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

## *General Information for the Year 1930-1931*

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

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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.

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# 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 24 to 27, 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 class 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 24 TO 27, INCLUSIVE, IS A REQUIREMENT.**

*It is recommended that as many as possible present themselves for registration on Monday, September 22, 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 22.*

## NOTICE TO PROSPECTIVE STUDENTS

——oOo——

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

## 1930-31

### *Fall Quarter*

| 1930 | | | |
|---|---|---|---|
| September | 15 | Monday | Extension registration first semester begins |
| September | 18 | Thursday | Payment of fees closes, except for new students |
| September | 22 | Monday | Entrance tests |
| September | 22-23 | | Registration of all new students entering the freshman class |
| September | 22-26 | | Examinations for removal of conditions<br>Physical examinations<br>Comprehensive examinations, Medical School |
| September | 23-26 | | Registration period,[1]* College of Science, Literature, and the Arts, and Education |
| September | 24-27 | | Freshman Week |
| September | 25-26 | | Registration days[1] for all colleges not included above except the College of Engineering and Architecture, and the School of Chemistry |
| September | 26 | Friday | Registration day[1] for the College of Engineering and Architecture, and the School of Chemistry<br>Payment of fees for new students closes |
| September | 27 | Saturday | Extension registration without penalty closes |
| September | 29 | Monday | Fall quarter classes begin, 8:30 a.m.[2]<br>First semester extension classes begin[3] |
| October | 16 | Thursday | Senate meeting, 4:30 p.m. |
| November | 1 | Saturday | Homecoming Day |
| November | 4 | Tuesday | General Election Day; a holiday (except for extension) |
| November | 5 | Wednesday | Mid-quarter grades due |
| November | 11 | Tuesday | Armistice Day; a holiday (except for extension) |
| November | 27 | Thursday | Thanksgiving Day; a holiday |
| December | 4 | Thursday | State Day Convocation |
| December | 15-18 | | Final examination period |
| December | 18 | Thursday | Commencement Convocation<br>Senate meeting, 4:30 p.m.<br>Fall quarter ends, 5:20 p.m. |
| December | 26 | Friday | Payment of fees closes for all students in residence fall quarter[4] |

* See footnotes on page 11.

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*Winter Quarter*

| | | | |
|---|---|---|---|
| January | 2 | Friday | Entrance tests |
| January | 2-3 | | Registration days for new students in all colleges except the College of Engineering and Architecture, and the School of Chemistry |
| | | | Registration closes at 12 m. Saturday |
| January | 3 | Saturday | Registration day for all students in the College of Engineering and Architecture, and the School of Chemistry |
| | | | Payment of fees for new students closes at 12 m. |
| January | 5 | Monday | Winter quarter classes begin 8:30 a.m.[2] |
| January | 19 | Monday | Extension registration second semester begins |
| January | 31 | Saturday | First semester extension classes close |
| | | | Extension registration without penalty closes |
| February | 2 | Monday | Second semester extension classes begin |
| February | 10 | Tuesday | Mid-quarter grades due |
| February | 12 | Thursday | Lincoln's Birthday; a holiday (except for extension) |
| February | 19 | Thursday | Charter Day Convocation |
| | | | Senate meeting, 4:30 p.m. |
| February | 23 | Monday | (Sunday February 22 Washington's Birthday) a holiday (except for extension) |
| March | 18-21 | | Final examination period |
| March | 19 | Thursday | Commencement Convocation |
| | | | Payment of fees closes for all students[4] in residence winter quarter |
| March | 21 | Saturday | Winter quarter ends, 5:20 p.m. |

No spring recess for members of the junior and senior classes in Medicine.

*Spring Quarter*

| | | | |
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| March | 27 | Friday | Entrance tests |
| March | 27-28 | | Registration days for new students in all colleges except the College of Engineering and Architecture, and the School of Chemistry |
| | | | Registration closes at 12 m. Saturday |
| March | 28 | Saturday | Registration day for all students in the College of Engineering and Architecture, and the School of Chemistry |
| | | | Payment of fees for new students closes at 12 m. |

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| March | 30 | Monday | Spring quarter classes begin, 8:30 a.m.[2] |
| April | 3 | Friday | Good Friday; a holiday (except for extension) |
| May | 6 | Wednesday | Mid-quarter grades due |
| May | 14 | Thursday | Cap and Gown Day Convocation<br>Senate meeting, 4:30 p.m. |
| May | 29 | Friday | Second semester extension classes close |
| May | 30 | Saturday | Memorial Day; a holiday |
| June | 7 | Sunday | Baccalaureate service |
| June | 8 | Monday | Fifty-ninth annual commencement |
| June | 10-13 | | Final examination period |
| June | 13 | Saturday | Spring quarter closes, 5:20 p.m. |

*Summer Quarter*

| | | | |
|---|---|---|---|
| June | 15-16 | | Registration, first term |
| June | 17 | Wednesday | Classes begin, 8:00 a.m. |
| July | 4 | Saturday | Independence Day; a holiday |
| July | 25 | Saturday | Registration and payment of fees for second term closes at 12 m. First term closes |
| July | 27 | Monday | Second term classes begin |
| August | 29 | 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 28.

[1] Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page ——. 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 a.m. 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.

# 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

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| The Hon. Fred B. Snyder, Minneapolis, President of the Board - | 1935 |
| The Hon. W. J. Mayo, Rochester - - - - - - - - | 1935 |
| The Hon. Bess M. Wilson, Minneapolis - - - - - - - | 1933 |
| The Hon. George H. Partridge, Minneapolis - - - - - - | 1931 |
| The Hon. John G. Williams, Duluth - - - - - - - | 1935 |
| The Hon. Egil Boeckmann, St. Paul - - - - - - - | 1933 |
| The Hon. Julius A. Coller, Shakopee - - - - - - - | 1931 |
| The Hon. J. E. G. Sundberg, Kennedy - - - - - - - | 1931 |
| The Hon. Samuel E. Lewison, Canby - - - - - - - | 1933 |
| The Hon. L. O. Teigen, Jackson, - - - - - - - - | 1935 |
| The Hon. W. H. Gemmell, Brainerd - - - - - - - | 1933 |
| The Hon. A. J. Olson, Renville - - - - - - - - | 1931 |

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Rodney M. West, B.A., Registrar
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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
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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 Architecture.*—A four-year course leading to the degree of bachelor of interior architecture. 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 Architecture |

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 Architecture* 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, grazing, 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 teacher's 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 in February and March; an Ice Cream Makers' Course of ten days in December; a Creamery Operators' Course of one week in June; a Horticultural Short Course of three days in March; a Beekeepers'

Course of four days in December; an Editors' Short Course of three days in May; a Short Course in Veterinary Medicine in July; and a Short Course in Home Nursing in the spring.

