected are:

Piano: Any major or minor scale in octaves, thirds, sixths, or tenths, M.M. quarter notes=108; Bach Invention or dance from one of the suites; a sonata by Haydn or Mozart; a modern composition of equal difficulty with the sonata.

Voice: Good natural equipment and two years of piano.

Violin: Major and minor scales, arpeggios; the simpler Kreutzer Etudes; a sonata by Handel, Haydn, Mozart, or Schubert; a more modern work displaying special technic peculiar to the violin.

Organ: Same as for piano.

A student wishing to register in the music course must first pass an examination in practical music before a committee of the faculty of the Music Department. This applies also to academic juniors and seniors who wish to elect courses in practical music.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor	
14f,w,s	Viola	Ar	Ar	Mu	Ar	
15f,w,s	Cello	Ar	Ar	Mu	Ar	
16f,w,s	Double Bass	Ar	Ar	Mu	Ar	
17f,w,s	Flute	Ar	Ar	Mu	Ar	
18f,w,s	Oboe	Ar	Ar	Mu	Ar	
19f,w,s	Clarinet	Ar	Ar	Mu	Ar	
20f,w,s	Bassoon	Ar	Ar	Mu	Ar	
21f,w,s	Trumpet	Ar	Ar	Mu	Ar	
22f,w,s	French Horn	Ar	Ar	Mu	Ar	
23f,w,s	Trombone	Ar	Ar	Mu	Ar	
24f,w,s	Tuba	Ar	Ar	Mu	Ar	
25f,w,s	Percussion	Ar	Ar	Mu	Ar	
26f,w,s	Harp	Ar	Ar	Mu	Ar	
40f-41w-42s*	Orchestra	7:30 p.m.	W	MuAud	Ar	
	(3 cred.; jr., sr.)					
43f-44w-45s†	University Chorus‡	IX	T	MuAud	Prof. Killeen	
	(3 cred.; fr. and soph. mu., acad. jr., sr.; prereq., consent of director)					
86f-87w-88s	Normal Piano	VII	MWF	Mu	Asst. Prof. Reeves	
	(6 cred.; jr.; prereq., 2 yrs. piano)					
89f-90w-91s	Advanced Normal Piano.....	VIII	MWF	Mu	Asst. Prof. Reeves	
	(6 cred.; sr.; prereq., 86-87-88)					
100-101-102	Composition-Orchestration	<i>Not offered</i>				
	(6 cred.; jr., sr.; prereq., 1-2-3, 4-5-6)					
103f-104w-105s	Analysis	VII	Th	4Mu	Miss Kendall	
	(3 cred.; soph., jr., sr.; prereq., 1-2-3)					
106f-107w-108s†	History of Music.....	II	MWF	4Mu	Mr. Egilsrud	
	(9 cred.; jr., sr.; prereq., 1-2-3)					
109-110-111	<i>Bach and Beethoven.....</i>	<i>Not offered</i>				
	(9 cred.; sr.; prereq., 106-107- 108)					
112f-113w-114s	Ensemble					
	(6 cred.; jr.)					
	Instrumental	Sec. 1	II	TTh	4Mu	Ar
	Vocal	2	II	TTh	104Mu	Asst. Prof. Hull
115f-116w-117s	Adv. Ensemble: Voice.....	VI	MW	4Mu	Prof. Killeen	
	(6 cred.; sr.; prereq., 112-113- 114)					
121f-122w-123s	Romantic Movement	VII	WF	104Mu	Miss Kendall	
	(6 cred.; jr., sr.; prereq., 106- 107-108)					
124f-125w-126s	Advanced Harmony	Ar	Ar	Mu	Prof. Scott	
	(6 cred.; jr.; prereq., 4-5-6)					
127-128-129	<i>Advanced Composition</i>	<i>Not offered</i>				
	(6 cred.; sr.; prereq., 100-101- 102)					

* Students majoring in music may take 4 years of orchestra.

† The entire course must be completed before credit is received for any quarter.

‡ Does not carry credit for academic freshmen and sophomores.

§ Students may receive credit for 2 years of chorus.

ORIENTATION

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Orientation				
	(10 cred.; entering freshmen with cert. of apt.; no prereq.)				
	Lect.	III§	Th	OLAud	
	Sec. 1	I	MWThFS	101F	
	2	II	MWThFS	200OLa	
	3	III	MTWFS	200OLa	
	4	VI	MTWThF	200OLa	
	5	VII	MTWThF	200OLa	
1w-2s†	Orientation	III	MTWFS	6F	
	(See 1f-2w)				

PHILOSOPHY

Major Adviser

Professor Wilde.

Major Sequence

From 27 to 36 credits in senior college courses, including Courses 50-51-52; 124 or 108-109-110 or 135-136; 141 or 147-148.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
1f	Problems of Philosophy				
	(5 cred.; soph., jr., sr.; no pre-req.)				
	Sec. 1	I	MWThFS	321F	Assoc. Prof. Conger
	2	II	MWThFS	321F	Ar
1w	Problems of Philosophy.....				
	(See 1f)				
	Sec. 1	III	MTWFS	321F	Prof. Swenson
	2	VII	MTWThF	321F	Assoc. Prof. Conger
1s	Problems of Philosophy	IV	MTWFS	321F	Assoc. Prof. Conger
	(See 1f)				
2f	Logic				
	(5 cred.; soph., jr., sr.; no pre-req.)				
	Sec. 1	III	MTWFS	322F	Prof. Swenson
	2	IV	MTWFS	321F	Ar
2w	Logic	VI	MTWThF	321F	Ar
	(See 2f)				
2s	Logic				
	(See 2f)				
	Sec. 1	III	MTWFS	321F	Ar
	2	VII	MTWThF	321F	Ar
3f	Ethics	I	MWThFS	322F	Prof. Wilde
	(5 cred.; soph., jr., sr.; no pre-req.)				
3w	Ethics	I	MWThFS	321F	Ar
	(See 3f)				

† The entire course must be completed before credit is given for any quarter.

§ There will be five meetings of the class each week, sometimes five recitations, sometimes four recitations and one lecture.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
35	Ethics (See 3f)				
	Sec. 1	I	MWThFS	322F	Prof. Wilde
	2	VI	MTWThF	322F	
105	Science and Religion (2 cred.; soph., jr., sr.; prereq., 10 cred. in phil. or a science)	VII	TTh	204F	Prof. Swenson
50f	Ancient Philosophy (3 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.)	IV	MWF	322F	Prof. Wilde
51W	Medieval and Renaissance Philos- ophy (3 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.)	IV	MWF	322F	Prof. Wilde
52S	Modern Philosophy (3 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.)	IV	MWF	322F	Prof. Wilde
100f	History of Religions..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Assoc. Prof. Conger
101W	Psychology of Religion..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Assoc. Prof. Conger
102S	Philosophy of Religion..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Assoc. Prof. Conger
103S	Esthetics (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	MWF	322F	Ar
104	<i>History of Esthetic Theory.....</i> (3 cred.; jr., sr., grad.; prereq., 10 cred.)	<i>Not offered</i>			
108f-109W-110S	History of Ethics (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	IV	TS	322F	Prof. Wilde
115W	Contemporary Philosophy (3 cred.; jr., sr., grad.; prereq., 50 or 51)	III	MWF	322F	Assoc. Prof. Conger
120	<i>Scandinavian Philosophy</i> (3 cred.; jr., sr., grad.; prereq., 10 cred.)	<i>Not offered</i>			
124	<i>Political and Social Ethics.....</i> (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	<i>Not offered</i>			
129W	Development of Political Thought (Same as Pol. Sci. 165. 5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	I	MWThFS	322F	Prof. Wilde
135f-136W	Philosophy of Plato..... (6 cred.; jr., sr., grad.; prereq., 10 cred.)	VIII	MWF	339Lib	Prof. Swenson
141S	Metaphysics (5 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2)	III	MTWFS	322F	Assoc. Prof. Conger

No.	Title	Hour	Day	Bldg.	Instructor
147f-148w	Advanced Logic (6 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2)	II	MWF	322F	Prof. Swenson
151-152	Modern Idealism (6 cred.; sr., grad.; prereq., 15 cred. in phil.)	Not offered			
161f-162w-163s	Seminar in Philosophy (9 cred.; sr., grad.; prereq., 20 cred. in phil. and consent of instructor)	Ar	Ar	Ar	Profs. Wilde and Swenson, Assoc. Prof. Conger

PHYSICAL EDUCATION FOR MEN

A physical examination is required of all new matriculants, and of all others using the departmental privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate.

Courses 1, 2, and 3 are prescribed for all freshmen and must be taken in the first year of residence. Students entering in the winter and spring quarters will register for Courses 2 and 3, respectively, but must complete the entire sequence, 1f, 2w, 3s. Those students taking the required course in physical education, who cannot swim, must make a reasonable effort, as determined by the department, to pass the swimming and life saving requirements, and will be assigned special hours for instruction.

Advanced students who have not completed the previous requirement in freshman hygiene may register for Preventive Medicine 3.

For a special four-year professional course in physical education and athletic coaching, see bulletin of the College of Education. Students interested in this course should consult Professor Keller before registering.

No.	Title	Hour	Day	Bldg.	Instructor
1f,2w,3s	Freshman Physical Education.... (3 cred.; fr.; no prereq.)				
	Sec. 1	I	MWF	202S	
	2	I	TThS	202S	
	3	II	MWF	202S	
	4	II	TThS	202S	
	5	III	MWF	202S	
	6	III	TThS	202S	
	7	IV	MWF	202S	
	8	VI	MWF	202S	
	9	VII	MWF	202S	
	10	VIII	MWF	202S (Boxing)	
7f,8w,9s	Advanced Leaders (3 cred.; soph., jr., sr.; prereq., 1-2-3)				
	Lect.	IV	T	206A	Assoc. Prof. Keller
	Lab.	Ar			
13f,14w,15s	Corrective Work (3 cred.; by petition only)				
	Sec. 1	II	TThS	264S	Mr. Iverson
	2	III	TThS		
	3	IV	MTS		
16f,17w,18s	Drill Substitution (No cred.; by petition only)				
	Sec. 1	II	MWF	264S	Mr. Iverson
	2	III	MWF		
	3	IV	MWF		

PHYSICAL EDUCATION FOR WOMEN

This department aims to promote the physical efficiency of the women students. It gives physical examinations and advice to all on entrance, plans systematically to keep in close touch with them during their first two years of residence; conducts yearly consultations with, and examines when necessary, all upper class students; gives courses in hygiene; organizes neuromuscular activity leading toward organic strength, nervous stability, conscious motor control, correct body mechanics, skill in handling the body and in physical recreation, and the development of that valuable social quality known as good sportsmanship; co-operates closely with the Women's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this department must be taken for six consecutive quarters in the Junior College. Every student must complete Courses 1, 2, and 3 in the order indicated. All sophomore students are allowed as free a choice as their physical condition permits (see Courses 7 to 31); except that students who cannot swim must register for Course 22-23 during the sophomore year. Physical examinations or consultations are required annually of all students. Additional six credits toward graduation can be gained by taking the following courses: 41, 42, 43, 44, 45, 66-67-68, 69-70-71.

For a special four-year professional course designed to prepare graduates for the responsible direction of physical education activities, see bulletin of the College of Education. Students desiring to enter the course should consult with the head of this department. They should be without organic disease or serious functional disorder, should have a keen sense of rhythm, and should possess qualities of personality which will win the co-operation of others.

Statement of fees.—Elementary physical training, \$2.50 a quarter. All other exercise courses, including swimming, for which registration is required, except Course 24, \$2.00 a quarter. Maximum fee paid by a student in physical education, \$3.50 a quarter.

No.	Title	Hour	Day	Bldg.	Instructor
1f	Freshman Physical Education.... (½ cred.; required of all students; no prereq.)				
	Lab. Sec. 1	III	MWF	3,151,153WGm	Ar
	2	IV	MWF	3,151,153WGm	Ar
	3	V	MWF	3,151,153WGm	Ar
	4	VI	MWF	3,151,153WGm	Ar
	5	VIII	MWF	3,151,153WGm	Ar
	6	III	TThS	3,151,153WGm	Ar
2w†	Freshman Physical Education ... (See 1f)				
	Lect. Sec. 1	I	T	OPhAud	Ar
	2	II	T	206OLa	Ar
	3	III	W	206OLA	Ar
	4	IV	M	OLAud	Ar
	5	VI	T	OLAud	Ar
	6	III	Th	206OLA	Ar
	Lab. Sec. 1	III	MWF	3,151,153WGm	Ar
	2	IV	MWF	3,151,153WGm	Ar
	3	V	MWF	3,151,153WGm	Ar
	4	VI	MWF	3,151,153WGm	Ar
	5	VIII	MWF	3,151,153WGm	Ar
	6	III	TThS	3,151,153WGm	Ar

† Courses 2w and 3s are not open to students who have not had the previous quarter. Freshman students entering in the winter or spring quarter may, with the permission of the department, register for sophomore courses in the spring.

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
3s§	Freshman Physical Education ... (See 1f)				
	Lab. Sec. 1	III	MWF	3,151,153WGm	Ar
	2	IV	MWF	3,151,153WGm	Ar
	3	V	MWF	3,151,153WGm	Ar
	4	VI	MWF	3,151,153WGm	Ar
	5	VIII	MWF	3,151,153WGm	Ar
	6	III	TThS	3,151,153WGm	Ar
4f||	Preliminary Hygiene (for nurses and dental hygienists) (No cred.; no prereq.)	II	Th	201WGm	Ar
4s	Preliminary Hygiene (See 4f)	II	T	206OLa	Ar
7f-8w||	Sophomore Gymnastics (1 cred.; soph.; prereq., 1-2-3)	IV	TS	153WGm	Ar
9s	Sophomore Archery (½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	II	MW	151WGm	Ar
	2	IV	TS		Ar
10f-11w‡	Sophomore Orthopedic and Indi- vidual Gymnastics (1 cred.; soph.; prereq., 1-2-3)				
	Sec. 1	IV	TS	3WGm	Asst. Prof. Tolg
	2	VI	TTh	3WGm	Miss Denny
	3	II	MW	3WGm	Miss Denny
12s	Sophomore Orthopedic and Indi- vidual Gymnastics (See 10f-11w)	IV	TS	3WGm	Asst. Prof. Tolg
13f-14w-15s*||	Sophomore Interpretive Dancing. (1½ cred.; soph.; prereq., 1-2-3)	VI	TTh	151WGm	Miss Timber- man
13f,w-14s*	Sophomore Interpretive Dancing. (See 13f-14w-15s)	II	MW	151WGm	Miss Timber- man
16f-17w	Sophomore Games and Folk Dancing (1 cred.; soph.; prereq., 1-2-3)	I	MW	151WGm	Miss Dickson
18s	Tennis (½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	Ar
	2	I	TTh	151WGm	Ar
	3	IV	TS	151WGm	Ar
	4	VIII	TTh	151WGm	Ar
	5	VI	TTh	151WGm	Ar
19f	Sophomore Hockey (½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	Ar
	2	V	MW	151WGm	Ar
	3	VIII	TTh	151WGm	Ar
20w	Sophomore Basket-Ball (½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	Ar
	2	V	MW	151WGm	Ar
	3	VII (3:00)	TTh	151WGm	Ar
	4	VIII	TTh	151WGm	Ar

* The spring quarter is not open to students who have not had the previous quarter.

‡ Students may enter any quarter.

§ Courses 2w and 3s are not open to students who have not had the previous quarter. Freshman students entering in the winter or spring quarter may, with the permission of the department, register for sophomore courses in the spring.

|| The winter quarter is not open to students who have not had the fall quarter.

¶ Students who have not completed the requirement in preliminary hygiene may register for this course or for Preventive Medicine 3.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
218	Sophomore Baseball (½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	Ar
	2	V	MW	151WGm	Ar
22f,s-23w*§	Sophomore Elem. Swimming (1 cred.; soph.; prereq., 1-2-3)				
	Sec. 1	III	MW	51WGm	Miss Starr and others
	2	IV	MW	51WGm	Ar
	3	II	TTh	51WGm	Ar.
	4	IV	TS	51WGm	Ar
	5	VII	TTh	51WGm	Ar
	6	VIII (3:30)	TTh	51WGm	Ar
	7	VIII (4:00)	TTh	51WGm	Ar
22f,w,s	Sophomore Elem. Swimming (See 22f,s-23w)	VII	MW	51WGm	Ar
24f,s†	Sophomore Horseback Riding (½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VIII	TTh	Ar	Miss Starr
	2	IX	TTh	Ar	Miss Starr
25f,s-26w*§	Sophomore Intermed. Swimming (1 cred.; soph.; prereq., 1-2-3, elementary swimming test)				
	Sec. 1	VIII½ (4:00)	MW	51WGm	Ar
	2	III	TTh	51WGm	Ar
	3	II	WF	51WGm	Ar
27f‡	Sophomore Golf—Advanced (½ cred.; soph.; prereq., 1-2-3)	VI	TTh	Ar	Miss Kiskoek
27s‡	Sophomore Golf—Elementary (½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	I	TTh	Ar	
	2	II	TTh	Ar	
	3	II	MW		
28f,s-29w*§	Sophomore Advanced Swimming (1 cred.; soph.; prereq., 1-2-3, inter. swim. test)	VIII (3:30)	MW	51WGm	Miss Starr
30s	Sophomore Life Saving and Water Sports (½ cred.; soph.; prereq., 1-2-3, adv. swim. test)	IX	MW	51WGm	Miss Starr
31w‡	Sophomore Skating (½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF		Ar
	2	II	TTh		
41f,42s	Individ. Projects in Phys. Ac- tivity (2 cred.; jr., sr.; prereq., 6 qtrs.)	Ar		Ar	Ar

* The winter quarter is not open to students who have not had the fall quarter.

† Students registering for this course will pay for riding lessons at about \$1 per lesson, but not the regular physical education fee. Attendance at class hour is required for credit.

§ No student may register for more than two quarters of swimming without permission, Course 22 is never closed for senior registration.

‡ Students must supply their own golf equipment. Golf course at university recreation field will be used for Course 27f. Student tickets 10 for \$3.

‡ Class meetings will be sixty minutes in length, since weather and ice conditions will cause omissions at times.

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor Asst. Prof.
43f-44w†-45s	Theory and Function of Play... (½ cred. fall, 3 cred. winter, ½ cred. spring; jr., sr.; pre- req., 6 qtrs.)	Lab. II Lect. III Lab. V	TTh (fall) MWF (winter) MW (spring)		Kissock
66f-67w†-68s	Interpretive Dancing (3 cred.; jr., sr.; prereq., 6 qtrs.)	VII	TThF	153WGm	Ar
69f-70w-71s‡	Advanced Interpretive Dancing... (3 cred.; jr., sr.; prereq., 13-14- 15 or 66-67-68)	IV	MTS	153WGm	Ar

Activities for Which No Registration Is Required

Elective Sports**	IX	MTWTh	151WGm	
(Fall)—field hockey, volley ball; track, baseball, swimming		(Winter)—basket-ball, ice hockey;		(Spring)—
General Swimming	IX	MTWTh	51WGm	

PHYSICS

Major Advisers

Professors Buchta, Erikson, Miller, Tate, Valasek, and Zeleny.

Major Sequence

Courses 101-103-105, plus 6 additional credits, and Mathematics 50, 51, and 52.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

Courses 3, 4, 9, 23, 24, 33, 34, 43, 44 comprise a general course in physics extending through four quarters. Those who intend to teach physics in secondary schools are advised to take Courses 52, 104, 124, 134, 144 in addition to the above general courses. Those who enter the field of industrial research are advised to take all the intermediate courses in addition to the general course.

Introductory Courses

No.	Title	Hour	Day	Bldg.	Instructor
3f	Elem. of Mechanics..... (3 cred.; all; prereq., Math. 4, or 6)	Lect. VIII Quiz II or IX	MWF Th	150Ph 150Ph	Prof. Erikson
3w	Elem. of Mechanics..... (See 3f)	Lect. VIII Quiz IX	MWF F	150Ph 150Ph	Prof. Erikson

† Two quarters must be completed before credit is received for either quarter.

‡ The entire course must be completed before credit is received for any quarter.

** With permission of director.

PROGRAM

89

No.	Title	Hour	Day	Bldg.	Instructor
3s	Elem. of Mechanics..... (See 3f)	Lect. III Quiz IX*	TThS F	150Ph 150Ph	Prof. Erikson
4f	Elem. of Mechanics Lab..... (1 cred.; all; prereq., 3 or reg. in 3)	Sec. 1 VI, VII 2 VIII, IX 3 I, II 4 VIII, IX	T T Th Th	153Ph 153Ph 153Ph 153Ph	Asst. Prof. Buchta and assts.
4w	Elem. of Mechanics Lab..... (See 4f)	Sec. 1 VI, VII 2 I, II 3 VI, VII 4 VI, VII 5 VI, VII	M T T Th F	153Ph 153Ph 153Ph 153Ph 153Ph	
4s	Elem. of Mechanics Lab..... (See 4f)	Sec. 1 VI, VII 2 I, II 3 VI, VII 4 VI, VII 5 VIII, IX	M T T Th T	153Ph 153Ph 153Ph 153Ph 153Ph	
9s‡	Acoustics (3 cred.; all; no prereq.)	VIII	MWF	133Ph	Asst. Prof. Buchta
23f	Heat (3 cred.; all; prereq., 3)	Lect. III Quiz IX	TThS Th	166Ph 166Ph	Assoc. Prof. Miller Assoc. Prof. Miller
23w	Heat (See 23f)	Lect. Sec. 1 II 2 VI Quiz Sec. 1 II 2 IX	MWF MWF Th Th	150Ph 150Ph 150Ph 150Ph	Assoc. Prof. Miller
24f	Heat Laboratory (1 cred.; all; prereq., 4, 23, or reg. in 23)	Sec. 1 VI, VII 2 VIII, IX 3 VI, VII 4 VIII, IX	M M T T	244Ph 244Ph 244Ph 244Ph	Assoc. Prof. Miller and assts.
24w	Heat Laboratory (See 24f)	Sec. 1 VI, VII 2 VIII, IX 3 I, II 4 VIII, IX	T T Th Th	244Ph 244Ph 244Ph 244Ph	Assoc. Prof. Miller and assts.
33f	Optics (3 cred.; all; prereq., 3)	Lect. I Quiz IX	TThS F	133Ph 133Ph	Assoc. Prof. Valasek

* Students who take Inorganic Chemistry 10s laboratory at VIII, IX, MWF should try to arrange with Professor Erikson for another quiz hour.

‡ Does not count as part of the pre-medical requirement in physics.

SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
33s	Optics				
	(See 33f)				
	Lect.	IV	MWF	133Ph	Assoc. Prof.
	Quiz	IX	F	133Ph	Valasek
34f,s	Optics Laboratory	Ar	Th	236Ph	Assoc. Prof.
	(1 cred.; all; prereq., 4 and 33 or 35 or reg. in 33 or 35)				Valasek and assts.
43W	Electricity				
	(3 cred.; all; prereq., 3)				
	Lect.	III	TThS	166Ph	Prof. Zeleny
	Quiz	IX	Th	150Ph	Prof. Zeleny
43s	Electricity				
	(See 43w)				
	Lect. Sec. 1	II	MWF	166Ph	Prof. Zeleny
	2	VI	MWF	166Ph	
	Quiz Sec. 1	II	Th	150Ph	
	2	IX	Th	150Ph	
44W	Electricity Laboratory				
	(1 cred.; all; prereq., 4, 43 or reg. in 43)				
	Sec. 1	VI, VII	T	231Ph	Prof. Zeleny
	2	VIII, IX	T	231Ph	and assts.
	3	VI, VII	W	231Ph	
44s	Electricity Laboratory				
	(See 44w)				
	Sec. 1	VI, VII	M	231Ph	Prof. Zeleny
	2	VI, VII	T	231Ph	and assts.
	3	VIII, IX	T	231Ph	
	4	I, II	T	231Ph	
<i>Intermediate Courses</i>					
52f,w,s	Laboratory Arts	VI, VII, VIII	TTh	39Ph	Ar
	(3 cred.; jr., sr.; prereq., 16 cred. and approval of depart- ment)				
101f-103w-105s	Theoretical Physics	V	MTWFS	145Ph	Prof. Tate
	(15 cred.; jr., sr., grad.; prereq., 12 cred. in phys., Math. 51)				
104	<i>Precision Mechanics</i>	<i>Not offered</i>			
	(3 cred.; jr., sr., grad.; prereq., 12 cred. and Math. 51)				
114f-116w-118s	Elem. Phys. Investigation.....	Ar	Ar	160Ph	Ar
	(3 cred.; jr., sr., grad.; prereq., 104, Math. 51)				
115f-117w-119s	Problem Course	Ar	Ar	145Ph	Asst. Prof. Buchta
	(3 cred.; jr., sr., grad.; prereq., 12 cred., Math. 51)				
124s	Pyrometry and Heat.....	V-IX or Ar	MW	245Ph	Assoc. Prof. Miller
	(3 cred.; jr., sr., grad.; prereq., 23 and 24)				
134f,w	Experimental Optics	VI, VII, VIII	MW	79Ph	Assoc. Prof. Valasek
	(3 cred.; jr., sr., grad.; prereq., 34)				
136w	Spectrum Analysis	VI, VII, VIII	MW	79Ph	Assoc. Prof. Valasek
	(3 cred.; jr., sr., grad.; prereq., 34)				
144f	Electricity Measurements	See 144f, Engineering program			Prof. Zeleny
	(3 cred.; jr., sr., grad.; prereq., 43 and 44)				

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
146w	Advanced Electricity Measurements (3 cred.; by permission from instructor; prereq., 144)	Ar	Ar	232Ph	Prof. Zeleny
148w	Radioactivity (3 cred.; jr., sr., grad.; prereq., 43, 44)	VI, VII, VIII	TTh	145Ph	Prof. Erikson
150f	Conduction Through Gases..... (3 cred.; jr., sr., grad.; prereq., 144)	VI, VII, VIII	TTh	145Ph	Prof. Erikson
152s	X-Rays (3 cred.; jr., sr., grad.; prereq., 43, 44)	Ar	Ar	145Ph	Prof. Erikson

POLITICAL SCIENCE

Major Advisers

Professors Anderson, Lambie, Quigley, and Young; Assistant Professors Mills and Saunders.

Major Sequences

Prerequisites: 10 credits in history or economics and 15 credits in political science. In addition the student is urged to take one or more of the following courses: History 33, English Legal Institutions; Economics 6-7, Principles of Economics; Psychology 1-2, General Psychology; and Sociology 45, Social Statistics.

The student majoring in political science, unless he is in the Honors Course, must earn at least 12 credits in courses numbered from 101 to 140, 6 credits in courses numbered from 141 to 180, 6 credits in courses numbered from 181 to 199, inclusive, and enough additional credits from these three groups of courses and the following to make a total of 33 credits. The additional courses which may be included are Political Science 51-52-53, and, with the consent of the major adviser, Economics 105; 106; 154; 161; 162; 164; 176; 191-192; 193; History 124; 144; 168; Preventive Medicine 106; Psychology 140; 160; Sociology 100; 101; 102; 140; 141.

Minor Sequences

Nine credits in political science courses numbered from 101 to 199.

Honors Course

A limited number of juniors and seniors will be accepted on the basis of their records for registration in the Honors Course. Instead of following a regular major sequence, a student in the Honors Course will pursue a comprehensive plan of study adapted to his particular interests and approved by the departmental tutors. Normally, he will carry in the junior year not less than nine credit hours of regular courses each quarter, and in the senior year not less than six credit hours of regular courses. The rest of his work will consist of assigned readings and reports, regular consultations with his tutor, and in the senior year intensive and specialized study in one or two branches of political science and possibly the preparation of a thesis, according to the plan adopted.

In certain cases the work done in five quarters of residence in the Senior College may be accepted as satisfying the requirements of the Honors Course. A part of

the reading and other work may also be done in summer vacation periods, but the work so done will be covered in the annual comprehensive examination. Each student electing the course will be assigned to a tutor, whom he will meet at stated times for consultation, and at the end of each year he will take a comprehensive examination upon his work. See Courses 81-82-83 and 91-92-93, below. Consult instructors.

Bureau for Research in Government

This bureau, with its special library, serves as a center of study for advanced and graduate students in political science, and also as an agency for conducting and directing investigations into problems of politics, legislation, and administration, national, state, and local.

Training for Diplomatic and Consular Service

A special program taking the place of a major sequence will be arranged for students of good standing who intend to enter this field of work. The courses in this program will be drawn from Political Science, Economics, History, Geography, and related departments. Consult Prof. Quigley.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s	American Government (5 cred.; soph., jr., sr., and fr. with 10 cred. in hist. or econ.; no prereq.)	Lect. IV Sec. 1 I 2 I 3 II 4 III 5 III 6 VI 7 VII		WFOld MWF 221OL TThS 15F(f), 221OL(w), 112OL(s) TThS 111OL(f), 25F(w), 209OL(s) TThS 111OL MWF 111OL MWF 221OL MWF 112OL	Prof. Young
Af-Bw‡	Introduction to Government and Politics (10 cred.; soph., jr., sr.; no prereq.)	III	MTWFS	5F	Asst. Prof. Saunders
2f,w,s	State Government (5 cred.; soph., jr., sr.; prereq., 1)	Lect. IV Sec. 1 IV 2 II		MW 211OL TFS 211OL TThS 124F	Prof. Lambie, Assoc. Prof. Field
3f,w,s	Comparative European Govern- ment (5 cred.; soph., jr., sr.; prereq., 1)	II	MWThFS	112OL(f,w), 111OL(s)	Mr. Starr
11f,s	Municipal Government (5 cred.; soph., jr., sr.; prereq., 1)	I	MWThFS	209OL	Prof. Anderson

‡ Alternative beginning course. Students who take this course should not take and will not receive credit for Courses 1, 2, or 15.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
15f,w,s	Elements of Political Science (5 cred.; soph., jr., sr.; prereq., 1)	VI	MTWThF	209OL	Asst. Prof. Saunders and others
25f,w,s	World Politics (5 cred.; soph., jr., sr.; prereq., 1, or Hist. 1-2)	III	MTWFS	25F	Asst. Prof. Mills
51f-52w-53s†	Business Law (9 cred.; jr., sr.; prereq., 10 cred. in pol. sci. or 10 cred. in econ. or 5 cred. in each)	Lect. IV	TS	OLAud	Prof. Young, Mr. Dalzell
	Sec. 1	I	M	5F	
	2	II	M	204F(f), 9F(w), 301F(s)	
	3	III	M	217F	
	4	I	T	201F	
	5	II	T	201F	
	6	III	T	3F(f), 322F(w), 109F(s)	
	7	IV	M	Ar	
81f-82w-83s†	Readings for Honors..... (Junior course. Cred. ar.)				Prof. Anderson, Quigley, and others
91f-92w-93s†	Reading and Theses for Honors (Senior course. Cred. ar.)				Prof. Anderson, Quigley, and others
101f-102w†	Constitutional Law (6 cred.; jr., sr., grad.; prereq., 15 cred.)	VI	MWF	221OL	Assoc. Prof. Field
103s	State Constitutional Law..... (3 cred.; jr., sr., grad.; prereq., 15 cred.)	VI	MWF	221OL	Assoc. Prof. Field
104f	Problems in State Government... (3 cred.; jr., sr., grad.; prereq., 2)	I	TThS	221OL	Assoc. Prof. Field
105f-106w†	American Constitutional Development (6 cred.; jr., sr., grad.; prereq., 15 cred. in pol. sci., or Hist. 7-8)	II	MWF	111OL	Prof. Young
107f	Recent Social Legislation..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci.)	II	TThS	211OL	Prof. Young
108	<i>Legislative Power and Methods</i> (3 cred., jr., sr., grad.; prereq., 15 cred.)	<i>Not offered</i>			
109s	Government and Business (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci., incl. 10 cred. in pol. sci.)	II	TThS	211OL	Prof. Young
111	Law of Public Utilities (3 cred.; grad. and sr. of suitable prep.)	See Law School bulletin			
113s	Administrative Law (3 cred.; jr., sr., grad.; prereq., 15 cred.)	I	TThS	221OL	Assoc. Prof. Field

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
116	<i>Municipal Powers and Functions</i>	<i>Not offered</i>			
	(5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 11)				
119*	Jurisprudence	See Law School bulletin			Prof. Rottschaefer
	(2 cred.; grad., and sr. of suitable prep.)				
131f-132w†	Principles of Public Administration	II	MWF	12Lib	Prof. Lambie
	(6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci., incl. 10 cred. in pol. sci.)				
133s	Problems in Public Administration	II	MWF	12Lib	Prof. Lambie
	(3 cred.; jr., sr., grad.; prereq., 131-132)				
137w	Municipal Administration	III	MTWFS	112OL	Prof. Anderson
	(5 cred.; jr., sr., grad.; prereq., 10 cred. incl. 11)				
145w-146s†	Comparative Federal Government	3:30-4:45	MF	12Lib	Asst. Prof. Saunders
	(6 cred.; jr., sr., grad.; prereq., 15 cred.)				
149f-150w†	Government and Politics of the British Empire	VI	MWF	211OL	Asst. Prof. Mills
	(6 cred.; jr., sr., grad.; prereq., 15 cred. or Hist. 109)				
153-154†	<i>Far Eastern Government and Politics</i>	<i>Not offered</i>			
	(6 cred.; jr., sr., grad.; prereq., 3 or 10 cred. and Hist. 1-2)				
161w-162s†	Current Political Thought	IV	TS and ar	209OL	Prof. Anderson
	(6 cred.; jr., sr., grad.; prereq., 20 cred.)				
163f	American Political Ideas	3:30-4:45	MF	12Lib	Asst. Prof. Saunders
	(3 cred.; jr., sr., grad.; prereq., 15 cred.)				
165w	Develop. of Political Thought	I	MWThFS	322F	Prof. Wilde
	(5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil. Same as Phil. 129)				
169	<i>Problems of Democracy</i>	<i>Not offered</i>			
	(3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci., incl. 10 cred. in pol. sci.)				
171s	Political Psychology	See Psychology 141			
	(3 cred.; jr., sr., grad.; prereq. §)				
175	<i>Political Parties</i>	<i>Not offered</i>			
	(3 cred.; jr., sr., grad.; prereq., 15 cred.)				
181f-182s††	International Law	IV	MWF	209OL	Prof. Quigley
	(6 cred.; sr., grad.; prereq., 20 cred. in soc. sci., incl. 10 cred. in pol. sci.)				

* Second semester.

† The entire course must be completed before credit is received for any quarter.

‡ Students should notice that the second quarter is offered in the spring.

§ Open to majors in social science who have had Psy. 1-2 and 4-5 or 7 or Zoology 1-2 and to majors in psychology who have had Psy. 140 or 20 credits in social science.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
183	<i>International Organization</i> (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	<i>Not offered</i>			
184	<i>Problems in International Law</i> .. (3 cred.; sr., grad.; prereq., 181- 182)	<i>Not offered</i>			
187f-188w†	American Diplomatic History... (6 cred.; jr., sr., grad.; prereq., 20 cred. in hist. and pol. sci. or 15 cred. in hist. or pol. sci.)	III	MWF	221OL	Prof. Shippee
189s	Topics in American Foreign Re- lations (5 cred.; jr., sr., grad.; prereq., 20 cred. in hist. incl. 9, or 20 cred. in pol. sci.)	VIII, IX	TTh	339Lib	Prof. Shippee
191f-192s*†	Far Eastern Diplomacy..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 25, or 10 cred. in pol. sci. and Hist. 1-2)	VII	MWF	209OL	Prof. Quigley
193	<i>Problems of the Pacific</i> (3 cred.; jr., sr., grad.; prereq., 153-154 or 191-192)	<i>Not offered</i>			
195s	Colonization (3 cred.; jr., sr., grad.; prereq., 15 cred. or 20 cred. in soc. sci. incl. 10 cred. in pol. sci.)	VI	MWF	112OL	Asst. Prof. Mills

NOTE.—Courses 201-202-203, 211-212-213, 221-222-223, and 231-232-233 are open to properly qualified seniors, with the permission of the department.

PREVENTIVE MEDICINE AND PUBLIC HEALTH
MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
2f,w	First Aid (1 cred.; prereq., 10 cred. zool.) (Limited to 20 women)	VI, VII	W	§	Miss Fisher
3f,w,s‡	Personal Hygiene and Elementary Sanitation (2 cred.; fr. with cert. of apt., soph.; no prereq.) (3 sections for men, 40 each) (2 sections for women, 40 each)	IV	TS	101bMH	Asst. Prof. Lees and others
5of,w,s	Public and Personal Health..... (3 cred.; jr., sr.; prereq., zool. 1-2 and Psy. 1-2 or permission of instructor)	V	MWF	101bMH	Asst. Prof. O'Brien

* Students should notice that the second quarter is offered in the spring.

† The entire course must be completed before credit is received for any quarter.

‡ Students may complete the former requirement in freshman hygiene by registering for this course.

§ Woman's Hall, University Farm.

No.	Title	Hour	Day	Bldg.	Instructor
52f,s	Health Care of the Family..... (3 cred.; jr., sr.; prereq., Bact. 41, Hum. Physiol. 4) (Lab. sections limited to 20)	Lect.	VIII	Th 213HE	Asst. Prof. Boynton
	Sec. 1	VI, VII	TTh	§	Miss Fisher
	2	VI, VII	MF	§	Miss Fisher
	3	III, IV(s only)	TS		
53f,s	Elements of Preventive Medicine (3 cred.; jr., sr.; prereq., Psy. 1-2; Bact. 41 or equiv.)	II	MWF	101bMH	Assoc. Prof. Diehl
57w	Health of Infant and Pre-school Child	III	TTh	101bMH	Asst. Prof. Boynton
	(2 cred.; jr., sr.; prereq., Zool. 1-2, Psy. 1-2; or 50, or 53)				
58w	Maternal and Child Hygiene.... (2 cred.; jr., sr.; prereq., 50 or 52 or 53) (For public health nurses only)	III	MW	101bMH	Asst. Prof. Boynton
59w	Social Hygiene	VII	M	Ar	Ar
	(1 cred.; jr., sr.; prereq., 50, 52, or 53, or permission of in- structor)				
60w	Tuberculosis and Its Control... (2 cred.; jr., sr.; prereq., 50 or 52 or 53)	IV	TS	101bMH	Assoc. Prof. Myers
61w	Mental Hygiene	III	TThS	101bMH	Asst. Prof. de Berry
	(3 cred.; jr., sr.; prereq., 50 or 52 or 53, Psy. 1-2)				
62f,w	Principles of Public Health Nursing	Ar	Ar	101bMH	Asst. Prof. Butzerin
	(3 cred.; jr., sr.; for public health nurses)				
63w,s	Special Fields in Public Health Nursing	Ar	Ar	101bMH	Asst. Prof. Butzerin
	(3 cred.; jr., sr.; public health nurses; prereq., 62 or equiva- lent)				
64f,w,s	Field Practice in Infant Welfare Nursing	Ar	Ar	Ar	Asst. Prof. Butzerin, Miss Peck
	(3 cred.; jr., sr.; prereq., 58 and 62)				
65f,w,s	Field Practice in School Nursing (2 cred.; jr., sr.; prereq., 62)	Ar	Ar	Ar	Asst. Prof. Butzerin
66f,w,s	Field Practice in County Nursing (2 cred.; jr., sr.; prereq., 62)	Ar	Ar	Ar	Asst. Prof. Butzerin
67f,w,s	Field Practice in a Tuberculosis Sanatorium	Ar	Ar	Ar	Asst. Prof. Mariette
	(2 cred.; jr., sr.; prereq., 60 and 62)				
68f,w,s	Field Practice in Visiting Nurs- ing	Ar	Ar	Ar	Asst. Prof. Butzerin, Miss Houlton
	(5 cred.; jr., sr.; prereq., 62)				
70f,w	Home Nursing and Child Care (3 cred.; public health nurses; prereq., 62, 63, or equiv.)	Ar	Ar	Ar	Asst. Prof. Butzerin

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
73w	Occupational Hygiene and Disease (2 cred.; jr., sr.; prereq., 53)	IV	MW	101bMH	Assoc. Prof. Myers
80w	Health Supervision of the School Child (3 cred.; jr., sr.; prereq., 50 or 52 or 53)	II	MWF	101bMH	Assoc. Prof. Diehl
102w	Sanitation (Cred. ar.; jr., sr., grad.; prereq., Bact. 101; Anal. Chem. 1-2 or 7; Org. Chem. 2 or 53; Phys. 24, 34, 44)	Ar	Ar	*	Asst. Prof. Whittaker
103s	Public Health Bacteriology..... (3 cred. or ar.; jr., sr., grad.; prereq., Bact. 101, 116)	VII, VIII or ar	MWF or ar	*	Asst. Prof. Wade
106f,w,s	Public Health Administration... (Cred. ar.; jr., sr., grad.; prereq., 53 or 101)	Ar	Ar	Ar	Assoc. Prof. Diehl
107s	Sanitary Surveys (2 cred.; jr., sr., grad.; prereq., 53 or 100)	Ar	Ar	Ar	Assoc. Prof. Diehl

PSYCHOLOGY

Major Advisers

Professors Elliott and Paterson; Associate Professor Bird; Assistant Professor Tinker.

Major Sequences

Prerequisites: For Sequences A, 1-2 and 4-5 or 7. Course 15 is recommended. For Sequence B, 9 credits. For Sequence C, 1-2 and 4-5 or 7. Course 3 is recommended.

A. General psychology. Courses 101-102-103; 125-126; 108; and 12 additional credits in senior college courses, excepting 56.

B. Human and animal behavior. Courses 114-115; 144-145; 151-152-153; and either 125-126 or Zoology 109-110. Zoology 183 is recommended.

C. Differential psychology. Courses 101-102; 125-126-127; 144-145; either 124 and 140 or 141, or Zoology 183; Educational Psychology 134.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Minor Sequence

Nine credits in senior college courses exclusive of 56.

Honors Course

Students interested in the work of an honors course should consult the chairman of the department.

No.	Title	Hour	Day	Bldg.	Instructor	
1f-2w†	General Psychology (6 cred.; soph., jr., sr.; no prereq.)	Sec. 1 2	I III	MWF MWF	OLAud OLAud	Prof. Elliott and others

* State Board of Health.

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
1w-2s†	General Psychology (See 1f-2w. Registration limited. Written permission must be obtained from junior college office‡)	Ar	Ar	Ar	
1s,2s	General Psychology (6 cred.; see 1f-2w. Registration limited. Written permission must be obtained from junior college office§)	Ar	Ar	Ar	
3s	Psychology Applied to Daily Life (3 cred.; soph., jr., sr.; prereq., 1-2)	III	MWF	301F	Prof. Paterson and others
4f-5w†	Introd. Lab. Psychology (4 cred.; soph., jr., sr.; with or after 1-2) (Sections limited to 48)				
	Sec. 1	I, II	TTh	211Psy	Asst. Prof.
	2	III, IV	TS	211Psy	Tinker
	3	VI, VII	TTh	211Psy	and others
	4	VIII, IX	TTh	211Psy	
	5	III, IV	MW	211Psy	
7s	Introd. Lab. Psychology (Identical with 4-5 combined. See 4f-5w)				
	Sec. 1	VI, VII	MTThF	211Psy	Asst. Prof.
	2	III, IV	MTWF	211Psy	Tinker and others
9s	Introd. to Animal Psychology (3 cred.; soph., jr.; prereq., 1-2)	III	MWF	109Psy	Asst. Prof. Heron
15s	Psychology of Sensation (3 cred.; soph., jr., sr.; prereq., 1-2)	II	TThS	211Psy	Asst. Prof. Tinker
56w*	Psychology of Advertising (3 cred.; jr., sr.; prereq., 1-2, and Prin. of Econ.)	VII	MWF	133Ph	Mr. Longstaff
101f-102w†-103s	Experimental Psychology (3 cred. per qtr.; and ar. for honors students; jr., sr., grad.; prereq., 1-2, and 4-5 or 7 or 8 cred. in physics)	VII VIII	MWF WF	116Psy	Asst. Prof. Tinker
108f	Systems of Psychology (3 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7)	III	TThS	109Psy	Assoc. Prof. Heidbreder
109f,w	Readings in Psychology (3 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7, or Zool. 1-2; and permission of instructor)	Ar	Ar	Ar	Assoc. Prof. Heidbreder
114w-115s†	Human Behavior (6 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7, or Zool. 1-2)	II	TThS	115Psy	Prof. Elliott
124f	Psychology of Learning (3 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7)	IV	MWF	109Psy	Asst. Prof. Heron

* Cannot be counted for a minor sequence.

† Two quarters must be completed before credit is received for any quarter.

‡ Offered VII MWF, VIII MWF.

§ Offered II MTWThFS, III MTWThFS.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
125f-126w†-127s	Psy. of Individual Differences... (3 cred. per qtr.; cred. ar. for honors students; jr., sr., grad.; prereq., 1-2; 4-5 or 7, or Ed. Psy. 116-117)	II	MWF	115Psy	Prof. Paterson
130s	Vocational Psychology (2 cred.; jr., sr., grad.; prereq., 1-2, 4 additional cred. in psy., educ., or a soc. sci.)	IX, X	F	301F	Prof. Paterson
137s	Psychology of Learning..... (3 cred.; jr., sr., grad.; prereq., 124 or equiv.)	III	TThS	109Psy	Asst. Prof. Heron
140w	Social Psychology (3 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7, or Zool. 1-2 or 20 cred. in a soc. sci.)	III	TThS	115Psy	Assoc. Prof. Bird
141s	Political Psychology (3 cred.; jr., sr., grad.; prereq.‡)	III	TThS	115Psy	Assoc. Prof. Bird
144w-145s†	Abnormal Psychology (6 cred.; jr., sr., grad.; prereq., 1-2, 4-5 or 7, or Zool. 1-2 or 10 cred. in a soc. sci.)	IV	MWF	133Ph(w) 166Ph(s)	Assoc. Prof. Heid- breder
151f-152w†-153s	Animal Psychology (3 cred. per qtr.; cred. ar. for honors students; jr., sr., grad.; prereq., 1-2, 4-5 or 7, Zool. 1-2)	VI Lab.	MWF Ar	Ar	Asst. Prof. Heron
160f	Psychology in Personnel Work... (3 cred.; jr., sr., grad.; prereq., 1-2, and Prin. of Econ. or 10 cred. in pol. sci.)	VI	MWF	115Psy	Mr. Longstaff
168	<i>Perception of Space</i> (3 cred.; jr., sr., grad.; prereq., 101-102 or permission of in- structor)	<i>Not offered</i>			
172f	Reaction Time (3 cred.; jr., sr., grad.; prereq., 101-102 or permission of in- structor)	II	TThS	109Psy	Asst. Prof. Heron

ROMANCE LANGUAGES

Major Advisers

Professors Olmsted, Searles, and LeCompte; Associate Professors Barton and Sirich; Assistant Professors Arjona, Clefton, and Nissen.

Major Sequences

FRENCH

Six credits in conversation and composition (except French 20). Nine credits in literary courses (except French 21-22-23 and 24-25). A minimum of 12 additional credits chosen from courses numbered 50 or above.

† Two quarters must be completed before credit is received for any quarter.

‡ Open to majors in social science who have had Courses 1-2 and 4-5 or 7, or Zoology 1-2 and to majors in psychology who have had Course 140 or 20 credits in social science.

ITALIAN

Courses 71; 72; 73; 74; 159-160 or 161-162; 164; and at least 2 additional credits chosen from the following: English 140, 146-147, 148-149; French 121-122-123, 153; Greek 108; History 105, 119, 120, 135; Italian 159-160, 161-162; Latin 123.

SPANISH

Six credits in conversation and composition (except Spanish 20).

Nine credits in literary courses, and in addition enough credits chosen from courses numbered 50 or above to make a minimum of 27 credits in all.

MIXED (French, Italian, and Spanish)

Six credits in conversation and composition (except French 20 or Spanish 20).

One literary course above 50, and in addition enough credits chosen from courses in any of the three languages numbered 50 or above to make a minimum of 27 credits in all.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

Admission to advanced courses.—No student will be allowed to elect courses more advanced than intermediate French or Spanish, who has not received an average grade of C in the intermediate courses.

Pre-medical students may satisfy the language requirement of the Medical School by completing any two quarters of French 8-9-10, or, if they have completed French 3 or equivalent with an average of C, by passing a special reading examination. Such examinations will be given the first Saturday of the winter and spring quarters, the third day after the Science, Literature, and the Arts finals in June, and the Friday preceding the opening of the University in September.

FRENCH

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†*	Beginning French	I	MWThFS	213F	Ar
	(10 cred.; fr. with cert. of apt.,	II	MWThFS	227F	Ar
	soph., jr., sr.; no prereq.)	IV	MTWFS	227F	Ar
		VI	MTWThF	226F	Ar
		VII	MTWThF	202F	Ar
1w-25†*	Beginning French	IV	MTWFS	202F	Ar
	(See 1f-2w)	VI	MTWThF	202F	Ar
1s†*	Beginning French	I	MWThFS	227F	Ar
	(See 1f-2w)	IV	MTWFS	212F	Ar
2f†*	Beginning French	I	MWThFS	202F	Ar
	(2nd qtr. of 1-2. See 1f-2w)	VI	MTWThF	213F	Ar
3f-4w	Intermediate French	I	MWThFS	124F	Ar
	(10 cred.; fr. with cert. of apt.,	III	MTWFS	226F	Ar
	soph., jr., sr.; prereq., 1-2, or 2 yrs. high school French)	VII	MTWThF	213F	Ar
3w-4s	Intermediate French	I	MWThFS	202F	Ar
	(See 3f-4w)	VI	MTWThF	213F	Ar

* Credit is usually not given for more than one beginning language. See paragraph 2, page 4.

† The entire course must be completed before credit is received for any quarter.

PROGRAM

101

No.	Title	Hour	Day	Bldg.	Instructor
3s	Intermediate French (First qtr. of 3-4. See 3f-4w)	I	MWThFS	213F	Ar
		II	MWThFS	227F	Ar
		IV	MTWFS	227F	Ar
		VI	MTWThF	226F	Ar
4f	Intermediate French (2nd qtr. of 3-4. See 3f-4w)	VII	MTWThF	202F	Ar
		II	MWThFS	113F	Ar
		IV	MTWFS	124F	Ar
8f-9w-10s§	Scientific French (pre-med.)... (9 cred.; pre-med.; prereq., 3 or equiv.)	VI	MTWThF	202F	Ar
		I	MWF	201F	Ar
20f	Oral and Written French..... (5 cred.; all; prereq., 4 or 3 yrs. high school French)	III	MTWFS	303F	Prof. Boyer
		VII	MTWThF	227F	Asst. Prof. Frelin
20s	Oral and Written French..... (See 20f)	I	MWThFS	204F	Ar
		III	MTWFS	226F	Ar
		VII	MTWThF	213F	Asst. Prof. Frelin
21f-22w-23s†	Survey of French Lit. (9 cred.; all; prereq., 3-4 or 20 or 4 yrs. high school French)	II	TThS	226F	Prof. LeCompte
		III	MWF	201F	Asst. Prof. Clefthon
24w-25s†	Survey of French Lit. (10 cred.; all; prereq., 3-4 or 20 or 4 yrs. high school French)	VII	MWF	201F	Prof. Searles
		III	MTWFS	303F	Mr. Owens
49f,w,s	French Pronunciation (3 cred.; all; prereq., 3-4 or 4 yrs. high school French)	VII	MTWThF	226F	Mr. Humiston
		VIII	MWF	207F	Mr. Owens
53f	French Composition (3 cred.; jr., sr.*; prereq., 3-4)	III	TThS	201F	Prof. Olmsted
		VI	MWF	201F	Mr. Borglum
54w-55s	French Conversation (4 cred.; jr., sr.*; prereq., 53 or 20)	III	TThS	201F	Prof. Olmsted
		VI	MWF	201F	Mr. Borglum
62w	Practical French Phonetics..... (3 cred.; jr., sr.*; prereq., 49)	VIII	MWF	203F	Miss Guinotte
63f	Adv. French Composition (3 cred.; jr., sr.*; prereq., 53 or 20 with a grade of B)	II	MWF	203F	Miss Guinotte
		VII	MWF	203F	Assoc. Prof. Barton
64w-65s	Adv. French Conversation (6 cred.; jr., sr.*; prereq. 54, 55 or 20 with a grade of B)	II	MWF	203F	Miss Guinotte
		VII	MWF	203F	Mr. Borglum
80f-81w-82s	French Lit.: 19th Century..... (9 cred.; jr., sr.*; prereq., 21-22-23 or 24-25)	IV	MWF	201F	Assoc. Prof. Barton
		VII	MWF	206F	Asst. Prof. Clefthon
100s	French Oral Diction..... (4 cred.; jr., sr., grad.; prereq., 62)	VIII	MTWF	203F	Miss Guinotte
103f-104w-105s†	French Syntax and Comp. (3 cred.; jr., sr., grad.; prereq., 63)	VI	F	217F	Assoc. Prof. Barton
115f	Fr. Lit.: 17th Cent.: Formation of Classic Ideal (4 cred.; jr., sr., grad.; prereq., 21-22-23, or 24-25)	IV	MTWF	205F	Prof. Searles

* Open without petition to sophomores who have an average of C in all their previous work and in the prerequisite courses.

† The entire course must be completed before credit is received for any quarter.

§ Students may enter any quarter. No student may receive credit for more than two quarters.

No.	Title	Hour	Day	Bldg.	Instructor
116w	Fr. Lit.: 17th Cent.: Molière, Racine, LaFontaine	IV	MTWF	205F	Prof. Searles
	(4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)				
117s	Fr. Lit.: 17th Cent.: Moral and Didactic Literature	IV	MTWF	205F	Prof. Searles
	(4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)				
118f-119w-120s	French Lit.: 18th Century	III	TThS	217F	Assoc. Prof. Sirich
	(9 cred.; jr., sr., grad.; prereq., 21-22-23, or 24-25)				
121f-122w-123s	French Lit.: 16th Century	III	MWF	203F	Prof. Searles
	(9 cred.; jr., sr., grad.; prereq., 80-81-82, or 115-116-117 or 118-119-120)				
145w-146s	Explication de Textes	VII	TTh	203F	Prof. Boyer
	(4 cred.; jr., sr., grad.; prereq., 80-81-82 or 115-116-117, or 118-119-120)				
150f-151w-152s	French Dramatic Lit.	III	TTh	203F	Prof. Olmsted
	(6 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)				
153s	Contemporary French Lyric Poetry	VI	MTWTh	217F	Prof. LeCompte
	(4 cred.; jr., sr., grad.; prereq., 20-21-22 or 24-25)				
157w	Modern French Novel	VI	MTWTh	217F	Prof. Boyer
	(4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)				
171f-172w-173s†	History of French Language	VIII	Th	203F	Prof. LeCompte
	(3 cred.; jr., sr., grad.; prereq., 63)				
174f-175w-176s	Contemp. French Novel and Drama: Lectures in French	IX	TTh	201F	Prof. Boyer
	(6 cred.; jr., sr., grad.; prereq., 53-54-55 (or 20); and 80-81-82)				

ITALIAN

NOTE.—Students may receive credit for Italian 1-2 in addition to one other beginning language.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Beginning Italian	IV	MTWFS	226F	Asst. Prof. Nissen
	(10 cred.; fr. with cert. of apt., soph., jr., sr.; no prereq.)				
3s	Intermediate Italian	IV	MTWFS	226F	Asst. Prof. Nissen
	(First qtr. of 3-4. 10 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., 1-2)				
4	<i>Intermediate Italian</i>	<i>Not offered</i>			
	(See 3s)				
70	<i>Survey of Italian Lit.</i>	<i>Not offered</i>			
	(3 cred.; jr., sr.*; prereq., 3-4‡)				
71w	Modern Poetry (Leopardi, Carducci)	II	TThS	217F	Asst. Prof. Nissen
	(3 cred.; jr., sr.*; prereq., 3-4‡)				

* Open without permission to sophomores with an average of C in all their previous work and in the prerequisite courses.

† The entire course must be completed before credit is received for any quarter.

‡ For students beginning Italian in the Senior College, 1-2 and permission of instructor.

PROGRAM

103

No.	Title	Hour	Day	Bldg.	Instructor
72f	Modern Drama (Giacosa, Bracco, Pirandello)	II	TThS	217F	Asst. Prof. Nissen
	(3 cred.; jr., sr.*; prereq., 3-4‡)				
73	Boccaccio	<i>Not offered</i>			
	(3 cred.; jr., sr.*; prereq., 3-4‡)				
74s	Petrarch	II	MWF	217F	Asst. Prof. Nissen
	(3 cred.; jr., sr.*; prereq., 3-4‡)				
159f-160w	Dante	II	MWF	217F	Asst. Prof. Nissen
	(6 cred.; jr., sr., grad.; prereq., one course above 50)				
161-162	<i>The Sixteenth Century</i>	<i>Not offered</i>			
	(6 cred.; jr., sr., grad.; prereq., one course above 50)				
164s	Dante (in English)	II	TThS	212F	Asst. Prof. Nissen
	(3 cred.; jr., sr., grad.; prereq., French 21-22-23 or 24-25, or 8 cred. in Eng. above 50)				

SPANISH

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†||	Beginning Spanish	I	MWThFS	226F	Ar
	(10 cred.; fr. with cert. of apt., soph., jr., sr.; no prereq.)	IV	MTWFS	125F	Ar
		VII	MTWThF	212F	Ar
1w-2s†||	Beginning Spanish	VII	MTWThF	227F	Ar
	(See 1f-2w)			(winter)	
		{ VII	MTThF	(spring)	
		{ V	W	(spring)	
1s†||	Beginning Spanish	II	MWThFS	201F	Ar
	(First qtr. of 1-2)				
2f	Beginning Spanish	III	MTWFS	202F	Ar
	(2nd qtr. of 1-2. See 1f-2w)				
3f-4w	Intermediate Spanish	II	MWThFS	201F	Ar
	(10 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., 1-2 or 2 yrs. high school Spanish)	VI	MTWThF	102F	Ar
3w-4s	Intermediate Spanish	III	MTWFS	202F	Ar
	(See 3f-4w)				
3s	Intermediate Spanish	I	MWThFS	226F	Ar
	(First qtr. of 3-4. See 3f-4w)	IV	MTWFS	125F	Ar
		{ VII	MTThF	212F	Ar
		{ V	W		
4f	Intermediate Spanish	II	MWThFS	202F	Ar
	(2nd qtr. of 3-4. See 3f-4w)	VI	MTWThF	227F	Ar
20s	Oral and Written Spanish	III	MTWFS	213F	Ar
	(5 cred.; all; prereq., 4, or 3 yrs. high school Spanish)				
30s	Spanish Commercial Correspondence	VII	MWF	209F	Mr. LeFort
	(3 cred.; all; prereq., 3)				
53f	Spanish Composition	II	MWF	304F	Ar
	(3 cred.; jr., sr.*; prereq., 3-4)				
54w-55s	Spanish Conversation	II	MWF	304F	Ar
	(4 cred.; jr., sr.*; prereq., 53 or 20)				
60f	Adv. Spanish Composition	VI	MWF	203F	Assoc. Prof. Arjona
	(3 cred.; jr., sr.*; prereq., 53 or 20 with grade of B)				

* Open without permission to sophomores with an average of C in all their previous work and in the prerequisite courses.

† The entire course must be completed before credit is received for any quarter.

‡ For students beginning Italian in the Senior College, 1-2 and permission of instructor.

|| Credit is usually not given for more than one beginning language. See paragraph 2, page 4.

No.	Title	Hour	Day	Bldg.	Instructor
61w-62s	Adv. Spanish Conversation..... (6 cred.; jr., sr.*; prereq., 54-55 or 20 with grade of B)	VI	MWF	203F	Assoc. Prof. Arjona
65f-66w-67s†	Survey of Spanish Lit. (9 cred.; jr., sr.*; prereq., 3-4)	II	TThS	302F	Mr. LeFort
68w-69s†	Survey of Spanish Lit. (10 cred.; jr., sr.*; prereq., 3-4)	VI	MTWThF	227F	Mr. LeFort
70w-71s	Latin American Culture and De- velopment	III	MWF	108F	Mr. LeFort
110f-111w-112s	Spanish Lit.: 19th Century..... (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	IV	MWF	108F	Assoc. Prof. Arjona
115-116-117	<i>Spanish Lit.: 17th Century.....</i> (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	<i>Not offered</i>			
141s	Modern Spanish Novel..... (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	VII	MTThF	102F	Ar
150	<i>Modern Spanish Drama.....</i> (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	<i>Not offered</i>			
156f-157w-158s	Spanish Lit.: 16th Century..... (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	II	TThS	305F	Assoc. Prof. Arjona
174f-175w-176s	Contemporary Spanish Literature: Lectures in Spanish	IX	TTh	202F	Assoc. Prof. Arjona
	(6 cred.; jr., sr., grad.; prereq., 20 (or 53-54-55) and 65-66-67)				

SCANDINAVIAN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w||	Beginning Norwegian	I	MWThFS	206F	Ar
	(10 cred.; fr. with cert. of apt., soph., jr., sr.; no prereq.)				
3s	Intermediate Norwegian	I	MWThFS	206F	Ar
	(5 cred.; fr. with cert. of apt., soph., jr., sr.; prereq., 1-2, or 1 yr. high school)				
4f-5w	Adv. Norwegian (Survey).....	III	MTWFS	206F	Ar
	(10 cred.; soph., jr., sr.; prereq., 1-2-3 or 2 yrs. high school)				
7f-8w||	Beginning Swedish	II	MWThFS	206F	Prof. Stomberg
	(10 cred.; all; no prereq.)				
9s	Intermediate Swedish	II	MWThFS	206F	Prof. Stomberg
	(5 cred.; all; prereq., 7-8 or 1 yr. high school)				
10f-11w	Adv. Swedish	I	MWThFS	110F	Prof. Stomberg
	(10 cred.; soph., jr., sr.; prereq., 7-8-9 or 2 yrs. high school)				
12s	Ancient and Medieval Scandina- vian History	I	MWThFS	110F	Prof. Stomberg
	(5 cred.; soph., jr., sr.; prereq., 10-11, or 4-5, or Hist. 1-2)				

* Open without permission to sophomores with an average of C in all of their previous work and in the prerequisite courses.

† The entire course must be completed before credit is received for any quarter.

|| Credit is usually not given for more than one beginning language. See paragraph 2, page 4.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
45s	Scandinavian Mythology	IV	MWF	206F	Prof. Stomberg
	(3 cred.; jr., sr.§; prereq., none)				
101f-102w-103s	Modern Norwegian Lit.	II	TThS	110F	Ar
	(9 cred.; jr., sr., grad.; prereq., 4-5)				
104f-105w	Mod. Scand. History	IV	MWF	206F	Prof. Stomberg
	(6 cred.; jr., sr., grad.; prereq., 10-11-12, or 4-5, or 15 cred. in hist.)				
107f-108w-109s	Modern Swedish Lit.	VI	MWF	206F	Prof. Stomberg
	(9 cred.; jr., sr., grad.; prereq., 10-11-12)				
110w	Ibsen	Ar	Ar	110F	Ar
	(3 cred.; sr., grad.; prereq., 101-102-103)				
111f-112w-113s	Old Norse (Icelandic)	Ar	Ar	Ar	Ar
	(6 cred.; sr., grad.; prereq., consent of instructor)				
114f	Strindberg	Ar	Ar	Ar	Prof. Stomberg
	(3 cred.; sr., grad.; prereq., 107-108-109)				
117s	Earlier Norwegian Lit.	III	MTWFS	206F	Ar
	(5 cred.; jr., sr., grad.; prereq., 4-5)				
130-131-132	<i>Danish Lit. of the 19th Century.</i>	<i>Not offered</i>			
	(9 cred.; jr., sr., grad.; prereq., 4-5)				
134-135	<i>The Landsmaal Movement.</i>	<i>Not offered</i>			
	(6 cred.; sr., grad.; prereq., 101-102-103, or 130-131-132)				
136s	Björnson	II	MWF	110F	Ar
	(3 cred.; sr., grad.; prereq., 101-102-103, or 130-131-132)				

SOCIOLOGY AND SOCIAL WORK

Major Advisers

Professors Chapin, Mudgett, Sorokin, Sutherland, and Willey.

Major Sequences

Prerequisites: A total of 25 credits from among the following departments: Sociology, Economics, Education, History, Philosophy, Political Science, Psychology, and Zoology. Students who are deficient in prerequisites may be required to make up their deficiencies in junior college courses.

Sequence A. General sociology. Courses 52 or 53 or 55; three of 100, 101, 102, 103; two of 116, 119, 158 or 160; two of 121, 122, 123; two of 120, 140, 141; 110 or 112 or 114.

Sequence B. Applied sociology. Courses 52, 53, 70; 55 or 60; 126 or 130; two of 128, 133, 134, 138, 139; two of 100, 101, 102, 103; two of 116, 119, 158 or 160; 120 or 122.

§ Does not count as a senior college course. Not open to sophomores. See Course Numbering, page 21.

Sequence C. Rural sociology. Courses as follows: two of 52, 53, 60; two of 100, 101, 102, 103; two of 116, 119, 158 or 160; 121 or 122; 120 or 140 or 141; 110, 112, 114.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Preparation for professional social work is provided in the Training Course for Social and Civic Work, described on pages 10 to 11 of this bulletin.

Honors Course

Students entering the Senior College in 1929-30 will be accepted for registration in the Honors Course if they have had at least two courses in this department, if their grades in this department have averaged B and in other departments C, and if they are approved by a committee of the department. Instead of following a regular major sequence, a student in the Honors Course will pursue a comprehensive plan of study adjusted to his particular interests and approved by the department. He will be assigned to a member of the department who will serve as his tutor, and with whom he will meet at stated times for consultation. The group of honors students will meet once a week with one or more members of the staff for group discussions. At the end of each year the honors student will be expected to pass a comprehensive examination upon his work.

In no case will less than five quarters of work in residence in the Senior College be accepted as satisfying the requirements of the Honors Course. The proportion of the student's time devoted to the Honors Course is limited and subject to approval by the department.

No.	Title	Hour	Day	Bldg.	Instructor
1f,w	Intro. to Sociology..... (5 cred.; soph., jr., sr., and 3d qtr. fr. with cert. of apt.; no prereq.)				
	Lect.	I	TTh	OLAud	Assoc. Prof.
	Sec. 1	I	MWF	4aOPh	Wiley
	2	III	MWF	104OPh	and others
	3	IV	MWF	109OPh	
	4	V	MWF	109OPh	
	5	VI	MWF	104OPh	
	6	VII	MWF	4aOPh	
	7	III	TThS	109OPh	
	(Univ. Farm, 3 cred.)	8	IV	MWF	*
1s	Intro. to Sociology..... (See 1f)				
	Lect.	I	TTh	OLAud	Assoc. Prof.
	Sec. 1	I	MWF	4aOPh	Wiley
	2	II	MWF	4aOPh	and others
	3	III	MWF	104OPh	
	4	IV	MWF	109OPh	
	5	V	MWF	109OPh	
	6	VI	MWF	109OPh	
	7	VII	MWF	104OPh	
	8	VII	MWF	109OPh	
	9	II	TThS	104OPh	
	10	III	TThS	109OPh	
	(Univ. Farm, 3 cred.)	11	IV	MWF	*

* Consult the bulletin of the College of Agriculture, Forestry, and Home Economics.

PROGRAM

107

No.	Title	Hour	Day	Bldg.	Instructor
6f,w	Social Interaction				
	(3 cred.; soph., jr., sr.; prereq., 1)				
	Lect.	II	WF	OPhAud(f), OLAud(w)	
	Sec. 1	I	T	4aOPh	
	2	II	M	2cOPh	
6s	Social Interaction				
	(Sec 6f)				
	Lect.	III	MF	OPhAud	
	Sec. 1	III	T	104OPh	
14f,w,s	Rural Sociology				
	(3 cred.; soph., jr., sr.; prereq., 1)				
	Lect.	IV	MW	OPhAud	Prof. Sorokin, Assoc. Prof. Zimmerman, and others
	Sec. 1	III	S	2cOPh	
	2	IV	F	2cOPh	
3	VI	Th	109OPh		
4	VI	F	2cOPh		
45f,w	Social Statistics	VII	MTWThF	109OPh	Prof. Chapin
49f,w,s	The Occurrence of the Socially Inadequate	I	MWF	109OPh	Ar
	(3 cred.; 3d qtr. soph., jr., sr.; prereq., 10 cred. in soc. or Soc. 1 and 10 cred. in soc. sci. or psy.)				
52f,w,s	Elem. Case Work.....	I	TThS	109OPh	Ar
53f,w,s	Elem. of Criminology	III	MWF	109OPh	Prof. Sutherland, Mr. Vold
	(3 cred.; jr., sr.; prereq., same as for 49)				
55w	Housing Problems	I	MWF	9F	Miss Salsberry
60f,w	Social Protection of the Child...	VI	MWF	109OPh	Mrs. Doyle
	(3 cred.; jr., sr.; prereq., 49 and 52)				
70f,w	Group Work in the Community	I	MWF	2cOPh	Miss Mead
71f,w	Elementary Field Training in Group Work	Ar	Ar	Ar	Asst. Prof. Mudgett, Miss Jones
	(2 cred.; jr., sr.; prereq., 49, 70, or simultaneously)				

No.	Title	Hour	Day	Bldg.	Instructor
90f,w,s-91f,w,s- 92f,w,s	Elementary Field Training in Case Work				
	(2 cred. each qtr.; jr., sr.; pre- req., 49, and 52 simultaneously with 90)				
	(Fall)	Sec. 1	I, II, III	MW	Asst. Prof.
		2	I, II, III	WF	Mudgett,
		3	VI, VII, VIII	MW	Mrs. Fen-
		4	VI, VII, VIII	WF	lason
	(Winter)	Sec. 1	II, III, IV	MW	Asst. Prof.
		2	II, III, IV	WF	Mudgett,
		3	VI, VII, VIII	MW	Mrs. Fen-
		4	VI, VII, VIII	WF	lason
	(Spring)	Sec. 1	VI, VII, VIII	MW	Asst. Prof.
		2	VI, VII, VIII	WF	Mudgett,
		3	II, III, IV	TTh	Mrs. Fen-
		4	VI, VII, VIII	TTh	lason
100f	Social Psychology	II	TThS	109OPh	Prof. Chapin
	(3 cred.; primarily for sociology students: jr., sr., grad.; prereq., Soc. 1, Psy. 1-2, and 11 cred. in soc. sci., educ., phil., and psy.)				
101W	Social Organization	II	TThS	109OPh	Prof. Sorokin
	(3 cred.; jr., sr., grad.; prereq., 4 courses in soc., or Soc. 1 and 15 cred. in soc. sci., educ., phil., or psy.)				
102S	Social Control	II	MWF	109OPh	Assoc. Prof. Willey
	(3 cred.; jr., sr., grad.; prereq., same as for 101)				
103S	Sociology of Conflict.....	II	MWF	2cOPh	Prof. Sutherland
	(3 cred.; jr., sr., grad.; prereq., same as for 101)				
110f	Rural Organization	V	MWF	104OPh	Assoc. Prof. Zimmer- man
	(3 cred.; jr., sr., grad.; prereq., same as for 101)				
112W	The Rural Social Survey.....	V	MW	104OPh	Assoc. Prof. Zimmer- man
	(2 cred.; jr., sr., grad.; prereq., same as for 101)				
114S	Rural Social Institutions.....	I	MWF	*	Asst. Prof. Lundquist
	(3 cred.; jr., sr., grad.; prereq., same as for 101)				
116W	The Newspaper As a Social In- stitution	IV	MWF	104OPh	Assoc. Prof. Willey
	(3 cred.; jr., sr., grad.; prereq., same as for 101)				
119f	The Family	III	TThS	104OPh	Prof. Sutherland
	(3 cred.; jr., sr., grad.; prereq., same as for 101)				
120f	Social Progress	II	MWF	109OPh	Prof. Wallis
	(3 cred.; jr., sr., grad.; prereq., same as for 101)				

* Consult the bulletin of the College of Agriculture, Forestry, and Home Economics.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
121W	Advanced Statistical Methods... (3 cred.; jr., sr., grad.; prereq., 4 courses in soc., including 45 or its equivalent)	VII	MWF	2cOPh	Prof. Chapin
122W-123S	Methods of Social Investigation.. (6 cred.; jr., sr., grad.; prereq., same as for 101)	VIII	MWF	109OPh	Prof. Sutherland
126S	Technique of Leadership in Group Work	I	TThS	104OPh	Miss Mead
	(3 cred.; sr., grad.; prereq., 70, 71)				
128S	Principles of Administration Ap- plied to Social Work.....	VIII, IX	Th	109OPh	Mr. Bradley
	(2 cred.; jr., sr., grad.; prereq., same as for 101)				
130S	Advanced Case Work.....	VIII, IX	T	109OPh	
	(2 cred.; jr., sr., grad.; prereq., same as for 101 incl. 49 and 52)				
132	<i>Juvenile Courts and Probation...</i> (2 cred.; jr., sr., grad.; prereq., 49, 52, 53)	<i>Not offered</i>			
133f	Social Case Work in Health Problems	III, IV and ar	S and ar	4aOPh	Asst. Prof. Gardiner
	(3 cred.; sr., grad.; prereq., 52, 90, 91 and Prev. Med. 50, or 53, or simultaneously)				
134S	Legal Protection of the Child... (3 cred.; jr., sr., grad.; prereq., same as for 101 incl. 60)	I	MWF	2cOPh	Mr. Waite
135S	Field Practice in Legal Protection of the Child.....	Ar	Ar	Ar	Asst. Prof. Mudgett
	(2 cred.; jr., sr., grad.; prereq., 90, open to students taking 134)				
138W-139S	Mental Case Work.....	III, IV	S and ar	104OPh	Miss Leahy
	(6 cred.; sr., grad.; prereq., 52, 90, 91 and Psy. 144-145, or Prev. Med. 61, or simultane- ously)				
140W	History of Social Theory..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	109OPh	Prof. Sorokin
141S	Contemp. Social Theorv..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	TThS	109OPh	Prof. Sorokin
152	<i>Seminar: Problems of Institu- tional Administration</i> (2 cred.; sr., grad.; prereq., con- sent of director)	<i>Not offered</i>			
153f,w,s-154f,w,s- 155f,w,s	Advanced Field Training in Group or Case Work.....	Ar	Ar	Ar	Asst. Prof. Mudgett, Miss Jones
	(3 cred. per qtr.; jr., sr., grad.; prereq., 90 and 91)				
158	<i>The Sociology of Revolution...</i> (3 cred.; jr., sr., grad.; prereq., same as for 101)	<i>Not offered</i>			
160f	Population Problems	III	MWF	4aOPh	Prof. Sorokin
	(3 cred.; jr., sr., grad.; prereq., 4 courses in soc., or Soc. 1 and 15 cred. in soc. sci., ed., phil. or psy.)				

SPEECH

Major Advisers

Professor Rarig; Assistant Professor Bryngelson.

Major Sequences

Prerequisites: 41-42-43 or 45-46; Psychology 1-2. Human Physiology 4 is recommended for Sequence C.

A. Course 55-56-57; 61; 67; 71-72-73; 81-82-83.

B. Courses 71-72-73; 81-82-83; 91-92-93; 105; 55-56 or 101-102.

C. Courses 61; 67; 121-122; 162-163; Psychology 114-115 or 125-126 and 144-145.

No.	Title	Hour	Day	Bldg.	Instructor
41f-42w†-43s*	Fundamentals of Speech (9 cred.; soph., jr., sr.; prereq., Eng. A-B-C or Comp. 4-5-6 or exemption)				Prof. Rarig and others
	Sec. 1	I	MWF	308F	
	2	II	MwF	308F	
	3	VI	MW	308F	
	4	I	TTh	311F	
	5	II	TThS	308F	
	6	III	TThS	308F	
41w-42s†*	Fundamentals of Speech (See 41f-42w-43s)	II	MWF	311F	
43f*	Fundamentals of Speech (3d qtr. of 41-42-43. See 41f- 42w-43s)	II	MWF	306F	
45f-46w*	Fundamentals of Speech (10 cred.; soph., jr., sr.; prereq., Eng. A-B-C or Comp. 4-5-6 or exemption)				
	Sec. 1	III	MTWFS	402F	
	2	IV	MTWF	402F	
	3	VI	MTWThl	402F	
	4	VII	MTWThF	308F	
	5	VIII	MTWThF	308F	
45w-46s*	Fundamentals of Speech (See 45f-46w)				
	Sec. 1	IV	MTWFS	102F	
	2	VI	MTWThF	6F	
45s*	Fundamentals of Speech (First qtr. of 45-46. See 45f- 46w)				
	Sec. 1	III	MTWFS	5F	
	2	IV	MTWFS	6F	
	3	VI	MTWThF	125F	
	4	VII	MTWThF	308F	
46f*	Fundamentals of Speech (2nd qtr. of 45-46. See 45f- 46w)				
	Sec. 1	IV	MTWFS	6F	
	2	VI	MTWThF	6F	

* Students taking these courses are required to pay a laboratory fee of \$1 each quarter.

† Two quarters must be completed before credit is received for either quarter.

PROGRAM

III

No.	Title	Hour	Day	Bldg.	Instructor
51S*	Advanced Public Speaking..... (3 cred.; jr., sr.; prereq., 41-42-43 or 45-46)	II	MWF	212F	Ar
55f-56w-57s†*	Arg. and Debating (9 cred.; jr., sr.; prereq., 41-42-43 or 45-46)	{ VII VII, VIII	T Th }	OLAud	Ar
61f	Speech Correction (4 cred.; jr., sr.; prereq., 41-42-43 or 45-46; Psy. 1-2)	VI	MTThF	306F	Asst Prof. Bryngelson
67S*	Phonetics (3 cred.; jr., sr.; prereq., 41-42-43 or 45-46)	IV	MWF	402F	Asst. Prof. Bryngelson
71f-72w-73S*	Elements of Play Production... (9 cred.; jr., sr.; prereq., 41-42-43 or 45-46)	III	MWF	19Mu	Mr. Stadt
81f-82w-83S*	Interpretative Reading (9 cred.; jr., sr.; prereq., 41-42-43 or 45-46)				
	Sec. 1	IV	MWF	308F	Prof. Rarig
	2	I	TThS	308F	Prof. Rarig
91f-92w-93S*	Stagecraft and Direction..... (9 cred.; jr., sr.; prereq., 71-72-73, 81-82-83, Eng. 55-56)	VII	MWF	19Mu	Mr. Stadt
97f,w,s	Intercollegiate Oratory and Debate (3 cred.; jr., sr.; prereq.§)	Ar	Ar	308F	Prof. Rarig
101f-102w†	Advanced Speech Composition... (6 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46; Psy. 1-2; 10 cred. soc. sci)	III	MWF	308F	Prof. Rarig
105S	Theory of Reading and Acting (3 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46; 81-82-83, and Psy. 1-2)	III	MWF	308F	Prof. Rarig
121f-122w†*	Advanced Speech Problems..... (6 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46, Psy. 1-2)	III	TThS	409F	Prof. Rarig, Mr. Holmes
141f-142w-143S*	Introduction to Laboratory Research (9 cred.; jr., sr., grad.; prereq., 41-42-43, Psy. 1-2 and 4-5 or 7)	Ar	Ar	Ar	Ar
162w-163S†*	Advanced Speech Correction... (6 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46; 61; 67; Psy. 1-2)	Ar	Ar	Ar	Asst. Prof. Bryngelson

* Students taking these courses are required to pay a laboratory fee of \$1 each quarter.

† The entire course must be completed before credit is received for any quarter.

‡ Speech Clinic. A service clinic is conducted for university students who have particular speech defects, whether or not registered in courses in Speech. 410F. Mr. Bryngelson.

§ Open to the representative of the University in the Northern Oratoric League and to members of the intercollegiate debate squad.

ZOOLOGY

Major Advisers

Professors Riley, Chapman, and Wodsedalek; Associate Professor Minnich; Assistant Professors Johnson, Mickel, and Ringoen.

Major Sequences

Prerequisites: 1-2 or equivalent, and one each of the alternatives 21 or 22, 23 or 24, and 25 or 26. If possible beginning chemistry and at least one year of French or German should be completed during the junior college work.

A. In Zoology, Courses 109-110-111 or 117-118-119; 107, 125-126 or 144-145; 148-149; 181-182; 183.

B. In special fields, such as ecology, embryology, entomology, experimental zoology, hematology, histology, parasitology, or protozoology, a major will consist of the respective one hundred course, five or more credits in a problem course in the special field, and additional credits in approved courses to make a total of 27 credits in senior college courses.

Honors Course in Zoology.—A student who has met all of the requirements for admission to the Senior College and who has maintained a grade of B in his work in the department may enroll for the Honors Course in Zoology. Such a student will carry at least twelve hours of problem work in some special phase of the work and will pursue under the direction of his adviser such special reading and outlined courses as may be required. The completion of the Honors Course will require a reading knowledge of either French or German.

Courses in human anatomy and embryology may be arranged for with the head of the Department of Anatomy.

Courses in general and human physiology may be arranged for with Dean Lyon.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

No.	Title	Hour	Day	Bldg.	Instructor Assoc. Prof.
1f-2w†	General Zoology (10 cred.; fr. with cert. of apt., soph., jr., sr.; no prereq.)				Minnich
	Lab. Sec. 1	III, IV	MWF	101Z	
	(Limit, 160) Lect.	III	TThS		
		IV	T	313Z	
	Lab. 2	VI, VII	MWF	101Z	
	(Limit, 160) Lect.	VI, VII	TTh	313Z	
1w-2s†	General Zoology (See 1f-2w)				Ar
	Lab. Sec. 1	I, II	MWF	101Z	
	Lect.	I	T		
		II	TThS	313Z	
1s†	General Zoology (First qtr. of 1-2. See 1f-2w)				
	Lab.	VI, VII, VIII	WF	101Z	Ar
	Lect.	VI, VII	MTh	313Z	

† The entire course must be completed before credit is received for any quarter.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
5f-6w-7sf	General Zoology (12 cred.; pre-medical and pre-dental students, fr. with cert. of apt., soph., jr., sr.; no prereq.)				
	Lab. Sec. 1	I, II	ThS	101Z	Asst. Prof. Ringoe
	(Pre-dental) Lect.	I	MWF	313Z	
	Lab. 2	III, IV	TS	101Z	
	(Pre-medical) Lect.	IV	MWF	313Z	
	(Spring) Lab.	III, IV	WF	101Z	
	Lect.	IV	MTS	313Z	
8f-9w	Survey Course (6 cred.; all; no prereq.)	III	MWF	313Z	Ar
14f-15w-16sf	General Zoology (9 cred.; Agr., For.; no prereq.)	See College of Agriculture bulletin.			
17f-18wf	General Zoology (6 cred.; H.E.; no prereq.)	See College of Agriculture bulletin.			
21sf	Introd. to General Physiology... (5 cred.; fr., soph., jr., sr.; prereq. 1-2, chem. or phys. desirable)	VI, VII, VIII	MW	10Z	Assoc. Prof. Minnich
		VI, VII, VIII, IX	F		
22s	General Ecology (5 cred.; fr., soph., jr., sr.; prereq., 1-2)	VI, VII, VIII	MW	211Z, 401Z	Prof. Chapman
		VI, VII, VIII, IX	F		
23f	Introd. Entomology (5 cred.; soph., jr., sr.; prereq. 1-2)				
	Lect.	VI	MWF	211Z	Asst. Prof. Mickel
	Lab.	VI, VII, VIII	TTh	208Z	
24f	Introd. Animal Parasitology.... (5 cred.; soph., jr., sr.; prereq. 1-2)	VI, VII, VIII	MWF	208Z	Prof. Riley
25w	Histology (5 cred.; soph., jr., sr.; prereq. 1-2 and permission of the head of the dept.)	VI, VII, VIII	MWF	201, 211Z	Asst. Prof. Ringoe
26w	Comp. Anatomy (5 cred.; soph., jr., sr.; prereq. 1-2)	III, IV	MTWFS	01Z	Asst. Prof. Johnson
27w	Technique (3 cred.; stud. in zool.; major and grad.; prereq., 20 cred.)				
	Lect.	V	Th	211Z	Miss Slider
	Lab.	Ar	Ar	213Z	
37f-38w-39sf	General Entomology (9 cred.; soph., jr., sr.; prereq. 1-2)	I, II	MWF	208Z	Asst. Prof. Mickel
46w-47sf	Ornithology (6 cred.; soph., jr., sr.; prereq. 1-2 and permission of instructor)	VI, VII, VIII	MW	314Z	Prof. Roberts
75s	Nature Study (3 cred.; jr., sr.; prereq., 20 cred. incl. 1-2)	VI, VII, VIII	TTh	213Z	Ar

† The entire course must be completed before credit is received for any quarter.

‡ Not open to pre-medical students or to those who have had college physiology.

No.	Title	Hour	Day	Bldg.	Instructor
107f	Protozoology (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1-2)		Ar	Ar	Ar
109f-110W-111S	Experimental Zoology (9 cred.; jr., sr., grad.; prereq., 20 cred.)	IV	MWF	10Z	Assoc. Prof. Minnich
117W-118S-119Su	Ecology of Insects..... (9 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1-2)	VI, VII, VIII	TTh	401Z	Prof. Chapman
120su	Advanced Ecology (5 cred.; jr., sr., grad.; prereq., 117-118-119)	Ar	Ar	Ar	Ar
125f-126W-127S	Advanced Entomology (9 cred.; jr., sr., grad.; prereq., 1-2 and 37-38-39)	Ar	Ar	208Z	Asst. Prof. Mickel
139f-140W	Histol. and Develop. of Insects (6 cred.; jr., sr., grad.; prereq., 1-2 and 37-38-39)	I, II and ar	TTh	208Z	Prof. Riley
144f,8-145W-146S	Animal Parasites and Parasitism (9 cred.; jr., sr., grad.; prereq., 15 cred. in zool., or 1-2 and 1 yr. chem.)	VI, VII, VIII	WF	208Z	Prof. Riley
148f-149W-150s†	Histology and Organology..... (9 cred.; jr., sr., grad.; prereq., 1-2, and 15 cred. in zool., or 1-2 and 1 yr. chem. and per- mission of head of dept.)	III, IV	MWF	201,211Z	Asst. Prof. Ringoen
181f-182W	Embryology (6 cred.; jr., sr., grad.; prereq., 1-2 and 25, or equiv.)	VI, VII, VIII	TTh	202Z	Asst. Prof. Ringoen
183s	Genetics and Eugenics..... (3 cred.; jr., sr., grad.; prereq., 1-2 and 5 other cred. in zool. or botany)	IV V	TS Th	211Z	Prof. Wodsedalek
197f-198W-199S	Problems (5 or more cred.; jr., sr., grad.; prereq., 1-2 and special require- ments)	Ar	Ar	Ar	Ar

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Students in this college may elect courses in Entomology and Economic Zoology by arrangement with the department. See program of the College of Agriculture, Forestry, and Home Economics.

COURSES IN OTHER COLLEGES

Certain courses in other colleges are open to election by seniors, according to General Information, Section 42 (Part I of this bulletin). Students interested in such courses may consult the assistant dean for the Senior College.

† The entire course must be completed before credit is received for any quarter.

INDEX

	Pages		Pages
Abbreviations	22	Eighteen hours, registration for. See Part I	
Absences	See Part I	English	44
Admission	See Part I	Entomology and Economic Zo- ology	114
Advanced standing.....	See Part I	Excuses	See Part I
Afternoon work	See Part I	Explanations	21
Agricultural Biochemistry	34	Extension courses	See Part I
Anatomy, Human	69	Faculty	See Part I
Anthropology	22	Failure, rules governing	See Part I
Architecture	23	Fees	See Part I
Architecture, six-year course in		Fine Arts	50
Arts and	18	French	99
Astronomy	25	General course leading to a B.A. degree	4
Auditors	See Part I	General information....	See Part I
Bachelor of arts		General regulations....	See Part I
general course leading to.....	4	Geography	50
special course leading to	8	Geology and Mineralogy.....	52
Bachelor of science, special courses		German	56
leading to	9	Grades	See Part I
Bacteriology	25	Graduate School, credit in.....	8
Biochemistry, Agricultural	34	Graduation honors	7
Botany	26	Greek	59
Buildings	22	History	60
Bureau for Research and Govern- ment	92	Home Economics	66
Business Administration, pre-business course	11	Honor points	See Part I
Certificate of aptitude.....	5, n	Honors, graduation	7
Chemistry	29	Honors course plan.....	6
Child Welfare	34	Hospital Library Service, course in	9
Classification of courses	4	How to Study	68
Combined arts and professional courses	16-20	Human Anatomy	69
Comparative Literature	35	Human Physiology	69
Comparative Philology	35	Interior Architecture, course pre- liminary to	14
Composition	48	Italian	102
Correspondence and Extension courses	See Part I	Journalism	70
Course numbers	21	Junior and Senior colleges.....	5, 6
Courses in other colleges	114	Latin	73
Courses of study.....	3	Law, six-year course in	
Credits and honor points	See Part I	Arts and	19
Dentistry, pre-dental course.....	12	pre-legal course	15
Description of courses	See Part I	Library, Hospital Library Service, course in	9
Diplomatic and Consular Service, course in training for.....	92	Library Methods	75
Directory, Department offices.....	21	Library Training	9
Drawing and Descriptive Geom- etry	36	Mathematics	76
Economics	36	Mechanical Engineering	78
Education, College of		Medical Technicians, course for....	9
preliminary course	12		

	Pages		Pages
Medicine,		Pre-Pharmacy	15
Arts and	19	Preventive Medicine and Public	
Science and	16	Health	95
Military Science and Tactics.....	79	Program of courses.....	22
credit for advanced.....	15	Psychology	97
requirements	3, 6	Public Health, Preventive Medi-	
special course for students of..	15	cine and	95
Mineralogy, Geology and.....	52	Public Health Training, course in	10
Music	79		
general course with major in...	80	Quality credits.....	See Part I
in extension	See Part I	Residence requirement..	See Part I
Nursing, five-year course in Arts		Romance Languages.....	99
and	20	Scandinavian	104
Orientation	82	Senior College	
Philosophy	82	admission to	5, 6
Physical Education		requirements	6
for Men	84	Shop Practice. <i>See</i> Mechanical	
Physical Education		Engineering.	
for Women	85	Social and Civic Work, course in..	10
fees	85	Sociology	105
Physical Education		Spanish	103
requirements	3, 6, 84, 85	Special courses leading to the de-	
Physics	88	gree of bachelor of arts.....	8
Physiology, Human	69	Special courses leading to the de-	
Plant Pathology and Botany.....	29	gree of bachelor of science....	9
Political Science	91	Speech	110
Pre-Business course	11	Subjects in other colleges, elec-	
Pre-Dental course	12	tion of	114
Pre-Legal course	15	Zoology	112
Pre-Medical course	16		

The Bulletin
of the University of
Minnesota

Institute of Child Welfare
Announcement for the Years
1929 - 1931



Vol. XXXII No. 51 September 3 1929.

*Entered at the post-office in Minneapolis as second-class matter
Minneapolis, Minnesota*

*Accepted for mailing at special rate of postage provided for in section 1103,
Act of October 3, 1917, authorized July 12, 1918*

CONTENTS

	Page
Staff and members of co-operating departments	3-4
General information	5
Courses of study offered by institute	6-9
List of courses in the general field offered by other departments	9-10
Curriculum in nursery school and kindergarten education	10-11
Summer school	12
Graduate work	12
Opportunities for research	12
Research assistants	12
Parent education	13-14
Study groups	13
Agricultural extension	13
Extension courses	13
Correspondence courses	14

FACULTY
ADMINISTRATION

Lotus Delta Coffman, Ph.D., LL.D., President
William Watts Folwell, M.A., LL.D., President Emeritus

INSTITUTE OF CHILD WELFARE

John E. Anderson, Ph.D., Professor of Psychology and Director of the
Institute of Child Welfare
Josephine C. Foster, Ph.D., Associate Professor and Principal of the
Nursery School and Experimental Kindergarten
Florence L. Goodenough, Ph.D., Research Associate Professor in Child
Welfare and Psychologist
Esther McGinnis, Ph.D., Associate Professor in charge of Parental
Education
Edith Boyd, M.D., Assistant Professor in charge of Infant Studies
Marion L. Faegre, B.A., Assistant Professor of Parental Education
Lawrence F. Richdorf, M.D., Ph.D., Assistant Professor of Pediatrics and
Medical Assistant
Mary M. Shirley, Ph.D., Assistant Professor of Infant Studies
Louise Beth Wilson, B.S., Assistant Professor of Parental Education in
charge of Duluth Center
Alice M. Leahy, M.A., Lecturer in Sociology, in charge of Investigations
of Foster Children
Belle O. Fish, M.S., Extension Specialist in Child Development, Agricul-
tural Extension Division
M. Adelia Boynton, Ph.B., Instructor and Teacher in the Nursery School
Robert C. Challman, M.A., Research Instructor in Parental Education
Pearl T. Cummings, B.S., Instructor in Parental Education
Neith E. Headley, M.A., Instructor and Teacher in the Kindergarten
Adelaide F. Lackey, B.S., Instructor in Parental Education
Robert L. Wilder, M.D., Instructor in Pediatrics
Esther S. Dahlstrom, Teacher in the Kindergarten
Florence M. Pitman, B.S., Teacher in the Nursery School
Margaret W. Richie, B.S., Teacher in the Nursery School
Marion E. Seeley, B.S., Teacher in the Kindergarten
Joseph T. Cohen, D.D.S., Dental Assistant
Dagny Ingebritson, Nurse in the Nursery School
Marjorie R. Armstrong, M.A., Psychometric Assistant
Jean R. Kirk, B.A., Editorial Assistant
Helen Lee Bennett, Research Assistant
Josephine A. Conger, B.A., Research Assistant
Edith A. Davis, M.A., Research Assistant
Ruby C. Glockler, M.A., Research Assistant
Elmer M. Hauge, B.S., Research Assistant

Victor G. Haury, B.A., Research Assistant
 Amanda Herring, M.A., Research Assistant
 Marguerita Hurwitz, B.A., Research Assistant
 Ruth Kaplan, B.S., Teaching Assistant in Nursery School
 Barbara Marx, M.A., Research Assistant
 Phillip J. Rulon, M.A., Research Assistant
 Gayle Shirey, B.A., Research Assistant
 Walter J. Siemen, M.D., Research Assistant
 Randolph B. Smith, M.A., Research Assistant
 J. Roderic Springob, B.A., Research Assistant
 M. Rebecca Whitaker, B.S., Nutrition Assistant
 Ella M. Wieg, Ph.M., Research Assistant
 Agnes E. Halvorset, B.A., Technical Assistant
 Bess James, Technical Assistant
 Dorothy E. Kuenzel, Technical Assistant
 Donovan Lawrence, Technical Assistant
 Ruth Johnson, Technical Assistant

MEMBERS OF OTHER DEPARTMENTS CO-OPERATING WITH THE
INSTITUTE OF CHILD WELFARE

Melvin E. Haggerty, Ph.D., Dean of the College of Education, Professor
 of Educational Psychology, and Director of the Psycho-Educational
 Clinic
 James C. Lawrence, B.A., Assistant to the President
 Harlow C. Richardson, B.A., Assistant Professor of English and Associate
 Director of the Summer Session
 Frank W. Peck, M.S., Professor of Farm Management and Director of
 Agricultural Extension
 Richard R. Price, Ed.D., Director of University Extension
 Richard M. Elliott, Ph.D., Professor of Psychology and Chairman of the
 Department of Psychology
 Arthur S. Hamilton, B.S., M.D., Professor of Nervous and Mental Diseases
 Wylie B. McNeal, M.A., Professor of Home Economics and Chief of the
 Division of Home Economics
 Richard E. Scammon, Ph.D., Professor of Anatomy
 Frederic W. Schlutz, B.A., M.D., Professor of Pediatrics and Chief of
 the Department of Pediatrics
 Malcolm M. Willey, Ph.D., Professor of Sociology, Acting Head of the
 Department of Sociology
 Edna F. Heidbreder, Ph.D., Associate Professor of Psychology
 Julia O. Newton, B.A., Associate Professor of Home Economics and State
 Leader, Home Economics Extension
 Eula B. Butzerin, R.N., B.S., Assistant Professor of Preventive Medicine
 and Public Health
 Jane M. Leichsenring, Ph.D., Assistant Professor of Home Economics
 John G. Rockwell, B.A., Assistant Professor of Educational Psychology
 Iva I. Sell, M.A., Instructor in Home Economics

GENERAL INFORMATION

The Institute of Child Welfare was organized at the University of Minnesota in July, 1925, for the purpose of making scientific studies of the development of the child, training future workers in the field of child welfare, and bringing to parents through an extension program the information accumulated in its own and other research centers.

The institute is organized as a separate division of the University co-operating with the schools, colleges, and departments of the University which are carrying on work related to its program. Among these departments are: Anatomy, Education, Home Economics, Pediatrics, Psychology, Nervous and Mental Diseases, Public Health Nursing, and Sociology. The institute also co-operates with the General Extension Division and with the Agricultural Extension Division of the University.

As part of its activities, the institute maintains a Nursery School of thirty-six children aged two, three, and four years, which is in session from nine in the morning until four in the afternoon five days a week. The group is made up of normal, healthy children forming as nearly as possible a cross section of the population of the city. Selection is based upon the physical and mental examinations of the child, relative nearness of the home, and on the occupation of the father.