*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 Schools 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. For requirements after 1930-31 see Law School bulletin. 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 interneship 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 33-36), (b) four years in the Medical School, and (c) one year of interneship 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 above, and (b) four years in the Medical School, and (c) one year of interneship 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 interneship.

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 courses and research facilities are offered to qualified students. (See page 21.)

*The School of Nursing* is conducted as part of 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 a diploma 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 degree of bachelor of science and a diploma 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.

A four-year college course in nursing leading to the degree of bachelor of science in nursing is contemplated. It is impossible at the date of publication of this bulletin to state when it will be inaugurated. Persons interested should consult the director of 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 opportunities for field work. (See special circular.) The Public Health Nursing Course is open to graduate nurses.

*A Course for Medical Technicians* is offered by the Medical School with the co-operation of the College of Science, Literature, and the Arts. (See special circular.)

*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' term of study, given annually in the winter and spring quarters. On the successful completion of the work, the university certificate in embalming will be issued. Those students who desire to procure a Minnesota embalmer's license must take the State Board examination which is held annually. The university certificate in embalming is issued to successful candidates without reference to the legal requirements for the issuance of an embalmer's license by the state of Minnesota.

*Short courses for physicians* are offered throughout the year by the medical faculty under the administration of the General Extension Division.

## COLLEGE OF DENTISTRY

The College of Dentistry offers a three-year course leading to the degree of doctor of dental surgery. The minimum requirement for admission is the completion of two years of pre-dental work in the College of Science, Literature, and the Arts at Minnesota or at some other university or college of equal rank.

*The School for Dental Hygienists.*—The College of Dentistry offers a two-year course leading to the degree of graduate dental hygienist. The minimum requirement for admission is the completion of a four-year high school course or its equivalent.

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 regular course of the College of Pharmacy leads to the degree of bachelor of science in pharmacy and extends over four university years and includes one year of prescribed academic work of a minimum of 45 quarter credits. The 1929 Legislature passed an act reading partly as follows: "To be entitled to examination by the Board (of Pharmacy) the applicant shall be at least 21 years old and shall be a graduate of a college approved by, or a member of, the American Association of Colleges of

Pharmacy." This act went into effect upon passage. The same legislative session passed a bill providing that: "After January 1, 1930, there shall be no examinations for registration or registration of any person as an 'assistant pharmacist'."

All of the colleges of pharmacy comprising the membership of the American Association of Colleges of Pharmacy will have gone upon a minimum four-year basis on January 1, 1932. The College of Pharmacy of the University of Minnesota is already on the four-year basis (Board of Regents' action April 1, 1926). The legislature has therefore established the graduating course in the College of Pharmacy as the minimum educational requirement preliminary to the state examination for license to practice pharmacy in Minnesota.

## SCHOOL OF CHEMISTRY

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

## COLLEGE OF EDUCATION

The College of Education is organized to offer professional courses in the field of education, to promote research in the problems of education, and to provide educational guidance for prospective teachers and other educational workers in the schools. The completion of satisfactory curricula in this college entitles graduates to receive certificates for school work from the Minnesota State Department of Education. Such certificates are issued only to those graduating from this college.

Among the important curricula, offered by the college are those relating to teaching in the following fields: academic subjects in elementary and high schools, agriculture, art, business subjects, home economics, industrial arts, natural science, physical education, and public school music.

Work is also offered in the fields of educational administration and supervision, clinical psychology, educational psychology, library service, school health work, sociology, teaching of subnormal children, work of the visiting teacher, educational and vocational guidance, nursery school and kindergarten education, nursing education, and public health education.

## 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 interneship. A number of fellowships and scholarships are provided for selected students undertaking graduate coures in chosen specialties in medicine (see page 55). 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, College of Engineering and Architecture, or the College of Agriculture, Forestry, and Home Economics 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 at 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 classes in correspondence courses, in science, literature, and the arts, business, education, and engineering subjects; it 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 embalming, engineering, dentistry, merchandising, medicine, banking, citizenship, and social service; offers guidance for the development of community organizations; gives advice to schools and other organizations on the selection and production of plays; operates a radio broadcasting station for educational purposes. 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. *Payment or satisfactory arrangement of all financial obligations* due the University.

5. *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 600,000 volumes.

The University Library Building contains not only the general collection but several important college and departmental collections.

In addition to the General Library, branches are maintained in the Department of Agriculture, the College of 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. Its course is accepted by the Colleges of Science, Literature, and the Arts and of Education as the senior year requirement for graduation.

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 Students' Health Service upon the basis established for the care of such patients.

On the main campus the offices of the Health Service and the Students' Hospital and Dispensary are located in the new Health Service Building. On the University Farm campus the hospital and dispensary also are located in a special 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 8720); for the one on the University Farm campus, Nestor 2881.

The facilities of the dispensary, medical and dental, are such that a large 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 kept on file. 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 regard-

ing 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.

*School of Nursing.*—Special arrangements with the hospitals are made for students in the School of Nursing. See School of Nursing bulletin.

## MILITARY SCIENCE AND TACTICS

### REQUIRED WORK

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.

The University requires that every physically fit male student shall take two years of military training.

### EXCEPTIONS

1. *Physical unfitness.*—If you believe you should be exempted on this ground report to Dr. Cooke of the Student Health Department for examination and petition. If the petition is approved by him, present it at the office of the dean of student affairs.

2. If you have attended another college where drill is not required and have completed one or more full years of work, the registrar's office will

give you a release from one or two years. In case of any irregularity in such cases make a petition for release and present at office of dean of student affairs.

3. In case you have had previous military training in college, high school, military school, national guard, naval reserve, or United States army, present a petition to the office of the dean of student affairs, giving full statement of facts and credentials.

If for any good and sufficient reason you need to be allowed to postpone this training for any quarter, make the request on petition blanks, giving reasons, and present at office of dean of student affairs.

Do not under any consideration fail to register for or attend drill unless you have attended to the matter in the registrar's office or that of the dean of student affairs.

### 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 29). 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 Group B or 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 30-39.

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 comp'eted 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.

(c) Major or minor in Groups B or C or E.

Note that one unit in a minor may be counted from work below the tenth grade in accordance with the regulation on page 28.

II. Admission by Examination

In accordance with the regulation printed on page 28, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

*Adult special students.*—See statement on page 39.

### 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).

For admission to the School of Chemistry, that is, for the courses in chemistry and chemical engineering, *one unit of chemistry* must be included.

Students who do not present a major (3 units) in mathematics, including *higher algebra and solid geometry,* will be required to take these sub-

jects in their first quarter at the University without credit. This will usually necessitate their attending summer session to complete the work of the freshman year.

*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.

*Courses in Interior Architecture*

Students in Interior Architecture 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 28, 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 39.

*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 28), 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 four 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 28, 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[1]

### *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 30.) Such candidates may be admitted upon presenting their credentials to

[1] For requirements for students entering the Law School after 1930-31, see Law School bulletin.

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, and mathematics.

### *Special Students*

Applicants who are twenty-three years of age and have preliminary education sufficient at least 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 the successful completion of two years of academic collegiate work[1] which years are defined as including not less than ninety quarter (sixty semester) credits which must carry 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.

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

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

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

1. Rhetoric, nine quarter (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. Sufficient high school and college training to insure a reading knowledge of German medical literature. This 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. This examination is conducted by the German Department.

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 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 to the dean of the Medical School.

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

[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.

### *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 unclassed 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 28.

II. Admission by Examination

In accordance with the regulation printed on page 28, 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 the director, 111 Millard Hall, and their credentials 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 enrolment 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 28. 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 28, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

*Adult special students.*—See statement on page 39.

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 28, 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

I. 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).

II. Admission by Examination

In accordance with the regulation printed on page 28, 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 unclassed students pending the completion of twenty-seven additional credits.

Graduates of the advanced (two-year) normal course in Minnesota teachers colleges are given full credit for additional work taken since September, 1926, which the University of Minnesota considers the equivalent of its own courses. Graduates of two- or three-year courses in out of state teachers colleges receive additional credit for work taken beyond graduation in so far as the subjects taken are of senior college grade.

## 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 30; the College of Agriculture, page 31; the College of Engineering and Architecture, page 30.)

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

1. *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.

The following institutions in Minnesota are recognized as institutions of full collegiate grade:

Carleton College, Northfield
Concordia College, Moorhead
Gustavus Adolphus College, St. Peter
Hamline University, St. Paul
Macalester College, St. Paul
College of St. Catherine, St. Paul
St. Olaf College, Northfield
College of St. Teresa, Winona

The following are recognized for three years of college work. Under certain conditions their graduates may be admitted to the Graduate School:

Augsburg College, Minneapolis
College of St. Benedict, St. Joseph
St. Mary's College, Winona
College of St. Scholastica, Duluth

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 course at the University for credit: Psychology 1-2.

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
Duluth Junior College, Duluth
Ely Junior College
Eveleth Junior College
Hibbing Junior College
Itasca Junior College, Coleraine
Park Region Luther College
Red Wing Seminary
Rochester Junior College
St. John's University, Collegeville
St. Mary's Hall, Faribault (for one year's work)
St. Thomas College, St. Paul
St. Paul Luther College
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
Adams
Adrian
Aitkin
Akeley
Albert Lea
Alden
Alexandria
Amboy
Annandale
Anoka
Appleton
Argyle
Arlington
Atwater

Aurora
Austin
Bagley
Barnesville
Barnum
Baudette
Belle Plaine
Bemidji
Benson
Bird Island
Biwabik
Blackduck
Blooming Prairie
Bloomington
Blue Earth
Brainerd
Breckenridge
Browns Valley
Buffalo
Buhl
Caledonia
Cambridge
Campbell
Canby
Cannon Falls
Carlton
Cass Lake
Chaska
Chatfield
Chisholm
Clarkfield
Cleveland
Cloquet
Cokato
Coleraine
  Greenway
  Olcott
Comfrey
Cottonwood
Crookston
Crosby-Ironton
Cyrus
Dassel
Dawson
Deer River
Delano
Delavan
Detroit Lakes
Dodge Center
Duluth
  Central
  Denfeld
  Morgan Park
Eagle Bend
East Grand Forks
Elbow Lake
Elk River
Elmore
Ely
Eveleth
Excelsior
Fairfax
Fairmont
Faribault
Farmington
Fergus Falls
Fertile
Forest Lake
Fosston
Frazee
Fulda
Gaylord
Gilbert
Glencoe
Glenwood
Glyndon
Grand Meadow
Grand Rapids
Granite Falls
Hallock
Halstad
Hancock
Harmony
Hastings
Hawley
Hayfield
Hector
Henderson
Hendricks
Herman
Heron Lake
Hibbing
Hill City
Hinckley
Hopkins
Houston
Hutchinson
International Falls
Ivanhoe
Jackson
Janesville
Jordan
Kasota
Kasson
Keewatin
Kenyon
Kerkhoven
Lake Benton
Lake City
Lake Crystal
Lakefield
Lake Park
Lamberton
Lanesboro
Le Roy
Le Sueur
Le Sueur Center
Lewiston
Lindstrom-Center City
Litchfield
Little Falls
Long Prairie
Luverne
McIntosh
Mabel
Madelia
Madison
Mahnomen
Mankato
Mantorville
Maple Lake
Mapleton
Marshall
Medford
Melrose
Milaca
Milroy
Minneapolis
  Central
  Edison
  John Marshall

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

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
St. Adrian High School
Austin
St. Augustin High School
Caledonia
Catholic High School
Collegeville
St. John's College
Crookston
Mount St. Benedict's Academy
St. Joseph's Academy

Duluth
- Cathedral High School for Boys
- Cathedral High School for Girls
- Villa Sancta Scholastica

Faribault
- Bethlehem Academy
- St. Mary's Hall
- Shattuck Military Academy

Fergus Falls
- Park Region Luther College

Graceville
- St. Mary's Academy

Hutchinson
- Maplewood Academy

Lake City
- McCahill Institute

Little Falls
- St. Francis High School

Mankato
- Good Counsel Academy

Minneapolis
- Academy, Augsburg Seminary
- Blake School for Boys
- De La Salle High School
- Minnehaha Academy
- Minnesota College
- Northrop Collegiate Institute
- St. Anthony High School
- St. Margaret's Academy

New Ulm
- Catholic High School

Owatonna
- Pillsbury Academy

Phalen Park
- Academy of the St. Paul Luther College

Red Wing
- Academy of the Red Wing Seminary

Rochester
- St. John's High School

Rolling Stone
- Holy Trinity School

St. Cloud
- Cathedral High School

St. Joseph
- Convent of St. Benedict

St. Paul
- Bethel Academy
- Breck School
- College of St. Catherine (Derham Hall)
- Cretin High School
- Oak Hall
- St. Joseph Academy
- St. Paul Academy
- St. Paul Institute Evening School
- St. Thomas Military Academy
- Summit School
- Visitation Convent

St. Peter
- Academy, Gustavus Adolphus College

Sleepy Eye
- St. Mary's School

Wabasha
- St. Felix High School

Waseca
- Sacred Heart High School

Winona
- Cathedral High School
- Cotter High School

Graduates of Minnesota state high school departments which are on the recommended list of the State Department of Education are accepted on the same basis as the graduates of fully accredited preparatory schools.

# 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 46) for further instructions on late registration and late payment of fees.

### TUITION FEES

| School or College | Quarter Fee | | Credit Hour Fee* | |
|---|---|---|---|---|
| | Resident | Non-resident | Resident | 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.