The Nursery School fulfills several functions. It is, first of all, a place in which children receive excellent care and informal instruction of a type suited to their stage of development. In the second place, the Nursery School provides opportunity for a considerable number of varied researches on small children under ideal conditions. Through periodic physical and mental examination, careful records of the behavior of each child, and studies of the relationship of the child to his environment, a wealth of information is being obtained. In the third place, the Nursery School is a demonstration center for good technique in handling young children. Advanced students are given the opportunity of actual contact with the children.

The institute also maintains an experimental Kindergarten in which 50 children are enrolled, 25 in the morning session and 25 in the afternoon session. Opportunities for observation and practice teaching are provided in the Kindergarten.

In addition to the children of the Nursery School and Kindergarten a considerable number of young children are being studied under home conditions. Studies on the physical and mental development of infants from birth to two years of age are being carried on both in private homes and in institutions.

COURSES OF STUDY

The institute aims to develop its instructional program to supplement and round out the courses already offered in other departments and colleges rather than to duplicate courses now in existence. The following courses which have been accepted for credit in the College of Agriculture, Forestry, and Home Economics, in the College of Science, Literature, and the Arts, and in the College of Education, and whenever marked for graduate credit in the Graduate School, are now offered by the institute.

DESCRIPTION OF COURSES

- C.W.40*w. Child Training. A study of the physical and mental development of the child followed by a discussion of the problems of the home training of young children. Lectures, recitations, and reports. (3 cred.; jr., sr.; prereq., Psy. 1-2; MW and one hr. ar.; 202OLa.) Mrs. Foster.
- C.W.60f. Modern Aspects of Child Study. A survey of the background and present scope of modern child study in its various aspects, such as nursery schools and parental education, child health and mental hygiene, the kindergarten and Montessori movements, and the development of research organizations. (2 cred.; jr., sr.; prereq., 6 cred. in psychology and 5 cred. in social sciences; TTh VI; 202OLa.) Miss McGinnis.
- C.W.80f. Child Psychology. A survey of child development with special reference to nursery school and kindergarten education. (3 cred.; jr., sr.; prereq., Psy. 1-2; MWF I; 202OLa.) Mr. Anderson.
- C.W.90f. Physical Development of the Young Child. The physical growth and development of the young child in its anatomical, physiological, and functional aspects. (2 cred.; jr., sr.; prereq., Zool. 1-2, Psy. 1-2; T V and one hr. ar.; 202OLa.) Miss Boyd.
- C.W.120s. Health Care of the Young Child. A course in the physical care, illnesses, prevention of disease, and health problems of the young child. Primarily for those who have charge of groups of children, and for workers in parental education. With the co-operation of the Department of Pediatrics. (2 cred.; sr., grad.; open to graduate students and to seniors in the curriculum in nursery school education; T V and 1 hr. ar.; 202OLa.) Miss Boyd.
- C.W.130s. The Development of the Young Child. An advanced course dealing with the development of the preschool child from the anatomical, physiological, psychological, educational, and social aspects. Lectures, readings in the experimental literature, and reports. (3 cred.; sr., grad.; prereq., 12 cred. in child welfare or psychology or equivalent, and permission of instructor; TThS I; 202OLa.) Mr. Anderson.
- C.W.133f,134w,†135s. Observational and Experimental Methods in the Study of the Development of the Young Child. A study of the various methods and techniques such as growth records, mental tests, ratings, controlled observations, etc., used in the experimental study of the young child. Practical exercises and problems on institute records and data. (6 or 9 cred.; sr., grad.; prereq., 10 cred. in psy. or ed. psy. incl. Psy. 4-5 or 7 and Ed. Psy. 60; M VI, WF VI-VII; 202OLa.) Miss Goodenough.
- C.W.170f. Parental Education in Child Care and Training. A consideration of the content and methods used in courses and study groups for

* Offered in fall and spring quarters as Home Economics Education 40. Consult bulletin of the College of Agriculture, Forestry, and Home Economics.

† Two quarters must be completed before credit is received for any quarter.

- parents in the care and training of young children. Lectures, discussions, and reports. (3 cred.; sr., grad.; prereq., 8 cred. in C.W., or H.E. 34, 35, and 44, or 15 cred. in education, or psychology, or sociology, or preventive medicine; MWF IV; 202OLa.) Miss McGinnis.
- C.W.173w-174s.† Technique and Practice of Parental Education. Field work in the technique of organizing and conducting parental study groups and courses for the study of the young child. (6 cred.; sr., grad.; prereq., C.W. 170 and permission of instructor; hrs. ar.) Miss McGinnis.
- C.W.190w-191s.† Mental Examination of Preschool Children. A study of the methods used in testing young children together with practice in such testing. (2 or 4 cred.; sr., grad.; prereq., Ed. Psy. 143-144-145 or 134-135-136, or equivalent, and permission of instructor; TTh II; 202OLa.) Miss Goodenough.
- C.W.230f-231w-232s. Seminar in the Development of the Young Child. Reviews of current literature, discussion of fundamental problems, and reports on research. Meetings in alternate weeks. (3 cred.; graduate students only. Permission of instructor; W 7:30-9:30 p.m.; 202OLa.) Mr. Anderson.
- C.W.233-234-235. Research in the Development of the Young Child. (Cred. ar.; grad. students only; hrs. ar.) Mr. Anderson, Mrs. Foster, Miss Goodenough.
- C.W.250f-251w-252s. Seminar in Nursery School Education. Reviews and interpretations of current literature, discussion of fundamental problems and theory, problems of administration and organization. (3 cred.; grad. students only, permission of instructor; hrs. ar.) (Offered in alternate years; offered in 1929-30.) Mrs. Foster.

The following course in Anatomy is open to, and usually taken by, graduate students in the institute.

- Anatomy 133. Anatomy of the Fetus and Child. A survey of prenatal and postnatal development (3 cred.; prereq., Anat. 103 or equivalent; hrs. ar.) Mr. Scammon.

In addition to the above courses, the following courses specifically designed for the training of nursery school and kindergarten teachers are offered by the institute under the auspices of the College of Education and are listed in the bulletin of the College of Education under "Theory and Practice of Teaching."

- T.30f. Principles of Kindergarten and Nursery School Education. The development, aims, and organization of kindergarten and nursery school education. A consideration of the curriculum and methods to be employed. (3 cred.; jr., sr.; prereq., C.W.80; MWF VIII.) Mrs. Foster.
- T.31w. Permanent Play Materials. A consideration of the various kinds and types of permanent play materials (blocks, dolls, trains, wagons, etc.) and their use by children of different ages. (2 cred.; jr., sr.; prereq., T.30; TTh VIII.) Mrs. Foster.

† Two quarters must be completed before credit is received for any quarter.

- T.32s. Plastic Materials. The materials used in constructive work, paper, crayons, paints, clay, woodwork, sewing, sand, etc. The student will be given some opportunity for actual use of the materials and will gain considerable knowledge of the abilities of children of different ages. (2 cred.; jr., sr.; prereq., T.30; TTh VIII.) Miss Boynton, Miss Headley.
- T.33w. Rhythms, Games, and Music for the Young Child. A course designed to train the student in the handling of a music and rhythm period and in group games. The student will be expected to take part in the rhythms and music work in both the nursery school and the kindergarten. (2 cred.; jr., sr.; prereq., T.30; TTh IX.) Miss Boynton, Miss Headley.
- T.34s. Story Telling for Young Children. A study of folk, fairy, here-and-now stories, and poetry suitable for young children. The principles underlying story telling, the selection of the story, and versions. The educational importance of conversation with the child. (2 cred.; jr., sr.; prereq., T.30; TTh VI.) Miss Boynton, Miss Headley.
- T.85f-86w-87s. Methods and Observation. Two hours each week will be spent observing in the nursery school or in the kindergarten. There will be written reports of the observations and a class discussion of one hour in alternate weeks. (3 cred.; jr., sr.; prereq., Psy. 1-2, 4-5; hrs. ar.) Miss Boynton, Miss Headley.
- T.88f-89w-90s. Practice Teaching in Kindergarten or Nursery School. Students must choose either nursery school or kindergarten practice teaching. If they desire, students may do practice teaching in both schools by putting in additional hours, but they can receive credit for only one. Practice will be arranged to give the student a varied experience and each student will be assigned one child for intensive study throughout the year. (9 cred.; sr., prereq., T.30-34 and T.85-87; hrs. ar.)

In addition to the courses offered by the institute, there are a considerable number of other courses offered in the University which are related directly to training in the field of child welfare. A list of some of these follows. These and other courses, with their prerequisites, are described in the catalogs of the various colleges of the University which may be obtained from the registrar.

- Anat. 163. Seminar in Human Growth.
- Art. Ed. 36. Cardboard and Paper Construction.
- Ed. Psy. 141. Psychology of Speech Disorders.
- Ed. Psy. 143, 144, 145. Individual Mental Examination.
- Ed. Psy. 146, 147. Child Guidance.
- Ed. Psy. 149, 150, 151. Psycho-educational Clinic.
- Ed. Psy. 157. Psychology of Child Development.
- Ed. Psy. 158. Psychology of Adolescence.
- H.E. 19. Nutritional Aspects of Health.
- H.E. 70. Nutrition Survey.
- H.E. 71. Elementary Dietetics.
- H.E. 170. Nutrition of the Family.

- H.E. 171. Child Nutrition.
 Phys. Ed. 43, 44, 45. Theory and Function of Play.
 Prev. Med. 52. Health Care of the Family.
 Prev. Med. 57. Health of Infant and Preschool Child.
 Prev. Med. 58. Maternal and Child Hygiene.
 Prev. Med. 61. Mental Hygiene.
 Prev. Med. 64. Field Practice in Infant Welfare Nursing.
 Psy. 125, 126, 127. Psychology of Individual Differences.
 Psy. 144, 145. Abnormal Psychology.
 Soc. 14. Rural Sociology.
 Soc. 52. Elementary Case Work.
 Soc. 119. The Family.
 Soc. 133. Social Case Work in Health Problems.
 Soc. 134. Legal Protection of the Child.
 Soc. 135. Field Practice in Legal Protection of the Child.
 Soc. 138, 139. Mental Case Work.
 Speech 61. Speech Correction.
 Speech 162-163. Advanced Speech Correction.
 T. 44. Children's Literature.

SPECIAL CURRICULUM IN NURSERY SCHOOL AND KINDERGARTEN EDUCATION

The following special curriculum is offered in the College of Education and leads to a degree of bachelor of science in education and a university teacher's certificate. The curriculum is arranged for persons who are preparing to teach or direct nursery schools and for persons who wish to enter the field of kindergarten teaching. Graduates of the two-year program in state teachers colleges frequently complete this curriculum for the Bachelor's degree, the requirements being modified in accordance with their previous training. Followed by a year of graduate work this curriculum offers excellent basic preparation for those wishing to enter the field of parent education or the direction of child study classes. Students taking this curriculum should be able to play simple piano music.

Freshman Year

Dept. No.	Title	Credits			Prerequisites
		F	W	S	
Zool. 1-2	General Zoology	5	5	..	None
Comp. 4-5-6	Freshman Composition	3	3	3	None
Hist. 1-2	Modern World	5	5	..	None
or	Orientation				
Orient. 1-2	American Government ....	..	..	5	None
Pol. Sci. 1	Introduction to Human				
or	Geography	0	0	0	None
Geog. 15	Elem. Phys. Training				
Phys. Ed. 1-2-3	.....	2	2	7	
Electives	.....			
		15	15	15	

Sophomore Year

Dept. No.	Title	Credits			Prerequisites
		F	W	S	
Psy. 1-2	General Psychology	3	3	..	None
Psy. 4-5	Introductory Lab. Psy. ....	..	..	4	Psy. 1-2
Soc. 1	Introduction to Sociology ..	5	..	..	None
Soc. 49	Occurrence of the Socially Inadequate .....	..	..	3	Soc. 1
Art. Ed. 1-2-3	Fundamental Principles of Design	3	3	3	None
Art. Ed. 7-8-9 ¹	Sketch	1	1	1	None
Ind. Ed. 11	Special Class Woodwork ..	..	2	..	None
Speech 41-42	Fundamentals of Speech ..	3	3	..	Comp. 4-5-6
Phys. Ed. 17-18	Sophomore Games and Folk Dancing	0	0	..	
Phys. Ed.	One other course in Physi- cal Education .....	..	..	0	
Electives	.....	0	3	4	
		15	15	15	

Junior Year

Dept. No.	Title	Credits			Prerequisites
		F	W	S	
Ed. Ad. 75	The Elementary School ...	..	..	3	Ed. Psy. 55 or 56 or equiv.
Phys. Ed. 43-44-45	Theory & Function of Play	½	3	½	6 qtrs. phys. ed.
Prev. Med. 50	Public and Personal Health	3	..	..	Zool. 1-2, Psy. 1-2
Soc. 52	Elementary Case Work ...	..	3	..	Soc. 49
Soc. 90-91	Elementary Field Training in Case Work .....	..	3	3	Soc. 49 and 52
T. 30	Principles of Kindergarten and Nursery School Ed.	3	..	..	6 cred. psy.
T. 31	Permanent Play Materials	..	2	..	T. 30
T. 32	Plastic Materials .....	..	2	..	T. 30
T. 33	Rhythms, Games, and Mu- sic for the Young Child	..	..	2	T. 30
T. 34	Story Telling for Young Children .....	..	..	2	T. 30
T. 85-86-87	Methods and Observation ..	1	1	1	6 cred. psy.
C. W. 80	Child Psychology	3	..	..	6 cred. psy.
C. W. 90	Physical Devel. of the Child	2	..	..	Zool. 1-2, Psy. 1-2
Electives	.....	3	1	4	
		15½	15	15½	

Senior Year

Dept. No.	Title	Credits			Prerequisites
		F	W	S	
Ed. Ad. 119	Elementary School Curric.	3	..	..	Ed. Psy. 55 or equiv.
Ed. Psy. 134-135	Mental Tests and Mental Diagnosis	2	2	..	Ed. Psy. 55 or equiv.
Ed. Psy. 146-147	Child Guidance .....	..	2	..	15 cred. psy. and ed.
C. W. 120	Health Care of Young Child	..	..	2	C.W. 90
H. E. 70	Nutrition Survey	3	..	..	10 cred. lab. science
T. 88-89-90	Practice Teaching in Kinder- garten or Nursery School	3	3	3	T. 30-34, 85-87
T. 143-144	The Teaching of Reading ..	2	2	..	9 cred. ed.
Electives	.....	2	6	8	
		15	15	15	

¹ For Art Ed. 7-8-9, Art Ed. 4-5-6 or Art Ed. 32, 35, 38 may be substituted.

SUMMER SCHOOL COURSES

In the summer quarter the institute offers a full program of courses. Usually during the first term. Courses C.W.40, 80, 90 or 120, 130, 170, Anat. 133, T.30, and either T.31 or 32, or T.33 or 34 are offered. During the second term Courses C.W.40 and 60 are usually offered. In addition, to the wide range of related courses given by other departments, courses given by scholars from other institutions are frequently available. Both the Nursery School and Kindergarten are in operation during the first term of the summer school and are utilized for observation and demonstration. A catalog describing the summer school offerings in detail can be secured from the registrar.

GRADUATE WORK

Qualified graduate students may major or minor in child welfare for an advanced degree. The requirements for graduate work are described in the bulletin of the Graduate School which may be obtained from the registrar. Students interested should also consult the director of the institute.

OPPORTUNITIES FOR RESEARCH

Graduate students in the University working toward advanced degrees in any of the sciences, may take advantage of the facilities of the institute for research. The proposed research must have the approval of the student's major adviser and the director of the institute.

Research fellows, advanced students, other than those working for degrees, and members of the faculty desirous of utilizing the facilities of the institute in a research project should consult the director of the institute. The institute feels that one of its primary functions is to promote research for qualified individuals by furnishing opportunity and facilities in so far as it may be possible. A large number of such co-operative researches are now under way.

RESEARCH ASSISTANTSHIPS

Upon the recommendation of the staff of the institute or of the representative of co-operating departments, the institute appoints a number of research assistants each year. Such assistantships are available at a junior level to promising students who have finished their work for the Bachelor's degree and at a senior level for students who have had at least one year of graduate work or who have demonstrated their ability to carry on research. Such assistants are assigned certain duties in connection with the institute program. In making appointments preference is given students who are undertaking a research problem in line with the general program of the institute in conjunction with their work for an advanced degree. Application blanks for these appointments may be secured by writing to the director of the institute. Normally appointments are made by March 1 preceding the academic year in which the assistant is to work.

PARENT EDUCATION

The extension or parent education activities of the institute are varied. The institute co-operates with the General Extension Division of the University in offering extension and correspondence courses and with the Agricultural Demonstration Extension Service in offering projects in child care and training in various localities and counties in the state. It organizes and supervises parental study groups in the Twin Cities and Duluth and in various other parts of the state, and co-operates with such organizations as parent-teacher associations, the American Association of University Women, Federation of Women's Clubs, etc., and such local groups as may be formed through churches, schools, neighborhood groups, and other organizations. It also co-operates with the Division of Child Hygiene of the State Board of Health and other health agencies, both state and local. From time to time as occasion may warrant, courses of lectures given by specialists are organized. A library of books and pamphlets on child welfare for use by study groups is maintained. A branch of the institute, known as the Duluth Center, is located at Room 404 Alworth Building, Duluth, Minn.

STUDY GROUPS

The institute furnishes leadership and supervision for groups of parents and others interested in the problems of child care and training. These groups are in some cases sponsored by state or local organizations. The plan followed is that of outlining and conducting or supervising the program and supplying a small traveling library of selected books and pamphlets bearing on the topics in which the group is interested, while the group is responsible for its own organization, the arrangements for time and place of meeting, the regular attendance of members, and the distribution and return of the books. The groups meet primarily for study and discussion, the leader serving not as a lecturer but rather as a guide and aid in controlling the discussion.

AGRICULTURAL EXTENSION

The enrolment for projects in child care and training offered in co-operation with the Agricultural and Home Demonstration Service is arranged through the county or home demonstration agent. The lessons are given by a specialist in child development sent out from the Agricultural Extension Division.

EXTENSION COURSES

In co-operation with the General Extension Division of the University, the institute offers the following extension courses. During the year 1929-30, they are being given in Minneapolis, St. Paul, and Duluth.

C.W.40. Child Development and Training. A brief study of the physical and mental development of the child is followed by a discussion of the training of young children. Behavior problems in their various aspects and techniques of good and bad management will be considered. (3 cred.; one meeting a week; first semester.) Miss McGinnis, Mrs. Faegre, Miss Wilson.

C.W.50. Educational Methods for Young Children. A study of the education of the young child in the home. Stories, music, art, and dramatics, as well as the use of tools, toys, and a variety of occupational materials are discussed. The educational importance of play and of projects initiated and carried out by the children is stressed. Slides and moving pictures of children will be used for illustration and demonstration. (3 cred. : one meeting a week ; second semester.) Miss McGinnis, Mrs. Faegre, Miss Wilson.

CORRESPONDENCE COURSES

In co-operation with the General Extension Division, the institute offers the following correspondence courses :

1. Child Care and Training. Physical growth, care, and diet of young children. Mental development, personality, and behavior. The management of young children with reference to the establishment of correct habits of behavior. Play, toys, games, stories, and music. Intended primarily for the parents of young children. Offered to residents of Minnesota without fee. Sixteen lessons, no credit.
2. Child Development and Training. A brief study of the physical and mental development of the young child is followed by a discussion of the training of young children. Behavior problems in their various aspects, and the techniques of good and bad management will be considered. Sixteen lessons ; three credits. Mr. Anderson, Miss McGinnis, Mrs. Faegre. \$10.
3. Educational Methods for Young Children. A study of the education of the young child in the home. Stories, music, art, and dramatics, as well as the use of tools, toys, and a variety of occupational materials are discussed. The educational importance of play and of projects initiated and carried out by the children is stressed. Open to those who have completed Course 2. Sixteen lessons ; three credits. Mr. Anderson, Miss McGinnis, Mrs. Faegre. \$10.

Special attention is called to Correspondence Course No. 1 which is a course offered to residents of the state of Minnesota without fee. The lessons which are presented in simple language are mailed to those registered, one each week until the entire sixteen are sent out. This course has proved very popular as is shown by the fact that over six thousand parents representing every section of the state of Minnesota have already completed it. A registration blank for this course may be obtained by writing to the General Extension Division, University of Minnesota, Minneapolis.

The Bulletin *of the University of* **Minnesota**

Division of Library Instruction
Announcement for the Year
1929-1930



Vol. XXXII *No. 34* *May 27 1929*

Entered at the post-office in Minneapolis as second-class matter
Minneapolis, Minnesota

Accepted for mailing at special rate of postage provided for in section 1103,
Act of October 3, 1917, authorized July 12, 1918

OFFICERS AND FACULTY

- Frank K. Walter, M.A., M.L.S., University Librarian, Director of the Division of Library Instruction, and Professor of Library Methods.
- Ina Ten Eyck Firkins, B.L., Reference Librarian, Associate Professor of Library Methods.
- Lura C. Hutchinson, B.A., Assistant Professor of Cataloging, Classification, and Reference.
- Harold Russell, B.A., B.L.S., Head of Order and Binding Sections, University Library, Assistant Professor of Library Methods.
- Della McGregor, B.A., Chief, Juvenile Department, St. Paul Public Library, Instructor in Work with Children.
- Elizabeth B. Scripture, B.A., Librarian, East High School, Minneapolis, Instructor in Library Administration.
- Clara F. Baldwin, B.A., Director of Libraries, Minnesota State Education Department, Lecturer on Library Administration.
- Edna L. Goss, B.L.S., Head, Catalog Department, University of Minnesota Library, Lecturer on Cataloging.
- Mabel Grondahl, B.A., Cataloger, University of Minnesota Library, Lecturer on Use of Books and Libraries.
- Blanche Moen, B.A., Reference Assistant, University of Minnesota Library, Lecturer on Use of Books and Libraries.
- Helen M. Smith, B.A., Head, Circulation Department, University of Minnesota Library, Lecturer on Library Administration.
- Harriet A. Wood, B.A., Assistant Director of Libraries and Supervisor of School Libraries, Minnesota State Education Department, Lecturer on Library Administration.

GENERAL INFORMATION

The Division of Library Instruction of the University of Minnesota was established by the regents of the University in April, 1928, in response to a very definite demand by school officials, library boards, and librarians and by prospective students desiring training for professional librarianship.

The division unites for instructional and administrative purposes all the facilities of the University for training librarians for service in libraries of varied types. The division submits to the different schools, colleges, or other units of the University interested in such training, curricula or programs suitable for the different types of work desired. It maintains an instructional staff to carry on such courses or curricula as may be approved by these university units.

Credits for such courses are given by the school or college approving them for inclusion in its curriculum. Students who offer these courses in library training as a partial requirement for a degree must comply in every particular with the requirements of the school or college from which the degree is desired. These specific requirements are included in the regular announcements of the various schools and colleges of the University. These announcements may be obtained on application to the registrar of the University.

The professional courses in library instruction are courses for senior students. In other words, at least two full years of approved college work are required as prerequisite for regular admission to any of these courses and at least three years of approved preliminary college work, in addition to the work in library instruction, are required for a degree. Persons not eligible for regular registration may be admitted as unclassified students only by passing such tests as may be required by university regulations to demonstrate their ability to carry the work they wish to undertake.

Registration.—All students, whether full time or part time, must be regularly registered. Full information concerning registration is given in the general information bulletin, which may be obtained on application to the registrar of the University.

Fees and expenses.—The tuition fees are, for full time students, \$40 per quarter for residents of Minnesota and \$45 per quarter for non-residents. Unclassified students, auditors, and others carrying less than full work in library instruction (15 credits per quarter) pay a tuition fee of \$3 per credit per hour for all courses under the supervision of the Division of Library Instruction (except Library Methods 1), irrespective of their registration in courses in other subjects. The incidental, penalty, and other general fees are given in the general information bulletin, in which information concerning the cost of board and room and other estimated expenses may also be found.

COURSES OF STUDY

Two programs of one year each, one in the College of Science, Literature, and the Arts, and the other in the College of Education, leading to the degree of bachelor of science are offered. Each requires for its completion four full years of work, including a full year of professional training in library methods, in the college in which the student is registered. All regulations of the college from which the degree is desired must be complied with before the degree will be granted.

A special course in Hospital Library Work, involving a fifth year of work, is outlined on pages 7-8.

DESCRIPTION OF COURSES

EXPLANATIONS

COURSE NUMBERING

A course is designated by a department name, a number, and a letter. It has the same number in whatever quarter it is offered. The quarter is indicated by the letter (f, fall; w, winter; s, spring; su, summer).

1f-2w, a two-quarter course given in the fall and winter.

1w-2s, the same course given in the winter and spring.

3f,w,s, a one-quarter course given each quarter.

Senior college courses are numbered as follows: courses primarily for juniors and seniors, from 50 to 99; for juniors, seniors, and graduates, from 100 to 199; for graduates only, from 200 up. This system is not uniformly followed by departments in other colleges than Science, Literature, and the Arts. The hours of recitation are numbered by Roman numerals, the day by the appropriate initial, the room by an arabic numeral, and the building by an abbreviation. For example (MWF III, 5Lib.) means that the class meets on Monday, Wednesday, and Friday, the third recitation hour, in Room 5, Library.

NON-PROFESSIONAL COURSE FOR FRESHMEN AND SOPHOMORES

Lib. Meth. I. Use of Books and Libraries. Study of reference material for personal study and research. No credit toward a degree in library instruction, but general credit is given in the College of Science, Literature, and the Arts, and in such other schools and colleges as may, by special arrangement, desire their students to be registered in the course. (2 cred.; for hours see bulletin of the College of Science, Literature, and the Arts.) Miss Firkins, Mr. Russell, Miss Grondahl, Miss Moen.

PROFESSIONAL COURSES

The courses below, aggregating a full year of college work, are open for regular credit only to students who have met all the requirements for admission to the senior college courses in the colleges specified above.

- Lib. Meth. 101f. Bibliography. Trade and national bibliography of the United States, Great Britain, and Europe; book ordering methods. (3 cred.; MWF III; 5Lib.) Mr. Russell.
- Lib. Meth. 102f. Cataloging. Elements of dictionary cataloging. Lecture, problems, and practice. (3 cred.; MWF I; 5Lib.) Miss Hutchinson.
- Lib. Meth. 103w. Cataloging. Continuation of Cataloging 102, with special attention to difficult books and administrative aspects of a catalog department. (3 cred.; prereq., Lib. Meth. 102; MWF I; 5Lib.) Miss Hutchinson.
- Lib. Meth. 104f. Classification. Classification by the Dewey Decimal System, subject headings, author numbers, shelf and accession records. (3 cred.; TThS II; 5Lib.) Miss Hutchinson.
- Lib. Meth. 105w. Classification. Continuation of Lib. Meth. 104. Library of Congress and other classifications; classed catalogs; special adaptations of classification. (3 cred.; prereq., Lib. Meth. 104f; TThS II; 5Lib.) Miss Hutchinson.
- Lib. Meth. 106f,w. Current Library Problems. Discussion of specific library problems and conditions in American libraries. Two quarters continuation course. (3 cred.; prereq., 9 cred. in library methods or simultaneously with Lib. Meth. 101, 102, 104; MWF IV; 5Lib.) Mr. Walter.
- Lib. Meth. 107s. School Library Administration. Administrative methods and problems of school libraries. (3 cred.; prereq., 9 cred. in library methods; MWF VIII; 5Lib.) Miss Scripture.
- Lib. Meth. 108s. Public Library Administration. Administration, equipment, finance, and extension work of public libraries. (3 cred.; prereq., 9 cred. in library methods; MWF I; 5Lib.) Miss Ba'dwin, Miss Wood.
- Lib. Meth. 109w. Library Work with Children. (3 cred.; prereq., 9 cred. in library methods; MWF II; 5Lib.) Miss McGregor.
- Lib. Meth. 110f. Library Binding. Economics of library binding. Materials, processes, records, book repair. (1 cred.; T III; 5Lib.) Mr. Walter.
- Lib. Meth. 111f,w,s. Library Practice. Practice, under supervision, in Minneapolis and St. Paul libraries. The time and character of the practice will be individually arranged to suit student aptitudes, usually in the second and third quarters. Required of all candidates as prerequisite for a degree in library training. (3 cred.; prereq., 15 cred. in library methods.) Mr. Walter.
- Lib. Meth. 112w. Reference. Reference books and other material with emphasis on methods of search and adaptation of material to needs of users. (3 cred.; MWF III; 5Lib.) Miss Hutchinson.
- Lib. Meth. 113s. Reference—Continued. Specialized reference material, public documents, and periodicals. Reference lists and reports on special problems. (3 cred.; prereq., Lib. Meth. 112; MWF III; 5Lib.) Miss Hutchinson.
- Lib. Meth. 114s. Selection of Books for Adolescents. Principles of selection and criticism of representative books. Study and preparation of book lists for adolescents in school and public libraries. (3 cred.; prereq., Lib. Meth. 109 or 4 cred. of 115; MWF IV; 5Lib.) Miss McGregor.
- Lib. Meth. 115f,w,s. Selection of Books for Adults. Principles of selection and criticism of representative books. Criticism and preparation of book lists. Continuation course. (Three qtrs. of 2 cred. each; ThS III; 5Lib.) Miss Hutchinson.

Lib.Meth.116w. Selection of Books for Children. Principles of selection and criticism of representative juvenile books. (3 cred.; MWF IV; 5Lib.) Miss McGregor.

Lib. Meth. 117w. Library Printing. Preparation of copy, editing, proof reading, layout of library publications. Criticism of typical printed material. (1 cred.; T III; 5Lib.) Mr. Walter.

Lib. Meth. 118s. Library Publicity. Preparation and use of print in library publicity. Library exhibitions, etc. (1 cred.; prereq., 9 cred. in library methods; T III; 5Lib.) Mr. Walter.

A special fifth year course in Hospital Library Training, is outlined on pages 7-8.

CURRICULUM IN THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

The successful completion of three years of work in the general course of the College of Science, Literature, and the Arts in addition to not less than 45 credits of courses listed on pages 4-6 will entitle the student to the degree bachelor of science. The specific requirements for the three years of preliminary work may be found in the bulletins of the College of Science, Literature, and the Arts.

During the four years, the student must secure 180 credits and 180 honor points. For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.

COLLEGE OF EDUCATION

SPECIALIZED CURRICULUM FOR SCHOOL LIBRARIAN

The successful completion of the following four-year curriculum will entitle the student to the degree of bachelor of science and to the university teachers' certificate for library training. Students will satisfy the requirements for a teaching major or for two teaching minors. It will be wisest to choose majors and minors in the fields of English and history. Students who complete Courses 102f, 104f, 107s, 108s, 112w, 114s will satisfy the requirements for a minor in library training. All library training work may be deferred till the senior year. (See pp. 4-6 for description of courses.)

<i>Freshman Year</i>		
FALL	WINTER	SPRING
Credits	Credits	Credits
English 5	English 5	English 5
Modern World 5	Modern World 5	Modern World 5
Language 5	Language 5	Language 5
—	—	—
15	15	15

<i>Sophomore Year</i>		
FALL	WINTER	SPRING
Credits	Credits	Credits
Science 5	Science 5	Elective 5
Language 5	Elective 7	Elective 5
Psychology 3	Psychology 3	Elective 5
Elective 2	—	—
—	—	—
15	15	15

<i>Junior Year</i>					
FALL		WINTER		SPRING	
	Credits		Credits		Credits
102	Cataloging 3	112	Reference 3	107	Library Administration 3
103	Classification 3	114	Selection of Books 3	108	Library Administration 3
55	Ed. Psy. 3	Ed. Ad. 65	The High School 3	T. 15	Tech. of H. S. Instruction 3
	Continuation of required elective academic courses 6		Continuation of required elective academic courses 6		Continuation of required elective academic courses 6
	—		—		—
	15		15		15

<i>Senior Year</i>					
FALL		WINTER		SPRING	
	Credits		Credits		Credits
Special Methods and Practice Teaching 3		Special Methods and Practice Teaching 3		Special Methods and Practice Teaching 3	

Completion of academic requirements—fall, winter, spring.

Library courses—27-45 credits—fall, winter, spring (see pp. 4-6.)

ADVANCED COURSE IN HOSPITAL LIBRARY SERVICE

This course is open to applicants who have completed four full years of approved college work, including at least a year (45 credits) of library training. Its purpose is to give the necessary social, scientific, and economic background for the successful application of library methods to the service of the sick and convalescent in hospital residence, and incidentally, to the professional staffs of these hospitals. The completion of the general courses, or an equivalent, is prerequisite. It is open also to graduates of other library schools with equivalent standards. (See pages 4-6 for general courses in a four-year program preparing for general or school library work.)

The field work will be given under careful supervision in hospitals of Minneapolis and St. Paul. The former city has organized hospital library service under the direction of the Minneapolis Public Library.

The course of training for hospital library service consists of three years of academic work, one year (45 credits) of library training, and a fifth year of specialized training for hospital service. During the first two years the student is registered in the Junior College and must earn 90 credits with an average of one honor point per credit. During the last three years he is registered in the Senior College under the direction of the director of the Division of Library Instruction and the assistant dean for the Senior College. The completion of five years work (225 credits and 225 honor points) will lead to the degree of bachelor of science or a certificate of proficiency in hospital library service.

REQUIRED COURSES

First Two Years

English A-B-C, Composition 4-5-6, or exemption from requirement; Composition 18-19; French 1-2 or 3-4; German 1, 2, 3; Sociology 1, 49, 52; History 1-2; Zoology 5-6-7 or 1-2; and electives to make a total of

90 credits. Courses in psychology, or additional courses in English, foreign languages, and history, are recommended.

Third Year

Psychology 1-2, 3, 7; Sociology 6, 45; English, at least 9 additional credits; Human Physiology; and electives. Courses in English and history are recommended.

Fourth Year

At least 45 credits of library training. (See pp. 4-6.)

Fifth Year

Courses in preventive medicine, medical social service, and library methods, under the direction of an adviser. A recommended schedule is given below. This schedule is subject to some modification to meet individual cases, but all such modification is subject to the approval of the director of the Division of Library Instruction.

COURSES OF STUDY IN THE FIFTH YEAR

Department	No.	Course	Quarters	Credits
Preventive Medicine	53	Preventive Medicine	1	3
Preventive Medicine	61	Mental Hygiene	1	1
School of Nursing	11	Ethics of Nursing	1	1
Medical Social Service	151	Principles and Practice of Medical Social Service in Clinic, Hospital, and Home ..	1	3
Medical Social Service	157	Relationships of Hospital to Social Work ..	1	1
Medical Social Service	158	Occupational Therapy	1	3
Medical Social Service	159	Hospitals and Hospital Economics	1	1
Medicine	68	Therapeutic Value of Reading	1	1
Medicine	75	Nervous and Mental Conditions	1	1
Library Meth.	116	Hospital Library Administration	1	1
Library Meth.	117	Literature for Use of Hospital Groups (Six hours weekly of required reading)	1	9
Library Meth.	118	Field Work in Hospital Libraries	3	9

Electives to the value of 11 credits to complete the total of 45 credits. Choice of these electives to be governed by choice of the student's projected field of service.

The Bulletin
of the University of
Minnesota

Department of Music
Announcement for the Years
1929-1931



Vol. XXXII No. 31 May 18 1929

Entered at the post-office in Minneapolis as second-class matter
Minneapolis, Minnesota

Accepted for mailing at special rate of postage provided for in section 1103,
Act of October 3, 1917, authorized July 12, 1918

DEPARTMENT OF MUSIC

FACULTY

Carlyle M. Scott, Professor and Director of the Department of Music
Donald N. Ferguson M.A., Professor of Music
Earle G. Killeen, M.Mus., Professor of Music
William Lindsay, Associate Professor of Music
George H. Fairclough, F.A.G.O., M.Mus., Assistant Professor of Music
Gertrude Hull, Assistant Professor of Music
Archie N. Jones, Assistant Professor of Music
Abe Pepinsky, Assistant Professor of Music
Gertrude Reeves, Assistant Professor of Music
Harold Ayers, Instructor in Violin
Alexandre Duvoir, Instructor in Oboe
Johann Egilsrud, Instructor in Music
Christian Erck, Instructor in Cello
Roger Gauthier, Instructor in Oboe
Georges Grisez, Instructor in Clarinet
Harrison Wall Johnson, Instructor in Piano
Blanche Kendall, Instructor in Music
Harry Larusson, Instructor in Music
Richard Otto Lindenhahn, Instructor in French Horn
Karl Scheurer, Instructor in Violin
Miles Sery, Instructor in Tuba and Cornet
Agnes Rast Snyder, Instructor in Voice
Clyde W. Stephens, Instructor in Piano
Kate Mork Twichell, Instructor in Piano
Henry J. Williams, Instructor in Harp
Mary Malcolm, B.S., Assistant

GENERAL INFORMATION

This bulletin is issued for the purpose of bringing together in convenient form all the information available concerning the courses of music offered in the different colleges of the University of Minnesota, together with announcements of some of the principal advantages and activities open to students of music at Minnesota.

The Department of Music is fortunate in having one of the most complete and satisfactory music buildings that is to be found in the country. It was granted by the state legislature and erected at a cost of \$257,000. It contains a concert hall with a seating capacity of 600 (provided with a fully equipped stage, orchestra pit, and a four-manual pipe organ), teachers' studios, classrooms, library, 3 small organs, and 32 sound proof practice studios. With this equipment, the excellent teaching staff is now enabled to offer to the music students of the state every advantage necessary to a broad and thoro musical education. Besides the regularly outlined courses, there are many cultural opportunities provided both on the campus and in the two cities.

FACULTY RECITALS

During the year, the Department of Music presents its faculty members in recital in the music auditorium. Among the faculty are concert artists and chamber music exponents of exceptional ability, who offer every type of program. These recitals are open to the general public as well as to the student body, and are given without admission charge.

STUDENT RECITALS

One of the chief factors in the college work of the music students is the student recital every Thursday at 4:30, in which, at least once during the year, each music student takes part. These programs are carefully arranged to include as much variety and interest as possible. Besides being instructive to the student body, these appearances furnish excellent experience for the performers and enable them to gain the poise and ease of execution before an audience that are essential to their training and success. Attendance at 50 per cent of the recitals is required.

THE UNIVERSITY CHORUS

The University Chorus, reorganized in 1921, has given public performances of Mendelssohn's *Elijah*, Handel's *Messiah*, Verdi's *Aida*, Gaine's *Russian Fantasy*, Pierene's *The Children's Crusade*, and Bizet's *Carmen*. This organization is designed to acquaint students with choral and operatic masterpieces. The University Symphony, the Minneapolis Symphony Orchestra, and nationally known artists have assisted at these productions.

DEPARTMENT OF MUSIC

SYMPHONY ORCHESTRA

The University Symphony Orchestra offers an unusual opportunity for the serious study of the best in orchestral literature. A nucleus of faculty music lovers with orchestral experience has materially aided the organization in maintaining high standards of attainment. During the past years the orchestra has developed in size and efficiency and is an important factor in the musical life of the campus.

BANDS

The University maintains two bands, one the R.O.T.C. band (70 pieces) and the other known as the Concert Band (64 pieces). Scholarships are available to 35 members of the Concert Band: 27, at \$35 each, and 8, at \$50 each, for the year. The band gives a series of concerts, plays at the commencement exercises, convocations, and football games, and is one of the most valuable organizations at the University.

UNIVERSITY CONCERT COURSES

Under the general direction of the Department of Music two remarkable courses are presented during the year: a course of all-star recitals in the University Armory and a shorter series of chamber music concerts in the Music Hall. In these, only artists of international reputation appear. The fee to students and faculty and all members of the university staff for either course never exceeds \$5. These two courses, together with the series of symphony concerts offered by the Minneapolis Symphony Orchestra, and other excellent programs given under different auspices during the year in both cities, make the cultural opportunities at Minnesota rich beyond measure.

COURSES OF STUDY

Two major courses of study are offered to the student of music as follows:

1. Course in Arts and Music leading to the degree of bachelor of arts with a major in music.
2. Course in Public School Music leading to the degree of bachelor of science and the university teacher's certificate.

Students desiring to follow the first course of study will register in the College of Science, Literature, and the Arts. Those desiring to follow the course in Public School Music will register in the College of Education.

Opportunities are also offered through registration in the General Extension Division to those who desire to take special work in practical and theoretical music without qualifying for a degree.

The Department of Music also offers its courses as electives to the students of any school or college of the University subject to the rules of the school or college in which the student is registered, and subject to satisfying the general requirements for admission to practical courses in music as stated below.

ADMISSION

1. *Admission to the freshman year.*—Admission to the University is either by certificate (for graduates of accredited secondary schools) or by examination. Candidates must have completed the equivalent of a four-year high school course and must present:

- a. Four units of English; or three units of English and four units of a foreign language; or three units of English and two units of each of two foreign languages.
- b. One unit of algebra and one unit of plane geometry or two units of unified mathematics.
- c. Enough additional work to make in all fifteen units, of which not more than four may be in Group F (vocational and miscellaneous subjects).

A detailed statement of admission requirements may be found in the bulletin of general information.

2. *General requirements for admission to the work of the Music Department.*—All students wishing to register in one of the four-year courses of study listed above must, upon matriculation, choose a major subject in practical music and pass an examination in that subject before a committee of the faculty of the Music Department. Entrance requirements for a major, according to instrument are:

- a. Piano: Any major or minor scale in octaves, thirds, sixths, or tenths, M.M. quarter notes=108; Bach Invention or dance from one of the suites; a sonata by Haydn or Mozart; a modern composition of equal difficulty with the sonata.

- b. Voice: Good natural equipment and 2 years of piano.
 c. Violin: Major and minor scales, arpeggios; the simpler Kreutzer Etudes; a sonata by Handel, Haydn, Mozart, or Schubert; a more modern work displaying special technic peculiar to the violin.
 d. Organ: Same as piano.

Also, all public school music students *not majoring* in piano and all Science, Literature, and the Arts students *majoring* in voice will be examined concerning requirements to be met in piano. (See I and II regarding practical music requirements for graduation.)

Students from other departments or colleges electing courses in practical music must take simple preliminary examinations in those courses.

3. *Admission to extension courses.*—Any student who meets the general requirements under 2, above, may register for extension courses in music. Such courses, however, will not carry credit toward a university degree until entrance requirements under 1, above, have been met.

FEES

DEGREE COURSES OF STUDY

Tuition fee (per quarter)	
Residents of Minnesota.....	\$20.00
Non-residents	30.00
Credit hour tuition fee (unclassified students, auditors, and others carrying less than full work)	
Residents of Minnesota.....	1.75
Non-residents	2.50
Incidental fee (per quarter).....	6.00
Deposit (first quarter only).....	5.00
Military deposit (required of all students taking military drill).....	10.00
Special fees	
Examination for removal of condition.....	1.00
Examination for credit (after the first quarter in residence).....	5.00
Special examination	5.00
Practice teaching fee for Grade and High School Methods (per quarter)	1.00
Graduation fee	10.00
Music fees, per quarter (for each course in practical music)	
Two lessons per week (one-half hour).....	65.00
One lesson per week.....	35.00
Practice fees	
Organ (per hour)	
Small .....	.20
Large .....	.40
Piano (six hours per week) per quarter.....	5.00
(\$.50 per quarter for each additional hour per week)	

COURSES OF STUDY

9

EXTENSION COURSES

Tuition fee per credit hour..... \$3.33
 Music fee (for each course in practical music) same as above.

Students in other schools and colleges of the University are required to pay the music fees for each course in practical music in addition to the regular fees of the curriculum in which they are registered.

I. GENERAL COURSES LEADING TO DEGREE OF BACHELOR OF ARTS WITH A MAJOR IN MUSIC

The four-year course leading to the degree of bachelor of arts combines the theoretical and practical work in music with the study of psychology, modern languages, English literature, and history. The object is to provide a well-rounded cultural course for those whose major interest is music.

To secure the degree of bachelor of arts with a major in music, students must fulfill the requirements of both the Junior and Senior colleges as stated in the bulletin of the College of Science, Literature, and the Arts, securing 144 credits in courses other than practical music (piano, voice, etc.). They must earn 36 credits in practical music, the number of credits required in their major subject to be determined by the department. Students majoring in voice must, before graduation, meet the entrance requirement for a major in piano. (See 2a under Admission.)

FRESHMAN AND SOPHOMORE YEARS

	Credits
English A-B-C or equivalent.....	15
Foreign language to fulfill the requirements for admission to Senior College..	0 to 20*
History 11-12-13, Medieval History.....	10
Psychology 1-2 and 4-5 or 7, General Psychology with laboratory.....	10
Music 1-2-3, Harmony; 4-5-6, Counterpoint; 7-8-9, Ear Training.....	18
Practical music under the direction of an adviser.....	24
Electives to make a total of 90	

JUNIOR AND SENIOR YEARS

A major sequence ..	27 or 30
A minor sequence. (9 credits in senior college courses in one department)...	9
Practical music	12-24
Electives to make a total of 180 credits.	

* A student must present for entrance four years of one foreign language, or he must complete twenty credits of one language in college, or he must continue a language which he presented for entrance, according to the following schedule:

<i>Amount Presented for Entrance</i>	<i>Amount Required in Junior College</i>
Four years of one language	None
Three years of one language	5 credits in same language
Two years of one language	10 credits in same language
One year of one language	15 credits in same language
Less than a year of one language	20 credits in one language

DEPARTMENT OF MUSIC

FIRST YEAR

FALL		WINTER		SPRING	
	Credits		Credits		Credits:
English†	—	English	—	English	—
History 11	3	History 12	3	History 13	4
Music 1	3	Music 2	3	Music 3	3
Music 7	1	Music 8	1	Music 9	1
Practical music	4	Practical music	4	Practical music	4
Elective		Elective		Elective	

SECOND YEAR

Psychology 1	3	Psychology 2	3	Psychology 7†	4
Language	0 or 5	Language	0 or 5	Language	0 or 5
Music 4	2	Music 5	2	Music 6	2
Practical music	4	Practical music	4	Practical music	4
Elective		Elective		Elective	

THIRD YEARS

<i>Major Sequence A</i>		<i>Major Sequence B</i>		<i>Major Sequence C</i>	
Ensemble	6	Advanced Harmony	6	Ensemble	6
History of Music	9	Ensemble	6	History of Music	9
Analysis	3	History of Music	9	Normal Piano	6
Practical music	6 or 12	Practical music	6 or 12	Practical music	6 or 12

FOURTH YEARS

<i>Major Sequence A</i>		<i>Major Sequence B</i>		<i>Major Sequence C</i>	
Bach-Beethoven	9	Bach-Beethoven	9	Advanced Normal Piano	6
Romantic Movement	6	Composition-Orchestration	6	Bach-Beethoven	9
Practical music	6 or 12	Practical music	6 or 12	Practical music	6 or 12
Electives		Electives		Electives	

II. FOUR-YEAR COURSE IN PUBLIC SCHOOL MUSIC LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

The Public School Music Course is a four-year course leading to the degree of bachelor of science, in which the theoretical, practical, and methods courses in music are combined with the study of English literature, psychology, and such subjects as the College of Education demands as a definite requirement. The object is to provide a well-rounded course for candidates for the bachelor of science degree in public school music.

For graduation, students must earn 180 credits and 180 honor points. They must earn 36 credits in practical music, 24 of which shall be the minimum requirement for their major subject. Students not majoring in piano shall be required to take one year of Piano A, B, C, 2 credits per quarter, exemption dependent upon entrance examination. (See 2 under Admission.)

† English A, B, C, or 4, 5, 6, or exemption from requirement. See Composition program.

‡ General Psychology and laboratory may be taken concurrently.

§ Credits in each case are for one year's work.

COURSES OF STUDY

11

The following subjects, English, history, language, etc., are suggested for a minor in one academic secondary school subject.

FIRST YEAR

FALL	Credits	WINTER	Credits	SPRING	Credits
English*	—	English	—	English	—
Music 1	3	Music 2	3	Music 3	3
Music 7	1	Music 8	1	Music 9	1
Music Education 1.....	1	Music Education 2.....	1	Music Education 3.....	1
Practical music	4	Practical music	4	Practical music	4
Elective		Elective		Elective	

SECOND YEAR

Psychology 1	3	Psychology 2	3	Music 92s	2
Music 103	1	Music 104	1	Music 105	1
Music Education 4.....	1	Music Education 5.....	1	Music Education 6.....	1
Music Education 29.....	3	Music Education 30.....	3	Music Education 31.....	3
Practical music	4	Practical music	4	Practical music	4
Elective		Elective		Elective	

THIRD YEAR

Music Education 32....	3	Music Education 33....	3	Music Education 34....	3
Music Education 51....	2	Music Education 52....	2	Music Education 53....	2
Music 106	3	Music 107	3	Music 108	3
Music 112	2	Music 113	2	Music 114	2
Practical music ....2 or 4		Practical music ....2 or 4		Practical music ....2 or 4	
Education. Psychology 55†	3	Elective		Elective	
Elective					

FOURTH YEAR

Music Education 64....	2	Music Education 65....	2	Music Education 66....	2
Music Education 81....	2	Music Education 82....	2	Music Education 83....	2
Practical music ....2 or 4		Practical music ....2 or 4		Practical music ....2 or 4	
Education 65†	3	Electives		Electives	
Electives					

* English A, B, C, or 4, 5, 6, or exemption from requirement. See Composition program.

† May be taken any quarter.

DESCRIPTION OF COURSES

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Major Advisers

Professors Scott, Ferguson, and Killeen.

Major Sequences

- A. Courses 103-104-105, 105-107-108, 109-110-111, 112-113-114, 121-122-123.
- B. Courses 105-107-108, 100-101-102, 109-110-111, 112-113-114, 124-125-126.
- C. Courses 86-87-88, 89-90-91, 105-107-108, 109-110-111, 112-113-114.

NOTE.—Courses numbering from 10 to 26, inclusive, carry 2 or 4 credits per quarter and must be repeated until the practical music requirement has been met.

- 1f-2w-3s.† Harmony. The study of chords, their construction, relations, and progressions. Written exercises on basses, the harmonization of given melodies. (9 cred.; fr. mu.; no prereq.; sec. 1 MWF II; sec. 2 MWF VI; Mu.) Prof. Scott.
- 1w-2s-(3su).† Harmony. Same as 1f-2w-3s. (MWF III; Mu.) Asst. Prof. Reeves.
- 4f-5w-6s.† Counterpoint. Strict counterpoint up to eight parts; free contrapuntal harmonization of chorales and composition of smaller contrapuntal forms as inventions. (6 cred.; soph. mu.; prereq., 1-2-3; TTh III; Mu.) Prof. Ferguson.
- 7f-8w-9s.† Ear Training and Solfeggio. (3 cred.; fr., soph. mu.; no prereq.; TTh VI; Mu.) Prof. Killeen, Asst. Prof. Reeves, Miss Kendall.
- 1f-Bw-Cs.*‡ Piano. Elementary course for those not able to meet the entrance requirements for a major in piano. (6 or 12 cred.; no prereq.; ar.)
- 10f,w,s. Organ. (Ar.; ar.; Mu.)
- 11f,w,s. Piano. (Ar.; ar.; Mu.)
- 12f,w,s. Voice. (Ar.; ar.; Mu.)
- 13f,w,s. Violin. (Ar.; ar.; Mu.)
- 14f,w,s. Viola. (Ar.; ar.; Mu.)
- 15f,w,s. Cello. (Ar.; ar.; Mu.)
- 16f,w,s. Double Bass. (Ar.; ar.; Mu.)
- 17f,w,s. Flute. (Ar.; ar.; Mu.)
- 18f,w,s. Oboe. (Ar.; ar.; Mu.)
- 19f,w,s. Clarinet. (Ar.; ar.; Mu.)
- 20f,w,s. Bassoon. (Ar.; ar.; Mu.)

* Carries no credit for students majoring in piano.

† The entire course must be completed before credit is received for any quarter

‡ May be taken only with the consent of the instructor.

- 21f,w,s. Trumpet. (Ar.; ar.; Mu.)
- 22f,w,s. French Horn. (Ar.; ar.; Mu.)
- 23f,w,s. Trombone. (Ar.; ar.; Mu.)
- 24f,w,s. Tuba. (Ar.; ar.; Mu.)
- 25f,w,s. Percussion. (Ar.; ar.; Mu.)
- 26f,w,s. Harp. (Ar.; ar.; Mu.)
- 40f-41w-42s.†* Orchestra. Study of standard orchestral literature and accompaniment of vocal and instrumental soloists. This ensemble group is an ideal campus institution, supporting and inducing campus spirit and activities. (3 cred.; all mu., acad. jr., sr.; W 7:30 p.m.; Mu.) Asst. Prof. Pepinsky.
- 43f-44w-45s.‡ University Chorus. Study of standard oratorios and operas. May be taken a second year with credit. (3 cred.; all mu.; acad. jr., sr.; T IX X; Mu.) Prof. Killeen.
- 86f-87w-88s. Normal Piano. Special course offered to students desiring to teach pianoforte as a profession. (6 cred.; jr.; prereq., 2 yrs. piano; MWF VII; Mu.) Asst. Prof. Reeves.
- 89f-90w-91s. Advanced Normal Piano. Practice teaching. (6 cred.; sr.; prereq., 86-87-88; MWF VIII; Mu.) Asst. Prof. Reeves.
- 92s. Principles of Vocal Technique. Historical development of vocal technique to meet demands of various schools of composition, and an appraisalment of modern theories. (2 cred.; soph., jr., sr.; TTh VII; Mu.) Prof. Killeen.
- 100f-101w-102s. Composition-Orchestration. For those specializing in theory. May be taken only with the consent of the instructor. (6 cred.; jr., sr.; prereq., 1-2-3, 4-5-6.) (Not offered in 1929-30.)
- 103f-104w-105s.† Analysis. The analysis of musical works as regards their formal construction; subdivisions of themes into phrases, sections, and motives. Symphonies to be presented by the local orchestra are among the compositions used in this course. (3 cred.; soph., jr., sr.; prereq., 1-2-3; T III; Mu.) Asst. Prof. Pepinsky.
- 106f-107w-108s.† History of Music. Some account of primitive systems and of the early Christian modal and harmonic developments, leading to a general survey of musical literature from Bach to the present time. (9 cred.; jr., sr.; prereq., 1-2-3; MWF II; Mu.) Prof. Ferguson.
- 109f-110w-111s.† Bach and Beethoven, Wagner and Brahms. Critical study of selections from master works of the four greatest composers. Biographical readings, topics, and analyses, giving historical and literary background to culminative periods in composition. (9 cred.; sr.; prereq., 106-107-108.) (Not offered in 1929-30.)
- 112f-113w-114s. Ensemble. Section 1. (For students of piano, violin, organ, etc.) Chamber music, duos, trios, and quartets and other larger combinations for strings and wind instruments. Section 2. (For voice students.) Oratorio and opera. (6 cred.; jr., sr.; sec. 1, TTh II; sec. 2, TTh II; Mu.) Sec. 1, Asst. Prof. Pepinsky; sec. 2, Asst. Prof. Hull.

* May be taken by music students four years with credit.

† The entire course must be completed before credit is received for any quarter.

‡ May be taken only with the consent of the instructor.

- 115f-116w-117s. Advanced Ensemble. Section 1. (For students of piano, organ, violin, etc.) Chamber music continued. Section 2. (For voice students.) Offers to groups made up of students from all voice ensemble classes, practical experience in scenes from opera. (6 cred.; sr.; prereq., 112-113-114; sec. 1, not offered in 1929-30; sec. 2, MW VI; Mu.) Prof. Killeen.
- 121f-122w-123s. Romantic Movement. An analytical course covering the romantic movement, with illustrations by the instructor. Papers assigned during the year. (6 cred.; sr.; prereq., 106-107-108; WF VII; Mu.) Miss Kendall.
- 124f-125w-126s. Advanced Harmony. A course designed to develop more freedom in expression and in musical effect. Especial attention given to modulations. (6 cred.; jr., sr., prereq., 4-5-6; T IV, V; Mu.) Prof. Scott.
- 127f-128w-129s. Advanced Composition. (9 cred.; sr.; prereq., 100-101-102.) (Not offered in 1929-30.)
- 201f-202w-203s. Basis of Musical Expression. A study of the expressive elements of music in general, and the application of the study to the work of one composer (to be chosen in conference with the instructor). The course must be completed by a thoro written exposition of the year's work. (9 cred.; grad.; prereq., 109-110-111.) (Not offered in 1929-30.)

PUBLIC SCHOOL MUSIC

COLLEGE OF EDUCATION

Major Advisers

- Professor Scott, and Assistant Professors Jones and Pepinsky.
- Mu.Ed.1f-2w-3s. Class Instrument Teaching. Fall quarter, beginner's classes in violin, viola, cello, and bass; winter quarter, beginner's classes in flute, oboe, clarinet, and bassoon; spring quarter, beginner's classes in all brass and percussion instruments. (3 cred.; fr.; no prereq.; T I; 4 Mu.) Asst. Prof. Pepinsky.
- Mu.Ed.4f-5w-6s. Advanced Class Instrument Teaching. Practical orchestral routine augmenting University High School Orchestra, under baton of the director and members of class in Orchestra Conducting. (3 cred.; soph.; prereq., Mu.Ed. 1-2-3; MW I; 4 Mu.) Asst. Prof. Pepinsky.
- Mu.Ed.29f. Grade School Methods. First quarter. Practical methods of teaching public school music in grades one and two. Particular attention is given to the child voice, its care and development. Students are required to observe in the Minneapolis and St. Paul public schools. (3 cred.; soph., jr., sr.; no prereq.; MWF III; 4 Mu.) Asst. Prof. Jones.

- Mu.Ed.30w. Grade School Methods. Second quarter. Methods of teaching public school music in grades three, four, five, and six. Theory and practice of teaching combined in class work. Students are required to observe in the Minneapolis and St. Paul public schools. (3 cred.; soph., jr., sr.; prereq., Mu.Ed.29; MWF III; 4 Mu.) Asst. Prof. Jones.
- Mu.Ed.31s. Grade School Methods. Third quarter. Same as above for grades seven, eight, and nine. Particular attention to the problems of the changing voice. Also includes a short course in methods of teaching appreciation. (3 cred.; soph., jr., sr.; prereq., Mu.Ed.30; MWF III; 4 Mu.) Asst. Prof. Jones.
- Mu.Ed.32f. High School Methods. First quarter. Methods of teaching music in the modern high school. Organization of, and material for, chorus. Students are required to observe in the Minneapolis and University high schools. Practical demonstrations within the class. (3 cred.; jr., sr.; prereq., Mu.Ed.29-30-31; MWF VI; 4 Mu.) Asst. Prof. Jones.
- Mu.Ed.33w. High School Methods. Second quarter. Application of methods of teaching by practical work with the class itself. Organization of, and material for, glee clubs. Students are required to observe in the Minneapolis and University high schools. (3 cred.; jr., sr.; prereq., Mu.Ed.32; MWF VI; 4 Mu.) Asst. Prof. Jones.
- Mu.Ed.34s. High School Methods. Third quarter. A practical course in methods of class voice teaching, in the use and care of the changing and adult voice. Testing and classification of voices in the junior and senior high schools. Includes methods of teaching high school appreciation and theory and methods of conducting chorus and glee clubs. (3 cred.; jr., sr.; prereq., Mu.Ed.33w; MWF VI; 4 Mu.) Asst. Prof. Jones.
- Mu.Ed.51f-52w-53s. Instrumentation and Orchestration. (Junior, three quarters.) Theoretical study of orchestral and band instruments. Examination, revision, and scoring of material suitable for school orchestras. (6 cred.; jr., sr.; prereq., Mu.Ed.1-2-3, 4-5-6.) (Not offered in 1929-30.)
- Mu.Ed.64f-65w-66s. Orchestra Conducting. (Fourth year, three quarters.) Devoted to the theory and practice of general principles of conducting. Technique of the baton and elements of interpretation. (6 cred.; sr.; prereq., Mu.Ed.51-52-53; MTh VIII; 4 Mu.) Asst. Prof. Pepinsky.
- Mu.Ed.81f-82w-83s. Supervision and Practice Teaching. Class lectures and demonstration in music supervision. Students are required to practice teach in the Minneapolis and St. Paul public schools, and the University High School. (6 cred.; sr.; prereq., Mu.Ed.29-30-31, Mu.Ed.32-33-34; M VII; 4 Mu.) Asst. Prof. Jones.

The Bulletin of the University of Minnesota

*Announcement of Courses
in
Preventive Medicine and Public Health
1928-1930*



Vol. XXXI No. 33 June 4 1928

*Entered at the post-office in Minneapolis as second-class matter
Minneapolis, Minnesota*

*Accepted for mailing at special rate of postage provided for in section 1103,
Act of October 3, 1917. authorized July 12, 1918*

UNIVERSITY CALENDAR

1928-29

Fall Quarter

1928			
September	20	Thursday	Payment of fees closes, except for new students
September	21-24		Entrance examinations (for removal of entrance deficiencies) Registration of all new students entering the freshman class
September	24-28		Examinations for removal of conditions Physical examinations Registration period, ¹ Colleges of Science, Literature, and the Arts, and Education
September	24-29		Freshman Week
September	27-28		Registration days ¹ for all colleges not included above
September	28	Friday	Payment of fees for new students closes
October	1	Monday	Fall quarter classes begin, 8:30 ² a.m.
October	18	Thursday	Senate meeting, 4:30 p.m.
October	20	Saturday	Homecoming Day
November	6	Tuesday	Election Day; a holiday
November	12	Monday	A holiday; (November 11, Sunday, Armistice Day)
November	29	Thursday	Thanksgiving Day; a holiday
December	6	Thursday	State Day Convocation
December	19-22		Final examination period
December	20	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	22	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	26	Wednesday	Payment of fees closes for all students in residence fall quarter ³

Winter Quarter

1929			
January	2-4		Entrance examinations
January	4-5		Registration days for new students in the College of Science, Literature, and the Arts

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, general information bulletin, page 44.

No student will be allowed to register in the University after one week from the beginning of the quarter excepting in unusual cases wherein special circumstances shall justify the appropriate committee of the college concerned permitting registration at a later date.

² First hour classes begin at 8:15 at University Farm.

³ New students must pay fees on dates announced for registration.

January	5	Saturday	Registration day for new students in all other colleges, 8:30 a.m.-3:00 p.m.
January	7	Monday	Christmas vacation ends, winter quarter classes begin, 8:30 ¹ a.m.
February	12	Tuesday	Lincoln's Birthday; a holiday
February	21	Thursday	Charter Day Convocation Senate Meeting, 4:30 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	20-23		Final examination period
March	21	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ²
March	23	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.

Spring Quarter

March	25-27		Entrance examinations
March	29	Friday	Good Friday; a holiday
March	30	Saturday	Registration day for new students in all colleges, 8:30 a.m.-3:00 p.m.
April	1	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ¹ a.m.
May	16	Thursday	Cap and Gown Day Convocation Senate Meeting, 4:30 p.m.
May	30	Thursday	Memorial Day; a holiday
June	12-15		Final examination period
June	15	Saturday	Spring quarter closes, 5:20 p.m.
June	16	Sunday	Baccalaureate service
June	17	Monday	Fifty-seventh annual commencement

Summer Quarter

June	18-19		Registration, first term
June	20	Thursday	Classes begin, 8:00 a.m.
July	4	Thursday	Independence Day; a holiday
July	27	Saturday	Registration and payment of fees for second term closes. First term closes
July	29	Monday	Second term classes begin
August	31	Saturday	Second term closes

¹ First hour classes begin at 8:15 at University Farm.

² Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, general information bulletin, page 44.

No student will be allowed to register in the University after one week from the beginning of the quarter excepting in unusual cases wherein special circumstances shall justify the appropriate committee of the college concerned permitting registration at a later date.

FACULTY

- Harold S. Diehl, M.A., M.D., Director of Students' Health Service, and Associate Professor and Chief of the Department of Preventive Medicine and Public Health
- Ruth E. Boynton, M.S., M.D., Assistant Professor of Preventive Medicine and Public Health, and Medical Adviser to Women, Students' Health Service
- Eula B. Butzerin, B.S., R.N., Assistant Professor of Preventive Medicine and Public Health, and Director of the Course in Public Health Nursing
- Albert J. Chesley, M.D., Associate Professor of Preventive Medicine and Public Health, and Executive Secretary of the State Board of Health
- James A. Childs, C.E., Assistant Professor of Preventive Medicine and Public Health and Engineer, Division of Sanitation, State Board of Health
- J. Horton Daniels, B.A., M.D., Instructor in Preventive Medicine and Public Health
- Ellett M. deBerry, B.A., M.D., Assistant Professor of Preventive Medicine and Public Health, and Mental Hygienist Students' Health Service
- Hally J. Fisher, R.N., Instructor in Preventive Medicine and Public Health
- Joseph C. Hathaway, B.S., M.D., Instructor in Preventive Medicine and Public Health.
- Ruth Houlton, B.A., R.N., Instructor in Public Health Nursing, and Superintendent, Visiting Nurse Association, Minneapolis
- Harry DeWitt Lees, B.M. (Tor.), Assistant Professor of Preventive Medicine and Public Health, and Assistant Director of Students' Health Service
- Orianna McDaniel, M.D., Assistant Professor of Preventive Medicine and Public Health, and Director, Division of Preventable Diseases, State Board of Health
- J. Arthur Myers, Ph.D., M.D., Associate Professor of Preventive Medicine and Public Health, and Director of Lymanhurst School for Tuberculous Children
- William A. O'Brien, M.D., Assistant Professor of Preventive Medicine and Public Health, and of Pathology
- Helen Chesley Peck, R.N., Instructor in Public Health Nursing, and Executive Secretary, Infant Welfare Society, Minneapolis
- Jean Taylor, B.S., R.N., Instructor in Public Health Nursing, and Supervisor of Instruction, Visiting Nurse Association, Minneapolis
- E. Marion Wade, M.A., Assistant Professor of Preventive Medicine and Public Health, and Director of Laboratory, State Board of Health
- Harold A. Whittaker, B.A., Assistant Professor of Preventive Medicine and Public Health, and Director, Division of Sanitation, State Board of Health

COMMITTEE ON PUBLIC HEALTH NURSING

- Harold S. Diehl, M.A., M.D., Director of Students' Health Service and Associate Professor and Chief of the Department of Preventive Medicine and Public Health

- Richard Olding Beard, M.D., Professor of Physiology, Emeritus
 Eula B. Butzerin, B.S., R.N., Assistant Professor of Preventive Medicine
 and Public Health, and Director of the Course in Public Health
 Nursing
 Marion L. Vannier, R.N., Director of School of Nursing and Associate
 Professor of Nursing

ADVISORY COMMITTEE FOR PUBLIC HEALTH NURSING
 EDUCATION IN THE PRACTICE FIELDS

- Harold S. Diehl, M.A., M.D., Director of Students' Health Service and
 Associate Professor and Chief of the Department of Preventive Medi-
 cine and Public Health
 Eula B. Butzerin, B.S., R.N., Assistant Professor of Preventive Medicine
 and Public Health and Director of the Course in Public Health
 Nursing
 Richard Olding Beard, M.D., Professor of Physiology, Emeritus
 Hazel Frasch, B.S., R.N., Supervisor of Instruction, Infant Welfare Soci-
 ety, Minneapolis
 Cora T. Helgesen, R.N., Supervisor of School Nurses, Board of Education,
 Minneapolis
 Ruth Houlton, B.A., R.N., Instructor in Public Health Nursing and
 Superintendent, Visiting Nurse Association, Minneapolis
 Selma Lindblad, R.N., Supervisor of School Nurses, Board of Education,
 St. Paul
 Deborah MacLurg, B.S., R.N., Instructor, University School of Nursing
 Vivian Mayland, B.S., R.N., Assistant Superintendent of Nurses, Glen
 Lake Sanatorium
 Helen Chesley Peck, R.N., Instructor in Public Health Nursing and
 Executive Secretary, Infant Welfare Society, Minneapolis
 Olivia T. Peterson, R.N., Superintendent, Public Health Nursing, Division
 of Child Hygiene, State Board of Health
 Jean Taylor, B.S., R.N., Instructor in Public Health Nursing, and Educa-
 tional Director, Visiting Nurse Association, Minneapolis
 Marion L. Vannier, R.N., Director of School of Nursing and Associate
 Professor of Nursing
 Alma Wretling, R.N., Supervisor of Nurses in Rural Hennepin County

ADVISORY COMMITTEE ON SCHOOL HEALTH WORK

- Harold S. Diehl, M.A., M.D., Chairman

ANNOUNCEMENT OF PUBLIC HEALTH COURSES

The knowledge of the way in which health may be conserved and disease avoided is no longer of interest to the medical profession alone. Teachers, parents, and citizens are realizing that health is an individual, as well as a community, problem and that each and every one must do his part. Consequently, the public is becoming interested in acquiring health information and in actively participating in health work. These new developments make trained teachers and leaders necessary and general education essential.

In response to this increasing demand on the part of the public for health education and for trained leaders in the various fields of public health work the Board of Regents established the Department of Preventive Medicine and Public Health. This department is in the Medical School, but offers courses which are available to students in all colleges and schools of the University.

Many other departments of the University also give courses which contribute to the education of sanitarians, health officials, public health nurses, teachers, etc. So, by properly choosing majors, minors, and electives, in accordance with the curriculum provisions of the college in which the student is registered, a student may obtain training for the various phases and specialties of health work.

The curricula in public health are planned so that, without the addition of any administrative organization, the splendid facilities of the various colleges and departments of the University, of the State Board of Health located on the University campus, and of the official and voluntary health organizations in Minneapolis and St. Paul are made available for training in public health work. Practical field and laboratory work receives credit in the same way as work in other courses.

UNDERGRADUATE COURSE IN PUBLIC HEALTH

A course leading to a bachelor of science degree in public health may be pursued in the College of Science, Literature, and the Arts. The program of this course is outlined in this bulletin but students should refer to the bulletin of the College of Science, Literature, and the Arts for information regarding registration, requirements for admission and graduation, college regulations, etc.

COURSE IN SCHOOL HEALTH WORK

An undergraduate course in school health work, leading to a bachelor of science degree, is offered in the College of Education. A statement of this course is presented in this bulletin but students should refer to the bulletin of the College of Education for information regarding registration, requirements for admission and graduation, college regulations, etc.

PUBLIC HEALTH NURSING COURSES

Development of the course.—As an emergency measure in 1918, when the need for public health nurses was very great, Minnesota responded to the urgent appeal made to her and established, under the direction of the University School of Nursing, a four months' course of instruction in public health nursing. This included both theory and practice. The health

and social agencies of Minneapolis and St. Paul most cordially co-operated in the development of teaching facilities in the field. This co-operation has continued and has made it possible for the University to offer to the students in public health nursing unusual opportunities in well-supervised practice fields. In the fall of 1922, when the Department of Preventive Medicine and Public Health was established in the Medical School, the course in public health nursing was transferred to this department and made an integral part of the University. The period of instruction was increased from four months to nine months and full university credit was granted to the work offered therein. Of these nine months, six months, or two quarters, are devoted to theory and three months, or one quarter, to the practice fields. With the development of public health and the ever increasing demands for better qualified workers in the various fields of activity the course has experienced a steady growth, both in attendance and in increased facilities for instruction.

Aim of the course.—It is the aim of the course to meet more adequately the urgent demands in the many fields now open to public health nurses, including the fields of maternal and child hygiene, infant welfare, pre-school, school, industrial, general visiting nursing, rural nursing, and many others. The need is especially great for nurses who possess that fine quality of leadership which will enable them to enter the fields of organization, administration, supervision, and teaching. To this end the course has enlarged its scope of study.

Facilities for instruction in public health nursing.—Through the various schools and departments of the University almost unlimited resources are available in class instruction.

A new and beautiful library building has recently been completed, the privileges of which are open to students in this department as to all students in the University. The fine medical section of the General Library is available and a generous supply of books especially related to the needs of public health nursing students has recently been purchased.

Field supervision in family case work is secured through the Sociology Department.

Field supervision in medical social service is secured through the Medical Social Service Department of the University Hospitals.

Experience in rural nursing is regularly available in Hennepin County under the immediate direction of the supervisor of nurses. An enlarged program in rural nursing is also being offered for those who are primarily interested in county nursing. Specially selected counties throughout the state are being developed as teaching centers. The student nurse takes up her residence in such county for a period of four weeks; here she is under constant supervision of the county nurse, she participates in the regular program of the county, and she attends group conferences which are planned for general discussion.

Affiliation with the Visiting Nurse Association, the Infant Welfare Society of Minneapolis, and the public schools of Minneapolis and St. Paul offers unusual opportunity in the practice fields. Direct supervision is given by the individual agency and definite programs of instruction have been worked out.

For the students who have not had previous experience or instruction in the care of the tuberculous, an affiliation of two weeks is arranged at Glen Lake Sanatorium. (This is required in addition to the regular nine months' prescribed work.)

In affiliation with the University School of Nursing and using the already existing five-year course of study, the course in public health nursing offers to qualified graduate nurses an opportunity to matriculate in the University and follow a major sequence in public health nursing leading to a bachelor of science degree. Credentials from the School of Nursing will be evaluated on an individual basis and credit granted accordingly by the nursing committee.

Extension.—Through the Extension Division of the University a limited number of classes required for the certificate are available to city nurses. Certain prerequisites are set up for applicants taking this work and to the student who fully qualifies for the regular course full credit is given. No certificate, however, is gained solely through work in the Extension Division; a minimum of at least one quarter must be spent in residence in consecutive study, before a certificate may be earned.

Candidates for admission.—

I. Students eligible to the course in public health nursing are of two groups:

- a. Qualified graduate nurses.
- b. Senior students referred from recognized schools of nursing willing to accept one or more quarters of the course in public health nursing as a contribution to the work of the final year in the hospital. These student nurses must meet the regular high school requirements and must have completed their major hospital services.

II. Qualifications for enrolment of graduate nurses:

- a. Nurse registration.
- b. Eligibility to nurse membership in the National Organization for Public Health Nursing.
- c. Graduation from an accredited four-year high school course. Limited deficiencies may be made up in accredited night classes in the city high schools or in the Minnesota College, Minneapolis, or through the University Extension Division.

Experience since graduation is desirable.

All applicants should have a complete health examination during the first quarter of residence.

III. Candidates for the bachelor of science degree must present high school credentials which fully meet university entrance requirements. Students having the necessary educational qualifications are urged to continue the work toward a degree; the demand for leaders is ever growing and, with this demand, the need of leaders equipped with higher education.

IV. Students may be admitted in any quarter, but it is especially desirable that students register for theory in the fall quarter. Field work is available four times a year.

Certificates.—The certificate in public health nursing is awarded to the student who has satisfactorily completed a minimum of 45 credits in certain prescribed subjects (see p. 12), carrying a "C" average.

Scholarships and loans.—A limited number of scholarship loans are available through the American Red Cross. Further information may be obtained from Mrs. Elsbeth Vaughan, assistant national director, American Red Cross, Public Health Nursing Service, Mid-Western Branch, 1709 Washington Ave., St. Louis, Missouri.

The State Organization for Public Health Nursing has made available a sum of \$500 to be used in small loans for students in the public health nursing course.

Fees.—The fees for the courses in public health nursing are as follows:

Tuition fee (per quarter).....	\$20.00
Incidental fee (per quarter).....	6.00
General deposit	5.00

For special and penalty fees see the bulletin of general information.

Residence.—Sanford Hall for women students offers board and room together with attractive living conditions. A list of other approved rooming and boarding places may be obtained from Mrs. Catherine McBeath, Shevlin Hall. The living expenses for the academic year are similar to those of any other student group; the minimum amount, including tuition, has been estimated at \$500; the average, \$700; and the maximum as \$900.

Uniforms.—While students are in the field they are requested to wear a uniform consisting of a plain blue or gray wash dress with white collar and cuffs, and a black Windsor tie. For outdoor wear a plain dark long coat and dark hat is worn.

THE DEGREE OF BACHELOR OF SCIENCE WITH MAJOR IN PUBLIC HEALTH NURSING

Graduate nurses may receive a bachelor of science degree by selecting one or the other of the following plans:

1. Register in the College of Science, Literature, and the Arts, in accordance with the five-year curriculum as outlined in the School of Nursing bulletin (pages 10-11). Description of junior college requirements on page 13 of this bulletin.

2. Register in the College of Education in accordance with curriculum outlined for School Health Work (p. 11).

Equivalents and substitutions may be made on an individual basis with the approval of the special committee in either case.

Registration requirements for gymnasium must be met.

GRADUATE WORK IN PUBLIC HEALTH

In recent years there has been a great increase in the demand for men and women with graduate training and experience in public health work. To assist in meeting this need the Graduate School of the University of Minnesota has made available the excellent facilities of the University for graduate instruction in this field. Formal courses are offered in bacteriology, immunology, parasitology, statistics, sanitary engineering, etc., while practical training under supervision is offered by the State Board of Health, located on the campus, in sanitation, epidemiology, public health, bacteriology, and public health administration. The students taking this work register in the Graduate School and upon the fulfillment of the requirements of that school will be granted graduate degrees. A minimum of at least one year in residence is required for a degree of master of arts or master of science, and at least three years in residence are required for a degree of doctor of philosophy. The detailed requirements for degrees will be found in the bulletin of the Graduate School of Medicine.¹

GRADUATE WORK IN SCHOOL HEALTH SUPERVISION

Graduate work, leading to specialization along the lines of supervision in physical education, school nursing, or health education, may be followed by properly qualified students, preferably after some actual experience in the field of school health work. Permission to pursue graduate work in

¹ Further inquiries concerning any of these courses may be addressed to the director of the Department of Preventive Medicine and Public Health, or to the director of the Course in Public Health Nursing, University of Minnesota.

this field must be obtained from the advisory committee on school health work. Students who register in the Graduate School and fulfill its various requirements will receive appropriate graduate degrees.

UNDERGRADUATE PROGRAMS OF STUDY

With the facilities available at the University of Minnesota, it is possible to plan courses which will provide training for students in the various phases of public health work. The following several courses of study are definitely outlined.

A FOUR-YEAR COURSE IN PUBLIC HEALTH LABORATORY OR SANITARY WORK LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

This curriculum is intended to prepare students to undertake sanitary surveys and inspections and to perform chemical and bacteriological examinations of water, sewage, foods, milk, excretions, and blood. Competent persons with such a training as this sequence comprises are in constant demand by federal, state, and municipal boards of health, as well as by certain private enterprises.

Students of this course register in the College of Science, Literature, and the Arts and are subject to the rules and requirements of that college. (See bulletin of that college.)

It is desirable that a student be prepared to make use of a foreign language. For this reason the language requirement of the bachelor of arts course is made one of the requirements of this course. If a student has not studied a foreign language in high school, he is advised to elect French or German. A student entering without a foreign language may be obliged to spend additional time in completing the course.

First and Second Years

DEPARTMENT	TITLE	CREDITS
English A-B-C	Freshman English	15
Language (Junior college requirements, see S. L. and A. bulletin) ¹		0 to 20
History 1-2 or 2-3	The Modern World.....	10
Zoology 1-2 or 5-6-7	General Zoology	10 or 12
Sociology 1	Introduction to Sociology.....	5
Psychology 1-2	General Psychology	6
Political Science 1	American Government	5
General Inorganic		
Chemistry 1-2-3 or 4-5	General Inorganic Chemistry.....	12 or 8
Bacteriology 51	General Bacteriology	5
Anatomy 4	Human Anatomy	4
Physiology 4 or 58-59	Human Physiology	4 or 8
Physics 3	Elements of Mechanics and Sounds.....	3
Physics 23	Heat	3
Physics 43	Electricity	3

Third and Fourth Years

Inorganic Chemistry 11	Qualitative Chemical Analysis.....	4
Chemistry 7	Quantitative Analysis	4
Chemistry 1-2	Elementary Organic Chemistry.....	8
Bacteriology 101	Special Bacteriology	4
Bacteriology 116	Immunity	3
Physiology 57	Physiological Chemistry	4
Civil Engineering 162	Water Supply and Sewerage.....	3
Zoology 44	Animal Parasites	3
Zoology 45	Insects and Disease.....	3
Preventive Medicine and Public Health 53, 73, 102, 103, 104, 107, 200.....		

Electives to complete a total of 180 credits for the four years.

¹A student entering without a foreign language may require additional time to complete the course.

FOUR-YEAR CURRICULUM IN SCHOOL HEALTH WORK

This course is designed to prepare students to take charge of health programs in school systems which do not provide specialists in the various phases of school health work. Since the responsibility of persons in these positions will cover all phases of school health work such as physical inspections, control of contagious diseases, correction of physical defects, and the teaching of health and physical education, the aim has been to provide a broad background in the whole field of health education, rather than a high degree of specialization in any one aspect of the problem.

First and Second Years

DEPARTMENT	TITLE	CREDITS
English A-B-C	Freshman English	15
History 1-2	Modern World	10
Inorganic Chemistry 1-2-3 or 4-5	General Inorganic Chemistry.....	12 or 8
Preventive Medicine and Public Health 3	Personal Hygiene and Elementary Sanitation..	2
Sociology 1	Introduction to Sociology.....	5
Psychology 1-2	General Psychology	6
Zoology 1-2 or 5-6-7	General Zoology	10 or 12
Anatomy 4	Human Anatomy	4
Physiology 4	Human Physiology	4
Speech 22	Fundamentals of Speech.....	3
Bacteriology 51	General Bacteriology	5
Home Economics 70	Nutrition Survey	2
Preventive Medicine and Public Health 2	First Aid	1

Approved electives to total 99 credits and the usual freshman-sophomore work in physical education are required in addition to the above prescribed courses.

Third and Fourth Years

DEPARTMENT	TITLE	CREDITS
Physical Education 80	Kinesiology and Physiology of Exercise.....	3
Physical Education 85	Principles or Philosophy of Physical Education	2
Physical Education ¹	Technique of Teaching Motor Activities, Play, Dancing, Games, Gymnastics, etc.....	3
Physical Education 88-89-90	Theory and Techniques of Orthopedic and Remedial Gymnastics	3
Physical Education 92	Practice Teaching in Physical Education.....	2
Physical Education 97	Organization and Supervision of Physical Education	3
Educ. T. (Ar.)	Health Education Methods and Materials.....	2
Educ. T. (Ar.)	Health Education Practice Teaching.....	3
Preventive Medicine and Public Health 53	Elements of Preventive Medicine.....	3
Preventive Medicine and Public Health 59	Social Hygiene	1
Preventive Medicine and Public Health 61	Mental Hygiene	1
Preventive Medicine and Public Health 69	School Nursing—Principles, Techniques, and Practices	4
Preventive Medicine and Public Health 80	Health Supervision of School Child.....	3
Preventive Medicine and Public Health 106	Public Health Administration (in Relation to the School)	2
Educational Psychology 55	Educational Psychology	3
Educational Administration 65	The High School.....	3
Educational Administration 75	The Elementary School.....	2

¹ This course is a specially adapted course in the Department of Physical Education for Women for this curriculum and will be developed as there is a demand for it.

DEPARTMENT	TITLE	CREDITS
Educational Administration 119 or 181	Elementary Curriculum or Technique of Elementary Instruction	2
Educational Administration 124	Educational Administration	3
Educational Administration 160	Principles of Supervision.....	2
Home Economics 171	Child Nutrition	3
Sociology 51	Occurrence of the Socially Inadequate.....	3
Sociology 52	Elementary Case Work.....	3
Sociology 90-91	Elementary Field Work	4
Child Welfare Institute 130	Development of the Young Child.....	3
Child Welfare Institute 170	Parental Education	3
Botany 101	Elementary Biometry	3
	Approved electives to total 90 credits	

CURRICULUM IN PUBLIC HEALTH NURSING

The following program is designed for students who are candidates for the certificate in public health nursing.

DEPARTMENT	TITLE	CREDITS
Psychology 1-2	General Psychology	6
Sociology 1	Introduction to Sociology.....	5
Sociology 52	Elementary Case Work.....	3
Sociology 90	Elementary Field Work.....	2
Sociology 60 or	Child Welfare	3
Home Economics 40	Child Training	
Preventive Medicine and Public Health 53	Elements of Preventive Medicine.....	3
Preventive Medicine and Public Health 58	Maternal and Child Hygiene.....	2
Preventive Medicine and Public Health 59	Social Hygiene	1
Preventive Medicine and Public Health 60	Tuberculosis and Its Control.....	2
Preventive Medicine and Public Health 61	Mental Hygiene	1
Preventive Medicine and Public Health 62-63	Principles of Public Health Nursing and Special Fields	6
Medical Social Service 65	Medical Social Service.....	2
Field Work—11 weeks	.....	12

Practice work is available through affiliation with the following local organizations: Minneapolis Visiting Nurse Association, Infant Welfare Society, public schools of Minneapolis and St. Paul, county services. See page 7 for tuberculosis requirement.

Before a certificate is granted the student must complete a minimum of 45 credits from the above specified subjects or accepted electives, and also must earn one honor point for each credit.

In addition to the foregoing curriculum in Public Health Nursing students who are candidates for the bachelor of science degree in the College of Science, Literature, and the Arts, as stated on page 8, must have their hospital credits evaluated by the nursing committee, and must complete any necessary hospital services required in accordance with the decision of the committee before credit is granted. They must also complete the following subjects of junior college work.

First and Second Years

English A-B-C or Composition 4-5-6, or exemption from requirement
Botany 1-2 or language requirement
Inorganic Chemistry (10 credits)
Bacteriology 51
Zoology 1-2
Anatomy 2
Physiology 4
History 1-2, 3-4, or 7-8
Composition 11-12 or 18-19, or Speech 41-42
Educational Psychology 53
History of Nursing
Theory of Dietetics
Lettering.

Students should refer to the bulletin of the College of Science, Literature, and the Arts, for general information regarding registration, requirements for admission and graduation, college regulations, etc.¹

¹All public health nurses should submit credentials to Eula B. Butzerin, director of Course in Public Health Nursing, before registration.

DESCRIPTION OF COURSES

- 2w. First Aid. (See bulletin of Physical Education.)
- 3f,w,s. Personal Hygiene and Elementary Sanitation. (See Science, Literature, and the Arts bulletin.)
- 4s. Increasing the Span of Human Life. (See Science, Literature, and the Arts bulletin.)
- 5f. Elementary Preventive Medicine for Nurses. (See Nursing bulletin.)
- 12s. Hygiene and First Aid to the Sick and Injured. (See Engineering bulletin.)
- 50f,w,su. Public and Personal Health. (See Science, Literature, and the Arts bulletin.)
- 52f,w,s. Health Care of the Family. (See Home Economics bulletin.)
- 53f,su. Elements of Preventive Medicine. Susceptibility, resistance, and immunity to disease; methods of spread and the prevention of communicable and degenerative diseases; protection of food, water, and milk; school health work; vital statistics. Prerequisites: Psychology 1-2, Bacteriology 51 (or equivalent). 3 credits. Dr. Diehl, Dr. Lees.
- 57f. Health of Infant and Pre-school Child. (See Science, Literature, and the Arts bulletin.)
- 58w,su. Maternal and Child Hygiene (for public health nurses). The maternal welfare program; importance of breast feeding; conduct of infant welfare clinics in cities and rural communities; consideration of child of pre-school and school age as to malnutrition, physical defects, cardiac and nervous disorders. Prerequisite: 50 or 52 or 53. 2 credits. Dr. Boynton and others.
- 59w. Social Hygiene. Relation to public health; normal physiological development through adolescence; educational measures; responsibility of the public health nurse; prevention and control of venereal diseases. Prerequisite: 50 or 52 or 53. 1 credit.
- 60w. Tuberculosis and Its Control. History of tuberculosis movement and campaign in the United States. Early diagnosis and sanatorium treatment. Tuberculosis in children. The psychology of tuberculosis; supervision of returned sanatoria patients. State program for the eradication of tuberculosis; legislation. Prerequisite: 50 or 52 or 53. 2 credits. Dr. Myers.
- 61w. Mental Hygiene. History of movement; social importance. Factors underlying emotional maladjustments and mental diseases. Relations to social work and social agencies. The importance of psychiatric nursing. Prerequisites: 50 or 52 or 53; and Psychology 1-2. 1 credit. Dr. deBerry.
- 62f,su. Principles of Public Health Nursing. Development, principles of organization, administration, and supervision of public health nursing; methods of co-operative endeavor with social agencies; health teaching as an essential factor in the promotion of individual and community well-being. Prerequisite: 53 or equivalent; 3 credits. Miss Butzerin.
- 63w. Special Fields in Public Health Nursing. Development of special fields in public health nursing; scope of program; analysis of services; special excursions; class demonstrations and discussions. Prerequisite: 62 or equivalent. 3 credits. Miss Butzerin.

- 64f,w,s,su. Field Practice in Infant Welfare Nursing. For public health nurses. Class instruction, observation, and supervised practice in home visiting in the interest of breast feeding and well baby care; in conducting well baby clinics and behavior clinics for pre-school children; in understanding family problems affecting children. Prerequisites: 58 and 62. 3 credits. Miss Butzerin, Miss Peck.
- 65f,w,s. Field Practice in School Nursing. Routine inspections with the school nurse; assistance at medical examinations; general sanitary inspections; home visits; visits to special classes, as sight-saving, defective speech and hearing, subnormal, and open air. Prerequisite: 62. 2 credits. Miss Butzerin.
- 66f,w,s,su. Field Practice in County Nursing. Student nurse observes and assists the nurse on her rounds in the county, in the routine physical inspection of school children, the home calls, the health talks and classes in home nursing, as well as the organizing, advertising, and conducting of the rural clinic. Prerequisite: 62. 2 credits. Miss Butzerin.
- 67f,w,s,su. Field Practice in a Tuberculosis Sanatorium. Observation and practical care of pulmonary, osseous, laryngeal tuberculosis; tuberculous enteritis; general sanatorium treatment; special treatment; exercise; laboratory; occupational therapy and the reading of literature on tuberculosis. Prerequisites: 60 and 62. 2 credits. Miss Butzerin, Miss Mayland.
- 68f,w,s,su. Field Practice in Visiting Nursing. Lectures, demonstrations, supervision, and field practice in bedside care of general and maternity patients; communicable disease, tuberculosis, and mental cases with special emphasis upon recognition of social problems, co-operation with social agencies and accurate record keeping. Prerequisite: 62. 5 credits. Miss Butzerin, Miss Houlton, Miss Taylor.
- 69f. School Nursing. Its objectives, program, and techniques. Discussion of duties of school nurse in the conduct of a health program in both rural and urban schools. Opportunities for practice work will be provided. Open to public health nurses and students with teaching experience. Prerequisite: 53 or equivalent. 4 credits. Miss Butzerin.
- 70f,su. Home Nursing and Child Care. Theory and practice in teaching lay groups the principles and methods of home sanitation, care of the sick, and prevention of illness. Prerequisites: 62, 63 or accepted equivalent. 3 credits. Miss Butzerin, Miss Fisher.
- 73w. Occupational Hygiene and Disease. For non-medical students. Working hours and conditions as related to health; specific occupational diseases, their causes and prevention; importance of temperature; light and dust; wages and disease; industrial medical and nursing services. Prerequisite: 50 or 52 or 53. 2 credits. Dr. Myers.
- 80w,su. Health Supervision of School Child. (See Education bulletin.)
- 100f. Preventive Medicine and General Hygiene. (See Medical bulletin.)
- 101w,s,su. Public Health Administrative and Field Work. (See Medical bulletin.)
- 102w. Sanitation. Sanitary supervision of water and milk supplies, sewage, refuse, and garbage disposal systems. Practical work, including field investigations, laboratory examinations, interpretation of results, recommendations to correct unsatisfactory conditions, report writing, and office procedure. Prerequisites: Bacteriology 101; Anal. Chem.

- 1-2 or 7, and Organic Chem. 1-2 or 53; Physics 24. 34. 44. Credits and hours arranged. Mr. Whittaker, Mr. Chi'ds.
- 103s. Public Health Bacteriology. Modern methods of a public health laboratory in making diagnoses; in the preparation of vaccines, and in research. Registration by permission. Prerequisites: Bacteriology 101. 116. 3 credits or arranged. Miss Wade.
- 104f,w,s,u. Epidemiology. Open only to graduate students. Lectures on principles and methods of epidemiological investigation. Analysis of data; methods of reaching conclusions; individual field work; collateral reading. Credits arranged. Dr. Chesley, Dr. McDaniel.
- 106f,w,s. Public Health Administration. Organization of state, municipal, and voluntary health activities; preparation of budgets; procedures in enforcing quarantine; in correcting unsanitary conditions, in controlling tuberculosis and venereal diseases; value of sanitary surveys, food inspections, etc. Prerequisite: 53 or 101. Credits arranged. Dr. Diehl.
- 107s. Sanitary Surveys. Conferences, practical field work and report on a specified survey. Of particular value to practitioners who may be called upon to serve as local health officers. Prerequisite: 53 or 100. 2 credits. Dr. Diehl.
200. Research. Opportunities will be offered by the University and by the various co-ordinated organizations for qualified students to pursue research work. Dr. Diehl and staff.

SOME OF THE COURSES CONTRIBUTING TO PUBLIC HEALTH EDUCATION BUT OFFERED BY OTHER DEPARTMENTS OF THE UNIVERSITY

No.	Title	Department	Instructor
44	Animal Parasites	Zoology	Mr. Riley
45	Insects and Disease.....	Zoology	Mr. Riley
107	Protozoology	Zoology	Mr. Sigerfoos
144-145-			
146	Animal Parasites and Parasitism	Zoology	Mr. Riley
51	General Bacteriology	Bacteriology	Dr. Green
101	Special Bacteriology	Bacteriology	Dr. Larson
114	Higher Bacteria	Bacteriology	Dr. Henrici
116	Immunity	Bacteriology	Dr. Larson
150-151	Advanced Bacteriology	Bacteriology	Dr. Larson
101	Elementary Biometry	Botany	Mr. Harris
145	Advanced Biometry	Botany	Mr. Harris
170	Development of Young Child...	Child Welfare	Mr. Anderson
190-191	Mental Examination of Pre-school Children	Child Welfare	Miss Goodenough
135	Physical Development of Childhood	Anatomy	Mr. Scammon
160-161-			
162	Seminar in Growth of Children	Anatomy	Mr. Scammon
114-115	Applied Physiology	Physiology	Dr. Greisheimer
201	Seminar in Physiology	Physiology	Dr. Lyon
91	Clinics in Dermatology and Syphilis	Medicine	Dr. Michelson
53	Contagious Diseases	Pediatrics	Dr. Huenekens
183	Genetics and Eugenics	Zoology	Arranged
7	State Government	Political Science	Mr. Lambie
11	Municipal Government	Political Science	Mr. Anderson
161	Hydrology	Sanitary Engineering	Mr. Bass
162-163	Water Supply and Sewerage....	Sanitary Engineering	Mr. Bass
261-262	Water and Sewage Purification..	Sanitary Engineering	Mr. Bass
114-145	Abnormal Psychology	Psychology	Mr. Anderson
100	Social Psychology	Sociology	Mr. Chapin

Students should retain this bulletin for use throughout the year

The Bulletin *of the University of* **Minnesota**

College of Engineering and Architecture
and
School of Chemistry
1929 - 1930



Vol. XXXII No. 48 August 22 1929

Entered at the post-office in Minneapolis as second-class matter
Minneapolis, Minnesota

Accepted for mailing at special rate of postage provided for in section 1103,
Act of October 3, 1917, authorized July 12, 1918

FRESHMAN WEEK

The University recognizes the need of giving its newly entering students an introduction to their work and to university life which is new and strange to many of them. For this purpose it is requiring freshmen to come to the University for part of the week before classes begin. This Freshman Week is devoted to efforts to help the freshman get a right start.

The period of September 25 to 28, inclusive, will be used by the freshman for the following duties:

- a. Making his living arrangements.
- b. Registration and paying his fees.
- c. Physical examinations
- d. Psychological tests.
- e. Other tests or examinations which will enable the faculty to place him in the classes for which he is best fitted.
- f. Hearing lectures on such subjects as:
 1. The use of the library.
 2. How to study.
- g. Making visits to acquaint himself with the University Library, scientific laboratories, and other points of interest in connection with his choice of studies and future occupations.
- h. Special exercises intended to acquaint him with the peculiar conditions or requirements of the college which he enters.
- i. Musical and social entertainments in the evenings arranged with the co-operation of the Student Council and the various religious bodies.

During the process of registration faculty advisers talk with all students, helping them to make the best selection of studies.

A committee on educational guidance maintains an office for conference with freshmen regarding their general vocational and educational problems.

Administrative officers, faculty, student government councils, upper class students, and organizations for religious work all co-operate to make Freshman Week a period during which the freshmen find themselves and learn how to go about their university work and how to profit by the opportunities for recreation and other activities in addition to their studies.

NOTICE THAT ATTENDANCE FROM SEPTEMBER 25 TO 28, INCLUSIVE, IS A REQUIREMENT.

It is recommended that as many as possible present themselves for registration on Monday, September 23, in order to avoid the inconvenience and delay incident to the congestion on the last day. All who have not completed the psychological and English tests must report on Monday, September 23.