*Non-resident fees.*—"All students under the age of twenty-one shall be considered to be domiciled where their parents or legal guardians are domiciled.

"All students who are and for six months prior to the date of registration have been domiciled in Minnesota shall pay resident fees, provided, however, that a student's domicile is not to be considered as alterable simply

by declaration of intention or by the fact of his presence in the state while attending an educational institution."—Board of Regents Minutes, May 9, 1928.

*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]

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, and Chemistry) 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.*

All students who are registered for five credits or more in any quarter shall be required to pay the regular incidental fee; while students who are registered for less than five credits in any quarter shall not be charged any incidental fee, nor be permitted to pay this fee in order to obtain the privileges to which the payment of this fee entitles students.

## 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.

[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.

## SPECIAL FEES

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

*Lesson fees—*

Two individual lessons per week, in one subject.....$65.00 per quarter
One individual lesson per week, in one subject..... 35.00 per quarter
Two individual lessons per week, in two subjects..... 70.00 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

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

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 |

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, 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 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 fireproof and 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 applications 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 chaperone, 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. It is understood that students engage rooms for the school year and shall not be released unless their places can be filled. 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.

School of Nursing Expenses

Expenses of the *Three-Year Nursing Course* are estimated as follows:

| | |
|---|---|
| Payable at the time of registration | |
| Tuition and deposit | $36.00 |
| Books | 15.00 |
| Payable at the end of first three months | |
| Uniform cape and cap | 22.50 |
| Payable during first year | |
| Books | 10.00 |
| Payable during junior year | |
| Books | 10.00 |
| Payable during senior year | |
| Books | 10.00 |
| Graduation fee | 10.00 |
| | $113.50 |

Room and board is furnished by the associated hospitals without charge to the student during the entire three years, including the preliminary quarter. Students who are below passing in the majority of their work at the end of the first six weeks may be asked to provide their own maintenance until the quarter's work is completed. Students who are advised to leave during the preliminary quarter are under no obligation to the school, but acceptable students who voluntarily leave the school before they have given any service to the hospitals are expected to reimburse the hospital for the cost of maintenance. Uniforms are furnished without charge, with the exception of the cape for outdoor wear. Students in the school of nursing receive no salary and have no opportunity for earning money while in training. After the first year they are eligible to apply for aid from the student loan funds. The above estimate does not include clothing, railroad fare, nor provision for the vacation periods.

Students in the *Five-Year Nursing Course* are registered in the academic college during the first five and last three quarters of the course and would have the same expenses in regard to maintenance, tuition, etc., as other students in that college. During the time they are in the School of Nursing their expenses would be similar to those of the three-year students.

*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. Rooms are assigned in these cottages for the year and students cannot be released until their places are filled.

The application fees are not refunded to students leaving university houses before the end of the college year. An additional charge of thirty dollars ($30) for the year must 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 Agric. For.,H.E. Educ. | Mines & Met. Business Adm. | Law | Eng. and Arch. Chem. | Dent. | Med. | Pharmacy |
|---|---|---|---|---|---|---|---|
| Incidental fee .... | $ 18.00 | $ 18.00 | $ 18.00 | $ 19.20 | $ 18.00 | $ 18.00 | $ 18.00 |
| *Deposit fee ..... | 5.00 | 5.00 | 5.00 | 5.00 | 10.00 | 10.00 | 10.00 |
| Gym.suit(approx.) | 8.00 | 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 | 36.00 |
| Room rent ..... | 90.00 | 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 | 260.00 |
| †Tuition ..... | 60.00 | 90.00 | 120.00 | 90.00 | 180.00 | 225.00 | 105.00 |
| Incidentals ..... | 200.00 | 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 | 35.00 |
| Total ..... | $712.00 | $742.00 | $782.00 | $743.20 | $962.00 | $887.00 | $762.00 |

* 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 | 1063.00 |

# 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.

### Department of Agriculture

#### 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.

#### SHEVLIN FELLOWSHIP IN AGRICULTURE

A fellowship of $500 open to graduate of any acceptable college or university.

### School of Chemistry

#### 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 Du PONT FELLOWSHIP IN CHEMISTRY

This fellowship, established by E. I. du Pont 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.

#### SHEVLIN FELLOWSHIP IN CHEMISTRY

A fellowship of $500 open to graduates of any acceptable college or university.

### College of Education

#### 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.

## Medical School

### MEDICAL SOCIAL WORK FUND

Gift from the Minnesota District of the American Association of Hospital Social Workers for a fund for the assistance of graduate students of medical social work to be known as the Medical Social Work Fund.

### SHEVLIN FELLOWSHIP IN MEDICINE

A fellowship of $500 open to graduates of any acceptable college or university.

## School of Nursing

### UNIVERSITY OF MINNESOTA NURSES' STUDENT GOVERNMENT ASSOCIATION SCHOLARSHIP

Gift of $100 annually from the Nurses' Student Government Association of the University of Minnesota for the establishment of the University of Minnesota Nurses' Student Government Association Scholarship. The recipient of this scholarship must be a graduate of the School of Nursing of the University of Minnesota. The scholarship is to be used for the purpose of higher education only, within two years after her graduation.

## College of Pharmacy

### 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 postgraduate course in pharmacy leading to the degree of master of science in pharmacy.

## College of Science, Literature, and the Arts

### THE CLASS OF 1889 MEMORIAL PRIZE IN HISTORY

A prize of $100 is offered biennially (odd years) for the best thesis in history written from the sources. It is open to graduate and undergraduate students. It will not be offered until 1931.

### 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.

### SHEVLIN FELLOWSHIP IN SCIENCE, LITERATURE, AND THE ARTS

A fellowship of $500 open to graduates of any acceptable college or university.

## General

### 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.

### THE CLARA UELAND FELLOWSHIP

The income from $11,191.67 is awarded annually to a recent woman graduate of any acceptable college or university for graduate study of problems of government and citizenship. Recipient is exempt from tuition fees.

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

### Department of Agriculture

#### 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.

#### 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."

### MARY L. BULL SCHOLARSHIP FUND

A gift of $500 from the Alpha Alumnae Chapter of Phi Upsilon Omicron for the establishment of the Mary L. Bull Scholarship fund. The income may be used for scholarships, or grants, for needy and worthy students enrolled in courses in Home Economics.

### 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 $50 each, one for men and one for women. Junior scholarships: two of $50 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 high schools of Minnesota and 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. The amount of the scholarship is $100. The number awarded depends upon funds available.

### 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 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.

## School of Business Administration

### 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.

## College of Dentistry

### ARTHUR V. ARONSON MEMORIAL SCHOLARSHIP

Gift of $50 annually from the Young Men's Jewish Club of St. Paul for the establishment of a scholarship for a Jewish student in Dentistry to be known as the Arthur V. Aronson Memorial Scholarship.

## College of Engineering and Architecture

### THE ALBERT MOORMAN MEMORIAL FELLOWSHIP IN ARCHITECTURE

A. Moorman and Company, of Minneapolis, contribute an annual fellowship for excellence in senior architectural design as determined by a competition and the award of a committee of judges. The fellowship 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.

## Law School

### LAW ALUMNI ASSOCIATION SCHOLARSHIP

Seventeen scholarships of $150 each are awarded to the students of the junior and senior classes who have made the most meritorious records in their work and qualify for the Board of the *Minnesota Law Review.*

### 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

### 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.

## College of Pharmacy

### 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.

### 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.

## College of Science, Literature, and the Arts

### THE AMERICAN LEGION AUXILIARY SCHOLARSHIP

The American Legion Auxiliary established a scholarship of $100 a year, the award to go to some woman student majoring in sociology with special service among the foreign born.

### DELTA SIGMA PSI SCHOLARSHIPS

One or more scholarships of $25 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.

### 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 MOSES MARSTON SCHOLARSHIP IN ENGLISH

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

### 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 Women'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.

### 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.

## GENERAL

### 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 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 thoroness 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.

### 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.

### 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.

### BETA IOTA ALPHA SCHOLARSHIP

Gift of $50 annually from the Beta Iota Sorority for the establishment of the Beta Iota Alpha Scholarship, open to women students of Jewish faith. Applicants must have completed two quarters work at time of award. The award will be given on the basis of scholarship, character, and need. Application should be made to the dean of women.

### 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.

### 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.

### 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 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 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 women of high scholarship and fine character. Application may be made to the dean of women before May 1.

### 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.

### 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.

### 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. 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.

## DEPARTMENT OF AGRICULTURE

### 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.

### 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.

### 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.

### 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.

### 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.

### 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.

## Art

### 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.

## School of Business Administration

### AMERICAN BANKER'S ASSOCIATION LOAN SCHOLARSHIP

The American Banker's Association has allocated two loan scholarships of $250 each to the University of Minnesota. These loan scholarships are available to students majoring in banking and finance. Applications are made to a committee on which there is representation from the Banker's Association.

### 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.

## College of Dentistry

### 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.

## College of Engineering and Architecture

### 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.

### 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 the gift of $15,000 from Major Max Toltz, of St. Paul. Applications should be made through the head of the Department of Mechanical Engineering.

## Graduate School

### LAMBDA ALPHA PSI GRADUATE LOAN FUND

Gift of $500 from the honorary language society of Lambda Alpha Psi for the establishment of a loan fund for needy graduate students to be known as the Lambda Alpha Psi Graduate Loan Fund. Applicants must have completed successfully one quarter's work in the Graduate School of the University of Minnesota. "Successfully" is to be interpreted as meaning an average of B for all work and A in 50 per cent of the major work. Application should be made through the dean of student affairs.

## Law School

### 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*. Application may be made to the dean of the Law School.

## School of Mines and Metallurgy

### 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. Application may be made to the dean of the School of Mines and Metallurgy.

## Medical School

### 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.

### RAMSEY COUNTY MEDICAL AUXILIARY LOAN FUND

Gift of $300 from the Ramsey County Medical Auxiliary for two loan funds of $150 each available for needy and worthy students in the Medical School.

## Foreign Students

### THE COSMOPOLITAN CLUB LOAN FUND

The Cosmopolitan Club of the University has established a $200 loan fund to be loaned to foreign students at the University, residing outside the territorial limits of the United States.

## Women Students

### 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.

### 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.

### 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.

### 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.

### 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.

### 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 loan to students. Applications may be made to the dean of women at any time.

### 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.

### 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.

### 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.

## GENERAL

### 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.

### 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 from the Class of 1902 for the establishment of a loan fund for worthy students, preferably those in the junior and senior classes.

### DAD'S DAY LOAN FUND

Due to the generosity and interest in the University of Minnesota on the part of the dads attending the 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 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.

### WILLIAM ARTHUR LAWHEAD SCHOLARSHIP LOAN FUND

Gift of $2,000 from the estate of Lillian Lawhead Rinderer for the establishment of a loan fund to be known as the William Arthur Lawhead Scholarship Loan Fund, for needy students.

### 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.

### 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.

### FIRST NATIONAL BANK OF ST. PAUL LOAN FUND

A gift of $400 received from the First National Bank of St. Paul, Minnesota, to be used as a loan fund for needy students.

## PRIZES

## Department of Agriculture

### A. D. WILSON PRIZE

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

### 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.

### 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.

## School of Chemistry

### 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.

### FACULTY PRIZE IN THE SCHOOL OF CHEMISTRY

Gift of $25 annually from the faculty of the School of Chemistry for the establishment of an annual prize of $25 in scientific books or journals to the senior who, while registered in the School of Chemistry, has attained the highest scholastic average in the work of the sophomore and junior years and the first two quarters of the senior year.

### 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.

### TAU BETA PI PRIZE

The Minnesota Chapter of Tau Beta Pi awards annually a prize of the value of $25 to a freshman in the College of Engineering and Architecture, the School of Chemistry, or the School of Mines and Metallurgy on the basis of high scholarship and merit.

## College of Dentistry

### 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.

## College of Engineering and Architecture

### TAU BETA PI PRIZE

The Minnesota Chapter of Tau Beta Pi awards annually a prize of the value of $25 to a freshman in the College of Engineering and Architecture, the School of Chemistry, or the School of Mines and Metallurgy on the basis of high scholarship and merit.

### 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.

### 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.

### ARCHITECTURE—FACULTY PRIZES

The faculty of the School of Architecture awards annual prizes of books to the value of $35 and $15, respectively, to the students attaining the first and second highest general averages in the sophomore year of the courses in architecture and architectural engineering.

### 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 WILLIAM A. FRENCH PRIZES IN INTERIOR ARCHITECTURE

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 architecture.

### AMERICAN SOCIETY OF CIVIL ENGINEERS, NORTHWESTERN SECTION

The Northwestern Section of the American Society of Civil Engineers offers prizes to the amount of $40 annually to upper class students in the course in civil engineering on the basis of scholarship.

### 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.

## Medical School

### THE ROLLINS E. CUTTS PRIZE IN SURGERY

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

### CHARLES LYMAN GREENE PRIZE IN PHYSIOLOGY

Certificate of merit and a prize of $100 from the Minnesota Society of Internal Medicine for the establishment of the Charles Lyman Greene Prize in Physiology. It is offered to an undergraduate medical student for the most meritorious thesis upon a subject in physiology which is closely related to clinical medicine.

## School of Mines and Metallurgy

### TAU BETA PI PRIZE

The Minnesota Chapter of Tau Beta Pi awards annually a prize of the value of $25 to a freshman in the College of Engineering and Architecture, the School of Chemistry, or the School of Mines and Metallurgy on the basis of high scholarship and merit.