1929							1930														
JULY																					
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	1	2	3	4	5
7	8	9	10	11	12	13	5	6	7	8	9	10	11	6	7	8	9	10	11	12	
14	15	16	17	18	19	20	12	13	14	15	16	17	18	13	14	15	16	17	18	19	
21	22	23	24	25	26	27	19	20	21	22	23	24	25	20	21	22	23	24	25	26	
28	29	30	31	..	..	..	26	27	28	29	30	31	..	27	28	29	30	31	..	..
..	
AUGUST																					
..	1	2	3	1	1	2
4	5	6	7	8	9	10	2	3	4	5	6	7	8	3	4	5	6	7	8	9	
11	12	13	14	15	16	17	9	10	11	12	13	14	15	10	11	12	13	14	15	16	
18	19	20	21	22	23	24	16	17	18	19	20	21	22	17	18	19	20	21	22	23	
25	26	27	28	29	30	31	23	24	25	26	27	28	..	24	25	26	27	28	29	30	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..
SEPTEMBER																					
1	2	3	4	5	6	7	..	..	..	..	..	..	1	..	1	2	3	4	5	6
8	9	10	11	12	13	14	2	3	4	5	6	7	8	7	8	9	10	11	12	13	
15	16	17	18	19	20	21	9	10	11	12	13	14	15	14	15	16	17	18	19	20	
22	23	24	25	26	27	28	16	17	18	19	20	21	22	21	22	23	24	25	26	27	
29	30	..	..	..	..	..	23	24	25	26	27	28	29	28	29	30	..	..	..	..
..	..	..	..	..	..	..	30	31	..	..	..	..	..	..	..	..	..	..	..	..
OCTOBER																					
..	..	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	6
6	7	8	9	10	11	12	6	7	8	9	10	11	12	5	6	7	8	9	10	11	
13	14	15	16	17	18	19	13	14	15	16	17	18	19	12	13	14	15	16	17	18	
20	21	22	23	24	25	26	20	21	22	23	24	25	26	19	20	21	22	23	24	25	
27	28	29	30	31	..	..	27	28	29	30	..	..	..	26	27	28	29	30	31	..
..	
NOVEMBER																					
..	1	2	3	1	2	3	1	2
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8	
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15	
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22	
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
DECEMBER																					
1	2	3	4	5	6	7	1	2	3	4	5	6	7	..	1	2	3	4	5	6	
8	9	10	11	12	13	14	8	9	10	11	12	13	14	7	8	9	10	11	12	13	
15	16	17	18	19	20	21	15	16	17	18	19	20	21	14	15	16	17	18	19	20	
22	23	24	25	26	27	28	22	23	24	25	26	27	28	21	22	23	24	25	26	27	
29	30	31	..	..	..	..	29	30	..	..	..	..	..	28	29	30	31	..	..	..
..	
JANUARY																					
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	
..	..	..	1	2	3	4	..	..	..	1	2	3	4	..	..	1	2	3	4	5
5	6	7	8	9	10	11	5	6	7	8	9	10	11	6	7	8	9	10	11	12	
12	13	14	15	16	17	18	12	13	14	15	16	17	18	13	14	15	16	17	18	19	
19	20	21	22	23	24	25	19	20	21	22	23	24	25	20	21	22	23	24	25	26	
26	27	28	29	30	31	..	26	27	28	29	30	31	..	27	28	29	30	31	..	..
..	
FEBRUARY																					
..	1	1	1	2
2	3	4	5	6	7	8	2	3	4	5	6	7	8	3	4	5	6	7	8	9	
9	10	11	12	13	14	15	9	10	11	12	13	14	15	10	11	12	13	14	15	16	
16	17	18	19	20	21	22	16	17	18	19	20	21	22	17	18	19	20	21	22	23	
23	24	25	26	27	28	..	23	24	25	26	27	28	..	24	25	26	27	28	29	30	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..
MARCH																					
..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	1	2	3	4	5	6
2	3	4	5	6	7	8	2	3	4	5	6	7	8	7	8	9	10	11	12	13	
9	10	11	12	13	14	15	9	10	11	12	13	14	15	14	15	16	17	18	19	20	
16	17	18	19	20	21	22	16	17	18	19	20	21	22	21	22	23	24	25	26	27	
23	24	25	26	27	28	29	23	24	25	26	27	28	29	28	29	30	..	..	..	..
30	31	..	..	..	..	..	30	31	..	..	..	..	..	..	..	..	..	..	..	..
APRIL																					
..	..	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	6
6	7	8	9	10	11	12	6	7	8	9	10	11	12	5	6	7	8	9	10	11	
13	14	15	16	17	18	19	13	14	15	16	17	18	19	12	13	14	15	16	17	18	
20	21	22	23	24	25	26	20	21	22	23	24	25	26	19	20	21	22	23	24	25	
27	28	29	30	..	..	..	27	28	29	30	..	..	..	26	27	28	29	30	31	..
..	
MAY																					
..	1	2	3	1	2	3	1	2
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8	
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15	
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22	
25	26	27	28	29	30	31	25	26	27	28	29	30	31	23	24	25	26	27	28	29	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
JUNE																					
1	2	3	4	5	6	7	1	2	3	4	5	6	7	..	1	2	3	4	5	6	
8	9	10	11	12	13	14	8	9	10	11	12	13	14	7	8	9	10	11	12	13	
15	16	17	18	19	20	21	15	16	17	18	19	20	21	14	15	16	17	18	19	20	
22	23	24	25	26	27	28	22	23	24	25	26	27	28	21	22	23	24	25	26	27	
29	30	..	..	..	..	..	29	30	..	..	..	..	..	28	29	30	31	..	..	..
..	

UNIVERSITY CALENDAR

1929-30

Fall Quarter

1929

September	19	Thursday	Payment of fees closes, except for new students
September	23	Monday	Entrance examinations (for removal of entrance deficiencies)
September	23-24		All new students entering the freshman class report to registrar
September	23-27		Examinations for removal of conditions Physical examinations
September	25-28		Freshman Week
September	27	Friday	Registration ¹ in the College of Engineering and Architecture and the School of Chemistry
September	27	Friday	Payment of fees for new students closes
September	30	Monday	Fall quarter classes begin, 8:30 ² a.m.
October	17	Thursday	Senate meeting, 4:30 p.m.
November	6	Wednesday	Mid-quarter grades due
November	11	Monday	Armistice Day; a holiday
November	16	Saturday	Homecoming Day
November	28	Thursday	Thanksgiving Day; a holiday
December	5	Thursday	State Day Convocation
December	18-21		Final examination period
December	19	Thursday	Commencement Convocation
December	21	Saturday	Senate meeting, 4:30 p.m.
December	26	Thursday	Fall quarter ends, 5:20 p.m. Payment of fees closes for all students in residence fall quarter ³

Winter Quarter

1930

January	3	Friday	Entrance examinations
January	4	Saturday	Registration ¹ in the College of Engineering and Architecture and the School of Chemistry

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, bulletin of general information, page 44.

No student will be allowed to register in the University after one week from the beginning of the quarter excepting in unusual cases wherein special circumstances shall justify the appropriate committee of the college concerned permitting registration at a later date.

² First hour classes begin at 8:15 at University Farm.

³ New students must pay fees on dates announced for registration.

CALENDAR

5

January	6	Monday	Winter quarter classes begin 8:30 ² a.m.
February	11	Tuesday	Mid-quarter grades due
February	12	Wednesday	Lincoln's Birthday; a holiday
February	20	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Saturday	Washington's Birthday; a holiday
March	19-22		Final examination period
March	20	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ¹
March	22	Saturday	Winter quarter ends, 5:20 p.m.

Spring Quarter

March	28	Friday	Entrance examinations
March	29	Saturday	Registration ¹ in the College of Engineering and Architecture and the School of Chemistry
March	31	Monday	Spring quarter classes begin, 8:30 ² a.m.
April	18	Friday	Good Friday; a holiday
May	7	Wednesday	Mid-quarter grades due
May	15	Thursday	Cap and Gown Day Convocation Senate meeting, 4:30 p.m.
May	30	Friday	Memorial Day; a holiday
June	8	Sunday	Baccalaureate service
June	9	Monday	Fifty-eighth annual commencement
June	11-14		Final examination period
June	14	Saturday	Spring quarter closes, 5:20 p.m.

Summer Quarter

June	17-18		Registration, first term
June	19	Thursday	Classes begin, 8:00 a.m.
July	4	Friday	Independence Day; a holiday
July	26	Saturday	Registration and payment of fees for second term closes. First term closes
July	28	Monday	Second term classes begin
August	30	Saturday	Second term closes

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, bulletin of general information, page 44.

No student will be allowed to register in the University after one week from the beginning of the quarter excepting in unusual cases wherein special circumstances shall justify the appropriate committee of the college concerned permitting registration at a later date.

² First hour classes begin at 8:15 at University Farm.

COLLEGE OF ENGINEERING AND ARCHITECTURE AND SCHOOL OF CHEMISTRY

FACULTY AND STAFF

ADMINISTRATION

- Lotus Delta Coffman, Ph.D., LL.D., President
Ora Miner Leland, B.S., C.E., Dean of the College of Engineering and Architecture and the School of Chemistry
Samuel Colville Lind, Ph.D., Professor of Chemistry and Director of the School of Chemistry
Robert W. French, B.S., C.E., Chairman of Students' Work Committee (Engineering and Architecture)
Carl A. Herrick, M.E., Chairman of Registration and Schedule Committees (Engineering and Architecture)
Howard D. Myers, B.S., C.E., Chairman of Advanced Standing Committee (Engineering and Architecture)
Hervey H. Barber, Ph.D., Superintendent of Supply and Equipment (Chemistry)
Lillian Cohen, Ph.D., Chairman of Schedule Committee (Chemistry)
I. William Geiger, Ph.D., Chairman of Advanced Standing Committee (Chemistry)
Everhart P. Harding, Ph.D., Chairman of Registration Committee (Chemistry)
Norville C. Pervier, Ph.D., Chairman of Students' Work Committee (Chemistry)

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

- Oscar B. Jesness, Ph.D., Professor of Agricultural Economics and Chief of Division
Andrew Boss, D.Sc., Professor of Farm Management and Vice-Director Agricultural Experiment Station
Lewis F. Garey, M.S., Assistant Professor of Farm Management
George B. Clark, B.S., Instructor in Agricultural Economics

AGRICULTURAL ENGINEERING

- William Boss, Professor of Agricultural Engineering and Chief of Division
Harry B. Roe, B.S.(Eng.), Professor of Drainage and Irrigation
Mark J. Thompson, M.S., Associate Professor of Land Clearing
Julius Romness, B.S., Assistant Professor of Agricultural Physics
Arthur J. Schwantes, B.S.(Agr.), Assistant Professor of Farm Machinery
James B. Torrance, B.S.(Agr.), Assistant Professor of Farm Mechanics
Arthur G. Tyler, B.S., Assistant Professor of Agricultural Physics
Hall B. White, M.S., Assistant Professor of Farm Buildings
J. Grant Dent, Instructor in Mechanical Training
Jesse H. Neal, M.S.(A.E.), Instructor in Drainage and Irrigation

AGRONOMY AND PLANT GENETICS

- Herbert K. Hayes, D.Sc., Professor of Plant Genetics and Chief of Division
Albert C. Army, M.S., Associate Professor of Agronomy
Harold K. Wilson, Ph.D., Assistant Professor of Agronomy

FACULTY

7

ANIMAL HUSBANDRY

Walter H. Peters, M.Agr., Professor of Animal Husbandry and Chief of Division

ARCHITECTURE

Frederick M. Mann,¹ M.S.(Arch.), C.E., Professor of Architecture and Head of the School of Architecture

Leon E. Arnal, Architect Diplômé. French Government, Professor of Architectural Design

Robert T. Jones, B.S.(Arch.), Professor of Architectural Construction

S. Chatwood Burton, M.A., Associate Professor of Fine Arts

Roy C. Jones, M.S.(Arch.), Associate Professor of Architectural Design

Rhodes Robertson, B.A., M.Arch., Assistant Professor of Architectural Design

Elmer E. Young, Assistant Professor of Fine Arts

Arthur R. Nichols, B.S.(Arch.), Lecturer in Landscape Architecture

Leon H. Sault, Lecturer in Estimating

David J. Deneen, B.S., Instructor in Architecture

Ivan Doseff, B.S., Instructor in Drawing and Painting

Esther Hargrave, B. Int. Dec., Instructor in Interior Architecture

Paul M. Havens, B.S.(Arch.), Instructor in Architecture

Donald C. Heath, B.S.(Arch.), Instructor in Architecture

ART EDUCATION

Ruth Raymond, M.A., Professor of Art Education and Chairman of the Department

Robert S. Hilpert, B.S., Assistant Professor of Art Education

ASTRONOMY

William O. Beal, Ph.D., Assistant Professor of Astronomy and Chairman of the Department

Clifford C. Crump, Ph.D., Professor of Astronomy

BOTANY

J. Arthur Harris, Ph.D., Professor of Botany and Head of the Department

William S. Cooper, Ph.D., Professor of Botany

Carl O. Rosendahl, Ph.D., Professor of Botany

Josephine E. Tilden, M.S., Professor of Botany

George O. Burr, Ph.D., Associate Professor of Botany

Frederic K. Butters, Ph.D., Associate Professor of Botany

Ned L. Huff, M.A., Assistant Professor of Botany

INORGANIC CHEMISTRY

M. Cannon Sneed, Ph.D., Professor of Inorganic Chemistry and Chief of the Division

Hervey H. Barber, Ph.D., Assistant Professor of Inorganic Chemistry and Superintendent of Supply and Equipment

Lillian Cohen, Ph.D., Associate Professor of Inorganic Chemistry

George Glockler, Ph.D., Associate Professor of Inorganic Chemistry

¹ Absent on sabbatic leave, spring and summer, 1930.

Lloyd H. Reyerson, Ph.D., Associate Professor of Inorganic Chemistry
Norville C. Pervier, Ph.D., Assistant Professor of Inorganic Chemistry
Henry N. Stephens, Ph.D., Assistant Professor of Inorganic Chemistry
Gladstone B. Heisig, M.S., M.A., Instructor in Inorganic Chemistry
J. Lewis Maynard, B.A., Instructor in Inorganic Chemistry
Richard Black, B.A., Assistant in Inorganic Chemistry
Donald R. Blumer, B.A., Assistant in Inorganic Chemistry
Angus E. Cameron, B.A., Assistant in Inorganic Chemistry
Albert L. Chaney, M.S., Assistant in Inorganic Chemistry
L. Wallace Cornell, B.S., Assistant in Inorganic Chemistry
Nylene Eckles, B.A., Assistant in Inorganic Chemistry
Keren E. Gilmore, M.A., Assistant in Inorganic Chemistry
Kenneth A. Kobe, Assistant in Inorganic Chemistry
Maurice G. Larian, M.S., Assistant in Inorganic Chemistry
Byron E. Lauer, B.S., Assistant in Inorganic Chemistry
Barnard M. Marks, B.S., Ch.E., Assistant in Inorganic Chemistry
Earl F. Ogg, M.A., Assistant in Inorganic Chemistry
Grant W. Smith, B.A., Assistant in Inorganic Chemistry
Marvin A. Spielman, B.S., Assistant in Inorganic Chemistry
Editha Underhill, M.S., Assistant in Inorganic Chemistry
Edward M. Van Duzee, B.Ch.E., Assistant in Inorganic Chemistry
Samuel Yuster, Assistant in Inorganic Chemistry

ANALYTICAL CHEMISTRY

Isaak M. Kolthoff, Ph.D., Professor of Analytical Chemistry and Chief of the Division
Charles F. Sidener, B.S., Professor of Analytical Chemistry, Emeritus
I. William Geiger, Ph.D., Associate Professor of Analytical Chemistry
Landon A. Sarver, Ph.D., Assistant Professor of Analytical Chemistry
Wouter Bosch, Assistant in Analytical Chemistry
Tohru Kameda, B.S., Assistant in Analytical Chemistry
Ernest B. Sandell, B.S., Assistant in Analytical Chemistry

ORGANIC CHEMISTRY

William H. Hunter, Ph.D., Professor of Organic Chemistry and Chief of the Division
George B. Frankforter, Ph.D., Professor of Industrial Organic Chemistry, Emeritus
Lee I. Smith, Ph.D., Associate Professor of Organic Chemistry
Walter M. Lauer, Ph.D., Assistant Professor of Organic Chemistry
Gordon D. Byrkit, M.S., Assistant in Organic Chemistry
Walter N. Day, B.S., Assistant in Organic Chemistry
William F. Filbert, B.S., Assistant in Organic Chemistry
Donovan E. Kvalnes, B.A., Assistant in Organic Chemistry
Robert V. Yohe, B.A., Assistant in Organic Chemistry
Elmore H. Northey, B.A., duPont Fellow

PHYSICAL CHEMISTRY

Frank H. MacDougall, Ph.D., Professor of Physical Chemistry
 Samuel C. Lind, Ph.D., Professor of Photo- and Radio-Chemistry
 Robert S. Livingston, Ph.D., Assistant Professor of Physical Chemistry
 Nelson W. Taylor,¹ Ph.D., Assistant Professor of Physical Chemistry
 Donald S. Villars, Ph.D., Assistant Professor of Physical Chemistry
 Charles P. Roe, B.Ch., Assistant in Physical Chemistry
 Charles Rosenblum, B.S., Assistant in Physical Chemistry
 Frank H. Stodola, B.S., Assistant in Physical Chemistry
 Edward C. Truesdale, M.A., Shevlin Fellow

TECHNOLOGICAL CHEMISTRY

Everhart P. Harding, Ph.D., Associate Professor of Technological Chemistry
 Arthur E. Stoppel, Ph.D., Assistant Professor of Technological Chemistry
 John R. McConnell, B.Ch.E., Assistant in Technological Chemistry
 Hubert A. Shabaker, B.Ch.E., Assistant in Technological Chemistry
 Theodor A. Petry, B.Ch.E., Assistant in Technological Chemistry

CHEMICAL ENGINEERING

Charles A. Mann, Ph.D., Professor of Chemical Engineering and Chief of the
 Division
 George H. Montillon,² Ph.D., Associate Professor of Chemical Engineering
 Ralph E. Montonna, Ph.D., Associate Professor of Chemical Engineering
 Irvin Lavine, B.S., Instructor in Chemical Engineering
 Burrell F. Ruth, M.S., Instructor in Chemical Engineering

CIVIL ENGINEERING

Frederic H. Bass, B.S., Professor of Municipal and Sanitary Engineering and
 Chairman of the Department
 Alvin S. Cutler, C.E., Professor of Railway Engineering
 John I. Parcel, B.A., B.S.(C.E.), Professor of Structural Engineering
 Fred C. Lang, C.E., Associate Professor of Highway Engineering
 Otto S. Zelner, B.S.(C.E.), Associate Professor of Surveying
 Leonard F. Boon, C.E., Assistant Professor of Civil Engineering
 Chester A. Hughes, M.A.Sc., Assistant Professor of Structural Engineering
 Joseph A. Wise, B.S.(C.E.), Assistant Professor of Structural Engineering
 Harvey W. Mohr, B.S.(C.E.), Research Fellow in Civil Engineering
 Albert J. Plath, B.S.E., Teaching Fellow in Civil Engineering

DAIRY HUSBANDRY

Clarence H. Eckles, M.S.A., D.Sc., Professor of Dairy Husbandry and Chief
 of Division
 Willes B. Combs, M.A., Professor of Dairy Husbandry

DRAWING AND DESCRIPTIVE GEOMETRY

William H. Kirchner, B.S., Professor of Drawing and Descriptive Geometry and
 Head of the Department

¹ Absent on leave, 1929-30.

² Absent on sabbatic leave, 1929-30.

- Robert W. French, B.S.(C.E.), Associate Professor of Drawing and Descriptive Geometry
- Leon Archibald, B.Sc., Assistant Professor of Drawing and Descriptive Geometry
- Henry C. T. Eggers, B.S., E.E., Assistant Professor of Drawing and Descriptive Geometry
- Alex S. Levens, M.S.(C.E.), C.E., Assistant Professor of Drawing and Descriptive Geometry
- Howard D. Myers, B.S.(C.E.), Assistant Professor of Drawing and Descriptive Geometry
- Orrin W. Potter, E.M., M.S., Assistant Professor of Drawing and Descriptive Geometry
- Robert F. Schuck, B.S.(E.E.), Assistant Professor of Drawing and Descriptive Geometry
- William S. Williams, B.S.(E.E.), Assistant Professor of Drawing and Descriptive Geometry
- Fred T. Cruzen, B.S.(E.E.), Instructor in Drawing and Descriptive Geometry
- Lloyd J. Quaid, B.S.(E.E.), Instructor in Drawing and Descriptive Geometry
- Russell H. Rankin, B.S., Instructor in Drawing and Descriptive Geometry
- Joseph M. Sheridan, B.A., Instructor in Drawing and Descriptive Geometry
- Emmett O. Shultz, B.S.(M.E.), Instructor in Drawing and Descriptive Geometry

ECONOMICS AND BUSINESS ADMINISTRATION

- Russell A. Stevenson, Ph.D., Professor of Accounting, Head of the Department, and Dean of the School of Business Administration
- Jay L. O'Hara, Ph.D., Lecturer in Economics, Secretary of the School of Business Administration, and Adviser in Engineering Pre-Business Course
- Frederic B. Garver, Ph.D., Professor of Economics
- Alvin H. Hansen, Ph.D., Professor of Economics
- Bruce D. Mudgett, Ph.D., Professor of Economics
- J. Warren Stehman, Ph.D., Professor of Economics
- Roland S. Vaile, M.A., Professor of Economics
- Jeremiah S. Young, Ph.D., Professor of Political Science
- Ernest A. Heilman, Ph.D., Associate Professor of Accounting
- Frederick C. Wagner, M.A., Associate Professor of Economics
- Harry J. Ostlund, B.A., Assistant Professor of Accounting
- William H. Stead, Ph.D., Assistant Professor of Economics
- Wayne E. Butterbaugh, M.S., Professorial Lecturer in Economics
- Ben W. Palmer, M.A., LL.B., Lecturer in Political Science
- Reuel I. Lund, M.A., C.P.A., Instructor in Accounting
- Robert B. Westbrook, M.A., Instructor in Economics

ELECTRICAL ENGINEERING

- John M. Bryant, M.S., E.E., Professor of Electrical Engineering and Head of the Department
- William T. Ryan, E.E., Professor of Electric Power Engineering
- Franklin W. Springer, E.E., Professor of Electrical Engineering
- Loyst C. Caverley, M.S., Assistant Professor of Electric Power Engineering
- Henry E. Hartig, B.S.(E.E.), Ph.D., Assistant Professor of Telephone and Telegraph Engineering

FACULTY

11

Elmer W. Johnson, B.S., M.E., E.E., Assistant Professor of Electric Power Engineering

John H. Kuhlman, B.A., E.E., Assistant Professor of Electrical Design

Milo E. Todd, B.A., E.E., Assistant Professor of Electric Power Engineering

Davis Bartholomew, B.S.(E.E.), Teaching Fellow in Electrical Engineering

Edwin W. Fredrickson, B.S.(E.E.), Teaching Fellow in Electrical Engineering

William D. McIlvaine, B.E.E., Teaching Fellow in Electrical Engineering

Anthony P. Schavone, B.S.(E.E.), Teaching Fellow in Electrical Engineering

James J. Haley, Assistant in Power Plant Operation

ENGLISH

Cecil A. Moore, Ph.D., Professor of English and Chairman of the Department

Harlow C. Richardson, B.A., Assistant Professor of English, in charge of Engineering English

Fred S. Beers, B.A., Instructor in English

Clifford I. Haga, B.A., Instructor in English

Hoffman R. Hays, M.A., Instructor in English

Allen E. Woodall, M.A., Instructor in English

FORESTRY

Henry Schmitz, M.S., Ph.D., Professor of Forestry and Chief of the Division

Edward G. Cheyney, B.A., Professor of Forestry

GEOLOGY AND MINERALOGY

William H. Emmons, Ph.D., Professor of Geology and Mineralogy and Head of the Department

Clinton R. Stauffer, Ph.D., Professor of Geology and Mineralogy

John W. Gruner, Ph.D., Associate Professor of Geology

George M. Schwartz, Ph.D., Associate Professor of Geology and Mineralogy

GERMAN

Samuel Kroesch, Ph.D., Professor of German and Head of the Department

George F. Lussky, Ph.D., Associate Professor of German

James Davies, Ph.D., Assistant Professor of German

Karl Ermisch, Ph.D., Instructor in German

Gina O. Wangsness, B.A., Instructor in German

Bertha M. Bertsch, Teaching Assistant in German

HORTICULTURE

William H. Alderman, B.S.A., Professor of Horticulture and Chief of Division

Lewis E. Longley, M.S., Assistant Professor of Horticulture

MATHEMATICS AND MECHANICS

William E. Brooke, B.C.E., M.A., Professor of Mathematics and Mechanics and Head of the Department

Hans H. Dalaker, Ph.D., Professor of Mathematics and Mechanics

George C. Priester, Ph.D., Professor of Materials of Engineering

Carl A. Herrick, M.E., Associate Professor of Mathematics and Mechanics

Hugh B. Wilcox, M.S.(E.E.), Associate Professor of Mathematics and Mechanics

Charles Boehnlein, B.S., M.E., Assistant Professor of Aerodynamics

Harry A. Doeringsfeld, C.E., Assistant Professor of Mathematics and Mechanics

Raymond R. Herrmann,¹ E.E., Assistant Professor of Mathematics and Mechanics
 William M. McClintock, M.A., Assistant Professor of Mathematics and Mechanics

Forrest E. Miller, M.S.(Ag.F.), Assistant Professor of Mathematics and Mechanics

Roderick W. Siler, B.S., Assistant Professor of Mathematics and Mechanics

Charles A. Barker, M.A., M.S., Instructor in Mathematics and Mechanics

Leo Branovan, M.S., Instructor in Mathematics and Mechanics

Glenn H. Peebles, M.S., Instructor in Mathematics and Mechanics

Edward Saibel, Ph.D., Instructor in Mathematics and Mechanics

Max Scherberg, B.S.(C.E.), Instructor in Mathematics and Mechanics

MECHANICAL ENGINEERING

John R. DuPriest, B.S.(E.E.), M.E., M.M.E., Professor of Mechanical Engineering and Head of the Department

Frank B. Rowley,¹ B.S., M.E., Professor of Mechanical Engineering and Director of the Experimental Engineering Laboratories

S. Carl Shipley,¹ B.S., M.E., Professor of Machine Construction and Superintendent of Shops

Charles F. Shoop, B.S., B.S.(M.E.), Professor of Steam Engineering

Charles A. Koepke, M.S.(M.E.), Associate Professor of Machine Construction and Superintendent of Shops

John V. Martenis, M.E., Associate Professor of Machine Design

Burton J. Robertson, E.E., Associate Professor of Gas Engines and Automotives and Acting Director of the Experimental Engineering Laboratories

John Flodin, M.E., M.A., M.S., Assistant Professor of Machine Design

Gustav O. Høglund, B.S.(Aero.E.), Assistant Professor of Aeronautical Engineering

William H. Richards, Assistant Professor of Woodworking

James R. Van Dyke, B.S., M.E., Assistant Professor of Gas Engines and Automotives

Axel B. Algren, B.S.(M.E.), Instructor in Mechanical Engineering and Assistant Director of the Experimental Engineering Laboratories

Ralph J. Hooker, B.S.(M.E.), Instructor in Mechanical Engineering

Thomas P. Hughes, Instructor in Forging

Jarl E. Larson, B.S.(Mar.E. and Naval Arch.), Instructor in Steam Engineering and Gas Engines

John H. Moffett, Met.E., Instructor in Foundry Practice

Herluf P. Nielsen, B.S.(M.E.), M.M.E., Instructor in Mechanical Engineering

Dayton A. Rogers, Instructor in Machine Shop Practice

E. H. Spencer Alden, Assistant in Foundry Practice

Harry Martinson, Assistant in Machine Shop Practice

Carl Peterson, Assistant in Woodworking

Fred Teal, Assistant in Forging

METALLOGRAPHY

Oscar E. Harder, Ph.D., Professor of Metallography

Ralph L. Dowdell, Ph.D., Assistant Professor of Metallography

Henry S. Jerabek, B.S., Instructor in Metallography

¹ Absent on leave, 1929-30.

METALLURGY

- William R. Appleby, M.A., Professor of Metallurgy and Dean of the School of Mines and Metallurgy
 Peter Christianson, B.S., E.M., Professor of Metallurgy
 Levi B. Pease, M.S., Professor of Metallurgy

MILITARY DEPARTMENT

- John H. Hester, Major, Infantry, Professor of Military Science and Tactics and Head of the Department
 Willis Shippam, Major, Coast Artillery Corps, Assistant Professor of Military Science and Tactics and Head of the Coast Artillery Corps Unit
 Frederick S. Matthews, Captain, Infantry, Assistant Professor of Military Science and Tactics
 Don F. Pratt, Captain, Infantry, Assistant Professor of Military Science and Tactics
 Porter P. Wiggins, Captain, Infantry, Assistant Professor of Military Science and Tactics
 William G. Walker, Captain, Infantry, Assistant Professor of Military Science and Tactics
 Murray T. Davenport, Captain, Infantry, Assistant Professor of Military Science and Tactics
 Richard A. Ericson, First Lieutenant, Coast Artillery Corps, Assistant Professor of Military Science and Tactics
 Vincent J. Conrad, First Lieutenant, Infantry, Assistant Professor of Military Science and Tactics
 Harlan N. Hartness, First Lieutenant, Infantry, Assistant Professor of Military Science and Tactics
 John F. Cassidy, First Lieutenant, Coast Artillery Corps, Assistant Professor of Military Science and Tactics
 Rex W. Minckler, First Lieutenant, Signal Corps, Assistant Professor of Military Science and Tactics and Head of the Signal Corps Unit
 Alfred Brandt, Master Sergeant, Infantry, Instructor in Military Science and Tactics
 Harry E. Strider, Master Sergeant, Signal Corps, Instructor in Military Science and Tactics
 Aubrey R. Dunkum, Technical Sergeant, Coast Artillery Corps, Instructor in Military Science and Tactics
 John Coop, Sergeant, Infantry, Instructor in Military Science and Tactics
 Ernest R. Mylk, Sergeant, Coast Artillery Corps, Instructor in Military Science and Tactics

PHYSICAL EDUCATION FOR MEN

- Fred W. Luehring, Ph.M., Professor of Physical Education and Director of the Department of Physical Education and Athletics
 Louis J. Cooke, M.D., Assistant Director of Physical Education and Athletics
 Louis F. Keller, B.A., Associate Professor of Physical Education
 David MacMillan, B.S., Assistant Professor of Physical Education
 Emil Iverson, Instructor in Physical Education for Men
 Blaine McKusick, B.A., LL.B., Instructor in Physical Education for Men

Guy O. Penwell, LL.B., Instructor in Physical Education
Niels Thorpe, Instructor in Physical Education for Men

PHYSICAL EDUCATION FOR WOMEN

J. Anna Norris, M.D., Professor of Physical Education for Women and Director
of Health and Physical Education for Women
Gertrude M. Baker, M.A., Assistant Professor of Physical Education for Women
May S. Kissock, M.A., Assistant Professor of Physical Education for Women
Alice J. H. Tolg, M.D., Assistant Professor of Physical Education for Women
Grace E. Denny, B.S., Instructor in Physical Education for Women
Helen Starr, B.S., Instructor in Physical Education for Women
Alice Timberman, B.S., Instructor in Physical Education for Women
Florence Warnock, B.S., Instructor in Physical Education for Women

PHYSICS

Henry A. Erikson, B.E.E., Ph.D., Professor of Physics and Chairman of the
Department
Louallen F. Miller, Ph.D., Professor of Physics
John T. Tate, Ph.D., Professor of Physics
Anthony Zeleny, Ph.D., Professor of Physics
J. William Buchta, Ph.D., Associate Professor of Physics
Joseph Valasek, Ph.D., Associate Professor of Physics

PHYSIOLOGIC CHEMISTRY

Jesse F. McClendon, Ph.D., Professor of Physiologic Chemistry
Truman A. Pascoe, Ph.D., Instructor in Physiologic Chemistry
Robert H. Hamilton, Jr., B.S., Teaching Fellow in Physiologic Chemistry

PREVENTIVE MEDICINE AND PUBLIC HEALTH

Harold S. Diehl, M.A., M.D., Professor of Preventive Medicine and Public Health
and Director of Health Service
Jay A. Myers, Ph.D., M.D., Associate Professor of Preventive Medicine and
Public Health
Harry DeWitt Lees, M.B.(Tor.), Assistant Professor of Preventive Medicine and
Public Health
William A. O'Brien, M.D., Assistant Professor of Pathology and Preventive
Medicine
Joseph C. Hathaway, B.S., M.D., Instructor in Preventive Medicine and Public
Health

RHETORIC

(College of Agriculture)

Robert C. Lansing, M.A., Assistant Professor of Rhetoric
William J. Routledge, B.A., Assistant Professor of Rhetoric

SOILS

Frederick J. Alway, Ph.D., Professor of Soils and Chief of Division
Clayton O. Rost, Ph.D., Associate Professor of Soils
Paul R. McMiller, M.S., Assistant Professor of Soils

SPEECH

Frank M. Rarig, M.A., Professor of Speech and Chairman of the Department

GENERAL INFORMATION

COLLEGE OF ENGINEERING AND ARCHITECTURE

The College of Engineering and Architecture had its beginning in the College of Agriculture and the Mechanic Arts which was authorized by the legislative act of 1868. Courses in civil and mechanical engineering were first offered in 1871. In the reorganization of the University, in 1872, the College of the Mechanic Arts was established. It became the College of Engineering, Metallurgy, and the Mechanic Arts in 1892, and the College of Engineering and the Mechanic Arts in 1897. A course in Electrical Engineering was first offered in 1887. Architecture and Architectural Engineering were announced in 1912. In 1916 the college received its present name. In 1925, the name of the Department of Architecture was changed to the School of Architecture. The course in Interior Architecture was established in 1923 being called Interior Decoration until 1929. The Agricultural Engineering course was offered in 1925, and the courses in Aeronautical Engineering and Landscape Architecture in 1928.

The purpose of this college is to give the students a broad foundation in the fundamental principles of engineering and architecture, together with sufficient knowledge of professional practice to enable them to apply those principles successfully. It is not possible in college to educate a fully trained engineer, as the application of the principles to the practice of engineering is to be learned through experience. There are certain subjects, such as surveying and drafting, in which some proficiency is required. This enables a student upon graduation to fill satisfactorily a subordinate position while obtaining a basis for growth and advancement.

It is intended that all of the technical courses given in this college shall be taught by men who have had practical experience in their respective fields in addition to their professional training.

The field of engineering is very broad and is continually becoming more extensive. From the technical lines of design, construction, maintenance, and operation of engineering works, which have always belonged to him, the trained engineer has been drawn into the business world to occupy positions of an executive character. To meet the demand for such service, the importance of the broader training in economic and commercial principles and industrial relations is recognized.

Withal, it is intended that the young graduate shall have obtained material assistance in developing those traits of character which will make him a loyal and exemplary citizen and a true gentleman.

SCHOOL OF CHEMISTRY

The School of Chemistry was established in 1897 as a school of analytical and applied chemistry, subsidiary to the College of Science, Literature, and the Arts. In 1904 it was made a separate unit of the University, and in 1919, its present name was adopted.

It occupies a large modern building, 180 by 200 feet, having six floors. Its laboratories are designed to afford facilities for instruction in the various branches of chemistry. The chemistry library is well provided with complete

sets of journals and compendia of chemical literature, among which are important sets not frequently found in university libraries. Many special laboratories for private research have been provided and facilities are available for graduate work leading to the higher degrees.

COURSES AND DEGREES

The College of Engineering and Architecture offers four-year courses of study in Aeronautical, Agricultural, Architectural, Civil, Electrical, and Mechanical Engineering, Architecture, and Landscape Architecture. These courses lead to the degree of bachelor of aeronautical, agricultural, architectural, civil, electrical, or mechanical engineering, architecture, or landscape architecture. In some of the courses, optional groups of electives are arranged for the guidance of students who desire to devote special attention to certain fields.

A four-year course in Interior Architecture is provided, of which the first two years are taken in the College of Science, Literature, and the Arts and the last two years in the College of Engineering and Architecture, leading to the degree of bachelor of interior architecture.

The Engineering Pre-Business course requires the first two years of work in this college. This is followed by two years in the School of Business Administration upon the completion of which the degree of bachelor of business administration is conferred.

The School of Chemistry offers two courses which lead to degrees, namely, (1) the four-year course in Chemistry, and (2) the course in Chemical Engineering. The former course leads to the degree of bachelor of chemistry. The course in Chemical Engineering leads to the degree of bachelor of chemical engineering at the end of four years, and to the Master's degree in chemical engineering at the end of the fifth year, which is taken in the Graduate School.

These colleges also offer work in the Graduate School leading to the Master's degree in the appropriate branch of engineering, in architecture, or in chemistry, or to the Doctor's degree.

The professional degree of aeronautical, agricultural, chemical, civil, electrical, or mechanical engineer will be conferred upon those who have received the degree of bachelor of aeronautical, agricultural, chemical, civil, electrical, or mechanical engineering, when they have completed the equivalent of one additional year's college work, four years of engineering experience in positions of responsibility, and have presented a satisfactory professional thesis.

Graduates of these colleges may be granted permission to pursue the year of graduate study *in absentia* under the direction of the faculty. It is recommended, however, that this year be spent in residence at this University and that the Master's degree be obtained in this manner. There are many advantages in taking this year immediately following graduation from the four-year course, thus making a five-year course leading to the Master's degree in the corresponding branch of engineering or in architecture. Then after four years of approved experience and the preparation of the professional thesis, the Engineer degree may be obtained. This procedure is especially recommended to those students whose undergraduate work is of high grade and who desire additional preparation for the higher positions which require strong character and leadership.

Candidates for the Engineer degrees register in the Graduate School.

ADMISSION

Detailed information concerning admission, entrance requirements, advanced standing, and expenses will be found in the bulletin of general information which will be sent to any address upon application to the registrar, University of Minnesota.

Students are admitted on certificate or by examination. In special cases, with the approval of the dean of the college, persons of mature age (twenty-four years or older) and experience may be admitted as adult special students to pursue specific courses of study.

Admission by certificate.—Applicants must present twelve units of work obtained in the last three years of high school (senior high school) of which at least nine must be included in Groups A, B, C, D, and E as listed below. These nine units must include a major of three units in one group and two minors of two units each in two other groups. Subject to these requirements, the applicant must include at least two units of English and two units of mathematics. One unit of mathematics and one unit of foreign language taken in the ninth grade may be counted in the minors. Students who do not present *higher algebra and solid geometry* for admission will be required to take these subjects in the first quarter at the University without credit. This will usually necessitate their attending Summer Session to complete the work of the freshman year. To avoid this irregularity in their courses, students are urged to obtain the required higher algebra and solid geometry in high school or the University Summer Session or Extension Division before entering this school. Students who do not present *chemistry* for admission to the School of Chemistry will be required to take additional work in inorganic chemistry. (Beginning in the fall of 1930, chemistry will be required for admission to the School of Chemistry.)

Students who desire to enter the freshman year at the beginning of the winter quarter should have had chemistry in high school.

Students who expect to enter the College of Engineering and Architecture or School of Chemistry are urged to include in their high school courses English, three units; elementary algebra, one unit; plane geometry, one unit; higher algebra, one-half unit; solid geometry, one-half unit; Latin, two units; chemistry, one unit; physics, one unit; ancient, modern, and American history; and American government.

List of entrance subjects.—Only those subjects included in the following groups may be counted toward admission.

The term *unit* means not less than five recitations of forty minutes each per week for a school year of thirty-six weeks. In laboratory, drawing, and other manual courses, twice this amount of class time is required for one unit.

Group A English: 1 to 3 units.

Group B Foreign languages: Latin, Greek, German, French, Spanish, Scandinavian, 1 to 4 units each.

Group C History and social sciences: European history, $\frac{1}{2}$ to 2 units; English and American history, $\frac{1}{2}$ or 1 unit each; economics and sociology, $\frac{1}{2}$ unit each; American government, commercial geography, and history of commerce, $\frac{1}{2}$ or 1 unit each.

Group D Mathematics: elementary algebra and plane geometry, 1 unit each; unified mathematics, 2 units; higher algebra, $\frac{1}{2}$ or 1 unit; solid geometry and trigonometry, $\frac{1}{2}$ unit each.

- Group E Natural sciences: biology, physics, and chemistry, 1 unit each; botany and zoology, $\frac{1}{2}$ or 1 unit each; physiology, astronomy, and geology, $\frac{1}{2}$ unit each.
- Group F Vocational and miscellaneous subjects: The three units which are not required to be in Groups A, B, C, D, E, may be in work which the superintendent certifies as being of acceptable nature and as having been counted toward the applicant's graduation.

Admission by examination.—Applicants who are high school graduates or at least nineteen years of age may be admitted provisionally and subject to one year of satisfactory work, upon passing the following tests:

- a. College aptitude test
- b. Test of proficiency in English
- c. Test in mathematics including arithmetic, algebra, and geometry.

Time of admission.—The regular time to enter the college is in September. However, students will be admitted at the beginning of the winter quarter in January; then by attending the following Summer Session it is possible to complete most of the work of the freshman year. Admission at the opening of the spring quarter is not recommended unless the student can present advanced credit from some other college.

ADVANCED STANDING

Students who have pursued courses of study in other colleges of recognized standing may receive advanced credit under the rules of the University and of the college. See Requirements for Graduation.

Students who have taken college algebra or trigonometry in high school with satisfactory records may be permitted to take comprehensive examinations for credit in these subjects.

REGISTRATION

All undergraduate students are required, at the beginning of each quarter of residence, to pay the prescribed fees to the university bursar, to fill and file at the Main Engineering Building (Chemistry Building for students registering in School of Chemistry) the necessary classification blanks showing the courses they expect to pursue during the quarter, and to enroll for their various classes.

All students entering the college for the first time must send or present their credentials to the registrar of the University, who will notify each applicant with regard to his admission. Before registering all new matriculants are required to take a physical examination.

Students should consult the university calendar in regard to registration dates and the *Handbook for Students in the College of Engineering and Architecture* or *Handbook for Students in the School of Chemistry* for the procedure of registration.

Students will not be allowed to register for less than 14 or more than 19 credit hours without the approval of the Students' Work Committee.

No change in registration will be permitted later than 10 days after the beginning of the quarter.

FEEES AND EXPENSES

The annual fee for students in this college is \$90 for residents and \$120 for non-residents, one third of which is due at the beginning of each quarter. Fel-

lows, scholars, assistants, and instructors are not required to pay university fees or tuition when they are regularly enrolled in the Graduate School.

Tuition fee (per quarter):	
Residents of Minnesota	\$30.00
Non-residents	40.00
Deposit ¹ (first quarter only)	5.00
Incidental fee, per quarter	6.40
Military deposit (required of all students taking military drill)	10.00
Special fees:	
Examination for removal of condition	1.00
Examination for credit (after the first quarter in residence)	5.00
Special examination	5.00
Chemistry deposit	5.00
Graduation fee	10.00

Registration penalty fees.—A penalty fee of two dollars (\$2) is charged for late registration, late change of registration, or late payment of fees and one dollar (\$1) additional for each day of delay after classes begin, provided that no student shall pay more than twelve dollars (\$12) of penalty in any given quarter.

Living expenses.—Detailed statements regarding living expenses may be found in the bulletin of general information.

THE UNIT OF CREDIT

The standard unit of credit in the University is the quarter credit, or simply, the *credit*. It corresponds to one class period per week for one quarter. This class period may be a one-hour lecture or recitation, or a two- or three-hour class in laboratory, drawing, surveying, or computations, but in any case one credit is supposed to require three actual hours of the average student's time per week for one quarter. One hour of recitation is assumed to require two hours of preparation or study. A two-hour laboratory period may require one hour of home work to complete the credit. A three-hour period usually carries one credit without additional work outside of class. The credit allowed for a lecture may be from one-third to one hour depending upon the amount of outside work or study required in connection with it.

CREDIT FOR OUTSIDE WORK

Credit for certain courses, as a result of work done outside of the regular classes, may be obtained by satisfactorily passing comprehensive examinations.

Work done outside of class includes work done by correspondence, by the aid of a private tutor, by individual study, through practical experience, or otherwise.

The comprehensive examination will be of such thoro and searching character as to determine whether the student has done all the work of the course. It should require at least three times the work of the usual final or condition examination and will be conducted by a committee appointed by the head of the department in which the course is given.

Permission to take the examination must be obtained from the Students' Work Committee, and the usual fee of \$5 for a special examination must be paid unless it be taken within six weeks after first entering the University.

¹ This deposit is made to cover such charges as may be incurred for lockers, library penalties, laboratory breakage, etc.

EXTENSION COURSES

Certain courses in engineering, architecture, and chemistry are offered by the Extension Division of the University in evening classes and by correspondence. Persons who are unable to attend the regular university courses may obtain valuable instruction in this manner.

Credit for any required course taken in either of these divisions is acceptable in the College of Engineering and Architecture or the School of Chemistry only after the student passes a comprehensive examination given by the department concerned. A fee of five dollars (\$5) is charged for each examination except when taken within six weeks after admission. Definite information regarding extension work will be found in the bulletins of the General Extension Division.

ATTENDANCE

It is expected that all students will be regular in attendance at all class exercises and that they will do all the work of their courses. Neglect of work, as indicated by irregularity in attendance or low scholarship, will be sufficient reason for exclusion from class. "Any student who has unexcused absences equal to the number of credits in a course, but in no case less than two, shall be dropped from the class with a record of failure in the the course." *Senate, May 11, 1921.*

JUNIOR RULE IN ENGINEERING AND ARCHITECTURE

In the College of Engineering and Architecture every student must complete all of the courses of the freshman year of his curriculum and have not more than twelve credits of required work of his sophomore year to complete before he will be allowed to register for any junior or senior courses. For 1929-30 only, students may take junior work if they have completed their sophomore mathematics and mechanics and two quarters of physics.

JUNIOR REVIEW EXAMINATIONS IN CHEMISTRY

The Junior Review Examinations in chemistry, courses Inorganic Chemistry 51 and 52, and Analytical Chemistry 53, are required of all students registered in the School of Chemistry, but not of students in other colleges who may be taking chemistry courses. The following rules apply only to students registered in the School of Chemistry.

1. These examinations are prerequisites for all other courses offered in the School of Chemistry having numbers greater than 53, with the exception of courses Technological Chemistry 105 and 106, and Chemical Engineering 101.
2. They will be held regularly at the beginning of the fall, winter, and spring quarters, on the day before registration. They need not be taken simultaneously, but each must be preceded by Analytical Chemistry 1 and 2, Quantitative Analysis.
3. Students who have taken their general inorganic courses, qualitative courses, and quantitative courses in the School of Chemistry and with an average in any of these subjects higher than "C," will be excused from the Junior Review Examination in the corresponding subject.
4. Students may be conditioned or failed in one or more of the Junior Review Examinations. To remove a condition a student must pay the usual fee of \$1

for this examination. This examination would be taken at the next regular Junior Review Examination period, namely the day before registration for the next quarter. The usual fee of \$5 must be paid for permission to repeat any Junior Review Examination in which a failure has been received.

5. Students who transfer to the School of Chemistry from another college or another institution will be required to take and pass the Junior Review Examinations in those subjects for which they have received advanced standing, before entering courses having numbers greater than 53, with the exception of Technological Chemistry 105 and 106, and Chemical Engineering 101.

CHEMICAL ENGINEERING INSPECTION TRIP

All seniors registered in Chemical Engineering are required to go on a trip of inspection and observation through certain large industrial plants. This trip is usually taken during the spring vacation and is under the personal supervision and guidance of members of the faculty. It includes plants in Milwaukee, Chicago, and near-by points. The expenses of the trip are minimized as far as possible, and must be defrayed by the individual student. They amount to from \$75 to \$100 per student.

THESES IN CHEMISTRY

Each senior in the course in Chemistry is required to prepare and submit a thesis based upon his original investigations. This work amounts to five credits per quarter throughout the senior year and each student is therefore expected to devote at least fifteen hours per week to it.

The subject of the thesis should be filed in the dean's office not later than November 1. The preliminary draft of the thesis should be submitted to the chief of the division concerned before June 1, and the final copy on or before June 10. A bound copy, 8½ by 11 inches, in the prescribed form, will be furnished by the student to be placed in the chemistry library.

REQUIREMENTS FOR GRADUATION

To be recommended for the degree of bachelor of aeronautical, architectural, civil, electrical, or mechanical engineering, of architecture, or of landscape architecture, the student must satisfactorily complete all of the courses prescribed in the corresponding curriculum together with sufficient electives to make a total of at least 204 credits. In agricultural engineering and chemistry, 210 credits are required for graduation. For the degree of bachelor in interior architecture, the requirements are 192 credits, including all required courses, plus 90 honor points. For the degree of bachelor of chemical engineering, 218 credits are required.

In cases of continued low scholarship, even tho all the courses of the curriculum have been passed, the faculty reserves the right to require additional work to be completed, over and above the regular curriculum, and with a specified grade, before the degree will be recommended.

Students entering the College of Engineering and Architecture or School of Chemistry with advanced standing from other colleges or universities must spend at least one year in residence here before they will be recommended for graduation. If the term of residence is only one year it must be the senior year; and in any case such a student must spend two "quarters" of his senior year in residence

SCHOLARSHIPS AND PRIZES.

Research fellowships.—In the Engineering Experiment Station there are several research fellowships which are open to engineering graduates, including chemical engineers. Each of these bears an annual stipend of \$750. The holder is required to give twenty hours per week, that is, about half of his time, to such research service as may be assigned him. In addition he is expected to carry half-time work in the Graduate School toward an advanced degree.

Teaching fellowships in civil and electrical engineering are open to graduates in these fields. The stipend is \$750 per year of nine months. Each fellow renders part time service in instruction while pursuing graduate study.

The Shevlin Fellowship in Chemistry.—The Shevlin Fellowship in Chemistry, established by the late Thomas H. Shevlin, of Minneapolis, is awarded annually and yields \$500. Candidates for this fellowship should file their applications before March 1 with the dean of the Graduate School. The Shevlin fellow devotes his entire time to graduate work and is not required to render any service to the University.

The duPont Fellowship in Chemistry.—This fellowship was founded by E. I. duPont de Nemours and Company, Wilmington, Delaware, and yields \$750 annually. The holder devotes his entire time to graduate work and is not required to render any service to the University. Applications for this fellowship should be submitted to the dean of the School of Chemistry before March 15.

Assistants.—The School of Chemistry employs twenty-six assistants at \$650 to \$750 per annum. They are required to devote twelve hours per week to instruction and other assigned work. They thereby obtain valuable experience in laboratory teaching under competent direction. In addition to these duties, each assistant is expected to pursue graduate work toward a higher degree.

Prizes.—Various prizes in the University are open to students in these colleges. A list of them is given in the general information bulletin. Two prizes are open to chemistry and chemical engineering students only. These have been established by the Phi Lambda Upsilon National Honorary Chemical Fraternity and the Twin City Alumni Association of the Alpha Chi Sigma Chemical Fraternity. These prizes are awarded to men students near the close of their sophomore year.

Six prizes and two medals are open to students registered in the School of Architecture. Medals are offered by the American Institute of Architects and the Scarab Fraternity. The prizes were established respectively by the Minnesota section of the American Institute of Architects, the faculty of the school, Mr. A. Moorman of St. Paul, Magney and Tusler of Minneapolis, Mr. William A. French of Minneapolis, and the Alpha Alpha Gamma Sorority.

RESERVE OFFICERS TRAINING CORPS

The War Department has established at this University units of infantry, coast (heavy) artillery, signal corps, medical corps, and dental corps in which both basic and advanced courses are given. The basic course is required for the first two years; the advanced course is elective for the third and fourth years.

Students in this college may enroll in the advanced course of the infantry, signal corps, or artillery under the prescribed regulations, and receive for this

work eighteen elective credits toward graduation. They receive an allowance of cash and clothing from the government during the two years of the course, pay and transportation to attend a special training camp in the summer, and if successful, a commission in the Reserve Corps of the U. S. Army after graduation. Special arrangements may be made in the student's program to enable him to take this course, the advantages of which are recognized.

SELF-SUPPORT AND OUTSIDE ACTIVITIES

A large number of students contribute to their financial support by means of part time work during the college year. Frequently such students undertake too much. They are advised to carry a lighter program of studies and to plan to spend more than four years in the college course if outside work requires a large amount of their time. Information regarding work for self-support during the college course may be obtained from the University Employment Service or the University Young Men's Christian Association.

Freshmen, in particular, are advised that the work of the first year in this college will require their closest attention and application if they are to succeed. They should refrain from participation in unnecessary outside activities, while bearing in mind the importance of physical as well as mental development.

HANDBOOK FOR STUDENTS

Regulations and instructions for the guidance of students are issued at the time of registration in the form of a small pamphlet. Each student is expected to observe these instructions.

CHANGES IN BULLETIN

The faculties of the College of Engineering and Architecture and the School of Chemistry reserve the right to change their curricula and to cancel or change without notice any course printed in this bulletin. The bulletin is a statement of present conditions, and is subject to modification in any particular by faculty action.

SOCIETIES

Branches of the following national professional societies are maintained at the University of Minnesota by students and faculty members: American Chemical Society, American Institute of Chemical Engineers, American Institute of Electrical Engineers, American Society of Civil Engineers, American Society of Mechanical Engineers, and American Society of Agricultural Engineers. In addition there are the Architectural Society and the Minnesota Society of Aeronautical Engineers.

CURRICULA

COLLEGE OF ENGINEERING AND ARCHITECTURE

Aeronautical Engineering, p. 25	Electrical Engineering, p. 42
Agricultural Engineering, p. 28	Engineering Pre-Business, p. 51
Architecture, pp. 31, 32	Interior Architecture, p. 44
Architectural Engineering, pp. 31, 33	Landscape Architecture, p. 46
Civil Engineering, p. 39	Mechanical Engineering, p. 48
	Engineering Administration, p. 53

SCHOOL OF CHEMISTRY

Chemistry, pp. 35, 36	Chemical Engineering, pp. 35, 37
-----------------------	----------------------------------

FRESHMAN YEAR

For the freshman year the course is the same for Aeronautical, Agricultural, Civil, Electrical, and Mechanical Engineering and Engineering Pre-Business and is shown on page 25. The freshman year for Architecture, Architectural Engineering, and Landscape Architecture is shown on page 31 and in Chemistry and Chemical Engineering on page 35.

Mathematics.—Freshmen entering without high school higher algebra will take Course 9 (Higher Algebra); and those who have had higher algebra will register for Course 11 (College Algebra). Students in Course 11 who show in the first two weeks that they are not prepared to continue in that course will be transferred to Course 9, to strengthen their mathematical preparation. Course 9 will be followed by Courses 11, 12, and 13 during the winter and spring quarters and the *following Summer Session*, respectively.

Students who do not offer *solid geometry* for entrance will take M. & M. 10 (Solid Geometry) instead of Drawing or Architecture 31 during the fall quarter and without university credit. Students in the College of Engineering should follow this by Drawing 1, 2, and 3 in the winter and spring quarters and the Summer Session, respectively; in the School of Architecture by Architecture 31, 32, and 33 and in the School of Chemistry by Drawing 7 and 8 in the winter and spring quarters.

Those who have had *solid geometry* but do not complete College Algebra in the fall quarter will have to postpone Drawing 3 until the Summer Session since they cannot complete its prerequisites, M. & M. 11 and 12 (College Algebra and Trigonometry), until the spring quarter.

Students who do not complete College Algebra in the fall quarter should plan to take M. & M. 11, 12, and 13 in the winter and spring quarters and the Summer Session, respectively.

Chemistry.—Students entering the College of Engineering and Architecture who have not had high school *chemistry* will take Inorganic Chemistry 14f-15w, five credits per quarter, instead of Inorganic Chemistry 4f-5w, four credits per quarter.

Students entering the School of Chemistry without high school chemistry will take Inorganic Chemistry 6-7-8 (General Inorganic Chemistry) during their freshman year and Inorganic Chemistry 12 (Qualitative Analysis) during the follow-

ing Summer Session, unless, owing to excellent work in Course 6, they are permitted to change to Course 9. Course 6 carries no credit towards graduation. Beginning in 1930, chemistry will be required for admission to the School of Chemistry.

Military Science and Tactics.—Students who, for any reason, are not required to take military science and tactics for their freshman and sophomore years, must take physical education both years in its stead and without credit. This applies to women and foreign students, as well as others.

REGULAR FRESHMAN PROGRAM

(For Aeronautical, Agricultural, Civil, Electrical, and Mechanical Engineering, and Pre-Business)

(For students who satisfy the requirements in higher algebra and solid geometry and who have presented entrance credit in high school chemistry.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 11	College Algebra	5	5	..	..
Inorg. Chem. 4	Inorganic Chemistry	4	1	3	3
Engl. 4	Rhetoric and Composition	3	3	..	..
Draw. 1	Engineering Drawing	3	..	1	6
M.E. 11, 12, or 13	Shop Practice	2	..	..	6
G.E. 11	Orientation	0	..	1	..
Mil. Sci. 1	First Year Basic Course	0	..	..	3
<i>Winter Quarter</i>					
M.&M. 12	Trigonometry	5	5	..	..
Inorg. Chem. 5	Inorganic Chemistry	4	1	3	3
Engl. 5	Rhetoric and Composition	3	3	..	..
Draw. 2	Engineering Drawing	3	..	1	6
M.E. 11, 12, or 13	Shop Practice	2	..	..	6
G.E. 12	Orientation	0	..	1	..
Mil. Sci. 2	First Year Basic Course	0	..	..	3
<i>Spring Quarter</i>					
M.&M. 13	Analytical Geometry	5	5	..	..
Inorg. Chem. 16	Qualitative Analysis	5	..	3	6
Engl. 6	Rhetoric and Composition	3	3	..	..
Draw. 3	Descriptive Geometry	3	..	1	6
M.E. 11, 12, or 13	Shop Practice	2	..	..	6
P.H. 12†	Hygiene and First Aid	0	..	1	..
Mil. Sci. 3	First Year Basic Course	0	..	..	3

† Women take Physical Education for Women, Course 4, in place of P.H. 12.

AERONAUTICAL ENGINEERING

Four-year course leading to the degree of bachelor of aeronautical engineering, B.Aero.E.

In addition to the prescribed courses, sufficient electives must be taken to complete a total of at least 204 credits for graduation. This is an average of 17 credits per quarter for 12 quarters.

The course in aeronautical engineering is intended to provide instruction and training for students who wish to enter this field of engineering as a profession. With the rapid development of aviation in recent years, aeronautical engineering is assuming a prominent and important position among the engineering professions.

The production of airplanes in the United States is increasing at a rapid rate. More attention is being given to lighter-than-air craft as well. Aeronautical engineers are required in all stages of the process, from the research work preliminary to improvements in design to the actual construction, testing, operation, and maintenance.

The aeronautical engineering course is similar to mechanical engineering. The fundamental studies are the same. As a result, the graduates in aeronautical engineering should be prepared to enter various branches of the mechanical engineering field if, for any reason, they should prefer to do so.

The first year of the course is the same as that of civil, electrical, mechanical, and agricultural engineering.

As in other technical courses, so in aeronautical engineering, mathematics plays an important part. No student should enter this course who feels poorly prepared in mathematics. Preferably, he should have had three years of algebra and geometry in high school.

It should be understood that this is a professional engineering course and not a training course for airplane pilots. It deals with the preparation of students for research, design, construction, operation, management, and maintenance of aircraft from the standpoint of the engineer or manager. However, the sophomore course in aviation serves as the ground school course of training for the Air Reserve Corps of the U. S. Navy, and upon graduation, properly qualified students may be accepted for actual flight training, leading to a commission in the Naval Reserve.

For freshman year, see page 25.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Draw. 28	Drafting	2	..	..	6
Aero.E. 1	Aviation	3	3	..	..
M.E. 19	Mechanical Technology	1	..	2	..
Mil. Sci. 4	Second Year Basic Course	0	..	..	3
<i>Winter Quarter</i>					
M.&M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat	1	..	..	2
Draw. 29	Drafting	2	..	..	6
Aero.E. 2	Auto and Airplane Engines	3	3	..	..
M.B. 14	Machine Shop Practice	3	..	..	8
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
<i>Spring Quarter</i>					
M.&M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
M.E. 15	Machine Shop Practice	3	..	..	8
Aero.E. 3	Aviation	3	3	..	..
C.E. 17	Surveying	3	..	1	7
Mil. Sci. 6	Second Year Basic Course	0	..	..	3

AERONAUTICAL ENGINEERING

27

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 127	Technical Mechanics (Dynamics)	5	5	..	..
Phys. 33	Optics	3	1	3	..
Phys. 34	Optics Laboratory	1	..	..	2
Aero.E. 100	Aerodynamics	3	3	..	..
M.E. 30	Steam Engineering	3	3	..	..
M.E. 32	Elementary Mechanical Laboratory	2	..	..	6
<i>Winter Quarter</i>					
M.&M. 128	Strength of Materials	5	5	..	..
M.&M. 141	Materials Testing Laboratory	2	..	1	3
Aero.E. 101	Aerodynamics	3	3	..	..
M.E. 23	Mechanism and Kinematics	3	3	..	..
M.E. 31	Thermodynamics	3	3	..	..
M.E. 33	Mechanical Laboratory	2	..	..	6
<i>Spring Quarter</i>					
M.&M. 129	Hydraulics	4	4	..	..
M.&M. 143	Hydraulics Laboratory	1	..	..	1
Aero.E. 83	Stresses in Simple Structures	3	..	1	7
Aero.E. 102	Aerodynamics	3	3	..	..
M.E. 27	Machine Design	3	..	1	6
M.E. 141	Thermodynamics	3	3	..	..

SENIOR YEAR

<i>Fall Quarter</i>					
E.E. 46	Electric Power	4	3	..	2
M.E. 150	Internal Combustion Engines	3	3	..	..
Met. 156	Metallography	3	..	2	3
Aero.E. 115	Airplane Stresses	3	2	..	2
Aero.E. 120	Airplane Design	2	1	..	3
Aero.E. 140	Airplane Laboratory	2	..	..	6
Aero.E. 190	Seminar	1	1	..	..
<i>Winter Quarter</i>					
E.E. 47	Electric Power	4	3	..	2
M.E. 151	Internal Combustion Engines	3	3	..	..
M.E. 156	Aero Engine Design	2	..	..	6
Aero.E. 121	Airplane Design	4	2	..	6
Aero.E. 141	Aeronautical Laboratory	2	..	..	6
Aero.E. 191	Seminar	1	1	..	..
<i>Spring Quarter</i>					
E.E. 48	Electric Power	4	3	..	2
M.E. 152	Aero Engine Testing	2	..	..	6
Aero.E. 122	Airplane Design	3	1	..	6
Aero.E. 160	Airships	3	2	..	3
Aero.E. 170	Air Transport	2	2	..	..
Aero.E. 192	Seminar	1	1	..	..

AGRICULTURAL ENGINEERING

Four-year course leading to the degree of bachelor of agricultural engineering, B.Agr.E., in co-operation with the College of Agriculture, Forestry, and Home Economics.

Requirements for graduation include all prescribed courses with sufficient approved electives to make a total of at least 210 credits. This is an average of 17½ credits per quarter for 12 quarters.

Agricultural engineering activities are usually grouped under the heads of *farm machinery*, *farm structures*, and *reclamation*. There is also need for service in the entire field necessitating general preparation in all three lines.

The farm machinery field covers the selection and proper operation of machinery and equipment best suited to produce good results locally on any given type of farm, the design and construction of such machinery or equipment where it does not yet exist, the improvement of such design to meet special needs, and the adaptation of available types of power to local farm conditions. The farm structures field covers arrangement of the structures on the farmstead for economy, convenience, and comfort, the design and construction of farm buildings and related structures, and the adaptation of available types of building materials to local farm conditions. The reclamation field covers development of virgin lands suited to agriculture and the improvement of lands already under cultivation through economical clearing operations, and soil conditioning through efficient design and proper installation of drainage and irrigation works and control of soil erosion.

The field, as yet comparatively new and uncrowded, offers many opportunities among which the following are prominent: with manufacturers of farm machinery, equipment, and building materials; as executives, research engineers, publicity and sales managers, and technical field experts; as managers of large farms requiring extensive machinery or equipment; as reclamation engineers with the local, state, and federal governments, and with development companies; as agricultural advisers with power companies in development of rural service; as agricultural engineering editors for farm papers and trade journals; as rural architects and builders; as teachers, investigators, and extension specialists in state agricultural colleges, experiment stations, and in the United States Department of Agriculture; as consulting agricultural engineers in general practice.

For freshman year, see page 25.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Ag.E. 19	Elementary Surveying	3	..	2	4
Hort. 6	Fruit Growing	3	..	2	4
Soils 4	Soils	3	..	2	2
Mil. Sci. 4	Second Year Basic Course	0	..	..	3

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Winter Quarter</i>					
M.&M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Ag.E. 31	Principles of Drainage	3	1	2	..
Agron. 1	Farm Crops	3	..	2	4
Soils 8	Physical Properties of Soils	3	..	1	4
or					
Ag.E. 42	Principles of Irrigation	3	1	2	..
Mil. Sci. 5	Second Year Basic Course	6	..	..	3

<i>Spring Quarter</i>					
M.&M. 84	Technical Mechanics	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
Ag.E. 12	Field Machinery	3	..	2	3
Ag.E. 13	Gas Engines	3	..	2	4
Ag.E. 20	Advanced Surveying	3	..	2	4
Mil. Sci. 6	Second Year Basic Course	6	..	..	3

JUNIOR YEAR

<i>Fall Quarter</i>					
M.&M. 85	Strength of Materials	4	3	..	2
Ag.E. 37	Rural Sanitation	3	..	3	..
Ag.Econ. 1	Introduction to Economics	5	4	1	..
Geol. 5	Engineering Geology	3	..	3	..
Ag.E. 122	Power Machinery	3	..	2	3

<i>Winter Quarter</i>					
M.&M. 86	Hydraulics with Laboratory	3	2	..	2
Ag.Econ. 2	Principles of Economics	3	..	3	..
Ag.E. 7	Farm Structures I.....	3	1	1	3
Ag.E. 42	Principles of Irrigation	3	1	2	..
or					
Soil 8	Physical Properties of Soils	3	..	1	4
Ag.E. 54	Applied Electricity	5	..	3	6
M.E. 23	Mechanism and Kinematics	3	2	1	..
	Elective to complete program.				

<i>Spring Quarter</i>					
A.H. 15	Fundamentals of Livestock Production	3	..	2	4
C.E. 42	Structural Engineering	3	..	..	7
D.H. 1	Elements of Dairying	5	..	3	4
M.E. 27	Machine Design	3	..	1	6
	Elective to complete program.				

SENIOR YEAR

<i>Fall Quarter</i>					
Ag.E. 133	Applied Electricity	3	..	1	6
Ag.Econ. 102	Farm Management II: Organization	3	..	3	..
C.E. 51	Highways and Pavements	3	..	2	3
C.E. 144	Reinforced Concrete	3	..	2	5
	Electives to complete program.				

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Winter Quarter</i>					
Ag.E. 121	Steam Boilers and Engines	3	..	2	4
Ag.Econ. 103	Farm Management Operation	3	..	3	..
G.E. 101	Contracts and Specifications	3	..	3	..
	Electives to complete program.				

Spring Quarter

Ag.E. 150	Seminar	2	2	..	..
Bus.Adm. 67	Market Administration	3	1	2	..
G.E. 193	Engineering Practice	2	..	2	..
	Electives to complete program.				

RECOMMENDED ELECTIVES

The following courses are suggested for the guidance of students who wish to elect work along the general lines indicated.

Farm Structures

Course No.	Title	Credits
Ag.E. 5f	Farm Building Construction	3
Ag.E. 36w	Rural Heating and Ventilation	3
Ag.E. 40f,s	Mechanical Training I	3
Ag.E. 67s	Farm Structures II	3
Ag.E. 111f	Structural Materials	3
Ag.E. 112s	Farm Building Problems	3
For. 27w	Farm Woodlots and Windbreaks	3
Hort. 77w	Principles of Landscape Design	3
Rhet. 22f,w,s	Public Speaking	3

Farm Mechanics

Ag.E. 14s	Elementary Farm Power	3
Ag.E. 15f	Ignition and Carburetion	3
Ag.E. 28w	Land Clearing	3
Ag.E. 40f,s	Mechanical Training I	3
Ag.E. 101f	Drainage Engineering and Works	3
Ag.E. 123s	Farm Power	3
Ag.E. 125w	Farm Machinery Design	3
Ag.E. 126s	Selection of Farm Equipment	3
Rhet. 22f,w,s	Public Speaking	3

Reclamation

Ag.E. 28w	Land Clearing	3
Ag.E. 40f,s	Mechanical Training I	3
Ag.E. 101f	Drainage Engineering and Works	3
Ag.E. 102s	Advanced Drainage Problems	3
Ag.E. 103s	Irrigation Engineering and Works	3
Ag.E. 104w	Drainage Administration and Law	3
C.E. 161f	Hydrology	3
Hort. 77w	Principles of Landscape Design	3
Rhet. 22f,w,s	Public Speaking	3

ARCHITECTURE AND ARCHITECTURAL ENGINEERING

The course in Architecture affords training for the general practice of architecture, and, while giving adequate attention to structural studies; lays particular stress on the study of architectural design. The course in Architectural Engineering is formulated for those who wish to specialize in the engineering aspects of architecture, with a view to practicing in association with one specializing more particularly in design. Each course requires normally four years for its completion.

Students who wish to broaden their architectural training may arrange to extend their studies over a period of five years by taking the B.A. course with a major in Architecture, in the College of Science, Literature, and the Arts, including the required work of the first three years of the course in Architecture, and completing the work required for the degree of B. Arch. in the College of Engineering and Architecture in one additional year. Such a five-year undergraduate course is recommended by the American Institute of Architects and those who are able thus to extend their studies are strongly advised to do so. Full collegiate training in Architecture includes a sixth year in the Graduate School leading to the master's degree in architecture.

REGULAR FRESHMAN PROGRAM

The freshman year is the same for Architecture, Architectural Engineering, and Landscape Architecture.

(For students who have satisfied the requirements in higher algebra and solid geometry.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 11	College Algebra	5	5	..	..
Engl. 4	Rhetoric and Composition	3	3	..	..
Arch. 21	Freehand Drawing	2	..	..	6
Arch. 31	Elements of Architecture	5	..	2	9
Draw. 61	Projections	2	..	1	3
G.E. 11	Orientation	0	..	1	..
Mil. Sci. 1	First Year Basic Course	0	..	..	3
<i>Winter Quarter</i>					
M.&M. 12	Trigonometry	5	5	..	..
Engl. 5	Rhetoric and Composition	3	3	..	..
Arch. 22	Freehand Drawing	2	..	..	6
Arch. 32	Elements of Architecture	5	..	2	9
Draw. 62	Shades and Shadows	2	..	1	3
G.E. 12	Orientation	0	..	1	..
Mil. Sci. 2	First Year Basic Course	0	..	..	3
<i>Spring Quarter</i>					
M.&M. 13	Analytical Geometry	5	5	..	..
Engl. 6	Rhetoric and Composition	3	3	..	..
Arch. 23	Freehand Drawing	2	..	..	6
Arch. 33	Elements of Architecture	5	..	2	9
Draw. 63	Perspective	2	..	1	3
P.H. 12†	Hygiene and First Aid	0	..	1	..
Mil. Sci. 3	First Year Basic Course	0	..	..	3

† Women take Phys. Ed. for Women, Course 4, in place of P.H. 12.

ARCHITECTURE

Four-year course leading to the degree of bachelor of architecture, B.Arch.

In addition to the prescribed courses, sufficient electives must be taken to complete a total of at least 204 credits. Also, 1,008 design points must be earned (see note, page 60).

For freshman year, see page 31.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 91	Calculus for Architects	4	4	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Arch. 14	Architectural History	2	..	2	..
Arch. 24	Freehand Drawing	2	..	..	6
Arch. 34	Architectural Design, Grade I	4	..	..	12
Arch. 44	Building Construction	2	1	2	..
Mil. Sci. 4	Second Year Basic Course	0	..	..	3
<i>Winter Quarter</i>					
M.&M. 92	Mechanics for Architects	4	4	..	..
Phys. 23	Heat	3	1	3	..
Arch. 15	Architectural History	2	..	2	..
Arch. 25	Freehand Drawing	2	..	..	6
Arch. 35	Architectural Design, Grade I	4	..	..	12
Arch. 45	Building Construction	2	1	2	..
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
<i>Spring Quarter</i>					
M.&M. 93	Strength of Materials for Architects	4	4	..	..
Phys. 43	Electricity	3	1	3	..
Arch. 16	Architectural History	2	..	2	..
Arch. 26	Freehand Drawing	2	..	..	6
Arch. 36	Architectural Design, Grade I	4	..	..	12
Arch. 46	Building Construction	2	1	2	..
Mil. Sci. 6	Second Year Basic Course	0	..	..	3

JUNIOR YEAR

<i>Fall Quarter</i>					
Arch. 17	Architectural History	2	..	2	..
Arch. 27	Freehand Drawing	2	..	..	6
Arch. 37	Architectural Design, Grade II	7	..	..	21
C.E. 38	Stresses in Structures	3	..	..	6
	Elective.				
<i>Winter Quarter</i>					
Arch. 18	Architectural History	2	..	2	..
Arch. 28	Freehand Drawing	2	..	..	6
Arch. 38	Architectural Design, Grade II	7	..	..	21
C.E. 39	Structural Design	3	..	..	6
	Elective.				

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Spring Quarter</i>					
Arch. 19	Architectural History	2	..	2	..
Arch. 29	Freehand Drawing	2	..	..	6
Arch. 30	Architectural Design, Grade II	7	..	..	21
C.E. 41	Reinforced Concrete	3	..	..	6
	Elective.				

SENIOR YEAR

<i>Fall Quarter</i>					
Arch. 131	Architectural Design, Grade III	10	..	..	30
Arch. 141	Building Construction	2	..	2	..
Arch. 151	Architectural Seminar	1	..	1	..
Arch. 161	Decoration and Applied Arts	2	..	2	..
E.E. 40	Electric Wiring and Equipment	2	..	2	..

Winter Quarter

Arch. 132	Architectural Design, Grade III	10	..	..	30
Arch. 142	Building Construction	2	..	2	..
Arch. 152	Estimating	1	..	1	..
Arch. 162	Landscape Design	2	..	2	..
C.E. 171	Building Sanitation	2	..	2	..

Spring Quarter

Arch. 133	Architectural Design, Grade III	9	..	..	27
Arch. 143	Building Construction	2	..	2	..
Arch. 153	Business Relations	2	..	2	..
Arch. 163	History of Painting and Sculpture	2	..	2	..
M.E. 164	Heating and Ventilating	2	..	2	..

ARCHITECTURAL ENGINEERING

Four-year course leading to the degree of bachelor of architectural engineering, B.Arch.E.

In addition to the prescribed courses, sufficient electives must be taken to complete a total of at least 204 credits for graduation. This is an average of 17 credits per quarter for 12 quarters.

The freshman year of this course is identical with the freshman year of the course in Architecture, page 31.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Arch. 14	Architectural History	2	..	2	..
Arch. 34	Architectural Design, Grade I	4	..	..	12
Arch. 44	Building Construction	2	1	2	..
Mil. Sci. 4	Second Year Basic Course	0	..	..	3

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Winter Quarter</i>					
M.&M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Arch. 15	Architectural History	2	..	2	..
Arch. 35	Architectural Design, Grade I	4	..	..	12
Arch. 45	Building Construction	2	1	2	..
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
<i>Spring Quarter</i>					
M.&M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
Arch. 16	Architectural History	2	..	2	..
Arch. 36	Architectural Design, Grade I	4	..	..	12
Arch. 46	Building Construction	2	1	2	..
Mil. Sci. 6	Second Year Basic Course	0	..	..	3
JUNIOR YEAR†					
<i>Fall Quarter</i>					
M.&M. 128	Strength of Materials	5	5	..	..
M.&M. 141	Materials Testing Laboratory	2	1	..	3
C.E. 31	Stresses in Structure	2	..	1	2
Arch. 17	Architectural History	2	..	2	..
Arch. 47	Building Construction	2	..	..	6
Chem. 1	Inorganic Chemistry	4	..	3	4
<i>Winter Quarter</i>					
M.&M. 127	Technical Mechanics (Dynamics)	5	5	..	..
C.E. 35	Analysis of Buildings	3	..	1	4
Arch. 18	Architectural History	2	..	2	..
Arch. 48	Building Construction	2	..	..	6
Chem. 2	Inorganic Chemistry	4	..	3	4
<i>Spring Quarter</i>					
M.&M. 129	Hydraulics	4	4	..	..
M.&M. 143	Hydraulics Laboratory	1	..	..	2
C.E. 36	Design of Steel Frame Buildings	4	..	1	6
Arch. 19	History of Architecture	2	..	2	..
Arch. 49	Building Construction	3	..	..	9
Chem. 3	Inorganic Chemistry	4	..	3	4
SENIOR YEAR‡					
<i>Fall Quarter</i>					
Arch. 141	Building Construction	2	..	2	..
M.E. 163	Heating and Ventilating	4	2	1	4
C.E. 141a	Reinforced Concrete	3	..	..	6
E.E. 40	Electric Wiring and Equipment	2	..	2	..
	Electives*				

* Program is arranged to accommodate Econ. 8f-9w, 28s; Engl. 7w; Geol. 5f.

† For the year 1929-30 Arch. 17-18-19 will be replaced by Arch. 14-15-16, and Arch. 44-45-46, two credits per quarter, are added to the junior year. Students who have completed Chem. 1-2-3 will substitute elective credits for this subject.

‡ For the years 1929-30 and 1930-31, Arch. 17-18-19, two credits per quarter, are added to the senior year.

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Winter Quarter</i>					
Arch. 142	Building Construction	2	..	2	..
Arch. 152	Estimating	1	..	1	..
C.E. 142a	Reinforced Concrete	3	..	1	6
C.E. 171	Building Sanitation	2	..	2	..
E.E. 49	Electric Motors	2	2	..	..
	Electives*				
<i>Spring Quarter</i>					
Arch. 153	Business Relations	2	..	2	..
C.E. 18	Surveying	3	..	..	8
C.E. 135	Reinforced Concrete Design	4	..	2	6
M.E. 140	Heat Engines	4	3	..	4
Arch. 143	Building Construction	2	..	2	..
	Electives*				

* Program is arranged to accommodate Econ. 8f-9w, 28s; Engl. 7w; Geol. 5f.

CHEMISTRY AND CHEMICAL ENGINEERING

FRESHMAN AND SOPHOMORE YEARS

The freshman and sophomore years are the same in Chemistry as in Chemical Engineering, so that the student may postpone his choice between these two curricula until the spring of his sophomore year.

REGULAR FRESHMAN YEAR

For students satisfying the requirements of higher algebra, solid geometry, and chemistry.

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 11	College Algebra	5	5	..	..
Inorg. Chem. 9†	General Inorganic Chemistry	5	1	3	5
English 4	Rhetoric and Composition	3	3	..	..
Drawing 4	Drawing and Descriptive Geometry	2	..	..	6
M.E. 12, 13, or 17	Shop	2	..	..	6
Mil. Sci. 1	First Year Basic Course	0	..	..	3
	Freshman Assembly	0	..	1	..
<i>Winter Quarter</i>					
M.&M. 12	Trigonometry	5	5	..	..
Inorg. Chem. 10†	General Inorganic Chemistry	5	1	3	5
English 5	Rhetoric and Composition	3	3	..	..
Drawing 5	Drawing and Descriptive Geometry	2	..	..	6
M.E. 12, 13, or 17	Shop	2	..	..	6
Mil. Sci. 2	First Year Basic Course	0	..	..	3
<i>Spring Quarter</i>					
M.&M. 13	Analytic Geometry	5	5	..	..
Inorg. Chem. 12†	Qualitative Analysis	5	2	1	6
English 6	Rhetoric and Composition	3	3	..	..
Drawing 6	Drawing and Descriptive Geometry	2	..	..	6
M.E. 12, 13, or 17	Shop	2	..	..	6
P.H. 12	Hygiene and First Aid	0	..	1	..
Mil. Sci. 3	First Year Basic Course	0	..	..	3

† Students who entered without high school chemistry will take Inorg. Chem. 6f instead of 9f and without credit; to be followed by Inorg. Chem. 7w-8s instead of 9f-10w. Inorg. Chem. 12 may then be taken in the Summer Session to complete the work of the freshman year.

REGULAR SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 24	Differential Calculus	5	5	..	..
Inorg. Chem. 13	Qualitative Analysis	5	2	..	9
Physics 3	Elements of Mechanics	3	1	3	..
Physics 4	Elements of Mechanics Laboratory	1	..	..	2
German 24	Chemical German	4	4	..	..
Mil. Sci. 4	Second Year Basic Course .....	..	..	..	3
<i>Winter Quarter</i>					
M.&M. 25	Integral Calculus	5	5	..	..
Anal. Chem. 1	Quantitative Analysis	5	1	1	10
Physics 23	Heat	3	1	3	..
Physics 24	Heat Laboratory	1	..	..	2
German 25	Chemical German	4	4	..	..
Mil. Sci. 5	Second Year Basic Course .....	..	..	..	3
<i>Spring Quarter</i>					
M.&M. 84	Technical Mechanics	5	5	..	..
Anal. Chem. 2	Quantitative Analysis	5	1	1	10
Physics 43	Electricity	3	3	1	..
Physics 44	Electrical Laboratory	1	..	..	2
German 26	Chemical German	4	4	..	..
Mil. Sci. 6	Second Year Basic Course .....	..	..	..	3

CHEMISTRY

Four-year course leading to the degree of bachelor of chemistry, B.Chem.

In addition to the prescribed courses, sufficient approved electives must be taken to complete a total of at least 210 credits. Fifteen elective credits must be taken in chemistry.

This professional course in Chemistry is designed to provide thoro training in the fundamentals of chemistry and related subjects. It serves as a basis for further specialization and a foundation for graduate work. Its graduates secure positions in practical chemistry, research, and teaching, in chemical industries, the government service, in colleges and laboratories, etc.

For freshman and sophomore years see pages 35 and 36.

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
Org. Chem. 51	Organic Chemistry	5	1	3	6
Anal. Chem. 123	Advanced Analytical Chemistry	3	..	1	7
Phys. Chem. 101	Physical Chemistry	5	1	3	6
German 27	Narrative Prose	3	3	..	..
	Electives to complete program.†				
<i>Winter Quarter</i>					
Org. Chem. 52	Organic Chemistry	5	1	3	6
Anal. Chem. 124	Advanced Analytical Chemistry	3	..	1	7
Phys. Chem. 102	Physical Chemistry	5	1	3	6
German 28	Advanced Chemical German	3	3	..	..
	Electives to complete program.†				

† For list of suggested electives in other colleges see page 54. A total of 15 elective credits must be taken in Chemistry for graduation.

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Spring Quarter</i> †					
Org. Chem. 53	Organic Chemistry	5	1	3	6
Phys. Chem. 193	Physical Chemistry	5	1	3	6
German 29	Advanced Chemical German	3	3	..	..
Physics 33	Optics	3	1	3	..
Inorg. Chem. 51	Junior Review Exam. (General Inorg.)	0	2	..	..
Inorg. Chem. 52	Junior Review Exam. (Qualitative)	0	1	..	..
Anal. Chem. 53	Junior Review Exam. (Quantitative)	0	2	..	..
	Electives to complete program.†				
SENIOR YEAR					
<i>Fall Quarter</i>					
Chemistry 96	Thesis (in any division)	5	..	..	15
Tech. Chem. 100	Food Analysis	3	..	1	6
	Electives to complete program.†				
<i>Winter Quarter</i>					
Chemistry 97	Thesis	5	..	..	15
Tech. Chem. 101	Food Analysis	3	..	1	6
	Electives to complete program.†				
<i>Spring Quarter</i>					
Chemistry 98	Thesis	5	..	..	15
Tech. Chem. 102	Food Analysis	3	..	1	6
	Electives to complete program.†				

† For list of suggested electives in other colleges see page 54. A total of 15 elective credits must be taken in Chemistry for graduation.

‡ Students who plan to take Industrial Chemistry in the senior year must register for Chem. Eng. in this quarter.

CHEMICAL ENGINEERING

Four-year course leading to the degree of bachelor of chemical engineering, B.Ch.E.

In addition to the prescribed courses, sufficient approved electives must be taken to complete a total of 218 credits.

The additional eight credits above the course in Chemistry are made up of two credits for the inspection, trip in the spring vacation of the senior year and six credits for the two courses in Chemical Manufacture in the Summer Session following the junior year. Thus the term requirements of the two courses are equal in amount and average $17\frac{1}{2}$ credits per quarter for 12 quarters.

Chemical engineering deals with the unit operations, such as crushing, grinding, sifting, mixing, filtration, evaporation, drying, distillation, and crystallization that are so vital in making any industry based on a chemical transformation of matter a commercial success. The chemist uses these operations in the laboratory but in order to apply them to large scale industrial processes he must have a thorough understanding of the fundamental physico-chemical and engineering principles on which they are based. The study of such principles constitutes the applied science of chemical engineering. For this purpose the chemical engineer must be thoroughly trained in the various branches of chemistry, physics, and mathematics and he must have a good training in the fundamentals of mechanical and electrical engineering so that he can design, construct, and successfully operate a plant using these unit operations.

The chemical engineer is primarily a producer. It is his province to develop a process from the laboratory stage through semi-works equipment to the production stage which uses engineering materials for the manufacture of unit process equipment in accordance with fundamental chemical engineering principles.

As many industries are based on some chemical operation, the chemical engineer is much in demand. He may be engaged in the manufacture of inorganic products—the mineral acids, alkalis, ammonia, paint pigments, fertilizers; in the organic industries—dyes, explosives, lacquers, solvents, medicinals; in the manufacture of gases—coal gas, carbureted blue gas, hydrogen, acetylene, helium; in the electrochemical industries such as the manufacture of graphite, calcium carbide, carborundum and other abrasives, wet and dry batteries, electroplating; in the metallurgical industries; and even in the food industries such as the manufacture of sugar, flour, salt, and starch. There are many others as leather, paper, textiles, soaps, petroleum, glass, and cement.

In these industries the chemical engineer does investigational work, development work, design of equipment, and plant operation. Some enter the field of sales engineering and technical writing.

For freshman and sophomore years see pages 35 and 36.

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
Org. Chem. 51	Organic Chemistry	5	1	3	6
Tech. Chem. 105	Methods of Technical Analysis	3	..	1	6
M.&M. 85	Strength of Materials (with lab.)	4	3	..	2
M.E. 28	Machine Design	3	..	1	6
German 27	Narrative Prose	3	3	..	..
<i>Winter Quarter</i>					
Org. Chem. 52	Organic Chemistry	5	1	3	6
Tech. Chem. 106	Methods of Technical Analysis	3	..	1	6
M.&M. 86	Hydraulics (with lab.)	3	2	..	2
M.E. 138	Heat Engines	4	..	3	4
German 28	Advanced Chemical German	3	3	..	..
<i>Spring Quarter</i>					
Org. Chem. 53	Organic Chemistry	5	1	3	6
Chem. Engr. 101	Unit Processes	4	1	4	3
M.E. 139	Heat Engines	3	..	2	4
Physics 33	Optics	3	1	3	..
German 29	Advanced Chemical German	3	3	..	..
Inorg. Chem. 51	Junior Review Exam. (General Inorg.)	0	2	..	..
Inorg. Chem. 52	Junior Review Exam. (Qualitative)	0	1	..	..
Anal. Chem. 53	Junior Review Exam. (Quantitative)	0	2	..	..

SUMMER SESSION

Summer practice consisting of Chem. Eng. 151f, su-152w, su, Chemical Manufacture, will be taken by students in Chemical Engineering in the regular Summer Session between their junior and senior years. It is required for the degree of bachelor of chemical engineering.

CIVIL ENGINEERING

39

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
Phys. Chem. 101	Physical Chemistry	5	1	3	6
Chem. Engr. 102	Unit Process Problems	2	2	..	..
Chem. Engr. 131	Industrial Inorganic Chemistry	4	1	4	..
E.E. 43	Electric Power	3	..	2	3
	Electives to complete program.*				
<i>Winter Quarter</i>					
Phys. Chem. 102	Physical Chemistry	5	1	3	6
Chem. Engr. 103	Unit Process Problems	2	2	..	..
Chem. Engr. 132	Industrial Inorganic Chemistry	4	1	4	..
E.E. 44	Electric Power	3	..	2	3
	Electives to complete program.*				
<i>Spring Quarter</i>					
Chem. Engr. 187	Inspection Trip, spring vacation	2	..	..	..
Phys. Chem. 103	Physical Chemistry	5	1	3	6
Chem. Engr. 104	Unit Process Problems	2	2	..	..
E.E. 45	Electric Power	3	..	2	3
	Electives to complete program.*				

* In one of the quarters 3 credits must be elected in metallography or mineralogy. See page 54 for list of electives in other colleges.

CIVIL ENGINEERING

Four-year course leading to the degree of bachelor of civil engineering, B.C.E.

In addition to the prescribed courses, sufficient electives must be taken to complete a total of at least 204 credits for graduation. This is an average of 17 credits per quarter for 12 quarters.

The principal aim of the course in civil engineering is to present to the student an opportunity to become familiar with the methods of science, so that in his attack upon any professional problem, he may employ his abilities with economy and secure dependable conclusions. A secondary but important object of the course is to train the student in technique, so that at graduation he may be able to be an economic asset to his employer.

The technique of surveying and platting, drawing, and certain laboratory procedures is taught throughout the course. Typical problems of railroad, highway, hydraulic, structural, and municipal engineering occupy the greater part of the last two years. In the junior year, there is a course of lectures and conferences on the relations of engineering projects to business and to public affairs. Elective courses are available in each of the three upper years; these offer a wide range of choice to the student who desires to extend his range of interests to those fields of knowledge and action related to civil engineering, but not strictly included therein.

The field of civil engineering is so comprehensive that no attempt is made toward specialization in the regular course of four years. Special courses for graduate students are offered in all of the divisions of railroad, highway, structural hydraulic, and municipal engineering.

For freshman year, see page 25.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Draw. 21	Drafting	2	..	..	6
C.E. 11	Surveying	3	1	..	7
Mil. Sci. 4	Second Year Basic Course	0	..	..	3
	*Elective.				

Winter Quarter

M.&M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Draw. 22	Drafting	2	..	..	6
C.E. 12	Surveying	3	1	..	7
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
	*Elective.				

Spring Quarter

M.&M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
Draw. 23	Drafting	2	..	..	6
C.E. 13	Surveying	3	1	..	7
Mil. Sci. 6	Second Year Basic Course	0	..	..	3
	*Elective.				

JUNIOR YEAR

Fall Quarter

M.&M. 128	Strength of Materials	5	5	..	..
M.&M. 141	Materials Laboratory	2	..	1	3
C.E. 14	Surveying	3	..	..	8
C.E. 31	Stresses in Structures	2	..	1	2
C.E. 51	Highways and Pavements	3	..	2	3
	*One or more electives.				

Winter Quarter

M.&M. 129	Hydraulics	4	4	..	..
M.&M. 143	Hydraulics Laboratory	1	..	..	1
C.E. 15	Surveying	2	..	4	..
C.E. 21	Railway Engineering	2	1	..	4
C.E. 32	Stresses in Structures	3	..	1	4
C.E. 52	Highways and Pavements	3	..	1	6
	*One or more electives.				

Spring Quarter

M.&M. 127	Technical Mechanics (Dynamics)	5	5	..	..
C.E. 16	Surveying	2	..	4	..
C.E. 22	Railway Engineering	2	1	..	4
C.E. 33	Elementary Structural Design	4	..	1	4
C.E. 53	Civil Engineering Practice	3	1	2	..
	*One or more electives.				

* For list of elective courses in other colleges, see page 54.

CIVIL ENGINEERING

41

Summer Camp

C.E. 23 Summer camp is held in the vacation preceding the senior year for 6 weeks beginning about the middle of August. Nine credits. Required of all students taking the course in Civil Engineering. Fee, \$25.

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
C.E. 121	Railway Engineering	3	..	1	6
C.E. 134	Statically Indeterminate Structures	3	..	..	6
C.E. 141	Reinforced Concrete	3	..	..	6
C.E. 161	Hydrology	3	1	1	3
C.E. 146	Plain Concrete	3	..	2	4
or					
C.E. 164	Water Power	3	..	1	6
	*Electives to complete program.				
<i>Winter Quarter</i>					
C.E. 124	Transportation	3	3	..	..
C.E. 131	Bridge Analysis	3	1	..	..
C.E. 142	Reinforced Concrete Design	3	..	1	6
C.E. 162	Water Supply and Sewerage	3	..	2	4
E.E. 42	Electric Power	4	3	..	2
or					
M.E. 140	Heat Engines	4	3	..	4
	*Electives to complete program.				
<i>Spring Quarter</i>					
C.E. 132	Bridge Design	3	..	1	6
C.E. 163	Water Supply and Sewerage	3	..	2	5
C.E. 146	Plain Concrete	3	..	1	6
or					
C.E. 164	Water Power	3	..	3	4
E.E. 42	Electric Power	4	3	..	2
or					
M.E. 140	Heat Engines	4	3	..	4
	*Electives to complete program.				

SPECIAL SENIOR YEAR

(For students who have completed Courses C.E. 23, 131, 132, 134.† Such students may be able to graduate at the end of the winter quarter if they have sufficient electives and no deficiencies.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
C.E. 121	Railway Engineering	3	..	1	6
C.E. 141	Reinforced Concrete Design	3	..	..	6
C.E. 161	Hydrology	3	1	1	3
C.E. 162	Water Supply and Sewerage	3	..	1	6
M.E. 140	Heat Engines	4	3	..	4
	*Electives to complete program.				

* For list of elective courses in other colleges, see page 54.

† Courses C.E. 131, 132, and 134 have been offered in the Summer Session by special arrangement only.

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Winter Quarter</i>					
C.E. 124	Transportation	3	..	..	..
C.E. 142	Reinforced Concrete Design	3	..	1	6
C.E. 146	Plain Concrete	3	..	..	6
C.E. 163	Water Supply and Sewerage	3	..	2	5
C.E. 164	Water Power	3	..	1	6
E.E. 42	Electric Power	4	3	..	2
*Electives to complete program.					

ELECTRICAL ENGINEERING

Four-year course leading to the degree of bachelor of electrical engineering, B.E.E.

In addition to the prescribed courses, sufficient electives must be taken to complete a total of at least 204 credits for graduation. This is an average of 17 credits per quarter for 12 quarters.

The course in Electrical Engineering is designed to fit the student for a position of responsibility in the electrical field. This work is based upon the principles of electricity and magnetism contained in the prescribed courses in general physics and upon the principles of mathematics. In the senior year, specialized courses may be selected in the field of electric power generation, transmission, and utilization, in telephone and radio communication or in illumination.

The main laboratory of the department is well equipped for preliminary training in the operation of electrical machinery and for advanced research problems in this field. The communication laboratories contain, besides the general equipment for study of circuits and equipment, a complete commercial radio broadcasting station and an experimental high frequency, short wave station.

Graduate courses in this department, together with graduate courses in physics and mathematics, are available for those with exceptional ability who desire training beyond the usual four-year undergraduate curriculum. For those desiring to fit themselves for the managerial and commercial side of engineering, the Engineering Pre-Business curriculum is provided. Graduates of this department are in demand by various operating and manufacturing companies. After a short period in the laboratories and offices of these companies, the graduates are advanced to positions of increasing responsibility.

For freshman year, see page 25.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
M.E. 16	Machine Shop	2	..	..	6
E.E. 11	Elements of Electrical Engineering	3	2	1	2
Mil. Sci. 4	Second Year Basic Course	0	..	..	3
*Elective.					

* For list of elective courses in other colleges, see page 54.

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Winter Quarter</i>					
M.&M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Draw. 26	Drafting	2	..	..	6
E.E. 13	Elements of Electrical Engineering	3	2	1	2
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
	*Elective.				

<i>Spring Quarter</i>					
M.&M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
Draw. 27	Drafting	2	..	..	6
E.E. 15	Elements of Electrical Engineering	3	2	1	2
Mil. Sci. 6	Second Year Basic Course	0	..	..	3
	*Elective.				

JUNIOR YEAR

<i>Fall Quarter</i>					
M.&M. 129	Hydraulics	4	4	..	..
M.&M. 143	Hydraulics Laboratory	1	..	..	2
E.E. 111	Direct Current Machinery	3	3	..	..
E.E. 112	Direct Current Machinery Laboratory	2	..	..	4
Phys. 144	Electrical Measurements	3	1	1	4
	*One or more electives.				

<i>Winter Quarter</i>					
M.&M. 127	Technical Mechanics (Dynamics)	5	5	..	..
E.E. 113	Direct Current Machinery	3	3	..	..
E.E. 114	Direct Current Machinery Laboratory	2	..	..	4
Phys. 33	Optics	3	1	3	..
M.E. 23	Mechanism and Kinematics	3	3	..	..
	*One or more electives.				

<i>Spring Quarter</i>					
M.&M. 128	Strength of Materials	5	5	..	..
M.&M. 141	Materials Laboratory	2	..	1	3
E.E. 115	Direct Current Machinery	3	3	..	..
E.E. 116	Direct Current Machinery Laboratory	2	..	..	4
M.E. 27	Machine Design	3	..	1	6
	*One or more electives.				

SENIOR YEAR

<i>Fall Quarter</i>					
E.E. 121	Alternating Currents	3	3	..	..
E.E. 122	Alternating Currents Laboratory	2	..	..	4
E.E. 132	Electrical Design†	2	..	1	3
M.F. 136	Heat Engines†	3	2	..	3
	*One or more electives.				

* For list of elective courses in other colleges, see page 54.

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Winter Quarter</i>					
E.E. 123	Alternating Currents	3	3	..	..
E.E. 124	Alternating Currents Laboratory	2	..	..	4
E.E. 134	Electrical Design†	2	..	1	3
M.E. 137	Heat Engines†	3	2	..	3
	*One or more electives.				
<i>Spring Quarter</i>					
E.E. 125	Alternating Currents	3	3	..	..
E.E. 126	Alternating Currents Laboratory	2	..	..	4
E.E. 136	Electrical Design†‡	2	..	1	3
M.E. 155	Internal Combustion Engines	3	2	..	3
	*One or more electives.				

* For list of elective courses in other colleges, see page 54.

† Students specializing in chemistry, physics, or electrical communication may substitute electives in such departments for Courses E.E. 132, 134, 136 and M.E. 144, 145, 146.

‡ Students specializing in business may substitute an approved elective in that department for Course E.E. 136.

SPECIALIZED COURSES IN ELECTRICAL ENGINEERING

The number of electives in the electrical engineering course makes it practicable to obtain either a broad or a specialized education. Further to facilitate such election, certain courses (indicated†) in the senior year may be replaced by substitutes in physics, chemistry, or electrical communication, subject to the approval of the head of the department and the Students' Work Committee. By properly choosing prerequisite subjects during the sophomore or junior year, a far-seeing student may prepare for advanced specialized courses in the following undergraduate and graduate years. As examples, one may specialize in business, chemistry, communication, education, illumination, manufacturing, military science, physics, power generation and distribution, public utilities, railway engineering, or other chosen line. Students are advised to consult with their classifier, or with the head of the department, concerning desirable sequences of general or special courses.

INTERIOR ARCHITECTURE

Four-year course leading to the degree of bachelor of interior architecture, B.Int.Arch.

The course in interior architecture is primarily designed to meet vocational needs of women who wish to prepare for the practice of architecture, or interior decoration. This course requires normally four years for its completion, the first two years in the College of Science, Literature, and the Arts, and the last two years in the College of Engineering and Architecture.

For the freshman and sophomore years, students register in the College of Science, Literature, and the Arts and complete the requirements of the Junior College, including 90 credits and 90 honor points.

INTERIOR ARCHITECTURE

45

COURSES REQUIRED IN THE FIRST TWO YEARS

	Credits
English A-B-C	15
Mathematics 4 or 6 (with prerequisite)	4 to 10
French (see Junior College Requirements, page 5, S. L. A. bulletin)	0 to 20
History 11-12-13	10
Physics 1 and 2 and any one of the continuations, 21, 31, 41, with laboratory	8
or	
Chemistry 1-2-3 or 4-5	8 to 12
Architecture 21-22-23	6
Architecture 31-32-33	12
Drawing 61-62-63	6

FOR THOSE WHO ENTER WITH HIGHER ALGEBRA AND TWO YEARS OF FRENCH

FRESHMAN YEAR

FALL	WINTER	SPRING	
Credits	Credits	Credits	Credits
English A	English B	English C	5
Mathematics	French	French	5
Elective	Elective	Elective	5

SOPHOMORE YEAR

Architecture 21-22-23	6
Architecture 31-32-33	12
History 11-12-13	10
Chemistry or physics	8 to 12
Drawing 61-62-63	6
Electives to complete a total of 90 for the two years.	

Having satisfied the requirements of the Junior College, the students transfer to the College of Engineering and Architecture and pursue the following curriculum, amounting to 102 credits for the remaining two years:

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
Arch. 14	Architectural History	2	..	2	..
Arch. 34	Architectural Design	4	..	..	12
Arch. 51	Building Construction	2	..	2	..
Arch. 74	Freehand Drawing	3	..	..	9
Art. Ed. 20	Principles of Harmony in Form and Color ..	3	..	..	6
	Non-technical electives	3			
<i>Winter Quarter</i>					
Arch. 15	Architectural History	2	..	2	..
Arch. 35	Architectural Design	4	..	..	12
Arch. 52	Building Construction	2	..	2	..
Arch. 75	Freehand Drawing	3	..	..	9
Art. Ed. 21	Principles of Harmony in Form and Color ..	3	..	..	6
	Non-technical electives	3			

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Spring Quarter</i>					
Arch. 16	Architectural History	2	..	2	..
Arch. 36	Architectural Design	4	..	..	12
Arch. 53	Building Construction	2	..	2	..
Arch. 76	Freehand Drawing	3	..	..	9
Art. Ed. 22	Principles of Harmony in Form and Color ..	3	..	..	6
	Non-technical electives	3			
SENIOR YEAR					
<i>Fall Quarter</i>					
Arch. 17	Architectural History	2	..	2	..
Arch. 27	Freehand Drawing	2	..	..	6
Arch. 134	Interior Design	7	..	..	21
Arch. 151	Seminar	1	..	1	..
Arch. 182	Furniture and Decoration	3	..	3	..
	Non-technical electives	3			
<i>Winter Quarter</i>					
Arch. 18	Architectural History	2	..	2	..
Arch. 28	Freehand Drawing	2	..	..	6
Arch. 135	Interior Design	7	..	..	21
Arch. 183	Furniture and Decoration	3	..	3	..
	Non-technical electives	3			
<i>Spring Quarter</i>					
Arch. 19	Architectural History	2	..	2	..
Arch. 29	Freehand Drawing	2	..	..	6
Arch. 136	Interior Design	7	..	..	21
Arch. 163	History of Sculpture and Painting	2	..	2	..
Arch. 184	Furniture and Decoration	3	..	3	..

LANDSCAPE ARCHITECTURE

Four-year course leading to the degree of bachelor of landscape architecture, B.L.A.

In addition to the prescribed courses, sufficient electives must be taken to complete a total of at least 204 credits for graduation. This is an average of 17 credits per quarter for 12 quarters.

The course in landscape architecture is intended to provide instruction and training for students who desire to enter this profession. It involves the same fundamental preparation as the course in architecture, and, also, special attention is given to architectural as well as landscape design.

The profession of landscape architecture is a broad one and should not be confused with the work of the landscape gardener. The landscape architect may be concerned in the design and construction involved in parks and park systems, real estate development of a high order, and on a large scale, university campuses, civic centers, municipal and state building plans, town and city planning, etc. His professional relations with architects are so intimate as to require familiarity with the architectural profession. This is given consideration in the close relationship between the course in landscape architecture and the course in architecture.

For freshman year, see page 31.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 91	Calculus	4	4	..	..
Arch. 14	Architectural History	2	..	2	..
Arch. 24	Freehand Drawing	2	..	..	6
Arch. 34	Architectural Design	4	..	..	12
Bot. 1	General Botany	4	1	3	..
Mil. Sci. 4	Second Year Basic Course	0	..	..	3

Winter Quarter

M.&M. 92	Technical Mechanics	4	4	..	..
Arch. 15	Architectural History	2	..	2	..
Arch. 25	Freehand Drawing	2	..	..	6
Arch. 35	Architectural Design	4	..	..	12
Bot. 7	Taxonomy of Flowering Plants	3	..	1	5
Mil. Sci. 5	Second Year Basic Course	0	..	..	3

Spring Quarter

M.&M. 93	Strength of Materials	4	4	..	..
Arch. 16	Architectural History	2	..	2	..
Arch. 26	Freehand Drawing	2	..	..	6
Arch. 36	Architectural Design	4	..	..	12
Bot. 21	Elementary Ecology	3	..	..	6
Mil. Sci. 6	Second Year Basic Course	0	..	..	3

Summer Session between Sophomore and Junior Years

Arch. 20	Outdoor Sketching	1	..	..	..
Geol. 1	General Geology	5	..	..	..
Hort. 70	Plant Materials	3	..	..	..

JUNIOR YEAR

Fall Quarter

Arch. 27	Freehand Drawing	2	..	..	6
Arch. 84	Modeling	2	..	..	6
C.E. 11	Surveying	3	1	..	7
Econ. 8	General Economics	3	3	..	..
Hort. 71	Plant Material	3	..	1	4
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2

Winter Quarter

Arch. 28	Freehand Drawing	2	..	..	6
Arch. 86	Modeling	2	..	..	6
C.E. 12	Surveying	3	1	..	7
Econ. 9	General Economics	3	3	..	..
Hort. 73	History of Landscape Gardening	3	..	3	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Lab.	1	..	..	2

Spring Quarter

Arch. 29	Freehand Drawing	2	..	..	6
Arch. 86	Modeling	2	..	..	6
C.E. 13	Surveying	3	1	..	7
Econ. 28	Business Law	3	..	3	..
Hort. 72	Plant Materials	3	..	1	4
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
C.E. 14	Surveying	3	..	..	8
C.E. 51	Highways and Pavements	3	2	..	3
C.E. 144	Reinforced Concrete	3	2	..	2
Hort. 74	Landscape Design	5	..	2	6
For. 1 or	General Forestry	3	..	3	
Soils 4	Soils	3	..	2	2
<i>Winter Quarter</i>					
G.E. 81	Estimating	3	3	..	..
Hort. 75	Landscape Design	5	..	2	6
Phys. 33	Optics	3	1	3	..
Phys. 34	Optics Laboratory	1	..	..	2
Sp.35	Public Speaking	3	3	..	..
<i>Spring Quarter</i>					
Ag.E. 31	Principles of Drainage	3	1	2	..
C.E. 272	City Planning	3	..	3	..
Engl. 31	Technical Writing	3	3	..	..
Hort. 76	Landscape Construction and Maintenance	5	..	2	6
RECOMMENDED ELECTIVES					
Arch. 44f.45w.46s	Building Construction	2	per quarter		
Hort. 56s	Plant Propagation	3			
Soils 4f	Soils	3			

MECHANICAL ENGINEERING

Four-year course leading to the degree of bachelor of mechanical engineering, B.M.E.

In addition to the prescribed courses, sufficient electives must be taken to complete a total of at least 204 credits for graduation. This is an average of 17 credits per quarter for 12 quarters.

It is recommended that each student in Mechanical Engineering spend at least one summer vacation in machine shop practice.

At the beginning of the junior year, the student should confer with his classifier with regard to the particular line of work, if any, for which he desires to prepare. He can then select his electives according to this plan.

The field of mechanical engineering is so broad that the young graduates enter almost every kind of industry, both in technical and executive positions.

The profession includes the following divisions: design of machinery and apparatus for all purposes; production and manufacturing methods; inspection and testing of materials and apparatus; operation of industrial plants; sales engineering; research and development; management of industry.

The course is planned to give broad training rather than highly specialized work. Fundamental courses in mathematics, physics, chemistry, and *English* are followed by strong courses in steam and gas machinery, electricity, hydraulics, machine design, materials testing, and mechanical laboratory work. Courses in economics, industrial management, and finance may be elected if desired.

The young man graduating in mechanical engineering will find an ever widening field of service in the future both in technical work and in administrative positions, and there is no limit to future progress except the ability of the individual.

For freshman year, see page 25.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Draw. 28	Drafting	2	..	..	6
M.E. 19	Mechanical Technology	1	..	2	..
Tech. Chem. 1†	Power Plant Chemistry	3	1	1	6
Mil. Sci. 4	Second Year Basic Course	0	..	..	3
<i>Winter Quarter</i>					
M.&M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Draw. 29	Drafting	2	..	..	6
M.E. 14	Machine Shop Practice	3	..	..	8
Phys. 33†	Optics	3	1	3	..
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
<i>Spring Quarter</i>					
M.&M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
M.E. 15	Machine Shop Practice	3	..	..	8
M.E. 24	Kinematics	2	..	..	6
M.E. 50†	Auto and Airplane Engines	3	3	..	..
Mil. Sci. 6	Second Year Basic Course	0	..	..	3

*Elective.

JUNIOR YEAR

<i>Fall Quarter</i>					
M.&M. 127	Technical Mechanics (Dynamics)	5	5	..	..
M.E. 21	Elementary Machine Design	2	..	..	6
M.E. 22	Mechanism	3	3	..	..
M.E. 30	Steam Engineering	3	3	..	..
M.E. 32	Elementary Mechanical Laboratory	2	..	..	6
*One or more electives.					
<i>Winter Quarter</i>					
M.&M. 128	Strength of Materials	5	5	..	..
M.&M. 141	Materials Laboratory	2	..	1	3
M.E. 25	Machine Design	3	..	2	6
M.E. 31	Thermodynamics	3	2	..	..
ME. 33	Mechanical Laboratory	2	..	..	6
*One or more electives.					

* For list of elective courses in other colleges, see page 54.

† Auto and Airplane Engines, Power Plant Chemistry, and Optics may be taken any quarter. The Power Plant Chemistry sections are limited to 20 students each.

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Spring Quarter</i>					
M.&M. 129	Hydraulics	4	4	..	..
M.&M. 143	Hydraulics Laboratory	1	..	..	2
M.E. 26	Machine Design	3	3	..	..
M.E. 34	Elementary Steam and Power Laboratory	2	..	..	6
M.E. 63	Heating and Ventilation	3	1	2	..
M.E. 141	Thermodynamics	3	2	..	3

*One or more electives.

SENIOR YEAR

Fall Quarter

M.E. 148	Advanced Steam Laboratory	2	..	..	6
or					
M.E. 159	Power and Gas Engine Laboratory	2	..	..	6
M.E. 150	Internal Combustion Engines	3	3	..	..
M.E. 190	Seminar	1	1	..	..
	Engineering Design†	2	..	..	6
E.E. 46	Electric Power	4	3	..	2

*One or more electives.

Winter Quarter

M.E. 148	Advanced Steam Laboratory	2	..	..	6
or					
M.E. 159	Power and Gas Engine Laboratory	2	..	..	6
M.E. 191	Seminar	1	1	..	..
	Engineering Design†	2	..	..	6
E.E. 47	Electric Power	4	3	..	2

*One or more electives.

Spring Quarter

M.E. 192	Seminar	1	..	1	1
M.E. 194	Advanced Engineering Laboratory	2	..	..	6
	Engineering Design†	2	..	..	6
E.E. 48	Electric Power	4	3	..	2
G.E. 193	Engineering Practice	2	..	2	..

*One or more electives.

* For list of elective courses in other colleges, see page 54.

† The following courses are accepted for this requirement: M.E. 121f-122w-123s, Advanced Engineering Design; M.E. 135f, 149w, Design of Steam Machinery; M.E. 156f,w-157w,s-158s, Design of Internal Combustion Engines; M.E. 254s, Gas Tractor Design; M.E. 145s, Design of Power Plant Units; M.E. 242f, 243w, Power Plant Design; M.E. 254, Gas Tractor Design; C.E. 37s, Structural Engineering.

In addition to the regular four-year course in Mechanical Engineering, those who are qualified are urged to take a fifth year, that is, a year of graduate study. This year's work may lead to the Master's degree in mechanical engineering and also satisfy the requirement of graduate study towards the professional degree of mechanical engineering. (For detailed information as to procedure, the bulletin of the Graduate School should be consulted.)

Graduate work for a degree is divided into a major subject, a minor subject, and a thesis. In this case, the major subject is Mechanical Engineering and the

thesis will lie in the same field. If the Master's degree is not sought as a result of the fifth year's work, the thesis is not required. The student is advised to obtain the Master's degree. The minor should be in another department. A total of 15 to 18 credits per quarter, should be taken.

ENGINEERING PRE-BUSINESS

(Combined Engineering-Business Administration Course)

This course has been arranged for students who wish to prepare for positions in industry for which basic technical training is necessary but must be accompanied by thoro training in business administration. Such positions are found in the fields of purchasing, sales and sales promotion, cost accounting, employment and rate setting, and production control.

Upon the completion of two years of prescribed work in the College of Engineering and Architecture, the student transfers to the School of Business Administration, where the third and fourth years are taken. The combined course leads to the degree of bachelor of business administration.

For freshman year, see page 25.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
<i>Fall Quarter</i>					
M.&M. 91	Calculus	4	4	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Econ. 8	General Economics	3	..	3	..
M.E. 17	Machine Shop Practice	2	..	..	6
M.E. 19	Mechanical Technology	1	..	2	..
Mil. Sci. 4	Second Year Basic Course	0	..	..	3
	*Elective.				
<i>Winter Quarter</i>					
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Econ. 3	The Mechanism of Exchange	5	3	2	..
Econ. 9	General Economics	3	3	..	..
Econ. 20†	Elements of Accounting	3	3	..	..
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
	*Elective.				
<i>Spring Quarter</i>					
M.&M. 84	Technical Mechanics	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
Econ. 14	Elements of Statistics	5	5	..	..
Econ. 25	Principles of Accounting	3	3	..	..
Mil. Sci. 5	Second Year Basic Course	0	..	..	3

* For electives in other colleges, see page 54.

† Students who have had a high school course or experience in bookkeeping may be exempt from this course and admitted to Econ. 25 by passing a placement test.

JUNIOR YEAR*

(In the School of Business Administration)

	Credits
Strength of Materials (M. & M. 85f)	4
Principles of Accounting (Econ. 26)	3
Business Law (Econ. 51-52-53)	9
Corporation Finance (Bus. Adm. 155)	3
Monetary and Banking Policy (Econ. 141)	3
Market Administration (Bus. Adm. 67)	3
Traffic Management (Bus. Adm. 71)	3
Production Management (Bus. Adm. 89)	3
Advanced General Accounting (Bus. Adm. 139)	3
Report Writing (Bus. Adm. 100)	1
Electives (See list below)	7 to 13

SENIOR YEAR

(In the School of Business Administration)

Cost Accounting (Bus. Adm. 130)	3
Advanced General Economics (Bus. Adm. 101-102)	6
Business Policy (Bus. Adm. 109)	3
Business Cycles (Bus. Adm. 149)	3
Labor Problems (Econ. 161)	3
Personnel Administration (Bus. Adm. 167)	3
Public Finance (Bus. Adm. 58)	3
Public Utilities (Econ. 154)	3
Production Topics Course (Bus. Adm. 180-181)	6
Electives (See list below)	12 to 18

ELECTIVES

Students may divide the time available for electives between groups A and B.

A. General and Business

	Hours
Economic History	3 to 6
Finance Management	3
Theory of Statistics	3
Geography of Commercial Production	5
Property Insurance	3
Casualty Insurance	3

B. Engineering

	Hours
Automotives	3
Gas Manufacture and Distribution	3
Municipal Engineering	3
Contracts and Specifications	3
Estimating	3
Technical Writing	3

* In addition to the required courses in the junior and senior years, the student must earn approximately 10 credits per year.

ENGINEERING ADMINISTRATION

The following group of elective courses has been prepared for those advanced students in this college who desire a broad training for service in executive and administrative positions. There is an increasing demand for engineers who have such training, and students whose scholastic records are of high grade are encouraged to include this series of electives.

SOPHOMORE YEAR

Course No.	Title	Credits
<i>Fall Quarter</i>		
Econ. 8	Principles of Economics	3
<i>Winter Quarter</i>		
Econ. 9	Principles of Economics	3
<i>Spring Quarter</i>		
Econ. 28	Business Law	3

JUNIOR YEAR

Course No.	Title	Credits
<i>Fall Quarter</i>		
Econ. 29	Principles of Accounting	3
<i>Winter Quarter</i>		
Bus. Adm. 89	Production Management	2
<i>Spring Quarter</i>		
Bus. Adm. 155	Corporation Finance	3

SENIOR YEAR

Course No.	Title	Credits
<i>Fall Quarter</i>		
Bus. Adm. 67	Market Administration	3
Econ. 161	Labor Problems	3
<i>Winter Quarter</i>		
Bus. Adm. 71	Traffic Management	3
Bus. Adm. 167	Personnel Management	3
<i>Spring Quarter</i>		
Bus. Adm. 130	Cost Accounting	3
Econ. 154	Public Utilities	3

ELECTIVE COURSES IN OTHER COLLEGES

For detailed schedules of classes see the programs of respective departments.

Course No.	Title	Credits	Prerequisites
Ast. 11f,w,s	Descriptive Astronomy	5	3rd qtr. fr., soph. jr. sr.; none
Fr. 1f,w,s-2f,w,s	Beginning French	10	None
Fr. 3f,w,s-4f,w,s	Intermediate French	10	French 1-2 or two years' high school French
Geol. 1f,w,s-2f,w,s	General Geology	10	None
Geol. 3w,s	Economic Geology	5	Geol. 1
Geol. 4s	Geology of Minnesota	5	Geol. 2 or 3
Geol. 11f	Elements of Paleontology	5	Geol. 1
Geol. 23w-24s	Elements of Mineralogy	10	Chemistry
Geol. 105f	Rock Study	3	Geol. 24
Geol. 106w	Petrography	3	Geol. 105
Geol. 121f	Crystallography	3	M.&M. 11 and Inorg. Chem. 16
Geol. 161w	Crystal Structures	3	Geol. 121, M.&M.13 and Elem. Phys.
Ger. 1f,w,s	Beginning German A	5	None
Ger. 2f,w,s	Beginning German B	5	Ger. 1 or one year prep- aration
Ger. 3f,w,s	Beginning German C	5	Ger. 2
Ger. 4f,w,s	Intermediate German	5	Ger. 3
Greek 42s	Greek Sculpture	2	None
Hist. 1f,w-2w,s	Modern World History	10	None
Hist. 7f-8w	American History	10	None
Hist. 11f-12w-13s	Medieval History (per quarter)	5	None (Int. Arch. only)
Italian 1f-2w	Beginning Italian	10	None
Jour. 5f,s	The American Newspaper	3	None
Jour. 13f-14w-15s	Reporting	9	Engl. 6
Lib. Meth. 1f,w,s	Use of Books and Libraries	2	None (Fr. and soph. only)
Phil. 2f,w,s	Logic	5	None
Phys. 146w	Advanced Electrical Measurements	3	Phys. 144
Pol. Sci. 1f,w,s	American Government	5	10 cred. in hist. or econ.
Pol. Sci. 2f,w,s	State Government	5	Pol. Sci. 1
Pol. Sci. 11f,s	Municipal Government	5	Pol. Sci. 1
Psy. 1f-2w	General Psychology	6	None
Psy. 160f	Psychology in Personnel Work	3	Psy. 1-2, Econ. 8-9
Soc. 1f,w,s	Introduction to Sociology	5	None
Span. 1f,w,s-2f,w,s	Beginning Spanish	10	None
Span. 3f,w,s-4f,w,s	Intermediate Spanish	10	Spanish 1-2 or two years' high school Spanish

DESCRIPTIONS OF COURSES

AERONAUTICAL ENGINEERING

- 1f—Aviation. Airplanes, their structure and rigging. Instruments. 3 cred.; prereq., M.&M. 12.
(1) I MWF; 110Ex (2) III TThS; 110Ex
- 2w—Auto and Airplane Engines. Principles and types. Electrical systems. Lubrication and cooling. Carburetors. Accessories. 3 cred.; prereq., I.
(1) I MWF; 110Ex (2) III MTTh; 110Ex
- 3s—Aviation. Aerial navigation. Communications. Handling of sea planes and land planes. 3 cred.; prereq., I and 2.
(1) I TThS; 252ME (2) VI TTh, III S; 110Ex
- 83s—Stresses in Simple Structures. Statically determinate trusses and beams. Graphic statics. Space frameworks. Combined stresses. Airplane wing bracing. Short and long struts. Deflection of structures. 3 cred.; prereq., M.&M. 128; IV MWF; 104E. Mr. Wise.
- 100f-101w-102s—Aerodynamics. Atmospheric properties. Resistance of simple bodies. Wing lift and drag. Propeller theory. Control surfaces and stability. Prediction of airplane performance. Dynamic loads. Maneuverability and controllability. Structural requirements. 3 cred. per qtr.; prereq., 3, M.&M. 26; I MWF; 215Ex. Mr. Boehnlein.
- 115f—Airplane Stresses. Theory of statically indeterminate structures. Analysis of fuselage trusses, landing gear, and wing beams. Structural details and connections. 3 cred.; prereq., 83. Mr. Wise.
Lect. II TS; 5E Lab. III-IV F; 229E
- 120f-121w-122s—Airplane Design. Performance curves. Stresses in wings, fuselage, and chassis. Control surfaces. Propellers. 120f 2 cred.; 121w 4 cred.; 122s 3 cred.; prereq., 83, 102, M.&M. 128. Mr. Hoglund.
120f Lect. IV S; 202ME Lab. VII-IX T; 251ME
121w Lect. II T; 154ME Lab. VII-IX TF; 151ME
122s Lect. IV T; 252ME Lab. I-III MF; 151ME
- 140f—Aeronautical Laboratory. Study of airplane parts and their construction. Fittings. Rigging. 2 cred.; prereq., 102; VII-IX MTh; Ex. Mr. Hoglund.
- 141w—Aerodynamics Laboratory. Measurement of air flow. Calibration of Pitot tubes and anemometers. Distribution of air pressure on surfaces. Wind tunnel tests of model wings and propellers. 2 cred.; prereq., 102; VI-VIII MTh; Ex. Mr. Boehnlein.
- 160s—Airships. Theory and design. Rigid and non-rigid types. Stresses. Performance. 3 cred.; prereq., 83, 102, M.&M. 128. Mr. Hoglund.
Lect. III ThS; 254ME Lab. I-III T; 151ME
- 170s—Air Transport. Economic Problems. Airports and airways. Lighting for night flying. 2 cred.; prereq., 102, C.E. 17; IV MW; 209Ex. Mr. Hoglund.
- 190f-191w-192s—Seminar. Readings, reports, conferences, and discussions. 1 cred. per qtr.; prereq., 102. Messrs. Boehnlein and Hoglund.
190f-191w I T; 252ME 192s I S; 254ME

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

- 1f,w,s—Principles of Economics. 5 cred.; no prereq.; IV MTWF, III Th; 204Da(UF).
- 2w,s—Agricultural Economics. 3 cred.; prereq., 1; I TThS; (w) 24Ad(UF), (s) 204Da(UF). Mr. Clark.
- 102f—Farm Management Organization. Business side of farming is emphasized. Special attention is given to farm organization and equipment. 3 cred.; prereq., Ag.Econ. 2, Soils 4. Mr. Garey.
Lect. II MW; 118Ad(UF)
Lab. (1) VI-VII T; 118Ad(UF) (2) II-III F. ar
- 103w—Farm Management Operation. Special attention is given to farm operation. 3 cred.; prereq., 102. Mr. Garey.
Lect. II MW; 118Ad(UF) Lab. VI-VII T; 118Ad(UF)

AGRICULTURAL ENGINEERING

FARM BUILDINGS

- 5f—Farm Building Construction. Instruction and practice in framing, construction, and painting of farm buildings. 3 cred.; no prereq. Mr. White.
Lect. VII WF; 41En(UF) Lab. VII-IX M; 48En(UF)
- 7w—Farm Structures I. Arrangement, planning, and designing of farm buildings. Special attention to convenience, economy, and the durability of farmhouses, barns, cribs granaries, hog houses, etc. 3 cred.; prereq., Dr. 3 or equiv. Mr. White.
Lect. IV TS; 305En(UF) Lab. VII-IX M; 305En(UF)
- 36w—Rural Heating and Ventilation. Fundamental principles of combustion, heat transmission, heating, and ventilation. Application of heating and ventilating systems to homes, rural schools, churches, warehouses, and farm structures. 3 cred.; prereq., 7, Phys. 23, 24; I TTh, VI-VIII T or Th; 101En(UF). Mr. Romness.
- 37f—Rural Sanitation. Wells, pumps, and water supply. Methods of securing sanitary water systems for farmsteads and rural institutions. Sanitary sewage disposal methods for homes, creameries, etc. 3 cred.; no prereq.; II TThS; 101En(UF). Mr. Romness.
- 67s—Farm Structures II. Planning, estimating, and construction of farm buildings. Study of materials commonly used. 3 cred.; prereq., 7; I-II TThS; 305En(UF). Mr. White.
- 111f—Structural Materials. Use, strength, practicability, and durability of materials used in farm building construction and equipment. 3 cred.; prereq., 67; III Th, III-IV TS; 305En(UF). Mr. White.
- 112s—Farm Building Problems. Investigations in the utility and durability of building materials such as concrete, hollow building tile, lumber, prepared roofing, etc. Methods of construction of farm buildings. 3 cred.; prereq., 67; VI-VIII TTh; 305En(UF). Mr. White.

FARM MACHINERY

- 12s—Field Machinery. Construction, operation, adjustment, and use of soil preparation, seeding and harvesting machinery. 3 cred.; no prereq. Mr. Schwantes.
Lect. I MW; 216En(UF) Lab. II-IV T; 49En(UF)

- 13s—Gas Engines. Theory, operation, care, and repair of gasoline engines. 3 cred.; no prereq.; VI-VIII TTh; 216, 37En(UF). Mr. Torrance.
- 14s—Elementary Farm Power. Lecture and laboratory course dealing with the construction, operation, care, adjustment, testing, and use of the tractor and other sources of farm power. 3 cred.; prereq., 13; VI-VIII MF; 216, 37En(UF). Mr. Torrance.
- 15f—Ignition and Carburetion. Lecture and shop study of the construction and action of the various forms of ignition and carburetion systems in use on gas engines of all types. 3 cred.; prereq., 13; III MW, III-IV F; 216En(UF). Mr. Torrance.
- 40f,s—Mechanical Training I. Instruction and laboratory practice in mechanical trades, embracing rope work; belt lacing and pulleys; cement work; soldering; pipe fitting; electric wiring; harness repair, etc. 3 cred.; no prereq. Mr. Dent.
 40f I-II MWF; 20, 106En(UF)
 40s V-VI TWF; 20, 106En(UF)
- 121w—Steam Boilers and Engines. Lecture and laboratory study of the construction, operation, and care of simple steam engines and boilers. 3 cred.; prereq., Phys. 23, 24; II TTh, VI-VII F; 216En(UF). Mr. Boss.
- 122f—Power Machinery. Study of machines requiring mechanical power for their operation such as feed grinders, corn shredders, ensilage cutters, threshers. 3 cred.; prereq., 12, 13; VI WF; 106En(UF), VII-IX W, 49En(UF). Mr. Schwantes.
- 123s—Farm Power. Comparative study of the application and cost of different sources of power to farm machinery and operations. 3 cred.; prereq., 122; I TTh; 216En(UF), VI-VIII T; 37En(UF). Mr. Schwantes.
- 125w—Farm Machinery Design. Drafting room study of design of farm machine parts, e.g., gearing, cams, shafts, flexible connections, etc.; laboratory tests of strength coupled with efficiency of machine parts. Recitation and lecture. 3 cred.; prereq., 122 and M.E. 27; VI-VIII MW; 106En(UF). Mr. Schwantes.
- 126s—Selection of Farm Equipment. Field laboratory study of types and construction of machinery and equipment suited to the various farm and farm home operations. 3 cred.; prereq., 14, 122; III MW; 106En(UF), III-IV F; 49En(UF). Mr. Schwantes.
- 133w—Applied Electricity. Laboratory work in direct and alternating current machines as used on farms, including generators, motors, storage batteries, transformers, and complete isolated electric and hydroelectric plants. 3 cred.; prereq., Phys. 43, 44, Lect. VI M; Lab. VII-IX MF; 101En(UF). Mr. Romness.

RECLAMATION

- 19f—Elementary Surveying. Use of tape, transit, level, and traverse board in agricultural field problems, e.g., mensuration surveys, traverses, differential and profile leveling; plotting and mapping. Care and adjustment of instruments. 3 cred.; prereq., Dr. 3, M.&M. 12. Mr. Neal.
 Lect. II T; 215En(UF) Lab. VI-VIII TTh; 305En(UF)

- 20s—Advanced Surveying. Topographic surveys by stadia and other methods, running simple curves, cross sectioning, plotting the survey, profile building, grade determination, and figuring of quantities in earth work. 3 cred.; prereq., 19. Messrs. Roe and Neal.
Lect. VI M; 215En(UF) Lab. VII-IX MF; 305En(UF)
- 28w—Land Clearing. Land clearing methods, explosives, and machinery. Farm development in cut over timber district. 3 cred.; no prereq.; I TThS, 103En(UF). Mr. Schwantes.
- 31f,w,s—Principles of Drainage. Elementary principles and practice of drainage in relation to plant growth, crop and land values, and farm operation and development. 3 cred.; no prereq.; III TThS; 215En(UF). Messrs. Roe and Neal.
- 42w—Principles of Irrigation. Irrigation and the development of arid and semi-arid lands, irrigation practices; duty of water and water rights; correlation of drainage and irrigation. (Offered only in alternate years, 1928-29, etc. Alternates with Soils 8.) 3 cred.; no prereq. Mr. Roe.
- 101f—Drainage Engineering and Works. Design, location, and construction of public and private drainage systems and works; construction estimates, drainage engineering, and public records. 3 cred.; prereq., 31, M.&M. 86; I M, II-IV MF; 215En(UF). Mr. Roe.
- 102s—Advanced Drainage Problems. Special drainage problems including surface run-off, soil permeability, relation of soil type to drainage, shape and regulation of water table in relation to root growth, etc. 3 cred.; prereq., 101; ar; 215En(UF). Mr. Roe.
- 103s—Irrigation Engineering and Works. Design, location, and construction of irrigation works; reservoir and transmission losses; general irrigation law; irrigation engineering and public records. 3 cred.; prereq., 42, M.&M. 86; I M, II-IV MW; 215En(UF). Mr. Roe.
- 104w—Drainage Administration and Law. Organizing, financing, problems in legal development and administration of drainage and flood control districts, fiduciary duties of the engineer, etc. 3 cred.; prereq., 101; 215En(UF). Mr. Roe.

GENERAL

- 150s—Seminar (Ag.E.). Students will give reports of their investigations on certain assigned problems for research. 2 cred.; prereq., 103 or 112 or 125. Messrs. Roe, Schwantes, and White.

AGRONOMY AND PLANT GENETICS

- 1f,w,s—Farm Crops. Important field crops of the United States with emphasis upon those of local importance, distribution, economic importance, agricultural classification, cultural methods, and principles of improvement and seed selection. 3 cred.; no prereq.; III-IV MWF; 2Ad(UF). Mr. Wilson.

ANIMAL HUSBANDRY

- 15s—Fundamentals of Livestock Production. Basic principles involved in the breeding, feeding, and management of livestock. 3 cred.; jr., sr.; no prereq.; I TThS; 3St(UF). (For professional agricultural engineering students only.) Mr. Peters.

ARCHITECTURE

- 14f-15w-16s—Architectural History. Technical study of architecture: (f) Ancient Egypt, Assyria, Persia, and especially Greece; (w) Ancient Rome and beginning of the Renaissance in Italy; (s) Renaissance in Italy and Spain. Illustrated lectures and library research. 2 cred. per qtr.; prereq., 33; III WF; 305E. Mr. Mann.
- 17f-18w-19s—Architectural History. Technical study of architecture: (f) The Middle Ages in Italy, France, and England; (w) Developed Gothic architecture and early Renaissance in France and England; sources and affecting influences; (s) Development from the seventeenth century to the present time, particularly in France, England, and America. Lectures and library research. 2 cred. per qtr.; prereq., 15; III TTh; 320E. Mr. Mann.
- 210f,w,s—Special Researches in Architectural History. 5 cred. or less per qtr.; prereq., completion of undergraduate architectural history; MW III; 320ME. Mr. Mann.

FINE ARTS

- Arch. 20su—Sketching. Sketching out-of-doors in water color and other media. 1 cred.; prereq., Arch. 23 or evidence of intermediate ability. Mr. Young.
 (1) I-III MW (3) III-V MW
 (2) I-III TTh (4) III-V TTh
- 21f,w,su-22w,s,su-23s,su—Freehand Drawing. Freehand perspective; pencil, charcoal, and wash drawings from geometric solids and architectural details. 2 cred. per qtr.; no prereq. Messrs. Young and Doseff.
 21f (1) VI-VIII T, VII-IX Th; 417E (3) VI-VIII MW; 417E
 (2) II-IV MF; 417E (4) II-IV TS; 417E
 21w II-III T, VI-VIII Th; 417E
 22w (1) VI-VIII TF; 417E (3) VI-VIII MW; 417E
 (2) II-IV WF; 417E
 22s VII-IX WTh; 417E
 23s (1) VII-IX TF; 417E (3) VI-VIII M, II-III T; 417E
 (2) II-IV WF; 417E
- 24f,w,s-25f,w,s-26f,w,s—Freehand Drawing. Drawing in charcoal and water color from still life, figure details, and the antique. 2 cred. per qtr.; prereq., 23; Messrs. Young and Doseff.
 24f,w-25f,w-26f,w II-IV TS; 417E 24s-25s-26s I-III TS; 417E
- 27f,w,s-28f,w,s-29f,w,s—Freehand Drawing. Drawing and painting from architectural detail, from the antique, and from life. 2 cred. per qtr.; prereq., 26. Mr. Burton.
 27f,w-28f,w-29f,w I-III MW; 417E (2) II-IV MW; 417E
 27s-28s-29s (1) I-III MW; 417E
- 68s—Time Studies from Life. Drawing from head life and the costumed figure, in any medium. 1 cred.; no prereq. Mr. Burton.
- 70f,w,s—Pictorial Composition. Study of the arrangement of the pictorial art of all ages. Original compositions in all mediums. 1 cred.; prereq., 26 or equiv.; VI-VIII T; 405E. Mr. Burton.
- 74f-75w-76s—Freehand Drawing. Similar to Courses 24, 25, and 26. For students in Interior Architecture. 3 cred. per qtr.; prereq., 23; III-IV M, II-IV TS; 417E. Mr. Young.

- 84f,w,s-85f,w,s-86f,w,s—Modeling. Elementary course in clay modeling. Ornament, heads, and animals from casts and from life. 2 cred. per qtr.; prereq., 23; VI-VIII MW; 405E. Mr. Burton.
- 87f,w,s-88f,w,s-89f,w,s—Advanced Modeling. 2 cred. per qtr.; prereq., 86. Mr. Burton.
87f,w-88f,w-89f,w VI-VIII MW; 405E 87s-88s-89s VII-IX MW; 405E
- 90f,w,s-91f,w,s-92f,w,s—Illustration. Design of illustration as applied to the printed page. Magazine illustration, posters and books. 1 cred. per qtr.; prereq., 29; VI-VIII T; 405E. Mr. Young.
- 93f,w,s-94f,w,s-95f,w,s—Hand Print Processes. Making and printing wood engravings, etchings, dry-points, and lithographs. 1 cred. per qtr.; prereq., 29; VI-VIII T; 405E. Mr. Burton.
- 121f,w,s-122f,w,s-123f,w,s—Freehand Drawing. Advanced life drawing, painting, or modeling and decoration. 2 cred. per qtr.; prereq., 29. Mr. Burton.
- 163s—History of Sculpture and Painting. Study of ancient Renaissance and modern sculpture, and of the Renaissance and modern schools of painting. 2 cred.; prereq., sr. standing; IV T, I F; 320E. Mr. Burton.
- 220f,w,s—Archeology. 3 cred. or less per qtr.; prereq., completion of undergraduate architectural history; hrs. ar. Mr. Arnal.
- 221f,w,s—Life Drawing and Figure Composition. 2 cred. per qtr.; prereq., completion of undergraduate freehand drawing; hrs. ar. Mr. Burton.

DESIGN

- 31f,w-32w,s-33s,su—Elements of Architecture. Architectural drawing, lettering, and wash rendering. Elements of architectural design; walls, doors, windows, colonnades, arcades, moldings, vaults, etc. Relation of building materials to design. 5 cred. per qtr.; no prereq. Messrs. R. T. Jones, Heath, and Havens.

31f	Lect. IV TS; 305E	
	Lab. (1) II-IV MWF; 309E	(3) VI-IX T, VI-VIII Th, II-III S; 309E
	(2) VI-VIII MWF; 309E	
31w	Lect. IV TS; 320E	Lab. II-IV MWF; 225E
32w	Lect. IV TS; 305E	
	Lab. (1) II-IV MWF; 309E	(3) VI-VIII TTh, I-III S; 309E
	(2) VI-VIII MWF; 309E	
32s	Lect. IV TS; 320E	
33s	Lect. IV TS; 305E	Lab. II-IV MWF; 225E
	Lab. (1) II-IV TS; 309E	(3) VII-IX TTh, I-III S; 309E
	(2) VI-VIII MWF; 309E	

- *34f,w,s-35f,w,s-36f,w,s—Architectural Design, Grade I. Long and short problems under individual criticism dealing in general with the elements of plan

* Work in all design courses is carried on simultaneously and students pass from one grade to the next in sequence in varying lengths of time according to their accomplishment and irrespective of university time units. The normal time required to complete the design courses is three years; some students require more time and some less. Advancement is based upon design "points" earned. For graduation, in addition to a passing grade in each quarter's work, the student must earn 192 points in Grade I, 336 points in Grade II, and 480 points in Grade III.

and elevation. Sketch problems dealing with composition. 4 cred. per qtr.; prereq., 33, 62. Messrs. Robertson and Deneen.

Arch. (f,w) VII-IX MF, VI-VIII TTh; 401E Arch.E. (f,w) II-IV MTS, II-III Th; 401E
(s) VI-VIII MWThF; 401E (s) I-IV T, I-III ThS, II-IV M;
401E

*37f,w,s-38f,w,s-39f,w,s—Architectural Design, Grade II. Long and short problems under individual criticism dealing with simple architectural composition. Sketch problems dealing with large composition or decorative detail. 7 cred. per qtr.; prereq., 36; VI-VIII; MWF, VI-IX TTh, I-IV S; 302E. Mr. R. C. Jones.

*131f,w,s-132f,w,s-133f,w,s—Architectural Design, Grade III. Long, short, and sketch problems under individual criticism dealing with more complex kinds of architectural composition, especially with subjects involving special character and a decorative and imaginative interest. 10 cred. per qtr. for 131 and 132, 9 cred. for 133; prereq., 39; III-IV F, VI-IX MTWThF, I-IV S; 317E. Mr. Arnal.

239f,w,s—Advanced Architectural Design. 10 cred. or less per qtr.; prereq., completion of undergraduate design; MTWThF VI-IX; S I-IV; 317E. Mr. Arnal.

CONSTRUCTION

44f-45w-46s—Building Construction. General study, of the principles, methods, and materials involved in the design of ordinary masonry and frame construction. 2 cred. per qtr.; prereq., 33. Mr. R. T. Jones.

44f I MW, IV F; 320E
45w I MWF; 320E
46s I MW, 320E; I F; 21E

47f-48w-49s—Building Construction (Arch. E.). Detailed study of the principles, methods, and materials involved in the design of all systems of light and heavy construction. 2 cred. for 47-48, 3 cred. for 49; prereq., 33. Mr. Deneen.

47f VI-VIII TTh; 225E
48w VI-VIII T, II-IV S; 225E
49s VI-VIII TW, I-III Th; 225E

51f-52w-53s—Building Construction (Int. Arch.). Non-technical study of the principles, methods, and materials of ordinary construction, particularly as related to domestic architecture and interior finish. 2 cred. per qtr.; prereq., 33; I TTh; 320E. Mr. R. T. Jones.

141f-142w-143s—Building Construction. Advanced study of the technology of building materials, soils, foundations, systems of framing, and fireproof and mill construction. 2 cred. per qtr.; prereq., C.E. 41 or M.&M. 26; II TTh; 320E. Mr. R. T. Jones.

240f,w,s. Technology of Building Materials. Prerequisite: Arch. 49 or Arch. 143. Three credits per quarter. Hours arranged. Mr. R. T. Jones.

* Work in all design courses is carried on simultaneously and students pass from one grade to the next in sequence in varying lengths of time according to their accomplishment and irrespective of university time units. The normal time required to complete the design courses in three years; some students require more time and some less. Advancement is based upon design "points" earned. For graduation, in addition to a passing grade in each quarter's work, the student must earn 192 points in Grade I, 336 points in Grade II, and 480 points in Grade III.

INTERIOR ARCHITECTURE

- 81f,w—Stage Design. Making of original models to solve stage problems in design. Form and color. For students interested in dramatics. 2 cred.; prereq., Sp. 41, 42, 43†; VI-VIII TTh; 405E. Mr. Burton.
- 82w—Advanced Stage Design. Original models and costumes for actual productions. 2 cred.; prereq., 81; VI-VIII TTh; 405E. Mr. Burton.
- *134f,w,s-135f,w,s-136f,w,s—Interior Design (Int. Arch.) Problems done under individual criticism dealing with the decorative treatment, furniture, and accessories of interiors. 7 cred. per qtr.; prereq., 36; VI-VIII WF, VI-IX MTTh, I-III S; 317E. Mr. Arnal.
- 161f—Decoration and Applied Arts. Historical and technical study of decoration, furniture, etc., together with discussion of the use of color. 2 cred.; prereq., 16, 26; II MW; 320E. Miss Hargrave.
- 182f-183w-184s—Furniture and Decoration (Int. Arch.). Historical and technical study of ornament, decoration, furniture, etc., together with discussion of the use of color in decoration. 3 cred. per qtr.; prereq., 16, 26. Miss Hargrave.
182f IV MWS; 320E
183w-184s IV MWS; 135E
- 243f,w,s—Advanced Interior Decoration Design. 10 cred. or less per qtr.; prereq., Arch. 136; hrs. ar. Mr. Arnal.

LANDSCAPE ARCHITECTURE

- 160f—History of Landscape Architecture. Study of landscape architecture in Italy, France, England, and America. 2 cred.; prereq., 16. Mr. Mann.
- 162w—Landscape Design. Theory and practice. Lecture and design problems. 2 cred.; prereq., 39; II MW; 320E. Mr. Nichols.
- 164s—Landscape Design. Particular attention to the relation of buildings to their sites and surroundings. 2 cred.; prereq., 162. Mr. Mann.

RELATED SUBJECTS

- 151f—Architectural Seminar. Literature of architecture, special topics, papers, and discussions. 1 cred.; prereq., sr. standing; I T; 206E. Mr. Mann.
- 152w—Estimating. Principles of the quantity survey; cost analysis. 1 cred.; prereq., sr. standing; I Th, 215E. Mr. Sault.
- 153s—Business Relations. Relations of the architect, owner and builder; professional ethics and practice; office administration. 2 cred.; prereq., sr. standing; II WF; 320E. Mr. Mann.

ART EDUCATION

- 20f-21w-22s—Principles of Harmony in Form and Color. Color theories of Munsell, Wilson, and Sargent discussed and exemplified, with analysis of color harmonies and original work therein. Applications of color harmonies in original designs throughout the year with reference to execution in handicraft and by commercial processes. 3 cred. per qtr.; prereq., 9 cred. in design or by permission; I-II MWF; 207OPh. Mr. Hilpert.

ASTRONOMY

- Ast. 51f,w,s—General Astronomy. Survey of the general principles and fundamental facts of astronomy, illustrated by laboratory apparatus, lantern slides,

* See (*) footnote on page 61.

† May be taken at the same time.

simple problems, naked eye and telescopic observations. 3 cred.; prereq., 15 cred. chosen from any of the following departments: Botany, Chemistry, Geology, Mathematics, Physics, Zoology. Mr. Beal.

51f (1) II MWF; 124F (2) IV MWF; 124F
 51w IV MWF; 124F
 51s I MWF; 124F

BOTANY

1f,w,s—General Botany. Structure, physiology, life histories, and evolution of plants. Lectures and quizzes. 4 cred.; no prereq. Mr. Huff.

1f Lect. Bot. Aud. (1) III TThS (2) VI T, VI-VII Th
 Quiz Bot. Aud. (1) I M (4) V T
 (2) II T (5) VI M
 (3) III W (6) VII T
 1w,s Lect. III TThS, Bot. Aud.
 Quiz Bot. Aud. (1) I T (3) III W
 (2) II T

7f,s—Taxonomy of Flowering Plants. A general study of the classification and relationship of flowering plants. 3 cred.; prereq., 1. Mr. Rosendahl.

7f I-II MWF; 1, 4, 5, 8 Bot.
 7s (1) I-II MWF; 1, 4, 5, 8 Bot. (2) VI-VIII TTh; 1, 4, 5, 8 Bot.

21f,w,s—Elementary Ecology. An introductory course in the study of plants in relation to their environment. 3 cred.; prereq., 1. Mr. Cooper.

21f III-IV MWF; 1, 4, 5, 8 Bot.
 21w,s VI-VIII TTh; 1, 4, 5, 8 Bot.

INORGANIC CHEMISTRY

1f-2w-3s—General Inorganic Chemistry. 1. Study of general laws of chemistry and of the non-metals and their compounds. 2. Continuation of Course 1. 3. Metals and their compounds. Continuation of Course 2. 4 cred. per qtr.; no prereq. Messrs. Reyerson and Pervier.

(1) (Pre-med., pre-dent.)
 Lect. VI MWF; 225C
 Quiz (a) VIII Th; ar C Lab. (a) VI-VIII T; 290C
 (b) VIII T; ar C (b) VI-VIII Th; 290C
 (2) (Agr., jr. arch. engr.) fall, winter
 Lect. VII MWF; 100C Lab. VIII-IX MW; 110C
 (2) (Agr., jr. arch. engr.) spring
 Lect. VII MF, IV S; 225C Lab. VIII-IX MF; 110C

4f-5w—General Inorganic Chemistry. Study of the general laws of chemistry and of the non-metals and their compounds. More intensive than Course 1f-2w-3s. 4 cred. per qtr.; prereq., high school chemistry. Messrs. Stephens and Heisig.

4f Engineers
 Lect. (1) VIII M, I ThS; 100C Lab. (1) III-V T; 110C
 (2) IV T, 225C, VI Th, IV S; 100C (2) II-IV M; 110C
 (3) IV T, 225C, VI Th, IV S; 100C (3) VII-IX F; 110C
 (4) VIII M, I ThS; 100C (4) I-III W; 110C
 Quiz IX Th; 100C
 Pre-med., pre-dent.
 Lect. (5) II TThS; 225C Lab. (5) VI-VIII T; 210C
 (6) VI MWF; 100C (6) VI-VIII Th; 210C
 Quiz VIII Th; ar C or VIII T; ar C

- 5w Engineers
 Lect. (1) I TThS; 100C
 (2) IV T, 225C, VI Th, IV S; 100C
 (3) I TThS; 100C
 Quiz VIII M; 100C
 Pre-med., pre-dent.
 Lect. (4) II TThS; 225C
 (5) VI MWF; 100C
 Quiz VIII Th; ar C or
- Lab. (1) III-V T; 110C
 (2) II-IV M; 110C
 (3), I-III W; 110C
 (4) VI-VIII T; 210C
 (5) VI-VIII Th; 210C
 VIII T; ar C
- 6f-7w-8s—General Inorganic Chemistry. 6. Includes a study of general laws of chemistry and of non-metals and their compounds. 7. Continuation of Course 6. 8. Study of metals and their compounds. 5 cred. per qtr.; no prereq. Miss Cohen.
 Lect. II MWF; 225C
 Lab. I-III ThS; 210C
- 9f,w-10w,s—General Inorganic Chemistry. Course 9. A study of general laws of chemistry and of non-metals and their compounds. More intensive than Courses 6 and 7. Course 10. The metals and their compounds. 5 cred. per qtr.; prereq., one year of high school chemistry. Messrs. Sneed and Reyerson, and Miss Cohen.
 9f-10w (1) (Agr.) Lect. VII MWF; 225C
 (2) (Chem. S. L. A.) II MWF; 100C
 9w-10s Lect. (1) III MWF; 225C
 Lab. (1) (Engrs.) V-VI MWF; 290C
- Lab. VIII-IX MWF; 210C
 I-III ThS; 290C
 (2) III MWF; 100C
 (2) (Others) VIII-IX MWF; 290C
- 11f,s—Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solutions, ionization, chemical and physical equilibria, oxidation and reduction, etc. 4 cred.; prereq., 3 or 5. Miss Cohen, Mr. Stephens.
 11f Lect. IV MWF; 225C
 Lab. (1) VI-VII MW; 210C
 (2) (limit 30) VI-IX M; 210C
 (3) (limit 30) VI-IX W; 290C
 11s Lect. (1) II TThS; 325C
 Lab. (1) VI-IX T; 210C
 (2) VI MWF; 100C
 (2) VI-IX Th; 210C
- 12f,s-13f,w—Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solutions, ionization, chemical and physical equilibria, oxidation and reduction, etc. 5 cred. per qtr.; prereq., 8 or 10. Messrs. Sneed, Heisig, and Maynard.
 12f Lect. I TThS; 325C
 12s Lect. II MWF; 100C
 13f Lect. VI WF; 410C
 13w Lect. VI WF; 115C
- Lab. VI-VIII MW; 290C
 Lab. I-III ThS; 290C
 Lab. VII-IX WF, VI-VIII M; 290C
 Lab. VII-IX MWF; 290C
- 14f-15w—General Inorganic Chemistry. (Engineers, miners, pharmacists, and physical education.) 14. Includes a study of the general laws of chemistry and of the non-metals, the metals, and their compounds. 15. Continuation of Course 14. 5 cred. per qtr.; no prereq. Messrs. Barber and Maynard.
 Engineers
 Lect. II TThS; 100C
 Lab. (1) VI-IX T, VI-VII Th; 110C
 (2) II-IV M, I-III W; 110C
 Quiz VIII F; 100C
 Miners
 Lect. II TThS; 100C
 Lab. VII-IX T, VI-VIII Th; 110C
 Pharm., phys. ed.
 Lect. I MWF; 325C
 Lab. VI-VIII TTh; 290C

16s—Qualitative Chemical Analysis. (Engineers, miners, and pharmacists.) Laboratory work in systematic qualitative analysis with lectures on solutions, ionization, chemical and physical equilibria, oxidation and reduction, and other subjects pertinent to qualitative analysis. 5 cred.; prereq., 5 or 15. Messrs. Barber, Heisig, and Maynard.

Engineers who entered with h.s. chemistry

Lect. (1) II TThS; 100C

(2) IV T, 225C, VI Th, IV S; 100C

(3) I TThS; 100C

Lab. (1) VII-IX M, III-V T; 110C

(2) II-IV M, VII-IX F, 110C

(3) I-II WF; 110C

Engineers who entered without h.s. chemistry

Lect. (4) II TThS; 100C

(5) II TThS; 100C

Lab. (4) I-III WF; 110C

(5) VII-IX WTh; 110C

Miners

Lect. II TThS; 100C

Lab. VI-VII Th, VI-IX F; 110C

Pharmacists

Lect. I MWF; 325C

Lab. VI-VIII TTh; 290C

17s—Glassblowing. Exercises in the more important operations in building chemical apparatus. 1 cred.; no prereq. Mr. Stephens.

51f,w,s—Junior Review Examination in General Inorganic Chemistry. Required of juniors in the School of Chemistry. Prereq., Anal. Chem. 1, 2. Mr. Sneed.

52f,w,s—Junior Review Examination in Qualitative Analysis. Required of juniors in the School of Chemistry. Prereq., Anal. Chem. 1, 2. Mr. Sneed.

96f-97w-98s—Senior Thesis. Open to seniors. 5 cred. per qtr.

101s—History of Chemistry. Historical development of the theories of chemistry from the period of the ancients to the present time is covered by this course, particular emphasis being given to modern theories and laws. 2 cred.; prereq., Org. Chem. 52. Miss Cohen.

102w—Advanced Qualitative Analysis. This course includes an analysis of minerals, alloys, paints, and the methods of detecting some of the rarer elements. 2 or 3 cred.; prereq., Anal. Chem. 1, 2; ar; 290C. Mr. Sneed.

103f-104w-105s—Advanced Inorganic Chemistry. Discussion of the periodic system and the chemistry of the elements and their compounds and of special subjects of inorganic chemistry such as valency, oxidation and reduction, complex ions, etc. 3 cred. per qtr.; prereq., Anal. Chem. 1, 2; Org. Chem. 52; IV MWF; 111C. Mr. Sneed.

106f-107w-108s—Chemistry of the Rare Elements. History, occurrence, preparation, and properties of the less usual elements and their compounds. Use of the microscope and the spectroscope in following the course of the purification. 3 cred. per qtr.; prereq., Anal. Chem. 1 or 2, or by permission. Mr. Glockler.

301f-302w-303s—Research in Inorganic Chemistry. Credits to be arranged. Messrs. Sneed and Reyerson.

ANALYTICAL CHEMISTRY

1w-2s—Quantitative Analysis. Introductory courses covering the general principles and methods of quantitative analysis. Typical problems are assigned and attention given to proper laboratory practice. Course 1, Gravimetric

Analysis. Course 2, Volumetric Analysis. 5 cred. per qtr.; prereq., Inorg. Chem. 13. Mr. Geiger.

Lect. VI M; 325C

Quiz VI W; 410C

Rec. (1) VII W; 315C

(2) VI F; 315C

Lab. (1) VII-IX M, VIII-IX W,
VI-IX F; 310C

(2) VIII-IX MWF; 310C

7f,w,s—Quantitative Analysis. (Pre-med.) Introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention is given to proper laboratory practice. 4 cred.; prereq., Inorg. Chem. 11 or 13. Messrs. Geiger and Sarver.

7f Lect. (1, 2) VI M; 325C

(3) VII T; 325C

Rec. (1) (limit 35) VI W; 315C

(3) VI Th; 325C

(2) (limit 35) VI F; 315C

Lab. (1) VII-IX MW, VI-VII F; 310C

(3) VIII-IX T, VII-IX Th,

(2) VII-IX MF, VI-VII W; 310C

I-III or II-IV S; 310C

7w,s Lect. VII T; 325C

Rec. VI Th; 325C

Lab. VIII-IX T, VII-IX Th, I-III or II-IV S; 310C

9w—Quantitative Analysis. (Dentists, engineers, miners.) Short introductory course covering general principles of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention given to proper laboratory practice. 3 cred.; prereq., Inorg. Chem. 11 or 16. Mr. Geiger.

Lect. VI T; 325C

Lab. VII-IX T, VI-IX Th; 310C

53f,w,s—Junior Review Examination in Quantitative Analysis. Required of juniors in the School of Chemistry. Prereq., 1, 2. Mr. Geiger.

96f-97w-98s—Senior Thesis. Open to seniors. 5 cred. per qtr.

101w-102s—Quantitative Analysis. Discussion of the general principles, methods, and procedure of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention is given to proper laboratory practice. 5 cred. per qtr.; prereq., Inorg. Chem. 13. VI-IX MWF; C. Mr. Geiger.

123f-124w-125s—Advanced Analytical Chemistry. Systematic survey by general lectures with typical procedures selected for laboratory practice. Drill in application of modern chemical theory to analytical problems. Sanitary analysis of water is included in spring quarter. 1 lect., 7 lab. hrs. per week; 3 cred.; prereq., 1, 2, or 7. Mr. Sarver.

Lect. VI T; 315C

Lab. VII-IX T, VI-IX Th; 310C

131f—Applications of Indicators in Neutralization Reactions and of p_h Determinations. 3 cred.; prereq., 1 and 2 and Physical Chemistry 103. Mr. Kolthoff.

132w-133s—Electrometric Measurements and Titrations. Application of potentiometric and conductometric methods in analytical work. 3 cred.; prereq., 1 and 2 and Physical Chemistry 103. Mr. Kolthoff.

134f,w,s—Seminar: Modern Problems in Analytical Chemistry. 1 cred.; prereq., 1 and 2, and Physical Chemistry 103. Mr. Kolthoff.

301f-302w-303s—Research in Quantitative Analysis. Cred. ar. Messrs. Kolthoff, Geiger, and Sarver.

ORGANIC CHEMISTRY

1f,w,s-2f,w,s—Elementary Organic Chemistry. (Pre-med., pre-dent., pharmacists.)

Discussion of the important classes of organic compounds, both aliphatic and aromatic. Laboratory work includes the preparation of typical substances. 4 cred. per qtr.; prereq., Inorg. Chem. 11. Messrs. Lauer and Smith.

1f,s-2w Lect. I MWF; 100C

Lab. Conference II Th; 225C

Quiz I Th; ar C

Lab. (1) I-IV T; 390C

(3) VI-IX T; 390C

(2) VI-IX M; 390C

(4) VI-IX W; 390C

1w-2f,s Lect. IV MWF; 100C

Lab. Conference IV T; 100C

Quiz V T; ar C

Lab. (1) VI-IX W; 390C

(3) VI-IX F; 390C

(2) VI-IX Th; 390C

(4) I-IV S; 390C

51f-52w-53s—Organic Chemistry. Introduction to the chemistry of carbon compounds. Laboratory work will include the preparation of characteristic substances. 5 cred. per qtr.; prereq., 15 cred. in chemistry. Messrs. Hunter and Lauer.

Lect. III MWF; 325C

Rec. (1) (Chem.) IV T; 111C

(2) (others) III Th; 111C

Lab. (1) (f,w) (Chem.) I-III TTh; 390C

(1) (s) (Chem.) VI-VIII TTh; 390C

(2) (others) VI-VIII TTh; 390C

96f-97w-98s—Senior Thesis. Open to seniors. 5 cred. per qtr.

101f-102w-103s—Advanced Organic Chemistry. An introduction to the literature of organic chemistry. Structure, reaction, mechanism, and relation of physical properties to constitution. May be accompanied by appropriate laboratory work in Organic Chemistry 137, 139. 3 cred. per qtr.; prereq., 53; III TThS; 325C. Mr. Hunter.

111f—Reagents in Organic Chemistry. Discussion of typical reagents used in organic reactions: their limits of applicability, methods of use, and types of substances with which they react. May be accompanied by appropriate laboratory work in Organic Chemistry 137. 3 cred.; prereq., 53; II MWF; 325C. Mr. Smith.

113s—The Aliphatic Compounds. Advanced descriptive course, with special emphasis upon the compounds having more than one functional group. May be accompanied by appropriate laboratory work in Organic Chemistry 139. 3 cred.; prereq., 53; II MWF; 315C. Mr. Smith.

115s—The Heterocyclic Compounds. A discussion of the nomenclature, preparation, properties, and uses of the typical heterocyclic systems. May be accompanied by appropriate laboratory work in 139. 3 cred.; prereq., 53. (Not offered in 1929-30.) Mr. Smith.

116f—The Cycloparaffins and Their Derivatives. A study of the chemistry of the cycloparaffins and their oxygen derivatives, together with their unsaturated analogs. In the terpene series, attention is also given to related open chain compounds and to the polyterpenes, particularly rubber. 3 cred.; prereq., 53. Mr. Stephens.

122w—The Aromatic Compounds. Chemistry of the aromatic compounds with special reference to dye intermediates and synthetic drugs. 3 cred.; prereq., 53. Mr. Lauer.

- 123s—Dyes. Study of the important classes of dyes from the viewpoint of the organic chemist. 3 cred.; prereq., 53. II TThS; 111C. Mr. Lauer.
- 137f—Advanced Organic Chemistry Laboratory Work. Difficult preparations and problems. It is intended primarily to supplement the student's knowledge of the methods of organic chemistry. 2 to 5 cred.; prereq., 53. Mr. Lauer.
- 139f,w,s—Advanced Organic Chemistry Laboratory Work. Selected laboratory problems of an advanced nature, including some original work. An introduction to research work. These advanced laboratory courses may be taken under any member of the Division of Organic Chemistry. Students may also register for this course who desire appropriate laboratory work for other advanced courses. 2 to 5 cred.; prereq., 53. Mr. Hunter.
- 201f-202w-203s—Organic Chemistry Seminar. 1 hr. per week. 1 cred. Open only to students taking research in organic chemistry. Mr. Hunter.
- 301f-302w-303s—Research in Organic Chemistry. Cred. ar. Messrs. Hunter, Smith, and Lauer.

PHYSICAL CHEMISTRY

- 96f-97w-98s—Senior Thesis. Open to seniors. 5 cred. per qtr.
- 101f-102w-103s—Physical Chemistry. A general survey of the subject. 3 lect. and 1 rec.; lab. work 3 or 6 hrs. per week; 3, 4, or 5 cred., depending on the amount of lab. work; prereq., two years' college chemistry, one year college physics. Messrs. MacDougall and Livingston.
- Lect. IV MWF; 325C
 Rec. (1) (Chem.) IV S; 111C (2) (others) IV S; 115C
 Lab. (1) (Chem.) VI-VIII MW; 15, 117C (2) (others) VI-VIII F; 15, 117C
- 105w—Application of Higher Mathematics to Chemical Problems. 3 lect.; 3 cred.; prereq., integral calculus. Mr. MacDougall.
- 110f,w—Physical Chemistry. (Designed chiefly for medical and biological students.) 4 cred. per qtr.; prereq., Org. Chem. 2. Mr. Villars.
 Lect. VI TTh, 225C, VI F; 325C
 Lab. (1) I-III MW; 15C (2) VII-IX TTh; 117C
- 116f-117w-118s—Advanced Physical Chemistry. 3 lect. and 1 rec.; lab. work for one 3-hour period may be taken if desired; 3 cred. per qtr. or 4 with lab.; prereq., 103 and calculus. Mr. Villars.
- 129s—Principles of Colloidal Chemistry. 2 cred.; prereq., 101. (Not offered in 1929-30.)
- 130s—Application of Colloidal Chemistry. 2 cred.; prereq., 101. Mr. Reyerson.
- 131f-132w-133s—Colloidal Chemistry Laboratory. Cred. and hrs. ar. Must be preceded or accompanied by 129 or 130. Mr. Reyerson.
- 144s—Magnetochemistry. Course in atomic structure dealing specially with the magnetic properties of substances. Lectures, discussions, and reports. 3 cred.; prereq., 103. (Not offered in 1929-30.)
- 161f-162w—Radioactivity. Discovery; theory of atomic disintegration; properties, transformations, and preparation of radioactive elements; properties and effects of alpha, beta, and gamma rays; radioactive and non-radioactive isotopes. 2 cred. per qtr.; prereq., 103. Mr. Lind.
- 164f,w,s—Radioactivity Laboratory. Use and standardization of electroscopes, radioactive measurements, and quantitative determination of radium in ores.

- minerals, waters, and plant products. 1 or 2 cred. Must be preceded or accompanied by 161. Mr. Lind.
- 175s—Photochemistry. History, development, and present status of photochemistry. 3 cred.; prereq., optics and 103. Mr. Lind.
- 201f-202w-203s—Thermodynamics and Chemistry. A detailed study of the principles of thermodynamics and their application to physical and chemical phenomena. 4 cred. per qtr.; prereq., 103 and calculus. II TThS; 115C. Mr. MacDougall.
- 204f-205w-206s—Kinetic Theory and Atomistics. Kinetic theory of gases and liquids, crystal structure, structure of atom, quantum theory. 4 cred. per qtr.; prereq., 103 and calculus. (Not offered in 1929-30.)
- 211f-212w-213s—Advanced Physical Chemistry Laboratory. To accompany or follow any of the advanced courses in physical chemistry. Cred. ar.; prereq., 103. Mr. MacDougall.
- 251f-252w-253s—Physical Chemistry Seminar. 1 hr. a week. For students taking advanced courses in physical chemistry. 1 cred. per qtr. Mr. MacDougall.
- 271f-272w-273s—Chemical Activation. (Seminar 1 hour per week for graduate students). Current theories of chemical activation, including photochemical excitation, gaseous ionization, and the kinetics of cluster and of chain reactions. 1 cred. per qtr.; prereq., physics and physical chemistry. Mr. Lind.
- 301f-302w-303s—Research in Physical Chemistry, Including Work in Electrochemistry, Photo- and Radio-Chemistry, and Colloids. Cred. ar. Messrs. Lind, MacDougall, Reyerson, and Villars.

TECHNOLOGICAL CHEMISTRY

- 1f,w,s—Power Plant Chemistry. (M.E.) Proximate analysis of coal, determination of calorific power; technical analysis of flue gases and furnace gases. 3 cred.; prereq., Inorg. Chem. 16. Mr. Harding.
- 1f Lect. II T; 215C
Rec. II T; 215C
Lab. (1) I-III MF; 10C (2) I-III W, II-IV S; 10C
- 1w Lect. VI T; 115C
Rec. VI Th; 115C
Lab. (1) II-IV MF; 10C (2) II-IV TS; 10C
- 1s Lect. I M; 115C
Rec. I F; 115C
Lab. II-IV MF; 10C
- 2w,s—Boiler Water. (M.E.) 2 or 3 cred.; prereq., 1. Mr. Harding.
- 2w Lect. I T; 215C
Lab. VI-IX TTh; 10C
- 2s Lect. IV M; 215C
Lab. ar
- 96f-97w-98s—Senior Thesis. Open to seniors. 5 cred. per qtr.
- 100f-101w-102s—Food Analysis. Course including the chemical analysis of the various food materials and food products and the detection of food adulterations. Course in methods of analysis. 3 cred. per qtr.; prereq., Anal. Chem. 1, 2. Mr. Stoppel.
- Lect. III F; 215C Lab. VI-VIII TF; 217C
- 103w—Exact Gas Analysis. 1 or 2 cred.; prereq., Anal. Chem. 1, 2. Mr. Harding.

- 104s—Microchemistry. Precipitation, examination, and identification of minute quantities of substances and the examination of food materials, fibers, etc., by means of the microscope. 1 or 2 cred.; prereq., Anal. Chem. 1, 2. Mr. Harding.
- 105f—Gas and Fuel Analysis. The chemical analysis of solid and gaseous fuels with a determination of their calorific value and methods of testing municipal gas. 3 cred.; prereq., Anal. Chem. 1, 2. Messrs. Harding and Stoppel.
Lect. I S; 215C
Rec. (1) II S; 215C (2) IV M; 215C
Lab. (1) I-III TTh; 10C (2) VII-IX TTh; 10C
- 106w—Petroleum and Petroleum Products. Examination and testing of petroleum products, principally gasoline, illuminating and lubricating oils. 3 cred.; prereq., Anal. Chem. 1, 2. Messrs. Harding and Stoppel.
Lect. I S; 215C
Rec. (1) II S; 215C (2) I W; 215C
Lab. (1) I-III TTh; 10C (2) VI-VIII TTh; 10C
- 107f,w,s—General Technical Analysis. Includes a large range of topics, textiles and paper, paint and varnishes, asphalt and tars, boiler waters, soaps, edible oils and fats, and various other food materials and food products. 1, 2, or 3 cred.; prereq., Anal. Chem. 1, 2. Mr. Harding.
- 301f-302w-303s—Research Work in Technological Chemistry. Cred. ar. Mr. Harding.

CHEMICAL ENGINEERING

- 31f—Chemistry of Engineering Materials. Application of general chemistry to engineering practice. Consideration of the chemistry and properties of wood, iron and steel, alloys, fuels, water, cements, paints, bitumens, etc. Lectures and recitations. 3 cred.; prereq., Inorg. Chem. 16. For engineers. IV MWF; 115C. Mr. Montonna.
- 41s—Gas Manufacture and Distribution. Fundamental principles of manufacture of coal gas, carbureted water gas, and other industrial fuel gases, and the apparatus for manufacture and distribution. Open to sophomores in the College of Engineering who have completed one year of chemistry. Lectures and recitations. 3 cred.
- 76f-77w—Applied Electrochemistry. Application of the electric current to chemical processes. Laws and phenomena of electrochemistry, batteries, electroplating, electric furnace construction and operation, and electrochemical products. Open to engineers. Class and laboratory work. 3 cred. Mr. Ruth.
- 96f-97w-98s—Senior Thesis. Open to seniors. 5 cred. per qtr.
- 101s—Unit Processes. Principles and materials of construction, operation, and uses of machinery for the unit processes. Lectures and recitations. Laboratory work in operating and testing. Visits to chemical plants. 4 cred.; prereq., Anal. Chem. 1, 2, Org. Chem. 52. Messrs. Montonna and Ruth.
Lab. (1) VII-IX M; 90C (3) I-III S; 90C
(2) VII-IX W; 90C (4) ar; 90C
- 102f—Unit Process Problems. Problems in combustion, furnaces, and kilns, the application of industrial heating and cooling devices, the study of crystallization on a commercial scale. 2 cred.; prereq., 101; II WF; 325C. Mr. Mann.

- 103w—Unit Process Problems. Problems in heat transfer, the use and design of heat exchangers, single and multiple effect evaporators, the applications of the laws of fluid flow, filtration, filter presses, and centrifugals. 2 cred.; prereq., 101; II WF; 325C. Mr. Mann.
- 104s—Unit Process Problems. Problems in leaching and dissolving, counter-current extraction, gas absorption, and distillation. Drying by air, steam, and direct heat dryers. 2 cred.; prereq., 101; II WF; 325C. Mr. Mann.
- 111f-112w-113s—Design of Chemical Equipment and Plants. Laying out of plants and design of equipment based on collected data for the same. Classroom and laboratory work. 2 cred. per qtr.; prereq., 131, 132.
- 131f—Industrial Inorganic Chemistry. Operations common to chemical industries, chemistry involved, apparatus used, marketing of products, utilization of by-products, use of trade journals. Topics: acids and alkalies, salts, chlorine, ammonia, glass, pigments, etc. Lectures and recitations. 4 cred.; prereq., 101; I MTWThF; 225C. Messrs. Mann and Montonna.
- 132w—Industrial Organic Chemistry. Similar to 131 but covering organic field. Destructive distillation of coal and wood, petroleum oils, paper, unit organic processes, vegetable and animal oils, fats, waxes, soap, sugar, starch, etc. Lectures and recitations. 4 cred.; prereq., 101; I MTWThF; 225C. Messrs. Mann and Montonna.
- 133f—Chemistry of Explosives. History and development of modern explosives, their manufacture and uses. Lectures, required reading, and reports. 4 cred.; prereq., 132; IV TS; ar. Th. Mr. Montonna.
- 134s—Intermediates and Dyestuffs. Their technical chemistry and manufacture. Processes, purification, uses, etc. Lectures and recitations. 3 cred.; prereq., 132 or equiv. (May be accompanied by laboratory work in 160); I MWF; 111C. Mr. Montonna.
- 136w—Chemistry and Technology of Cellulose. Discussions on processes and industries based on the use of cellulosic materials including the chemical and technological considerations. Pulp and paper, plastics, esters, artificial silks, etc. Lectures and recitations. 3 cred.; prereq., Org. Chem. 52 or equiv.; IV TS, ar. Th; 215C. Mr. Montonna.
- 141s—Gas Manufacture and Distribution. Fundamental principles of manufacture of coal gas, carbureted water gas, and other industrial fuel gases, and the apparatus for manufacture and distribution. Open to chemists and chemical engineers. 3 cred.; prereq., Org. Chem. 52.
- 151f,su—Chemical Manufacture (Inorganic). Manufacture of technical products on a scale large enough to afford data for the determination of costs of manufacture. Use of semiplant scale equipment. Technical trade journals used. Laboratory. 3 or more cred.; prereq., 101. Mr. Montonna.
- 152w,su—Chemical Manufacture (Organic). Similar to 151 but covering the organic field. Laboratory. 3 or more cred.; prereq., 101. Mr. Montonna.
- 153f-154w-155s-156su—Special Laboratory Problems. Laboratory investigations on equipment and the manufacture of special chemical products on a large scale. 3 or more cred.; prereq., 151, 152. Messrs. Mann and Montonna.
- 160s—Intermediates and Dyestuffs Laboratory. Manufacture of intermediates and dyestuffs on a large scale using semi-works equipment. Operations on

sulphonation, hydroxylation, nitration, reduction, alkylation, diazotization, coupling, etc. Laboratory. 3 or more cred.; prereq., 132 or ar. Mr. Montonna.

176f-177w—Applied Electrochemistry. Application of the electric current to chemical processes. Laws and phenomena of electrochemistry, batteries, electroplating, electric furnace construction and operation, and electrochemical products. Class and laboratory work. 4 cred. per qtr.; prereq., Phys. Chem. 103.

Lect. I MWF; 115C

Lab. VI-VIII W or Th; 25C

179s—Advanced Applied Electrochemistry. More recent development in the manufacture of inorganic and organic products. Lectures and recitations. Laboratory optional. 3 cred.; prereq., 176-177. Mr. Mann.

187s—Inspection Trip. Various industrial plants in the middle west are visited by the class on a trip which lasts about ten days, during the spring vacation period. Written reports covering the plants must be submitted. Required of seniors in Chemical Engineering. 2 cred.; prereq., 131, 132. Mr. Mann.

201f-202w-203s—Seminar. Presentation and discussion of papers concerning the newer developments in chemical industries. 1 cred. per qtr. Messrs. Mann and Montonna.

301f-302w-303s—Research in Chemical Engineering. Unit processes, applied electrochemistry and electric furnace work, and chemical manufacture. Cred. ar. Messrs. Mann and Montonna.

CIVIL ENGINEERING

SURVEYING

11f—Surveying. Field problems; use of chain, compass, transit, and level. Computation and platting of field surveys. Determination of areas. 3 cred.; prereq., M.&M. 12, Dr. 2 or Arch. 23. Mr. Boon.

Lect. (1) III Th; 107E

(2) I T; 21E

Lab. (1) II-IV T, VI-IX Th; 1E

(3) VI-VIII W, VI-IX F; 1E

(2) VI-IX T, II-IV S; 1E

12w—Surveying. Lectures and drawing room. Platting of maps, profiles, and cross sections. Computation of earthwork. Public land surveys. Conventional signs. 3 cred.; prereq., 11. Messrs. Cutler, Boon, and Zelner.

Lect. (1) III Th; 107E

(2) III W; 206E

Lab. (1) II-IV T, VI-IX Th; 217E

(3) VI-IX W, VI-VIII F; 217E

(2) VII-IX M, VI-IX T; 217E

13s—Surveying. Adjustments of instruments, profile and differential leveling, transit surveys, circular curves. 3 cred.; prereq., 12. Messrs. Cutler and Boon.

Lect. (1) II Th; 21E

(2) III Th; 21E

Lab. (1) I-IV T, 217 E; VI-IX F; 21E

(3) VI-IX W, 101E; VI-VIII Th; 217E

(2) VII-IX W, I-IV S; 217E

14f—Surveying. Complete topographical survey, stadia method, is made and plotted. 3 cred.; prereq., 13. Mr. Zelner.

(1) VI-IX TW; 229E

(3) VI-IX M, I-IV T; 229E

(2) VI-IX F, I-IV S; 229E

15w—Surveying. Classroom. Purpose and theory of triangulation, meridian determination, methods of angular measurement, base line measurements. Pre-

- cise, trigonometric, and barometric leveling. Theory and use of sextant. 2 cred.; prereq., 14. Mr. Zelner.
 (1) VI-VII W, II-III Th; 21E (2) II-III MF; 21E
- 16s—Surveying. Classroom and field. Hydrographic surveying. Soundings, purpose, methods, location. Measurement of stream flow. Use of sextant. Triangulation. Plane table surveys. Preparation for summer camp. 2 cred.; prereq., 15. Mr. Zelner.
 (1) III-IV T, VI-IX M; 229E (2) I-II F, I-IV S; 229E
- 17s—Surveying (Aero. E.) Short course in the use, care, and adjustment of surveying instruments, including leveling, transit and topographic surveys. 3 cred.; prereq., M.&M. 12, Dr. 2. Mr. Boon.
 Lect. II S; 21E
 Lab. (1) II-IV T, I-IV W; 1E (2) I-IV M, II-IV F; 1E
- 18s—Surveying. Short course in the use, care, and adjustment of surveying instruments. Leveling and transit surveys. Open to juniors and senior engineers. 3 cred.; VI-IX TTh; 7E. Messrs. Cutler and Zelner.
- 19s—Surveying. Short course in the use, care, and adjustment of surveying instruments. Leveling, transit and stadia surveys, triangulation, plane table. Reduction of notes, mapping. Arranged especially for students in geology. 1 lect., 7 hrs. in field per week. 3 cred.; prereq., Math. 6; VI-IX WF; 7E. Mr. Zelner.
- 23su—Summer Camp. Six weeks immediately preceding the beginning of the senior year. Extended railroad, topographic, hydrographic, and triangulation surveys. 9 cred.; prereq., 16, 22. Fee, \$25. Messrs. Cutler, Zelner, and Boon.

RAILWAY ENGINEERING

- 21w—Railway Engineering. General survey of the problems of railway location, including grades, curvature, rise and fall, etc. 2 cred.; prereq., 14. Mr. Boon.
 Lect. I Th; 205E
 Lab. (1) VI-IX F; 229E (3) I-IV S; 217E
 (2) I-IV T; 227E
- 22s—Railway Engineering. Study of the construction and maintenance of railway track and structures. Simple, compound, and spiral curves, and turnouts. 2 cred.; prereq., 21. Messrs. Cutler and Boon.
 Lect. VI T; 21E
 Lab. (1) VI-IX F; 229E (2) VI-IX M; 217E
- 121f—Railway Engineering. Train resistance, ruling and momentum grades, curvature, distance, rise and fall as factors in location and operation of railroads. Train loading, acceleration, retardation; locomotives and equipment. Operating costs governing grade revision. 3 cred.; prereq., 23. Mr. Cutler.
 Lect. III F; 206E
 Lab. (1) II-IV W, VI-VIII Th; 229E (2) VI-VIII M; 217E
- 122w—Railway Engineering. Lectures, office work, and field inspection. Design and operation of various types of yards and terminals, and terminal facilities, including the hump, engine house, coal and water station. Signalling and interlocking. 3 cred.; prereq., 23. Mr. Cutler.
- 123s—Railway Engineering. Design and construction of railroad buildings and structures; culverts, wooden trestles, switches, cross-overs, crossing frogs, etc.

- Earthwork, computation, estimates and reports. Distribution of material by mass diagram. 3 cred.; prereq., 23. Mr. Cutler.
- 124w—Transportation. Development of railway and inland waterway transport, railway regulation and control with special reference to the 1920 Railway Transportation Act, geographical, financial, and rate of grouping of railways, Interstate Commerce Commission method of accounting, cost and value of service, present systems, and organization. 3 cred.; prereq., 121; IV MW, II S; 22E. Mr. Cutler.
- 125s—Transportation. Specific illustrative problems: Twin City and Mississippi Valley traffic situation, Mississippi River experiment, New York Barge Canal, Great Lakes traffic, Panama Canal status. Rapid transit, motor transport. 3 cred.; prereq., 121. Mr. Cutler.
- 221f-222w-223s—Railway Administration. Analysis of railway organization and methods of management and operation. Principles of valuation and rate making. 3 cred. per qtr.; prereq., 122. Mr. Cutler.
- 224f—Railway Terminals and Yards. Continuation of Course 123. 3 cred.; prereq., 122. Mr. Cutler.

STRUCTURAL ENGINEERING

- 31f—Stresses in Structures. Algebraic and graphic analysis of various types of roof and bridge trusses for fixed loading. 2 cred.; prereq., M.&M. 26, Dr. 23. Messrs. Parcel and Wise.
Lect. (1) Th; 7E (2) III Th; 7E
Lab. (1) VIII-IX Th; 201E (3) VIII-IX F; 217E
(2) I-II S; 201E
- 32w—Stresses in Structures. Moving loads and influence lines. Standard engine loadings and equivalent uniform loads. Laboratory tests of structural members. 3 cred.; prereq., 31, M.&M. 128. Messrs. Parcel, Hughes, and Wise.
Lect. III W; 21E
Lab. (1) VI-VII T; 229E; I-II S; Ex (2) VI-VII M; 229E; VII-VIII Th; Ex
- 33s—Elementary Structural Design. Designing principles and methods. Complete design and detail drawing of framed mill building bent and railway plate girders. Laboratory tests of structural members and connections. 4 cred.; prereq., 32. Mr. Parcel.
Lect. VI W; 21E
Lab. (1) VIII-IX W, III-IV F; 229E; III-IV M; Ex
(2) VIII-IX Th, I-II W; 229E; VI-VII F; Ex
- 35w—Analysis of Buildings. (Arch. E.) Loads on buildings: dead load, live loads and their influence on design. Building code requirements. Loads on footings and foundation. Wind loads on structures. Laboratory tests of structural members, frames and connections. 3 cred.; prereq., 31, M.&M. 128; II-III M; 217E; VII-VIII Th; Ex. Mr. Parcel.
- 36s—Design of Steel Frame Buildings. Beams and girders, columns and built-up sections. Design of a typical steel building frame. Laboratory tests of structural members and connections. 4 cred.; prereq., 35. Mr. Parcel.
Lect. II W; 206E Lab. VI-IX Th; 229E; III-IV M; Ex
- 37s—Structural Engineering. (M.E., E.E.) Analysis of stresses in simple structural frames. Roof trusses, crane girders, mill building bent. 3 cred.; prereq., M.&M. 26 or 84. Mr. Wise.
VI Th; 206E Lab. VI-IX T, VII-IX Th; 229E

- 38f—Stresses in Structures. (Arch.) Application of laws of equilibrium to simple structures. Special emphasis is placed on graphic methods. 3 cred.; prereq., M.&M. 93; I-II TThF; 302E. Mr. Hughes.
- 39w—Structural Design. (Arch.) General principles of structural design. Girders, columns, and roof trusses. 3 cred.; prereq., 38; I-II TThF; 302E. Mr. Hughes.
- 41s—Reinforced Concrete. (Arch.) Brief course in theory and designing methods with special reference to building. 3 cred.; prereq., M.&M. 93; I-II TTh, III-IV F; 302E. Mr. Hughes.
- 42s—Structural Engineering. (Ag. E.) Analysis of stresses in simple structures. Design of timber and of structural steel members and connections. Design of wood and steel roof trusses. 3 cred.; prereq., M.&M. 85; VI-IX T, VII-IX W; 227E. Mr. Wise.
- 131f—Bridge Analysis. Stresses in simple span railway bridge trusses of the larger type. Baltimore, Petit, Whipple, and "K" trusses. 3 cred.; prereq., 134; VIII-IX MTh, III-IV F; 229E. Mr. Parcel.
- 132s—Bridge Design. Design and detail drawing of railway pin connected truss span. 3 cred.; prereq., 131; III-IV, VI-IX M; 227E. Mr. Parcel.
- 134f—Statically Indeterminate Structures. Theory of deflections and statically indeterminate stresses and their application to continuous girder, frames, swinging bridges, and redundant members. 3 cred.; prereq., 33; M.&M. 128. Mr. Parcel.
- Lect. VI F; 205E Lab. I-II S; 227E
- 135s—Reinforced Concrete Design. Analysis of structures as rigid frames. Application to reinforced concrete buildings. Effect of temperature and shrinkage. Effect of settlement of foundations. 4 cred.; prereq., 142a; II-III M, VI-IX F; 217E. Mr. Wise.
- 141f—Reinforced Concrete. Principles of reinforced concrete. Theory of beams, slabs, and columns and the application to ordinary structures. 3 cred.; prereq., M.&M. 128. Mr. Wise.
- (1) VI-VII M, III-IV TS; 227E (2) VI-VII TTh, VIII-IX F; 227E
- 141(a)f—Reinforced Concrete. Similar to 141 with problems of special interest to students in architectural engineering. 3 cred.; prereq., M.&M. 128; VI-VII TTh, VIII-IX F; 227E. Mr. Wise.
- 142w—Reinforced Concrete Design. Continuation of 141 with especial emphasis on the practical features of the design of buildings, bridges, retaining walls, etc. 3 cred.; prereq., 141. Mr. Wise.
- (1) VI-VII MT, I-II Th; 227E (2) VIII-IX T, VI-VII F; 227E
- 142(a)w—Reinforced Concrete Design. Similar to 142 with problems of special interest to students in architectural engineering. 3 cred.; prereq., 141(a); VIII-IX MT, VI-VII F; 227E. Mr. Wise.
- 143s—Reinforced Concrete Analysis. Advanced problems in design including reinforced concrete arch. 3 cred.; prereq., 134, 142. Mr. Wise.
- 144f—Reinforced Concrete. (For students other than civil engineers.) Design of reinforced concrete beams, girders, and columns. Design of footings and foundations. Design of retaining walls. Form work. Mixed and placing concrete. Testing and inspection of concrete work. 3 cred.; prereq., M.&M. 84 or 85, or M.&M. 127 and 128; IV MW; 215E; VIII-IX Th; 217E. Mr. Hughes.

- 146f,w,s—Plain Concrete. Theory of design and control of concrete mixtures. Practice in control tests of concrete and concrete materials. Lectures and laboratory work. 3 cred.; prereq., M.&M. 141. Mr. Hughes.
- 146f III-IV M, VI-IX W; Ex
 146w VI-IX W, VIII-IX F; Ex
 146s VI-IX Th, III-IV W; Ex
- 147w—Foundations. Design and construction of footings, cofferdams, and caissons for bridges and buildings. Piers and abutments. Underpinnings of buildings. Exploration and testing of foundation sites. Excavation and removal of materials from foundation side. 2 cred.; prereq., 33. Mr. Wise.
- 148f-149w-150s—Advanced Concrete. Short research problems in concrete. 2 cred. per qtr.; prereq., 146; ar. Mr. Hughes.
- 234f-235w-236s—Advanced Structural Design. Application of fundamental theory of stresses. Stress distribution in girders, riveted joints. Bending of straight bars. Built-up compression members. Impact and fatigue. Relative economy in design. Comparative study of specifications. 3 cred. per qtr.; prereq., 132, 142. Mr. Parcel.
- 237w-238s—Structural Laboratory. Experimental problems in structural steel. Strain gauge study of actual stress distribution in beams, columns, and riveted joints. 3 to 5 cred. per qtr.; prereq., 133.
- 245f-246w-247s—Advanced Reinforced Concrete Analysis. Review of literature of reinforced concrete, study of theory. Test data and analysis of stresses in reinforced concrete structures. 3 cred. per qtr.; prereq., 134, 142. Mr. Hughes.

HIGHWAY ENGINEERING

- 51f—Highways and Pavements. Elementary course with field inspection, relating to the economics, location, construction, and maintenance of highways and pavements. 3 cred.; prereq., 12. Mr. Lang.
- Lect. (1) VI M, VII Th; 215Ex (3) VII W, VI Th; 215Ex
 (2) VI TW; 215Ex
- Lab. (1) VII-IX M; 215Ex (3) VII-IX Th; 215Ex
 (2) VII-IX T; 215Ex
- 52w—Highways and Pavements. Continuation of Course 51, with laboratory practice. 3 cred.; prereq., 51. Mr. Lang.
- Lect. VI Th; 215Ex
 Lab. (1) VI-IX M, VIII-IX W; 215Ex (3) VI-IX T, VI-VII W; 215Ex
 (2) VII-VIII Th, VI-IX F; 215Ex
- 156w—Highway Transport. Development, economic field, relation to other forms of transportation. Highway transport surveys, economics of location, economics of selection of the type of surface, effect of vehicle on road and road on vehicle. 3 cred.; prereq., 52. Mr. Lang.
- 157s—Highway Transport. Motor vehicle as a common carrier, analysis of road legislation, taxation. Principles of successful operation. Selling motor transportation. 3 cred.; prereq., 156. Mr. Lang.
- 251s—Highway Laboratory. Investigations in co-operation with State Highway Department. 3 to 5 cred.; prereq., 52. Mr. Lang.
- 252s—Highway Design. Preparing of a plan and specification for short sections of highways and city streets, also making estimates of materials and cost. 3 cred.; prereq., 52. Mr. Lang.

HYDRAULIC ENGINEERING

161f—Hydrology. Rainfall, evaporation, transpiration, percolation, run-off. Flood and low water of streams. Storage for use in water supply, water power, irrigation and navigation. Mass curves and frequency curves. 3 cred.; open to sr. only. Mr. Bass.

Lect. II MF; 5E

Lab. (1) VII-IX T; 217E

(2) I-III T; 227E

164f,w,s—Water Power. Types of low, medium, and high-head developments. Details of developments. Dams. Turbine settings and characteristics. 3 cred.; prereq., M.&M. 129. Mr. Bass.

164f Lect. I T; 107E

Lab. III-IV M, VI-IX W; 217E

164w Lect. I M; 135E

Lab. VI-IX Th, II-III WS; 227E

164s Lect. II MWF; 21E

Lab. VI-IX F; 227E

263s—Hydraulic Engineering Problems. Special hydraulic problems in laboratory, drafting room, and field. 3 to 5 cred.; prereq., 164.

MUNICIPAL AND SANITARY ENGINEERING

162f,w—Water Supply and Sewerage. Sources of water supply; quality of water. Methods of testing, collection, distribution, and purification of water. Selection of pumping machinery and motive power. Sewer systems and sewage disposal works. 3 cred.; prereq., M.&M. 129. Mr. Bass.

162f Lect. III M; 7E

Lab. VIII-IX T, VI-VII F; 227E

162w Lect. III MW; 5E

Lab. VIII-IX T; 229E

163w,s—Water Supply and Sewerage. 3 cred.; prereq., 162. Mr. Bass.

163w Lect. I WF; 135E

Lab. II-III Th, II-IV F; 217E

163s Lect. II T; 5E

Lab. III-IV F, II-IV S; 227E

171w—Building Sanitation. Location and orientation of buildings; lighting, ventilation, water supply, plumbing, sewage, and refuse disposal. 2 cred.; prereq., sr. arch. only. I T, II F; 7E. Messrs. Bass and Martenis.

261f-262w—Water and Sewage Purification. Design of water purification and sewage disposal works. 3 to 5 cred. per qtr.; prereq., 163. Mr. Bass.

GENERAL

53s—Civil Engineering Practice. Greater problems of engineering. Interrelations of various branches of engineering in practice. Legal, financial, and business functions of the engineer. Relations of the engineer to government and public affairs. 3 cred.; open to juniors and seniors. Mr. Bass.

(1) I TTh, VII W; 21E

(2) I MTh; 21E

272s—City Planning. Physical elements of the city; topography, drainage, geology. Public works and structures. Internal and external transportation. Zoning. Subsurface structures. Esthetic features of the city. 3 to 5 cred.; prereq., 52; III MWF; 21E. Messrs. Bass and Mann.

280f-281w-282s—Civil Engineering Research. Original work in concrete, structural steel, hydraulics, municipal or transportation problems. Investigations, reports, tests, designs. 5 cred. per qtr.; by permission. Messrs. Bass, Cutler, Parcel, and Lang.

DAIRY HUSBANDRY

1f,s—Elements of Dairying. Composition of milk. Causes of variation in composition; milk constituents and their uses in dairy manufacture and as food; Babcock test; sanitary handling of milk and cream on the farm; cream separating and farm buttermaking. 5 cred.; no prereq. Mr. Combs.

Lect. III TWS; 100HH(UF)

Lab. III-IV MF; 100HH(UF)

DRAWING AND DESCRIPTIVE GEOMETRY

1f,w,s,su—Engineering Drawing. Elements of drafting including an introductory course in methods of representation, and constructive geometry. Graphs and formulas. Sketching, lettering, working drawings, conventions, standards, tracing, and blueprinting. 3 cred.; prereq., solid geometry. Messrs. Schuck, Archibald, Potter, Williams, Cruzen, and Rankin.

1f (1) I-II MWF, VIII F; 455C (4) III-IV TS, VIII-IX T, III Th; 455C
(2) II T, VIII-IX W, VII-VIII (5) VI-VII MWF, VIII M; 455C
Th, I-II S; 455C

(3) III-IV MWF, I Th; 455C

1w (1) I-II MWF, IV W; 455C (4) III-IV TS, VIII-IX T, VIII Th; 455C
(2) I-II TS, VII Th, III-IV F; (5) VI-VII MWF, III Th; 455C
455C

(3) VIII-IX MWF, I Th; 455C

1s VIII-IX MWTh, VIII F; 455C

2w,s,su—Engineering Drawing. 3 cred.; prereq., 1. Messrs. Schuck, Archibald, Potter, Williams, Cruzen, and Rankin.

2w (1) I-II MWF, IV W; 417C (4) III-IV TS, VIII-IX T, VIII Th; 417C
(2) I-II TS, VII Th, III-IV F; (5) VI-VII MWF, III Th; 417C
417C

(3) VIII-IX MWF, I Th; 417C

2s (1) I-II MWF, VIII F; 455C (4) III-IV TS, III Th, VIII-IX Th; 455C
(2) I-II TS, III W, III-IV F; (5) III-IV M, VI-VII MF, VI W; 455C
455C

(3) VIII-IX MW: I Th, VI-VII
Th; 455C

3f,w,s,su—Descriptive Geometry. Elementary course in the methods of representation, correlated in part with analytical geometry. Graphical and algebraic solutions. Lectures, demonstrations, and drafting. 3 cred.; prereq., 2, M.&M. 11 and 12. Messrs. Eggers, Levens, Williams and Shultz.

3f (1) III MWF; 5E (3) VII MWF; 205E
(2) II MTF; 139EE

3w VII MWF; 104E

3s (1) I-II MWF, VIII F; 417C (4) III-IV TS, III Th, VIII-IX Th; 417C

(2) I-II TS, III W, III-IV F; (5) III-IV M, VI-VII MF, VI W; 417C
417C

(3) VIII-IX MW: I Th, VI-VII
Th; 417C

4f,su-5w,su-6s,su—Engineering Drawing and Descriptive Geometry. (Chem. and chem. engr.) 2 cred. per qtr.; prereq., solid geometry. Messrs. Williams, Schuck, and Cruzen.