## School of Nursing

### 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.

## College of Science, Literature, and the Arts

### THE '89 MEMORIAL PRIZE IN HISTORY

A prize of $100 is offered biennially (odd years) for the best thesis in history, written from the sources. It is open to undergraduate and graduate students. It will not be offered until 1931.

### 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 two annual prizes of $50 and $25 for the best essays 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 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.

### 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.

### 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.

### HELEN DWAN PRIZE

Gift of $1,050 from Mrs. Helen R. Dwan for the establishment of the Helen Dwan Fund, with the understanding that the income from this fund will be used as a prize to be awarded each year to a student in the Department of Music, junior or senior, and with the further understanding that the principal and income, either or both, may be used as a loan fund in the Department of Music.

## Speech Arts

### THE FRANK H. PEAVEY PRIZE

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

### 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.

### 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.

### 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.

### ZETA ALPHA PSI PRIZES

Gift of $40 annually from the Zeta Alpha Psi, forensic sorority of the University of Minnesota, for the establishment of the Zeta Alpha Psi prizes

of $25 and $15 for first and second places in the annual extemporaneous speaking contest.

#### 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.

## General

#### THE MINNESOTA QUARTERLY AWARD

*The Minnesota Quarterly* offers two prizes of $15 each, 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.

## MEDALS

### Department of Agriculture

#### 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.

#### 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.

### Architecture

#### 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.

#### 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.

### Athletics

#### 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.

## College of Pharmacy

### 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.

## Speech Arts

### 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.

### KAPPA RHO AWARD

A cup is awarded annually to that woman member of the senior class who has been outstanding in ability and achievement in one or more of the speech arts. Recommendation of candidate is made by a committee of five, three members of which are appointed by the chairman of the Department of Speech, and two members by Kappa Rho. In the absence of a suitable candidate the committee may withhold the award.

## General

### 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, rooms for games, 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 representatives of the senior and junior classes. There is one senior representative from each of the twelve colleges, and one junior representative elected for a term of two years, from each of three groups of colleges—professional, technical and academic-education. Its functions are: to recognize the common purpose and responsibility of students and faculty in the development and safeguarding of the University; to build and develop a spirit of co-operation; to represent the whole student body in matters affecting student interest; to afford a suitable medium for communication and contact between the student body and the university authorities; and to exercise general supervision over student activities.

*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 is a department of the University devoted primarily to the publication of books, both of general and of special scholarly and scientific interest. It also issues at irregular intervals the following series of research publications: 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, and the School of Chemistry. It is devoted to articles on engineering subjects and to student and 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 magazine published three times during the academic year 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 Agricultural Extension Division Special Bulletins, and Circulars,* are a series of popular pamphlets issued by the Agricultural Extension Division, designed 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 issued by the Agricultural Extension Division, 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 Visitor* is a news letter issued monthly by the Division of Agricultural Education of the College of Education and 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 Gopher Peavey* is a booklet published annually by the students in the Forestry course of the College of Agriculture, Forestry, and Home Economics.

*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*

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# THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

## FACULTY

### ADMINISTRATION

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John B. Johnston, Ph.D., Dean, Professor of Neurology
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Joseph M. Thomas, Ph.D., Assistant Dean for the Senior College and Professor of English
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Royal R. Shumway, B.A., Assistant Dean for Students' Work and Associate Professor of Mathematics

### ANTHROPOLOGY

Albert Ernest Jenks, Ph.D., Professor and Chairman
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### 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

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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

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Joseph M. Thomas, Ph.D., Professor
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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
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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.

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

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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

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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

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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 Turtletaub, 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

[1] Resigned, June 30, 1927.

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. Clefton, 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 Pedagogique, 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.

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 Gillilland, 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 | $20.00 |
| Non-residents | 30.00 |
| Credit hour tuition fee (unclassed students, auditors, and others carrying less than full work) | |
| Residents of Minnesota | 1.75 |
| Non-residents | 2.50 |
| Incidental fee (per quarter) | 6.00 |
| Deposit[1] (first quarter only) | 5.00 |
| Military deposit (required of all students taking military drill) | 10.00 |
| Special fees | |
| Examination for removal of condition | 1.00 |
| Examination for credit (after the first quarter in residence) | 5.00 |
| Special examination | 5.00 |
| Laboratory deposit (required of students registered for courses in chemistry) | 5.00 |
| Graduation fee | 10.00 |
| Music fees (in addition to tuition) for those electing music | |
| Class fees per quarter | |
| Class lessons (three students in each class) two hours per week | 45.00 |
| One class and one individual lesson per week | 55.00 |
| Two individual lessons per week (one-half hour) | 65.00 |
| One individual lesson per week | 35.00 |
| Practice fees | |
| Organ (per hour) | 0.20 to 0.40 |
| Piano[2] (per quarter) | 5.00 |
| ($.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 classes[1] 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 1½ 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 list[1] are

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

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 College[2] 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]

| *Amount Presented for Entrance* | *Amount Required in Junior College* |
|---|---|
| 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 HONORS[1]

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
2. Zoology 5-6-7 or 1-2
3. Inorganic Chemistry 1-2-3 or 4-5; 11
4. Analytical Chemistry 7
5. Organic Chemistry 1-2
6. Mathematics 4 or 6
7. A reading knowledge of scientific French or German

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 WORK[1]

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, 11[1]
Psychology 1-2
Zoology 1-2[2]
Human Physiology 1[3] or 4[3]

### *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 53[3]
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 Credits[1]:

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
2. Inorganic Chemistry 1-2-3 or 4-5, and 11
3. Organic Chemistry 6-7
4. Mathematics 4 or 3-4 or 6
5. Physics 3 and 4, and one of the combinations 23 and 24, 33 and 34, 43 and 44
6. Drawing 41-42-43[2]
7. Mechanical Engineering 11-12-13[2]
8. English A-B-C or Composition 4-5-6 or exemption from requirement
9. Psychology 1-2[2]
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. 25.