4f (1) VIII-IX MTF; 443C (2) VIII-IX MTF; 443C

5w III-IV MW, VI-VII T; 443C

6s III-IV M, VIII-IX T, VI-VII F;
445C

7w,su-8s,su—Engineering Drawing and Descriptive Geometry. (Chem. and chem. engr.) 3 cred. per qtr.; prereq., solid geometry. Messrs. Williams and Schuck.

7w VI-VII MTW; 445C

8s VII-IX MF, VIII-IX T; 443C

9f,w,s—Drafting. (Chem. engr.) 2 to 6 cred.; prereq., 6 or 8. Mr. French.

M.&M.10f,w,su—Solid Geometry. Lines and planes in space, dihedral and polyhedral angles, polyhedrons, surfaces, cylinders, cones, spheres. Numerical

exercises in area, volumes, weights. 4 hrs. per wk.; no cred.; no prereq.
Messrs. Archibald, French, Potter, Williams, and Shultz.

- 10f (1) II MWF, VII Th; 136E (4) IV T, III Th, III-IV S; 215Ex
(2) III TW, I-II S; 7E (5) VII MTWF; 106E
(3) IV MWF, 104E; I Th; 205E (6) VIII MTWF; 106E
10w VIII WTh, III-IV T; 7E

11f—Engineering Drawing (Mines). 4 cred.; no prereq.; III-IV MTWFS;
101E. Messrs. Potter and Archibald.

12w—Engineering Drawing (Mines). 3 cred.; prereq., 11; III-IV WF; 445C.
Messrs. Potter and Archibald.

13s—Engineering Drawing (Mines). 3 cred.; prereq., 12; III-IV TWFS; 443C.
Messrs. Potter and Myers.

14f—Descriptive Geometry (Mines). 3 cred.; prereq., 13. Math. 5; I MWF;
7E. Messrs. Eggers and Myers.

15w—Drafting (Mines). 2 cred.; prereq., 14; III-IV WF; 101E. Messrs Pot-
ter and Archibald.

21f,w,s,su—Drafting (C.E.). Drawing of structures and machines. Detail, as-
sembly, and construction drawings. Graphical solution of simple problems.
Applied descriptive geometry. 2 cred.; prereq., 3. Messrs. French, Archibald,
Levens, and Myers.

- 21f (1) III-IV MWF; 201E (2) VI-VII MTTh; 101E
21w III-IV MWF; 201E
21s I-II MWF; 201E

22w,s,su-23s,su—Drafting (C.E.) Drafting problems in concrete, highway, and
topographical work as met by the civil engineering draftsman in practice.
Intersections, development, and other practical geometric problems. 2 cred.;
prereq., 21. Messrs. French, Archibald, Levens, and Myers.

- 22w (1) III-IV MFS; 1E (2) VI-VII MTTh; 1E
22s III-IV MWF; 101E
23s (1) III-IV MWF; 201E (2) I-II TThS; 101E

26w,s,su—Drafting (E.E.). Applications of descriptive geometry to drafting
room problems. Sheet metal work, belting, conveyors, and connections.
Working drawings and tracing. 2 cred.; prereq., 3. Messrs. Eggers, Cruzen,
and Quaid.

- 26w (1) VI-VII TThF; 101E (2) VIII-IX MTF; 101E
26s VIII-IX MThF; 101E

27s,su—Drafting (E.E.). Application of elementary formulas in the proportioning
of simple machine parts. Outline and assembly drawings, electrical conven-
tions, circuit diagrams, the development of simple formulas, and graphical
methods. 2 cred.; prereq., 26. Messrs. Eggers, Schuck, and Shultz.

- (1) VIII-IX M, VI-VII Th, III-IV S; 201E (2) I-II TThS; 201E

28f,w,s,su—Drafting (M.E.). Application of descriptive geometry to drafting
room problems. Forgings, castings, sheet metal work, belting conveyors, and
connections. Working drawings and tracing. 2 cred.; prereq., 3. Messrs.
Shultz, Potter, and Williams.

- 28f (1) III-IV T, VI-VII TTh; 201E (3) VIII-IX MWF; 201E
(2) VI-VII MW, III-IV S; 201E
28w VIII-IX MWF; 1E
28s VIII-IX WThF; 201E

29w,s,su—Drafting (M.E.). Application of elementary formulas in the propor-
tioning of simple machine parts. Outline and assembly drawings, structural

- drafting, the development of simple formulas, and graphical methods. 2 cred.; prereq., 28. Messrs. Shultz, Potter, and Williams.
^{29W} (1) VIII-IX MWF; 201E (2) VI-VII TTh, III-IV S; 201E
^{29S} VIII-IX MWF; 1E
- 34f,w,s—Lettering. Study and analysis of single stroke lettering with particular emphasis on the application to engineering drawing. 1 cred.; prereq., 1. Messrs. Levens, Archibald, and Quaid.
 (1) IV T; 107E (2) II Th; 7E
- 35w,s—Printing and Lettering. Analysis of modern type faces. Study of the design and technique of printing and advertising, including a brief survey of the more common methods of reproduction. Exercises: layouts, simple compositions and advertisements. 2 cred.; prereq., the equivalent of 37 or 45; I W; 206E. Mr. Levens.
- 37f,w,s—Lettering for Engineers. Analysis of the alphabets. Exercises in roman and gothic lettering. Design and composition of the paragraph and the title. 2 cred.; prereq., 2. Messrs. Archibald and Schuck.
^{37f,w} I WF; 238EE
^{37s} I WF; 36EE
- 41f,w,s,su-42f,w,s,su-43f,w,s,su—Technical Drawing. (a) General course in the theory and practice of drawing. Sketching, lettering, tracing, conventions, renderings, and mechanical drawings. (b) Modification of the above course of particular interest to dental and medical students. 2 cred. per qtr.; no prereq. Messrs. Kirchner and Sheridan.
^{41f,w} (1) I-II MWF; 411C (3) VIII-IX MWF; 411C
 (2) III-IV MWF; 411C
^{41s} (1) I-II TThS; 411C (3) VIII-IX MWF; 411C
 (2) III-IV MWF; 411C
- 44f,w,s—Lettering. Practical course in plain lettering. Not an engineering elective. 1 cred.; no prereq. Messrs. Levens, Archibald, and Schuck.
 (1) IV T; 36EE (2) II Th; 237EE
- 45f,w,s-46f,w,s—Alphabets. Construction and analysis of various types of letters and their arrangement. Exercises, and reference work. Open to soph., jr., and sr. 2 cred. per qtr.; no prereq.; II TTh; 206E. Mr. Kirchner.
- 50w,s—Diagrams and Charts. Elementary course dealing with the construction of simple diagrams and charts. 2 cred.; no prereq.; I TTh; 206E. Messrs. Eggers and Cruzen.
- 51w,s—Graphs and Charts. General course in graphical methods of representation and computation, including a study of scales and the construction of various types of charts and diagrams. 3 cred.; prereq., I, M.&M. 12. Messrs. Eggers, Schuck, and Cruzen.
^{51w} II MWF; 206E
^{51s} (1) VIII WF, III Th; 107E (2) VI M, I WF; 7E
- 57f-58w-59s—Graphical Methods. Theory and construction of graphic charts and diagrams. Course can be entered at any quarter. 2 cred. per qtr.; prereq., soph. dr., M.&M. 26; I MF; 206E. Messrs. Kirchner, Eggers, and Levens.
- 61f—Projections. Elementary principles of descriptive geometry and their application to architectural problems of projections and intersections. 2 cred.; no prereq. Messrs. Kirchner and Myers.
 Lect. III Th; 335EE
 Lab. (1) VI-VIII W; 225E (3) VI-VII F; 225E
 (2) II-IV W; 225E (4) II-IV F; 225E

- 62w—Shades and Shadows. Geometrical determination of shades and shadows on architectural forms. 2 cred.; prereq., 61. Messrs. Kirchner and Myers.
 Lect. III Th; 335EE
 Lab. (1) VI-VIII W; 225E (3) VI-VIII F; 225E
 (2) VI-VIII Th; 225E (4) VI-VIII T; 225E
- 63s—Perspective. Principles and methods of perspective as applied to architectural drawing. 2 cred.; prereq., 61. Messrs. Kirchner and Myers.
 Lect. III Th; 335EE
 Lab. (1) VI-VIII M; 225E (3) VI-VIII F; 225E
 (2) II-IV M; 225E (4) I-III S; 225E
- 64f—The Graphic Arts. Introduction. Field, development, and application in art and industry. Elementary principles of design. Discussion of materials, style, and technique. Exercises including the construction of simple graphs. 2 cred.; open to jr., sr.; prereq., 15 cred. of econ.; IV MW; 5E. Mr. Kirchner.
- 65w—The Graphic Arts—Printing Layout. Printing art, its history and development. Analysis of the standard type faces. Making of type, composition, imposition. Study of specimens of fine printing. Exercises: simple layouts, including lettering associated with type. 2 cred.; prereq., 15 cred. in econ.; IV MW; 5E. Mr. Kirchner.
- 66s—The Graphic Arts. Processes. Design and composition including the use of illustrations in black and white, line, and color. Discussion of the various processes of printing, lithography, and engraving. Exercises in planning for text and display work. 2 cred.; prereq., 15 cred. in econ.; IV MW; 5E. Mr. Kirchner.
- 69f,w,s,su—Exercises in Lettering. (Nurses.) See School of Nursing bulletin. 1 cred. per qtr. Messrs. Myers, Archibald, French, Potter, and Williams.
- 71f,w,s—Graphics for Electrical Engineers. Representation and computation of complex quantities, rotating vectors, hyperbolic functions, and their application to direct and alternating current circuits. 3 cred.; prereq., 27, E.E. 111. Mr. Eggers.
 71f,w I MWF; 339EE
 71s I MWF; 209Ex
- 81f,w,s—Advanced Drawing. 3 cred. per qtr.; prereq., 43 or equivalent. Messrs. Kirchner and Sheridan.
- 86f,w,s—Anatomical Drawing. 3 cred. per qtr.; prereq., 43 or equivalent. Messrs. Kirchner and Sheridan.
- 111f,w,s-112f,w,s-113f,w,s—Advanced Descriptive Geometry. Methods of representation; parallel and central projection. Curves and surfaces, geometrography, axonometry, and photogrammetry. 3 cred. per qtr.; prereq., 3, calculus. Mr. Kirchner.
- 114f,w,s—Perspective. Principles and practice of perspective, including shadows, reflections, distortions, corrections, systems, methods, the practical problem, and inverse construction. 3 cred.; prereq., 63. Mr. Kirchner.
- 215f-216w-217s—Geometry. Pure and applied. Transformations, perspective, kinematics, stereotomy, graphic statics, graphic calculus, nomography. 3 cred. per qtr.; prereq., calculus. Mr. Kirchner.
- 218f,w,s-219w-220s—Nomography. Technique and theory of computing charts. Equations of three and more variables. Determination of constants of empirical equations. 3 cred. per qtr.; prereq., 3, M.&M. 128. Messrs. Kirchner, Eggers, and Levens.

ECONOMICS

3w—The Mechanism of Exchange. Elementary course in money and banking. Study of financial institutions and their relations as parts of the financial structure. Relation of financial organization to the economic organization. 5 cred.; no prereq. Mr. Stehman.

Lect. III TTh; ar

Rec. (1) I TThS; 303B

(3) IV MWF; ar

(2) II MWF; 109B

(4) VI MWF; ar

8f-9w—General Economics. (Eng., Arch., Chem.) Principles of economics with special emphasis upon their application to current problems such as money, banking, conservation, insurance, international commerce, monopolies, transportation, labor, socialism, public ownership, and finance. 3 cred. per qtr.; no prereq. Mr. O'Hara.

(1) I MWF; 107E

(4) IV MWF; 107E

(2) I MWF; 215E

(5) IV MWF; 135E(f) 136E(w)

(3) III MWF; 135E

14f,w,s*—Elements of Statistics. Elementary concepts in statistical method; averages, ratios, errors, sampling, index numbers, graphic representation, collection of material. 5 cred.; prereq., 8, 9. Mr. Mudgett.

(1) I TWThFS; ar

(4) IV MTWFS; 301B

(2) II MWThFS; 109B

(5) VI MTWThF; 301B

(3) III MTThFS; ar

(6) VII MTWThF; 301B

20f,w,s*—Elements of Accounting. Fundamental principles underlying bookkeeping and accounting. Sufficient practice in technical processes will be given to serve as a background for more advanced work. Preparation and analysis of statements. 3 cred.; no prereq. Mr. Heilman.

^{20w} (1) III TThS; 302B

(3) VI MWF; 301B

(2) III MWF; 302B

25w-26s—Principles of Accounting. Course following Econ. 20 presenting the principles underlying the accounting statements, the accounts, principles of valuation, depreciation, preparation, and analysis of statements. 4 cred. per qtr.; prereq., 20. Mr. Heilman.

(1) II MWF; 303B

(3) III MWF; 301B

(2) II TThS; 303B

28f,s—Business Law. Business law arranged for engineers, including the law of contracts, suretyship, agency, partnership, corporations, negotiable instruments, conveyance patents, and riparian rights. 3 cred.; open to soph., jr., sr. with 6 cred. in econ. or sr. without econ. cred.; I MWF; 135E. Mr. Palmer.

29f,s—Principles of Accounting. (Eng., Arch., Chem.) Purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts, and other statements. 3 hrs. of lect. a wk. 3 cred.; no prereq. Mr. Heilman.

^{29f} I MWF; 5E

^{29s} I MWF; 339EE

* For other quarter schedules see bulletin of the School of Business Administration.

51f-52w-53s—Business Law. 3 cred. per qtr.; prereq., 9 cred. in econ. or pol. sci.
Mr. Young.

Lect. IV TS; OLAud

Rec. (1) I M

(2) II M

(3) III M

(4) I T

(5) II T

(6) III T

(7) Ar

154f,w,s—Public Utilities. Economic and legal bases of classification. Relative advantages of public ownership and regulation. Central and municipal regulation compared. Basis of rates; relative rates; rates and service. Summary of the theories of valuation. 3 cred.; prereq., 8, 9. Mr. Garver.

154f III TThS; 202B

154w II TThS; 202B

154s III TThS; 102B

161f,w,s—Labor Problems and Trade Unionism. Discussion of employment; hours; wages; extent and strongholds of unionism; open and closed shops; collective bargaining; industrial unrest; government regulation of labor disputes. 3 cred.; prereq., 8, 9. Mr. Hansen.

161f IV MWF; 202B

161w,s III TThS; 202B

172f,w,s†—Economics of Transportation. 3 cred.; prereq., 8-9; VIII MWF; 102B. Mr. Butterbaugh.

BUSINESS ADMINISTRATION

67f,w,s—Market Administration. General course dealing with the mechanics and operation of markets; classification, organization, market agencies as factors in production. Price making process; control of supply, assumption of risk, incident of marketing costs. Wastes of competition. 3 cred.; prereq., 8-9. Messrs. Vaile and Wagner.

67f I TThS; 109B

67w I TThS; 209B

67s I TThS; 202B

71f,w,s†—Traffic Management. Survey of the rail, water, and highway transportation facilities, services, rates, and laws in their relation to business establishments; the executive's organization and management problems in handling freight, express, and mail shipments. 3 cred.; prereq., 8, 9; VI MWF; 202B. Mr. Butterbaugh.

89f,w,s—Production Management. Administration of business enterprises; coordination of men and departments; delegation of authority; planning, production control; scientific management. 3 cred.; prereq., 8, 9. Mr. O'Hara.

89f II MWF; 209B

89w II MWF; 202B

89s I MWF; 109B

130f,s—Cost Accounting. (General survey.) 3 cred.; prereq., 29; I TThS; 303B. Mr. Ostlund.

131f-132w*—Cost Accounting. 3 cred. per qtr.; prereq., 29. II TThS; 301B. Mr. Ostlund.

133s—Accounting Systems. 3 cred.; prereq., 131, 132; II TThS; 301B. Mr. Ostlund.

* The entire course must be completed before credit is given for any quarter.

† Students may not receive credit for both Econ. 172 and Bus. Adm. 71.

155f,w,s—Corporation Finance. 3 cred.; prereq., 8-9. Mr. Stehman.

155f,w III MWF; 102B

155s III MWF; 109, 202B

167w—Personnel Administration. Managerial policy, for various types of organization, on labor. Special attention to job analysis, employment, incentives, and regulation of employment. 3 cred.; prereq., 8-9, I TThS; 202B. Mr. Stead.

ELECTRICAL ENGINEERING†

DIRECT CURRENT

11f-13w-15s—Elements of Electrical Engineering. Introduction to the development, principles, materials, safety, and general applications of electrical engineering. 3 cred. per qtr.; prereq., reg. in phys., and not more than 1 qtr. behind in math. Messrs. Bryant and Todd.

11f	Lect.	(1) III T; 335EE; III ThS; 237EE	(3) I T; 335EE; I ThS; 238EE
		(2) III T; 335EE; III ThS; 238EE	(4) I T; 335EE; I ThS; 138EE
	Lab.	(1) VIII-IX T; 21EE	(5) III-IV T; 21EE
		(2) VII-VIII W; 21EE	(6) VIII-IX M; 21EE
13w	Lect.	(3) VI-VII Th; 21EE	(7) VIII-IX Th; 21EE
		(4) I-II S; 21EE	(8) VI-VII F; 21EE
	Lab.	(1) III T; 335EE; III ThS; 138EE	(3) I T; 335EE; I ThS; 237EE
		(2) III T; 335EE; III ThS; 238EE	(4) I T; 335EE; I ThS; 238EE
15s	Lect.	(1) I T; 335EE; I ThS; 237EE	(3) III T; 335EE; III ThS; 237EE
		(2) I T; 335EE; I ThS; 238EE	(4) III T; 335EE; III ThS; 238EE
	Lab.	(1) VI-VII M; 21EE	(5) VIII-IX W; 21EE
		(2) VI-VII W; 21EE	(6) VI-VII Th; 21EE
	Lect.	(3) I-II T; 21EE	(7) VIII-IX T; 21EE
		(4) I-II S; 21EE	(8) VIII-IX Th; 21EE
	Lab.	(1) I T; 335EE; I ThS; 237EE	(3) III T; 335EE; III ThS; 237EE
		(2) I T; 335EE; I ThS; 238EE	(4) III T; 335EE; III ThS; 238EE
	Lab.	(1) VIII-IX W; 21EE	(5) VIII-IX M; 21EE
		(2) VIII-IX F; 21EE	(6) VII-VIII Th; 21EE
	Lab.	(3) I-II M; 21EE	(7) VI-VII M; 21EE
		(4) I-II F; 21EE	(8) VI-VII W; 21EE

111f-113w-115s—Direct Current Machinery. Measuring instruments and their use. Units. Theory of dynamo electric machinery. Methods of regulation, construction, operation. Methods of testing. 3 cred. per qtr.; prereq., 11, 13, 15; II MWF; 335EE. Mr. Springer.

112f-114w-116s—Direct Current Machinery Laboratory. Taken with Course 111-113-115. Measurements, calibration of instruments, operation and characteristic curves of generator and motor. 2 cred. per qtr.; prereq., reg. in 111, 113, or 115. Mr. Springer.

112f	(1) VI-IX T; 107EE	(3) VI-IX Th; 107EE
	(2) VI-IX W; 107EE	(4) VI-IX F; 107EE
114w-116s	(1) VI-IX M; 107EE	(3) VI-IX W; 107EE
	(2) VI-IX T; 107EE	(4) VI-IX F; 107EE

ALTERNATING AND TRANSIENT CURRENTS

121f-123w-125s—Alternating Currents. Phenomena, measurement, and use of alternating currents. Theory of the transformer, generator, and motor. Types of apparatus. 3 cred. per qtr.; prereq., 115, 116. Mr. Ryan.

(1) III MWF; 237EE

(2) IV MWF; 237EE

† In courses continuing through three quarters, the work of each quarter is prerequisite for following quarters.

- 122f-124w-126s—Alternating Current Laboratory. Alternating current circuits. Regulation and efficiency tests of transformers, and machines. 2 cred. per qtr.; prereq., 116 and reg. in 121, 123, or 125. Mr. Ryan.
- | | | |
|-----------|--------------------|---------------------|
| 122f | (1) VI-IX M; 107EE | (3) VI-IX W; 107EE |
| | (2) VI-IX T; 107EE | (4) VI-IX F; 107EE |
| 124w-126s | (1) VI-IX T; 107EE | (3) VI-IX Th; 107EE |
| | (2) VI-IX W; 107EE | (4) VI-IX F; 107EE |
- 127f—Transient Electrical Phenomena. Mathematical study of electric circuit with resistance, inductance, and capacitance. Abnormal currents and voltages upon switching circuits containing iron core inductance. 2 cred.; prereq., reg. in 121; I TTh; 339EE. Mr. Bryant.
- 128w—Transient Electrical Phenomena. Current and voltage distribution in circuits containing distributed resistance, inductance, and capacitance. Distortion in telephone lines and its correction. 2 cred.; prereq., 127; I TTh; 339EE. Mr. Bryant.
- 129s—Transient and High Frequency Phenomena. Transient phenomena in coupled circuits. Distribution of current and flux in conductors. Change of resistance with frequency. 2 cred.; prereq., 128; I TTh; 339EE. Mr. Bryant.

DESIGN

- 132f-134w-136s—Electrical Design. The design of direct current generators and motors, alternating current transformers, generators and synchronous motors. 2 cred. per qtr.; prereq., for 132, 115; for 134 and 136, 121. Mr. Kuhlman.
- | | |
|---------------------------|-----------------------|
| Lect. IV T; 335EE | |
| Lab. (1) VI-VIII M; 227EE | (3) VI-VIII W; 227EE |
| (2) VI-VIII T; 227EE | (4) VI-VIII Th; 227EE |
- 232w-234s-236f—Electrical Design. Special problems. 2 cred. per qtr.; prereq., 132, 134, or 136. (Not offered in 1929-30.)
- 237s—Power Transmission Line Design. Preparation of detailed plans and specifications for construction of high voltage transmission lines and distributing systems. 3 cred.; prereq., 134, 142. (Not offered in 1929-30.)

ELECTRIC POWER

- 40f—Electric Wiring and Equipment. Elements of direct and alternating current circuits. Interior wiring and electrical equipment of buildings. Elements of illumination. Sr. arch. and arch. engr. 2 cred.; prereq., Phys. 43; III MW; 138EE. Mr. Todd.
- 41f—Electric Power. Elementary principles of continuous and alternating currents, generators, and motors, transmission and distribution. Measurement of power. Sr. mines. 3 cred.; prereq., Phys. 43.
- | | |
|---------------------|---------------------|
| Lect. II TTh; 238EE | Lab. I-III F; 107EE |
|---------------------|---------------------|
- 42w,s—Electric Power. Similar to 41. Sr. C.E. 4 cred.; prereq., Phys. 43, 44.
- | | |
|---------------------|----------------------|
| Lect. I TThS; 138EE | Lab. III-IV T; 107EE |
|---------------------|----------------------|

- 43s-44f-45w—Electric Power. Elementary study of the generation, distribution, measurement, and utilization of electric power. Jr. and sr. chem. 3 cred. per qtr.; prereq., Phys. 43, 44. Mr. Johnson.
- 43s Lect. III TThS; 138EE
 Lab. (1) I-II T; 107EE (2) I-II S; 107EE
- 44f Lect. II TTh, I S; 138EE
 Lab. (1) III-IV T; 107EE (2) II-III S; 107EE
- 45w Lect. II TTh, III S; 138EE
 Lab. (1) II-III M; 107EE (2) I-II S; 107EE
- 46f-47w-48s—Electric Power. Similar to 43-44-45. Sr. M.E. 4 cred. per qtr.; prereq., Phys. 43, 44. Mr. Johnson.
- Lect. VI MWF; 237EE
 Lab. (1) II-III W; 107EE (2) I-II Th; 107EE
- 49w—Electric Motors. Elementary principles of direct and alternating current motors. Applications to elevators and ventilation equipment. Sr. arch. engr. 2 cred.; prereq., 40; III WF; 138EE.
- 141f—Central Stations. Electric power generating stations and distributing systems. Load diagrams. Selection of prime movers and units. Cost of electrical energy. Methods of charging. Maintenance of plants. 2 cred.; prereq., reg. in 121; III TTh; 237EE. Mr. Ryan.
- 142w—Electrical Transmission. Consideration involved in the designing and building of transmission lines. Kelvin's law and its limitations. Transmission line as a mechanical structure. Lightning arresters. 2 cred.; prereq., reg. in 123; III TTh; 237EE. Mr. Ryan.
- 143f,w,s—Power Plant Operation. Practice in operation and care of gas, steam, and electric apparatus of the university lighting plant. 1 cred.; prereq., 116 or 45 or 48. Any three consecutive hours. Messrs. Ryan and Haley.
- 144w—Railway Electrical Engineering. Principles of mechanics applied to electric train movements. 2 cred.; prereq., 42 or 45 or 48 or 115; I WF; 237EE. Mr. Johnson.
- 145s—Railroad Electrification. Reasons for electrification. Study of European and American systems. Results of electrification. 2 cred.; prereq., 144; I WF; 237EE. Mr. Johnson.
- 146s—Storage Battery Engineering. Operation and performance of acid and alkaline storage batteries and their practical applications. Charging and regulating equipment. 2 cred.; prereq., 45 or 48 or 113. (Not offered in 1929-30.)

ELECTRIC LIGHTING

- 151f—Electrical Lighting. Nature of light. Laws of vision. Principles of illumination. Photometry. Sources of light and their characteristics. Lighting equipment. Illumination requirements and calculation for various fields of use. 2 cred.; prereq., Phys. 43; I WF; 237EE. Mr. Johnson.
- 152f—Photometric Laboratory. Photometer practice. Distribution curves of lamps and reflectors. Measurement of lighting installations. 1 cred.; prereq., reg. in 151; VI-VII Th; ar. Mr. Johnson.
- 153w-154s—Illumination Problems. Illumination design and specifications applied to problems in street, residence, industrial, commercial, and other kinds of lighting. 2 cred. per qtr.; prereq., 151. (Not offered in 1929-30.)

251w-253s—Illuminating Engineering. Lectures and laboratory work. Methods of determining locations, kind, and quality of lights for obtaining desired illumination. 2 cred. per qtr.; prereq., 151. Mr. Johnson.

TELEPHONE AND TELEGRAPH ENGINEERING

61f-63w-65s*—Elements of Communication. Importance of communication. Comparison of methods. Theory of telegraph apparatus and circuits. Simplex, duplex, and multiplex telegraphs. Location of opens and grounds. Care of batteries. Speech sounds. Essential parts of telephone systems. Theory of telephone apparatus. Switchboard practice. Telephone circuits. Interference and transpositions. Multiple uses of lines. Elements of transmission phenomena. 2 cred. per qtr.; prereq., reg. in 111-113-115. Mr. Hartig.

61f	Lect.	(1) III T; 238EE	(2) II T; 237EE
	Lab.	(1) VI-IX W; 307EE	(3) VI-IX F; 307EE
		(2) VI-IX Th; 307EE	
63w	Lect.	(1) IV T; 238EE	(2) III T; 238EE
	Lab.	(1) VI-IX W; 307EE	(3) VI-IX F; 307EE
		(2) VI-IX Th; 307EE	
65s	Lect.	(1) II T; 238EE	(2) III T; 237EE
	Lab.	(1) VI-IX W; 307EE	(3) VI-IX; F 307EE
		(2) VI-IX Th; 307EE	

164f—Telegraph and Telephone Apparatus. Theoretical and experimental study of apparatus used for signaling, telegraphy, and telephony. 2 or 3 cred.; prereq., 63. Mr. Hartig.

Lect. I MW; 139EE

Lab. VI-VIII F; 307EE

165w-166s—Telegraph and Telephone Circuits. Theoretical and experimental study of telegraph and telephone circuits and the phenomena of long line transmission. Phantoms, loading, repeaters. Inductive disturbances, transpositions. Multiplex telephony. 2 or 3 cred. per qtr.; prereq., reg. in 123. Mr. Hartig.

Lect. I MW; 139EE

Lab. VI-VIII F; 307EE

267f-268w-269s—Telephone Transmission. Advanced transmission theory at communication frequencies. Class and laboratory. Registration by permission. 2 or 3 cred. Mr. Hartig.

287f-288w-289s—Advanced Communication Laboratory and Seminar. Special problems in communication. Study and discussion of current articles on communication. Registration by permission. 2 or 3 cred. (Not offered in 1929-30.)

RADIO ENGINEERING

161f-162w-163s—Radio Communication. Damped wave transmitting and receiving circuits and apparatus. Inductance and capacitance measurements at high frequency. Frequency meters. Electron tube as a detector and as an amplifier. Undamped wave transmitting and receiving circuits. Heterodyne reception. Selective circuits. Mathematical theory of electron tube. Design of electron tube amplifier and generator systems. Radio and carrier current

* NOTE.—Courses 61, 63, 161, and 162 are required as part of military science. Courses 51 to 54 for R.O.T.C. Signal Corps, and are open as electives to civilian students.

telephony. 3 cred. per qtr.; prereq., reg. in 121. 161 is prereq. for 162, 162 for 163.

Lect. II MW; 237EE

Lab. (1) VI-VII M; 308EE

(2) VIII-IX M; 308EE

(3) VI-VII T; 308EE

(4) VIII-IX T; 308EE

(5) VI-VII W; 308EE

167f-168w-169s—Radio Station Operation. For men already proficient licensed radio operators. Includes construction of transmitting and receiving equipment, maintaining schedule in the radio station, and the interpretation of the data. Jr., sr. by permission. 1 or 2 cred. per qtr.; 1 to 6 cred. total; prereq., reg. in 161.

261f-263w-265s—Advanced Radio Communication. Theoretical study of the transmission of electromagnetic waves. Design and testing of radio transmitting and receiving apparatus. Theory of electron tubes and their use in radio circuits. High frequency measurements. Taken with 262-264-266. 2 cred. per qtr.; reg. by permission. II TTh; 339EE.

262f-264w-266s—Advanced Radio Laboratory. Special problems in radio laboratory and station, usually taken in connection with Course 261-263-265. For students specializing in electrical communication. 1 or more cred. per qtr.; reg. by permission.

RESEARCH

171w-172s—Undergraduate Thesis. Investigation of some approved problem in electrical engineering. 3 to 6 cred. per qtr.; prereq., 121.

275f-276w-277s—Electrical Engineering Research. Investigation of special problems in laboratory or library. 2 to 6 cred. per qtr.; open to graduate students.

MEASUREMENT

81w—Electrical Engineering Measurements. Principles of electrical measuring instruments, construction, limitations, sources of error. methods of calibration. Methods of measuring voltage, current, watts, watt hours, resistance, inductance, mutual inductance, capacity. 3 cred.; prereq., 111. Mr. Todd.

Lect. IV MW; 339EE

Lab. VI-VII M; 107EE

181s—Communication Frequency Measurements. Vector treatment of network. Bridge circuits for measuring of resistance, inductance, and capacity at audio and radio frequencies. 2 cred.; prereq., 126. (Not offered in 1929-30.)

183f-184w-185s—Special Electrical Laboratory. Efficiency tests and special problems. 2 cred. per qtr.; 2 to 12 cred. total; prereq., 116. Mr. Springer and others.

186w,s—High Tension Testing. Low high frequency to several million voltage, applied to study of dielectric phenomena, such as testing high tension transmission cables, transformer oil, transmission line insulators. 2 cred.; prereq., 123, 124, or reg. in 123 or 124, and by permission. Mr. Springer.

187f-188w-189s—Special Communication Laboratory. Special problems in electrical communication. Includes a weekly seminar meeting. 1 to 2 cred. per qtr.; 1 to 12 cred. total; open to jr., sr., grad. by permission. Mr. Hartig.

281w-282s—Advanced High Frequency Measurements. Vector treatment of circuit networks. Bridge circuits for the measurement of resistance, inductance,

and capacity at audio and radio frequencies. 2 cred. per qtr.; prereq., 126.
 284w-285s-286f—Precise Electrical Engineering Measurements. Measurements of resistance, voltage, current, self-induction, and capacity; standardization of measuring instruments. 2 cred. per qtr.; prereq., 122. (Not offered in 1929-30.)

GENERAL

91s,su—Inspection Trip. Personally conducted inspection of factories, power plants, and other places of engineering interest. During spring recess or in summer, costing about \$50 for each person. 1 cred.; prereq., 11.
 93s—Seminar. Weekly discussion of current engineering periodicals and reports on assigned topics. 1 cred.; no prereq., jr. E.E. (Not offered in 1929-30.)
 191f-192w-193s—Seminar. Weekly discussion of current electrical periodicals. 1 cred. per qtr.; prereq., 111. (Not offered in 1929-30.)
 291f-292w-293s—Graduate Seminar. Discussion problems and results of research work. 1 cred. per qtr.; prereq., 126. (Not offered in 1929-30.)
 294f-295w-296s—Electrical Ignition and Automobile Electrical Accessories. Study of ignition apparatus; characteristics of automobile accessories, such as generators, starters, controllers, electrical transmitting devices, etc. 2 cred. per qtr.; prereq., 124. Mr. Springer.

ENGLISH

4f,w-5w,s-6s—Rhetoric and Composition. Review of grammar; principles of composition; constant practice in writing. Studies in literature. 3 cred. per qtr.; no prereq. Messrs. Richardson, Beers, Haga, Hays, and Woodall.

4f	(1) II TThS; 107E	(8) VII MWTh; 203E
	(2) II TThS; 135E	(9) VI MThF; 107E
	(3) II TThS; 136E	(10) VI MThF; 136E
	(4) II WF, III S; 135E	(11) III T, I ThS; 107E
	(5) II WF, III S; 107E	(12) III T, I ThS; 135E
	(6) II WF, III S; 138EE	(13) III MWF; 335EE
	(7) VII MWTh; 107E	(14) III MWF; 107E
4w	(1) VII MWF; 203E	(2) VI MTh, V F; 206E
5w	(1) II TThS; 107E	(7) VI MThF; 107E
	(2) II TThS; 135E	(8) VI MThF; 205E
	(3) III TS, II W; 107E	(9) I TThS; 107E
	(4) III TS, II W; 135E	(10) I TThS; 135E
	(5) VII MWF; 107E	(11) III MWF; 107E
	(6) VII MWF; 205E	(12) III MWF; 335EE
5s	(1) VII M, III TS; 206E	(2) V MWF; 107E
6s	(1) II TThS; 107E	(7) VI MThF; 107E
	(2) II TThS; 135E	(8) VI MThF; 203E
	(3) III TS, II W; 107E	(9) I TThS; 107E
	(4) III TS, II W; 135E	(10) I TThS; 203E
	(5) I MWF; 107E	(11) III MWF; 107E
	(6) I MWF; 203E	(12) III MWF; 335EE

7w,8s—Explorations in Literature. An attempt to introduce world literature to the student through a study of books and their authors. 3 cred. per qtr.; prereq., 4, 5, 6, or equiv. Mr. Richardson.

7w	IV MWF; 203E
8s	IV MWF; 107E

- 31s—Technical Writing. Quarter course in business letters, reports, etc., planned to meet the professional needs of engineering students. 3 cred.; prereq., 4-5-6. I MWF; 215E.

FORESTRY

- 27w—Farm Woodlots and Windbreaks. Trees and their relation to the farm. Planning and planting farm windbreaks and shelter belts. Utilization and marketing of farm grove, or woodlot products. 3 cred.; no prereq.; IV MWF; 301Hr(UF). Mr. Cheyney.

GENERAL ENGINEERING

- 11f-12w—Orientation. General lectures for vocational guidance covering the various phases of engineering and allied professions. Introduction to the University. Duties and privileges of students. Illustrated by lantern slides and moving pictures. Given by various members of the university staff. No cred.; no prereq.; required of freshmen in Engineering and Architecture. Mr. Zelter.

11f I T; Univ Aud
12w IX Th; 305E

- 81f,w,s—Estimating. Plan reading and quantity surveying. Study of costs of concrete, brick, timber, and steel construction. Analysis of material and labor costs. 3 cred.; jr., sr., only. Mr. French.

81f,w I MWF; 36EE
81s I MWF; 138EE

- 101w—Contracts and Specifications. Engineering specifications. Classes of specifications; essential features; clauses, details. Bids and bidders, engineering contracts. Sr. only; 3 cred.; IV MWF; 138EE.

- 111s—Valuation of Public Utility Properties. Factors affecting value, depreciation, taxation, and regulation of public utility properties. Elements of engineering economics; cost analysis, economic investigations, rate making. Open only to sr. and grad. 2 cred.; III TTh; 238EE. Mr. Ryan.

- 193s—Engineering Practice. Engineering relations, legal and ethical, collaboration and consultation; technical reports, investigation and estimates. Professional employment, ownership of plans, patents and rights of invention. Day labor and contract systems of construction; public and private works, arbitration. Sr. only; 2 cred. Mr. Martenis.

(1) III MTh; 202ME

(2) III Th, 202ME, III S; 154ME

GEOLOGY AND MINERALOGY

- 1su—General Geology. Introductory study of earth materials and geologic processes. Lectures with a limited amount of laboratory work and field excursions. 5 cred.; all; no prereq. Mr. Stauffer.

- 5f—Engineering Geology. Materials of the earth and geologic processes. Application of geology to engineering problems. Lectures, rock study, and reference work. 3 cred.; no prereq.; I MWF; 110P. Mr. Schwartz.

- 6w—Applied Geology for Civil Engineers. Occurrence, properties, production, and uses of building stones, cements, clay, fuels, and road materials. Lectures and reference work. 3 cred.; prereq., 5; I MWF; 110P. Mr. Schwartz.

- 7s—Applied Geology for Civil Engineers. Includes a brief survey of the occurrence of the important metals. Lecture and reference work, 3 cred.; prereq., 6; I MWF; 110P. Mr. Schwartz.
- 67f—Mineralogy of Chemical Materials. Lectures on special laboratory methods of mineralogy, nature and identification of the chief commercial minerals, and the world's supply and market for the same. Laboratory work in identification and tests of the value of minerals. 3 cred.; prereq., 6 qtr. cred. of chemistry at University. Mr. Gruner.
Lect. III MWThF; 104P; III-IV T; 100P

GERMAN

- 24f-25w-26s—Chemical German. Pronunciation, conversation, grammar and composition, and reading. 4 cred. per qtr.; no prereq.
(1) IV MTWF; 209½F (2) IV MTWF; 209F
- 27f—Elementary Chemical German. Reading, grammar review. 3 cred.; prereq., 26 or two years preparatory German.
(1) I MWF; 108F (2) I MWF; 217F
- 28w-29s—Advanced Chemical German. Selections from more difficult works on chemistry. 3 cred. per qtr.; prereq., 27. Messrs. Davies and Ermisch.
(1) II MWF; 209½F (2) II MWF; 113F

HORTICULTURE

- 6f—Fruit Growing. Fundamental principles of fruit growing. Sites, soils, nursery stock, planting and planting plans, tillage, fertilization, cover crops, pollination, frost avoidance, pruning, and thinning. Lectures, recitations, references, and laboratory. 3 cred.; no prereq. Mr. Alderman.
Lect. (1) II MW; 102Hr(UF) (2) IV WF; 8aHr(UF)
Lab. (1) I-II T or F; 8Hr(UF) (2) VII-VIII M; 8Hr(UF)
- 70su—Plant Materials. Garden flowers, identification, classification, and landscape uses. Lectures and field trips. 3 cred.; prereq., Bot. 10 cred.; 3Hr(UF).
- 71f—Plant Materials. Deciduous and evergreen trees, shrubs and vines, identification; fall and winter characters and use in landscape gardening. Lectures and field trips. 3 cred.; prereq., Bot. 10 cred.; 3Hr(UF).
- 72s—Plant Materials. Deciduous and evergreen trees, shrubs and vines, herbaceous perennials, biennials, annuals, and bulbs, identification; spring and summer characteristics; use in landscape gardening. Lectures, field trips, and problems. 3 cred.; prereq., 71; 8aHr(UF).
- 73w—History of Landscape Gardening. Literature and development of landscape gardening from ancient to modern times and influences that have affected the different periods. Lectures, assigned readings, field trips, and reports. 3 cred.; no prereq.; II TThS; 102Hr(UF).
- 74f—Landscape Design. Composition of the various elements used in landscape gardening, methods of presentation. Lectures and problems. 5 cred.; prereq., Arch 23; 8aHr(UF).
- 75w—Landscape Design. Continuation of Course 74. 5 cred.; 305En(UF).
- 76s—Landscape Construction and Maintenance. Construction and maintenance of turf for lawns, golf courses, and other play areas; garden architecture, grad-

ing, planting and care, cost of construction. Lectures, field trips, and reports. 5 cred.; prereq., 75; 8aHr(UF).

77w—Principles of Landscape Design. (For senior professional agricultural engineers only.) Study of the principles underlying the arrangement of land and landscape for human use and amusement. 3 cred.; no prereq.; III TThS; 102Hr(UF).

MATHEMATICS AND MECHANICS

MATHEMATICS

Entering freshmen will register for Course 11 if they have had high school higher algebra; otherwise for Course 9.

9f,w,s—Higher Algebra. (High school.) Fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, complex quantities, quadratic equations, numerical exercises. No cred.; no prereq. Mr. Brooke.

- | | | |
|----|--------------------|----------------------------|
| 9f | (1) III MWThFS; 3E | (7) IV MTWFS; 3E |
| | (2) III MWThFS; 4E | (8) IV MTWFS; 4E |
| | (3) V MTWFS; 3E | (9) I MWThFS; 3E |
| | (4) V MTWFS; 4E | (10) VI MTWThF; 3E |
| | (5) II MTWThF; 3E | (11) XI(6:30) MTWThF; 205E |
| | (6) VII MTWThF; 3E | |
| 9w | (1) III MWThFS; 3E | (3) V MTWFS; 136E |
| | (2) II MTWThF; 3E | |
| 9s | V MTWFS; 5E | |

10f,w,su—Solid Geometry. See 10f,w,su under Department of Drawing and Descriptive Geometry.

11f,w,s—College Algebra. Theory of quadratic equations, interpretation of complex results, graphical representation, indeterminate equations, ratio, proportion, variation, progressions, series, undetermined coefficients, binomial theorem, logarithms, theory of equations, Horner's method. 5 cred.; prereq., higher algebra. Mr. Saibel.

- | | | |
|-----|---------------------|----------------------------|
| 11f | (1) III MWThFS; 21E | (8) IV MTWFS; 21E |
| | (2) III MWThFS; 22E | (9) IV MTWFS; 22E |
| | (3) V MTWFS; 21E | (10) I MWThFS; 21E |
| | (4) II MTWThF; 21E | (11) I MWThFS; 22E |
| | (5) II MTWThF; 22E | (12) VI MTWThF; 4E |
| | (6) VII MTWThF; 21E | (13) XI(6:30) MTWThF; 203E |
| | (7) VII MTWThF; 22E | |
| 11w | (1) III MWThFS; 4E | (8) IV MTWFS; 3E |
| | (2) III MWThFS; 7E | (9) IV MTWFS; 4E |
| | (3) V MTWFS; 3E | (10) I MTWThF; 3E |
| | (4) V MTWFS; 4E | (11) I MTWThF; 4E |
| | (5) II MTWThF; 4E | (12) VIII MTWF, VI Th; 3E |
| | (6) II MTWThF; 215E | (13) XI(6:30) MTWThF; 205E |
| | (7) VII MTWThF; 3E | |
| 11s | (1) III MWThFS; 3E | (4) II MTWThF; 4E |
| | (2) V MTWFS; 3E | (5) VII MWThF, VI T; 3E |
| | (3) II MTWThF; 3E | (6) IV TWFS, VI Th; 3E |

12f,w,s—Trigonometry. Graphical representation of functions, computation by logarithms and slide rule. Trigonometric functions, plane right triangles, reduction formulas, fundamental relations, addition formulas, double angles,

half angles, identities and equations, inverse functions, oblique triangles, De Moivre's theorem, spherical right triangles. 5 cred.; prereq., 9 or equiv.
Mr. McClintock.

- | | | |
|-----|---------------------------|-----------------------------|
| 12f | V MTWFS; 136E | (6) I MTWThF; 21E |
| 12w | (1) III MWThFS; 22E | (7) I MTWThF; 22E |
| | (2) V MTWFS; 21E | (8) VIII MTWF, VI Th; 4E |
| | (3) II MTWThF; 22E | (9) VIII MTWF, VI Th; 22E |
| | (4) VII MTWThF; 4E | (10) XI (6:30) MTWThF; 203E |
| | (5) IV MTWFS; 21E | (7) IV MTFS, VI Th; 4E |
| 12s | (1) III MWThFS; 4E | (8) I MTWThF; 4E |
| | (2) III MWThFS; 22E | (9) I MTWThF; 205E |
| | (3) V MTWFS; 4E | (10) V MTWFS; 104E |
| | (4) II MTWThF; 205E | (11) XI (6:30) MTWThF; 205E |
| | (5) VII MWThF, VI T; 4E | |
| | (6) VII MWThF, VI T; 205E | |

13f,w,s,su—Analytical Geometry. Co-ordinate systems, locus and equation, straight line, circle, parabola, ellipse, hyperbola. Transformation of co-ordinates and simplification of equations. Polar co-ordinates, higher plane curves, tangents, normals. Empirical equations, solid analytic geometry. 5 cred.; prereq., 11 and 12. Mr. Branovan.

- | | | |
|-----|--------------------------|----------------------------|
| 13f | (1) VI MTWF, II S; 21E | (4) III MTWThF; 136E |
| | (2) VIII MTWThF; 205E | (5) V MTWFS; 106E |
| | (3) III MTWThF; 104E | |
| 13w | (1) II MTWThF; 136E | (2) VI MTWThF; 136E |
| 13s | (1) III MWThFS; 5E | (5) IV TWFS, VI Th; 22E |
| | (2) V MTWFS; 106E | (6) I MTWThF; 22E |
| | (3) II MTWThF; 22E | (7) V MTWFS; 22E |
| | (4) VII MWThF, VI T; 22E | (8) XI (6:30) MTWThF; 203E |

24f,w,s—Differential Calculus. Limit, derivative, simple applications of derivative, maxima and minima, differentials, rates, change of variables, radius of curvature, mean value, indeterminate forms, partial differentiation, series. 5 cred.; prereq., 13. Mr. Siler.

- | | | |
|-----|-------------------------|-----------------------|
| 24f | (1) II MTWThF; 106E | (5) III MTWThF; 106E |
| | (2) IV MTWFS; 106E | (6) VIII MTWThF; 203E |
| | (3) I MTWThF; 106E | (7) III MTWThF; 215E |
| | (4) VI MTWF; II S; 22E | |
| 24w | (1) VI MTWF, II S; 106E | (4) III MTWThF; 106E |
| | (2) VI MTWF, II S; 104E | (5) IV MTWFS; 104E |
| | (3) VII MTWThF; 106E | (6) I MTWThF; 104E |
| 24s | (1) I MTWThF; 104E | (2) V MTWFS; 136E |

25f,w,s,su—Integral Calculus. Expansion of functions, Taylor's theorem. Standard elementary forms, definite integral, rational fractions, integration by substitution, by parts, reduction formulas, integration a process of summation, successive and partial integration, elementary ordinary differential equations. 5 cred.; prereq., 24. Mr. Dalaker.

- | | | |
|-----|---------------------|----------------------------|
| 25f | V MTWFS; 205E | (4) VII MTWThF; 136E |
| 25w | (1) II MTWThF; 205E | (5) III MTWThF; 136E |
| | (2) IV MTWFS; 205E | (6) III MTWThF; 203E |
| | (3) I MTWThF; 106E | (3) VIII MWThF, VI T; 215E |
| 25s | (1) VI MTWThF; 104E | (4) III MTWThF; 104E |
| | (2) II MTWThF; 203E | |

91f—Calculus (Arch., pre-bus.). Short course, derivatives, maxima and minima, integration of simple forms, definite integrals, areas. 4 cred.; prereq., 13. Mr. Wilcox.

91f II MWF, III Th; 205E

91w II MWThF; 5E

151f—Differential Equations. Differential equations and their solutions. First order and first degree, first order and higher degree, singular solutions; total differential equations, linear differential equations, miscellaneous methods, system of simultaneous equations, integration in series. Partial differential equations. 3 cred.; prereq., 25; IV MWF, 7E.

152w-153s—Advanced Calculus and Applications. 3 cred. per qtr.; prereq., 151; IV MWF; 7E.

157f-158w-159s—Determinants and Solid Analytical Geometry. An advanced course. 3 cred. per qtr.; prereq., 151. (Not offered in 1929-30.)

254f-255w-256s—Modern Analysis. Based on Whittaker and Watson's text. 3 cred. per qtr.; prereq., 153. (Not offered in 1929-30.)

261f-262w-263s—Functions of a Complex Variable. Elliptic functions and integrals with applications. 3 cred. per qtr.; prereq., 153. Mr. Dalaker.

264f-265w-266s—Advanced Topics in Functions of Complex Variable. 3 cred. per qtr.; prereq., 263. Mr. Dalaker.

MECHANICS

26f,w,s,su—Technical Mechanics: Statics. Characteristics of a force, parallelogram law, moments, couples, resultant of a force system, equilibrium of a force system, frictions, centroids, moments of inertia, catenary. 5 cred.; prereq., 25. Messrs. Herrick and Doeringsfeld.

26f (1) V MTWFS; 215E

(2) II MTWThF; 215E

26w II MTWThF; 106E

26s (1) II MTWThF; 106E

(4) III MTWThF; 136E

(2) IV MTWFS; 106E

(5) VII MWThF, IV S; 104E

(3) VI MTWThF; 106E

84f,s—Technical Mechanics. (Chem., Ch.E., Agr.E., and Pre-bus.) Statics, resolution of forces, conditions of equilibrium, center of gravity, moment of inertia, stresses in framed structures, and machines, kinematics, dynamics of a particle. Newton's laws of motion, work, energy, power, impulse, and momentum. 5 cred.; prereq., 25. Mr. Doeringsfeld.

84f II MWF, VI TTh; 7E

84s III MTWThF; 203E

92w—Mechanics for Architects. Statics, resolution of forces, conditions of equilibrium, center of gravity, moment of inertia of plane sections, stresses in framed structures. 4 cred.; prereq., 91; IV MWF, III Th; 320E. Mr. Wilcox.

127f,w,s—Technical Mechanics: Dynamics. Force, mass, acceleration, translation and rotation, gyroscope, governors, work, energy, power, conservation of energy, impulse, momentum, loss of kinetic energy, conservation of momentum. 5 cred.; prereq., 26. Messrs. Wilcox, Herrmann, and Doeringsfeld.

127f (1) II MTWThF; 104E

(3) III MTWThF; 203E

(2) I MTWThF; 203E

127w (1) VI TWThF, I S; 203E

(3) III MTWFS; 205E

(2) I MTWThF; 203E

(4) IV MTWFS; 106E

127s (1) II MTWThF; 136E

(3) II MTWThF; 215E

(2) III MTWThF; 106E

161f-162w-163s—Advanced Technical Mechanics. Special problems in the dynamics of machinery; vibration, balancing, whirling shafts, rapidly rotating disks, dynamical stability, gyroscope. 3 cred. per qtr.; prereq., 127. Mr. Wilcox.

161f IV MWF; 36E

162w I MWF; 7E

163s I MWF; 5E

267f-268w-269s—Advanced Dynamics. Text, Routh's *Rigid Dynamics*, Vol. I. 3 cred. per qtr.; prereq., 153. Mr. Brooke.

274f-275w-276s—Advanced Dynamics of a Particle. 3 cred. per qtr.; prereq., 127. Mr. Brooke.

277f-278w-279s—Advanced Statics. Text, Routh's *Analytical Statics*. 3 cred. per qtr.; prereq., 127. (Not offered in 1920-30.)

MATERIALS

85f—Strength of Materials with Laboratory. (Ch.E., Agr.E., and Pre-bus.) Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, dynamic stresses. 4 cred.; prereq., 84. Mr. Miller.

Lect. II MWF; 206E

Lab. VI-VII M; Ex

93s—Strength of Materials. (Arch.) Mechanical and elastic properties of materials of construction, design of riveted joints, beam theory, columns, arches. 4 cred.; prereq., 91; IV MTWF; 136E. Mr. Wilcox.

128f,w,s—Strength of Materials. Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, hollow cylinder rollers, plates, curved bars, springs, dynamic stresses, true stresses. 5 cred.; prereq., 26. Messrs. Priester and Miller.

128f (1) II MTWThF; 203E

(3) III MWThFS; 206E

(2) I MTWThF; 104E

128w (1) II MTWThF; 203E

(3) III MTWThF; 215E

(2) I MTWThF; 136E

128s (1) I MTWFS; 106E

(3) III MTWThF; 215E

(2) I MTWFS; 136E

(4) IV MTWFS; 205E

141f,w,s—Materials Testing Laboratory. Investigation of the physical properties of various metals and engineering materials (wood, cement, ropes, etc.) Standard methods of testing. 2 cred.; prereq., 128 or reg. in 128. Messrs. Priester and Miller.

141f Lect. (1) III T; 110Ex

(2) IV S; 110Ex

Lab. (1) VII-IX F; Ex

(3) VII-IX T; Ex

(2) VII-IX W; Ex

141w Lect. (1) VI W; 110Ex

(2) VI Th; 110Ex

Lab. (1) VII-IX Th; Ex

(3) VII-IX M; Ex

(2) I-III S; Ex

(4) VII-IX F; Ex

141s Lect. (1) VI T; 110Ex

(2) VI W; 110Ex

Lab. (1) I-III Th; Ex

(3) VI-VIII M; Ex

(2) II-IV S; Ex

(4) VII-IX W; Ex

144w—Materials Testing Laboratory. (Mines.) Four laboratory hours with Mech. 101. VI-IX Th; Ex. Mr. Priester.

180f-181w-182s—Advanced Strength of Materials. Special problems in applied elasticity. 3 cred. per qtr.; prereq., 128; IV MWF; 206E. Mr. Priester.

- 184f-185w-186s—Advanced Testing Materials Laboratory. Special problems relating to the physical properties of engineering materials. 2 cred. per qtr.; prereq., 141. Mr. Priester.
- 204f-205w-206s—Mathematical Theory of Elasticity. 3 cred. per qtr.; prereq., 128, 153. (Not offered in 1929-30.)

HYDRAULICS

- 86w—Hydraulics with Laboratory. (Ch.E., and Agr.E.) Hydrostatics, Bernoulli's theorem, flow through orifices, pipes, and over weirs, dynamic action of jets and streams, flow of gases through pipes. 3 cred.; prereq., 84. Mr. Doeringsfeld.
- Lect. I MF; 5E
- Lab. VI-VII W; Ex
- 129f,w,s—Hydraulics. Laws of equilibrium of fluids, flow through orifices and over weirs, pressure and flow through tubes and pipes, flow in conduits and rivers, dynamic pressure of water, elementary principles of turbines and pumps. 4 cred.; prereq., 26. Messrs. Boehnlein and Barker.
- | | | |
|------|--|--------------------|
| 129f | (1) III MWFS; 205E
(2) I MTWF; 205E | (3) IV TWFS; 209Ex |
| 129w | (1) II MTWF; 104E
(2) IV MWFS; 215E | (3) I MTWF; 205E |
| 129s | (1) II MTFS; 104E
(2) IV MTWF; 203E | (3) III MTWF; 205E |
- 143f,w,s—Hydraulics Laboratory. Experimental and demonstrational work. Pressure head, Piezometer tubes, gages, stability of flotation, Bernoulli's theorem. Venturi meter, flow through orifices, over weirs, and through pipes. Open channels, gaging, impact on vanes, pumps, and hydraulic machines. 1 cred.; prereq., 129 or reg. in 129. Messrs. Boehnlein and Barker.
- | | | |
|------|---|---------------------------------------|
| 143f | (1) I-II T; Ex
(2) VI-VII T; Ex | (3) I-II S; Ex |
| 143w | (1) VIII-IX Th; Ex
(2) VIII-IX T; Ex | (3) II-III Th; Ex |
| 143s | (1) VIII-IX M; Ex
(2) VIII-IX Th; Ex | (3) VIII-IX W; Ex
(4) III-IV T; Ex |
- 191w—Hydraulic Motors and Pumps. Study of the hydraulic theory of the ram, impulse wheel, reaction turbine, and centrifugal pump. 3 cred.; prereq., 129.
- 192s—Hydraulic Motors Laboratory. Experimental study of the characteristics of the hydraulic ram, centrifugal pump, reaction turbine, and impulse wheel. 3 cred.; prereq., 129.
- NOTE.—It is advisable but not necessary that this course be preceded by 191.
- 193f—Hydraulic Measurements. Detailed study of the current meter. Venturi meter, weir, orifice, traveling screen, chemical method of gaging, etc. 3 cred.; prereq., 129.

MECHANICAL ENGINEERING

MACHINE CONSTRUCTION

11f,w,s—Pattern Practice. Study and application of methods and principles used in constructing and using patterns and core-boxes in the production of castings. Shop drawings and materials used. Manipulation and care of wood-working tools and machinery. Inspection trips and reports. 2 cred.; no prereq. Mr. Richards.

11f	Lect.	(1) VI Th; 202ME	(4) IV F; 202ME
		(2) IX F; 202ME	(5) III W; 202ME
		(3) VI F; 202ME	(Pre-dent.) IX M; 202ME
Lab.	(1) VII-IX T, IV-V M	(2) I-III Th, VII-VIII F	(4) IV-V W, I-III F
		(3) V-VI T, I-III S	(5) I-III M, I-II W
		(Pre-dent.) VII-VIII M, VII-IX W	
11w	Lect.	(1) VI F; 202ME	(4) IV F; 202ME
		(2) IX F; 202ME	(5) III W; 202ME
		(3) VI Th; 202ME	(Pre-dent.) IX W; 202ME
Lab.	(1) IV-V M, VII-IX T	(2) I-III Th, VII-VIII F	(4) IV-V W, I-III F
		(3) V-VI T, I-III S	(5) I-III M, I-II W
		(Pre-dent.) VII-IX M, VII-VIII W	
11s	Lect.	(1) IV S; 202ME	(4) IV M; 202ME
		(2) VIII W; 202ME	(5) III W; 202ME
		(3) III S; 202ME	(Pre-dent.) IX M; 202ME
Lab.	(1) VII-IX T, V-VI F	(2) VII-VIII W, I-III Th	(4) I-III M, IV-V W
		(3) III-IV T, I-II S	(5) I-II W, I-III F
		(Pre-dent.) VII-VIII M, VII-IX F	

12f,w,s—Foundry Practice. Theory and practice in mixing, molding, and casting of ferrous and non-ferrous metals. Preparation of materials used in making cores and molds. Bench, floor, and machine molding. Inspection trips and reports. 2 cred.; no prereq. Mr. Moffett.

12f	Lect.	(1) VI Th; 153ME	(5) I M; 153ME
		(2) VII F; 153ME	(Chem.) II T; 153ME
		(3) VI F; 153ME	(Pre-dent.) VII W; 153ME
		(4) I F; 153ME	
Lab.	(1) VII-IX T, IV-V M	(2) I-III Th, VIII-IX F	(5) II-III M, I-III W
		(3) V-VI T, I-III S	(Chem.) III-IV T, VII-X Th
		(4) IV-V W, II-IV F	(Pre-dent.) VII-IX M, VIII-IX W
12w	Lect.	(1) VI F; 153ME	(5) I M; 153ME
		(2) VII F; 153ME	(Chem.) VII T; 153ME
		(3) VI Th; 153ME	(Pre-dent.) VII M; 153ME
		(4) I F; 153ME	
Lab.	(1) VII-IX T, IV-V M	(2) I-III Th, VIII-IX F	(5) II-III M, I-III W
		(3) V-VI T, I-III S	(Chem.) VIII-IX T, VII-IX Th
		(4) IV-V W, II-IV F	(Pre-dent.) VIII-IX M, VII-IX W
12s	Lect.	(1) IV S; 153ME	(5) I W; 153ME
		(2) I Th; 153ME	(Chem.) VI T; 153ME
		(3) I S; 153ME	(Pre-dent.) VII M; 153ME
		(4) I M; 153ME	
Lab.	(1) VII-IX T, V-VI F	(2) VII-IX W, II-III Th	(5) II-III W; I-III F
		(3) III-IV T, II-III S	(Chem.) I-II T, VII-IX Th
		(4) II-IV M, IV-V W	(Pre-dent.) VIII-IX M, VII-IX F

13f,w,s—Forge Practice. Lectures and discussions on modern forge and drop-forge practices, industrial welding methods, steels and their treatment. Prac-

tice in welding, hardening, tempering, and die forging. Plants inspection and reports. 2 cred.; no prereq. Mr. Hughes.

- | | | | |
|------|-------------------------|---------------------------------|--------------------------|
| 13f | Lect. | (1) VI F; 252ME | (5) I W; 202ME |
| | | (2) I Th; 202ME | (Chem.) VII T; 202ME |
| | | (3) VI Th; 254ME | (Pre-dent.) VII M; 202ME |
| | | (4) I F; 154ME | |
| Lab. | (1) VII-IX T, IV-V M | (5) I-III M, II-III W | |
| | (2) II-III Th, VII-IX F | (Chem.) II-IV T, VIII-IX Th | |
| | (3) V-VI T; I-III S | (Pre-dent.) VIII-IX M, VII-IX W | |
| | (4) IV-V W, II-IV F | | |
| 13w | Lect. | (1) VI F; 252ME | (5) I W; 254ME |
| | | (2) I Th; 202ME | (Chem.) VII T; 202ME |
| | | (3) VI Th; 202ME | (Pre-dent.) VII M; 202ME |
| | | (4) I F; 254ME | |
| Lab. | (1) VII-IX T, IV-V M | (5) I-III M, II-III W | |
| | (2) II-III Th, VII-IX F | (Chem.) II-IV T, VIII-IX Th | |
| | (3) V-VI T, I-III S | (Pre-dent.) VIII-IX M, VII-IX W | |
| | (4) IV-V W, II-IV F | | |
| 13s | Lect. | (1) IV S; 202ME | (5) I W; 202ME |
| | | (2) VII W; 202ME | (Chem.) VI T; 202ME |
| | | (3) III T; 202ME | (Pre-dent.) VII M; 202ME |
| | | (4) I M; 202ME | |
| Lab. | (1) VII-IX T, V-VI F | (5) II-III W, I-III F | |
| | (2) VIII-IX W, I-III Th | (Chem.) I-II T, VII-IX Th | |
| | (3) IV-V T, I-III S | (Pre-dent.) VIII-IX M, VII-IX F | |
| | (4) II-IV M, IV-V W | | |

14w,su—Machine Shop Practice. Care and operation of machine tools; screw cutting, taper turning, and gear cutting, including spur, helical, worm, and bevel gears. 3 cred.; prereq. 11, 12, 13. Mr. Rogers.

- | | | |
|-----|--------------|---------------------|
| 14w | (1) I-IV WF | (3) VI-IX T, II-V S |
| | (2) VI-IX MW | |

15s,su—Advanced Machine Practice. Manufacturing methods, quantity production; also carbonizing and heat treatment of steel, autogenous welding and brazing. 3 cred.; prereq., 14. Mr. Rogers.

- | | | |
|-----|--------------|-------------|
| 15s | (1) I-IV TW | (3) I-IV MF |
| | (2) VI-IX MW | |

16f—Machine Shop Practice. Elementary course in machine work arranged especially for students in electrical engineering. 2 cred.; prereq., 11, 12, 13. Mr. Rogers.

- | | |
|--------------------------------|---------------|
| (1) II-III, VII-VIII M, V-VI T | (3) VII-IX TF |
| | (2) II-IV WF |

17f,w,s—Machine Shop Practice. (Chem. and chem. engr.) 2 cred.; no prereq. Mr. Rogers.

- | | | |
|-----|---------------------|--------------------------|
| 17f | Lect. VII Th; 154ME | Lab. II-IV T, VIII-IX Th |
| 17w | Lect. III T; 254ME | Lab. II-IV T, VIII-IX Th |
| 17s | Lect. III T; 154ME | Lab. V-VII T, VII-IX Th |

18f,w,s—General Woodworking. For teachers desiring elementary or advanced practice in manual training, wood turning, and pattern making. Planning and layout of projects, materials used, care and operation of woodworking tools and machinery; selection and installation of equipment. 3 cred.; no prereq. Mr. Richards.

19f—Mechanical Technology. Study of mechanical processes involved in various manufacturing industries and in the development and utilization of power.

Lectures by various specialists. 1 cred.; open only to soph., jr., and sr.; IV MF; 305E. Mr. Richards.

110f,w,s-111f,w,s—Tool Design and Construction. Tools, jigs, dies, and fixtures for manufacturing interchangeable parts. 3 cred. per qtr.; prereq., 15. Mr. Rogers.

MACHINE DESIGN

21f—Elementary Machine Design. Screws, rivets, machine keys, cotttered joints and connections, hubs and rims of rotating parts. Factors of safety, drawing room systems and conventions. Lectures and drafting. 2 cred.; prereq., Dr. 29. Mr. Martenis.

(1) VI-VIII M, II-IV S; 151ME

(3) VI-VIII TF; 255ME

(2) VI-VIII TTh; 151ME

22f—Mechanism. Motion studies. Revolving and oscillating bodies, linkages, chains, flexible connectors, gearing, wheels in trains, epicyclic gear trains, worm and wheel, screws, straight line motions, hoists, pulley blocks, ratchets, intermittent motions. Recitations and problems. 3 cred.; prereq., 24 and M.&M. 24. Mr. Martenis.

(1) I TThS; 252ME

(3) II TTh, I F; 252ME

(2) III MWF; 252ME

23w—Mechanism and Kinematics. (E.E.) Transmission of motion. Levers, linkwork, flexible connections, gearing, screws, cams, epicyclic trains, parallel motions, quick return motions, graphical studies of velocities. Intermittent motion, escapements. Recitations and problems. 3 cred.; prereq., Dr. 27 and M.&M. 24. Mr. Martenis.

(1) III TThS; 252ME

(3) I MWF; 252ME

(2) IV TS, VI Th; 252ME

(4) III MWF; 252ME

24s—Kinematics. Instant centers, centroids, point paths, gear tooth profiles, cam construction, velocity diagrams. Lectures and drafting. 2 cred.; prereq., Phys. 3. Mr. Martenis.

(1) I-III ThS; 255ME

(3) II-IV TW; 255ME

(2) VII-IX Th, VI-VIII F; 255ME

25w—Machine Design. Riveted joints, screwed fastenings, shafts and couplings, strength of gear teeth, flywheels, engine details, machine frames, steam piping, bearings. Lectures and drafting. 3 cred.; prereq., 22. Mr. Martenis.

Lect. (1) IV WF; 252ME

(3) I TTh; 254ME

(2) II MW; 254ME

Lab. (1) VI-VIII TF; 255ME

(3) VI-VII Th, I-III S; 255ME

(2) II-IV T, VII-IX W; 255ME

26s—Machine Design. Design of machines and hoisting equipment with reference to complex stresses. Lectures and recitations. 3 cred.; prereq., 25, M.&M. 128. Mr. Flodin.

(1) III MWF; 252ME

(3) IV MWF; 252ME

(2) II WThS; 252ME

27s—Machine Design. (E.E. and Ag.E.) Calculation of machine parts, riveted joints, screwed fastenings, rotating pieces, belted connections, gearing, bearings. Lectures and drafting. 3 cred.; prereq., 23. Mr. Martenis.

Lect. (1) III M; 254ME

(3) I T; 254ME

(2) VI M; 254ME

(4) III W; 254ME

Lab. (1) II-IV T, VII-IX T; 251ME

(3) VII-IX WTh; 251ME

(2) VII-IX MF; 251ME

(4) I-III ThS; 251ME

28f—Machine Design. (Ch.E.) Screw fastenings, riveted joints, belting, shafting, bearings, machine frames, pulleys, etc. Lectures, drafting, and problems. 3 cred.; prereq., M&M. 84.

Lect. III S; 254ME

Lab. VII-IX WF; 151ME

121f-122w-123s—Advanced Engineering Design. Problems selected to suit the student's special interest. Automatic machines; machines for quantity production; materials handling and heavy plant equipment. Drafting and problems. 2 cred. per qtr.; prereq., 26. Mr. Flodin.

121f VII-IX MTh; 251ME

122w VII-IX MTh; 151ME

123s VII-IX MW; 151ME

STEAM ENGINEERING

30f—Steam Engineering. Elementary study of the steam power plant, including boilers, stokers, furnaces, fuels, combustion, steam generation, and prime movers. 3 cred.; prereq., Phys. 23. Mr. DuPriest.

(1) III MWF; 251ME

(3) II MWF; 251ME

(2) III TThS; 251ME

(4) IV MWF; 251ME

31w—Thermodynamics. Heat and mechanical energy and the laws governing the operation of machines used to convert heat energy into mechanical energy. Steam, gas, and oil engines, air compressors, refrigeration machines, and turbines. 3 cred.; prereq., 30. Mr. DuPriest.

(1) III TTh, VI-VIII M; 154ME

(3) II WF, VI-VIII T; 154ME

(2) III WF, VI-VIII F; 154ME

32f—Elementary Mechanical Laboratory. Calibration of pressure gages, anemometers, indicator springs. Use of steam calorimeters, planimeters, indicators. Calculations from indicator cards. Tests of mechanical appliances, lubricating oils. 2 cred.; prereq., reg. in 30. Mr. Larson.

(1) VI-IX T, VI-VIII F; Ex

(4) VI-VII M, VI-IX W; Ex

(2) VI-VII T, VI-IX F; Ex

(5) VI-IX Th, I-II S; Ex

(3) VI-IX M, VI-VII W; Ex

(6) VI-VII Th, I-IV S; Ex

33w—Mechanical Laboratory. Calibration of tachometers, pyrometers, steam flow meters. Valve setting. Flow of steam through orifices. Test of steam trap, surface condenser, simple steam engine. Inspection trip. 2 cred.; prereq., 32. Mr. Larson.

(1) VI-IX W, I-II S; Ex

(4) VI-VII M, VI-IX Th; Ex

(2) VI-VII W, I-IV S; Ex

(5) I-II M, VI-IX F; Ex

(3) VI-IX M, VI-VII Th; Ex

34s—Elementary Steam and Power Laboratory. Friction test of oils. Test of hot air engine, centrifugal fan, injector, steam pump, steam boiler. Calibration of transmission dynamometer. Power study of industrial machines. Approximate analysis of fuels. Use of Mahler, Bomb, and Junkers calorimeters. 2 cred.; prereq., 33. Mr. Larson.

(1) VI-IX W, VI-VII F; Ex

(4) VI-VII M, VI-IX T; Ex

(2) VI-VII W, VI-IX F; Ex

(5) VI-IX Th, I-II S; Ex

(3) VI-IX M, VI-VII T; Ex

35f—Elementary General Laboratory. (Mines.) Calibration of pressure gages, anemometers. Use of steam calorimeters, planimeters. Steam indicator practice, card calculation, valve setting. Tests of oils, simple steam engine and steam pump. 4 hours; prereq. with Mech. 112; VI-IX Th. Mr. Shoop.

- 135f—Design of Steam Machinery. Piping systems, boiler and engine details, settings, valve gears, governors, turning moment diagrams, flywheel weights, etc. 2 cred.; prereq., 141; VII-IX MTh; 251ME. Mr. Shoop.
- 136f-137w—Heat Engines. (E.E.) Properties of steam; principle of operation of steam machinery; fuels, combustion, and smoke prevention; construction, operation and testing of engines, turbines, boilers, condensers, pumps, and power plant equipment. Selection of equipment for different types of plants. 3 cred. per qtr.; prereq., Phys. 23. Mr. Nielsen.
- | | |
|------------------------|-------------------|
| Rec. (1) II WF; 110Ex | (3) III WF; 110Ex |
| (2) II WF; 215Ex | (4) III WF; 215Ex |
| Lab. (1) VI-VIII F; Ex | (3) I-III Th; Ex |
| (2) VI-VIII Th; Ex | (4) VI-VIII M; Ex |
- 138w-139s—Heat Engines. (Chem. engr.) Study of steam properties, steam calorimetry, elementary thermodynamics, fuels, and combustion; calibration and use of instruments; valve setting; operation and testing of steam engines, boilers, compressors, stage evaporators, water heaters, and purifiers, gas engines, etc. Selection of equipment for power plants. 4 cred. for 138w; 3 cred. for 139s; prereq., Phys. 23. Mr. Nielsen.
- | | |
|-------------------------|------------------|
| 138w Rec. IV MWF; 215Ex | Lab. VI-IX F; Ex |
| 139s Rec. IV WF; 215Ex | Lab. VI-IX M; Ex |
- 140f,w,s—Heat Engines. (C.E. and arch.) Steam generation and properties. Fuels and combustion. Construction and operation of boilers and auxiliaries. Elementary thermodynamics. Use and calibration of engine-room instruments. Types, details, and tests of steam engines, steam turbines, gas engines, and air compressors. Performance and adaptability of power equipment. 4 cred.; prereq., Phys. 23.
- | | |
|---------------------------|------------------|
| 140f Rec. IV MWF; 215Ex | (2) I-IV S; Ex |
| Lab. (1) VI-IX W; Ex | Lab. VI-IX W; Ex |
| 140w,s Rec. I TThS; 209Ex | |
- 141s—Thermodynamics. Elementary principles of thermodynamics as applied to heat motors and power plant equipment. Treatment of the actual and ideal cycles. 3 cred.; prereq., 31. Mr. DuPriest.
- | | |
|------------------------------|------------------------------|
| (1) I TS, VII-IX Th; 154ME | (3) II TTh, VI-VIII T; 154ME |
| (2) III MW, VI-VIII F; 154ME | |
- 142w—Steam Turbines. Theory and practice applied to various types. Thermodynamics and mechanical analysis of problems involved in the design of nozzles, blades, rotors, etc. Condition of operation; systems of transmission; lubrication; economy; field of service. Laboratory investigation. 3 cred.; prereq., 141; IV MWF; 209Ex. Mr. Shoop.
- 143w—Applied Thermodynamics. Laws of heat transmission, mean temperature difference, in condensers, boilers, brine coils, feed water heaters. Treatment of cooling towers, accumulators, multiple stills, stage evaporators, vapor refrigeration; air compressors, multi staging, intercooling, etc. 3 cred.; prereq., 141; III MWF; 209Ex. Mr. Shoop.
- 144f—Power Plant Machinery. Advanced study and application of engines, stokers, boilers, fans, purifiers, heaters, coal- and ash-handling equipment, etc. 3 cred.; prereq., 31; IV MWF; 254ME. Mr. Shoop.
- 145s—Design of Power Plant Units. Treatment of condensers, air pumps, cooling towers, stage evaporators, reheaters, etc. 2 cred.; prereq., 149; VII-IX T, I-III S; 151ME. Mr. Shoop.

- 146s—Fuels and Combustion. Fuels: classification and analyses. Hand and stoker treatment; regulation. Pulverized and liquid fuels. Types of burners, controls. Combustion: generation of heat; furnace gases; stratification; flame way; smoke prevention. Furnaces. Lectures and recitations. 3 cred.; prereq., 31; IV MWF; 215Ex. Mr. Shoop.
- 147w—Advanced General Laboratory. (Mines.) (a) Tests of air compressor, steam turbine, compound steam engine, centrifugal fan, gas engine. (b) The use of hydraulic measuring devices, weirs, differential gages, etc., in tests of centrifugal pumps, hydraulic turbines and rams. 4 hours; prereq., 35; VI-IX Th; Ex. Mr. Shoop.
- 148f,w—Advanced Steam Laboratory. Tests of steam turbines, uniflow and compound steam engines, condensers, evaporators, and vacuum pumps. Tests of compound steam pump. Air compressor, boiler, superheater, and power plant. Studies of fluid flow meters and air-conditioning apparatus. 2 cred.; prereq., 141. Mr. Shoop.
(1) I-IV, VI-VII T; Ex (2) III-IV, VI-IX T; Ex
- 149s—Design of Steam Machinery. Includes stokers, superheaters, feedwater heaters, feed pumps, automatic controls, etc. 2 cred.; prereq., 135; VII-IX T, I-III S; 151ME. Mr. Shoop.
- 241f—Advanced Thermodynamics. Reversible changes of state and efflux of wet and superheated vapors. Flow of compressible fluids in mains, moving channels, into receivers, and communicating vessels. Gas mixtures, critical points, liquefaction. Power plant cycles: regenerative, reheating, and bleeding. 2 cred.; prereq., 143. Mr. Shoop.
- 242f-243w—Power Plant Design. Problems, designs, and estimates for power plants and central stations. Selection of motive powers, relative advantages of steam, producers, and gas plants. Choice of engines and boilers; pumps, piping, and accessories. 2 cred. per qtr.; prereq., 145. Mr. Shoop.
- 244s—Power Plant Management. Operation and maintenance of boilers, engines, steam turbines, and accessory apparatus. Smoke prevention, lubricants and lubrication. Power plant finance. Daily logs and power costs. Study of recent power researches. 3 cred.; prereq., 144. Mr. Shoop.

GAS ENGINES AND AUTOMOTIVES

- 50f,w,s—Auto and Airplane Engines. Principles and types. Electrical systems. Lubrication and cooling. Carburetors. Accessories. 3 cred.; prereq., 11, 12, 13. Messrs. Robertson and Van Dyke.
50f,s (1) I TThS; 110Ex (2) IV MWF; 110Ex
50w (1) VI MThF; 110Ex (2) II TThS; 110Ex
- 150f—Internal Combustion Engines. Laws of gases; gas cycles. Otto, semi-Diesel, and Diesel engines. Mechanism of various types. Carburetion, governing, cooling, lubrication. Combustion. Gas producers. 3 cred.; prereq., 30, 31. Mr. Robertson.
(1) I MWF; 254ME (2) II MWF; 254ME
- 151w—Advanced Internal Combustion Engines. Special reference to automobile, truck, and airplane engines. Theoretical consideration of fuels, combustion, detonation, lubrication, etc. 3 cred.; prereq., 150; I MWF; 209Ex. Mr. Robertson.

- 152s—Automobile Engine Testing. Use of modern research instruments and methods for testing. Experiments showing effect of fuel mixture, distribution, spark timing, etc., upon general engine performance. 2 cred.; prereq., 151; VII-IX TF; Ex. Mr. Robertson.
- 153s—Automobile Fleet Maintenance. Study of available types of motor coaches and trucks, their design features from a maintenance viewpoint, a survey of service depot requirements with a study of fleet service methods and maintenance practice. Lectures and recitations. 3 cred.; open to seniors only; prereq., 150. Mr. Robertson.
- 155s—Internal Combustion Engines. (E.E.) Laws of gases; gas cycles, Otto, semi-Diesel, and Diesel engines. Carburetion, cooling, lubrication, and governing. Gas producers and power plants. 3 cred.; prereq., 137. Mr. Robertson.
- | | | |
|------|------------------------|-------------------|
| 155s | Rec. (1) II WF; 110Ex | (3) III WF; 110Ex |
| | (2) II WF; 215Ex | (4) III WF; 215Ex |
| | Lab. (1) VI-VIII F; Ex | (3) I-III S; Ex |
| | (2) VI-VIII Th; Ex | (4) I-III Th; Ex |
- 156f,w-157w,s-158s—Design of Internal Combustion Engines. Calculations of inertia forces and size of cylinders for automobile, aircraft, and stationary service. Theoretical diagrams and details of parts. 2 cred.; prereq., 150. Mr. Robertson.
- | | |
|--------|---|
| 156f,w | VII-IX W, I-III S; (f) 251ME; (w) 151ME |
| 157w | VII-IX W, I-III S; 151ME |
| 157s | VII-IX MW; 255ME |
| 158s | VII-IX MW; 255ME |
- 159f,w—Internal Combustion Engine Laboratory. Tests of gasoline, semi-Diesel, and Diesel engines. Power plant units and automotive engines. 2 cred.; prereq., 150 or reg. in 150. Messrs. Robertson and Van Dyke.
- | | |
|------------------------|-------------------------|
| (1) I-IV, VI-VII T; Ex | (2) III-IV, VI-IX T; Ex |
|------------------------|-------------------------|
- 251f-252w-253s—Automobile and Motor Truck Design. Theory and design of the automobile, motor truck engine and chassis, complete design of engine, transmission, and chassis. Lecture and drawing room. 2 cred. per qtr.; grad. Mr. Robertson.
- 254s—Gas Tractor Design. Selection of wheel sizes; horse power weight and drawbar pull. Bearing pressures; ratios and strength of gearing. Details of principal parts. Senior option. 2 cred.; prereq., 156. Mr. Robertson.
- 255f-256w-257s—Automobile Testing and Research. Dynamometer and road tests including over-all efficiency of cars at various speeds, fuel consumption, effect of road surface on traction, efficiencies, and general performances. Special research problems. 2 cred. per qtr.; prereq., 155 or 159. Mr. Robertson.
- 258s—Motor Truck and Bus Transportation. Problems involving motor truck transportation, capacity of trucks, trailers, drawbar pull. Efficiencies. Effect of road surface. Freight handling. Analysis of costs of truck operation and maintenance. Relative costs of transportation. 3 cred.; prereq., 152. Mr. Robertson.

HEATING, VENTILATION, AND REFRIGERATION

- 63s—Heating and Ventilation. Principles of heating and ventilation. Warm air, steam, hot water, vapor, vacuum, and fan systems of heating; pipe systems; heat regulation. Ventilation, synthetic air chart, humidification, central station

- heating. Recitations, lectures. 3 cred.; prereq., M.&M. 127, 128, and reg. in 129. Mr. Martenis.
- Lect. III ThS; 215Ex
 Rec. (1) II W; 209Ex (3) IV T; 215Ex
 (2) II M; 209Ex
- 163f—Heating and Ventilation. (Arch. engr.) Principles of heating and ventilation including the design and layout of warm air, steam, hot water, vapor, vacuum, and fan systems of heating. Requirements and design of ventilating systems. General principles of central station heating. Recitations, lectures, and designs. 4 cred.; prereq., M.&M. 127, 128, 129; II MWF; 209Ex; VI-IX M; 255ME. Mr. Martenis.
- 164s—Heating and Ventilation. (Arch.) Principles of heating and ventilation. Heating systems; furnaces, steam, hot water, vapor, vacuum and fan blast. Piping systems. Ventilation; humidification, synthetic air chart. Temperature regulation. 2 cred.; prereq., M.&M. 92; I TTh; 215Ex. Mr. Martenis.
- 165f,w—Advanced Heating and Ventilating. Special selected problems. 3 cred.; prereq., 63. Mr. Martenis.
- 165f I MWF; 209Ex
 165w I MWF; 154ME
- 166s—Compressed Air and Refrigerator Machinery. (a) Air compressors and motors; power transmission by compressed air. (b) Principles of refrigeration. Various types of refrigerating machines, refrigerants, applications to ice making, cold storage, cooling of air, liquids, and solids. Lectures and recitations. 3 cred.; prereq., 141; I MWF; 110Ex. Mr. Nielsen.
- 167w—Advanced Heating and Ventilation. 3 cred.; prereq., 165; IV MWF; 110Ex. Mr. Martenis.
- 265f,w,s—Advanced Heating and Ventilating. Taken in connection with research work in the laboratory. Credits to be arranged; prereq., 63; open to grad. only. Mr. Martenis.
- 267w—Mechanical Equipment of Buildings. Selection of heating, ventilating, and plumbing systems for various types of buildings. Piping layouts, for fire protection, air, gas, and vacuum cleaning systems, elevators. Designs and layout of equipment. Lectures and drafting. 3 cred.; prereq., 63, Phys. 43. Mr. Martenis.

INDUSTRIAL ENGINEERING

- 170w—Industrial Plants. Factory organization and construction for economical manufacture. Organization of the industry. Location and type of buildings, power development. Layout of plant. Routing systems and machine layout. Heating and ventilating requirements. Lighting. Sanitation. Distribution of power. Welfare features. Lectures, recitations, and drawing room practice. 3 cred.; prereq., sr. with 15 or 16; IV MWF; 154ME. Mr. Koepke.
- 171f—Production Factors. Principles and practice involved in economical production. Standardization. Requirements for uniformity and interchangeability. Jigs, fixtures, and special equipment; gases and inspection systems. Divisions of labor. Conveying, handling, and stores control. Fatigue elimination. 3 cred.; prereq., sr. with 15 or 16; I MWF; 202ME. Mr. Koepke.
- 173s—Industrial Management. General principles. Taylor system; wage, bonus, and profit sharing systems. Maintenance and depreciation. Purchasing.

- Allocation of cost, overhead, and machine burden. Graphical representation. 3 cred.; prereq., 171; I MWF; 154ME. Mr. Koepke.
- 274f—Industrial Management Laboratory. Planning department. Time and motion studies; rate setting. Instruction cards. Production control. Shop practice with investigations in local factories. Lectures, assigned reading practice, and reports. 3 cred.; prereq., 173; IV MWF; 252ME. Mr. Koepke.
- 275w—Industrial Management. Labor administration. Foreman training. Training the worker; job analysis. Employment and turnover; the human element, service departments. Stabilization of labor. Lectures, reading, shop visits, and reports. 3 cred.; prereq., 274; I MWF; 202ME. Mr. Koepke.
- 276s—Safety Engineering. Safety of the worker; fire and other hazards; prevention of industrial accidents. Compensation laws. Fire prevention; construction; automatic sprinkler systems. Effect of safety on production. Factory sanitation. Safety organization. Lectures, assigned reading, factory inspections, and reports. 3 cred.; prereq., 171. Mr. Koepke.
- 277f-278w-279s—Industrial Engineering Problems. Special investigations of practical problems and suggested methods of procedure. Lectures, assigned reading, shop visits, and reports. 3 cred. per qtr.; prereq., 173, 274, 275, or reg. in 274, 275, grad. Mr. Koepke.

NAVAL ARCHITECTURE

- 85f,w,s—Ships and Shipping. Types and sizes of ships, tonnage and classification requirements, factors governing choice of size and type of ship. Introductory course touching on the commercial side of ship design. 1 cred.; open to soph., jr., sr. Mr. Flodin.
- 185f,w,s—Theoretical Naval Architecture. Ship measurement; stability and trim; resistance, coefficients, speed, and powering. 2 cred.; jr., sr., preferably preceded by 85. Mr. Flodin.
- 185f VII-IX MTh; 251ME
185w VII-IX MTh; 151ME
185s VII-IX MW; 151ME
- 186f,w,s—Theoretical Naval Architecture. Strength of ship as a whole, and of various parts of the ship under local stresses; effect of rolling, pitching, and vibration. 2 cred.; open to jr., sr. Mr. Flodin.
- 186f VII-IX MTh; 251ME
186w VII-IX MTh; 151ME
186s VII-IX MW; 151ME
- 187f,w,s—Ship Drawing. Preliminary design of commercial ships, including consideration of mechanical equipment, with special emphasis on river and lake transportation. 2 cred.; prereq., 185, 186. Mr. Flodin.

HYDRAULIC MACHINERY

- 189s—Hydraulic Turbines. Theory of operation, design, construction, and regulation of water turbines. Turbine testing; characteristics, selection of type. Cost of turbines and water power. 3 cred.; sr.; prereq., M.&M. 129; IV MWF; 154ME.

RAILWAY MECHANICAL ENGINEERING

- 281f—Railway Technology. Systematic course of visits to the various railroad shops in the vicinity to study locomotive details and classifications. Loco-

motive practice. Lectures and reports. 1 cred.; prereq., M.&M. 127, 128, 129. Mr. Martenis.

282f-283w-284s—Locomotive Design and Construction. Locomotive details. Design of boiler, cylinders, frame, springs, trucks, axles, wheels, running gear, equalizing arrangements, valve gears, lubrication. Lectures, assigned reading, and drafting. 3 cred. per qtr.; prereq., 271. Mr. Martenis.

SEMINAR AND RESEARCH

190f-191w-192s—Seminar. Reading of assigned articles in current technical press. Classroom presentation of principal features of assigned articles. 1 cred. per qtr.; jr., sr. Messrs. DuPriest and Robertson.

190f	(1) IV S; 154ME	(3) IV S; 254ME
	(2) IV S; 252ME	(4) IV S; ar
191w	(1) IV S; 154ME	(3) IV S; 254ME
	(2) IV S; 202ME	(4) IV S; ar
192s	(1) IV S; 154ME	(3) IV S; 209Ex
	(2) IV S; 254ME	(4) IV S; ar

194s—Advanced Engineering Laboratory. Opportunity will be offered for carrying on investigations and tests of power units, refrigerators, compressors, fans, or other problems as arranged. 2 cred.; prereq., 148, 159. Messrs. Shoop and Robertson.

(1) I-IV T, II-III F; Ex (2) VI-IX Th, I-II S; Ex

290f-291w-292s—Mechanical Engineering Research. Courses may be elected which involve investigations in connection with lubrication, fuels, furnaces, boilers, steam engines, turbines, gas engines, heating and ventilation, industrial and other engineering problems. Reports, special problems, and related tests. Cred. as ar. per qtr.; prereq., 194 or reg. in 194. Messrs. DuPriest, Shoop, Robertson, Martenis, and Koepke.

METALLOGRAPHY

150f—Metallography for Electrical Engineers. Principles of metallography, including pyrometry, thermal analysis, constitution diagrams, microscopic and photomicrographic technique; study of typical alloys with special reference to electrical resistance, conductivity, magnets, etc. Laboratory work and demonstrations. 3 cred.; open to jr., sr. EE. Messrs. Dowdell and Jerabek.

Lect. I MW; 315M Lab. VI-VIII M; 307M

151w—Advanced Metallography for Electrical Engineers. Study of iron and steel, alloy steels, metals and alloys used in electrical engineering practice. Special problems for outside reading and for research. Laboratory work. 3 cred.; prereq., 150. Messrs. Dowdell and Jerabek.

Lect. I MW; 315M Lab. VI-VIII M; 307M

156f—Metallography for Mechanical Engineers. Principles of metallography, including pyrometry, thermal analysis, constitution diagrams, microscopic and photomicrographic technique; metallography and heat treatment of iron and steel. Laboratory work. 3 cred.; prereq., sr. ME. Messrs. Dowdell and Jerabek.

Lect. III ThS; 315M (2) VII-IX F; 307M
Lab. (1) VII-IX W; 307M

- 157w—Advanced Metallography for Mechanical Engineers. Metallography of alloy steels, tool steels, high speed tool steels, and important non-ferrous alloys; metallography applied to engineering practice and specifications. Outside reading and special reports. Laboratory work. 3 cred.; prereq., 156. Messrs. Harder and Jerabek.
 Lect. III ThS; 315M
 Lab. (1) VII-IX W; 307M (2) VII-IX F; 307M

METALLURGY

- 3f—General Metallurgy. Combustion, fuels, refractory materials, furnaces, and fluxes. Lectures and recitations. 3 cred.; prereq., Inorg. Chem. 8 or equiv. I TThS; 108M. Mr. Christianson.
- 4w—Metallurgy of Pig Iron. General principles of iron blast furnace practice. Construction of furnace, handling of stock and products, principles of regulations. Lect. and rec.; 3 cred.; prereq., Metallurgy 3. I TThS; 108M. Mr. Christianson.
- 5s—Metallurgy of Wrought Iron and Steel. General principles involved in the production of wrought iron and steel. Lect. and rec.; 3 cred.; prereq., Metallurgy 4. I TThS; 108M. Mr. Christianson.
- 106f—Metallurgy of the Base Metals. Lead, copper, zinc, and mercury. Consideration of smelting methods and principles involved in refining. Lectures and recitations; 4 cred.; prereq., Metallurgy 3. I F, III TThS; 108M. Mr. Pease.
- 107w—Metallurgy of the Base Metals. 4 cred.; prereq., Metallurgy 106. I F, III TThS; 108M. Mr. Pease.
- 108s—Metallurgy of the Precious Metals. Principles involved and methods used in the extraction of gold, silver, and other precious metals. Lectures and recitations; 4 cred.; prereq., Metallurgy 107. I F, III TThS; 108M. Mr. Pease.
- 109f—Metallurgy of Base Metals. (Ch.E., M.E.) Special consideration is given to mechanical appliances. Lect. and rec.; 3 cred.; prereq., Inorg. Chem. 8, 16 or equivalent. IV MWF; 111M. Messrs. Christianson and Pease.
- 109w—Metallurgy of Base Metals. (Chem. and elect. engr.) Special consideration is given to electrical appliances. Lect. and rec.; 3 cred.; prereq., Inorg. Chem. 8, 16 or equiv. IV MWF; 111M. Messrs. Christianson and Pease.
- 160f—Metallography. (Chem.) Principles of metallography, including constitution diagrams, preparation and standardization of thermocouples, preparation and thermal analysis of alloys, their microscopic examination and photomicrographs; typical alloy systems such as iron carbon (steel, cast iron), and some non-ferrous alloys. Lab. work; 3 cred.; prereq., Anal. Chem. 1, 2. Mr. Harder.
 Lect. III MF
 Lab. (1) VI-VIII Th; 306M (2) Ar
- 161w—Advanced Metallography. (Chem.) Metallography and heat treatment of iron and steel, including alloy steels, commercial uses of various steels, and engineering specifications. Lab. work; 3 cred.; prereq., 160. Mr. Harder.
 Lect. III MF
 Lab. (1) VI-VIII Th; 306M (2) Ar

- 162s—Advanced Metallography. (Chem.) Metallography of the non-ferrous metals with a study of the constitution diagrams, properties, and uses of important commercial alloys. Lab. work; 3 cred.; prereq., 160. Mr. Harder.
Lect. III MF
Lab. (1) VI-VIII Th; 306M (2) Ar
- 163f—Advanced Metallography. Seminar work on recent advances in metallography. Lectures and recitations, with outside reading and special reports. May be accompanied by laboratory work. 3 cred.; prereq., 6 cred. in metallography. Mr. Harder.
- 164w—Advanced Metallography. Advanced consideration of the structures, properties, and uses of metals and alloys. May be accompanied by laboratory work. 3 cred.; prereq., 6 cred. in metallography. Mr. Harder.
- 165s—Advanced Metallography. Technical metallography as applied to the automotive industry. Lectures and special reports. May be accompanied by laboratory work. 3 cred.; prereq., 6 cred. in metallography. Mr. Harder.
- 201f-202w-203s—Advanced Metallography for Graduate Students. Intended primarily for research work. Mr. Harder.

MILITARY SCIENCE AND TACTICS

REQUIRED WORK

All physically fit male students are required to take instruction in military science for three hours each week during the first two undergraduate years of their course. Previous instruction in this subject at other institutions under an officer of the regular army detailed as professor of military science and tactics exempts the student from so much of this work as the length of his prior training justifies in each case. All students taking this course are given the instruction prescribed for the Basic Course, Senior Division, R.O.T.C. No credits are allowed for this work.

ELECTIVE WORK

Students who have completed the Basic Course, R.O.T.C., may be selected for advanced work by the professor of military science and tactics. Those who pursue the Advanced Course are required to sign an agreement with the government to continue the two years' course to completion. This includes attendance at a training camp, held normally during the summer following the first year's advanced work. The camp is conducted free of cost to the student, and in addition, while actually in camp, the student receives the pay prescribed for the seventh grade in the army. Students pursuing the Advanced Course are also furnished a special uniform and receive a fixed allowance per day. The total government compensation for the two years' advanced work amounts to something over \$200. Students who satisfactorily complete the Advanced Course will be commissioned in the Officers' Reserve Corps of the United States Army.

The University allows 18 credits for the two years' Advanced Course, R.O.T.C., in all units except the Signal Corps, in which a total of 21 credits is allowed. These credits may be applied towards graduation.

The Advanced Course for the students of this college embraces three departments: Infantry, Coast (Heavy) Artillery, and Signal Corps, in any of which the student may be enrolled.

1f-2w-3s—First Year Basic Course, R.O.T.C.

Infantry. Practical and theoretical instruction in infantry drill, rifle marksmanship, hygiene and first aid, physical training, military courtesy, infantry equipment and ceremonies. No cred.; no prereq.

Coast Artillery. Duties of the Coast Artillery soldier, military customs and methods. Practical study of one anti-aircraft gun and carriage. Instruction for second class gunner, Coast Artillery, with particular reference to anti-aircraft artillery. No cred.; no prereq.

Signal Corps. Infantry drill and physical training, rifle marksmanship, military courtesy, guard duty, military policy of the United States; basic signal communication; military telegraph apparatus; army organization and organization of signal corps. No cred.; no prereq.

1f-2w (1) I MWF; A (2) IX MWF; A

3s Coast Artillery (1) VII-IX T; A (2) VII-IX W; A

Signal Corps

VII-IX T, A

4f-5w-6s—Second Year Basic Course R.O.T.C.

Infantry. Practical instruction in school of the platoon and company; command and leadership; scouting and patrolling; and automatic rifle; musketry; and interior guard duty. No cred.; prereq., 1-2-3.

Coast Artillery. Duties of non-commissioned officer of Coast Artillery; instruction for first class gunner, Coast Artillery Corps, with particular reference to anti-aircraft artillery. No cred.; prereq., 1-2-3.

Signal Corps. Infantry drill and physical training; military sketching and map reading; military hygiene; army organization and organization of signal troops; basic signal communication; military telegraph apparatus. No cred.; prereq., 1-2-3.

4f-5w Coast Artillery (1) I TThS; A (2) II TThS; A

Signal Corps

(1) I MWF; A (2) IX MWF; A

6s VII-IX T; A

51f-52w-53s—First Year Advanced Course R.O.T.C.

Infantry. Field engineering and combat principles; military sketching and map reading; machine gun; and command and leadership. 3 cred. per qtr.; prereq., 4-5-6.

Coast Artillery. Duties of the Coast Artillery officer; guns; carriages and gunnery, analysis, instruction for expert gunner, with particular reference to anti-aircraft artillery. 3 cred. per qtr.; prereq., 4-5-6.

Signal Corps. Command and leadership; minor tactics; field engineering; army administration; codes and ciphers; hippology; message centers; communication engineering (Electric Communication, E.E. 61-63-65.) 1 cred. per qtr.; prereq., 4-5-6, and reg. in E.E. 61-63-65.

51f-52w Coast Artillery. Major Shippam. (2) II MWF; A

Rec. (1) IV MWF; A (2) VIII-IX M; A

Lab. (1) VIII-IX W; A (2) II MWF; A

53s Rec. (1) IV MWF; A (2) II MWF; A

Lab. (1) VII-IX T; A (2) III, IX T; A

Signal Corps. Lieut. Minckler.

51f-52w III Th, VI M; 321EE

53s VII-IX T, III Th; 136EE

54f-55w-56s—Second Year Advanced Course R.O.T.C.

Infantry. 37 mm. gun; 3" trench mortar; administration; military history and national defense act; combat principles; military law; rules of land warfare; command and leadership. 3 cred. per qtr.; prereq., 51-52-53.

Coast Artillery. Duties of Coast Artillery officer; command and leadership. Military history, military law, orientation, field engineering. Motor transport (M.E. 50w, prereq., M.E. 11, 12, 13), completion of student's military education in preparation for his duties as a second lieutenant. 3 cred. per qtr.; prereq., 51-52-53.

Signal Corps. Command and leadership; staff organization and duties; military law; tactics of all arms; military history and policy of the United States; radio communication (Electrical Communication, E.E. 161-163-165). 1 cred. per qtr.; prereq., 51-52-53 and reg. in E.E. 161-163-165.

54f-55w	Coast Artillery	
	Rec. (1) I MWF; A	(2) III MWF; A
	Lab. (1) VIII-IX F; A	(2) VIII-IX W; A
56s	Rec. (1) I MWF; A	(2) III MWF; A
	Lab. VIII-IX T; A	
54f-55w	Signal Corps	
	I MW; 321EE	
56s	I W, VII-IX T; 321EE	

PHYSICAL EDUCATION FOR MEN

A physical examination is required of all new matriculants, and of all others using the department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate.

1f-2w-3s—Freshman Physical Education. Mass activities, corrective exercise, apparatus work, swimming, games, and efficiency test. Cred.*; no prereq. Messrs. MacMillan and Penwell.

(1) II MW; Field House	(6) VI MW; Field House
(2) II TTh; Field House	(7) VI TTh; Field House
(3) III MW; Field House	(8) VII MW; Field House
(4) III TTh; Field House	(9) VII TTh; Field House
(5) IV MW; Field House	(10) VIII TTh; Field House (boxing)

Note.—Sections limited to 60 men.

4f,w,s—Freshman Hygiene. Cred.*; no prereq. Dr. Cooke.

4f	(1) II T; 301F	(3) IV T; 301F
	(2) II F; 301F	
4w	(1) IV T; 301F	(3) IV S; 301F
	(2) II F; 301F	
4s	(1) II F; 301F	(3) II F; 301F
	(2) IV T; 301F	

7f-8w-9s—Advanced Leaders. One hour of instruction; two hours leading squads in Physical Education 1-2-3 or 16-17-18 under supervision. 1 cred. per qtr.; prereq., 1-2-3 or instructors' permission. Mr. Keller.

Lect. IV T; A

Lab. Ar

* Courses 1-2-3 and 4 carry a total of three credits. The entire course must be completed before credit is received for any quarter. Preventive Medicine 12s may be offered as a substitute for 4.

Course 1f-2w-3s carries no credit when taken in place of military science and tactics by foreign students and others in the College of Engineering and Architecture.

4w,s—Preliminary Hygiene. One lecture a week. The most essential aspects of the care of personal health. No cred.; no prereq. Required of all new students.

- | | | |
|----|--------------------|---------------------|
| 4w | (1) I T; OPhAud | (4) IV M; OLAud |
| | (2) II T; 206OLaw | (5) VI T; OLAud |
| | (3) III W; 206OLaw | (6) III Th; 206OLaw |
| 4s | II T; 201WGm | |

7f-8w†—Sophomore Gymnastics. Fundamental gymnastics based on the German, Swedish and Danish systems. The exercises include work for flexibility, strength, and co-ordination. Apparatus work. No cred.; prereq., 1-2-3; IV TS; 153WGm.

9s—Sophomore Archery. Suitable in strength for girls in Individual Gymnastics. No cred.; prereq., 1-2-3.

- | | |
|-------------------|-------------------|
| (1) II MW; 151WGm | (2) IV TS; 151WGm |
|-------------------|-------------------|

10f-11w-12s‡—Sophomore Orthopedic and Individual Gymnastics. For those who need more individual supervision than is possible in other classes. No cred.; prereq., 1-2-3. Misses Tolg and Denny.

- | | | |
|---------|------------------|-----------------|
| 10f-11w | (1) IV TS; 3WGm | (3) II MW; 3WGm |
| | (2) VI TTh; 3WGm | |
| 12s | IV TS; 3WGm | |

13f,w-14w,s-15s*—Sophomore Interpretive Dancing. An art and a phase of physical education designed to develop a sense of beauty and body control through rhythmic movements prompted by the imagination. No cred.; prereq., 1-2-3. Miss Timberman.

- | | | |
|-----|--------------------|-------------------|
| 13f | (1) VI TTh; 151WGm | (2) II MW; 151WGm |
| 13w | II MW; 151WGm | |
| 14w | VI TTh; 151WGm | |
| 14s | II MW; 151WGm | |
| 15s | VI TTh; 151WGm | |

16f-17w—Sophomore Games and Folk Dancing. Suitable in strength for C-D girls. Conducted outdoors when weather permits. No cred.; prereq., 1-2-3; I WF; 151WGm. Miss Warnock.

18s—Tennis. No cred.; prereq., 1-2-3.

- | | |
|--------------------|----------------------|
| (1) VII WF; 151WGm | (4) VIII TTh; 151WGm |
| (2) I TTh; 151WGm | (5) VI TTh; 151WGm |
| (3) IV TS; 151WGm | |

19f-20w-21s—Sophomore Major Sports. Hockey in autumn, basket-ball in winter, baseball in spring. Suitable in strength for A-B girls. No cred.; prereq., 1-2-3.

- | | | |
|-----|--------------------|----------------------|
| 19f | (1) VII WF; 151WGm | (3) VIII TTh; 151WGm |
| | (2) V MW; 151WGm | |
| 20w | (1) VII WF; 151WGm | (3) VII TTh; 151WGm |
| | (2) V MW; 151WGm | (4) VIII TTh; 151WGm |
| 21s | (1) VII WF; 151WGm | (2) V MW; 151WGm |

22f,w,s-23w—Sophomore Elementary Swimming. 22, elementary; 23, low intermediate. No cred.; prereq., 1-2-3.

- | | | |
|-------------|-------------------|----------------------------|
| 22f,w,s-23w | (1) III MW; 51WGm | (5) VII TTh; 51WGm |
| | (2) IV MW; 51WGm | (6) VIII (3:30) TTh; 51WGm |
| | (3) II TTh; 51WGm | (7) VIII (4:00) TTh; 51WGm |
| | (4) IV TS; 51WGm | |
| 22f,w,s | VII MW; 51WGm | |

* The spring quarter is not open to students who have not had either fall or winter quarter course.

† The winter quarter is not open to students who have not completed Phys. Ed. 7.

‡ Students may enter course any quarter.

- 24f,s†—Sophomore Horseback Riding. Lessons for beginning and advanced classes under competent instruction, supervised by a member of the Department of Physical Education for Women. Miss Starr.
 (1) VIII TTh; ar (2) IX TTh; ar
- 25f,s-26w§—Sophomore Intermediate Swimming. Wide range of strokes, elementary diving. No cred.; prereq., 1-2-3, elementary swimming test.
 (1) VIII (4:00) MW; 51WGm (3) II WF; 51WGm
 (2) III TTh; 51WGm
- 27f,s||—Sophomore Golf. The fall quarter is open to students who know the rudiments of golf, and the spring quarter is open only to beginners in golf. Miss Starr.
 27f VI TTh; ar (2) II TTh; ar
 27s (1) I TTh; ar
- 28f,s-29w—Sophomore Advanced Swimming. Advanced strokes and diving, life saving. No cred.; prereq., 1-2-3, intermediate swimming test; VIII (3:30) MW; 51WGm. Miss Starr.
- 30s—Sophomore Life Saving and Water Sports. Red Cross life saving leading to membership in the Life Saving division of the American Red Cross. No cred.; soph., jr., sr.; prereq., 1-2-3, and adv. swimming test; IX MW; 51WGm. Miss Starr.
- 31w||—Sophomore Skating. Practice and technique of fundamental strokes. No cred.; prereq., 1-2-3.
 (1) VII WF; ar (2) II TTh; ar

PHYSICS

- 3f,w,s,su—Elements of Mechanics. Mechanics of solids and fluids. Study of the simpler fundamental principles. First part of a general course 3, 23, 33, 43. Course 4 should be taken in conjunction with this course. 3 cred.; prereq., M.&M. 12 or equiv. Mr. Erikson.
 3f Lect. (1) II MWF; 150Ph (2) VI MWF; 150Ph
 Quiz (1) II Th; 150Ph (2) IX Th; 150Ph
 3w Lect. VII MWF; 150Ph Quiz IX F or ar; 150Ph
 3s Lect. III TThS; 150Ph Quiz IX F; 150Ph
- 4f,w,s,su—Elements of Mechanics Laboratory. The laboratory part supplementing Course 3. 1 cred.; prereq., 3 or reg. in 3. Mr. Erikson.
 4f 153Ph (1) VIII-IX, F (8) I-II, M
 (2) III-IV, T (9) VI-VII, F
 (3) VIII-IX, M (10) III-IV, W
 (4) I-II, S (11) VI-VII, W
 (5) I-II, T (12) I-II, F
 (6) III-IV, S (13) VI-VII, Th
 (7) VI-VII, M
 4w,s 153Ph (1) VI-VII, T (3) I-II, Th
 (2) VIII-IX, T (4) VIII-IX, Th

† Students registering for this course will pay for riding lessons at \$1 per lesson, but not the physical education fee. Attendance at class hour is required for credit.

§ No student may register for more than two quarters of swimming without permission. Course 22 is never closed for senior registration.

¶ Students must supply their own golf equipment. Golf course at University Recreation Field will be used for Course 27. Student tickets 10 for \$3.

|| Class meetings will be sixty minutes in length, since weather and ice conditions will cause omissions at times.

- 9s—Acoustics. Study of the principles and application of sound. 3 cred.; prereq., 3; VIII MWF; 133Ph. Mr. Buchta.
- 23f,w—Heat. Study of the principles underlying heat phenomena. Course 24 should be taken in conjunction with this course. 3 cred.; prereq., 3. Mr. Miller.
- | | | |
|-----|-------------------------|-------------------|
| 23f | Lect. III TThS; 150Ph | Quiz IX Th; 150Ph |
| 23w | Lect. (1) II MWF; 150Ph | (2) VI MWF; 150Ph |
| | Quiz (1) II Th; 150Ph | (2) IX Th; 150Ph |
- 24f,w—Heat Laboratory. Laboratory part supplementing Course 23. 1 cred.; prereq., 4, 23, or reg. in 23. Mr. Miller.
- | | | |
|-----|---------------------|-----------------|
| 24f | 244Ph (1) VI-VII, M | (3) VI-VII, T |
| | (2) VIII-IX, M | (4) VIII-IX, T |
| 24w | 244Ph (1) III-IV, W | (8) I-II, M |
| | (2) III-IV, T | (9) VI-VII, F |
| | (3) VIII-IX, M | (10) VI-VII, W |
| | (4) I-II, S | (11) III-IV, W |
| | (5) II-III, W | (12) VIII-IX, F |
| | (6) III-IV, S | (13) VI-VII, Th |
| | (7) VI-VII, M | |
- 33f,w,s—Optics. Experimental demonstrations of optical phenomena and a study of the fundamental optical principles. Course 34 should be taken in conjunction with this course. 3 cred.; prereq., 3.
- | | | |
|-----|----------------------|---------------------|
| 33f | Lect. I TThS; 133Ph | Quiz IX F; 133Ph |
| 33w | Lect. II TThS; 133Ph | Quiz VIII Th; 133Ph |
| 33s | Lect. IV MWF; 133Ph | Quiz IX F; 133Ph |
- 34f,w,s—Optics Laboratory. Laboratory part supplementing Course 33. 1 cred.; prereq., 33 or reg. in 33. Mr. Valasek and others.
- | | | |
|--|----------------------|---------------------|
| | (1) VI-VII Th; 236Ph | (2) VI-VII F; 236Ph |
|--|----------------------|---------------------|
- 43w,s—Electricity. Study of the principles underlying electric phenomena. Course 44 should be taken in conjunction with this course. 3 cred.; prereq., 3. Mr. Zeleny.
- | | | |
|-----|-------------------------|-------------------|
| 43w | Lect. III TThS; 150Ph | Quiz IX Th; 150Ph |
| 43s | Lect. (1) II MWF; 150Ph | (2) VI MWF; 150Ph |
| | Quiz (1) II Th; 150Ph | (2) IX Th; 150Ph |
- 44w,s—Electricity Laboratory. Laboratory part supplementing Course 43. 1 cred.; prereq., 4, 43, or reg. in 43. Mr. Zeleny.
- | | | |
|-----|---------------------|-----------------|
| 44w | 231Ph (1) VI-VII, T | (3) VI-VII, W |
| | (2) VIII-IX, T | |
| 44s | 231Ph (1) I-II, S | (8) VIII-IX, M |
| | (2) III-IV, T | (9) III-IV, S |
| | (3) VI-VII, F | (10) VIII-IX, F |
| | (4) III-IV, F | (11) II-III, Th |
| | (5) I-II, W | (12) VIII-IX, W |
| | (6) III-IV, M | (13) VI-VII, Th |
| | (7) VIII-IX, Th | |
- 123s—Pyrometry and Heat. Experimental study of pyrometry, heat, transfer, hygrometry, and gas liquefaction. One lecture, two three-hour sessions in the laboratory a week. 3 cred.; prereq., 23, 24; VI-IX MW; 245Ph. Mr. Miller.
- 144f—Electrical Measurements. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux. One lecture, one quiz hour and two two-hour laboratory periods a week. 3 cred.; prereq., 43, 44. Mr. Zeleny.
- | | | |
|--|----------------------------|------------------------------|
| | Lect. V M; 166Ph | Quiz II Th; 166Ph |
| | Lab. (1) VI-VII TTh; 231Ph | (4) III-IV TS; 231Ph |
| | (2) VII-IX TTh; 231Ph | (5) VIII-IX F, I-II S; 231Ph |
| | (3) VI-VII WF; 231Ph | |

For other electives in the Department of Physics see the bulletin of the College of Science, Literature, and the Arts.

PHYSIOLOGIC CHEMISTRY

- 100xw—Physiologic Chemistry. Metabolism of proteins, fats, carbohydrates in health and disease. 3 cred.; prereq., physics and Organic Chemistry 53. IV MWF; 214MH. Mr. McClendon.
- 101xs,su—Physiologic Chemistry. Application of physical chemistry to Physiology. 3 cred.; prereq., Physiology 100x and physical chemistry. IV MWF; 214MH. Mr. McClendon.
- 100yw-101ys—Physiologic Chemistry Laboratory. 2 cred. per qtr. Messrs. McClendon, Hamilton, and Pascoe.
- (a) (med.) I-III TTh; 310MH (c) VI-VIII TTh; 310MH
 (b) (med.) I-III FS; 310MH

PREVENTIVE MEDICINE AND PUBLIC HEALTH

- 3f,w,s—Personal Hygiene and Elementary Sanitation. 2 cred.; no prereq., IV TS; 101bMH. Dr. Lees.
- 12s—Hygiene and First Aid. No cred.; no prereq. Dr. Hathaway.
 (1) VI T; 305E (2) IX F; 305E
- 50f,w,su—Public and Personal Health. 3 cred.; prereq., jr., sr.; V MWF; 101bMH. Dr. O'Brien.
- 53f,s,su—Elements of Preventive Medicine. 3 cred.; prereq., Psy. 1-2, Bact. 51 or equiv., or by permission; II MWF; 101bMH. Dr. Diehl.
- 73w—Occupational Hygiene and Disease. 2 cred.; prereq., 53; IV MW; 101bMH. Dr. Meyers.

RHETORIC

(College of Agriculture)

- 22f,w,s—Public Speaking. Practical course in fundamentals of speech making. 3 cred.; prereq., 6. Mr. Routledge.
- 22f,s (1) III MTWFS; 311En(UF) (2) IV MTWFS; 311En(UF)
 22w (1) I MTWFS; 311En(UF) (2) IV MTWFS; 311En(UF)

SOILS

- 4f—Soils. Origin, formation, composition, and classification of soils; physical properties, moisture relations; principles of tillage. Lecture, laboratory, and field work. 3 cred.; prereq., 10 cred. in chem. Mr. Rost.
 Lect. III TTh; 251Ch(UF) Lab. II-III S; 253Ch(UF)
- 8w—Physical Properties of Soils. Determination of physical constants of soils, including chemical composition, moisture equivalent, and hygroscopic coefficient. (Given only in alternate years—to be given in 1929-30.) 3 cred.; prereq., 4. Mr. McMiller.

SPEECH

- 35w,s—Fundamentals of Speech. Study of speech as applied in the social adaptation of the individual and in his control of his environment. Emotional problems. Technique of thought. Oral reading and original speeches. 3 cred.; prereq., Engl. 6; I MWF; 238EE. Mr. Rarig.

The Bulletin of the University of Minnesota

*The College of Agriculture, Forestry,
and Home Economics ·*

*Part I
Announcement of Courses for the Years
1928-1930*



Vol. XXXI No. 28 May 22 1928

*Entered at the post-office in Minneapolis as second-class matter
Minneapolis, Minnesota*

*Accepted for mailing at special rate of postage provided for in section 1103,
Act of October 3, 1917, authorized July 12, 1918*

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

FACULTY

ADMINISTRATION

Lotus Delta Coffman, Ph.D., LL.D., President
William Watts Folwell, LL.D., President Emeritus
Walter C. Coffey, M.S., LL.D., Dean of the Department of Agriculture
Edward M. Freeman, Ph.D., Dean of the College of Agriculture, Forestry,
and Home Economics
Edward E. Nicholson, M.A., Dean of Student Affairs
Anne D. Blitz, M.A., Dean of Women
Rodney M. West, B.A., Registrar

AGRICULTURAL BIOCHEMISTRY

Professors Ross A. Gortner, Ph.D., Clyde H. Bailey, Ph.D., Leroy S. Palmer, Ph.D.; Associate Professor John J. Willaman, Ph.D.; Assistant Professor Cornelia Kennedy, Ph.D.; Instructors Kurt W. Franke, Ph.D., W. Martin Sandstrom, Ph.D.

AGRICULTURAL ECONOMICS

Professor H. Bruce Price, Ph.D., Associate Professors Warren C. Waite, Ph.D., Elmer J. Working, M.S.; Assistant Professors Budd A. Holt, M.A., Dorothea D. Kittredge, M.A.; Instructors Albert G. Black, Ph.D., George B. Clarke, B.S., Arnold F. Hinrichs, B.S.

AGRICULTURAL EDUCATION

Professors Ashley V. Storm, Ph.D., Dexter D. Mayne, Frank W. Peck, M.S.; Associate Professors Albert M. Field, M.S., Frank W. Lathrop, Ph.D.; Instructors Lyman E. Jackson, M.S., Victor E. Nylin, M.S.

AGRICULTURAL ENGINEERING

Professor William Boss; Associate Professors Harry B. Roe, B.S. in Eng., Earl A. Stewart, B.Pd., B.S., Mark J. Thompson, M.S.; Assistant Professors Arthur J. Schwantes, B.S., James B. Torrance, B.S. in Agr., Arthur G. Tyler, Hall B. White, B.S. in Agr.; Instructors Josephine E. Brudwick, B.S., J. Grant Dent, Maurice G. Jacobson, Jesse H. Neal, B.S., Julius Romness, B.S.

AGRONOMY, FARM MANAGEMENT, AND PLANT GENETICS

Professor Andrew Boss, D.Sc.; Associate Professors Albert C. Army, M.S., George A. Pond, Ph.D., Assistant Professors Harvey E. Brewbaker, Ph.D., Lewis F. Garey, M.A., Frederick J. Stevenson, M.S., Harold K. Wilson, Ph.D.; Instructors Andrew T. Hoverstad, B.S., J. Wesley Nelson, B.S. in Agr.; Extension Specialists William L. Cavert, M.S., Ralph F. Crim, B.S. in Agr.

4 AGRICULTURE, FORESTRY, AND HOME ECONOMICS

ANIMAL HUSBANDRY

Professors Walter H. Peters, M.Agr., Evan F. Ferrin, M.Agr.; Assistant Professors Philip A. Anderson, B.S. in Agr., Mark A. McCarty, M.S.; Instructor Alfred L. Harvey, M.S.; Extension Specialists William E. Morris, B.S., Henry G. Zavoral, B.S.A.

BEE CULTURE

Instructor James W. Thompson, B.S.

DAIRY HUSBANDRY

Professors Clarence H. Eckles, D.Sc., Willis B. Combs, M.A.; Professor Emeritus Theophilus L. Haecker; Assistant Professor Harold Macy, B.S.; Instructor Lloyd M. Thurston, B.S.; Assistants Samuel T. Coulter, B.S., Harold B. Richie, B.S.; Extension Specialists Raymond L. Donovan, B.S., Charles C. Geddes, Edwin A. Hanson, B.S. in Agr., Harold R. Searles, B.S. in Agr.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors Royal N. Chapman, Ph.D., William A. Riley, Ph.D., Arthur G. Ruggles, M.A.; Associate Professor Robert A. Wardle, M.S.; Assistant Professors Maynard S. Johnson, Ph.D., Clarence E. Mickel, Ph.D., August L. Strand, M.A.

FORESTRY

Professors Henry Schmitz, Ph.D., John H. Allison, Ph.B., M.F., Edward G. Cheyney, B.A., Raphael Zon, B.A., B.S., F.E.; Associate Professor John P. Wentling, M.A.; Assistant Professors Randolph M. Brown, M.F.; Thorwald S. Hansen, B.S., M.F., Louis W. Rees, B.S.

HOME ECONOMICS

Professor Wylle B. McNeal, M.A.; Associate Professors Alice Biester, Ph.D., Harriet I. Goldstein, Marion Weller, B.A.; Assistant Professors Alice M. Child, M.A., Frances Dunning, M.S., Jane M. Leichsenring, Ph.D., Katharine McFarland, M.A., Amy P. Morse, B.A., Ethel L. Phelps, Ph.D., Lucy A. Studley, M.A.; Instructors Monica J. Aamodt, B.S., Carlotta M. Brown, Beatrice Counts, M.S., Sparkle V. Furnas, B.S., Vetta Goldstein, Ethel R. Gorham, M.A., Hope H. Hunt, M.S., Fanny J. Kendall, Agnes Kolshorn, M.A., Caroline Little, M.A., Kathryn B. Niles, B.S., I. Irene Sell, M.S., Helen J. Topp, B.S., Julia B. Whiteside, B.S.

HOME ECONOMICS EDUCATION

Professor Wylle B. McNeal, M.A.; Associate Professors Clara M. Brown, M.A., Harriet I. Goldstein; Assistant Professor Ella J. Rose, M.S.; Instructors Monica J. Aamodt, B.S., Lola M. Cremeans, M.S., Laura B. Hadley, B.S., Hedda Kafka, B.S., I. Irene Sell, M.S., Helen J. Topp, B.S.

HORTICULTURE

Professor William H. Alderman, B.S.A.; Associate Professor Wilfred G. Brierley, M.S.; Assistant Professors Clarence E. Cary, B.S. in Agr., Fred A. Krantz, Ph.D.; Instructors Hamilton D. Traub, Ph.D., Arthur

N. Wilcox, M.S.; Extension Specialist Roger S. Mackintosh, M.S. in Agr.

MILITARY SCIENCE AND TACTICS

Professor Bernard Lentz, Major, Infantry; Assistant Professors Ray C. Hill, Major, Infantry, Frederick S. Matthews, Captain, Infantry, Don F. Pratt, Captain, Infantry, Porter P. Wiggins, Captain, Infantry, Julian H. Gist, Captain, Infantry, William G. Walker, Captain, Infantry, Murray T. Davenport, Captain, Infantry; Instructors, Alfred Brandt, Master Sergeant, Infantry, John Coop, Sergeant, Infantry.

PHYSICAL EDUCATION FOR MEN

Associate Professors Louis J. Cooke, M.D., Louis F. Keller, M.A.

PHYSICAL EDUCATION FOR WOMEN

Professor J. Anna Norris, M.D.; Assistant Professors Gertrude M. Baker, B.A., Alice J. H. Tolg, M.D.; Instructors Else Bockstruck, B.S., Mary S. Conger, Grace E. Denny, B.S., Pauline Lane, B.A.; Assistant Evelyn M. Anderson, B.S.

PLANT PATHOLOGY

Professors Edward M. Freeman, Ph.D., Elvin C. Stakman, Ph.D.; Assistant Professors Jonas J. Christensen, Ph.D., Alvin H. Larson, B.S. in Agr., Julian G. Leach, Ph.D.; Instructors Louise Dodsall, Ph.D., Ralph Lindgren, B.S., Paul D. Peterson, M.S., Herman A. Rodenhiser, M.S.; Extension Specialist Raymond C. Rose, M.S.

POULTRY HUSBANDRY

Professor Arthur C. Smith, B.S.; Instructor Alvie A. Hoberg, B.S., Extension Specialist Cora E. Cooke, B.S.

PUBLICATIONS AND RURAL JOURNALISM

Professor William P. Kirkwood, M.A., Extension Specialist Edwin C. Torrey.

RHETORIC

Assistant Professors Robert C. Lansing, M.A., William J. Miller M.A.; Instructors Wilbur S. Furlow, M.A., Mabel D. Hessler, M.A.

SOILS

Professor Frederick J. Alway, Ph.D.; Associate Professor Clayton O. Rost, Ph.D.; Assistant Professor Paul R. McMiller, M.S.

VETERINARY MEDICINE

Professors Clifford P. Fitch, M.S., D.V.M., Willard L. Boyd, D.V.S., Myron H. Reynolds, B.S., D.V.M., M.D.; Associate Professor Howard C. H. Kernkamp, D.V.M.; Assistant Professor Earl A. Hewitt, B.A., B.S., D.V.M.

MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN
THE COLLEGE OF AGRICULTURE, FORESTRY,
AND HOME ECONOMICS

ARCHITECTURE

Instructor Elmer E. Young.

6 *AGRICULTURE, FORESTRY, AND HOME ECONOMICS*

ART EDUCATION

Professor Ruth Raymond, M.A.; Assistant Professor Robert S. Hilpert, B.S.; Instructors Cornelia Clousing, B.S., Leah M. Hanley, B.S.

BACTERIOLOGY AND IMMUNOLOGY

Professor Winford P. Larson, M.D.; Instructor Charles E. Skinner, Ph.D.

BOTANY

Professors J. Arthur Harris, Ph.D., C. Otto Rosendahl, Ph.D.; Assistant Professor Ned L. Huff, M.A.

CHILD WELFARE INSTITUTE

Professor John E. Anderson, Ph.D.; Assistant Professors Edith Boyd, M.D., Josephine C. Foster, Ph.D., Florence L. Goodenough, Ph.D.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

Professorial Lecturer Wesley E. Peik, M.A.

EDUCATIONAL PSYCHOLOGY

Professor Wilford S. Miller, Ph.D.

GEOLOGY AND MINERALOGY

Professor William H. Emmons, Ph.D.; Assistant Professors Ira S. Allison, Ph.D., John W. Gruner, Ph.D., George A. Thiel, Ph.D.

HISTORY AND PHILOSOPHY OF EDUCATION

Assistant Professor Ross L. Finney, Ph.D., LL.B.; Instructor Jean H. Alexander, M.A.

INORGANIC CHEMISTRY

Associate Professor Lloyd H. Reyerson, Ph.D.; Assistant Professor Norville C. Pervier, Ph.D.

PHYSIOLOGY

Professors Elias P. Lyon, Ph.D., M.D., LL.D., Jesse F. McClendon, Ph.D., Frederick H. Scott, M.B., Ph.D., D.Sc.; Associate Professor Chauncey J. V. Pettibone, Ph.D.; Assistant Professor Esther Greisheimer, Ph.D., M.D.; Instructors Joseph T. King, M.A., M.D., Milo M. Loucks, Ph.D.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

Associate Professor Harold S. Diehl, M.A., M.D.; Instructors Marbry Duryea, B.S., M.D., Hally J. Fisher, R.N.

PSYCHOLOGY

Professor Richard M. Elliott, Ph.D.

SOCIOLOGY AND SOCIAL WORK

Assistant Professor Gustave A. Lundquist, Ph.D.

ZOOLOGY

Instructor, Ralph W. Dawson, M.A.

GENERAL INFORMATION

ADMISSION

New students are admitted at the opening of any quarter provided a suitable program can be arranged. Prospective students, however, are advised to enter at the opening of the fall quarter if possible.

All students entering for the first time must submit their credentials to the Enrolment Committee.

Admission is either by certificate (in the case of graduates of accredited schools) or by examination.

For details of admission requirements and definition of "unit," see the bulletin of general information.

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the school course, one additional school year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

Applicants for admission are urged to present physics (1 unit) and chemistry (1 unit), for entrance credits. If not completed in the high school, additional work in these subjects will have to be taken in the University, thus postponing some of the vocational courses.

Every prospective student in agriculture is urged to obtain, before entering college, at least six months' practical experience on a farm. Entering students whose farm experience credentials are not satisfactory will be examined as to their familiarity with farm practices, and farm experience will be required during the college course in accordance with the results of these examinations. For students who major in dairy husbandry at least three of the six months of approved farm experience must be on an accredited dairy farm.

ADVANCED STANDING

Advanced standing credit is allowed provisionally subject to one year satisfactory work in residence. Credits in courses from any recognized institution of college grade are accepted so far as such courses are equivalent in subject-matter to required or elective work of the curriculum. Students desiring to transfer to this college after completing two years or less in a junior college or an institution in which the technical courses are not available may do so with little or no loss of credit by so arranging their work as to correspond as closely as possible with the following suggestions:

Pre-Agriculture and Pre-Forestry Courses in Junior Colleges

Students from accredited junior colleges who have completed the general requirements described below will be admitted to the junior class in the agricultural and forestry courses of the College of Agriculture, Forestry, and Home Economics of the University of Minnesota. The amount of additional time required to complete the work of the college for the degree of bachelor of science will depend (1) upon the quality and quantity of work which such students can do and (2) upon the special

curriculum which they elect. Many of these curricula may be completed in two years by students who maintain at least the average quality and quantity of work. Additional work in summer sessions or regular quarters may be necessary in some of the special curricula. Since a large number of fields of specialization are open to students, and since these curricula vary so greatly in the subject-matter courses required, it is impossible to make any more specific statement. The requirements given below can be satisfied in the average junior college which offers a fundamental arts and science curriculum. Students in some junior colleges can select additional subjects which may be directly applicable and very helpful in the field of specialization to be followed later. Students who have not completely met the requirements will be given proportional credit.

1. A total of 90 credits (1 semester credit = 1.5 quarter credits)
2. Required courses:
 - (a) Botany 9-15 cred.; Gen. Chem. 10-15 cred.; Zool. 9-15 cred.; Rhetoric and English 9-15 cred.
 - (b) At least two of the following: Mathematics 9-15 cred.; Economics 9-15 cred.; Modern Language 15 cred.
 - (c) Electives. Sufficient to bring total credits to minimum of 90 cred.

The following is a general list of electives applicable in one or more of the specialization fields in the College of Agriculture, Forestry, and Home Economics. These subjects are, of course, not equally applicable in all fields. Sociology, psychology, economics, physics, history, advanced mathematics, technical business, and agriculture and engineering subjects, advanced English, public speaking, mechanical drawing, freehand drawing, surveying, qualitative, quantitative, and organic chemistry, advanced courses in zoology and botany, bacteriology, modern language (especially French and German). For prospective forestry students, physics and especially survey are recommended.

Home Economics in Junior Colleges

In planning the work in the junior college with the idea of transferring later to the University of Minnesota the prospective transfer student should keep these facts in mind.

The requirements for a B.S. degree in Home Economics are set down in the catalog for the College of Agriculture, Forestry, and Home Economics on page 10.

Physical and biological science courses such as general and inorganic chemistry, bacteriology, biology, and physiology are required. A student may receive exemption from physics if she has had one year of physics in high school.

Color and design, textiles, clothing, and foods courses are required in the freshman and sophomore years.

English including public speaking, psychology, and sociology are junior college requirements.

The student transferring to the University of Minnesota, Home Economics Division, may expect to receive credit for such courses as listed

above and elective credits for courses not listed. The complete junior college record should be sent to the chairman of the Enrolment Committee for the College of Agriculture, Forestry, and Home Economics at University Farm, St. Paul, for evaluation before the student enters.

PSYCHOLOGICAL EXAMINATION

All new students are required to take a psychological examination on entrance as a part of the matriculation procedure. Admission, however, does not depend upon the results of the examination.

EXAMINATION IN ENGLISH COMPOSITION

All freshman students are required to take preliminary tests in English. Those failing to pass the tests will be required to do extra work in composition until their disability is removed. Students who desire to do so may take further examinations in rhetoric, the passing of which will exempt them from registering for part or all of the courses in freshman rhetoric.

PLACEMENT TESTS

The College of Agriculture, Forestry, and Home Economics desires to bring about the best correlation possible between the technical courses in the fields of agriculture, forestry, and home economics, as taught in the schools of agriculture, in the high schools, and in other institutions. Where students have taken considerable work in these technical courses, it may be desirable for them not to be required to repeat a part or all of this work in the elementary courses in the college. The amount of work taken in the preparatory school and the quality of that work, and, finally, the question as to whether or not the subject-matter course has been used for entrance to the University, must be taken into consideration. In general, two possibilities for placement tests are offered:

1. For subjects not used for entrance to the University and in which the student has had adequate training, examinations may be taken for full credit in the elementary technical course in the college. These examinations may be taken during the first six weeks of residence without fee. After that time, a five-dollar fee is required.

2. For subjects which the student has used for entrance to the University, the student may, by satisfactory examination or by the presentation of other satisfactory evidence, be given permission to omit the elementary subject in the college course, substituting therefor credits in other subjects and taking immediately the more advanced courses in this field.

FEES

Tuition fee, per quarter	
Residents of Minnesota	\$20.00
Non-residents	30.00
Credit hour tuition fee (for students registered for less than full work)	
Residents of Minnesota	1.50
Non-residents	2.25
Students in Agricultural Business Administration will pay the fees of the School of Business Administration in their junior and senior years.	
Incidental fee, per quarter	6.00
Military deposit (for all students registered for military drill)	10.00

10 AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Deposit (first quarter only)	5.00
Special fees	
Itasca Park tuition (freshmen and juniors in forestry) prorated on basis of regular quarter tuition per quarter of 12 weeks	20.00
Physical Training for Men, per quarter course	1.50
Physical Training for Women	
First year courses, per quarter	2.50
Other courses, per quarter	2.00
Maximum fee per quarter, \$3.50	
Vocal or instrumental music see general information bulletin for special fees	
Practice teaching laboratory, per credit hour	1.00
Examination for removal of condition	1.00
Examination for credit (after the first six weeks in residence)	5.00
Special examination	5.00
Change of registration	2.00
Graduation fee	10.00

Late registration.—Old students must indicate their registration and pay their fees not later than two weeks before the day set for classes to begin. New students must complete their registration (including payment of fees) before the day set for classes to begin. The penalty for delay in either indicating or completing registration is two dollars. An additional dollar is charged for each day of delay after the last day set for the completion of registration and a similar charge is made for each day of delay after the last day set for payment of fees.

Important.—The regulations require that no student be allowed to register after the quarter opens except by special committee action.

FACULTY REGULATIONS

Students are held responsible for compliance with all faculty regulations. These regulations are published in a booklet issued to students at the time of registration.

REQUIREMENTS FOR GRADUATION AND DEGREES

After the completion of the prescribed curriculum including all of the required work and the requisite amount of elective work to make the total given below, candidates will be recommended for graduation with the degree indicated.

The number of free elective credits required for graduation will be decreased by one for each five honor points in excess of one honor point per credit. This provision does not apply to candidates in the professional curriculum in Agricultural Engineering.

Course of Study	Credit Honor Point		Degree Conferred
	Require- ment	Require- ment	
Technical Agricultural courses	204	204	Bachelor of science
Agricultural Science courses	192	192	Bachelor of science
Forestry courses	204	204	Bachelor of science
Home Economics courses	189	189	Bachelor of science
Agricultural Engineering (professional course)	210	None	Bachelor of agricultural engineering
Agricultural Business Administration	192	192	Bachelor of business administration in agriculture
Agricultural Journalism	192	192	Bachelor of science

Degrees with distinction.—The degree of bachelor of science with distinction is granted to graduates of this college who have attained excellence

in scholarship as evidenced by an average grade of "B" for the entire four-year curriculum. Transfer students with less than two years of work in this college shall not be eligible. Recommendations to the faculty for the degree with distinction shall be made through the Students' Work Committee on the basis of scholarship and other evidence of satisfactory achievement and advancement in the courses pursued.

Degrees with high distinction.—The degree of bachelor of science with high distinction is granted to graduates of this college who have attained special excellence in scholarship as evidenced by an average of two and one-half honor points per credit for the entire curriculum. The same conditions for residence and recommendation apply as for the degree with distinction.

GRADING SYSTEM AND HONOR POINTS

There are four passing grades, A, B, C, and D, of which A is the highest and D the lowest. In addition there are the following non-passing grades: E (condition), F (failure), and I (incomplete). For rules governing the non-passing grades, see the booklet of Faculty Regulations.

Honor points are awarded on the following basis: each credit hour with a grade of A counts three honor points; each credit hour with a grade of B counts two honor points; and each credit hour with a grade of C counts one honor point. A grade of D counts no honor points.

CANDIDATES FOR THE TEACHER'S CERTIFICATE IN AGRICULTURE AND HOME ECONOMICS

The university teacher's certificate will be granted only to graduates of the College of Education. Students expecting to receive this certificate upon graduation shall be registrants in the College of Education from the beginning of the junior year. Students in the College of Agriculture, Forestry, and Home Economics desiring the university teacher's certificate shall in addition to their registration in this college register also in the College of Education. No formal application is necessary for transfer from the college of Agriculture, Forestry, and Home Economics to the College of Education if such transfer is made at the beginning of the junior year. However, no student may transfer who has not earned 90 credits and 90 honor points.

BOARD AND ROOM

Sanford Hall.—The one dormitory for university women, is located near the Minneapolis campus. It accommodates ninety women, about one half of whom may be freshmen. Applications should be sent to the director of Sanford Hall, University of Minnesota.

Private houses.—For information concerning approved boarding and rooming houses, address The Housing Bureau, University of Minnesota, Minneapolis.

STUDENTS' BOOKSTORE

The University owns and operates a bookstore for the convenience of students and faculty. Books and supplies are handled on a profit sharing basis, rebate checks being given on all purchases with the exception of candy, special bulletins, class material, and books obtained on individual orders.

CURRICULA

AGRICULTURE

(See pages 15 to 31)

A. Technical Agricultural Curriculum. This curriculum provides an opportunity in the junior and senior years to major in one of the following groups:

- | | |
|---|---|
| 1. Agricultural Economics and Farm Management | 3. Agricultural Sciences and Plant Industry |
| 2. Animal Industry | 4. Agricultural Engineering |

Several suggested curricula have been arranged which students are advised to follow. These curricula are:

- | | |
|--|-------------------------|
| 1. General Agriculture | 7. Dairy Products |
| 2. Agricultural Economics | 8. Farm Management |
| 3. Agricultural Education ¹ | 9. Fur Farming |
| 4. Agricultural Engineering | 10. Horticulture |
| 5. Animal Husbandry | 11. Landscape Gardening |
| 6. Dairy Husbandry | |

Students desiring to specialize in one of the agricultural sciences with a view to further study in the Graduate School may arrange majors in the following fields:

- | | |
|---------------------------------|------------------------------------|
| 1. Agricultural Biochemistry | 6. Entomology and Economic Zoology |
| 2. Agricultural Economics | 7. Horticulture |
| 3. Agronomy and Farm Management | 8. Plant Pathology and Botany |
| 4. Animal Husbandry | 9. Soils |
| 5. Dairy Husbandry | 10. Veterinary Medicine |

B. Agricultural Science Curriculum. This curriculum provides opportunities for specializing in the following fields of work:

- | | |
|------------------------------------|--------------------|
| 1. Agricultural Biochemistry | 5. Nutrition |
| 2. Agronomy | 6. Plant Breeding |
| 3. Entomology and Economic Zoology | 7. Plant Pathology |
| 4. Horticulture | 8. Soils |

C. Agricultural Engineering Professional Curriculum. The professional curriculum in Agricultural Engineering is offered jointly with the College of Engineering and Architecture. In addition to the outlined curriculum, electives may be selected in order to major in one of the following fields of work:

- | | |
|-------------------|----------------|
| 1. Farm Buildings | 3. Reclamation |
| 2. Farm Machinery | |

¹ Offered jointly with the College of Education.

D. Agricultural Business Administration Curriculum. Students desiring to prepare for admission to the School of Business Administration may complete the Agriculture-Pre-Business Curriculum in the College of Agriculture, Forestry, and Home Economics. The work of the junior and senior years, is offered jointly with the School of Business Administration.

E. Agricultural Journalism. This curriculum is offered jointly with the College of Science, Literature, and the Arts.

FORESTRY

(See pages 32 to 36)

The curriculum in Forestry provides an opportunity in the junior and senior years to major in one of the following fields:

- | | |
|-------------------------|--------------------|
| 1. General Forestry | 4. Grazing |
| 2. Commercial Lumbering | 5. Forest Sciences |
| 3. Forest By-Products | |

HOME ECONOMICS

(See pages 37 to 45)

In home economics opportunity is provided in the junior and senior years to major in one of the following outlined curricula:

- | | |
|--|---------------------------|
| 1. General Home Economics, as a type of general arts education for women | 3. Textiles and Clothing |
| 2. Foods and Nutrition | 4. Dietitians |
| | 5. Institution Management |

The following teacher's curricula are also offered jointly with the College of Education:

- | | |
|-----------------------------|--------------------------|
| 6. General Home Economics | 9. Textiles and Clothing |
| 7. Home Economics Extension | 10. Related Art |
| 8. Foods and Nutrition | |

EXPLANATION OF TERMS AND COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters f (fall), w (winter), s (spring), and su (summer) following the course number. For example: 5f,w,s indicates that Course 5 is given in the fall quarter and is repeated in the winter and again in the spring quarter; 5f-6w indicates a two-quarter course extending through the fall and winter quarters; and 5f,w-6w,s, indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200.

Numbers following the descriptive name of a course indicate the number of credit hours.

Course numbers in parentheses, following the number of credit hours, indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives, will be found on pages 46 to 80. The program of classes is printed in Part II. The divisional statements are arranged alphabetically according to the names of the divisions.

One *credit hour* is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each week for one quarter.

Honor points.—See page 11 for definition.

A *major* is a series of courses equivalent to from 24 to 36 credit hours chosen from one of the elective groups.

A *minor* is a series of courses equivalent to 18 credit hours chosen from one of the elective groups.

A *required* course is a course required of all students for graduation, irrespective of their major sequence.

A *limited elective* course is an elective which may not be chosen from the same group as the major or minor.

A *free elective* course may be chosen from any courses offered in the University for which the student has completed the prerequisites.

REGISTRATION

In planning registration note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

Registration for courses as electives in other colleges of the University must be in conformity with regulations of the college offering the course.

Elective courses in the College of Science, Literature, and the Arts are separated into junior college courses (numbered 1 to 49) open to freshmen and sophomores, and senior college courses (numbered 50 to 199) open to juniors and seniors. In addition to satisfying other prerequisites a minimum of 90 credits and 90 honor points must be earned before registering for a senior college elective.

CURRICULA IN AGRICULTURE

- A. Technical Agricultural Curriculum, pages 15 to 25
- B. Agricultural Science Curriculum, pages 26 to 27
- C. Agricultural Engineering, Professional Curriculum, pages 27 to 29
- D. Agricultural-Business Administration Curriculum, pages 29 to 30

A. TECHNICAL AGRICULTURAL CURRICULUM

This curriculum requires 204 credit hours for graduation and is made up of (1) required courses which every student must complete and (2) elective courses distributed according to several methods described below (pages 17 to 25).

REQUIRED COURSES¹

These courses are required of every student before graduation. They constitute approximately half of the curriculum and are considered fundamental and necessary to any curriculum in technical agriculture. Every student must complete these courses, if possible, before the end of the sophomore year.

For some students the outline of the first two years, given below, represents more than the regular amount of work of 17 credit hours per quarter. In such cases those subjects which cannot be taken in the freshman and sophomore years must take precedence the following year. Registration for from 15 to 18 credit hours of work each quarter will be allowed without special permission. Phys. Ed. 1-2-3, Gymnasium, 3 (credit is allowed only when the three quarters together with Course 4 are completed) may be taken in addition to the regular schedule if desired. Care should be taken in registration to give precedence to courses offered only one quarter.

Not more than one half of the listed credit will be allowed for the courses listed under the freshman and sophomore years, below, unless completed prior to classification as a senior except in the case of students transferring with at least one full year of advanced standing from a college where these courses are not available.

FRESHMAN YEAR

- 1. *Non-credit courses* required for graduation in addition to the 204 credit hours. Freshman lectures. A course of lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.
- Mil. Sci. 1f-2w-3s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

¹ Modifications in the requirements of the freshman and sophomore year may be permitted upon approval by the Students' Work Committee where students have a very definite objective in their college curriculum in which substitutions for certain of the above listed freshman and sophomore required courses may profitably be made. Approval of the adviser by special letter must be presented with the petitions to the Students' Work Committee.

16 AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Phys. Ed. 4f,w,s, Freshman Hygiene or Prev. Med. 3, Personal Hygiene and Elementary Sanitation, 2.

2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.

Agr. Eng. 3 credits elected from the following:

Agr. Eng. 13f,s, Gas Engines, 3; Agr. Eng. 28w, Land Clearing, 3; Agr. Eng. 31,w,s, Principles of Drainage, 3; Agr. Eng. 37s, Rural Sanitation, 3. One or more of these courses are required in the junior and senior years of several of the outlined curricula. If completed in meeting this requirement some other of the above courses must be submitted in the junior or senior year.

Agr. Eng. 9f,w-10w,s, or 11f,w, Applied Mathematics, 5. Students found unable to pursue Course 11 to advantage will be transferred to Course 9-10 which covers the same work and carries the same credit but is extended through two quarters with additional scheduled time for class exercises. Not required of those who complete Math. 5 or 8.

¹Agron. 1f,w,s, General Farm Crops, 3

¹An. Husb. 10f-11w, Types and Market Classes of Livestock, 6

Bot. 1f,s, General Botany, 4 and 6 credits selected from the following: Bot. 2, 5, 7, 12, 13, 21, 22.

¹Dy. Husb. 1f,s, Elements of Dairying, 5

¹Hort. 6f, Fruit Growing, 3; or Hort. 32s, Vegetable Growing, 3

Inorg. Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 9-10. Those required to take this course because of inability to carry successfully Inorg. Chem. 9-10 will be allowed not more than 10 credits.

Inorg. Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. (1 yr. h. s. chem.) Those required to take Inorg. Chem. 1-2-3 may omit this course.

Math. 5f,w,s, Higher Algebra, 5 (1 yr. Elem. Algebra) or Math. 8f,w,s, Commerce Algebra, 5 (Math. 5 or h. s. higher algebra). Not required of those who complete Agr. Eng. 9-10 or 11.

²Rhet. 1f,w,s, Rhetoric I, 3

Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)

Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.

Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

2. *Freshman courses* which were not completed during the freshman year.

3. *General courses.*—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.

³Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10 (Inorg. Chem. 10 cred.)

Agr. Econ. 1f,w, Principles of Economics I, 5

Agr. Econ. 2w,s, Agricultural Economics II, 3 (Agr. Econ. 1)

¹Agr. Eng. 3f,s, Mechanical Drawing, 2

Agr. Eng. 23f,s, General Physics, 5. Those presenting a year of high school physics may omit this course and substitute 5 credits elective later in their curriculum.

Bact. 41f,w,s, General Bacteriology, 5 (Chem., zool.)

Soils 4f, Soils, 3 (Inorg. Chem., 10 credits)

Soils 5s, Soil Fertility, 3 (Inorg. Chem., 10 credits)

¹ Students presenting acceptable high school work in this course may substitute an elective.

² Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 77.

³ Students who expect to major in Agricultural Education may substitute 10 credits elective for this course with the approval of the chief of the Division of Agricultural Education.

JUNIOR YEAR

Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, Rhet. 22 advised) or Rhet. 31f,w,s, English Literature I, 5 (Rhet. 3)
 Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)
 Zool. 14f-15w-16s, General Zoology, 9

ELECTIVE COURSES

Elective courses may be distributed according to one of the following methods: I (below) or II (page 18). Every student is required to file in the registrar's office by the end of his sophomore year a statement of the curriculum which he plans to pursue during his junior and senior years. Such statements from each student will make it possible to provide a workable program of subject courses. The student may make, and is strongly advised to make, this statement at the end of his freshman year. In this case he would have ample opportunity to change his curriculum at the end of the sophomore year. A change from one curriculum to another after the close of the sophomore year is permitted only on approval and does not exempt the student from any of the requirements of the curriculum which he finally selects. Such changes usually involve inconvenience and sometimes loss of credit to the student. All students are invited to consult with the dean of the college concerning the selection of curricula.

Method I—*Open Elective Curricula*

Recommended for those students who are preparing themselves for some special line of work and who have definitely in mind the relations of subjects offered to this work:

Under this method the student, with the approval of his adviser, may select any curriculum which complies with the following requirements:

- a. A major of from 24 to 36 credit hours.
- b. A minor of 18 credit hours.
- c. Limited electives 18 credit hours, which must be selected outside of the groups from which the major and minor have been chosen, and
- d. Free electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University.

The major and minor must be selected from different elective groups, except that students whose major is chosen from Group 3 (see below), Agricultural Sciences and Plant Industry, may select their minor from a different field of work in the same group.

ELECTIVE GROUPS

A. Groups from which major, minor, or electives may be chosen

1. Agricultural Economics and Farm Management
2. Animal Industry, including
 - Animal Husbandry
 - Dairy Husbandry
 - Poultry Husbandry
 - Veterinary Medicine

3. Agricultural Sciences and Plant Industry, including
 - Agricultural Biochemistry
 - Agronomy and Plant Genetics
 - Entomology and Economic Zoology
 - Horticulture
 - Plant Pathology and Botany
 - Soils
4. Agricultural Engineering

B. Groups from which electives only may be chosen

1. Agricultural Education¹
2. Bee Culture
3. Forestry
4. Home Economics
5. Military Science and Tactics
6. Physical Education
7. Rural Publications and Journalism
8. Courses in departments of other schools and colleges of the University

Method II—*Suggested Elective Curricula*

The following curricula have been arranged and are recommended by the several departments as useful and suggestive. Changes may be made with the approval of the Students' Work Committee. The subject course programs and the offerings of subjects in different quarters are based primarily on these curricula so that students will have an opportunity of getting the courses in their proper sequence and without conflict. These specified curricula are offered in the hope that they will also be of value to the students in vocational guidance. Students who desire to select any of these curricula with modifications should study the changes involved to see whether or not the desired modifications admit of a possible program.

I. GENERAL AGRICULTURE

Recommended for those students who desire a general curriculum in agriculture. It is designed especially for those who aim to obtain a broad general training and for those who expect to engage in general farming. It emphasizes two features, viz.: to include in its subject-matter the principal fields of study in agriculture and to select the essential courses necessary to an understanding of these fields. A sufficient number of electives is provided to permit the student to emphasize any special line in which he may become interested.

This curriculum is completely included in the curricula in agricultural education and agricultural extension, and in the general curricula in farm management and agricultural economics. It is included, with only a few substitutions, in the curricula in animal husbandry, dairy husbandry, and in horticulture.

¹ All students intending to teach agriculture are referred to the required curriculum in Agricultural Education, pages 19 to 20.

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
 Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)
 Agron. 131f,w, Principles of Genetics, 3 (Bot or Zool. 9 cred.)
 An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
 Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)
 Electives, 2 or 5

Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 10)
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
 Soc. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)

Winter Quarter

Agron. 132w, Farm Crops Plant Breeding, 3 (Agron. 131)
 An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
 Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
 Electives, 8

Agr. Econ. 141w,¹ Marketing Organization: Dairy and Poultry Products, 3 (Agr. Econ. 40)
 Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
 Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
 An. Husb. 5w, Livestock Breeding, 3 (Agron. 131)
 Vet. 9w, Veterinary Studies, 3
 Electives, 2

Spring Quarter

Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 Agr. Eng. 12s, Field Machinery, 3
 Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)
 An. Husb. 8s, Fundamentals of Feeding and Management, 5
 Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of the general requirements)
 Electives, 0 or 3

Vet. 10s, Veterinary Studies, 3 (Vet. 9)
 Electives, 14

2. GENERAL CURRICULUM IN AGRICULTURAL ECONOMICS

Opportunities for majoring in Agricultural Economics are offered in various lines. Those who desire to take a general curriculum with emphasis on agricultural economics are requested to consult with the chief of that division.

3. AGRICULTURAL EDUCATION

(Required for university teacher's certificate)

Students who desire to teach agriculture in the high schools or other secondary schools may, upon graduation, obtain the university teacher's certificate in addition to the regular college degree, by registering in both the College of Education and the College of Agriculture, Forestry, and Home Economics, in the junior and senior years. It is desirable to consult the head of the Department of Agricultural Education earlier to avoid

¹ Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

difficulties that may arise in the program of specialization. The university teacher's certificate entitles the holder to teach agriculture in any Minnesota high school for two years. Upon satisfactory completion of the teaching of these two years, the holder may have the certificate renewed as a life certificate by approval of the president of the University and the state commissioner of education. It is recommended that electives be chosen from courses in Agricultural Education or from such of the following as will best complete a well-balanced preparation in subject-matter:

Agr. Eng. 12; Agron. 122, 132, 133; For. 37; Pl. Path. 9; Poul. 1; Pub. and Rur. Jour. 19.

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

Agr. Ed. 21f, Vocational Education, 3
Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)
Electives, 0 or 3

Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agr. Ed. 181f, Teaching Agriculture, 5 (See Part II)
Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)

Winter Quarter

Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Vet. 9w, Veterinary Studies, 3
Electives, 5

Agr. Ed. 182w, Teaching Agriculture, 5 (See Part II)
Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)
Electives, 6

Spring Quarter

Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
Agr. Eng. 40f,s, Mechanical Training I, 3
Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)
An. Husb. 8s, Fundamentals of Feeding and Management, 5
Vet. 10s, Veterinary Studies, 3 (Vet. 9)

Agr. Ed. 42f,w,s, Supervised Teaching Experience, 3 (See Part II)
Agr. Ed. 183s, Teaching Agriculture, 5 (See Part II)
Electives, 9

4. GENERAL CURRICULUM IN AGRICULTURAL ENGINEERING

Suggested for those who intend to prepare for general farming, with emphasis on engineering. Students desiring a professional curriculum in Agricultural Engineering are referred to the outline on pages 27 to 29.

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

Agr. Eng. 5f, Farm Building Construction, 3
 Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)
 An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
 Electives, 3

Agr. Eng. 19f, Elementary Surveying, 3 (Agr. Eng. 3, 11 or equiv.)
 Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb.)
 Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)
 Electives, 2

Winter Quarter

Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
 Agr. Eng. 31w,s, Principles of Drainage, 3
 Agron. 122w, Grain and Hay Grading, 3 (Agron. 1, Bot. 9 cred.)
 An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
 Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
 Electives, 2

Agr. Eng. 24f,w, Agricultural Physics I, 4 (Agr. Eng. 11, 23 or equiv.)
 Agr. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
 An. Husb. 5w, Livestock Breeding, 3 (Agron. 131)
 Electives, 7

Spring Quarter

Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 Agr. Eng. 12s, Field Machinery, 3
 Agr. Eng. 13f,s, Gas Engines, 3
 Agr. Eng. 14s, Elementary Farm Power, 3 (Agr. Eng. 13)
 An. Husb. 8s, Fundamentals of Feeding and Management, 5

Agr. Econ. 142s, Marketing Organization: Fruits and Vegetables, 3 (Agr. Econ. 40)
 Agr. Eng. 25w,s, Agricultural Physics II, 4 (Agr. Eng. 24)
 Agr. Eng. 37s, Rural Sanitation, 3
 Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
 Electives, 4

5. GENERAL CURRICULUM IN ANIMAL HUSBANDRY

For those who aim to make a special study of livestock as a preparation for (a) various phases of livestock farming, for (b) the technical positions relating to livestock, and for (c) further study in graduate work when the student desires to prepare for college, experiment station, and government research and similar positions requiring a still greater degree of specialization.

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
 Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
 An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
 Vet. 2f, Comparative Anatomy and Physiology of Domestic Animals, 3

Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 Agron. 103f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
 An. Husb. 7f, Meats, 3 (An. Husb. 2-3, Agr. Biochem. 15)
 An. Husb. 101f, Advanced Stock Judging, 3 (An. Husb. 4)
 Vet. 6f, Physiology of Reproduction, 4 (Vet. 2-3-4)

Winter Quarter

- Agron. 122w, Grain and Hay Grading, 3 (Agron. 1, Bot. 9 cred.)
 An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
 An. Husb. 5w, Livestock Breeding, 3 (Agron. 131)
 Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
 Vet. 3w, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 2)
 Electives, 2
- Agr. Econ. 143w¹, Marketing Organization: Livestock and Meats, 3 (Agr. Econ. 40)
 Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
 Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
 An. Husb. 6w, Livestock Feeding, 5 (Agr. Biochem. 15)
 Vet. 12w, Infectious Diseases, 3 (Vet. 2-3-4, Bact. 41)

Spring Quarter

- Agron. 123s, Forage Crops, 3 (Agron 1, Bot. 9 cred.)
 Agr. Eng. 12s, Field Machinery, 3
 An. Husb. 4s, Livestock Judging, 3 (An. Husb. 2-3)
 An. Husb. 9s, Pedigrees and Herd Books, 3 (An. Husb. 5)
 Vet. 4s, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 3)
 Electives, 2
- An. Husb. 102s, Horse Husbandry, 3 (An. Husb. 5, 6) or
 An. Husb. 103s, Beef Cattle Husbandry, 3 (An. Husb. 5, 6) or
 An. Husb. 104s, Sheep Husbandry, 3 (An. Husb. 5, 6) or
 An. Husb. 105s, Swine Husbandry, 3 (An. Husb. 5, 6)
 Electives, 14

6. GENERAL CURRICULUM IN DAIRY HUSBANDRY

Recommended for those students who plan definitely to engage in dairy farming or in some practical branch of dairy production.

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

- Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
 An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
 Vet. 2f, Comparative Anatomy and Physiology of Domestic Animals, 3
 Electives, 2
- Agr. Econ. 110f, Economics of Agricultural Production, 3 (Agr. Econ. 2)
 Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
 Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)
 Dy. Husb. 105f, Seminar I, 1 (3 courses in dy. husb.)
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
 Electives, 2

Winter Quarter

- Agron. 122w, Grain and Hay Grading, 3 (Agron. 1, Bot. 9 cred.)
 Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
 An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
 Dy. Husb. 2w, Dairy Bacteriology, 5 (Bact. 41)
 Vet. 3w, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 2)
- Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
 An. Husb. 5w, Livestock Breeding, 3 (Agron. 131)
 Dy. Husb. 103w, Dairy Stock Feeding, 3 (Dy. Husb. 101, Agr. Biochem. 15)
 Dy. Husb. 106w, Seminar II, 1 (3 courses in dy. husb.)
 Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
 Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)

¹ Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

Spring Quarter

- Agron. 101s, Farm Management, 3 (Agron. 1, Econ. 2)
 Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)
 Dy. Husb. 104s, Advanced Study of Dairy Breeds, 3 (Dy. Husb. 6, 101)
 Sociol. 1f,w,s, Introduction to Sociology, 3
 Vet. 4s, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 3)
 Electives, 2
- Agr. Econ. 40s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 Agr. Eng. 40f,s, Mechanical Training I, 3
 Animal Husbandry 105s, Swine Husbandry, 3 (An. Husb. 5, 6)
 Electives, 8

7. GENERAL CURRICULUM IN DAIRY PRODUCTS

Those desiring to specialize in dairy products may enter the Agricultural Science curriculum beginning with the freshman year or pursue the general requirements for the Technical Agricultural curriculum. In either case specialization will begin with the junior year. Major groups will be arranged to include suitable courses from the general curriculum in Dairy Husbandry and from the following of special importance to the dairy products field.

- Agr. Biochem. 15, 101, 102, 103
 Agr. Econ. 25, 130, 131, 140, 141, 142
 Agron. 102, 103
 Agr. Eng. 24, 25, 40
 Dy. Husb. 2, 4, 101, 102, 105, 107, 111, 112, 113, 115

The minor may be in Agricultural Economics or Agricultural Biochemistry.

8. GENERAL CURRICULUM IN FARM MANAGEMENT

Suggested for those who desire a broad training in agriculture in preparation for general farm management. This includes the subjects of the general curriculum and suggested electives which add an emphasis upon those subjects which bear on technical farm management.

JUNIOR YEAR

- Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
 Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)
 Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
 An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
 Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)
 Electives, 2 or 5

SENIOR YEAR

- Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)

Winter Quarter

- Agron. 132w, Farm Crops Plant Breeding, 3 (Agron. 131)
 An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
 An. Husb. 5w, Livestock Breeding, 3 (Agron. 131)
 Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
 Electives, 5

- Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
 Agron. 103w,s, Farm Management Organization, 3 (Agron. 102)
 Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)
 Vet. 9w, Veterinary Studies, 3
 Electives, 5

Spring Quarter

Agron. 101s, Farm Management, 3 (Agron. 1, Agr. Econ. 2)	Agr. Econ. 50s, Farm Finance, 5 (Agr. Econ. 2)
Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)	Agron. 104s, Types of Farming, 3 (Agron. 103)
Agr. Eng. 12s, Field Machinery, 3	Vet. 10s, Veterinary Studies, 3 (Vet. 9)
An. Husb. 8s, Fundamentals of Feeding, and Management, 5	Electives, 6
Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of the general requirements)	
Electives, 0 or 3	

9. FUR FARMING

The prices for furs during the past few years have stimulated greatly the interest in fur bearing animals. Some fox farms and skunk farms have been established and other fur bearing animals are being raised with a view to supplying furs for the trade. This has aroused frequent inquiry for a curriculum that would fit students for such work either as a business or in connection with other farm enterprises. The college does not offer a special curriculum for students desiring to engage in fur farming but the important underlying studies are already provided by the required work of the curriculum of the College of Agriculture, Forestry, and Home Economics. Certain elective courses are also available which under faculty regulations may be so chosen as to meet the needs of students wishing to specialize in fur farming.

10. GENERAL CURRICULUM IN HORTICULTURE

A foundation curriculum suggested for those who purpose to engage in the production of horticultural crops or to enter into some horticultural business.

JUNIOR YEAR

Fall Quarter

Agron. 121f, ¹ Grain Crops, 3 (Agron. 1, Bot. 9 cred.)
Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements.)
Hort. 56f, Plant Propagation and Nursery Practice, 3
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Electives, 3 or 6

SENIOR YEAR

Hort. 93f, Judging Horticultural Crops, 2 (Hort. 6 or 32)
Hort. 107f, Orchard Management, 3 (Hort. 6, Bot. 9 cred.)
Hort. 136f, Truck Crops and Potatoes II, 3 (Hort. 135)
Hort. 193f, Horticultural Seminar, 1 (Hort. 9 cred.)
Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)
Electives, 5

Winter Quarter

Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Hort. 21w, Small Fruit Culture, 3 (Hort. 6 or 32, Bot. 9 cred.)
Hort. 135w, Truck Crops and Potatoes I, 3 (Hort. 32, Bot. 9 cred.)
Electives, 5

Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Hort. 110w, Horticultural Crop Breeding, 3 (Agron. 131)
Hort. 194w, Horticultural Seminar, 1 (Hort. 193)
Electives, 7

¹Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.) may be substituted for this course.

Spring Quarter

- Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 Agr. Eng. 13f,s, Gas Engines, 3 or Agr. Eng. 40f,s, Mechanical Training I, 3
 Bot. 22f,s, Elementary Plant Physiology, 5 (Bot. 2 or 5, org. chem. advised)
 Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of the general requirements.)
 Pl. Path. 112s, Diseases of Fruit Crops, 3 (Pl. Path. 1 or 10) or
 Pl. Path. 113s, Diseases of Vegetable Crops, 3 (Pl. Path. 1 or 10)
 Electives, 0 or 3
- Agr. Econ. 142s,¹ Marketing Organization: Fruits and Vegetables, 3 (Agr. Econ. 40)
 Agr. Eng. 12s, Field Machinery, 3 or
 Agron. 132w, Farm Crops Plant Breeding, 3 (Agron. 131)
 Agron. 103w,s, Farm Management Operation, 3 (Agron. 103)
 Electives, 5

II. LANDSCAPE GARDENING

A suggested curriculum for students majoring in landscape gardening.

JUNIOR YEAR

Fall Quarter

- Arch. 21f,w, Freehand Drawing, 2
 Hort. 71f, Plant Materials I, 2 (Bot. 9 cred.)
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
 Electives, 8

SENIOR YEAR

- Agr. Eng. 19f, Elementary Surveying, 3 (Agr. Eng. 3, 11, or equiv.)
 Hort. 74f, Principles of Landscape Design, 3 (Arch. 23)
 Hort. 190f, Special Problems, 3 (Instructor's permission)
 Pol. Sci. 51f, Business Law, 3
 Electives, 5

Winter Quarter

- Arch. 22w,s, Freehand Drawing, 2
 For. 27w, Groves and Windbreaks, 3
 Hort. 73w, History of Landscape Gardening, 3
 Electives, 9

- Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
 Hort. 75w, Landscape Problems, 3
 Hort. 74, Agr. Eng. 3, 19)
 Hort. 191w, Special Problems, 3 (Hort. 190)
 Pol. Sci. 52w, Business Law, 3 (Pol. Sci. 51)
 Electives, 5

Spring Quarter

- Arch. 23s, Freehand Drawing, 2
 Hort. 50s, Floriculture, 3
 Hort. 56s, Plant Propagation and Nursery Practice, 3 (Bot. 9 cred.)
 Hort. 72s, Plant Materials II, 2 (Bot. 9 cred.)
 Electives, 7

- Agr. Eng. 31w,s, Principles of Drainage, 3 (Agr. Eng. 3, 11, or equiv.)
 Hort. 76s, Landscape Construction, 3 (Hort. 75)
 Hort. 192s, Special Problems, 3 (Hort. 191)
 Electives, 8

¹ Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

AGRICULTURAL SCIENCES

Opportunity is offered to students who have completed the required courses of the Technical Agricultural curriculum and who desire to specialize in the various branches of agriculture and agricultural sciences. Students who desire such specialization are advised, however, to follow the requirements of the Agricultural Science curriculum from the beginning of the freshman year. In all cases it is assumed that such students will spend one or more years in graduate study. Only those students who have had high scholarship records in their undergraduate curriculum and who have a clear understanding of the study to be pursued and who have a lasting and abiding enthusiasm for the chosen field of specialization should enter upon these curricula. Since a comparatively small number of students will enter these special curricula and since the specialization may vary considerably even in one field with the individual student, complete curricula are not suggested in all lines.

Students in these curricula may prepare themselves for teaching in colleges and universities, for research and experimental work in experiment stations, for regulatory, experimental, and extension service in the state and federal departments of agriculture, and for various technical and industrial positions in agricultural industries and in the industries related to agriculture. For the opportunities offered, the student is advised to consult with the various divisions and with the dean of the college.

Students are advised to construct a curriculum in accordance with the open elective system (Method I, page 17) including as many of the subjects listed under the General Curriculum in Agriculture as are consistent with their special curriculum. The attention of the student is also called to the modern language requirements for graduate students. In many divisions French or German is required for the Master's degree and in all cases both French and German are required for a degree of doctor of philosophy. At least one modern language should be obtained during the undergraduate work.

The divisions offering such opportunities for specialization are listed below. In each case the student should consult with the division in the selection of his major, minor, and electives.

- | | |
|---|------------------------------------|
| 1. Agricultural Biochemistry | 6. Entomology and Economic Zoology |
| 2. Agricultural Economics | 7. Horticulture |
| 3. Agronomy, Farm Management, and
Plant Genetics | 8. Plant Pathology and Botany |
| 4. Animal Husbandry | 9. Soils |
| 5. Dairy Husbandry | 10. Veterinary Medicine |

B. AGRICULTURAL SCIENCE CURRICULUM

This curriculum requires 192 credit hours for graduation and is made up of (1) required courses with such options as are indicated in the freshman and sophomore years, and (2) a major and electives in the junior and senior years.

FRESHMAN YEAR

1. *Non-credit courses* required for graduation in addition to the 192 credit hours. Freshman lectures. A course of lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.
- Mil. Sci. 1f-2w-3s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.
- Phys. Ed. 4f,w,s, Freshman Hygiene or Prev. Med. 3, Personal Hygiene and Elementary Sanitation, 2.
2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.
- Bot. 4f-5w-6s, General Botany, 9 or Zool. 14f-15w-16s, General Zoology, 9.
- Inorg. Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 9-10. Those required to take this course because of inability to carry successfully Inorg. Chem. 9-10 will be allowed not more than 10 credits.
- Inorg. Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. s. chem.). Those required to take Inorg. Chem. 1-2-3 may omit this course.
- Math. 5f,w,s, Higher Algebra, 5; Math. 6f,w,s, Trigonometry, 5 (Math. 5 or equiv.); and Math. 7f,w,s, College Algebra, 5 (Math. 6) or modern language, 15
- Rhetoric 1f,w,s-2w,s,f-3s,f,w, Rhetoric, 9

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 192 credit hours. Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.
2. *General courses.*—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.
- Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10 (Inorg. Chem., 10 cred.)
- Bot. 4f-5w-6s, General Botany, 9 or Zool. 14f-15w-16s, General Zoology, 9
- Bact. 41f,w,s, General Bacteriology, 5 (Chem., zool.)
- Math. 5f,w,s, Higher Algebra, 5; Math. 6f,w,s, Trigonometry, 5 (Math. 5 or equiv.); and Math. 7f,w,s, College Algebra, 5 (Math. 6) or modern language, 15
- Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, Rhet. 22 advised)
- Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)

JUNIOR AND SENIOR YEARS

1. A major sequence of 24 to 36 credits from one of the following fields:

(a) Agricultural Biochemistry	(e) Nutrition
(b) Agronomy	(f) Plant Breeding
(c) Entomology and Economic Zoology	(g) Plant Pathology
(d) Horticulture	(h) Soils
2. A minor sequence of 18 credits to be chosen outside the major field of work.
3. Electives sufficient to make a total of 192 credit hours for the four years of work of which at least 31 credit hours must be in technical agriculture or in sciences fundamental thereto.

C. AGRICULTURAL ENGINEERING

(Professional Curriculum)

This curriculum leads to the degree of bachelor of agricultural engineering and is offered jointly by the College of Agriculture, Forestry, and Home Economics, and the College of Engineering and Architecture. Three distinct lines of specialization are provided, namely, Farm Buildings, Farm Machinery, and Reclamation. (See also general curriculum in

Agricultural Engineering for students in Agriculture who desire to major in this field, page 20.)

FRESHMAN YEAR

During the freshman year those following this curriculum will register in the College of Engineering and Architecture and follow the work of the freshman year as outlined in the bulletin of that college.

SOPHOMORE YEAR

The following courses should be scheduled for the quarter as indicated below. For the last three years of the curriculum students are registrants both of the College of Agriculture, Forestry, and Home Economics, and the College of Engineering and Architecture.

1. *Non-credit courses* required for graduation.

Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

2. *General courses.*

Agr. Eng. 13f,s, Gas Engines, 3

Agr. Eng. 19f-20s, Surveying, 6 (Draw. 3 or M. & M. 12, or equiv.)

Agr. Eng. 24f,w-25w,s, Agricultural Physics, 8 (M. & M. 13, Agr. Eng. 23 or equiv.)

Agr. Eng. 31w,s, Principles of Drainage, 3

Agr. Eng. 40f,s, Mechanical Training I, 3

Agron. 1f,w,s, General Farm Crops, 3

Hort. 6f, Fruit Growing, 3. Those entering without high school physics must postpone Hort. 6 until later in their curriculum and register for Agr. Eng. 23f, General Physics, 5

Hort. 32s, Vegetable Growing, 3

M. & M. 24f, Differential Calculus, 5 (M. & M. 13)

M. & M. 25w, Integral Calculus, 5 (M. & M. 24)

M. & M. 84s, Technical Mechanics, 5 (M. & M. 25)

Soils 4f, Soils, 3 (Inorg. Chem. 10 cred.)

Soils 8w, Physical Properties of Soils, 3 (Soils 4)

JUNIOR AND SENIOR YEARS

The following courses are required of all students in the professional curriculum in Agricultural Engineering. Electives should be chosen from the recommended list with a view to specialization in one of the three fields of work.

JUNIOR YEAR

Agr. Econ. 1f,w, Principles of Economics, 5
 C. E. 51f, Highways and Pavements, 3 (Agr. Eng. 20)
 Geol. 5f, Engineering Geology, 3
 M. & M. 85f, Strength of Materials, 4 (M. & M. 84)
 M. E. 38f, Machine Design, 3 (M. & M. 84)

SENIOR YEAR

Fall Quarter

Agr. Eng. 122f, Power Machinery, 4 (Agr. Eng. 12, 13, 25)
 Agron. 102f,w, Farm Management Organization, 3 (Agr. Econ. 2, Soils 4)
 C. E. 144f, Reinforced Concrete, 3 (M. & M. 85)
 Electives, 8

Winter Quarter

Agr. Econ. 2w,s, Principles of Economics II, 3 (Agr. Econ. 1)
 Agr. Eng. 7w, Farm Structures I, 3 (Draw. 3 or equiv.)
 Agr. Eng. 42w, Principles of Irrigation, 3
 Agr. Eng. 133w, Applied Electricity, 5 (Agr. Eng. 25 or equiv.)
 M. & M. 86w, Hydraulics with Laboratory, 3 (M. & M. 84)

Agr. Eng. 121w, Steam Boilers and Engines, 3 (Agr. Eng. 25, 40)
 Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
 G. E. 101w, Contracts and Specifications, 3 (sr. class.)
 Electives, 9

Spring Quarter

Agr. Eng. 12s, Field Machinery, 3	Agr. Eng. 37s, Rural Sanitation, 3
Agr. Eng. 134s, Agricultural Hydraulics, 3 (Agr. Eng. 25, M. & M. 25)	Agr. Eng. 126s, Selection of Farm Equipment, 3 (Agr. Eng. 14, 122)
An. Husb. 8s, Fundamentals of Feeding and Management, 5	Agr. Eng. 150s, Seminar, 2 (Agr. Eng. 102, 112, 125 or parallel 136)
C. E. 37s, Structural Engineering, 3 (M. & M. 84)	Econ. 85s, Principles of Marketing, 3 (Agr. Econ. 2)
Dy. Husb. 1, Elements of Dairying, 5	G. E. 193s, Engineering Practice, 2 (sr. class.)
	Electives, 5

RECOMMENDED ELECTIVES

1. Farm Structures

Agr. Eng. 5, 36, 67, 111, 112, 136; For. 27; Hort. 77; Rhet. 22

2. Farm Mechanics

Agr. Eng. 14, 15, 28, 101, 123, 125, 135, 136; Rhet. 22

3. Reclamation

Agr. Eng. 28, 101, 102, 103, 104, 136, 141; C. E. 161; Hort. 77; Rhet. 22

D. AGRICULTURAL BUSINESS ADMINISTRATION
CURRICULUM

This curriculum offers an opportunity for those who wish to prepare specifically for some branch of agricultural business, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising, and the like. The first two years are prescribed and include introductory courses in agriculture, economics, and the fundamental sciences necessary for further work in agriculture and economics. During the freshman and sophomore years, students will register in the College of Agriculture, Forestry, and Home Economics. The junior and senior years are offered in the School of Business Administration. The transfer to the School of Business Administration may be made without petition when the required work of the freshman and sophomore years outlined below has been completed with a minimum of 101 credits and 101 honor points. For definition of "honor point" see page 11. Approximately one third of the last two years is elective and may include advanced courses in agriculture and economics.

FRESHMAN YEAR

The freshman year consists of the regular freshman courses outlined on pages 15 to 16, except that students are advised to take Math. 8 rather than Agr. Eng. 9-10, or 11; or Math. 5 if they do not have the prerequisites for Math. 8. If any course of the freshman year is deferred, it should be An. Husb. 10-11, to the sophomore year.

SOPHOMORE YEAR

The following courses should be scheduled for the quarters as indicated below.

1. *Non-credit courses* required for graduation.

Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

30 AGRICULTURE, FORESTRY, AND HOME ECONOMICS

2. *Freshman courses* which were not completed during the freshman year.
3. *General courses.*
 - Agr. Econ. 1f, Principles of Economics I, 5
 - Agr. Econ. 2w, Principles of Economics II, 3 (Agr. Econ. 1)
 - Agr. Econ. 6s, Economic History of Agriculture, 5 (Agr. Econ. 1 or parallel)
 - Agr. Econ. 8s, Rural Economics, 3 (Agr. Econ. 1)
 - Agr. Econ. 50s, Farm Finance, 5 (Agr. Econ. 2)
 - ¹Econ. 20, Elements of Accounting, 3
 - Econ. 25w-26s, Principles of Accounting, 6
 - Psychology 1f-6w, General Psychology for Business Students, 6
 - Zool. 14f-15w-16s, General Zoology, 9
4. *Electives.*—Enough elective credits should be selected to make with the required work of the freshman and sophomore years a total of 101 credit hours.

JUNIOR YEAR

A. *General Requirements*

Bus. Adm. 100f,w,s, Report Writing, 1 (To be taken in connection with Econ. 141)
Econ. 51f-52w-53s, Business Law, 9 (10 cred. in pol. sci. or 10 cred. in econ. or 5 cred. in each)

Econ. 141f,w,s, Monetary and Banking Policies, 3 (Econ. 3 and 4 or 6-7)

B. *Special Requirements*

Agr. Econ. 30f, Prices of Farm Products, 3 (Agr. Econ. 2)
Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agr. Econ. 90f, Agricultural Statistics, 5 (Agr. Econ. 2)
Agr. Econ. 110f-111w, Economics of Agricultural Production, 6 (Agr. Econ. 2)
Agr. Econ. 131w, Market Prices, 3 (Agr. Econ. 40)
Agr. Econ. 141w, Marketing Organization: Dairy and Poultry Products, 3 (Agr. Econ. 40)
Agr. Econ. 142s, Marketing Organization: Fruits and Vegetables, 3 (Agr. Econ. 40)

SENIOR YEAR

A. *General Requirements*

Bus. Adm. 58, Public Finance, 3
Bus. Adm. 71, Traffic Management, 3
Bus. Adm. 101f,w-102w,s, Advanced General Economics, 6 (Econ. 4 or 6-7)
Bus. Adm. 139s, Advanced General Accounting, 3 (Econ. 25-26)
Econ. 149f,w,s, Business Cycles, 3 (Econ. 3 and 4 or 6-7)

B. *Special Requirements*

Agr. Econ. 135s, Methods of Price Analysis, 3 (Agr. Econ. 30, 90)
Agr. Econ. 150s, Advanced Farm Finance, 3 (Econ. 3 and 4 or 6-7)
Agr. Econ. 170s, Land Economics, 3 (Agr. Econ. 110)

AGRICULTURAL JOURNALISM CURRICULUM

This curriculum is intended for those who wish to prepare for some branch of journalism which relates to agriculture: such as staff positions on agricultural magazines, writing on agricultural questions, editing of bulletins for state and federal departments of agricultural and experimental stations, editing of special farm pages or departments for newspapers, and editing of publications for farm organizations. The first two years are prescribed and include introductory courses in agriculture, journalism, and economics. During the freshman and sophomore years, students will register in the College of Agriculture, Forestry, and Home Economics, and during the junior and senior years, will become registrants in both

¹ Students who have had a high school course or experience in bookkeeping may be exempted from this course and admitted to Econ. 25-26 by passing a placement test.

the College of Agriculture, Forestry, and Home Economics and the College of Science, Literature, and the Arts.

FRESHMAN YEAR

The freshman year consists of the regular freshman courses outlined on pages 15 to 16 except that English Survey A-B-C should be substituted for Rhetoric 1-2-3.

SOPHOMORE YEAR

Mil. Sci. 4-5-6, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.
 Agr. Econ. 1f,w,s-2w,s, Principles of Economics I-II, 8
 Agr. Econ. 6s, Economic History of Agriculture, 5 (Agr. Econ. 1 or parallel)
 Agr. Econ. 8s, Rural Economics, 3 (Agr. Econ. 1)
 Engl. 11f,w,s-12w,s, Description and Narration, 6 (A-B-C, or 4-5-6 or exemption from req.)
 Jour. 13f, Introduction to Reporting, 3 (Engl. A-B-C, Comp. 4-5-6 or exemption)
 Jour. 14w-15s, Newspaper Reporting and Correspondence, 6 (13 or practical experience, and Comp. 11-12 or 18-19)
 Psy. 1f-6w, General Psychology (for business students) 6
 Zool. 14f-15w-16s, General Zoology, 9

JUNIOR YEAR

Agr. Econ. 40s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 Agr. Econ. 90f, Agricultural Statistics, 3 (Agr. Econ. 2)
 Agr. Econ. 110f-111w, Economics of Agricultural Production, 6 (Agr. Econ. 2)
 Jour. 51f-52w, Newspaper Copyreading and Make-Up, 6 (Jour. 15)
 Jour. 57s, Magazine Typography, 2 (Jour. 51)
 Jour. 69s, The Writing of Special Articles, 3
 Sociol. 1f,w,s, Introduction to Sociology, 5
 Sociol. 14f,w,s Rural Sociology, 3 (Sociol. 1 or sr. class.)

SENIOR YEAR

Agr. Econ. 30f, Prices of Farm Products, 3 (Agr. Econ. 2)
 Agr. Econ. 135s, Methods of Price Analysis, 3 (Agr. Econ. 30, 90)
 Agr. Jour. 10f-11w-12s, Agricultural Journalism, 9 (Jour. 13-14-15, 51-52)
 Econ. 149f, Business Cycles, 3 (Econ. 3 and 4 or 6-7)
 Jour. 75s, Law of the Press, 3 (Jour. 51)
 Jour. 104f, Editorial Writing, 3 (Jour. 73 and 25 cred. in soc. sci.)
 Jour. 191w-192s, Topics Course, 6 (Jour. 104, 110)
 Psy. 56w, Psychology of Advertising, 3 (Psy. 1-2 and Prin. of Econ.)

RECOMMENDED ELECTIVES

Agr. Econ. 25, 126, 170; Agr. Ed. 11, 75; Engl. 44-45; For. 1; Geog. 51; Jour. 60-61, 70-71; Pol. Sci. 1, 2; Sociol. 110, 112.

MINOR IN JOURNALISM

For students in the various divisions of the College of Agriculture, Forestry, and Home Economics wishing a short course in journalistic writing, elections from the following program are recommended:

Engl. Comp. 11-12; Jour. 13, 41, 69, 70-71.

MAJOR IN HOME ECONOMICS

Jour. 65.

CURRICULA IN FORESTRY

The curriculum is made up of 204 credit hours of work including:

1. Required courses, 140 to 157 credit hours, which every student must complete. These are considered as fundamental to any curriculum in forestry.

2. Elective courses, 47 to 64 credit hours, distributed according to several methods described below (pages 34 to 36).

(For explanation of terms and course numbers, see page 13.)

REQUIRED COURSES

Required courses, 140 to 157 credit hours, are required of every student before graduation. These are considered fundamental and necessary to any curriculum in forestry. For some students the outline for the first two years, given below, represents more than the regular amount of work of 17 credit hours per quarter. In such cases those subjects which cannot be taken in the freshman and sophomore years must take precedence the following year. Registration for from 15 to 18 credit hours of work each quarter (summer quarter at Itasca Park, 6 credit hours), will be allowed without special permission. Phys. Ed. 1-2-3, Gymnasium, 3 (credit is allowed only when the three quarters together with Course 4 are completed), may be taken in addition to the regular schedule if desired. Care should be taken in registration to give precedence to courses offered only one quarter.

Not more than one half of the listed credit will be allowed for the courses listed under the freshman and sophomore years, below, unless completed prior to classification as a senior except in the case of students transferring with at least one full year of advanced standing from a college where these courses are not available.

FRESHMAN YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours. Freshman lectures. A course of lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.

Mil. Sci. 1f-2w-3s, Basic Course. Students found to be physically unfit may be required to substitute corrective exercises in physical education.

Phys. Ed. 4f,w,s, Freshman Hygiene or Prev. Med. 3, Personal Hygiene and Elementary Sanitation, 2

2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.

¹Agr. Eng. 3f,s, Mechanical Drawing, 2

Bot. 1f,s, General Botany, 4, and 6 credits selected from the following: Bot. 2, 5,

7, 12, 13, 21, 22

For. 1f, General Forestry, 3

For. 3w, Dendrology, 3

¹ Students presenting acceptable high school work in this course may substitute an elective.

- For. 4s, Dendrology, 4
 Inorg. Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 9-10. Those required to take this course because of inability to carry successfully Inorg. Chem. 9-10 will be allowed not more than 10 credits.
 Inorg. Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. & chem.)
 Those required to take Inorg. Chem. 1-2-3 are exempt.
¹Math. 5f,w,s, Higher Algebra, 5
 Math. 6f,w,s, Trigonometry, 5 (Math. 5 or equiv.)
²Rhet. 1f,w,s, Rhetoric I, 3
 Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)
 Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)

Itasca Park (Summer Session)

- Bot. 3su, Forest Botany, 1½
 For. 2su, Field Dendrology, 1½
 For. 5su, Field Silviculture, 1½
 For. 9su, Field Mensuration, 1½

SOPHOMORE YEAR

- Non-credit courses* required for graduation in addition to the 204 credit hours.
 Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.
- Freshman courses* which were not completed during the freshman year.
- General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.
 Agr. Econ. 1f,w, Principles of Economics I, 5
 Agr. Econ. 2w,s, Principles of Economics II, 3 (Agr. Econ. 1)
 Agr. Eng. 19f-20s, Surveying, 6 (Agr. Eng. 3, 11 or equiv.)
 Agr. Eng. 23f,s, General Physics, 5. Those presenting a unit of high school physics for entrance may omit this course and substitute 5 credits elective later in their curriculum.
 For. 7f-8w, Forest Mensuration, 10 (For. 3-4)
 Geol. 1f,w,s, General Geology, 5 or Geol. 29f, General Physiography, 5
 Pl. Path. 10f,s, Forest Pathology, 5 (Bot. 4-5-6)
 Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, and 22 recommended) or Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3) or Rhet. 31f,w,s, Survey of English Literature I, 5 (Rhet. 3)
 Zool. 14f-15w-16s, General Zoology, 9

JUNIOR YEAR

- Sophomore courses* which were not completed during the sophomore year.
- General courses.*—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.
 Agr. Eng. 24f,w-25w,s, Agricultural Physics, 8 (Math. 8, Agr. Eng. 11, 23 or equiv.)
 Ent. 6w, Forest Protection against Insects, 3 (Zool. 16)
 For. 28w, Logging, 3 (For. 7-8)
 For. 33f-34w, Wood Structure and Identification, 6 (For. 3-4)
 For. 126f, Silvics, 3 (For. 3-4)
 For. 127w, Silviculture, 3 (For. 126)
 For. 130f, Forest Valuation, 5 (For. 7-8)
 For. 131w, Forest Policy and Administration, 5 (For. 130)

¹ Students presenting higher algebra for entrance may omit this course and substitute 5 credits elective.

² Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 77.

3. *Special courses* selected from one of the major groups (pages 34 to 36 and electives to make from 15 to 18 credit hours per quarter. Full work for the year consists of 51 credit hours.

SENIOR YEAR

1. *Junior courses* which were not completed during the junior year.
 2. *General courses.*—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.

For. 37w, Forest Protection, 3 (For. 127)

For. 134f-135w, Forest Problems, 4 (sr. class.)

ELECTIVE COURSES

Elective courses, 47 to 64 credits, may be distributed as described below. Every student is required to file in the registrar's office by the end of his sophomore year a statement of the curriculum which he plans to pursue during his junior and senior years. Such statements from each student will make it possible to provide a workable program of subject courses. The student may make, and is strongly advised to make, this statement at the end of his freshman year. In this case he would have ample opportunity to change his curriculum at the end of the sophomore year. A change from one curriculum to another after the close of the sophomore year is permitted only on approval and does not exempt the student from any of the requirements of the curriculum which he finally selects. Such changes usually involve inconvenience and sometimes loss of credit to the student. All students are invited to consult with the dean of the college concerning the selection of a curriculum.

The student, with the approval of his adviser, may select any curriculum which complies with the following requirements:

a. A major of from 24 to 36 credit hours chosen from one of the following groups.

b. Electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University except those included in the group from which the major is chosen.

I. GENERAL FORESTRY

Suggested for those who are preparing themselves for technical forest work, such as positions in the federal or state services, or foresters for paper companies, lumber companies, or other large timber owners, involving the growth, management, and harvesting of forest crops. Students majoring in this field are required to spend the spring quarter of the junior year in the field at the Cloquet Forest Experiment Station pursuing the following courses:

For. 13s, Forest Mensuration Laboratory, 2 (For. 7-8)

For. 31s, Logging Laboratory, 1 (For. 28)

For. 128s, Silviculture Laboratory, 7 (For. 127)

For. 132s, Forest Regulation Laboratory, 7 (For. 131)

The major will be selected from the following:

Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10

Agr. Econ. 25f,w, Principles of Accounting, 4

Agron. 131f,w, Principles of Genetics, 3

Bot. 7s, Taxonomy of Flowering Plants, 3

Bot. 22f,w,s, Elementary Plant Physiology, 3

Bot. 101f,w, Elementary Biometry, 3
 Bot. 131f, Field Ecology, 5
 Bot. 132w, Ecological Anatomy, 5
 Bot. 133s, Plant Geography of North America, 5
 Bot. 141f-142w-143s, Advanced Plant Physiology, 15
 Chem. 31w-32s, Elementary Organic Chemistry, 10
 Econ. 26f,w,s, Principles of Accounting, 4
 Econ. 72w, Economics of Transportation, 3
 Econ. 73s, Railway Traffic and Rates, 3
 For. 20w, Grazing, 3
 For. 101w, Advanced Dendrology, 3
 For. 112w, Advanced Forest Mensuration, 3
 For. 122f-123w, Forestry Seminar, 2
 For. 125s, Wood Preservation, 3
 For. 129f, American Silvicultural Practice, 3
 For. 136f, Forest Economics, 3
 Geog. 33, Climatology, 3
 Geol. 2w-3s, General Geology, 10
 Org. Chem. 51f-52w-53s, Organic Chemistry, 15
 Pl. Path. 108f, Methods, 3
 Pl. Path. 110w, Principles of Pathology, 3
 Pl. Path. 114w, Advanced Forest Pathology, 3
 Soils 4f, Soils, 3
 Soils 5s, Soil Fertility, 3

2. COMMERCIAL LUMBERING

Suggested for those who wish to enter any branch of lumber business. Includes fundamental business courses and a thoro training in the structure, handling, and use of wood. The major will be chosen from the courses listed below.

Agr. Econ. 25f,w, Principles of Accounting, 4
 Agr. Econ. 40f,s, Principles of Marketing Organization, 3
 Agr. Econ. 50s, Farm Finance, 5
 Agr. Econ. 90f, Agricultural Statistics, 5
 Agr. Eng. 5f, Farm Building Construction, 3
 Bus. Adm. 73w, Transportation Charges, 3
 Bus. Adm. 89w, Production Management, 3
 Bus. Adm. 155s, Corporation Finance, 3
 Econ. 26f,w,s, Principles of Accounting, 4
 Econ. 72f,w,s, Economics of Transportation, 3
 Econ. 141f,w,s, Monetary and Banking Policy, 3
 Econ. 161f,w, Labor Problems and Trade Unionism, 3
 For. 13s, Forest Mensuration Laboratory, 2 (Cloquet)
 For. 23s, Factory Experience, 3-5
 For. 30s, Wood Seasoning, 3
 For. 31s, Logging Laboratory, 1 (Cloquet)
 For. 107f-108w, Uses of Wood, 6
 For. 112w, Advanced Forest Mensuration, 3
 For. 114f-115w-116s, Mechanical and Physical Properties of Wood, 9
 For. 132s, Forest Regulation Laboratory, 7 (Cloquet)
 For. 136f, Forest Economics, 3

3. FOREST BY-PRODUCTS

Suggested for those who wish to enter the field of pulp and paper manufacture, wood distillation, wood preservation, etc. Includes a series of courses in chemistry and mathematics and a thoro training in the structure, properties, and uses of wood. The major will be chosen from the following courses:

Agr. Biochem. 2f, Quantitative Methods, 5
 Agr. Biochem. 3f,w-4w,s, Types of Carbon Compounds, 6

Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10
 Agr. Biochem. 101f-102w, Agricultural Quantitative Analysis, 6
 Agr. Biochem. 111f-112w, Biochemistry, 6
 Agr. Biochem. 113f-114w-115s, Biochemical Laboratory Methods, 6
 Anal. Chem. 7f, Quantitative Chemistry, 4
 For. 23s, Factory Experience, 3 to 5
 For. 29f, Sawmill and Woodworking Machinery, 3
 For. 30s, Wood Seasoning, 3
 For. 107f-108w-109s, Uses of Wood, 9
 For. 113f, Wood Pulp and Paper, 3
 For. 114f-115w-116s, Mechanical and Physical Properties of Wood, 9
 For. 119f-120w, Advanced Wood Structure, 6
 For. 125s, Wood Preservation, 3
 Inorg. Chem. 11f,s, Qualitative Chemical Analysis, 4
 Math. 7f,w,s, College Algebra, 5
 Math. 30f, Analytical Geometry, 5
 Math. 50-51-52f,w,s, Calculus, 15
 M. & M. 26f,s, Technical Mechanics, 5
 M. & M. 128f,w,s, Strength of Materials, 5
 Org. Chem. 51f-52w-53s, Organic Chemistry, 15
 Phys. 23f,w,s, Heat, 3
 Phys. 124s, Pyrometry and Heat, 3

4. GRAZING

Suggested for those who wish to prepare themselves for range and management work. It is important that these men should be well prepared in plant physiology, systematic botany, plant ecology, as well as in the underlying principles of forestry. In addition, they should have some knowledge of the feeding and breeding of livestock. Students selecting a grazing major will be permitted to make certain substitutions in the general forestry requirements. The major, however, must include the following courses:

Agr. Biochem. 3f,w-4w,s, Types of Carbon Compounds, 6
 Agr. Econ. 90f, Agricultural Statistics, 5
 An. Husb. 1f,w, Types and Market Classes of Livestock, 5
 An. Husb. 5w, Livestock Breeding, 3
 An. Husb. 6w, Livestock Feeding, 5
 Bot. 7s, Elementary Taxonomy, 3
 Bot. 21f,s, Elementary Ecology, 3
 Bot. 22f,w, Elementary Plant Physiology, 3
 Bot. 113f-114w-115s, Advanced Taxonomy, 9
 Bot. 134s, Research Methods in Ecology, 5
 Bot. 140f,w, General Plant Physiology, 5
 Soils 4f, Soils, 3
 Soils 5s, Soil Fertility, 3

5. FOREST SCIENCES

Suggested for those who wish to specialize in the various branches of forestry or the forest sciences. It is assumed that students who follow this curriculum will spend one or more years in graduate study. Attention is therefore called to the language requirements for advanced degrees. Only those students who have maintained high scholarship records and who appreciate the true spirit of research should contemplate following this specialization.

The major may be selected from any courses offered in the following fields:

Botany	Entomology and Economic Zoology	Plant Pathology
Chemistry	Genetics	Soils
Economics	Geography	

CURRICULA IN HOME ECONOMICS

The curricula in home economics are designed to train young women for homemaking and for a payroll job in which all or most of them engage for at least a short period. Throughout the training period there are a certain number and kind of courses required to safeguard the preparation for homemaking. The first two years are essentially the same for all students irrespective of later specialization for the payroll job. At the close of the sophomore year each student signifies her interest in some special field and prepares for it, e.g., resident or extension teaching along one of several possible lines, dietetics, institution management, etc. By choosing electives wisely it is possible to extend one's training in fields other than home economics, e.g., economics, sociology, journalism, history, literature, etc.