[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 study[1] 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

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 MEDICINE[1]

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 premedical 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 ARCHITECTURE[1]

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 36 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 LAWS[1]

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 MEDICINE[1]

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 NURSING[1]

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 nursing[1] 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 Quarters*[3]

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 college[1] 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

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[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. Geothe'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 premedical 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; interrelations 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 somaesthetic 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 Oehlenschläger 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 restatement 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 seaside 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

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

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

## *Part II*

## *Announcement of Program for the Year 1930 - 1931*

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## 1930

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| .. | .. | .. | .. | .. | .. | .. |

# UNIVERSITY CALENDAR

## 1930-31

| 1930 | | | *Fall Quarter* |
|---|---|---|---|
| September | 18 | Thursday | Payment of fees closes, except for new students |
| September | 22 | Monday | Entrance tests |
| September | 22-23 | | Registration of all new students entering the freshman class |
| September | 22-26 | | Examinations for removal of conditions<br>Physical examinations |
| September | 23-26 | | Registration and change of registration[1] |
| September | 24-27 | | Freshman Week |
| September | 26 | Friday | Payment of fees for new students closes |
| September | 29 | Monday | Fall quarter classes begin, 8:30 a.m.[2] |
| October | 16 | Thursday | Senate meeting, 4:30 p.m. |
| November | 1 | Saturday | Homecoming Day |
| November | 4 | Tuesday | General Election Day; a holiday |
| November | 5 | Wednesday | Mid-quarter grades due |
| November | 11 | Tuesday | Armistice Day; a holiday |
| November | 27 | Thursday | Thanksgiving Day; a holiday |
| December | 4 | Thursday | State Day Convocation |
| December | 15-18 | | Final examination period |
| December | 18 | Thursday | Commencement Convocation<br>Senate meeting, 4:30 p.m.<br>Fall quarter ends, 5:20 p.m. |
| December | 26 | Friday | Payment of fees closes for all students in residence fall quarter[3] |

| 1931 | | | *Winter Quarter* |
|---|---|---|---|
| January | 2 | Friday | Entrance tests |
| January | 2-3 | | Registration and change of registration[1]<br>Registration closes at 12 m. Saturday |
| January | 3 | Saturday | Payment of fees for new students closes at 12 m. |
| January | 5 | Monday | Winter quarter classes begin, 8:30 a.m.[2] |
| February | 10 | Tuesday | Mid-quarter grades due |
| February | 12 | Thursday | Lincoln's Birthday; a holiday |
| February | 19 | Thursday | Charter Day Convocation<br>Senate meeting, 4:30 p.m. |
| February | 23 | Monday | (Sunday February 22 Washington's Birthday) a holiday |

[1] Registration subsequent to the date specified will necessitate the approval of the assistant dean for student's work. See also penalty fees for late registration. 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 in permitting registration at a later date.

[2] First hour classes begin at 8:15 a.m. at University Farm.

[3] New students must pay fees on dates announced for registration.

| | | | |
|---|---|---|---|
| March | 18-21 | | Final examination period |
| March | 19 | Thursday | Commencement Convocation |
| | | | Payment of fees closes for all students[1] in residence winter quarter |
| March | 21 | Saturday | Winter quarter ends, 5:20 p.m. |

*Spring Quarter*

| | | | |
|---|---|---|---|
| March | 27 | Friday | Entrance tests |
| March | 27-28 | | Registration and changes of registration[2] Registration closes at 12 m. Saturday |
| March | 28 | Saturday | Payment of fees for new students closes at 12 m. |
| March | 30 | Monday | Spring quarter classes begin, 8:30 a.m.[3] |
| April | 3 | Friday | Good Friday; a holiday |
| May | 6 | Wednesday | Mid-quarter grades due |
| May | 14 | Thursday | Cap and Gown Day Convocation Senate meeting, 4:30 p.m. |
| May | 30 | Saturday | Memorial Day; a holiday |
| June | 7 | Sunday | Baccalaureate service |
| June | 8 | Monday | Fifty-ninth annual commencement |
| June | 10-13 | | Final examination period |
| June | 13 | Saturday | Spring quarter closes, 5:20 p.m. |

*Summer Quarter*

| | | | |
|---|---|---|---|
| June | 15-16 | | Registration, first term |
| June | 17 | Wednesday | Classes begin, 8:00 a.m. |
| July | 4 | Saturday | Independence Day; a holiday |
| July | 25 | Saturday | Registration and payment of fees for second term closes at 12 m. First term closes |
| July | 27 | Monday | Second term classes begin |
| August | 29 | Saturday | Second term closes |

*Entrance Examinations*

Entrance examinations for admission 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 28, bulletin of general information.

[1] New students must pay fees on dates announced for registration.

[2] Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration. 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 in permitting registration at a later date.

[3] First hour classes begin at 8:15 a.m. at University Farm.

# 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 Laboratory or Sanitary Work.
   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 Nursing 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 five-year course leading to the degrees of bachelor of arts and bachelor 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.

## REGULATIONS APPLYING TO ALL COURSES

1. *Physical Education and Military Drill.*—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.

2. *Freshman English.*—Unless freed from the requirement by placement tests all students must complete three quarters of English A-B-C or Composition 4-5-6. On the basis of placement tests in English, students are:

Exempt from any requirement in English,

[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.

Permitted to choose between English A-B-C and Composition 4-5-6,
Assigned to Composition 4-5-6,
Required to make up minimum essentials as a preliminary to Composition 4-5-6.

Students who are exempt from Freshman English may register for any junior college courses in English, composition, or speech for which English A-B-C is the prerequisite.

3. *Classification of studies.*—After many years of study of the aptitude of individual students for college work, the courses in the Junior College have been classified according to their value for certain types of student. In a large percentage of cases, a student's aptitude for college work can be clearly understood at entrance. Many students will gain little from work in foreign languages, laboratory exercises in science, or the more technical and specialized courses. For their own advantage, these students should devote their time to courses which contribute more directly to the general information and culture which are of value to all.

Accordingly, certain courses are restricted to those students who have given evidence that they will be able to profit by them. Other courses, of a more general nature, are open to all. Tho the requirements for graduation include courses in the restricted group, all courses in both groups are of standard college grade and many curriculum requirements can be satisfied by courses in the second group.

The original estimate of a student's ability will be revised on the basis of his college work. A student who shows ability in studies of the second group will be admitted to the more restricted courses and may proceed to the completion of the requirements for a degree. On the other hand, a student who does not show sufficient ability in his first two quarters of work may find himself limited thereafter in his choice of studies until he shows his ability and willingness to do work of college grade.

4. *Beginning languages.*—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.

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

### JUNIOR COLLEGE

1. For admission to the Senior College[1] 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. See page 5.

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

B. Foreign language, 0 to 20 credits, according to the following schedule:[2]

| *Amount Presented for Entrance* | *Amount Required in Junior College* |
|---|---|
| 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, 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. 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.

6. The student must earn a total of 90 credits in addition to the requirement in physical education, 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 90 is diminished by one.

A student entering with advanced standing from some other institution must secure a total of 90 credits in addition to the requirement in physical education, 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 90 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, Fine Arts, Geography, Geology and Mineralogy, German, Greek, History, Human Physiology, Journalism, Latin, Mathematics, Music, Philosophy,

[2] Not required in the Social and Civic Course.

Physics, Political Science, Psychology, Romance Languages, Sociology, Speech, 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.

3. The student must earn 90 credits and 90 honor points in addition to the number required for admission, or a smaller number of credits determined as follows: for every five honor points in excess of one honor point per credit, the number 90 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 13 credit hours of work and to secure an average of one honor point per credit.

Three quarters of residence in the Senior College are required before graduation.