The required courses for the various specializations are outlined on the following pages.

The College of Agriculture, Forestry, and Home Economics, and the College of Education co-operate in the preparation of teachers of home economics. At the beginning of the junior year when a student has acquired 90 credits and 90 honor points and indicates her specialization as the teachers' or the extension curriculum she becomes also a registrant in the College of Education. The teachers' curricula are arranged in accordance with the provisions of the Smith-Hughes Act.

(For explanation of terms and course numbers, see page 13.)

HOME EXPERIENCE

Clothing.—Home experience in the construction of garments is required of all students who have completed H.E. 11, as a prerequisite to H.E. 13. The character and amount of home experience will be arranged by a member of the faculty of the textile and clothing section.

Foods.—Home experience in cooking following H.E. 83, is a prerequisite for H.E. 35 and H.E. 49. A conference with a member of the faculty of the foods and cookery section should precede this work. An examination covering this work must be passed. For the schedule of these examinations consult the office of the division.

GROUP I. GENERAL REQUIREMENTS FOR ALL STUDENTS IN HOME ECONOMICS

FRESHMAN YEAR

All of the following work is required of every student except for the exemptions indicated. For some students this represents more than the regular amount of work of 15 credit hours per quarter. In such cases those subjects listed below which cannot be taken in the freshman year must take precedence in the following year. Registration for from 14 to

16 credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

Not more than one half of the listed credit will be allowed for the courses listed under the freshman and sophomore years, below, unless completed prior to classification as a senior except in the case of students transferring with at least one full year of advanced standing from a college where these courses are not available.

1. *Non-credit courses* required for graduation in addition to the 189 credit hours. Freshman lectures. A course of lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.

Phys. Ed. 1f-2w-3s, Elementary Physical Training

Phys. Ed. 4w, Preliminary Hygiene

2. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequences of continuation courses and the prerequisites must be observed.

H. E. 3f,w,s, Textiles, 5

H. E. 5of,w,s,51w,s,f, Color and Design 6

H. E. 7of,w,s, Nutrition Survey, 2

Inorg. Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 9-10. Those required to take this course because of inability to carry Inorg. Chem. 9-10 successfully will be allowed not more than 10 credits

Inorg. Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. s. chem.).

Those required to take Inorg. Chem. 1-2-3 are exempt from this course.

Rhet. 1f,w,s,¹ Rhetoric I, 3

Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)

Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)

Sociol. 1f,w,s, Introduction to Sociology, 3

Zool. 14f-15w, General Zoology, 6

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 189 credit hours.

Phys. Ed. 22f, Sophomore Elementary Swimming. Not required of those who can pass the swimming test in their freshman year.

2. *Freshman courses* which were not completed during the freshman year.

3. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence for continuation courses and prerequisites must be observed. From 15 to 17 credit hours should be selected each quarter

Agr. Biochem. 3f,w-4w,s, Types of Carbon Compounds, 6 (Inorg. Chem. 10 cred.)

Agr. Eng. 23f,s, General Physics, 5. Those presenting a year of high school physics may omit this course and substitute 5 credits elective later in their curriculum

Bact. 41f,w,s, Elementary Bacteriology, 5 (Chem., biol.)

H. E. 15f,w,s, Clothing Problems, 3 (H. E. 3, 51)

H. E. 53f,w,s, Advanced Design, 3 (H. E. 51 or 56)

H. E. 8of,w,s, Foods and Cookery, 5 (Agr. Biochem. 3, 4 parallel). Not required of those who qualify for H. E. 81

H. E. 81w, Foods and Cookery, 3 (Agr. Biochem. 3, 4 parallel). Students who have had high school training in foods work and who satisfactorily pass the test for admission to this course may substitute H. E. 81 for H. E. 80

Psy. 1f,w-2w,s, General Psychology, 6

Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)

¹ Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 77.

4. Electives.—Enough elective credits should be selected to make, with the required work of the freshman and sophomore years, a total of 93 credit hours. The number selected will vary from 1 to 11 credit hours depending upon the specific high school preparation of each student. Those whose programs permit are advised to register for Rhet. 11, Argumentation, 3, otherwise required in the junior year.

JUNIOR YEAR

1. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.

Agr. Econ. 1f,w,s, Principles of Economics, 5

H. E. 83f,w,s, Food Management, 3 (H. E. 80 or 81)

H. E. 85f,w,s, Food Marketing, 2 (Agr. Econ. 1 or parallel)

H. E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H. E. 53)

Physiol. 4f,w,s, Human Physiology, 4 (Inorg. Chem. 4 cred., Zool., 3 cred.)

H. E. Ed. 40f,w,s, Child Training, 3 (Psy. 1-2)

Prev. Med. 52f,w,s, Health Care of the Family, 3 (Bact. 41, Physiol. 4)

Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, 22 advised) or Rhet. 31f,w,s, Survey of English Literature I, 5 (Rhet. 3)

2. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 39 to 45.

3. *Electives.*—Enough electives should be selected to make, with those listed in 1 and 2 above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

SENIOR YEAR

1. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.

H. E. 34f,w, Home Management: Operation and Maintenance, Lectures, 3 (H. E. 35, parallel 83, Agr. Econ. 1 or parallel, Prev. Med. 52)

H. E. 35f,w,s,¹ Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 83, H. E. Ed. 40, or parallel, Prev. Med. 52, home practice in foods and cookery; must parallel H. E. 34)

H. E. 170f,w,s, Nutrition of the Family, 3 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)

H. E. 171f,w,s, Child Nutrition, 3 (H. E. 170 or parallel, H. E. Ed. 40)

2. *Special courses* are prescribed by the curriculum of the line of specialization selected. See special requirements on pages 39 to 45.

3. *Electives.*—Enough electives should be selected to make, with those listed above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

GROUP II. SPECIAL REQUIREMENTS IN THE DIFFERENT LINES OF SPECIALIZATION (SUPPLEMENTARY TO GROUP I)

Students should consult with advisers with reference to the required and elective courses which must be chosen to complete a specialization and to make up the 189 credit hours required for graduation.

In selecting electives, note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

¹A special project in the field of home management may be substituted or required at the discretion of the Division of Home Economics.

Registration for courses as electives in other colleges of the University must be in conformity with the regulations of the college offering the course.

Elective courses in the College of Science, Literature, and the Arts, are separated into junior college courses (numbered 1 to 49), open to freshmen and sophomores, and senior college courses (numbered 50 to 199), open to juniors and seniors. In addition to satisfying other prerequisites a minimum of 90 credits and 90 honor points must be earned before registering for a senior college elective.

I. GENERAL CURRICULUM IN HOME ECONOMICS

- a. *General requirements* as listed above, and
- b. *Elective courses* of which the major portion should be chosen from fields other than home economics, e.g., agricultural biochemistry, history, journalism, physics, preventive medicine, sociology, etc.

2. CURRICULUM IN FOODS AND NUTRITION

- a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
 An. Husb. 111w, Utilization of Meats, 3 or
 H. E. 75f, Dietetics Laboratory, 2 (H. E. 170 or equivalent and
 H. E. 179w,s, Readings in Nutrition, 2 (H. E. 170)
 H. E. 73f,w, Nutrition I, 4 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)
 H. E. 173s, Nutrition in Disease, 3 (H. E. 170, 175)
 H. E. 175f,w, Nutrition II, 4 (H. E. 73)
 H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80) or
 H. E. 183f,w,s, Experimental Cookery, 5 (H. E. 80)
 H. E. 186f,s, Special Food Problems, 3 (H. E. 182) or
 H. E. 187f,s, Special Food Problems, 5 (H. E. 182, Agr. Biochem. 2)

- b. *Elective courses*.—Sixteen additional credits must be chosen from the following courses:

Agr. Biochem. 2, 106, 108; Agr. Eng. 34, 35; Bus. Adm. 88, 180, 181, 182; Eng. 31, 32 or 33, 73, 74; German 1, 2, 3, 4, 24, 25, 26, 27, 28, 29; Hist. 1-2, or 2-3; H. E. 60, 61, 63, 163; Jour. 13, 41, 65, 69; Lib. Meth. 1; Math. 3, 4, 5, 6, 7; Phys. Chem. 110; Phys. 3, 4, 23, 24, 43, 44; Pol. Sci. 1; Psy. 56; Rom. Lang., French 1, 2, 3, 8, 9, 10

3. CURRICULUM IN TEXTILES AND CLOTHING

- a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
 H. E. 11f,w,s, Clothing Planning and Construction, A, 3
 H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equiv., 51, home exp. in garment making)
 H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
 H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
 H. E. 102f,s, Advanced Textiles, 3 (H. E. 3, Agr. Biochem. 3-4, Agr. Econ. 1 or parallel)
 H. E. 115f,w, Clothing Economics, 2 (H. E. 13, Agr. Econ. 1)

b. *Elective courses.*—One of the following groups must be completed.

Group A

- H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
- H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
- H. E. 55f, Decorative Needlework and Other Crafts, 3 (H. E. 53 or parallel)
- H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)
- H. E. 154s, Advanced Costume Design, 3 (H. E. 13, 53, 55 recommended)
- Bus. Adm. 69w, Retail Store Management, 3 (Agr. Econ. 1)
- Psy. 56w, Psychology of Advertising, 3 (Psy. 1-2 and Agr. Econ. 1)

Group B

- Agr. Biochem. 2f, Quantitative Methods, 5 (Inorg. Chem. 10 cred.)
- Bot. 1s, General Botany, 5
- H. E. 107w, Textile Analysis and Related Problems, 3 (H. E. 102, Agr. Biochem. 2)

4. CURRICULUM FOR DIETITIANS

a. *General requirements* as listed above with the following additional courses:

- Agr. Biochem. 2f, Quantitative Methods, 5 (Inorg. Chem. 10 cred.)
- Agr. Econ. 25f,w, Principles of Accounting, 4
- H. E. 60s, Institution Marketing, 2 (H. E. 61 or parallel, 85)
- H. E. 61f,w,s, Quantitative Cookery, 4 (H. E. 83)
- H. E. 63f,w,s, Institution Experience, 3 (H. E. 61 or parallel, 83)
- H. E. 65w, Institution Equipment, 2 (H. E. 61, 63 or parallel)
- H. E. 73f,s, Nutrition I, 4 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)
- H. E. 75f, Dietetics Laboratory, 2 (H. E. 182 or equivalent)
- H. E. 79s, Selected Problems for Dietitians, 3 (H. E. 170 or equivalent)
- H. E. 156f,w,s, Hospital Social Service, 3 (H. E. 170 or parallel, 175)
- H. E. 163s, Institution Management Problems, 3 (H. E. 61, 63)
- H. E. 173s, Nutrition in Disease, 3 (H. E. 170, 175)
- H. E. 175f,w, Nutrition II, 4 (H. E. 73)
- H. E. 176w, Advanced Nutrition, 5 (H. E. 73, Agr. Biochem. 2)
- H. E. 179w,s, Readings in Nutrition, 2 (H. E. 170)
- H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80)

b. *Elective courses.*

5. CURRICULUM IN INSTITUTION MANAGEMENT

a. *General requirements* as listed above with the following additional courses:

- Agr. Econ. 25f,w, Principles of Accounting, 4
- Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
- Econ. 1, Marketing, 3
- Econ. 161f,w, Labor Problems and Trade Unionism, 3 (20 cred. in soc. sci. incl. Econ. 4 or 6-7)
- H. E. 60s, Institution Marketing, 2 (H. E. 61 or parallel, 85)
- H. E. 61f,w,s, Quantity Cookery, 4 (H. E. 83)
- H. E. 63f,w,s, Institution Experience, 3 (H. E. 61 or parallel, 83)
- H. E. 65w, Institution Equipment, 2 (H. E. 61, 63 or parallel)
- H. E. 163s, Institution Management Problems, 3 (H. E. 61, 63)
- H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80) or
- H. E. 183f,w,s, Experimental Cookery, 5 (H. E. 80)

b. *Elective courses.*—Six credits from Group A and nine credits from Group B must be completed.

Group A.—An. Husb. 111; Bus. Adm. 67, 130, 167; Econ. 51.

Group B.—Agr. Eng. 34, 35; Child Wel. 60; Econ. 3, 149; Eng. 31-32 or 33, 73-74; H. E. 73 or 75 or 173, 150; Jour. 13, 41, 65, 69; Phys. 3, 4, 23, 24, 43, 44; Psy. 56; Rhet. 28, 32, 33.

CURRICULA FOR TEACHERS

(College of Education)¹

For the junior and senior years the following curricula have been approved by the College of Agriculture, Forestry, and Home Economics and by the College of Education and all students who are candidates for the university teacher's certificate are required to pursue one of the following curricula.

Such students become registrants in both colleges during the junior and senior years but register for their freshman and sophomore work in the College of Agriculture, Forestry, and Home Economics. Every student who expects to teach home economics and who expects to obtain the university endorsement for a certificate must sign specialization card at the beginning of the junior year and meet the following requirements:

6. TEACHERS' CURRICULA IN GENERAL HOME ECONOMICS

General requirements as listed above with the following additional courses:

- Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
- Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
- Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
- Hist. Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
- Hist. Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
- Hist. Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in history) or
- Ed. Ad. 65f,w,s, The High School, 3 (Ed. 55)
- H. E. 11f,w,s, Clothing Planning and Construction, A, 3
- H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equivalent, 51, home practice in garment making)
- H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
- H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
- H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)
- H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
- H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
- H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Five to ten credits must be elected from Group A and enough credits from Group B to make a total of sixteen credits.

Group A.—Hist. 1-2 or 2-3, Pol. Sci. 1.

Group B.—Bot. 1; Child Wel. 60; Eng. 31-32 or 33, 73-74; H. E. 55, 57, 61, 182, 195, 154, 73 or 75 or 179 or 173; H. E. Ed. 142; Jour. 13, 41, 65, 69; Lib. Methods 1; Psy. 3, 56 or 60; Rhet. 28, 32, 33, 34; Zool. 183.

7. TEACHERS' CURRICULA IN HOME ECONOMICS EXTENSION

a. *General requirements* as listed above with the following additional courses:

- Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
- Agr. Ed. 11f,w,s, Principles of Vocational Education, 3

¹ See scholarship requirements for admission to the College of Education, page 11.

- Hist. Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
 Hist. Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
 Hist. Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred.
 in hist.) or
 Ed. Ad. 65f,w,s, The High School, 3 (Ed. 55)
 H. E. 11f,w,s, Clothing Planning and Construction, A, 3
 H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equivalent,
 51, home practice in garment making)
 H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
 H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
 H. E. 44w, Home Economics Extension Work, 3 (H. E. Ed. 42, 49 or parallel)
 H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)
 H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83,
 Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
 H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E.
 Ed. 42. In addition to other prerequisites a student registering for this course
 must have received a grade of C or higher in each of the following courses:
 H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
 H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Ten credits from the following courses must be completed.

Agr. Ed. 75; Agr. Eng. 34; Child Wel. 60; Agr. Econ. 25; H. E. 57, 61, 75,
 173, 179, 182, 195; Jour. 13, 41, 65, 69; Psy. 56; Rhet. 24; Sociol. 110.

8. TEACHERS' CURRICULUM IN FOODS AND NUTRITION

a. *General requirements* as listed above with the following additional courses:

- Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
 Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
 Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
 Hist. of Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
 Hist. of Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
 Hist. of Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6
 cred. in hist.) or
 Ed. Ad. 65f,w,s, The High School, 3 (Ed. 55)
 H. E. 73f,s, Nutrition I, 4 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)
 H. E. 173s, Nutrition in Disease, 3 (H. E. 170) or
 H. E. 175f,w, Nutrition II 4 (H. E. 73) or
 H. E. 75f, Dietetics Laboratory, 2 (H. E. 170 or equivalent) and H. E. 179w,s,
 Readings in Nutrition, 2 (H. E. 170)
 H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80) or
 H. E. 183f,w,s, Experimental Cookery, 5 (H. E. 80)
 H. E. 186f,s, Special Food Problems, 3 (H. E. 182) or
 H. E. 187f,s, Special Food Problems, 5 (H. E. 182, Agr. Biochem. 2)
 H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83,
 Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
 H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E.
 Ed. 42. In addition to other prerequisites a student registering for this course
 must have received a grade of C or higher in each of the following courses:
 H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
 H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Fifteen additional credits from the following courses must be completed.

Agr. Biochem. 2, 106, 108; Agr. Eng. 34, 35; Eng. 31-32 or 33, 73-74; German 1, 2,
 3, 4, 24, 25, 26, 27, 28, 29; Hist. 1-2 or 2-3; H. E. 11, 13, 17, 18, 60, 61,
 63, 65, 136, 150, 163; Jour. 13, 41, 65, 69; Lib. Meth. 1; Math. 3, 4, 5, 6, 7,
 Phys. Chem. 110; Phys. 3, 4, 23, 24, 43, 44; Pol. Sci. 1; Rhet. 28, 32, 33, 34,
 Rom. Lang. French 1, 2, 3, 8, 9, 10.

9. TEACHERS' CURRICULUM IN TEXTILES AND CLOTHING

a. *General requirements* as listed above with the following additional courses:

- Agr. Econ. 126s, Economics and Consumption, 3 (Agr. Econ. 1)
 Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
 Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
 Hist. of Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
 Hist. Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
 Hist. Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in hist.) or
 Ed. Ad. 65f,w,s, The High School 3 (Ed. 55)
 H. E. 11f,w,s, Clothing Planning and Construction, A, 3
 H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equivalent, 51, home experience in garment making)
 H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
 H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
 H. E. 102f,s, Advanced Textiles, 3 (H. E. 3, Agr. Biochem. 3-4, Agr. Econ. 1 or parallel)
 H. E. 115f,w, Clothing Economics, 2 (H. E. 13, Agr. Econ. 1)
 H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)
 H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
 H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
 H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses*.—Eleven additional credits from the following courses must be completed.

Agr. Biochem. 2; Botany 1; H. E. 17 or 18, 55, 57, 107, 154, 195.

10. TEACHERS' CURRICULUM IN RELATED ART

a. *General requirements* as listed above with the following additional courses:

- Art Ed. 4f-5w-6s, Still Life, 3
 Art Ed. 7f-8w-9s, Sketch, 3
 Art Ed. 29f-30w-31s, Sketch, Course II, 3 (Art Ed. 7, 8, 9)
 Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
 Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
 Hist. of Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
 Hist. of Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
 Hist. of Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in hist.) or
 Ed. Ad. 65f,w,s, The High School, 3 (Ed. 55)
 H. E. 11f,w,s, Clothing Planning and Construction, A, 3
 H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equivalent, 51, home experience in garment making.)
 H. E. 55f, Decorative Needlework and Other Crafts, 3 (H. E. 53 or parallel)
 H. E. 57s, Batik and Other Crafts, 3 (H. E. 3, 53 or parallel)
 H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)
 H. E. 152w, Advanced Interior Design, 3 (H. E. 53, 131, 150)
 H. E. 154s, Advanced Costume Design, 3 (H. E. 13, 53, 55 recommended)
 H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)

- H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
- H. E. Ed. 147w, Organization and Methods for Related Art Teaching, 3 (H. E. Ed. 42 or parallel, H. E. 53, 131 or parallel)

b. *Elective courses.*

II. RESEARCH IN THE FIELD OF HOME ECONOMICS

In the undergraduate curricula there is not sufficient opportunity to prepare prospective research workers adequately except in so far as electives may be used in that direction, with the expectation of going ahead with graduate study following graduation with the baccalaureate degree. Persons interested in research in textiles, nutrition, home management, home economics education, related art, home equipment, etc., should choose all electives following consultation with a faculty member interested in that particular field.

DESCRIPTION OF COURSES

AGRICULTURAL BIOCHEMISTRY

This division offers two types of work, namely, courses in those phases of chemistry which have special application in agriculture or home economics for students whose major work is in other divisions; and courses designed to train chemists for research or instruction in the special field of agricultural biochemistry.

2. Quantitative Methods. Principles of quantitative analysis, including stoichiometric problems, practice in the use of the balance and in typical gravimetric and volumetric manipulations.
- 3-4. Types of Carbon Compounds. The groups of carbon compounds, with special reference to their relationships and their occurrence in plant and animal materials used as food.
- 7-8. General Agricultural Biochemistry. A qualitative and quantitative study of the types of organic and inorganic compounds found in plants and animals and of the chemical changes involved in metabolism, growth, and maintenance. Lecture and laboratory.
15. Principles of Animal Nutrition. Lectures, recitations, and collateral reading emphasizing the chemical and physiological principles underlying digestion, metabolism, utilization of feeds, maintenance, growth, fattening, milk production, vitamin hypothesis, and deficiency diseases.
- 101-102. Agricultural Quantitative Analysis. The estimation of inorganic and organic constituents of biological products, the proximate analysis of foods and feeding stuffs, the use of the polariscope, immersion refractometer, colorimeter and nephelometer, viscosimeter, and other special apparatus.
103. Dairy Chemistry. Lectures and laboratory work on the physical, colloidal, and chemical properties of milk and dairy products, the chemistry of the various constituents of milk and of the processes involved in the manufacture of dairy products.
106. Biochemistry in Industry. A seminar course.
108. Chemistry of Wheat and Wheat Products. A lecture course, with collateral library reference work, on the chemical technology of the production and milling of wheat and the conversion of its products into human food.
110. Flour Laboratory Methods. A laboratory course in methods of analysis of wheat and its products; milling tests of wheat, baking, and special tests of flour. Designed to train students for research and control work in the cereal industry.
- 111-112. Biochemistry. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes, and pigments and their physiochemical relations to the vital processes involved in growth and nutrition.

- 113-114-115. Biochemical Laboratory Methods. A laboratory course paralleling the lectures in 111-112, using recent methods for the investigation of biologically important compounds.
116. Advanced Animal Nutrition. Recent developments in animal nutrition, covering the field of proteins, mineral metabolism, and vitamins.
117. Laboratory Problems in Animal Nutrition. A laboratory course on methods used in nutrition studies.
118. Laboratory Problems in Biochemistry. Special laboratory work in the preparation and isolation of pure compounds which occur in living cells, the study of biochemical reactions, and special methods of identification or determination of biochemical products.

AGRICULTURAL ECONOMICS

1. Principles of Economics I.
2. Principles of Economics II.
6. Economic History of Agriculture. The evolution of the economic organization with special reference to agriculture. The development of methods of agricultural production and marketing, types of farming, and tenure systems.
7. Natural Resources. See under Agron. 7 for course description.
8. Rural Economics. An economic analysis of a number of the important social problems of agriculture, including rural organization, tenancy, farm incomes, rural population and standards of living, agricultural policy.
25. Principles of Accounting. Same as Economics 25 but credit is allowed without the completion of Economics 26.
30. Prices of Farm Products. Past and probable future trends in prices of important farm products. Adjustment of production to price changes, foreign competition. Price stabilization.
40. Principles of Marketing Organization. The principles of the organization of the market and of marketing enterprises, both proprietary and co-operative.
47. Marketing Accounting.
50. Farm Finance. The mechanism of exchange with special reference to the financing of the production and marketing of farm products.
90. Agricultural Statistics. Statistical method applied to the analysis of agricultural data; collection, tabulation, and graphical presentation; averages; measures of dispersion; index numbers; time series.
110. Economics of Agricultural Production I. The principles of production economics applied to agriculture, especial emphasis being placed upon comparative advantage and localization of production. (Includes old Course 7, Economic Geography of Agriculture.)
111. Economics of Agricultural Production II. Continuation of Economics 110.
126. Economics of Consumption. Nature of human wants; standards of living; costs of living; income, administration of income; nature of

- demand; demand and price; relation of consumption to the population problem.
131. Market Prices. Manner in which prices are determined in the market place. Local, wholesale, and retail prices. Price fluctuation and speculation. Prices and market grades. Market quotations.
 135. Methods of Price Analysis. Statistical methods for the study of the forces determining prices, forecasting price changes, and determining "established prices." Survey of research work in the field.
 140. Marketing Organization: Staples. Principles of production economics applied to the organization of markets and marketing organization for the grains, tobacco, cotton, and wool. Special attention to co-operative organization.
 141. Marketing Organization: Dairy and Poultry Products.
 142. Marketing Organization: Fruits and Vegetables.
 143. Marketing Organization: Livestock and Meats.
 144. Co-operative Organization. Development of co-operation in agriculture in the United States and foreign countries. Analysis of economic problems peculiar to co-operative organization, especially of marketing agencies.
 150. Advanced Farm Finance.
 170. Land Economics. Land as a factor of production; rural and urban utilization; rents and land values; land classification; land exchange.
 171. Land Tenure. Property in land; tenancy; farm labor; evolution of the tenure classes.
 191. Advanced Agricultural Statistics. Analysis of agricultural data by methods of correlation, partial and multiple correlation.

See also courses in Economics.

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

11. Principles of Vocational Education. The fundamental principles upon which education is based. Emphasis is placed on those phases which are most closely related to vocational education.
21. Vocational Education. A short history of vocational education; present status in Europe and the United States; manual training and home arts in an educational system; place of agriculture in the public schools with special reference to Minnesota.
41. Apprentice Teaching. An introductory course in teaching, including observation of class work, apprentice teaching, and special conference discussions of problems relating to teaching. Intended to initiate the student into the routine of classroom procedure. Professional readings. (Not offered in 1928-29.)
42. Supervised Teaching Experience. Preparation of lesson plans and actual teaching of classes under careful supervision in recitation and laboratory; criticism and discussion of plans, methods, and results of student teaching. Review and discussion of assigned professional readings.

64. Survey of Agriculture. A course in general agriculture designed to give students practical familiarity with fundamental principles and basic facts, best procedures, literature, and important problems of agriculture in this region.
75. Visual Presentation. To prepare persons for presenting materials by means of slides, films, charts, etc. Students assist in assembling materials for their own use and in acquiring skill and technique in preparation and operation of various mediums.
81. Extension Work. Federal, state, and local extension aims, organization. Assembling and use of extension data and equipment. Development of extension methods especially as applied to the work of Minnesota.
82. Agricultural Extension Field Work. Actual field practice in extension work on part salary in addition to credits. Number admitted to course limited by positions available. Usually will cover summer quarter, may extend into fall quarter.
121. Teachers' Course, Home and School Gardening. A lecture and laboratory course designed to give teachers the preparation necessary for the proper planning, management, and supervision of home and school gardens.
131. Methods in Teaching High School Agriculture. Fundamentals of method in teaching as related to teaching agriculture in high school. Organizing subject-matter of daily work; selection and manipulation of devices. Classroom and laboratory method. Specific plans for teaching secondary agriculture. (Not offered in 1928-29.)
135. The Curriculum in Vocational Agriculture. A study of curriculum organization, determination of subject-matter, organization of subject-matter, job analysis, course construction, texts, and references.
141. Supervised Practice in Vocational Agriculture. A special methods course dealing with the selection, planning, supervising, and summarizing of the practical work in agriculture. Special emphasis on the problem method of teaching, and the use of the farm and community for teaching purposes.
151. Organization and Management. Organization and management of work in secondary schools, particularly in Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and coordination of work. (Not offered in 1928-29.)
153. Consolidated Rural Schools. To prepare principals to meet the problems of organization and management peculiar to consolidated rural schools, such as building arrangements, curriculum adjustments, transportation of pupils, and home project work.
154. Rural Education and Community Life. The rural school as a community center, and ways and means of organizing educational and recreational activities, such as clubs, festivals, fairs, and other desirable features of rural community life.

155. Consolidated Rural School Problems. Opportunity for intensive study and research in special problems of administration and supervision of village and consolidated rural schools.
161. Vocational Education in Agriculture. A study of the principles developed and established in agricultural education. The principles developed in other vocational education and their relation to agricultural education.
162. The Basis of Vocational Teaching Technique. A course which includes an analysis of the philosophical, psychological, and other bases of teaching technique from the viewpoint of the teacher of vocational agriculture.
164. Fundamentals of Agriculture. Emphasis on current problems in meats, milk, poultry, plant pathology, mechanical training, and other essentials for teachers of agriculture.
171. Problems in Procedure. For agriculture teachers. Emphasizes working out problems in detail in order that the processes as formulated can be used in teaching the following year by those enrolled. Discussions, readings, papers, laboratory.
176. Problems in Visual Presentation. Special attention to use of visual aids in teaching agriculture. The development of proper visual methods by means of research.
- 181-182-183. Teaching Agriculture. A study of all activities of the teacher in conducting a high school agriculture department in Minnesota including all day, part time, evening, and elementary classes, and community activities. Observation, participation, reading, preparing plans, criticisms, discussions, reports.
- 191-192-193. Seminar in Agricultural Education. Critical studies of important problems in agricultural education; opportunity for individual investigation and research; review and interpretation of current educational literature.

AGRICULTURAL ENGINEERING

3. Mechanical Drawing. Materials, instruments, and their uses. Lettering, scale reading, conventional symbols, and blue printing. Orthographic projection, pictorial drawing, and planning farm buildings (Agriculture); or records and plots of surveys, contour and profile map tracing (Forestry).
5. Farm Building Construction. Instruction and practice in estimating, framing, construction, and painting of farm buildings.
7. Farm Structures I. The arrangement, planning, and designing of farm buildings giving special attention to convenience, economy, and the durability of farmhouses, barns, cribs, granaries, hog houses, etc.
- 9-10. Applied Mathematics. Same as Course 11 extended over two quarters.
11. Applied Mathematics. Rules of practical mathematics with special attention to formulas and problems directly related to agricultural and forestry work; e.g., areas, volumes, progressions, statistics, averages, proportions, variations, investments, cost problems.

12. Field Machinery. Construction, operation, adjustment, and use of soil preparation, seeding and harvesting machinery.
13. Gas Engines. Theory, operation, care, and repair of gasoline engines.
14. Elementary Farm Power. Construction, operation, care, adjustment, testing, and use of the tractor and other sources of farm power. Lectures and laboratory.
15. Ignition and Carburetion. Lecture and shop study of the construction and action of the various forms of ignition and carburetion systems in use on gas engines of all types.
19. Elementary Surveying. Use of tape, level, transit, and traverse board in agricultural field problems, e.g., mensuration surveys, traverses, differential and profile leveling; plotting and mapping. Care and adjustment of instruments.
20. Advanced Surveying. Topographic surveys by stadia and other methods, running simple curves, cross sectioning, plotting the survey, profile building, grade determination, and figuring of quantities in earth work.
23. General Physics. The elements of physics for those who have not had physics in high school. Mechanics, heat, light, and electricity with laboratory work.
24. Agricultural Physics I. An applied course involving lectures and laboratory work in mechanics and heat. Special emphasis given to farm power, hydraulics, heating, ventilation, and meteorology.
25. Agricultural Physics II. A practical lecture, recitation, and laboratory course on electricity and light, including electric generating plants, batteries, motors, lighting systems, and light and radiant energy as applied to farm problems.
28. Land Clearing. Land clearing methods, explosives, and machinery. Farm development in cut-over timber districts.
31. Principles of Drainage. Elementary principles and practice of drainage in relation to plant growth, crop and land values, and farm operation and development.
34. Household Mechanics. Lectures and recitations on household appliances and methods of operation, such as water supply, plumbing, sewage disposal, washing, cooking, refrigeration, heating, and electrical appliances.
35. Household Physics. A course of lectures and laboratory work on the principles of physics that apply to cooking, cleaning, plant and animal growth, dyeing, and other subjects of household importance. Molecular physics, heat, light, and color.
36. Rural Heating and Ventilation. Fundamental principles of combustion, heat transmission, heating and ventilation. Application of heating and ventilating systems to homes, rural schools, churches, warehouses, and farm structures.
37. Rural Sanitation. Wells, pumps, and water supply, with methods of securing sanitary water systems for farmsteads and rural institutions. Sanitary sewage disposal methods for homes, creameries, etc.

40. Mechanical Training I. Instruction and laboratory practice in mechanical trades, embracing rope work; belt lacing and pulleys; cement work; soldering; pipe fitting; electric wiring; harness repair; etc.
41. Mechanical Training II. Instruction and laboratory practice in mechanical trades embracing metal work, tool sharpening, painting, wood finishing, cement construction, machinery repairs. Special attention given to practical applications and features of special interest to teachers.
42. Principles of Irrigation. Irrigation and the development of arid and semi-arid lands, a study of irrigation practices; duty of water and water rights; correlation of drainage and irrigation.
67. Farm Structures II. Planning, estimating, and construction of farm buildings including a study of materials commonly used.
101. Drainage Engineering and Works. Design, location, and construction of public and private drainage systems and works; construction estimates, drainage engineering, and public records.
102. Advanced Drainage Problems. Special drainage problems including surface run-off, soil permeability, relation of soil type to drainage, shape and regulation of water table in relation to root growth, etc.
103. Irrigation Engineering and Works. Design, location, and construction of irrigation works; reservoir and transmission losses; general irrigation law; irrigation engineering and public records.
104. Drainage Administration and Law. Organizing, financing, problems in legal development and administration of drainage and flood control districts, fiduciary duties of the engineer, etc.
111. Structural Materials. Use, strength, practicability, and durability of materials used in farm building construction and equipment.
112. Farm Building Problems. Investigations in the utility and durability of building materials such as concrete, hollow building tile, lumber, prepared roofing, etc., as well as methods of construction of farm buildings.
121. Steam Boilers and Engines. Lecture and laboratory study of the construction, operation, and care of simple steam engines and boilers.
122. Power Machinery. A study of those machines requiring mechanical power for their operation, such as feed grinders, corn shredders, ensilage cutters, threshers.
123. Farm Power. Comparative study of the application and cost of the different sources of power to farm machinery and operations.
125. Farm Machinery Design. Drafting room study of design of farm machine parts, e.g., gearing, cams, shafts, flexible connections, etc.; laboratory tests of strength coupled with efficiency of machine parts. Recitation and lecture.
126. Selection of Farm Equipment. Field laboratory study of types and construction of machinery and equipment suited to the various farm and farm home operations.
133. Applied Electricity. Course, largely of laboratory work in direct and alternating current machines as used on farms, including generators,

motors, storage batteries, transformers, and complete isolated electric and hydroelectric plants.

134. Agricultural Hydraulics. A laboratory and lecture course on hydraulics as applied to water movements in pipes, tile and open ditches in farm water systems, drainage, and irrigation.
135. Ignition Systems. Lecture and laboratory course in the study of ignition and generating systems used on gas engines and tractors.
136. Experimental Physical Analysis. A laboratory course in physical measurements for specialists in the agricultural sciences. The work includes the use of bridges, potentiometers, galvanometers, refractometers, spectrometers, polarimeters, thermocouples, etc.
141. Land Clearing II. Special problems in stump removal under different conditions of soil and vegetation; stone removal; dirt blasting in construction of silos, temporary ditches and building excavations. Breaking virgin soils of varying composition and texture. Technique in use and manufacture of explosives and land clearing equipment.
150. Seminar. Students will give reports of their investigations on certain assigned problems for research.

AGRONOMY, FARM MANAGEMENT, AND PLANT GENETICS

1. General Farm Crops. A study of the important field crops of the United States.
7. Natural Resources. A study of the natural resources of the United States and other countries in their relation to agriculture. Attention is given to the importance of these resources and to their wise utilization. Lectures, reference work, and discussions.
101. Farm Management. Farm records—simple farm accounting and the forms and methods employed in making cost of production studies and farm management surveys. Practice in record keeping and accounting.
102. Farm Management Organization. The business side of farming is emphasized. Special attention is given to farm organization and equipment.
103. Farm Management Operation. Continuation of 102. Special attention is given to farm operation.
104. Types of Farming. A study of types of farming and of prevailing farm practices in the principal agricultural production areas.
121. Grain Crops. Structure, function, culture, improvement, and uses of corn, wheat, oats, barley, rye, flax, and buckwheat.
122. Grain and Hay Grading. History of grading, study of grading methods, and actual practice in grading grain and hay samples according to federal standards.
123. Forage Crops. A study of the structure, function, culture, and improvements and uses of forage crops including meadow and pasture management.

124. Special Crops. Climate and soil requirements as related to distribution and culture of the following crops: legumes for seed production, potatoes, sugar beets, sorghum for sirup, flax and hemp for fiber, tobacco, and other minor crops.
125. Advanced Farm Crops. The ecology of crop plants and the application of plant science to crop production.
131. Principles of Genetics. Fundamental principles of breeding, heredity, variation, biometry, and evolution. Same as Hort. 109.
132. Farm Crops Plant Breeding. Applied genetics. Methods of breeding each of the important agricultural crops.
134. Laboratory Problems in Genetics. Methods of taking and arranging genetics data. Special inheritance problems with *Drosophila*. Construction of chromosome map.

ANALYTICAL CHEMISTRY

SCHOOL OF CHEMISTRY

1-2. Analytical Chemistry.

For additional courses and course descriptions see the bulletin of the School of Chemistry.

ANIMAL HUSBANDRY

- 2-3. Types and Breeds of Livestock. The types as related to performance and production in horses, beef cattle, sheep, and swine, and the origin, history, characteristics, and economic importance of the breeds, classified according to type.
4. Livestock Judging. Practice in judging horses, cattle, sheep, and hogs from both the market and breed standpoint.
5. Livestock Breeding. The application of the principles of genetics to the breeding of livestock; a review of the master-breeders' methods and consideration of the practical breeders' problems.
6. Livestock Feeding. Feeding livestock under farm conditions; efficiency and economy in feeding, growing, and fattening meat animals; feeding draft horses and colts. Consideration of experimental work and present practice. Practical feeding problems.
7. Meats. Dressing of animals and the cutting of carcasses. Lectures and laboratory work.
8. Fundamentals of Feeding and Management. A study of livestock and dairy feeding designed for students not majoring in animal industry. Not open to those who have completed Course 6 or Dy. Husb. 103.
9. Pedigrees and Herd Books. Pedigree registration; laboratory practice in the use of the stud, herd, and flock records; tracing and tabulating pedigrees.
- 10-11. Types and Market Classes of Livestock. Livestock markets, and marketing methods. The market classes of horses, cattle, sheep, and swine. Practice in classifying, judging, and appraising livestock.

101. Advanced Stock Judging. Competitive judging of all types, breeds, and classes of livestock supplemented by visits to nearby stock farms.
102. Horse Husbandry. Stud farm management; the selection of foundation stock and the breeding, feeding, and marketing of horses; factors determining a horse's efficiency for work. Practice in decorating horses for the show ring.
103. Beef Cattle Husbandry. Lectures and laboratory work in feeding and management of purebred and grade herds; selection of foundation stock and sires; buildings and equipment; keeping records; recording; advertising; fitting for show and sale; showing; buying; selling; labor.
104. Sheep Husbandry. The care and management of sheep. The fitting of sheep for show and sale. Practice in feeding, shearing, and blocking sheep. The care of young lambs.
105. Swine Husbandry. Hog barn equipment. Building up the breeding herd, private herd records, herd management, fitting and showing. Marketing breeding stock. Barn work and feeding practice.
106. Advanced Meats. Practice work in dressing animals and cutting carcasses, giving particular attention to conformation as related to dressing percentage and the carcass; a study of the physical and chemical composition of meat.
107. Meat Problems. The wholesale cuts and grades of meat; the packing industry and the utilization of by-products. Special problems and trips to packing establishments.
- 108-109-110. Seminar. Special problems and research assignments on investigations pertaining to the livestock industry.
111. The Utilization of Meats. A detailed study of the different cuts of pork, beef, veal, mutton, and lamb, with reference to prices, relative economy, uses, nutritive value, chemical composition, ripening, curing, palatability. (For Home Economics students.)

ANTHROPOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

51. Introduction to Anthropology.
53. Cultural Anthropology.
54. Cultural Anthropology.
62. Ethnology.
80. The American Indian.
110. Physical Anthropology.
112. The American Negro.
113. The Peoples of Europe.
114. The American People.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

21-22-23. Elementary Freehand Drawing.

For additional courses and course descriptions see the bulletin of the College of Engineering and Architecture.

ART EDUCATION

COLLEGE OF EDUCATION

1-2-3. Fundamental Principles of Design.

4-5-6. Still Life.

7-8-9. Sketch.

10-11-12. Composition.

20-21-22. Principles of Harmony in Form and Color.

For additional courses and course descriptions see the bulletin of the College of Education.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

41. General Bacteriology.

103. Soil Microbiology. Studies of the microscopic inhabitants of the soil, their interrelationships and rôle in the transformations of soil constituents with particular emphasis on the cycles of carbon, nitrogen, and sulphur in nature.

105. Food Bacteriology. The decay, fermentation, and putrefaction of foods; molds; canning; bacterial food poisoning.

For additional courses and course descriptions see the bulletin of the Medical School.

BEE CULTURE

Students registering for beekeeping should have a working knowledge of botany, zoology, and entomology.

1. Elementary Bee Science. Classification, structure of *Apis Melifica*. Development and life history of the queen, worker, and drone. Organization of the colony. Colony instincts and activities. Breeding, swarming; hibernation.
2. Industrial Beekeeping. Bees as honey producers and pollinators. Beehives, tools, and appliances. Bee shop. Location. Handling bees; spring management, swarm control. Production of comb and extracted honey. Food sources. Increase. Wintering. Diseases and enemies.
3. Advanced Beekeeping. Outfit of a commercial apiary. Location and management of out-apiaries. Migratory beekeeping. Package bees, nuclei, queen raising, judging. Bee products.
5. Bee Diseases. Fungi and parasites. Brood and mature bee diseases. The diagnosis, causes, and practical treatment of American and European foul brood diseases. Bee inspection.

6. Bee Products. Analysis, purity of honey, specific gravity, granulation. Color grading of honey. Influence of weather, soil, etc., on quality and color of honey. Honey judging, by taste and color. Wax, foundation, vinegar, and by-products.
7. Beekeeping Problems. (For beginners and amateurs.) Study of chief bee instincts and functions leading to management of bees for production of comb and extracted honey.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. General Botany.
2. Elementary General Morphology of Plants.
3. Forest Botany. Field work in the classification and recognition of the herbaceous and shrubby undergrowth of the different forest types, together with quadrat and statistical studies.
5. Elementary Plant Histology.
7. Taxonomy of Flowering Plants.
12. General Morphology of Algae.
13. General Morphology of Fungi.
21. Elementary Ecology.
22. Elementary Plant Physiology.
51. Histological Methods.
63. General Morphology of Angiosperms and Gymnosperms.
101. Elementary Biometry.
- 113-114-115. Advanced Taxonomy.
118. Cytology.
127. Anatomy of Vascular Plants.
131. Field Ecology.
132. Ecological Anatomy.
133. Plant Geography of North America.
134. Research Methods in Ecology.
141. Physical Phases of Plant Physiology.
142. Plant Metabolism.
143. Plant Metabolism and Growth.
144. Plant Microchemistry.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

CHILD WELFARE INSTITUTE

40. Child Training. A study of the physical and mental development of the child followed by a discussion of the problems of training young children. Observations in the Nursery School, lectures, and reports.
- 50-51. Nursery School Methods. A consideration of the materials and methods utilized in the training of small children as individuals and in groups. Observations in the Nursery School, lectures, discussions, and reports.

- 52-53-54. Nursery School Technique. The technique and practice of nursery school instruction and management. The student will be expected to spend considerable time in the Nursery School.
60. The Nursery School and Parental Education Movement. To orient student with reference to the nursery school and the parental education movement. Consideration given also to the kindergarten and Montessori movement and to the physical and mental hygiene movement.
120. Health Care of the Young Child. A course in the physical care, illnesses, prevention of disease, and health problems of the young child. Primarily for those who have charge of groups of children, and for workers in parental education. Opportunities for observation in the Nursery School and in clinics. In co-operation with the Department of Pediatrics.
130. The Development of the Small Child. An advanced course dealing with the development of the pre-school child from the anatomical, physiological, psychological, educational, and social aspects. Lectures, readings in the experimental literature, and reports.
- 133-134-135. Observational and Experimental Methods in the Study of the Development of the Young Child. A study of various methods and techniques such as growth records, mental tests, ratings, controlled observations, used in the experimental study of the young child. Practical exercises and problems on institute records and data.
170. Parental Education in Child Care and Training. A consideration of the content and methods used in courses and study groups for parents in the care and training of young children. Lectures, discussions, and reports.
- 173-174. Technique and Practice of Parental Education. Field work in the technique of organizing and conducting parental study groups and courses for the study of the young child.
- 190-191. Mental Examination of Pre-School Children. A study of the methods used in testing young children together with practice in such testing.

DAIRY HUSBANDRY

1. Elements of Dairying. Composition of milk. Causes of variation in composition; milk constituents and their uses in dairy manufactures and as food; Babcock test; sanitary handling of milk and cream on the farm; cream separating and farm butter making.
2. Dairy Bacteriology. Lectures and laboratory exercises. Types of milk organisms; the contamination of milk and how prevented; relation of milk to the public health; the bacteriology of dairy products.
4. Dairy Products Practice. A study of factory methods. Includes a minimum of one month's practical experience in a plant handling dairy products in a factory way. Reports and records of work done required.
6. Judging Dairy Cattle. Comparative judging of dairy cattle and study of breed types. Should parallel 101.

101. Milk Production. Problems of the dairy farmer, such as characteristics and adaptations of dairy breeds; selection and management of dairy herd and sire; calf raising; dairy barns.
102. Market Milk. Lectures and laboratory work. Classes of market milk; transportation and marketing; sanitary inspection; equipment of plants; problems of public control. Standardization. Pasteurization. Reconstitution. Accounting.
103. Dairy Stock Feeding. Application of principles of nutrition to feeding the dairy cow and growing young animals. Feeding standards; characteristics of various feeding stuffs; formation of rations.
104. Advanced Study of Dairy Breeds. Practice in comparative judging of dairy cattle representing different breeds and ages; selection and valuation of cattle according to type and pedigree; a study of important strains and families; visits to purebred herds.
105. Seminar I. Special investigation and study of selected topics. Each student presents papers and reports on assigned subjects and reviews recent scientific investigations along dairy husbandry lines.
106. Seminar II. Continuation of 105.
107. Seminar III. Continuation of 106.
111. Dairy Products I. The manufacture of butter, condensed milk, and powdered milk, with special reference to the chemical and bacteriological processes involved. Organization, construction, equipment, operation, and accounting in such factories. Laboratory exercises to illustrate these processes.
112. Dairy Products II. The manufacture of cheese and ice cream with special reference to the chemical, bacteriological, and physical processes involved. Organization, construction, equipment, operation of such factories. Laboratory exercises and lectures.
113. Technical Control. Lectures and laboratory. Chemical and bacteriological laboratory methods used in technical control of milk and its products. Use of Mojonnier tester, cryoscope, and bacteriological control methods.
114. Problems in Dairy Husbandry. A study of special problems in dairy feeding, selection, and management for the teacher and extension worker.
115. Problems in Dairy Bacteriology. Investigations of specific problems on the bacteriology of milk and dairy products.

ECONOMICS

SCHOOL OF BUSINESS ADMINISTRATION

1. Marketing Organization.
3. Mechanism of Exchange.
7. Traffic Management.
73. Transportation Charges.
89. Production Management.
- 103-104. Value and Distribution.
112. Business Statistics.

- 113-114. Theory of Statistics.
- 131-132. Cost Accounting.
- 133. Cost Accounting Systems.
- 141. Monetary and Banking Policy.
- 149. Business Cycles.
- 155. Corporation Finance.
- 172. Economics of Transportation.
- 176. Commercial Policies.
- 177. Foreign Trade.

For additional courses and course descriptions see the bulletin of the School of Business Administration.

See also courses in Agricultural Economics.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

COLLEGE OF EDUCATION

- 119. The Elementary School Curriculum.

For additional courses and course descriptions see the bulletin of the College of Education.

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

- 55. Educational Psychology.
- 106-107-108. Advanced Educational Psychology.
- 111. Educational Diagnosis.

For additional courses and course descriptions see the bulletin of the College of Education.

ENGLISH

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

- 21-22-23. Introduction to English Literature.
- 31-32. Development of the English Novel.
- 33. The Later-English Novel.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Courses in this department are closely correlated with those offered by the Department of Zoology of the College of Science, Literature, and the Arts. Courses 37-38-39, 44, 117-118-119, 125-126-127, 139-140, 144-145-146, and 197 of this division are also offered under these numbers by the Department of Zoology.

For introductory courses in general entomology see 37-38-39 and Zoology 16.

3. Economic Entomology. The life histories, habits, and methods of control of the insect pests of orchard, field, and garden. Laboratory work in the determination of the more important forms.
4. Economic Vertebrate Zoology. Deals with the various kinds of vertebrate animals (except birds) of Minnesota, the habits and economic status of each, and means by which their numbers may be controlled.
6. Forest Protection Against Insects. Lectures and laboratory work, dealing with the principles of controlling insects that attack trees and forest products, together with a consideration of the life history and habits of important representative species.
8. Varieties and Habits of Fur Bearing Animals. Distinguishing characters and life histories of the various mammal groups, particularly those represented in the state. Consideration is given to the possibilities of fur farming in the case of certain species.
- 37-38-39. General Entomology. Leads up to discussion of the principles of taxonomy and their application to the classification of insects. Text-book, lectures, quizzes, and laboratory.
44. Introductory Course in Animal Parasites and Parasitism. Lectures and laboratory work. A consideration of the origin and biological significance of parasitism, and of the structure, life history, and economic relations of representative animal parasites. Methods of control and prevention will be emphasized.
- 117-118-119. General Ecology of Insects. General ecology with special reference to the insects of Minnesota. Frequent field trips. Lectures, laboratory, and field work.
- 125-126-127. Advanced General Entomology. Advanced work in the lines of morphology and classification of insects with lectures on the history of entomology. Lectures and laboratory.
- 139-140. Histology and Development of Insects. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. Individual work along these lines is available to properly qualified students in Course 197.
- 144-145-146. Animal Parasites and Parasitism. Lectures and laboratory work. Origin and biological significance of parasitism; structure, life history, and economic relations of representative parasites. Second term devoted primarily to the relation of insects to diseases of man and animal.
- 175-176. Advanced Economic Entomology. A critical consideration of the principles of insect control and the history of their development.
177. Insecticides and Their Action. A study of the chemical composition, the physical properties, and the physiological action of standard, of little known, and of new insecticides.
185. Physical Entomology. A study of precision methods of recording ecological and physiological phenomena: and embodying both the use of instruments and a study of the physical principles involved.
197. Introduction to Research. Preparation for investigational work in lines of entomology, parasitology, or economic zoology. Advanced

laboratory, field, and library work; training in preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible.

FORESTRY

1. General Forestry. A brief history of the development of forestry in Europe and America; its bearing on the forestry problems of the United States; description of the United States forests. Lectures and collateral reading.
2. Field Dendrology. Trees and shrubs found in Itasca Park, with special reference to identification by means of gross characters.
- 3-4. Dendrology. The forest trees of the United States; their classification, characteristics, and range, with special attention to prominent and constant characteristics. Lectures, assigned reading, laboratory.
5. Field Silviculture. Largely field work designed to give the student a working knowledge of the forest. Includes silvicultural study of the species found in the north woods and the general principles underlying silvicultural reconnaissance.
- 7-8. Forest Mensuration. The basic principles underlying the measurement of forest products. Measurement of standing and felled timber. Special attention is given to log rules, preparation and use of volume tables, growth of trees, and yield tables.
9. Field Mensuration. Largely field work. Includes elementary work in timber cruising, valuation surveys, stem analysis, and the study of the measurements of stand, volume, and yield; use of compass, pacing and mapping.
13. Forest Mensuration Laboratory. Field work at the Cloquet Forest Experiment Station; advanced work in log scaling; timber cruising; valuation surveys; stem analysis, and the study of measurements of the stand valuation and yield.
20. Grazing. History of grazing in the West. Kind of stock used. Forage plants. Regulations and methods of handling stock. Range management and protection. Lectures, recitations, and reading.
23. Factory Experience. Time actually spent in work and study in an approved wood using industry. Complete detailed report is required.
27. Groves and Windbreaks. Trees and their relation to the farm. Planning and planting farm windbreaks and shelterbelts. Utilization and marketing of farm, grove, or woodlot products.
28. Logging. The practice, cost, and development of the different logging methods in use in the different forest regions of the United States, and the modifications required by forest management. Report based on personal investigations required.
29. Sawmill, and Woodworking Machinery. Sawmills, woodworking machinery, and other processes in the primary manufacture of lumber products.
30. Seasoning of Wood. The theory and practice of air seasoning and kiln drying of wood.

31. Logging Laboratory. The student will be required to spend at least one week in an approved logging camp and make a complete report according to an outline which will be furnished him.
- 33-34. Wood Structure and Identification. Structure, classification, and identification of the most important commercial, domestic, and foreign woods. Lectures, laboratory.
37. Forest Protection. The protection of forests from fire, fire prevention, and fire suppression. The causes of forest fires and their elimination, climate and fires, fire fighting and fire legislation.
47. Forest Products I. An introductory survey of all the wood products of forests including regions of production, amounts, value, etc. Lectures, reading, reports.
48. Forest Products II. An introductory survey of the products of forests other than wood as naval stores, tannins, wood pulp, paper, etc. Lectures, reading, reports.
50. House and Furniture Woods. The woods used in house construction and finish, furniture, etc. Their identification and properties. Lectures and laboratory.
101. Advanced Dendrology. A continuation of Course 3-4 with special studies in classification and distribution of the timber species of the world.
107. Uses of Wood I. The economic hard and soft woods, both foreign and domestic from standpoint of production, distribution, qualities, amounts, and prices in relation to the wood using industries. Lectures, reading, reports.
108. Uses of Wood II. A continuation of Course 107 dealing with the industries and the woods they use. Kinds, grades, qualities, properties, requirements for each product. Use, re-use, distribution of product. Regions of production and relation to other industries. Lectures, reading, reports.
109. Uses of Wood III. The actual use of wood in the industries. At least six hours per week must be spent in actual study in a factory. Complete reports and collateral reading.
112. Advanced Forest Mensuration. Continuation of Course 10 with special emphasis on tree forms. The development of the formula used in study of volume and growth of trees.
113. Wood Pulp and Papers. Cellulose and its properties. Methods of production of wood pulp and paper products, naval stores, tannins, oils, wood distillation products, etc. Lectures, reading, reports.
- 114-115. Physical Properties of Wood. Study of moisture in relation to hardness, strength, stiffness, density, shrinking, swelling, absorption, humidity, etc. Lecture and laboratory.
116. Mechanical Properties of Wood. Study of strength in relation to grain, density, structure, etc. Calculation of stresses, strains, etc. Lecture and laboratory.
- 119-120. Advanced Wood Structure I. A detailed study of the elements and structure of native and foreign economic woods. Preparation, section-

- ing, and mounting of typical sections. Classification of woods based on structure. Reference reading and reports.
- 122-123. Forestry Seminar. Research problems in silviculture and forest management with special reference to the questions involved in the program of the Lake States Forest Experiment Station.
125. Wood Preservation. Lectures and collateral reading upon the history, development, and methods of wood preservation. Different systems now in use and preservatives used.
126. Silvics. The fundamentals forming the basis of silviculture with special attention to the sylvics of the important tree species. Lectures, readings, and required papers.
127. Silviculture. A study of the general principles underlying the art of silviculture, and a brief study of European methods as applied to American conditions.
128. Silvicultural Laboratory. Nursery practice and field planting. Preparation of a silvicultural plan for a small tract of timber and the application of that plan.
129. American Silvicultural Practice. A study of the silvicultural methods now being employed in the United States and the probable results of the application of other European methods. Lectures, references, and discussion.
130. Forest Valuation. The business of forest management. A study of the different factors entering into the valuation of forest property.
131. Policy and Administration. Policy of the United States and the states toward the utilization of the public forest resources. Policy of other owners toward forest resources controlled by them. Administration of the national and state forests.
132. Forest Regulation Laboratory. Field work. The collection of the data necessary to working up a forest working plan. Includes the making of the timber estimates, growth studies, and maps necessary to a forest working plan.
133. Lumber Distribution. The standing timber of the United States in its relation to the lumber market. The organization of the industry and the distributing agencies.
- 134-135. Forest Problems. The preparation of a report on some phase of forestry work. This report may include the results of some original investigation, or it may consist in collecting and arranging facts and the drawing of proper conclusions from these facts.
136. Forest Economics. The place of the forest in the productive utilization of land; past and present markets and source of supply of timber and timber products, particularly with reference to the present situation in North America.

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. General Geology.
2. Historical Geology.
3. Economic Geology.

8. Introductory Geology.
- 23-24-25. Elements of Mineralogy.
29. General Physiography.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. Beginning A.
2. Beginning B.
3. Beginning C.
4. Rapid Reading.
7. Prose and Poetry.
8. Advanced Prose and Poetry.
- 28-29. Chemical German.
- 31-32. Medical German.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

HISTORY AND PHILOSOPHY OF EDUCATION

COLLEGE OF EDUCATION

1. A Brief Course in the History of Education.
3. Educational Sociology.
5. Public Education in the United States. A survey of factors determining public education in the United States followed by a study of the development of educational theory and the rise of state systems.

For additional courses and course descriptions see the bulletin of the College of Education.

HOME ECONOMICS

The following courses are planned primarily for students majoring in home economics, and are required in the courses of study in home economics. They are open for election to students in other courses who offer the prerequisites as stated in Part II of the bulletin.

3. Textiles. Textile fibers, their structure, properties, and chemical reactions; fabrics, their structure and processes of manufacture; art and economic consideration in selection and purchase of materials for clothing and household furnishing.
4. Textiles. See bulletins of the College of Science, Literature, and the Arts and Education.
11. Clothing Planning and Construction, A. Provides instruction and practice in planning, buying, cutting, fitting, and making garments of washable materials; sewing machines, care and use; commercial patterns, interpretation and adaptation.

13. Clothing Planning and Construction, B. Laboratory practice in costume modeling; preparation of dress form; adaptation of textile and art principles in selection of materials and designs; instruction and practice in construction of a semi-tailored wool garment and of infant's or children's garments.
15. Clothing Problems. A consideration of the individual clothing budget; care of clothing; clothing in relation to health; the selection of ready-to-wear clothing; children's clothing. Talks by store people and trips to stores and clothing factories are arranged for.
17. Advanced Clothing. Laboratory course in the designing, modeling, and construction of silk or wool costume, including millinery; one problem to test acquired speed.
18. Commercial Clothing Manufacture. Laboratory practice upon commercial basis. Shop organization, with problems involving clothing design and construction.
34. Home Management: Operation and Maintenance, Lectures. Discussion of management responsibilities of homemaker with special emphasis on budgets and household accounts.
35. Home Management: Operation and Maintenance, Laboratory. Twelve weeks actual experience in a home management house with various household management problems including the care and behavior of a child of pre-school age.
44. Home Economics Extension Work. Study of state and national plans for home economics extension work; methods of organization and practical presentation of subject-matter; preparation of illustrative material; field work.
- 50-51. Color and Designing. The principles of color and design related to such problems as selecting and designing costumes, and selecting, arranging, and designing house furnishings.
53. Advanced Design. Principles discussed and problems worked out relating to costume and house furnishing design.
55. Decorative Needlework and Other Crafts. Applied design in needlework the major interest. Other crafts given consideration such as block printing, to be worked out in such problems as book ends, blotter pads, folios.
56. Applications of Color and Design. See Course 50-51.
57. Batik and Other Crafts. Principles of design and color harmony applied to batik and such other crafts as leather tooling, tie dyeing, and lamp shade making. Articles are planned to relate to definite dress and home furnishing problems.
60. Institution Marketing. Problems involved in the purchasing of foods on a large quantity basis. Factors in the production, distribution, and sale of such commodities which affect the wholesale buyer.
61. Quantity Cookery. Application of the principles of cookery to large quantity preparation; planning of meals for dining hall, cafeteria, and tea room; a study of standardized formulae and production costs.
63. Institution Experience. Experience in the minor problems of cafeteria, dining hall, and tea room administration.

65. Institution Equipment. Equipment for the institution food department; materials, construction, operation. Placing of equipment in relation to the routing of work within the unit, and in relation to the work of other departments.
70. Nutrition Survey. Selection of food from a nutritional standpoint and the relation of food to health and efficiency.
73. Nutrition I. (1) The nature and properties of groups of compounds occurring in the cell and in food, (2) digestion, and (3) absorption.
75. Dietetics Laboratory. (1) Food values, (2) problems relating to the selection of food under conditions of health and under such pathological conditions as are chiefly dependent upon diet.
79. Selected Problems for Dietitians. A selected group of problems related to the work of the dietitian involving discussions, assigned readings, and field trips.
80. Foods and Cookery. The development of technique and the application of fundamental science principles to cookery processes. The establishment of good standards for food products.
81. Foods and Cookery. A three-credit course open by examination to a limited number of students. See 80.
83. Food Management. Determination and study of the management factors involved in the food problems of the homemaker.
85. Food Marketing. Food problems of the consumer. A study of the quality and cost of foods on the market. Laboratory and field work.
89. Camp Cookery. Simple cookery processes with adaptations to out-of-door cookery. Laboratory and field work. Not open to home economics students. For prospective foresters, engineers, and others. (Given alternate years. Not offered in 1928-29.)
102. Advanced Textiles. An intensive study of textile materials with special reference to the following: nature of the raw materials; economic, chemical, and physical applications involved in their manufacture and use; methods and significance of physical testing.
107. Textile Analysis and Related Problems. Problems and application of quantitative methods in textile analysis with special reference to establishing standards for fabrics.
115. Clothing Economics. A study of the economic aspects of clothing which directly or indirectly affect the consumer.
131. Home Management: House Planning and Equipment. Study of the small house which aims at more intelligent planning in building and furnishing. House plans, kitchen arrangements, and equipment of house studied from homemaker's point of view of economy, convenience, and beauty.
136. Budget Problems. An intensive study of problems relating to individual and family budgets. Readings, discussions, and field work.
150. Art History and Appreciation. The historical development of painting, sculpture, architecture, decoration, furniture, and costumes, studied with special emphasis on design and influence upon modern styles.

152. Advanced Interior Design. Special problems of small house decoration will be studied. Elevation drawings made. Actual materials will be used as far as possible.
154. Advanced Costume Design. A study of figure construction; line, color, and textures for beautiful arrangements and with reference to individual types. Laboratory work with fabrics and designs carried out in pencil and water colors.
156. Hospital Social Service.
163. Institution Management Problems. Problems affecting the efficient administration of the institution; departmental organization, operation, maintenance; employment problems; business policies. Field trips to various types of institutions.
170. Nutrition of the Family. The fundamental principles of human nutrition as applied to the feeding of individuals and groups under conditions of health, and under such pathological conditions as are chiefly dependent upon dietetic treatment.
171. Child Nutrition. Lectures, discussions, and field work dealing with the principles of child nutrition and with the formation of desired food habits.
173. Nutrition in Disease. A study of the fundamental principles involved in using diet in the treatment of certain diseases.
175. Nutrition II. Metabolism including work on tissues, blood, milk, and urine.
176. Advanced Nutrition. Selected quantitative methods applicable to investigations relating to digestion and metabolism.
177. Digestion and Metabolism. An intensive study of problems relating to digestion and metabolism involving lectures, readings, demonstrations, and laboratory work.
179. Readings in Nutrition. A course designed to give intensive experience in the use of nutrition books and periodicals, involving assigned readings, oral and written reports.
182. Experimental Cookery. An intensive study of problems in foods and food preparation with individual laboratory problems.
183. Experimental Cookery. The same as Course 182 with additional problems.
186. Special Food Problems. Individual problems in foods and food preparation.
187. Special Food Problems. The same as Course 186 with additional problems.
195. Home Economics Survey. A discussion of the historical development of home economics with special emphasis upon current problems.

HOME ECONOMICS EDUCATION

COLLEGE OF EDUCATION

The university teacher's certificate will be granted only to graduates of the College of Education. Students expecting to receive this certificate upon graduation shall be registrants in the College of Education from

the beginning of the junior year. No formal application is necessary to register in the College of Education if specialization in one of the teachers' courses is desired at the beginning of the junior year. However, no student may transfer who has not earned 90 credits and 90 honor points.

40. Child Training. A brief study of the physical and mental development of the child is followed by a discussion of the problems of training small children. Emphasis is placed on the pre-school child. Lectures, observations in the Nursery School, and reports.
42. Special Methods of Teaching Home Economics. The psychological bases for teaching; methods of teaching applied to home economics. Required of all students preparing to teach.
49. Observation and Teaching: General Home Economics. Observation of classes in day schools and evening schools; teaching under supervision of at least two phases of home economics; individual and group conferences on teaching problems.
141. Problems in Vocational Education in Home Economics. The place and development of home economics in the vocational education program. Study of the problems of the all day, evening, and part time schools.
142. Educational Measurement in Home Economics. Survey of accomplishment in this field; evaluation and construction of objective tests.
143. Home Economics Curricula. A study of the objectives of home economics in the junior and senior high schools; organization of curricula.
147. Organization and Methods for Related Art Teaching. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes.
149. Research Problems. A study of the methods used in collection, treatment, and interpretation of data in the field of home economics.

HORTICULTURE

6. Fruit Growing. The fundamental principles of fruit growing. Sites, soils, nursery stock, planting and planting plans, tillage, fertilization, cover crops, pollination, frost avoidance, pruning, and thinning. Lectures, recitations, references, and laboratory work.
21. Small Fruit Culture. Cultural practices for each of the small fruits. Brief consideration is given to their botanical relationships and the history of their commercial development. Lectures, problems, and survey of literature.
32. Vegetable Growing. The fundamental principles of vegetable growing. Scope of the industry and its place in agriculture. Varieties, seed production, regional adaptation, soils, fertilizers, equipment, storage, systems of production, and marketing.
50. Floriculture. Designed to give the student a working knowledge of the culture and uses of common house plants, annuals, perennials, and greenhouse plants. Lectures, reference reading, and laboratory.

56. Plant Propagation and Nursery Practice. Methods of propagating plants by seed, cuttings, layers, and grafting. Practical work in management of nursery stock, bulbs, and plants. Lectures, reference reading, and field trips.
71. Plant Materials I. Deciduous and evergreen trees, shrubs and vines, identification; fall and winter characters and use in landscape gardening. Lectures, field trips, and problems.
72. Plant Materials II. Deciduous and evergreen trees, shrubs and vines, herbaceous perennials, biennials, annuals, and bulbs, identification; spring and summer characteristics; use in landscape gardening. Lectures, field trips, and problems.
73. History of Landscape Gardening. Literature and development of landscape gardening from ancient to modern times and influences that have affected the different periods. Lectures, assigned readings, field trips, and reports.
74. Principles of Landscape Design. The composition of the various elements used in landscape gardening, methods of presentation. Lectures and problems.
75. Landscape Problems. The planning and planting of home properties in the city and country. Lectures, field trips, and reports.
76. Landscape Construction. Construction and maintenance of turf for lawns, golf courses, and other play areas; garden architecture, grading, planting and care, costs of construction. Lectures, field trips, and reports.
77. Principles of Landscape Design (for senior professional agriculture engineers only). A study of the principles underlying the arranging of land and landscape for human use and enjoyment.
93. Judging Horticultural Crops. The principles and practice of judging and exhibiting fruits, vegetables, and flowers.
107. Orchard Management. A detailed study of the various operations in orchards and berry fields. Operating costs and profits. Lectures, laboratory, and individual problems.
110. Horticultural Crop Breeding. Applied genetics are emphasized. The method of breeding each of the important horticultural crops with special attention to experiment station investigations and to the methods used by plant breeders.
111. Systematic Pomology. Fruit varieties. Classification, description, identification, and elements of judging. Lectures, laboratory, and a survey of the literature.
- 135-136. Truck Crops and Potatoes. Truck crop production as an applied science. The crop or the plant is used as the unit of consideration and the sciences used to explain cultural practices and plant behavior.
137. Systematic Olericulture. A reading and conference course covering the taxonomy, anatomy, composition, quality, and uses of truck crop plants as a basis of their classification and standardization.
138. Laboratory Methods in Systematic Olericulture. A laboratory course covering the taxonomy, anatomy, composition, quality, and uses of truck crop plants as a basis of their classification and standardization.

190-191-192. Special Problems. Problems based upon the work given in the preceding courses.

193-194-195. Horticultural Seminar. Reports and discussions of problems and investigational work.

INORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

1-2-3. General Inorganic Chemistry.

9-10. General Inorganic Chemistry.

11. Qualitative Chemical Analysis.

For additional courses and course descriptions see the bulletin of the School of Chemistry.

MATHEMATICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Placement tests.—In each of Courses 3, 4, 5, 6, and 8, students who fail to pass certain tests will be dropped from the course during the first two weeks. A student who is dropped from Course 4 or 6 or 8 must complete Course 3 or 5 before taking any other course in mathematics. A student dropped from Course 3 or 5 must pass Subfreshman Mathematics in the Extension Division before returning to Course 3 or 5.

3. Higher Algebra, Short Course.

4. Trigonometry, Short Course.

5. Higher Algebra.

6. Trigonometry.

7. College Algebra.

8. Commerce Algebra.

For additional courses, consult the bulletin of the College of Science, Literature, and the Arts.

MILITARY SCIENCE AND TACTICS

Students who have completed the Basic Course, R.O.T.C. may be selected for advanced work by the professor of military science and tactics. Those who pursue the Advanced Course are required to sign an agreement with the government to continue the two years' course to completion. This includes attendance at a training camp, held normally during the summer following the first year's advanced work. The camp is conducted free of cost to the student, and in addition, while actually in camp, the student receives the pay prescribed for the seventh grade in the army. Students pursuing the Advanced Course are also furnished a special uniform and receive a fixed allowance per day. The total government compensation for the two years' advanced work amounts to something over \$200. Students who satisfactorily complete the Advanced Course will be commissioned in the Officers' Reserve Corps of the United States Army. The University allows 18 credits for the two years advanced R.O.T.C. work.

- 1-2-3. First Year Basic Course R.O.T.C. Practical instruction in schools of soldier, squad, platoon, company, and battalion; ceremonies, rifle marksmanship, military courtesy, military hygiene and first aid, physical drill.
- 4-5-6. Second Year Basic Course R.O.T.C. Practical and theoretical instruction in schools of company and battalion; scouting and patrolling, musketry, interior guard duty, automatic rifle.
- 51-52-53. First Year Advanced Course R.O.T.C. Military sketching, military field engineering, machine guns, military law, rules of land warfare, command and leadership.
- 54-55-56. Second Year Advanced Course R.O.T.C. Command and leadership, infantry weapons (37-mm. gun, 3-inch trench mortar) administration, military history and National Defense Act, combat principles.

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Credit is offered to students in the College of Agriculture, Forestry, and Home Economics who may wish to elect work in the Department of Music. Nine credits may be obtained.

- 1-2-3. Harmony.
- 10-11-12. Organ.¹
- 16-17-18. First Year Pianoforte.¹
- 22-23-24. Violin.¹
- 28-29-30. Voice.¹
- 34-35-36. Other Orchestral Instruments.¹
- 40-41-42. Orchestra.
- 43-44-45. University Choir.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

ORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

- 51-52-53. Organic Chemistry.

For additional courses and course descriptions see the bulletin of the School of Chemistry.

PHYSICAL CHEMISTRY

SCHOOL OF CHEMISTRY

- 101-102-103. Physical Chemistry.
110. Physical Chemistry.

For additional courses and course descriptions see the bulletin of the School of Chemistry.

¹For special fees for these courses and practice fees see bulletin of general information.

PHYSICAL EDUCATION FOR MEN

A physical examination is required of all new matriculants, and of all others using the department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate.

For a special four-year professional course in physical education and athletic coaching, see bulletin of the College of Education. Students interested in this course should consult the department before registering.

Not more than nine credits in courses in physical activities may be counted toward graduation.

1-2-3. Freshman Physical Education.

4. Freshman Hygiene. Required of all freshmen. Fall quarter A-H; winter quarter I-R; spring quarter S-Z.

7-8-9. Advanced Leaders.

10-11-12. Minor Sports.

16-17-18. Drill Substitution. (By petition only.)

30. Athletic Training and First Aid.

For additional courses and course descriptions see the bulletin of the College of Education.

PHYSICAL EDUCATION FOR WOMEN

This department aims to promote the physical efficiency of the women students. It gives physical examination and advise to all on entrance, plans systematically to keep in close touch with them during their first two years of residence; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes neuromuscular activity leading toward organic strength, nervous stability, conscious motor control, correct body mechanics, skill in handling the body and in physical recreation, and the development of that valuable social quality known as good sportsmanship; co-operates closely with the Women's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this department is required of all newly entering students (see Courses 1-2-3 and 4), and of all sophomores who cannot pass the swimming examination (see Courses 22-23). Physical examinations or consultations required annually of all students.

Six credits is the maximum number that can be gained toward the degree by taking courses in exercises (Courses 41, 42, 44-45, 66-67-68, 69-70-71).

For a special four-year professional course designed to prepare graduates for the responsible direction of physical education activities see bulletin of the College of Education.

1-2-3. Elementary Physical Training. Gymnastics, apparatus work, orthopedic exercise, folk dancing, indoor and outdoor games. Individual health consultations.

74 *AGRICULTURE, FORESTRY, AND HOME ECONOMICS*

4. Preliminary Hygiene. One lecture a week. The most essential aspects of the care of the personal health.
- 7-8. Sophomore Danish Gymnastics.
9. Sophomore Archery.
- 10-11-12. Sophomore Orthopedic and Individual Gymnastics.
- 13-14-15. Sophomore Interpretive Dancing.
- 16-17. Sophomore Games and Folk Dances.
18. Tennis.
19. Sophomore Hockey.
20. Sophomore Basket-Ball.
21. Sophomore Baseball.
- 22-23. Sophomore Elementary Swimming.
24. Sophomore Horeback Riding.
- 25-26. Sophomore Intermediate Swimming.
27. Sophomore Golf.
- 28-29. Sophomore Advanced Swimming.
30. Sophomore Life Saving and Water Sports.
31. Sophomore Skating.
- 43-44-45. Play and the Playground.
- 66-67-68. Interpretive Dancing.
- 69-70-71. Advanced Interpretive Dancing.

For additional courses and course descriptions see the bulletin of the College of Education.

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

3. Elements of Mechanics and Sound.
4. Elements of Mechanics Laboratory.
9. Acoustics.
23. Heat.
24. Heat Laboratory.
33. Optics.
34. Optics Laboratory.
43. Magnetism and Electricity.
44. Electrical Laboratory.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

PHYSIOLOGY

MEDICAL SCHOOL

4. Human Physiology. Elementary Course. For academic, home economics, pharmacy, and other students. Lectures and demonstrations.
57. Physiologic Chemistry. Intermediate Course.
- 58-59. Human Physiology. Intermediate Course.
- 100-101. Physiologic Chemistry.

103. Physiology of Muscle, Nerve, Blood, Circulation, and Digestion.
104. Physiology of the Nervous System and Special Senses.

For additional courses and course descriptions see the bulletin of the Medical School.

PLANT PATHOLOGY AND BOTANY

1. Plant Pathology. An introductory course in plant diseases. Lectures, laboratory, and reference. Not open to those who have completed 10.
- 7-8. Weeds and Grasses. Agricultural and applied botanical study of weeds and grasses with special reference to agricultural importance.
9. Weeds and Seed Testing. Detailed study of seed testing methods and seed legislation. Weed and crop seeds and weed plants studied with special reference to identification.
10. Forest Pathology. Diseases of forest and shade trees, and the rotting of timber. Symptoms, etiology, and control. Lectures, laboratory, and reference work. Not open to those who have completed 1.
12. Seed Problems. Special seed problems are assigned. Advanced work in seed testing methods.
- 105-106-107. Mycology. Morphology and taxonomy of fungi. Lectures, laboratory, and field work.
108. Methods. Plant pathological methods including mycological and bacteriological technique. Laboratory, lecture, and greenhouse work. Special problems.
110. Principles of Pathology. Physiology of plant pathogens; parasitism, physiological specialization, host reactions, predisposition, resistance, and immunity.
111. Diseases of Cereal Crops. Detailed study of diseases of cereal crops, including symptomatology, etiology, and practical methods of control. Laboratory, lecture, and field work.
112. Diseases of Fruit Crops. Special study of diseases of fruit crops, especially those important in Minnesota. Laboratory, lecture, and greenhouse work. (Given in alternate years. Offered in 1928-29.)
113. Diseases of Vegetable Crops. A detailed study of diseases of potatoes and other vegetable crops. Lecture, reference, laboratory, and greenhouse work. (Given in alternate years. Not offered in 1928-29.)
114. Advanced Forest Pathology. A detailed study of wood rots, including a study of the deterioration of wood products caused by fungi. Lectures, laboratory, and greenhouse work. (Given in alternate years. Not offered in 1928-29.)
116. Pathological Histology. A study of the histological changes in diseased plants. Lectures, laboratory, and reference work.
117. Diseases of Forage and Fiber Crops. Symptomatology, etiology, and methods of control. Lectures, laboratory, and field work. (Given in alternate years. Not offered in 1928-29.)

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. American Government.
2. State Government.
- 51-52-53. Business Law.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

POULTRY HUSBANDRY

1. Poultry. The importance and extent of the poultry industry, market products, principles of house construction, methods of care and management, feeding for egg production.
2. Poultry Judging. The origin, standard requirements, and common defects of the leading commercial standard breeds and varieties and determination of standard values by the score card and comparison methods.
4. Incubating and Brooding. Instruction and practice in incubation and brooding, selection of breeding stock and eggs for hatching, and feeding young chicks. Of practical value to teachers of agriculture and poultry raisers.
5. Advanced Poultry Judging. Practice in close selection for high egg production; for standard values of different color patterns and principal standard types; mating to produce high standard quality.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

MEDICAL SCHOOL

3. Personal Hygiene and Elementary Sanitation.
4. Increasing the Span of Human Life.
52. Health Care of the Family. First aid; communicable diseases, their transmission and prevention; hygiene of infancy, maidenhood, maturity. The care of the sick room; observation and care of the patient. Elementary symptomatology. Arranged for students of home economics.
57. Health of Infant and Pre-school Child.
58. Maternal and Child Hygiene.
60. The Tuberculosis Problem.
61. Mental Hygiene.
73. Occupational Hygiene and Disease.
80. Educational Hygiene.
102. Sanitation.
103. Public Health Bacteriology.

For additional courses and course descriptions see the bulletin of the Medical School.

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

- 1-2. General Psychology.
- 3. Psychology Applied to Daily Life.
- 4-5. Introductory Laboratory Psychology.
- 7. Introductory Laboratory Psychology.
- 9. Introduction to Animal Psychology.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

PUBLICATIONS AND RURAL JOURNALISM

- 10-11-12. Agricultural Journalism. Intended for students who may wish to enter the field of agricultural journalism as a profession.
- 19. Publicity. For students planning careers in agriculture or some allied industry, in which the co-operation of the press will be needed.

For additional courses see the Department of Journalism, in the bulletin of the College of Science, Literature, and the Arts.

RHETORIC

Rhetoric credits will not be granted officially until the close of the second quarter of the senior year.

Any instructor who finds that a student is deficient in English will submit the name of the student together with the evidence to the chairman of the Students' Work Committee. If the evidence warrants, the committee will send the student to the Section of Rhetoric for such additional work in English as is needed. This work the student must take, without credit, to validate his freshman and sophomore rhetoric credits.

Students whose work in the rhetoric courses shows at any time an inadequate knowledge of the conventions of English will be required to enter a class in elementary rhetoric.

- 1. Rhetoric I. Note taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading.
- 2. Rhetoric II. Sentence structure, diction, exposition, news articles, supplementary reading.
- 3. Rhetoric III. Description, narration, supplementary reading.
- 11. Argumentation. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating.
- 22. Public Speaking. (5-hour course.) A practical course in fundamentals of speech making.
- 23. Public Speaking. (3-hour course.)
- 24. Advanced Public Speaking. Types of audiences, persuasion, voice, extemporaneous speeches for special occasions.
- 26. Parliamentary Law. Theoretical study and practical usage in conduct of occasional and regular meetings of organizations. One hour lecture, one hour practice.

28. Play Production. A practical course for teachers in directing and producing plays. Each student required to produce a one-act play and to take a part in another.
31. Survey of English Literature I. Survey of English literature of the sixteenth, seventeenth, and eighteenth centuries.
32. Survey of English Literature II. Survey of English literature of the nineteenth century.
33. Modern Literature. Contemporary English and American writers.
34. Books and Reading. The selection of books and periodicals for the home library.

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

French

- 1-2. Beginning French.
- 3-4. Intermediate French.
20. Oral and Written French.
- 21-22-23. Survey of French Literature.
- 50-51-52. Elementary French Conversation.
- 53-54-55. Elementary French Composition.

Spanish

- 1-2. Beginning Spanish.
- 3-4. Intermediate Spanish.
20. Oral and Written Spanish.
- 50-51-52. Spanish Conversation.
- 53-54-55. Spanish Composition.
- 68-69. Survey of Spanish Literature.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. Introduction to Sociology.
6. Social Interaction.
14. Rural Sociology.
45. Social Statistics.
55. Housing Problems.
60. Child Welfare.
100. Social Psychology.
110. Rural Organization.
112. The Rural Social Survey.
114. Rural Social Institutions.
116. The Newspaper As a Social Institution.
119. The Family.
120. Social Progress.
134. Legal Protection of the Child.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

SOILS

4. Soils. Origin, formation, composition, and classification of soils; physical properties, moisture relations; principles of tillage. Lectures, laboratory and field work.
5. Soil Fertility. Principles of soil fertility; soil organisms; use of lime, commercial fertilizers, stable manure, and green manures in relation to crop production. Lectures and laboratory work.
8. Physical Properties of Soils. See Course 108 for description.
101. Chemical Analysis of Soils. A laboratory course on the chemical examination of soils, including both fusion and extraction methods for mineral nutrients.
102. Special Problems in Soils. Individual laboratory or field work upon some special problems in soil physics, soil chemistry, or soil management. Arrangement must be made in advance.
104. Soil Surveying. Field practice in surveying soils and the preparation of soil maps. (Given in alternate years. Offered in 1928-29.)
107. Fertilizers and Manures. Sources, composition, and uses of the various fertilizers, manures, and soil amendments. Lectures and laboratory work.
108. Physical Properties of Soils. The determination of physical constants of soils, including mechanical composition, moisture equivalent, and hygroscopic coefficient. (Given in alternate years. Not offered in 1928-29.)

VETERINARY MEDICINE

- 2-3-4. Comparative Anatomy and Physiology of Domestic Animals. A course in anatomy and physiology with special reference to the structures involved in conformation, circulation, respiration, digestion, and excretion. Recitation and lectures.
6. Physiology of Reproduction. A study of embryology, obstetrics, sterility; the common diseases associated with breeding animals; non-infectious diseases associated with digestion.
8. Veterinary Studies.¹ Study of causes, prevention, treatment of common diseases; simple surgical operations; lameness and unsoundness; common medicines. Planned especially for students taking only one quarter veterinary work.
12. Infectious Diseases. Etiology, morbid anatomy, symptomatology, diagnosis, prevention, and the basis of treatment of the common infectious diseases of animals. Special instruction will be given in preparation and use of vaccines, bacterins, serums, and antitoxins. Those who have completed Course 8 can obtain only half credit for this course.

¹ Full credit will not be allowed for this course when other courses in this division are completed. Students pursuing other courses in veterinary medicine should apply to the division for adjustment of credit.

- 101-102. Advanced Anatomy of Domestic Animals. Advanced study of the structures involved in the type, conformation, and nutrition of the common farm animals. Dissection of farm animals, including a study of the osseous, muscular, and other principal anatomical structures. Limited to nine students.
- 103-104. Advanced Comparative Physiology. An advanced course in physiology of the domestic animals, including laboratory work with special emphasis on animal nutrition.

ZOOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Courses in this department are closely correlated with those offered by the Division of Entomology and Economic Zoology of the College of Agriculture, Forestry, and Home Economics. For courses of that division, see page 60.

Credit is given for acceptable work done at any approved seaside laboratory.

- 14-15-16. General Zoology. Structure, physiology, embryology, classification, and evolution of animals. Third quarter is devoted to the Arthropoda, principally the Insecta.
21. Introduction to General Physiology.
23. Introductory Entomology.
24. Introductory Animal Parasitology.
25. Introductory Histology.
26. Comparative Anatomy.
27. Technique.
- 46-47. Ornithology.
107. Protozoology.
- 117-118-119. Ecology of Insects.
- 125-126-127. Advanced Entomology.
- 139-140. Histology and Development of Insects.
- 144-145-146. Animal Parasites and Parasitism.
- 148-149-150. Histology and Organdology.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

The Bulletin *of the University of* **Minnesota**

*The College of Agriculture, Forestry,
and Home Economics*

Part II

Announcement of Program for the Year
1929-30



Vol. XXXII No. 25 May 9 1929

Entered at the post-office in Minneapolis as second-class matter
Minneapolis, Minnesota
Accepted for mailing at special rate of postage provided for in section 1103,
Act of October 3, 1917, authorized July 12, 1918

CURRICULA

Following is a summarized statement of the curriculum requirements for use in arranging registration. Detailed statements of the various curricula will be found in Part I of the bulletin.

TECHNICAL AGRICULTURAL CURRICULA

REQUIRED COURSES

Freshman year.—Freshman lectures; Mil. Sci. 1-2-3; Phys. Ed. 4 or Prev. Med. 3; Agr. Eng. 13, 28, 31, or 37; Agr. Eng. 9-10 or 11 or Math. 5 or 8; Agron. 1; An. Husb. 10-11; Bot. 1 and 6 credits from the following: Bot. 2, 5, 7, 12, 13, 21, 22; Inorg. Chem. 1-2-3 or 9-10; Dy. Husb. 1; Hort. 6 or 32; Rhet. 1, 2, 3.
Sophomore year.—Mil. Sci. 4-5-6; Agr. Biochem. 7-8; F. Mgt. 1, 2; Agr. Eng. 3, 23; Bact. 41; Soils 4, 5.
Junior year.—Rhetoric 11 or 31, 22; Zool. 14-15-16.

ELECTIVE COURSES

General Curriculum in Agriculture

Junior year.—Agr. Biochem. 15; F. Mgt. 40; Agr. Eng. 12; Agron. 121, 123, 131, 132; An. Husb. 2-3, 8; Ent. 3; Hort. 6 or 32.
Senior year.—F. Mgt. 102, 103, 141; Agr. Eng. 7; An. Husb. 5; Dy. Husb. 6, 101; Pl. Path. 1; Sociol. 14; Vet. 9-10.

General Curriculum in Agricultural Economics

Consult division for outline of curriculum.

Agricultural Education

Same as general curriculum in Agriculture omitting Agr. Biochem. 15, Agr. Eng. 7, 12, Agron. 132, An. Husb. 5, F. Mgt. 141, and adding the following:
Junior year.—Agr. Ed. 11, 21; Agr. Eng. 40.
Senior year.—Agr. Ed. 42, 181, 182, 183.

Agricultural Engineering

Same as general curriculum in Agriculture omitting Agr. Biochem. 15, F. Mgt. 141, Agron. 123, 132, Hort. 6 or 32, Vet. 9-10 and adding the following:
Junior year.—Agr. Eng. 5, 13, 14, 31; Agron. 122.
Senior year.—F. Mgt. 142; Agr. Eng. 19, 24, 25, 37.

General Curriculum in Animal Husbandry

Same as general curriculum in Agriculture omitting F. Mgt. 141, Agron. 121, 132, An. Husb. 8, Dy. Husb. 6, 101, Hort. 6 or 32, Sociol. 14, Vet. 9-10 and adding the following:
Junior year.—Agron. 122; An. Husb. 4, 9; Vet. 2, 3-4.
Senior year.—An. Husb. 6, 7, 101, and one of the following: 102, 103, 104, or 105; F. Mgt. 143; Vet. 6, 12. F. Mgt. 110 may be substituted for F. Mgt. 143.

General Curriculum in Dairy Husbandry

Same as general curriculum in Agriculture omitting F. Mgt. 141, Agr. Eng. 7, 12, Agron. 132, An. Husb. 8, Hort. 6 or 32, Vet. 9-10 and adding the following:
Junior year.—Agron. 122; Dy. Husb. 2, 104; F. Mgt. 101; Sociol. 1; Vet. 2, 3-4.
Senior year.—F. Mgt. 110; Agr. Eng. 40; An. Husb. 105; Dy. Husb. 103, 105, 106.

General Curriculum in Dairy Products

Arrange with adviser on major-minor plan.

General Curriculum in Farm Management

Same as general curriculum in Agriculture omitting F. Mgt. 141 and adding the following:

Junior year.—F. Mgt. 101.

Senior year.—F. Mgt. 50, 104.

General Curriculum in Horticulture

Same as general curriculum in Agriculture omitting Agr. Biochem. 15, F. Mgt. 141, Agr. Eng. 12, Agron. 121, 123, 132, Dy. Husb. 6, 101, An. Husb. 2-3, 5, 8, Vet. 9-10 and adding the following:

Junior year.—Agr. Eng. 13 or 40; Agron. 121 or 123; Bot. 22; Hort. 21, 36, 135; Pl. Path. 112 or 113.

Senior year.—F. Mgt. 142; Agr. Eng. 12 or Agron. 132; Hort. 93, 107, 110, 136, 193-194. F. Mgt. 110 may be substituted for F. Mgt. 142.

Landscape Gardening

Junior year.—Arch. 21-22-23; For. 27; Hort. 50, 56, 71, 72, 73; Pl. Path. 1.

Senior year.—Agr. Eng. 19, 31; Ent. 3; Hort. 74, 75, 76, 190-191-192; Pol. Sci. 51-52.

Open Elective Curricula

In addition to the required subject courses a major of 24 to 36 credits may be chosen from one of the following groups: (a) Farm Management and Agricultural Economics, (b) Animal Industry, (c) Agricultural Sciences, and Plant Industry, (d) Agricultural Engineering; together with a minor of 18 credits from any group except that chosen for the major. Eighteen credit hours of the remaining electives must be chosen from groups other than major and minor.

AGRICULTURAL SCIENCE

Freshman year.—Freshman lectures; Mil. Sci. 1-2-3; Phys. Ed. 4 or Prev. Med. 3; Zool. 14-15-16 or Bot. 1 and 6 cred. from the following: Bot. 2, 5, 7, 12, 13, 21, 22; Inorg. Chem. 1-2-3 or 9-10; Math. 5, 6, 7, or Modern Language 15 cred.; Rhet. 1-2-3.

Sophomore year.—Mil. Sci. 4-5-6; Agr. Biochem. 7-8; Zool. 14-15-16 or Bot. 1 and 6 cred. from the following: Bot. 2, 5, 7, 12, 13, 21, 22; Bact. 41; Math 5, 6, 7, or Modern Language 15 cred.; Rhet. 11, 22.

Junior and senior years.—Major sequence 24-36 cred.; minor sequence 18 cred. Minimum of 21 credits elective in applied or technical agriculture or in sciences fundamental thereto.

AGRICULTURAL ENGINEERING

Professional Curriculum

Freshman year.—See bulletin of the College of Engineering and Architecture.

Sophomore year.—Mil. Sci. 4-5-6; Agr. Eng. 13, 19-20, 24-25, 31, 40; Agron. 1; Hort. 6, 32; M. & M. 24, 25, 84; Soils 4, 8.

Junior year.—F. Mgt. 1, 2; Agr. Eng. 7, 12, 42, 133, 134; An. Husb. 8; C. E. 37, 51; Dy. Husb. 1; Geol. 5; M.&M. 85, 86; M.E. 38.

Senior year.—Agr. Eng. 37, 121, 122, 126, 150; F. Mgt. 102, 103; C.E. 144; Econ. 85; G.E. 101, 193.

4 AGRICULTURE, FORESTRY, AND HOME ECONOMICS

AGRICULTURAL JOURNALISM

- Freshman year.*—Same as for Technical Agriculture curriculum substituting Engl. A-B-C for Rhet. 1-2-3.
- Sophomore year.*—Mil. Sci. 4-5-6; F. Mgt. 1, 2, 8; Engl. 11-12; Jour. 13, 14-15; Psy. 1-6; Zool. 14-15-16.
- Junior year.*—F. Mgt. 40, 90, 110-111; Jour. 51-52, 57, 69; Sociol. 1, 14.
- Senior year.*—F. Mgt. 30, 135; Econ. 149; Jour. 75, 104, 191-192; Pub. and Rur. Jour. 10-11-12; Psy. 56.

AGRICULTURAL BUSINESS ADMINISTRATION

- Freshman year.*—Same as for Agriculture except that Math. 5 or 8 should be substituted for Agr. Eng. 9-10 or 11.
- Sophomore year.*—Mil. Sci. 4-5-6; F. Mgt. 1, 2, 8, 50; Econ. 20, 25-26; Psy. 1-6; Zool. 14-15-16.
- Junior year.*—F. Mgt. 30, 40, 110-111, 131, 141, 142; Bus. Adm. 51-52-53, 100, 141.
- Senior year.*—F. Mgt. 90, 135, 150, 170, 191; Bus. Adm. 58, 71, 101-102, 139, 149.

FORESTRY

REQUIRED COURSES

- Freshman year.*—Freshman lectures; Mil. Sci. 1-2-3; Phys. Ed. 4 or Prev. Med. 3; Agr. Eng. 3; Bot. 1 and 6 credits from the following: Bot. 2, 5, 7, 12, 13, 21, 22; Inorg. Chem. 1-2-3 or 9-10; For. 1, 3-4; Rhet. 1-2-3; Math. 5-6; (summer at Itasca Park).
- Sophomore year.*—Mil. Sci. 4-5-6; F. Mgt. 1, 2; Agr. Eng. 19-20, 23; Zool. 14-15-16; For. 7-8; Geol. 1 or 29; Pl. Path. 10; Rhet. 11 or 22 or 31.
- Junior year.*—Agr. Eng. 24-25; Ent. 6; For. 28, 33-34, 126, 127, 130, 131.
- Senior year.*—For. 37, 134-135.

ELECTIVE COURSES

See elective groups in Part I of the bulletin.

HOME ECONOMICS

REQUIRED COURSES

GROUP I

- Freshman year.*—Freshman lectures; Phys. Ed. 1-2-3, 4; Inorg. Chem. 1-2-3 or 9-10; H.E. 3, 50-51, 70; Rhet. 1, 2, 3; Sociol. 1; Zool. 14-15.
- Sophomore year.*—Phys. Ed. 22; Agr. Biochem. 3-4; Agr. Eng. 23; Bact. 41; H.E. 15, 53, 80 or 81; Psy. 1-2; Rhet. 22.
- Junior and senior years.*—F. Mgt. 1; H.E. 34, 35, 83, 85, 131, 170, 171; H.E. Ed. 40; Physiol. 4; Prev. Med. 52; Rhet. 11 or 31.

General Curriculum in Home Economics

Junior and senior years.—To those listed as required courses under Group I for freshman, sophomore, junior, and senior years add additional elective credits to total 189 quarter credit hours.

Curriculum in Foods and Nutrition

The same as those listed under Group I adding the following:

- Junior and senior years.*—F. Mgt. 126. An. Husb. 111 or H.E. 75 and 179, 73, 173, 175, 182 or 183, 186 or 187.

Curriculum in Textiles and Clothing

The same as those listed under Group I adding the following:

Junior and senior years.—F. Mgt. 126; H.E. 11, 13, 17 or 18, 102, 115.

Curriculum for Dictitians

The same as those listed under Group I adding the following:

Junior and senior years.—Agr. Biochem. 2; F. Mgt. 25; H.E. 60, 61, 63, 65, 73, 75, 79, 156, 163, 173, 175, 176 or 177, 179, 182.

Curriculum in Institution Management

The same as those listed under Group I adding the following:

Junior and senior years.—F. Mgt. 25, 126; Econ. 1, 161; H.E. 60, 61, 63, 65, 163, 182 or 183.

Teachers' Curriculum in Home Economics

Professional requirements: Ed. Psy. 55 or Agr. Ed. 11; Hist. of Ed. 1 or 5 or 101 or Ed. Ad. 65; H.E. Ed. 42,¹ 49, 143.

Teachers' Curriculum in General Home Economics

To the professional requirements listed above and the courses listed under Group I add the following:

Junior and senior years.—F. Mgt. 126; H.E. 11, 13, 17 or 18, 150.

Teachers' Curriculum in Home Economics Extension

To the professional requirements listed above and the courses listed under Group I add the following:

Junior and senior years.—F. Mgt. 126; H.E. 11, 13, 17 or 18, 44, 150.

Teachers' Curriculum in Foods and Nutrition

To the professional requirements listed above and the courses listed under Group I add the following:

Junior and senior years.—F. Mgt. 126; H.E. 73, 173 or 175 or 75 and 179, 182 or 183, 186 or 187.

Teachers' Curriculum in Textiles and Clothing

To the professional requirements listed above and the courses listed under Group I add the following:

Junior and senior years.—F. Mgt. 126; H.E. 11, 13, 17 or 18, 102, 115, 150.

Teachers' Curriculum in Related Art

To the professional requirements listed above and the courses listed under Group I add the following:

Junior and senior years.—H.E. Ed. 147 instead of H.E. Ed. 143; Art Ed. 4-5-6, 7-8-9, 29-30-31; H.E. 11, 13, 55, 57, 150, 152, 154.

¹ Offered jointly with the College of Education and leads to the university teacher's certificate.

TABULAR STATEMENT OF PROGRAM OF COURSES

CLASS HOUR SCHEDULE

	University Farm	Minneapolis Campus
I Hr	8:15- 9:05	8:30- 9:20
II Hr	9:15-10:05	9:30-10:20
III Hr	10:15-11:05	10:30-11:20
IV Hr	11:15-12:05	11:30-12:20
V Hr	12:15- 1:05	12:30- 1:20
VI Hr	1:30- 2:20	1:30- 2:20
VII Hr	2:30- 3:20	2:30- 3:20
VIII Hr	3:30- 4:20	3:30- 4:20
IX Hr	4:30- 5:20	4:30- 5:20

Convocation—Thursdays, IV hour.

Freshman Assembly—Tuesdays, I hour (fall quarter).

CLASS SCHEDULE

Other schools and colleges.—For programs of classes given in other schools and colleges of the University, not listed below, send to the registrar, University of Minnesota, Minneapolis,

Abbreviations.—The following abbreviations are used to indicate names of buildings, those marked with an asterisk (*) are located on the Minneapolis campus; all others are at the University Farm:

A, *Armory	HH, Haecker Hall
AB, *Animal Biology	Hr, Horticulture
Ad, Administration	JA, *Institute of Anatomy
Ag, Agronomy	Lib, *Library
B, *School of Business Administration	MH, *Millard Hall
BB, Beef Barn	MS, Meat Shop
BCh, Biochemistry	Mu, *Music
Bot, *Botany	OL, *Old Library
C, *Chemistry	OLa, *Old Law
CWI, *Child Welfare Institute	OPh, *Old Physics
Da, Old Dairy Hall	P, *Pillsbury Hall
DB, Dairy Barn	Ph, *Physics
DiH, Dining Hall	PP, Plant Pathology
E, *Main Engineering	Psy, *Psychology
Ed, *Education	S, *Stadium
En, Agricultural Engineering	So, Soils
F, *Folwell Hall	St, Stock Pavilion
G, *Greenhouse	Ve, Veterinary
Gy, Gymnasium	WGM, *Women's Gymnasium
HE, Home Economics	WH, Women's Hall

Explanation of course numbers.—All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 100 to 200. The letters f (fall), w (winter), and s (spring), indicate the quarters in which the course is offered. For example: 5f,w,s indicates that Course 5 is a one-quarter course given in the fall and repeated in the winter and again in the spring; 10f-11w-12s indicates that Course 10-11-12 is a three-quarter course running through three quarters; 25f,w-26w,s indicates a two-quarter course given in the fall and winter quarters and repeated in the winter and spring quarters.

PROGRAM

1929-30

AGRICULTURAL BIOCHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
2f	Quantitative Methods (5 cred.; jr., sr.; prereq., Inorg. Chem. 10 cred.)	VI, VII, VIII, IX	MWF	108BCh	Mr. Rogers
3f-4w	Types of Carbon Compounds..... (6 cred.†; soph., jr., sr.; prereq., Inorg. Chem. 10 cred.) (Limited to 40)				
	Sec. 1	I	MWF	116BCh	Prof. Bailey
	2	I	TThS	116BCh	Dr. Sandstrom
3w-4s	Types of Carbon Compounds..... (Same as 3f-4w) (Limited to 40)	I	MWF	113BCh	Dr. Sandstrom
7f-8w	General Agricultural Biochemistry.... (10 cred.; soph., jr., sr.; prereq., Inorg. Chem. 10 cred.)				
	Lect.	II	TThS	113BCh	
	Lab.	VII, VIII, IX	MW	102BCh	
7w-8s	General Agricultural Biochemistry.... (Same as 7f-8w)				
	Lect.	III	TThS	113BCh	
	Lab.	VII, VIII, IX	MF	108BCh	Mr. Rogers
15f	Principles of Animal Nutrition..... (3 cred.; jr., sr.; prereq., 7-8)	III	TThS	116BCh	Prof. Palmer
101f-102w	Agricultural Quantitative Analysis... (6 cred.; jr., sr.; prereq., 7-8)	VI, VII, VIII	MWF	208BCh	Prof. Bailey
103s	Dairy Chemistry (5 cred.; jr., sr.; prereq., 7-8)				
	Lect.	VI	MWF	116BCh	Prof. Palmer
	Lab.	VII, VIII, IX	MWF	208BCh	Prof. Palmer
106f,w,s	Biochemistry in Industry..... (1 cred.‡; jr., sr.; prereq., org. chem.)	Ar	Ar	Ar	Prof. Bailey
108s	Chemistry of Wheat and Wheat Products (3 cred.; jr., sr.; prereq., 3-4 or 7-8)	I	MWF	211BCh	Prof. Bailey
110s	Flour Laboratory Methods..... (3-5 cred.; jr., sr.; prereq., 101-102 or Technolog. Chem. 100-101-102)	VI, VII, VIII, IX	MWF	202BCh	Prof. Bailey
111f-112w	Biochemistry (6 cred.; sr.; prereq., Zool. or Bot., 9 cred., org. chem.)	III VI	MWF Th	113BCh 113BCh	Prof. Gortner Dr. Sandstrom
113f-114w- 115s	Biochemical Laboratory Methods..... (6 cred.; sr.; prereq., quant. anal., parallel 111-112)	VI, VII, VIII VII, VIII, IX	T Th	202, 208BCh	Dr. Sandstrom
116w	Advanced Animal Nutrition..... (3 cred.; jr., sr.; prereq., 15 and 111 or physiologic chem.)	III IV	TTh TS	211BCh	Prof. Palmer, Asst. Prof. Kennedy

† The full course must be completed before credit will be given.

‡ A total of not more than 6 credits may be earned in this course.

No.	Title	Hour	Day	Bldg.	Instructor
117f,w,s	Laboratory Problems in Animal Nutrition (3 cred.; jr., sr.; prereq., 116, instructor's permission)	Ar	Ar	314BCh	Prof. Palmer, Asst. Prof. Kennedy
118f,w,s	Laboratory Problems in Biochemistry (3 or 5 cred.; sr.; prereq., 111-112, 113-114; or 103 or 110)	Ar	Ar	Ar	Ar

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
11f,w,s	Principles of Vocational Education.... (3 cred.; jr., sr.*; no prereq.)	II	TThS	202Ad	Assoc. Prof. Field
21f	Vocational Education (3 cred.; jr., sr.; no prereq.)	III	TThS	202Ad	Prof. Mayne
41†	Apprentice Teaching	Not offered in	1929-30		
42f,w,s	Supervised Teaching Experience..... (3 cred.; jr., sr.†; no prereq.)	Ar	Ar	Ar	Assoc. Prof. Field, Mr. Nylin
64w,s	Survey of Agriculture..... (3 cred.; no prereq.)	Ar	Ar	Ar	Assoc. Prof. Field and others
75	Visual Presentation	Not offered in	1929-30		
81s	Extension Work	VI	MWF	202Ad	Profs. Peck, Storm
82f,w,s	Agricultural Extension Field Course... (3 to 10 cred.; jr., sr.; prereq.‡ 81)	Ar	Ar	Ar	Profs. Peck, Storm, Assoc. Prof. Field
121	Teachers' Course, Home and School Gardening	Ar	Ar	Ar	
131	Methods in Training ^{Teaching} High School Agriculture	Not offered in	1929-30		
141w,s	Supervised Practice in Vocational Agriculture	Ar	Ar	Ar	Assoc. Prof. Field
144w	Course Organization and Instruction for the Individual in Vocational Agriculture	Ar	Ar	Ar	Assoc. Prof. Lathrop

* Offered only to those preparing to teach.

† Only students pursuing the Agricultural Education curriculum are eligible to register for this course. Registration limited. Written approval of head of Department of Agricultural Education must be obtained before registration. Students entering this course will be expected to have completed the Agricultural Education curriculum of the preceding quarters.

‡ A special fee of \$1 per credit hour is charged for this course.

§ Broad curriculum approved by the Agricultural Education Division and a position approved by the Agricultural Extension Division are also prerequisites in this course.

** Open to juniors on the approval of the chief of the division.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
151	Organization and Management..... (5 cred.; sr.†; prereq., 11, 21)	Not offered in 1929-30			
154	Rural Education and Community Life (3 cred.; sr.; prereq., 11)	Ar	Ar	Ar	
171w,s	Problems in Procedure..... (3 cred.; sr.†; prereq., 42, 131, or equiv. teaching experience)	Ar	Ar	Ar	Prof. Storm, Assoc. Profs. Field, Lathrop
176s	Problems in Visual Presentation..... (3 cred.; jr., sr.†; prereq., 75)	Ar	Ar	Ar	Assoc. Prof. Field
181f	Teaching Agriculture (5 cred.; jr., sr.†; prereq., 11)	III	MTWThS	202Ad	Prof. Storm, Assoc. Profs. Field, Lathrop, Mr. Nylin
182w	Teaching Agriculture (Same as 181f)	III	MTWThF	202Ad	
183s	Teaching Agriculture (Same as 181f)	III	MTWThF	202Ad	
191f-192w- 193s	Seminar in Agricultural Education... (6 cred.; sr.; prereq., 11 cred.)	Ar	Ar	Ar	Prof. Storm, Assoc. Profs. Field, Lathrop

AGRICULTURAL ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
3f,s	Mechanical Drawing (2 cred.; no prereq.)	III, IV	MWF	303En	Mr. Jacobson
5f	Farm Building Construction..... (3 cred.; no prereq.)				<i>Mr. Newbauer</i>
	Lect.	VII	WF	41En	Asst. Prof.
	Lab.	VII, VIII, IX	M	48En	White
7w	Farm Structures I..... (3 cred.; jr., sr.; prereq., 3)				
	Lect.	IV	TS	305En	Asst. Prof. White
	Lab.	VII, VIII, IX	M	305En	Asst. Prof. White
9f,w	Applied Mathematics (3 cred.†; no prereq.)	III	MTWFS	103En	Mrs. Brudwick
10w,s	Applied Mathematics (2 cred.; prereq., 9)	II 10w	TThS	215En	Mrs. Brudwick
11f,w	Applied Mathematics (5 cred.; no prereq.)	III	MTWFS	105En	Mr. Neal <i>Mr. Poe</i>
12s	Field Machinery (3 cred.; jr., sr.; no prereq.)				
	Lect.	I	MW	216En	Asst. Prof.
	Lab.	VI, VII, VIII	W		Schwantes
13f	Gas Engines (3 cred.; no prereq.)	VI, VII, VIII	TTh	216,37En	Asst. Prof. Torrance

† Only students pursuing the Agricultural Education curriculum are eligible to register for this course. Registration limited. Written approval of head of Department of Agricultural Education must be obtained before registration. Students entering this course will be expected to have completed the Agricultural Education curriculum of the preceding quarters.

‡ Course 10 must be completed before credit will be allowed.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg	Instructor
13s	Gas Engines	VI, VII, VIII	TTh	216,37En	Asst. Prof. Torrance
14s	(Same as 13f) Elementary Farm Power.....	VI, VII, VIII	MF	216,37En	Asst. Prof. Torrance
15f	(3 cred.; prereq., 13) Ignition and Carburetion				
	(3 cred.; prereq., 13) Lect.	III	MW	216En	Asst. Prof. Torrance
	Lab.	III, IV	F		
19f	Elementary Surveying				
	(3 cred.; prereq., 3, 11, or equiv., or Draw. 3 and M.&M. 12) Lect.	II	T	215En	Assoc. Prof. Roe
	Lab.	VI, VII, VIII	WF	215,305En	Mr. Neal
20s	Advanced Surveying				
	(3 cred.; prereq., 19) Lect.	VI	M	215En	Assoc. Prof. Roe, Mr. Neal
	Lab.	VII, VIII, IX	MF	305En	
23f	General Physics				
	(5 cred.; no prereq.) Lect.	III	TThS	101En	Asst. Prof. Romness
	Sec. 1 Lab.	I, II	TThS	102En	Asst. Prof. Romness
	2	VI, VII	TTh	102En	Asst. Prof. Tyler
23s	General Physics				
	(Same as 23f) Sec. 1 Lect.	III	TThS	101En	Asst. Prof. Romness
	2	IV	MWF	101En	Asst. Prof. Romness
	Sec. 1 Lab.	I, II	WF	102En	Asst. Prof. Romness
	2	I, II	TS	102En	Asst. Prof. Romness
	3	VI, VII	TTh	102En	Asst. Prof. Tyler
	4	VI, VII, VIII, IX	M	102En	Asst. Prof. Tyler
	5	VI, VII, VIII, IX	W	102En	Asst. Prof. Tyler
	6	III, IV	MW	102En	Asst. Prof. Tyler
	7	III, IV	TS	102En	Asst. Prof. Tyler
24f	Agricultural Physics I.....				
	(4 cred.; prereq., 11, 23, or equiv.) Lect.	III	MWF	101En	Asst. Prof. Romness
	Lab.	VI, VII, VIII	M or F	102En	
25w	Agricultural Physics II.....				
	(4 cred.; prereq., 24) Lect.	I	TThS	101En	Asst. Prof. Romness
	Lab.	VI, VII, VIII	T or F	102En	
28w	Land Clearing	I	TThS	103En	Asst. Prof. Schwantes
	(3 cred.; jr., sr.; no prereq.)				

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
31w,s	Principles of Drainage..... (3 cred.; no prereq.)	III	TThS	215En	Assoc. Prof. Roe, Mr. Neal
34w	Household Mechanics (4 cred.; prereq., 23 or equiv.)	I, II	MWF	103En	Asst. Prof. Romness
35s	Household Physics (4 cred.; prereq., 23 or equiv.)	I, II	MWF	101,103En	Asst. Prof. Romness
36w	Rural Heating and Ventilation..... (3 cred.; jr., sr.; prereq., 7, 23, 24)	I	TTh	101En	Asst. Prof. Romness
37s	Rural Sanitation (3 cred.; no prereq.)	I	TThS	101En	Asst. Prof. Romness
40f	Mechanical Training I..... (3 cred.; no prereq.)	I, II	MWF	20,106En	Mr. Dent
40s	Mechanical Training I..... (Same as 40f)	I, II	MWF	20,106En	Mr. Dent
41w	Mechanical Training II..... (3 cred.; no prereq.)	I, II	MWF	20,106En	Mr. Dent
42	Principles of Irrigation..... (3 cred.; no prereq.)	Not offered in 1929-30			
67s	Farm Structures II..... (3 cred.; jr., sr.; prereq., 7)	I, II	TThS	305En	Asst. Prof. White
101f	Drainage Engineering and Works.... (3 cred.; prereq., 31, M.&M. 86)	I	M		Assoc. Prof. Roe
102s	Advanced Drainage Problems..... (3 cred.; sr.; prereq., 101)	Ar	Ar	Ar	Assoc. Prof. Roe
103s	Irrigation Engineering and Works.... (3 cred.; prereq., 42, M.&M. 86)	I	M		Assoc. Prof. Roe
104w	Drainage Administration and Law.... (3 cred.; prereq., 101)	Ar	Ar	Ar	Mr. Neal
111f	Structural Materials (3 cred.; jr., sr.; prereq., 67)				
	Lect.	III	Th	305En	Asst. Prof.
		III, IV	TS	305En	White
112s	Farm Building Problems (3 cred.; sr.; prereq., 67)	VI, VII, VIII	TTh	305En	Asst. Prof. White
121w	Steam Boilers and Engines..... (3 cred.; prereq., Phys. 3, 4)				
	Lect.				
	Lab.	VI, VII	TTh	216En	Prof. Boss
122f	Power Machinery (3 cred.; prereq., 12, 13)				
	Lect.	VI	WF	106En	Asst. Prof.
	Lab.	VII, VIII, IX	W	49En	Schwantes
123s	Farm Power (3 cred.; prereq., 122)				
	Lect.	I	TTh	216En	Asst. Profs.
	Lab.	VI, VII, VIII	T	49En	Schwantes, Torrance
125w	Farm Machinery Design..... (3 cred.; jr., sr.; prereq., 122, M.E. 27)	VI, VII, VIII	MW	106En	Asst. Prof. Schwantes
126s	Selection of Farm Equipment..... (3 cred.; prereq., 14, 122)				
	Lect.	III	MW	106En	Asst. Prof.
	Lab.	III, IV	F	49En	Schwantes

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
133w	Applied Electricity				
	(3 cred.; prereq., Phys. 43, 44)				
	Lect.	VI	M		
	Lab.	VII, VIII, IX	M	101En	Asst. Prof. Romness
		VI, VII, VIII	F		Assoc. Prof. Thompson
141w	Land Clearing II.....	Ar	Ar	Ar	
	(3 cred.; prereq., 28)				

AGRONOMY AND PLANT GENETICS

No.	Title	Hour	Day	Bldg.	Instructor
1f,w	General Farm Crops.....	III, IV	MWF	100Ad	Assoc. Prof. Army
	(3 cred.; no prereq.)				
121f	Grain Crops	VI, VII, VIII	TTh	100Ad	Asst. Prof. Wilson
	(3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)				
122w	Grain and Hay Grading.....	VI, VII, VIII	TTh	100Ad	Asst. Prof. Wilson
	(3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)				
123s	Forage Crops	VI, VII, VIII	TTh	100Ad	Assoc. Prof. Army
	(3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)				
124w,s	Problems in Farm Crops.....	Ar	Ar	Ar	Asst. Prof. Wilson
	(3 cred.; jr., sr.; prereq., 1, 121, 123 or parallel)				
131f,w	Principles of Genetics.....				
	(3 cred.; soph., jr., sr.; prereq., Bot. or Zool. 9 cred.)				
	Lect.	I	ThS	102Ad	Asst. Prof. Stevenson
	Lab.	I, II	T	102Ad	Asst. Prof. Stevenson
132w	Farm Crops Plant Breeding.....	VI, VII, VIII	TTh	102Ad	Asst. Prof. Stevenson
	(3 cred.; jr., sr.; prereq., 131)				
134f,w	Laboratory Problems in Genetics....	Ar	Ar	303Ag	Asst. Prof. Brewbaker
	(3 cred.; jr., sr.; prereq., 131 or parallel)				

ANIMAL HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
2f-3w	Types and Breeds of Livestock.....	I, II	MWF	WSt	Asst. Prof. McCarty
	(6 cred.; soph., jr., sr.; prereq., 10-11)				
4s	Livestock Judging	III, IV	MWF	CSt	Prof. Ferrin
	(3 cred.; jr., sr.; prereq., 2-3)				
5w	Livestock Breeding	IV	MWF	3St	Assoc. Prof. Winters
	(3 cred.; jr., sr.; prereq., Agron. 131)				
6w	Livestock Feeding	III	MTWFS	3St	Prof. Ferrin
	(5 cred.; jr., sr.; prereq., Agr. Biochem. 15)				
7f	Meats	VI, VII, VIII	TTh	MS	Asst. Prof. Anderson
	(3 cred.; jr., sr.; prereq., 2-3)				
8s	Fundamentals of Feeding and Management	I	MTWThF	3St	Asst. Prof. Anderson
	(5 cred.; sr.; no prereq.)				
9s	Pedigrees and Herd Books.....	II	TThS	3St	Asst. Prof. Anderson
	(3 cred.; jr., sr.; prereq., 5)				

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
10f-11w	Types and Market Classes of Live-stock (6 cred.; no prereq.)	I, II	MWF	CSt	Asst. Prof. Harvey
10w-11s	Types and Market Classes of Live-stock (Same as 10f-11w)	I, II	TThS	CSt	Assoc. Prof. Winters
12f	Meat Selection (1 cred.; jr., sr.; no prereq.)	VIII	M	MS	Asst. Prof. Anderson
15s	Fundamentals of Livestock Production (3 cred.; jr., sr. in prof. Agr. Eng.; no prereq.)	I	TThS	WSt	Prof. Peters
101f	Advanced Stock Judging (3 cred.; sr.; prereq., 4)	VI, VII	MWF	CSt	Prof. Ferrin
102s	Horse Husbandry (3 cred.; jr., sr.; prereq., 5, 6)				
	Lect.	II	TTh	WSt	Asst. Prof. Harvey
	Lab.	VI, VII, VIII	F	CSt	
103s	Beef Cattle Husbandry (3 cred.; jr., sr.; prereq., 5, 6)				
	Lect.	III	MW	WSt	Prof. Peters
	Lab.	VI, VII, VIII	T	BB	
104s	Sheep Husbandry (3 cred.; jr., sr.; prereq., 5, 6)				
	Lect.	IV	WF	3St	Asst. Prof. Anderson
	Lab.	VI, VII, VIII	M	CSt	
105s	Swine Husbandry (3 cred.; jr., sr.; prereq., 5, 6)				
	Lect.	III	TS	3St	Prof. Ferrin
	Lab.	VI, VII, VIII	Th	CSt	Asst. Prof. McCarty
106w	Advanced Meats (3 cred.; jr., sr.; prereq., 7)	VI, VII, VIII	WF	MS	Asst. Prof. Anderson
107s	Meat Problems (3 cred.; sr.; prereq., 106)				
	Lect.	IV	TS	MS	Asst. Prof. Anderson
	Lab.	VI, VII, VIII	W	MS	
108f-109w-					
110s	Seminar (3 cred.; jr., sr.; prereq., 2-3)	II	F	3St	Prof. Peters
111w	Utilization of Meats (3 cred.; Home Econ. students; no prereq.)	III, IV	ThS	MS	Asst. Prof. Anderson
			T	MS	

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
21f*	Freehand Drawing (2 cred. per qtr.; no prereq.)				
	Sec. 1	VI-VIII	TTh	417E	Mr. Doseff
	2	II-IV	MF	417E	Asst. Prof. Young
	3	VI-VIII	MW	417E	Mr. Doseff
	4	II-IV	TS	405E	Mr. Doseff
21w*	Freehand Drawing (See 21f)	II-III	T		
		VI-VIII	Th	417E	Mr. Doseff

* Offered on the Minneapolis campus.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
22w*	Freehand Drawing				
	(2 cred.; prereq., 21)				
	Sec. 1	VI-VIII	TF	417E	Mr. Doseff
	2	II-IV	WF	417E	Mr. Doseff
	3	VI-VIII	MW	417E	Asst. Prof. Young
22s*	Freehand Drawing	II-III	TTh		
	(See 22w)	VII-VIII	F	417E	Mr. Doseff
23s*	Freehand Drawing				
	(2 cred.; prereq., 22)				
	Sec. 1	VII-IX	Th		
	2	I-III	S	417E	Mr. Doseff
	3	II-IV	MF	417E	Asst. Prof. Young
	3	VI-VIII	MW	417E	Mr. Doseff

For additional courses see the bulletin of the College of Engineering and Architecture.

ART EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*†	Fundamental Principles of Design....				
	(9 cred.; no prereq.)				
	Sec. 1 Lect.	II	TThS	207BOPh	Miss Clousing
	Lab.	III	TThS	207BOPh	
	Sec. 2 Lect.	III	TThS	207AOPh	Mrs. Hanley
	Lab.	IV	TThS	207AOPh	
4f-5w-6s*	Still Life				
	(3 cred.; no prereq.)				
	Sec. 1	III, IV	M	203OPh	Mrs. Hanley
	2	III, IV	W	203AOPh	Miss Clousing
7f-8w-9s*	Sketch				
	(3 cred.; no prereq.)				
	Sec. 1	I, IV	F	203AOPh	Miss Clousing
	2	II, III	F	203OPh	
	3	I, II	W	203OPh	Miss Lutz
10f-11w-12s*	Composition				
	(3 cred.; no prereq.)				
	Sec. 1	II, III	M	203OPh	Prof. Raymond
	2	III, IV	M	203AOPh	Prof. Raymond
20f-21w-22s*	Principles of Harmony in Form and Color				
	(9 cred.; soph., jr., sr.; prereq., 1-2-3 or instructor's permission)				
	Lect.	II	MWF	207OPh	Asst. Prof.
	Lab.	I	MWF	207OPh	Hilpert
29f-30w-31s*	Sketch, Course II.....				
	(3 cred.; soph., jr., sr.; prereq., 7, 8, 9)				
	Sec. 1	I, II	S	203AOPh	Prof. Raymond
	2	II, III	F	203OPh	Prof. Raymond
	3	III, IV	F	203OPh	Prof. Raymond

For additional courses see the bulletin of the College of Education.

* Offered on the Minneapolis campus.

† Home Economics students with credit in H.E. 51 and 53 will be admitted to the last quarter of the course.

PROGRAM

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
41f,w,s*	General Bacteriology	VII, VIII, IX	MWF	Ar	
	(5 cred.; soph., jr., sr.; prereq., chem. and biol.)				
103w*	Soil Microbiology	I, II, III	TS	MH	Dr. Skinner
	(5 cred.; jr., sr.; prereq., 41)	I, II	Th	MH	
121w	Industrial Bacteriology	I, II	TTh	Ar	Ar
	(3 cred.; jr., sr.; prereq., 41)				
122s*	Industrial Bacteriology (cont'd).....	I, II	TTh	MH	Ar
	(Same as 121)				

For additional courses see the bulletin of the Medical School.

*S.L.A. 1:30-4:00
ag. College 3-5.*

BEE CULTURE

No.	Title	Hour	Day	Bldg.	Instructor
of,w,s	Elementary Bee Science.....				
	(3 cred.; all; no prereq.)				
	Sec. 1	IV	MWF	203aDa	Prof. Tanquary
	2	V	MWF	203aDa	
tof,w	Industrial Beekeeping	V	TTh	203aDa	Prof. Tanquary
	(3 cred.; all; no prereq.)	2 hrs ar			
tos	Industrial Beekeeping				
	(Same as 2f,w)				
	Sec. 1	IV	TS	203aDa	
		2 hrs ar			
	2	V	TS	203aDa	
		2 hrs ar			
11w,s	Advanced Beekeeping I.....	Ar	Ar	203aDa	Prof. Tanquary
	(3 cred.; prereq., 9 or 10)				
12s	Advanced Beekeeping II.....	Ar	Ar	203aDa	Prof. Tanquary
	(3 cred.; prereq., 11)				

Research Prot in Beekeeping see Ent 197

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f*	General Botany				
	(4 cred.; students in Agr. and For.)				
	Lect.	VI	TTh	BotAud	Asst. Prof. Huff
		VII	Th		
	Quiz Sec	VII	T		
1s*	General Botany				
	(4 cred.; students in H.E.; no prereq.)				
	Lect.	III	TThS	BotAud	Asst. Prof. Huff
	Quiz Sec. 1	I	M		
	2	II	T		
	3	III	W		
2w,s*	Elementary General Morphology of Plants	III, IV	MWF	1,4,5,8Bot	Asst. Prof. Huff
	(3 cred.; all; prereq., 1)				
3su	Forest Botany	Given at Itasca Park			Prof. Rosendahl
	(1½ cred.; no prereq.)				

* Offered on the Minneapolis campus

No.	Title	Hour	Day	Bldg.	Instructor
5w*	Elementary Plant Histology..... (3 cred.; all; prereq., 1)	VI, VII, VIII	TTh	1,4,5,8Bot	Assoc. Prof. Butters
7f, ^k *	Taxonomy of Flowering Plants..... (3 cred.; all; prereq., 1)	I, II	MWF	1,4,5,8Bot	Prof. Rosendahl
7s*	Taxonomy of Flowering Plants..... (Same as 7f,w)				
	Sec. 1	I, II	MWF	1,4,5,8Bot	Prof. Rosendahl
	2	VI, VII, VIII	TTh	1,4,5,8Bot	Prof. Tilden
12f,w,s*	Morphology of Algae..... (3 cred.; all; prereq., 1)	I, II	TThS	1,4,5,8Bot	Prof. Tilden
21f*	Elementary Ecology..... (3 cred.; all; prereq., 1)	III, IV	MWF	1,4,5,8Bot	Assoc. Prof. Cooper
21w,s*	Elementary Ecology..... (Same as 21f)	VI, VII, VIII	TTh	1,4,5,8Bot	Assoc. Prof. Cooper
22f,w,s*	Elementary Plant Physiology..... (3 cred.; all; prereq., 1)				
	Lect.	VI	TTh	1,4,5,8Bot	Asst. Prof. Burr
	Lab. Sec. 1	III, IV	TS		
	2	VI, VII, VIII	TTh		<i>res for by College</i>

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

CHILD WELFARE INSTITUTE

No.	Title	Hour	Day	Bldg.	Instructor
40w*	Child Training (See also H.E. Ed. 40) (3 cred.; jr., sr.; prereq., Psy. 1-2)	IV 1 hr ar	MW	202OLa	Assoc. Prof. Foster
60f*	Modern Aspects of Child Study..... (2 cred.; jr., sr.; prereq., 6 cred. in psy. or ed.)	VI	TTh	202OLa	Assoc. Prof. McGinnis
80f*	Child Psychology..... (3 cred.; jr., sr.; prereq., Psy. 1-2)	I	MWF	202OLa	Prof. Anderson
90w*	Physical Development of the Young Child..... (2 cred.; jr., sr.; prereq., Psy. 1-2, Zool. 1-2)	V	TTh	202OLa	Asst. Prof. Boyd
120s*	Health Care of Young Child..... (2 cred.; sr.; prereq., 50-51 and permission of instructor)	V	TTh	202OLa	Asst. Prof. Boyd
130s*	The Development of the Small Child (3 cred.; sr., grad.; prereq., 15 cred. in psy. or equiv. and permission of instructor)	I	TThS	202OLa	Prof. Anderson
133f-134w-135s*	Observation and Experimental Methods in Study of Young Child..... (6 or 9 cred.; sr.; prereq., 10 cred. in psy. or ed. psy., incl. 1 lab. course, or equiv., permission of instructor)	VI VI, VII	M WF	202OLa	Assoc. Prof. Goodenough
170f*	Parental Education in Child Care and Training..... (3 cred.; sr., grad.; prereq., 52-53-54 or H.E. 34, 35, and 44, or 15 cred. in ed. or psy., or social or prev. med.)	VI	MWF	202OLa	Assoc. Prof. McGinnis

* Offered on the Minneapolis campus.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
173w-174s*	Technique and Practice of Parental Education (6 cred.; sr., grad.; prereq., 170 and permission of instructor)	Ar	Ar	204OLA	Assoc. Prof. McGinnis
190w-191s*	Mental Examination of Pre-School Children (2 or 4 cred.; sr., grad.; prereq., Ed. Psy. 143-144-145 or 134-135-136 or equiv. and permission of instructor)	III	TTh	202OLA	Assoc. Prof. Goodenough

DAIRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
1f,s	Elements of Dairying..... (5 cred.; no prereq.) (Limited to 35)				
	Lect.	III	TWS	100HH	Prof. Combs,
	Lab.	III, IV	MF		Mr. Thurston
2w	Dairy Bacteriology (5 cred.; soph., jr., sr.; prereq., Bact. 41) (Limited to 12)	VI, VII, VIII	MWF	210HH	Asst. Prof. Macy
3w	Dairy Bacteriology (3 cred.; soph., jr., sr.; prereq., Bact. 41)	VI	MWF	210HH	Asst. Prof. Macy
4s	Dairy Products Practice..... (3 cred.; soph., jr., sr.; prereq., 1)	Ar	Ar	Ar	Prof. Combs
6f	Judging Dairy Cattle..... (1 cred.; jr., sr.; prereq., An. Husb. 1)	VI, VII, VIII	Th	DB	Asst. Prof. Petersen
7f,s	Elements of Dairying..... (3 cred.; students with credits in Dairy Husb. in School of Agr.)	III	TWS	100HH	Prof. Combs
101f	Milk Production (5 cred.; jr., sr.; prereq., 1)	IV	MTWFS	210HH	Prof. Eckles
102s	Market Milk (3 cred.; jr., sr.; prereq., 1, 2)	IV VI, VII, VIII	MW Th	210HH	Asst. Prof. Macy
103w	Dairy Stock Feeding..... (3† cred.; sr.; prereq., 101, Agr. Biochem. 15)	III	MWF	210HH	Prof. Eckles
104s	Dairy Stock Selection (3 cred.; jr., sr.; prereq., 6, 101)	VI, VII, VIII VI	MW F	210HH 210HH	Asst. Prof. Petersen
105f	Seminar I (1 cred.; sr.; prereq., 3 courses in dy. husb.)	II	S	214HH	Prof. Eckles
106w	Seminar II (Same as 105f)	II	S	214HH	Prof. Eckles
107s	Seminar III (Same as 105f)	II	S	214HH	Prof. Eckles
110w	Dairy Products III..... (3 cred.; jr., sr.; prereq., 1)	IV VI, VII, VIII	TS T	210HH	Prof. Combs
111f	Dairy Products I..... (3 cred.; jr., sr.; prereq., 1, 2 or 3)	VI VI, VII, VIII	MW F	210HH	Prof. Combs, Mr. Thurston

* Offered on the Minneapolis campus.

† Only two credits allowed those who have completed An. Husb. 8.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
112S	Dairy Products II..... (3 cred.; jr., sr.; prereq., 1, 2 or 3)	IV	TS	210HH	Prof. Combs, Mr. Miller
113S	Technical Control (3 cred.; sr.; prereq., 111 or 112)	VI, VII, VIII	T	210HH	Prof. Combs, Mr. Morrison
114SU	Problems in Dairy Husbandry.....	(See bulletin of Summer Session)			Prof. Combs, Asst. Prof. Macy
115f,w,s	Advanced Dairy Bacteriology..... (3 cred.; sr.; prereq., 111 or 112)	Ar	Ar	Ar	Asst. Prof. Macy

EDUCATIONAL ADMINISTRATION AND SUPERVISION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
119f*	The Elementary School Curriculum... (3 cred.; sr.; prereq., Hist. and Philos. of Ed. 1 or 101-102-103, Ed. Sociol. 3)	I	MWF	Ar	Prof. Peik
119Tf- 120Tw*	The Elementary School Curriculum... (Same as 119f)	I, II	S	Ar	Prof. Peik

For additional courses see the bulletin of the College of Education.

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
55f,w,s*	Educational Psychology (3 cred.; jr., sr.; prereq., Psy. 6 cred.)	I	MWF	Psy	Prof. Miller
111S*	Educational Measurements in the Ele- mentary School (3 cred.; jr., sr.; prereq., 55 or equiv.)	II	MWF	Psy	Asst. Prof. Van Wagenen

For additional courses see the bulletin of the College of Education.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title	Hour	Day	Bldg.	Instructor
3f,w	Economic Entomology (3 cred.; soph., jr., sr.; prereq., Zool. 16)	V, VII	MWF	302Ad	Prof. Ruggles
4w	Economic Vertebrate Zoology..... (3 cred.; soph., jr., sr.; prereq., Zool. 16)	Ar	Ar	Ar	Asst. Prof. Johnson
5f,w	Economic Entomology (5 cred.; soph., jr., sr.; prereq., Zool. 16)	VI, VII, VIII	MWF	302Ad	Prof. Ruggles
6w	Forest Protection Against Insects.... (3 cred.; soph., jr., sr.; prereq., Zool. 16)	VI, VII, VIII	MTh	307Ad	

* Offered on the Minneapolis campus.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
8f	Varieties and Habits of Fur Bearing Animals (3 cred.; soph., jr., sr.; prereq., Zool. 9 cred.)	Ar	Ar	Ar	Asst. Prof. Johnson
27f-38w-39s*	General Entomology	I, II	MWF	212AB	
44s*	Introductory Course in Animal Parasites and Parasitism..... (3 cred.; soph., jr., sr.; prereq., Zool. 9 cred.)	VI, VII, VIII	WF	212AB	Prof. Riley
117f-118w-119s*	General Ecology of Insects..... (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	VI, VII, VIII	TTh	401AB	Prof. Chapman
125f-126w-127s*	Advanced General Entomology..... (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	III, IV	TThS	212AB	
130f-140w	Histology and Development of Insects (6 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	II, III, IV II, III	T Th	302Ad 302Ad	Prof. Riley
One additional hour to be arranged.					
144f-145w-146s*	Animal Parasites and Parasitism.... (3 to 9 cred.; jr., sr.; prereq., Zool. 9 cred.)	VI, VII, VIII	WF	212AB	Prof. Riley
175f-176w	Advanced Economic Entomology..... (6 cred.; sr.; prereq., 3, 5, or 6, Zool. 117-118-119)	I	MWF	302Ad	Prof. Ruggles, Assoc. Prof. Friederichs,
177s	Insecticides and Their Action..... (3 cred.; sr.; prereq., inorg. and org. chem.)	I	MWF	302Ad	Asst. Prof. Strand
185f,w,s	Physical Entomology	Ar	Ar	Ar	
(3 cred.; sr., grad.; prereq., permission of instructor)					
197f,w,s	Introduction to Research..... (5 or more cred.; sr.; prereq., 37-38-39 or 44 and other work as prescribed by the division)	Ar	Ar	Ar	Prof. Chapman, Riley, Ruggies, Assoc. Prof. Friederichs Asst. Profs. Mickel, Strand

Include research in Bee Culture also for more credits. May reg for this course for 3 credits - C.C.D. Mickel 12-2-27

FARM MANAGEMENT AND AGRICULTURAL ECONOMICS

No.	Title	Hour	Day	B'dg.	Instructor
1f	Principles of Economics I (Agriculture)				
(5 cred.; soph., jr., sr.; no prereq.)					
	Sec. 1†	I	MTWThF	302HH	Mr. Clarke
	2†	IV	MTWFS	312HH	Mr. Clarke

* Offered on the Minneapolis campus.

† If either of these sections has less than 10 students it will be consolidated with the other.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
1f	Principles of Economics I (Home Economics)				
	(Same as 1f)				
	Sec. 1	II	MTWThF	108Da	Mr. Lowe
	2	III	MTWThF	108Da	Mr. Lowe
1w	Principles of Economics I.....				
	(Same as 1f)				
	Sec. 1 (Agriculture)	I	MTWThF	108Da	Mr. Lowe
	2 (Forestry)	III	MTWThF	302HH	Mr. Clarke
1w,s	Principles of Economics (Home Economics)				
		II (w)	MTWThF	108Da	Mr. Lowe
		III (s)	MTWFS	108Da	Mr. Lowe
2w	Principles of Economics II (Agriculture)				
	(3 cred.; soph., jr., sr.; prereq., 1)	I	TThS	311HH	Mr. Clarke
2s	Principles of Economics II.....				
	(Same as 2w)				
	Sec. 1 (Agriculture)	I	TThS	302HH	Mr. Clarke
	2 (Forestry)	II	MWF	108Da	Mr. Lowe
7s	Natural Resources	II	MWF	312HH	Prof. Boss,
	(3 cred.; jr., sr.; no prereq.)				Asst. Prof.
					Black
8s	Rural Economics	III	TThS	302HH	Prof. Boss
	(3 cred.; soph., jr., sr.; prereq., 1)				
25f,w	Principles of Accounting.....				
	(4 cred.; soph., jr., sr.)				
	Lect.	II	MWF	311HH	Ar
	Lab. Sec. 1	III, IV	S	311HH	
	2	VIII, IX	W	311HH	
30f	Prices of Farm Products.....	II	TThS	302HH	Assoc. Prof.
	(3 cred.; jr., sr.; prereq., 2)				Waite
40f	Principles of Marketing Organization (Agriculture and Forestry)....	I	MWF	312HH	Prof. Jesness
	(3 cred.; soph., jr., sr.; prereq., 2)				
40s	Principles of Marketing Organization (Same as 40f)	II	TThS	312HH	Prof. Jesness
50s	Farm Finance	I	MTWThF	312HH	Asst. Prof.
	(5 cred.; soph., jr., sr.; prereq., 2)				Black
90f	Agricultural Statistics				
	(5 cred.; soph., jr., sr.; prereq., 2)				
	Lect.	III	TThS	312HH	Asst. Prof.
	Lab.	Ar	Ar		Kittredge
101s	Farm Management	Not offered in 1929-30			
	(3 cred.; jr., sr.; prereq., 2, Agron. 1)				
102f	Farm Management: Organization....				
	(3 cred.; sr.; prereq., 2, Agron. 1, Soils 4)				
		II	MW	302HH	Asst. Prof.
	Lab. Sec. 1	VI, VII	T	311HH	Garey
	2	II, III	F	302HH	
102w	Farm Management: Organization....	I	MW	311HH	Asst. Prof.
	(Same as 102f)	VII, VIII	Th	311HH	Garey
103w	Farm Management: Operation.....	II	MW	302HH	Asst. Prof.
	(3 cred.; sr.; prereq., 102)	VI, VII	T	311HH	Garey
103s	Farm Management: Operation.....	I	MW	302HH	Asst. Prof.
	(Same as 103w)	VII, VIII	Th	311HH	Garey

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
104S	Types of Farming..... (3 cred.; sr.; prereq., 103)	II	MWF	311HH	Prof. Boss
110f-111W	Economics of Agricultural Production I and II..... (6 cred.; jr., sr.; prereq., 2)	I	TThS	312HH	Asst. Prof. Black
126S	Economics of Consumption..... (3 cred.; jr., sr.; prereq., 1)				
	Sec. 1	I	MWF	311HH	Assoc. Prof. Waite
	2	II II	MWF	302HH	Waite
131W	Market Prices (3 cred.; jr., sr.; prereq., 40)	III	TThS	312HH	Assoc. Prof. Waite
135S	Methods of Price Analysis..... (3 cred.; sr.; prereq., 30, 191)	III	TThS	312HH	Assoc. Prof. Waite
140f	Marketing Organization: Staples.... (3 cred.; soph., jr., sr.; prereq., 40)	III	MWF	312HH	Prof. Jesness
141W	Marketing Organization: Dairy and Poultry Products (3 cred.; jr., sr.; prereq., 40)	II	TThS	312HH	Prof. Jesness
142S	Marketing Organization: Fruits and Vegetables (2 cred.; jr., sr.; prereq., 40)	III	MW	312HH	Prof. Jesness
143W	Marketing Organization: Livestock and Meats (2 cred.; jr., sr.; prereq., 40)	IV	TS	312HH	Prof. Jesness
144f	Co-operative Organization (3 cred.; jr., sr.; prereq., 40)	II	TThS	312HH	Prof. Jesness
150S*	Advanced Farm Finance..... (3 cred.; sr.; prereq., 50 or Econ. 3)	VI, VII	F	104B	Asst. Prof. Myers
170S	Land Economics (3 cred.; jr., sr.; prereq., 110)	VII, VIII½	TTh	302HH	Asst. Prof. Black
191W	Advanced Agricultural Statistics..... (3 cred.; jr., sr.; prereq., 90)	IV	MWF	312HH	Asst. Prof. Kittredge

109. H. 4.

For additional courses see Economics and the bulletin of the School of Business Administration.

FORESTRY

No.	Title	Hour	Day	B'dg.	Instructor
1f	General Forestry (3 cred.; no prereq.)	III	TThS	102Hr	Prof. Cheyney
2su	Field Dendrology (1½ cred.; no prereq.)	Given at Itasca Park			Assoc. Prof. Wentling
3w	Dendrology (3 cred.; no prereq.)	III	MWF	301Hr	Prof. Schmitz
4S	Dendrology (4 cred.; no prereq.)				
	Lect.	III	MWF	301Hr	Prof. Schmitz
	Lab.	II, III	S	301Hr	Asst. Prof. Rees
5su	Field Silviculture (1½ cred.; no prereq.)	Given at Itasca Park			Prof. Cheyney
7f-8w	Forest Mensuration (10 cred.; all; prereq., 9)				
	Lect.	II	MWThF	302Hr	Asst. Prof. Brown
	Lab. Sec. 1	VII, VIII, IX	M	302Hr	
	2	I, II, III	S	302Hr	

* Offered on the Minneapolis campus.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
95u	Field Mensuration (1½ cred.; no prereq.)	Given at Itasca Park			Prof. Allison, Asst. Prof. Brown
13s	Forest Mensuration Laboratory..... (2 cred.; jr., sr.; prereq., 7-8)	Given at Cloquet			Asst. Prof. Hansen
20w	Grazing (3 cred.; soph., jr., sr.; no prereq.)	II	TThS	301Hr	Prof. Allison
23†	Factory Experience (3 to 5 cred.; jr., sr.; prereq., 33-34)	Ar	Ar	Ar	
27w	Farm Wood Lots and Windbreaks..... (3 cred.; no prereq.†) <i>Can.</i>	IV	MWF	301Hr	Prof. Cheyney
28w	Logging (3 cred.; jr., sr.; no prereq.)	III	MWF	204So	Asst. Prof. Brown
29f	Sawmill and Woodworking Machinery (3 cred.; soph., jr., sr.)	IV	MWF	302Hr	Prof. Cheyney
30s	Wood Seasoning (3 cred.; jr., sr.; prereq., 33-34)	I	TThS	301Hr	Assoc. Prof. Wentling
31s	Logging Laboratory (1 cred.; jr., sr.; prereq., 28)	Given at Cloquet			Asst. Prof. Brown
32f,w	Forest Reports (2 cred.; soph., jr., sr.; no prereq.)	Ar	Ar	Ar	Prof. Cheyney
33f-34w	Wood Structure and Identification.... (6 cred.; jr., sr.; prereq., 3-4)	VI, VII, VIII	WF	303Hr	Assoc. Prof. Wentling
37w	Forest Protection (3 cred.; jr., sr.; prereq., 127)	III	MWF	302Hr	Asst. Prof. Hansen
48w	Forest Products (3 cred.; no prereq.)	I	TThS	301Hr	Asst. Prof. Rees
50s	House and Furniture Woods..... (2 cred.‡; soph., jr., sr.; no prereq.)	III, IV	TS	303Hr	Asst. Prof. Rees
101w	Advanced Dendrology (3 cred.; jr., sr.; prereq., 3-4)	I	MWF	301Hr	Asst. Prof. Rees
107f	Uses of Wood I..... (3 cred.; sr.; prereq., 33-34)	IV	MWF	301Hr	Assoc. Prof. Wentling
108w	Uses of Wood II..... (3 cred.; sr.; prereq., 33-34)	IV	MWF	303Hr	Assoc. Prof. Wentling
109s	Uses of Wood III..... (3 cred.; sr.‡; prereq., 107, 108)	VI, VII, VIII	TTh	303Hr	Assoc. Prof. Wentling
112w	Advanced Forest Mensuration..... (3 cred.; sr.; prereq., 10)	Ar	Ar	Ar	Asst. Prof. Brown
113f	Wood Pulp and Paper..... (3 cred.; jr., sr.; prereq., 33-34, Chem. 3 or 10)	III	MWF	301Hr	Prof. Allison
114f-115w	Mechanical and Physical Properties of Wood (6 cred.; sr.; prereq., 33-34)	I, II	TThS	303Hr	Assoc. Prof. Wentling
116s	Mechanical and Physical Properties of Wood (3 cred.; sr.; prereq., 33-34)	I, II	MWF	303Hr	Asst. Prof. Rees
119w	Advanced Wood Structure I..... (3 cred.; sr.; prereq., 33-34)	VI, VII, VIII	TTh	303Hr	Asst. Prof. Rees
120s	Advanced Wood Structure II..... (3 cred.; sr.; prereq., 33-34)	VI, VII, VIII	WF	303Hr	Asst. Prof. Rees

† Arrangements for this course must be made in advance.

‡ Not open to students majoring in Forestry.

§ Open only to those majoring in Forest Products.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
122f-123w	Forestry Seminar (2 cred.; sr.; no prereq.)	IX	W	302Hr	Prof. Schmitz, Allison, Cheyney, Assoc. Prof. Wentling
125s	Wood Preservation (3 cred.; jr., sr.; prereq., 33-34)	IV	MWF	301Hr	Prof. Schmitz
126f	Silvics (3 cred.; jr., sr.; prereq., 3-4)	IV	TThS	301Hr	Prof. Cheyney
127w	Silviculture (3 cred.; jr., sr.; prereq., 126)	III	TThS	301Hr	Prof. Cheyney
128s	Silviculture Laboratory (7 cred.; jr., sr.; prereq., 127)	Given at Cloquet			Prof. Cheyney
129f	American Silvicultural Practice..... (3 cred.; jr., sr.; prereq., 127)	III	TThS	301Hr	Prof. Cheyney
130f	Forest Valuation (5 cred.; jr., sr.; prereq., 7-8)	I	MTWThF	301Hr	Prof. Allison
131w	Forest Policy and Administration (5 cred.; jr., sr.; prereq., 130)	IV	MTWFS	302Hr	Prof. Allison
132s	Forest Regulation Laboratory (7 cred.; jr., sr.; prereq., 131)	Given at Cloquet			Prof. Allison
134f-135w	Forest Problems (4 cred.; sr. class)	Ar	Ar	Ar	Prof. Schmitz
136f	Forest Economics (3 cred.; jr., sr.; prereq., 131, Econ. 2)	II	MWF	301Hr	Prof. Allison

FRESHMAN ASSEMBLY

During the fall quarter all freshmen are required to attend the assembly first hour on Tuesdays. See *Official Daily Bulletin* for place of meeting and further announcements.

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w**†	General Geology (10 cred.; all; no prereq.)				
	Sec. 1 Lect.	I	TThFS	210P	Assoc. Prof.
	Lab.	I, II or VII	MW	212P	Thiel
	2 Lect.	VII	MTWTh	110P	Mr. Dutton
	Lab.	VI, VII	TTh	212P	
1f-3w**†	General Geology (Same as 1f-2w)				
	Lect.	III	TThFS	110P	Prof. Emmons
	Lab.	III, IV or VI, VII	MW	212P	
			TTh	212P	
1w-2s**††	General Geology (Same as 1f-2w)				
	Lect.	IV	MTWF	110P	Mr. Dutton
	Lab.	VI, VII	TTh	212P	

* Offered on the Minneapolis campus.

† The entire course must be completed before credit is given for any quarter.

†† Course 2 may be followed by 3, 4, or 11; or 3 by 2, for a three-quarter sequence.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
1w-3s*†‡	General Geology				
	(Same as 1f-2w)				
	Lect.	II	MWFS	206P	Mr. Dutton
	Lab.	I, II	TTh	212P	Prof. Emmons
1s 2f*†‡	General Geology				
	(Same as 1f-2w)				
	Lect.	III(s)	MWThF	110P	Prof. Emmons
	Lab.	III, IV(s)	TS	212P	
	Lect.	III(f)	MWThF	110P	Mr. Dutton
	Lab.	III, IV(f)	TS	212P	
8f,w,s*§	Introductory Geology				
	(5 cred.; all; no prereq.)				
	Sec. 1	II	MWThFS	210P	Assoc. Prof.
	2 (w)	IV	MTWFS	210P	Thiel
23w-24s*	Elements of Mineralogy.....				
	(8 cred.; soph., jr., sr.; prereq. course in chem.)				
	Lect. (w)	II	WF	110P	Asst. Prof.
	Rec.	VII	T	110P	Gruner
	Sec. 1 Lab.	VII-VIII	WF	100P	
	2	III-IV	TS	100P	
	Lect. (s)	II	MWF	206P	Asst. Prof.
	Rec.	IX	T		Gruner
	Sec. 1 Lab.	VII-VIII	M	100P	
	2	VI-VII	T		
		III-IV	M		
		VII-VIII	F		

(For other sections see the bulletin of the School of Mines and Metallurgy.)

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

HISTORY AND PHILOSOPHY OF EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s*	Brief Course in the History of Educa- tion	IV	MTWFS	204Ed	Miss Alexander
	(5 cred.; jr., sr.; prereq., 6 cred. in psy.)				
3f,w,s*	Educational Sociology	III	MWF	OLawAud	Asst. Prof. Finney
	(3 cred.; jr., sr.; prereq., 6 cred. in psy.)				
5s	Public Education in the United States (3 cred.; jr., sr.; prereq., 6 cred. in psy.)	VIII	MWF	160HE	Miss Alexander

For additional courses see the bulletin of the College of Education.

HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
3f,w	Textiles				
	(5 cred.; no prereq.)				
	Sec. 1	I,II	MWThFS	311,307HE	Assoc. Prof. Weller
	(Limited to 24 each) 2	III, IV	MTWFS	311,307HE	Asst. Prof. Phelps

* Offered on the Minneapolis campus.

† The entire course must be completed before credit is given for any quarter.

‡ Course 2 may be followed by 3, 4, or 11; or 3 by 2, for a three-quarter sequence.

§ Not open to students with credit in Geol. 1 or 29.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
3s	Textiles (Same as 3f,w) (Limited to 24)	I, II	MTWThF	311,307HE	Assoc. Prof. Weller, Miss Little
4f,s	Textiles (S. L. and A.)..... (3 cred.; no prereq.; not open to students in H.E.) (Limited to 24)				
	Sec. 1	VI, VII	MWF	311,307HE	Assoc. Prof.
	2 (s)	VI, VII	MWF	304HE	Weller, Miss Little
11f,s	Clothing Planning and Construction, A (3 cred.: no prereq.)				
	Sec. 1	I, II	MWF	304HE	Miss Little, Miss Sell,
	(Limited to 24 each) 2	I, II <i>III</i>	Th S	304HE	Miss Little, Miss Gorham
	3	VI, VII, VIII	TTh	304HE	Miss Gorham, Miss Sell
11w	Clothing Planning and Construction, A (Same as 11f,s)				
	Sec. 1	I, II	MWF	304HE	Miss Little
	(Limited to 24 each) 2	VI, VII, VIII	TTh	304HE	Miss Gorham
13f,s	Clothing Planning and Construction, B (3 cred.; prereq. 3, 11 or equiv., 51, home pract. in garment making)				
	Sec. 1	III, IV	MWF	304HE	Miss Little
	(Limited to 24 each) 2	I, II	MWF	305HE	Miss Gorham
13w	Clothing Planning and Construction, B (Same as 13f,s)				
	Sec. 1	III, IV	MWF	304HE	Miss Little
	(Limited to 24 each) 2	VI, VII, VIII	TTh	305HE	Miss Gorham
15f,w	Clothing Problems (3 cred.; 3d qtr. fr., soph., jr.; pre-req., 3, 51) (Limited to 30)	Lect.			
		N <i>III</i>	S <i>4</i>	313HE	
		VI	Th	313HE	
	Lab.	VI, VII, VIII	T	313HE	Assoc. Prof. Weller, Miss Gorham
15s	Clothing Problems (Same as 15f,w) (Limited to 30)	VI, VII, VIII, IX	T	313HE	
		VI, VII	Th	313HE	
17w	Advanced Clothing (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 24)	III, IV	MWF	305HE	Miss Gorham, Miss Carlotta Brown
17s	Advanced Clothing (Same as 17w) (Limited to 24)	I, II	TThS	305HE	Miss Gorham, Miss Carlotta Brown
18f,s	Commercial Clothing Manufacture... (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 15)	VI, VII, VIII	MWF	305HE	Miss Gorham
34f,w	Home Management: Operation and Maintenance, Lectures (3 cred.; jr., sr.; prereq., 35, parallel, 83, F. Mgt. 1 or parallel, Prev. Med. 52 or parallel, H.E. Ed. 40)	VIII	MWF	203HE	Asst. Prof. Studley, Miss White- side

No.	Title	Hour	Day	B'dg.	Instructor
35f,w,s	Home Management: Operation and Maintenance, Laboratory (6 cred.; jr., sr.; prereq., 83, home exp. in foods and cookery, Prev. Med. 52 and H.E. Ed. 40 or parallel, 34 or parallel)	IV and other hours	T	203HE	Asst. Prof. Studley Miss White-side
44w	Home Economics Extension Work..... (3 cred.; sr.; prereq., H.E. Ed. 42, 49 or parallel)	V	MW	213HE	Assoc. Prof. Newton, Miss Hadley
50f,w	Color and Design I..... (3 cred.; no prereq.)				
	Sec. 1	I, II(f)	MWF	402HE	Miss Topp
	(Limited to 20 each) 2	III, IV(w)	MWF	402HE	Miss Segolson
	2	I, II	TThS	402HE	Miss Segolson
	3	III, IV(f)	MWF	402HE	Miss Segolson
50s	Color and Design I..... (Same as 50f,w)				
	Sec. 1	I, II	MWF	402HE	Miss Topp
	(Limited to 20 each) 2	VI, VII	MWF	402HE	Miss Topp
51f	Color and Design II..... (3 cred.; all; prereq., 50)				
	Sec. 1	I, II	MWF	401HE	Miss V. Gold-stein
	(Limited to 20 each) 2	I, II	TThS	401HE	Miss V. Gold-stein
51w	Color and Design II..... (Same as 51f)				
	Sec. 1	III, IV	MWF	401HE	Miss V. Gold-stein
	(Limited to 20 each) 2	I, II	TThS	401HE	Miss V. Gold-stein
51s	Color and Design II..... (Same as 51f)				
	Sec. 1	VI, VII, VIII	TTh	402HE	Miss V. Gold-stein
	(Limited to 20 each) 2	I, II	MWF	401HE	Miss V. Gold-stein
53f	Advanced Design (3 cred.; soph., jr., sr.; prereq., 51, or 56)				
	Sec. 1	VI, VII	MWF	402HE	Assoc. Prof. H. Goldstein
	(Limited to 20) 2	VI, VII	MWF	401HE	
53w	Advanced Design (Same as 53f)				
	Sec. 1	VI, VII	MWF	402HE	Miss Segolson
	(Limited to 20 each) 2	I, II	MWF	402HE	Assoc. Prof. H. Goldstein
53s	Advanced Design (Same as 53f)				
	Sec. 1	I, II	TThS	402HE	Miss Segolson
		III, IV	MWF	402HE	Miss Segolson
55f	2-21-30. Garv. Decorative Needlework and Other Crafts (3 cred.; prereq., 53 or parallel) (Limited to 20)	VI, VII, VIII	TTh	401HE	Asst. Prof. Morse

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
56f	Applications of Color and Design.... (3 cred.†; no prereq.)	VI, VII, VIII	TTh	402HE	Assoc. Prof. H. Goldstein
57s	Batik and Other Crafts..... (3 cred.; prereq., 3, 53 or parallel) (Limited to 20)	VI, VII, VIII	TTh	110HE	Miss Topp
60s	Institution Marketing (2 cred.; jr., sr.; prereq., 61 or parallel, 85)	III	WF	106HE	Asst. Prof. Ehlers
61f,s	Quantity Cookery (4 cred.; 3d qtr. soph., jr., sr.; pre- req., 83)				
	(Limited to 12) Lect.	I		S 106HE	Asst. Prof.
	Lab.	I, II, III		TTh DiH	Ehlers
61w	Quantity Cookery (Same as 61f,s)				
	Lect.	I		S 106HE	Asst. Prof.
	Sec. 1 Lab.	I, II, III		TTh DiH	Ehlers
	(Limited to 12) 2	VI, VII, VIII		MW DiH	
63f,w,s	Institution Experience (3 cred.; 3d qtr. soph., jr., sr.; pre- req., 61 or parallel, 83)				
	(Limited to 12) Lect.	IV, V		MWF Ar	Asst. Prof. Dunning
65w	Institution Equipment (2 cred.; jr., sr.; prereq., 61 or parallel, 63 or parallel)				
	Lect.	IX		W	
	Lab.	VI, VII, VIII		F	Miss Hunt
70f	Nutrition Survey (2 cred.; allf; no prereq.)	IV		WF 203HE	Assoc. Prof. Biester
70w	Nutrition Survey (Same as 70f)	III		TTh 213HE	Assoc. Prof. Biester
70s*	Nutrition Survey (Same as 70f)	VII		TTh Ar	Assoc. Prof. Biester
73f	Nutrition I (4 cred.; soph.‡ jr., sr.; prereq., Agr. Biochem. 4, H.E. 80 or 81, Physiol. 4)	VI, VII, VIII		MWF 211,213HE	Miss Counts
	(Limited to 24)				
73s	Nutrition I (Same as 73f)	VI, VII, VIII		MWF 211,213HE	Mrs. Furnas
	(Limited to 24)				
75f	Dietetics Laboratory (2 cred.; jr., sr.; prereq., 170 or equivalent or parallel)	I, II		MW 107HE	Miss Hunt
75w	Dietetics Laboratory (Same as 75f)	III, IV		MW 107HE	Miss Hunt
79s	Selected Problems for Dietitians..... (3 cred.; sr.; prereq., 170 or equiv.)	IX <i>II</i>		MWF 313HE	Assoc. Prof. Biester
80f	Foods and Cookery..... (5 cred.; prereq., Agr. Biochem. 3, parallel 4)	I, II		MTWThF 209HE	Miss Hovlid

* Offered on the Minneapolis campus.

† Intended for students in Science, Literature, and the Arts. Open to students in Home Economics only by permission of chief of division.

‡ Open to sophomores only in their third quarter.

§ Open to juniors and seniors in home economics only with consent of instructor.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
80w,s	Foods and Cookery..... (Same as 80f)				
	Sec. 1	VI, VII	MTWThF	209HE	Miss Hovlid, Mrs. Niles
	(Limited to 20 each)				
	2	III, IV	MTWFS	20)HE	Miss Hovlid, Mrs. Niles
81w	Foods and Cookery..... (3 cred.; soph., jr., sr.; by examina- tion; prereq., same as 80f)	I, II	MWF	207HE	Miss Hovlid
	(Limited to 20)				
83f,w	Food Management	III, IV	MWF	203,207HE	Mrs. Niles
	(3 cred.; soph., jr., sr.; prereq., 80 or 81)				
	(Limited to 20)				
83s	Food Management				
	(Same as 83f,w)				
	Sec. 1	III, IV	MWF	203,207HE	Mrs. Niles
	(Limited to 20 each) 2	VI, VII, VIII	PT	203,207HE	Mrs. Niles
85f,w	Food Marketing	VI	T	207,203HE	Miss Hovlid
	(2 cred.; prereq., F. Mgt. 1 or parallel)	VI, VII, VIII	Th		
	<u>07</u>				
85s	Food Marketing				
	(Same as 85f,w)				
	Sec. 1	VI	T	207,203HE	Miss Hovlid
		VI, VII, VIII	Th		
	2	VI	M	207,203HE	
		VI, VII, VIII	W		
89	Camp Cookery	Not offered in 1929-30			
	(2 cred.; no prereq., not open to stu- dents in H.E.)				
102f,s	Advanced Textiles	VI, VII, VIII	TTh	307,311HE	Asst. Prof. Phelps
	(3 cred.; jr., sr.; prereq., 3, Agr. Biochem. 3-4, F. Mgt. 1 or parallel)				
	(Limited to 16)				
107w	Textile Analysis and Related Problems	VI, VII, VIII	MWF	311HE	Asst. Prof. Phelps
	(3 cred.; jr., sr.; prereq., 102, Agr. Biochem. 2)				
115f,w	Clothing Economics	III	TTh	203HE	Assoc. Prof. Weller
	(2 cred.; jr., sr.; prereq., 13, F. Mgt. 1)				
131f	Home Management: House Planning and Equipment	III, IV	MTWFS	401HE	Asst. Prof. Morse
	(5 cred.; jr., sr.; prereq., 53)				
	(Limited to 20)				
131w	Home Management: House Planning and Equipment	VI, VII	MTWThF	401HE	Asst. Prof. Morse
	(Same as 131f)				
	(Limited to 20)				
131s	Home Management: House Planning and Equipment				
	(Same as 131f)				
	Sec. 1	III, IV	MTWFS	401HE	Asst. Prof. Morse
	(Limited to 20 each) 2	VI, VII	MTWThF	401HE	Asst. Prof. Morse
136s	Problems of Income Management.....	VIII	MWF	203HE	Asst. Prof. Studley
	(3 cred.; sr.; prereq., 34, 35, 17c, F. Mgt. 126 parallel)				

see 3

with 111 7.5
+ 2 hrs arranged

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
150f,w,s	Art History and Appreciation..... (3 cred.; jr., sr.; prereq., 51 or equivalent)	VIII	MWF	313HE	Assoc. Prof. H. Goldstein
152w	Advanced Interior Design..... (3 cred.; jr., sr.; prereq., 53, 131, 150)	I, II	MWF	401HE	Asst. Prof. Morse <i>and</i>
154s	Advanced Costume Design..... (3 cred.; jr., sr.; prereq., 13, 53, 55 recommended)	I, II	TThS	401HE	Assoc. Prof. H. Goldstein
156f,w,s	Hospital Social Service..... (3 cred.; jr., sr.; prereq., 170 or parallel, 175) (Limited to 8)	VI, VII, VIII 3 hrs. to be arranged	TTh	Ar	Miss Tebbets, Miss Hunt
163s	Institution Management Problems.... (3 cred.; sr.; prereq., 61, 63)				
	Lect.	III	TTh	106HE	Asst. Prof. Dunning
	Lab.	III, IV	S	DiH	
170f,s	Nutrition of the Family..... (3 cred.; jr., sr.; prereq., 80 or 81, Agr. Biochem. 4, Physiol. 4) Sec. 1 (Limited to 25 each) 2	I IV	MWF	313HE	Miss Counts, Miss Hunt
170w	Nutrition of the Family..... (Same as 170f,w) (Limited to 25)	I	MWF	313HE	Miss Counts
171f,w,s	Child Nutrition (3 cred.; jr., sr.; prereq., 170, H.E. Ed. 40) (Limited to 25)				
	Lect.	III III, IV	MW F	213HE 213HE	Asst. Prof. Leichsenring, Miss Mattson
	Lab.	IV	Ar before completing registration		
173s	Nutrition in Disease..... (3 cred.; sr.; prereq., 170, 175) Lect.	VII	MWF	213HE	Miss Hunt
175f	Nutrition II (4 cred.; jr., sr.; prereq., 73) (Limited to 24)	I, II	MTWTh	211,213HE	Mrs. Furnas
175w	Nutrition II (Same as 175f) (Limited to 24)	VI, VII, VIII	MWF	211,213HE	Miss Counts
176w	Advanced Nutrition (4 cred.; jr., sr.; prereq., 73, Agr. Biochem. 2) (Limited to 15)				
	Lect.	I	T	313HE	Assoc. Prof. Biester
	Lab.	II, III, IV I, II, III	TS Th	311HE 311HE	Mrs. Furnas
177s	Digestion and Metabolism..... (3 cred.; sr.; prereq., 175, Agr. Biochem. 2) (Limited to 6)	VI, VII, VIII	TTh	213HE	Asst. Prof. Leichsenring
179w	Readings in Nutrition..... (2 cred.; jr., sr.; prereq., 170)	IV	MW	213HE	Miss Counts

No.	Title	Hour	Day	Bldg.	Instructor
179s	Readings in Nutrition..... (Same as 179w)	I	TTh	213HE	Miss Counts
182f,w,s	Experimental Cookery (3 cred.: jr., sr.; prereq., 80) (Limited to 12)	VI, VII	MWF	107HE	Asst. Prof. Child
186f,s	Special Food Problems..... (3 cred.; sr.; prereq., 182)	I, II, III	TTh	107HE	Asst. Prof. Child
187f,s	Special Food Problems..... (5 cred.; sr.; prereq., 182, Agr. Bio- chem. 2)	I, II, III 4 hrs. to be arranged	TTh	107HE	Asst. Prof. Child
195 <i>s</i>	Home Economics Survey..... (2 cred.; sr.; no prereq.)	Not offered in 1929-30 <i>Miss Stud...</i>			

HOME ECONOMICS EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
40f,s	Child Training (3 cred.; jr., sr.; prereq., Psy. 1-2)	IV	MWF	106HE	Prof. Anderson
40w*	Child Training (Same as 40f,s)	Ar <i>W</i>	Ar Ar <i>M W</i>	<i>for arr</i>	Prof. Anderson
42f,s†	Special Methods of Teaching Home Economics (3 cred.; jr., sr.; prereq., H.E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)	VIII	MWF	213HE	Asst. Prof. Rose
49f,w,s†	Observation and Teaching: General Home Economics (8 cred.; sr.; prereq., †42)				
	Lect.	IX	TTh	213HE	Asst. Prof. Rose
	Teaching	Ar	Ar Ar		Asst. Prof. Rose and others
141f	Problems in Vocational Education in Home Economics (2 cred.; sr.; prereq., 42)	Ar	Ar Ar		Assoc. Prof. Clara Brown, Asst. Prof. Rose
142s	Educational Measurement in Home Economics (2 cred.; sr.; prereq., 42, Ed. Psy. 55)	Ar	Ar Ar		Assoc. Prof. Clara Brown
143f,w,s	Home Economics Curricula..... (2 cred.; jr., sr.; prereq., 42 or parallel)	VIII	TTh	106HE	Assoc. Prof. Clara Brown, Asst. Prof. Rose
147w	Organization and Methods for Re- lated Art Teaching..... (3 cred.; jr., sr.; prereq., 42 or parallel; H.E. 53, 131 or parallel)	III	TThS	313HE	Assoc. Prof. H. Goldstein
149f,w,s	Research Problems (Cred. ar.; sr.; permission of in- structor)	Ar	Ar Ar		Prof. McNeal, Assoc. Prof. Clara Brown

* Offered on the Minneapolis campus.

† A special fee of \$1 per credit hour is charged for this course.

‡ In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H.E. 3, 11, 13, 50, 51, 53, 80 or 81, and 83, and must have completed home experience work in foods and clothing.

PROGRAM

HORTICULTURE

No.	Title	Hour	Day	Bldg.	Instructor
6f	Fruit Growing (3 cred.; no prereq.)				
	Sec. 1 Lect.	II	MW	102Hr	Prof. Alderman
	(Laboratory sections	IV	WF	8aHr	Prof. Alderman
	limited to 20 each) Sec. 1 Lab.	I, II	F	8Hr	Assoc. Prof. Brierley
	2	VII, VIII	M	8Hr	Assoc. Prof. Brierley
21w	Small Fruit Culture..... (3 cred.; soph., jr., sr.; prereq., 6 or 32, Bot. 9 cred.)	I	MWF	102Hr	Assoc. Prof. Brierley
32s	Vegetable Growing (3 cred.; no prereq.)				
	Lect.	II	MW	102Hr	Asst. Prof. Krantz
	(Limited to 30)	Lab.	F	8Hr	Mr. Hutchins
50s	Floriculture (3 cred.; no prereq.)	III	MWF	102Hr	Mr. Sando
56s	Plant Propagation and Nursery Prac- tice (3 cred.; jr., sr.; prereq., Bot. 9 cred.)	I VI, VII	ThS T	8aHr 8Hr	Mr. Sando
71f	Plant Materials I..... (2 cred.; prereq., Bot. 9 cred.)	II I, II	Th T	8aHr Ar	
72s	Plant Materials II..... (2 cred.; prereq., Bot. 9 cred.)	IV III, IV	T S	8aHr Ar	
73w	History of Landscape Gardening..... (3 cred.; all; no prereq.)	II	TThS	102Hr	
74f	Principles of Landscape Design..... (3 cred.; jr., sr.; prereq., Arch. 23)	VIII VI, VII	T TTh	8aHr 8aHr	
76s	Landscape Construction (5 cred.; sr.; prereq., 74 or 77)	III VI, VII, VIII	TTh TTh	8aHr 8aHr	
77w	Principles of Landscape Design..... (3 cred.; profess. agr. eng.; no pre- req.)	III	TThS	102Hr	
93f	Judging Horticultural Crops..... (2 cred.; soph., jr., sr.; prereq., 6 or 32)	VI, VII, VIII	M	8aHr	Prof. Alderman, Assoc. Prof. Brierley, Asst. Prof. Krantz
107f	Orchard Management (3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.)	IV VI, VII	TS W	103Hr 8Hr	Assoc. Prof. Brierley Assoc. Prof. Brierley
110w	Horticultural Crop Breeding..... (3 cred.; jr., sr.; prereq., Agron. 131)	III	TThS	106Hr	Mr. Wilcox <i>Carroll</i>
111f	Systematic Pomology (3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.)	II VI, VII	TTh Th	102Hr 8Hr	Assoc. Prof. Brierley
135w	Truck Crops and Potatoes..... (3 cred.; jr., sr.; prereq., 32, Bot. 9 cred.)	Ar	Ar	Ar	Asst. Prof. Krantz
137f	Vegetable Crops (3 cred.; jr., sr.; prereq., 32, Bot. 9 cred.)	Ar	Ar	Ar	Asst. Prof. Currence

No.	Title	Hour	Day	Bldg.	Instructor
190f-191w- 192s	Special Problems	Ar	Ar	Ar	Prof. Alderman and staff
	(6-12 cred.; jr., sr.; prereq., in- structor's permission)				
193f-194w- 195s	Horticultural Seminar	Ar	Ar	Ar	Horticultural staff
	(3 cred.; jr., sr.; prereq., 9 cred.)				

INORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Inorganic Chemistry.....				
	(8 cred.; no prereq.)				
	Lect.	VII	MWF	100C	Asst. Prof.
	Lab.	VIII, IX	MW	210C	Pervier
3s*	General Inorganic Chemistry.....				
	(4 cred.; prereq., 1-2)				
	Lect.	VII	MF	325C	Asst. Prof.
		IV	S	325C	Pervier
	Lab.	VIII, IX	MF	210C	
9f-10w*	General Inorganic Chemistry.....				
	(10 cred.; prereq., 1 yr. h. s. chem.)				
	Lect.	VII	MWF	225C	Assoc. Prof.
	Lab.	VIII, IX	MWF	110C	Reyerson

For additional courses see the bulletin of the School of Chemistry.)

MATHEMATICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
3f*	Higher Algebra, Short Course.....	III	MTWF	133Ph	Ar
	(4 cred.; all; prereq., 1 yr. elem. alg.)				
3w*	Higher Algebra, Short Course.....				
	(Same as 3f)				
	Sec. 1	II	MWThF	210P	Ar
	2	IV	MTWF	105F	Ar
4f*	Trigonometry, Short Course.....	II	MWThF	206OLA	Ar
	(4 cred.; all; prereq., 3 or 5, or prep. higher alg.)				
4w*	Trigonometry, Short Course.....	III	MTWF	133Ph	Ar
	(Same as 4f)				
4s*	Trigonometry, Short Course.....				
	(Same as 4f)				
	Sec. 1	II	MWThF	166Ph	Ar
	2	IV	MTWF	104F	Ar
5f*	Higher Algebra				
	(5 cred.; all; prereq., 1 yr. elem. alg.)				
	Sec. 1	II	MWThFS	133Ph	Ar
	2	VI	MTWThF	133Ph	Ar
5w*	Higher Algebra	VI	MTWThF	166Ph	Ar
	(Same as 5f)				
5s*	Higher Algebra	I	MWThFS	133Ph	Ar
	(Same as 5f)				

* Offered on the Minneapolis campus.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
6f*	Trigonometry (5 cred.; all; prereq., 3 or 5 or prep. higher alg.)	II	MWThFS	104F	Ar
6w*	Trigonometry (Same as 6f)	VI	MTWThF	105F	Ar
6s*	Trigonometry (Same as 6f)	IV	MTWFS	105F	Ar
7f*	College Algebra (5 cred.; all; prereq., 6)	I	MWThFS	104F	Ar
7w*	College Algebra (Same as 7f)	II	MWThFS	104F	Ar
7s*	College Algebra (Same as 7f)	VI	MTWThF	104F	Ar
8f*	Commerce Algebra (5 cred.; pre-bus. stud.; prereq., 5 or prep. high. alg.)	I	MWThFS	OPhAud	Ar
8w*	Commerce Algebra (Same as 8f)	II	MWThFS	OPhAud	Ar
8s*	Commerce Algebra (Same as 8f)	VI	MTWThF	105F	Ar

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	First Year Basic Course..... (No cred.; must be legally eligible for enrollment in R.O.T.C.)	V, VI	MWF	A	Ar
3s*	First Year Basic Course..... (No cred.; fr.; prereq., 1-2)	VII, VIII, IX	T or W	A	Ar
4f-5w*	Second Year Basic Course..... (No cred.; soph.; prereq., 1-2-3)	V, VI	MWF	A	Ar
6s*	Second Year Basic Course..... (No cred.; soph.; prereq., 4-5)	VII, VIII, IX	T or W	A	Ar
51f-52w*	First Year Advanced Course..... (6 cred.; jr.; prereq., Second Year Basic Course)	II III VI	MWF MWF MWF	A A A	Ar Ar Ar
	(Additional 2-hour period to be arranged for each section)	VIII	MWF	A	Ar
53s*	First Year Advanced Course..... (3 cred.; jr.; prereq., 51-52)	VII, VIII, IX	T or W	A	Ar
	(Additional 2-hour period to be arranged)				
54f-55w*	Second Year Advanced Course..... (6 cred.; sr.; prereq., 51-52-53)	II III VI	MWF MWF MWF	A A A	Ar Ar Ar
	(Additional 2-hour period to be arranged for each section)	VIII	MWF	A	Ar
56s*	Second Year Advanced Course..... (3 cred.; sr.; prereq., 54-55)	VII, VIII, IX	T or W	A	Ar
	(Additional 2-hour period to be arranged)				

* Offered on the Minneapolis campus.

PHYSICAL EDUCATION FOR MEN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*	Freshman Physical Education..... (Cred.†; fr.; no prereq.) (Sections limited to 60 each)				
	Sec. 1	II	MW	202S	
	2	II	TTh	202S	
	3	III	MW	202S	
	4	III	TTh	202S	
	5	IV	MW	202S	
	6	VI	MW	202S	
	7	VI	TTh	202S	
	8	VII	MW	202S	
	9	VII	TTh	202S	
	10 (boxing)	VIII	TTh	202S	
4f*	Freshman Hygiene..... (Cred.†; A-H inclusive; no prereq.)				
	Sec. 1	II	T	301F	Assoc. Prof. Cooke
	2	III	W	301F	
	3	IV	T	301F	
4w*	Freshman Hygiene..... (Same as 4f; I-R inclusive)				
	Sec. 1	II	T	301F	Assoc. Prof. Cooke
	2	III	W	301F	
	3	IV	S	301F	
	4	IV	T	301F	
4s*	Freshman Hygiene..... (Same as 4f; S-Z inclusive)				
	Sec. 1	II	T	301F	
	2	IV	T	301F	
	3	III	W	301F	
7f-8w-9s*	Advanced Leaders..... (3 cred.; soph., jr., sr.; prereq., 1-2-3)				
	Lect.	IV	T	206A	Assoc. Prof. Keller
	Lab.	Ar	Ar		
10f-11w-12s*	Minor Sports..... (6 cred.; soph., jr., sr.; prereq., 1-2-3)				
	Lect.	IV	S	206A	
	Lab.	IV	MWF		
16f-17w-18s*	Drill Substitution..... (No cred.; by petition only; no prereq.)				
	Sec. 1	II	MWF	S	
	2	III	MWF		
	3	IV	MWF		
30s*	Athletic Training and First Aid..... (2 cred.; jr., sr.; no prereq.)	I	MWF	A	Assoc. Prof. Cooke

For additional courses see the bulletin of the College of Education.

* Offered on the Minneapolis campus.

† Courses 1-2-3 and 4 carry a total of 3 credits. Both courses must be completed before credit is given.

PHYSICAL EDUCATION FOR WOMEN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*†	Elementary Physical Training..... (No cred.; required of all new students)				
	Sec. 1	III	MWF	3,151,153WGm	Ar
	2	IV	MWF	3,151,153WGm	Ar
	3	VI	MWF	3,151,153WGm	Ar
	4	VIII	MWF	3,151,153WGm	Ar
	5	III	TThS	3,151,153WGm	Ar
	6	V	MWF	3,151,153WGm	Ar
4w*	Preliminary Hygiene (No cred.; required of all new students)				
	Sec. 1	I	T	OPhAud	Prof. Norris
	2	II	T	206OLa	
	3	III	W	206OLa	
	4	IV	M	OLaAud	
	5	VI	T	OLaAud	
	6	III	Th	206OLa	
7f-8w*	Sophomore Danish Gymnastics..... (No cred.; soph.; prereq., 1-2-3)	IV	TS	153WGm	
9s*	Sophomore Archery (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	II	MW	151WGm	
	2	IV	TS		
10f-11w*†	Sophomore Orthopedic and Individual Gymnastics (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	IV	TS	3WGm	Asst. Prof. Tolg
	2	VI	TTh	3WGm	Miss Denny
	3	II	MW	3WGm	Miss Denny
12s*	Sophomore Orthopedic and Individual Gymnastics (Same as 10-11)	IV	TS	3WGm	Asst. Prof. Tolg
13f-14w-15s*	Sophomore Interpretive Dancing..... (No cred.; soph.; prereq., 1-2-3)	VI	TTh	151WGm	Miss Timberman
13f,w-14s*	Sophomore Interpretive Dancing..... (Same as 13f-14w-15s)	II	MW	151WGm	Miss Timberman
16f-17w*	Sophomore Games and Folk Dancing.. (No cred.; soph.; prereq., 1-2-3)	I	WF	151WGm	Miss Warnock
18s*	Tennis (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
	2	I	TTh	151WGm	
	3	IV	TS	151WGm	
	4	VIII	TTh	151WGm	
	5	VI	TTh	151WGm	
19f*	Sophomore Hockey (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
	2	V	MW	151WGm	
	3	VIII	TTh	151WGm	

* Offered on the Minneapolis campus.

† Students may enter course in any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
20w*	Sophomore Basket-Ball				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
	2	V	MW	151WGm	
	3	VII (3:00)	TTh	151WGm	
	4	VIII	TTh	151WGm	
21s*	Sophomore Baseball				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
	2	V	MW	151WGm	
22f,s-23w*†	Sophomore Elementary Swimming....				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	III	MW	51WGm	
	2	IV	MW	51WGm	
	3	II	TTh	51WGm	
	4	IV	TS	51WGm	
	5	VII	TTh	51WGm	
	6	VIII (3:30)	TTh	51WGm	
	7	VIII (4:00)	TTh	51WGm	
22f,w,s*	Sophomore Elementary Swimming....	VII	MW	51WGm	
	(Same as 22-23)				
24f,s*†	Sophomore Horseback Riding.....				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VIII	TTh		
	2	IX	TTh		
25f,s-26w*‡	Sophomore Intermediate Swimming....				
	(No cred.; soph., prereq., 1-2-3, elementary swimming test)				
	Sec. 1	VIII (4:00)	MW	51WGm	
	2	III	TTh	51WGm	
	3	II	WF	51WGm	
27f*§	Sophomore Golf (advanced).....	VI	TTh		
	(No cred.; soph.; prereq., 1-2-3)				
27s*§	Sophomore Golf (elementary).....				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	I	TTh		
	2	II	TTh		
28f,s-29w*†	Sophomore Advanced Swimming....	VIII	MW	51WGm	Miss Starr
	(No cred.; soph., prereq., 1-2-3, intermediate swimming test)				
30s*	Sophomore Life Saving and Water Sports	IX	MW	51WGm	Miss Starr
	(No cred.; soph., jr., sr.; prereq., 1-2-3, adv. swimming test)				
31w*	Sophomore Skating				
	Sec. 1	VII	WF		Ar
	2	II	TTh		

For additional courses see the bulletin of the College of Education.

* Offered on the Minneapolis campus.

† Students in this course will pay for lessons at about \$1 per lesson but will not be charged the regular physical education fee.

‡ No student may register for more than two quarters of swimming without permission.

§ Students must supply their own golf equipment.

Phy Ed. 322. Recreational Activities, w. methods of Teaching open to soph. jr., sr.
No prereq. VI T. H. 1er. 203 H. E.
Miss Dickinson

PHYSIOLOGY

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
4f,w,s*	Human Physiology (4 cred.; prereq., 1 qtr. zool., 1 qtr. chem.)	III, IV	MWF	301MH	Prof. Lyon, Assoc. Prof. Greisheimer, Dr. King, and others
57f*	Physiologic Chemistry (4 cred.; jr., sr.; prereq., Zool. 5-6-7; Inorg. Chem. 1-2-3 or 9-10)	I	TThS	310MH	
	Lab. Div. A	II, III, IV	T		
	Lab. Div. B	VI, VII, VIII	W		
58w-59s*	Human Physiology (8 cred.; jr., sr.; prereq., same as 57)	I	TThS	310MH	Prof. Lyon, Dr. King, Dr. Loucks, and others
	Lab. Div. A	II, III, IV	T		
	Lab. Div. B	VI, VII, VIII	W		
100w-101s*	Physiologic Chemistry (10 cred.; jr., sr.; prereq., org. chem., phys.) (Div. A and B primarily for medical students) (Limited to 160, permission of Prof. McClendon required)	IV	MWF	310MH	Prof. McClendon, Dr. Pascoe, and others
	Lab. Div. A	I, II, III	TTh		
	Lab. Div. B	I, II, III	FS		
	Lab. Div. C	VI, VII, VIII	TTh		

For additional courses see the bulletin of the Medical School.

PLANT PATHOLOGY AND BOTANY

No.	Title	Hour	Day	Bldg.	Instructor
1f	Plant Pathology (5 cred.; jr., sr.; prereq., Bot. 9 cred.)	VII, VIII, IX	MWF	106,107PP	Prof. Stakman, Mr. Roden- hiser
7w-8s	Weeds and Grasses..... (6 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	III IV	TThS TS	100PP 100PP	Asst. Prof. Larson
9f	Weeds and Seed Testing..... (3 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	III IV	TThS TS	100PP 100FP	Asst. Prof. Larson
10f	Forest Pathology (5 cred.; soph., jr., sr.; prereq., Bot 9 cred.)	VII, VIII, IX	MWF	106,107PP	Prof. Stakman, Mr. Verrall
10s	Forest Pathology (Same as 10f)	I I, II	MWF TThS	107PP 106,107PP	Mr. Verrall
12w	Seed Problems (3 cred.; jr., sr.; prereq., 9)	Ar	Ar	Ar	Asst. Prof. Larson

* Offered on the Minneapolis campus.

Memo: - Old course in Diseases of Field Crops divided into P.P. 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
105f-106w-107s	Mycology (9 cred.; jr., sr.; prereq., 1, 10, or equiv.)	Ar	Ar	Ar	Prof. Freeman, Miss Dosdall
110W	Principles of Pathology..... (4 cred.; jr., sr.; prereq., 1 or 10, Bact. 41)	III, IV	MWF	106,107PP	Prof. Stakman, Mr. Rodenhiser
111W	Diseases of Cereal Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	106,107PP	Asst. Prof. Christensen
112	Diseases of Field Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	Not offered in	1029-30		
113S	Diseases of Vegetable Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	106,107PP	Assoc. Prof. Leach
114W	Advanced Forest Pathology..... (3 cred.; jr., sr.; prereq., 1 or 10)	Ar	Ar	Ar	Prof. Stakman, Mr. Verrall
116f	Pathologic Histology (3 cred.; jr., sr.; prereq., 1 or 10)	III, IV	MWF	106,107PP	Assoc. Prof. Leach
117S	Diseases of Forage and Fiber Crops.. (3 cred.; jr., sr.; prereq., 1 or 10)	III, IV	MWF	106,107PP	Asst. Prof. Christensen, Mr. Rodenhiser
118f	Bacterial Diseases (3 cred.; jr., sr.; prereq., 1 or 10, Bact. 41)	Ar	Ar	Ar	Assoc. Prof. Leach

POULTRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
1f.w	Poultry (3 cred.; no prereq.)	VI	MWF	102Ve	Prof. Smith
2w, S	Poultry Judging (3 cred.; prereq., 1)	VI, VII, VIII	TTh	102Ve	Prof. Smith, Mr. Hoberg
4S	Incubating and Brooding..... (3 cred.; no prereq.)	VI	MWF	102Ve	Prof. Smith, Mr. Hoberg
5S	Advanced Poultry Judging..... (3 cred.; prereq., 2)	VI, VII, VIII	TTh	102Ve	Prof. Smith
6S	Poultry Problems (1 cred.; jr., sr.; prereq., 1)	Ar	Ar	Ar	Prof. Smith

and 101w. Adv Poultry Breeding (Genetics) 131

PREVENTIVE MEDICINE AND PUBLIC HEALTH

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
3f,w,s*	Personal Hygiene and Elementary Sanitation (2 cred.; fr.; no prereq.)	IV	TS	101bMH	Asst. Profs. Boynton, Lees, and others

* Offered on the Minneapolis campus.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
52f,s	Health Care of the Family..... (3 cred.; prereq., Bact. 41, Physiol. 4) (Laboratory sections limited to 20) Lect.	VIII	Th	313HE	Asst. Prof. Boynton
	Sec. 1 Lab.	VI, VII	TTh	WH	Miss Fisher
	2	VI, VII	MF	WH	
	3 (s only)	III, IV	TS	WH	
57w*	Health of Infant and Pre-school Child (2 cred.; jr., sr.; prereq., Zool. 1-2, Psy. 1-2; or 50, 52 or 53)	III	TTh	101bMH	
80w*	Child Health and Educational Hygiene (3 cred.; jr., sr.; prereq., 50, 52 or 53)	II	MWF	101bMH	Assoc. Prof. Diehl

For additional courses see the bulletin of the Medical School.

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Psychology (6 cred.; †; soph., jr., sr.; no prereq.) Sec. 1	I	MWF	OLAud	Prof. Elliott
	2	III	MWF	Psy	
1w-2s*	General Psychology (Same as 1f-2w) (Limited to 40)	IX	MWF	Psy	

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

PUBLICATIONS AND RURAL JOURNALISM

No.	Title	Hour	Day	Bldg.	Instructor
10f-11w-12s	Agricultural Journalism (9 cred.; jr., sr.; prereq., Journ. 13- 14-15, 51-52)	VI	MWF	301Ad	Prof. Kirkwood
19w	Publicity (3 cred.; soph., jr., sr.; prereq., Journ. 13-14-15)	I	TThS	105En	Prof. Kirkwood

For additional courses see under the Department of Journalism in the bulletin of the College of Science, Literature, and the Arts.

RHETORIC

No.	Title	Hour	Day	Bldg.	Instructor
1f	Rhetoric I (3 cred.; no prereq.) (Limited to 35) Sec. 1	I	MWF	308En	Mr. Furlow
	2	II	MWF	310En	Miss Hessler
	3	III	MWF	310En	Miss Hessler
	4	IV	MWF	310En	Miss Hessler
	5	III	TThS	308En	Mr. Furlow
1w	Rhetoric I (Same as 1f) (Limited to 35)	II	TThS	310En	Miss Hessler

* Offered on the Minneapolis campus.

† The full course must be completed before credit will be given.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
1s	Rhetoric I (Same as 1f)	III	TThS	307En	Asst. Prof. Lansing
2f	Rhetoric II (3 cred.; prereq., 1) (Limited to 35)	II	MWF	308En	Mr. Furlow
2w	Rhetoric II (Same as 2f) (Limited to 35 each)				
	Sec. 1	II	MWF	310En	Miss Hessler
	2	III	TThS	308En	Mr. Furlow
	3	II	TThS	307En	Asst. Prof. Lansing
	4	III	MWF	310En	Miss Hessler
	5	I	MWF	308En	Mr. Furlow
2s	Rhetoric II (Same as 2f) (Limited to 35)	II	TThS MWF	308En	Mr. Furlow
3f	Rhetoric III (3 cred.; prereq., 2) (Limited to 35)	IV	MWF	308En	Mr. Furlow
3w	Rhetoric III (Same as 3f) (Limited to 35)	I	TThS	310En	Miss Hessler
3s	Rhetoric III (Same as 3f) (Limited to 35 each)				
	Sec. 1	II	MWF	310En	Miss Hessler
	2	IV	MWF	310En	Miss Hessler
	3	I	MWF	308En	Mr. Furlow
	4	I	TThS	310En	Miss Hessler
	5	II	TThS	310En	Mr. Furlow
	6	III	TThS	310En	Miss Hessler
11f	Argumentation (3 cred.; soph., jr., sr.; prereq., 3, 22 recommended) (Limited to 30)	I	MWF MWF	307En	Asst. Prof. Lansing
11w	Argumentation (Same as 11f) (Limited to 30)	III	MWF	307En	Asst. Prof. Lansing
11s	Argumentation (Same as 11f) (Limited to 30)	II	MWF	307En	Asst. Prof. Lansing
22f,s	Public Speaking (3 cred.; soph., jr., sr.; prereq., 3) (Limited to 20)	III	MWF	311En	Mr. Routledge
22w	Public Speaking (Same as 22f,s) (Limited to 20)				
	Sec. 1	I	MWF	311En	Mr. Routledge
	2	II	MWF	311En	
23f,w,s	Public Speaking (5 cred.; soph., jr., sr.; prereq., 3) (Limited to 30)	IV	MTWFS	311En	Mr. Routledge
24s	Advanced Public Speaking (3 cred.; soph., jr., sr.; prereq., 22)	II	MWF	311En	Mr. Routledge

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
26f	Parliamentary Law (1 cred.; all; no prereq.)	I	TTh	311En	Mr. Routledge
28f	Play Production (3 cred.; soph., jr., sr.; prereq., 3)	II	TThS	AudAd	Mr. Routledge
29s	Advanced Play Production..... (3 cred.; jr., sr.; prereq., 28)	III	TThS	311En	Mr. Routledge
31f	Survey of English Literature I..... (5 cred.; soph., jr., sr.; prereq., 3) (Limited to 40)	III	MTWFS	307En	Asst. Prof. Lansing
31w	Survey of English Literature I..... (Same as 31f) (Limited to 40)	II	MTWFS	308En	Mr. Furlow
31s	Survey of English Literature I..... (Same as 31f) (Limited to 40)	III	MTWFS	308En	Mr. Furlow
32f	Survey of English Literature II..... (3 cred.; soph., jr., sr.; prereq., 3) (Limited to 35)	III	TThS	310En	Miss Hessler
33w,s.	Modern Literature (3 cred.; soph., jr., sr.; prereq., 3)	IV	MWF	307En	Asst. Prof. Lansing
34f	Books and Reading..... (1 cred.; soph., jr., sr.; no prereq.)	IV	T	310En	Miss Hessler

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s	Introduction to Sociology..... (3 cred.; 3d qtr. fr., soph., jr., sr.; no prereq.)	IV	MWF	204Da	Asst. Prof. Lundquist
14f,w	Rural Sociology (3 cred.; soph., jr., sr.; prereq., 1 or sr. class)	I	MWF	204Da	Asst. Prof. Lundquist
14s	Rural Sociology (Same as 14f,w)	II	TThS	204Da	Asst. Prof. Lundquist
114s	Rural Social Institutions..... (3 cred.; jr., sr.; prereq., 4 courses in soc. or 1 and 15 cred. in soc. sci., educ., philos., or psychol.)	III I	MWF	204Da	Asst. Prof. Lundquist

For additional courses and additional sections of the above courses offered on the Minneapolis campus, see the bulletin of the College of Science, Literature, and the Arts.

SOILS

No.	Title	Hour	Day	Bldg.	Instructor
4f	Soils (3 cred.; soph., jr., sr.; no prereq.)				
	Lect.	III	TTh	204So	Assoc. Prof.
	Lab.	III, IV	S	201So	Rost
5s	Soil Fertility (3 cred.; soph., jr., sr.; no prereq.)				
	Lect.	II	TTh	204So	Prof. Alway.
	Lab.	I, II	S	201So	Assoc. Prof. Rost

No.	Title	Hour	Day	Bldg.	Instructor
8w	Physical Properties of Soils..... (3 cred.; soph., jr., sr.; prereq., 4)	Ar	Ar	Ar	Asst. Prof. McMiller
101f	Chemical Analysis of Soils..... (3 to 5 cred.; jr., sr.; prereq., 5, Quant. Anal.)	Ar	Ar	Ar	Assoc. Prof. Rost
102w,s	Special Problems in Soils..... (Cred. assigned according to amount of work; jr., sr.; prereq., 101 or 108)	Ar	Ar	Ar	Prof. Alway, Assoc. Prof. Rost
104	Soil Surveying	Not offered in 1929-30			
<i>Jan</i> 107w	Fertilizers and Manures..... (2 cred.; jr., sr.; prereq., 4, 9)	IV	TS	Ar	Assoc. Prof. Rost
108w	Physical Properties of Soils..... (3 cred.; jr., sr.; prereq., 4)	Ar	Ar	Ar	Asst. Prof. McMiller

VETERINARY MEDICINE

No.	Title	Hour	Day	Bldg.	Instructor
2f-3w-4s	Comparative Anatomy and Physiology of Domestic Animals..... (9 cred.†; soph., jr., sr.; no prereq.)	VI (f)	MWF	103Ve	Asst. Prof. Hewitt, Assoc. Prof. Kernkamp
6f	Physiology of Reproduction..... (4 cred.; jr., sr.; prereq., 2-3-4)	IV	MTWF	103Ve	Prof. Boyd
9w-10s	Veterinary Studies	III	TThS	102Ve	Prof. Fitch
12w	Infectious Diseases..... (3 cred.; jr., sr.; prereq., 2-3-4, Bact. 4†)	I	MWF	103Ve	Prof. Fitch
101w-102s	Advanced Anatomy of Domestic Ani- mals	Ar	Ar	Ar	Assoc. Prof. Kernkamp
103w-104s	Advanced Comparative Physiology... (6 cred.§; jr., sr.; prereq., 3-4 or equiv.)	Ar	Ar	Ar	

ZOOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
14f-15w-16s*	General Zoology (Agr., For.)..... (9 cred.§; no prereq.)	VI, VII, VIII	TTh	101,313AB	Mr. Daw- son
17f-18w*	General Zoology (H.E.)..... (6 cred.§; on prereq.)	VII, VIII, IX	TTh	150Ph,101AB	Prof. Wein- stein

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

* Offered on the Minneapolis campus.

† The full course must be completed before credit will be given. The course may be started at the opening of any quarter.

‡ Full credit will not be allowed for this course when other courses in this division are completed.

Students pursuing other courses in Veterinary Medicine should apply to the division for adjustment of credit.

§ The full course must be completed before credit will be given.

*Memo: Work of Zool 5. off. similar to that of
Zool 14. to permit transfer from series 5-6-7
to 14-15-16- (Sand in Zool 5 removed by "C" wk.
in Zool 5)*