A student entering the Senior College with advanced standing from some other institution must secure the same total, 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 is diminished by one.

## 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 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 1930-31 Honors Courses are offered by the Departments of Anthropology, English, History, Political Science, Psychology, Sociology, and Zoology. An Honors course in Economics will be offered to begin in 1931-32.

### GRADUATION HONORS[1]

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 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.

[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.

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 9.

### 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 senior college years, the student must secure 90 credits and 90 honor points in addition to the requirements for admission. The student is registered in this college during the entire course. (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 90 credits in addition to the requirement in physical education, (see page 5) with an average of one honor point per credit.[1] The required courses are listed below. High school physics is a prerequisite, but Physics 11, Survey of Physics, may be taken after admission.

1. English A-B-C, or Composition 4-5-6, or exemption from requirement
2. Zoology 5-6-7 or 1-2 and 3-4, 24[2], 25[2]
3. Inorganic Chemistry 1-2-3 or 4-5; 11
4. Analytical Chemistry 7
5. Organic Chemistry 1-2
6. A reading knowledge of scientific French or German
7. Bacteriology 51[2]
8. Human Physiology 4[2]

For the work in the Medical School consult the special bulletin obtainable at the office of the registrar.

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 LABORATORY OR SANITARY WORK

For the specific requirements of this course see the special bulletin of Preventive Medicine and Public Health obtainable at the office of the registrar.

### E. COURSE IN SOCIAL AND CIVIC WORK[3]

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.

[1] For the requirements in physical education and military drill, see p. 5.

[2] Need not be taken during the first two years.

[3] No requirement in foreign 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 90 credits, in addition to the requirement in physical education, with an average of one honor point per credit. In the Senior College he must secure 90 credits and 90 honor points in addition to the number required for admission. (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, 11[1]
Psychology 1-2
Zoology 1-2 and 3-4[2]
Human Physiology 1[3] or 4[3]

### *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] 54, 55, 60, 70, 71,
90, 91, 94
Preventive Medicine 50 or 53[3]
Home Economics 70, Child Welfare
40 and 130
or
Child Welfare 40, 60, 130
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 and 3-4 by students in group work.

[3] Required of students preparing for medical social work.

### *Fourth Year*

Professional specialization by grouped requirements.

a. *Case work:* Sociology 92, 94, 100 or 120, 119, 128, 130, 134, 135, 153-154; Economics 161.

b. *Group work:* Sociology 71, 72, 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 94, 100 or 119, 133, 138-139, 153-154; Preventive Medicine 57, 60, 61, 73; Psychology 144-145.

d. *Rural social work:* Sociology 52, 90, 91, 92, 94, 101, 110, 112, 114, 130, 131, 153-154; Preventive Medicine 60; Agricultural Education 154.

### *Fifth Year*

For details consult the bulletin of the Graduate School.

## 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 90 credits, in addition to the requirement in physical education, 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 90 is diminished by one.

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

A. Required Credits[1]:

1. English A-B-C or Composition 4-5-6, or exemption from requirement. See page 5.
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.[2]
4. Ten credits in the Principles of Economics. (This requirement may be satisfied by the completion of Economics 4 with its prerequisites, or 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:

[1] For the requirements in physical education and military drill, see p. 5.

[2] Sociology 45, Social Statistics, is not accepted in fulfillment of this requirement.

Economics 3, (Mechanism of Exchange)
Economics 14, (Elements of Statistics)[1]
Economics 25-26 (Principles of Accounting)[2]

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 and 20 (Commerce Algebra and Mathematics of Investment). Required of students who take the accounting, insurance, or finance sequence.
   c. Mathematics 8 and 6 (Commerce Algebra and Trigonometry). Required of students who take the statistics sequence.
   d. Students in the foreign trade sequence are required to have a reading knowledge of at least one foreign language.

## 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.[3] 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
2. Inorganic Chemistry 1-2-3 or 4-5, and 11
3. Organic Chemistry 6-7
4. Mathematics 4 or 3-4 or 6
5. Physics 3 and 4, and one of the combinations 23 and 24, 33 and 34, 43 and 44
6. Drawing 41-42-43[4]
7. Mechanical Engineering 11-12-13[4]
8. English A-B-C or Composition 4-5-6 or exemption from requirement
9. Psychology 1-2[4]
10. Electives to make a total of 90, in addition to the requirement in physical education

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 desire to receive the state teacher's certificate upon graduation from the University of Minnesota must register in the College of Education beginning with the junior year. They should enroll as pre-education students in the Junior College as early in their course as possible. Entrance to the college will be conditioned upon a student's meeting the general and specific requirements outlined below:

1. A minimum of ninety credits, exclusive of credit for physical education, carried with an average of one honor point per credit. The ninety

[1] Credit may not be received for both Economics 14, Elements of Statistics, and Sociology 45, (Social Statistics).

[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.

[3] For the requirement in physical education and military drill, see page 5.

[4] The faculty may accept electives for these courses.

credits thus indicated 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, Speech, 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 required work indicated under A, B, C, and D below. At least 20 credits in groups B, C, and D must be completed in college.

| When 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 same language |
| | or | |
| | 1 year in one language | and 15 credits in same language |
| C. Social sciences | 2 years | or 10 credits in one department |
| D. Natural sciences | 2 years | or 10 credits in one department |

NOTE.—In lieu of the specific course requirements indicated in the language group a student may take 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 Section 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.

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, Part I, the above requirements may be modified in details.

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

6. At the time of entrance a student must present a certificate from the Students' Health Service indicating that he is free from physical defects that would prevent him from the successful pursuit of educational work.

7. 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.

8. For the requirement in physical education and military drill, see page 5.

9. Students preparing to qualify in one of the specialized curricula or in the limited honors course should consult the College of Education bulletin.

### D. COURSE PRELIMINARY TO NURSING EDUCATION IN THE COLLEGE OF EDUCATION

For the first five quarters of the five-year course in Nursing Education, the student is registered in the Junior College. She must complete the requirements listed below, and must earn an average of one honor point per credit.

English A-B-C or Composition 4-5-6 or exemption from the requirement. See page 5.
Zoology, 10 credits
History, 10 credits
Human Physiology 1 and 2
Psychology 1-2
Home Economics 70
Sociology, 5 credits
Botany, 10 credits
Electives to make a total of 75 credits exclusive of Physical Education
Physical Education, see page 5. One quarter of this requirement may be completed after registering in the School of Nursing.

Upon completion of the above requirement the student registers in the School of Nursing for two and a half years, followed by three quarters in the College of Education, with a major in Public Health Nursing or Nursing Education.

### E. 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 90 credits and 90 honor points,[1] with the required work in physical education. (See page 5.) 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.)

[1] For the requirements in physical education and military drill, see p. 5.

| Courses Required in the First Two Years | Credits |
|---|---|
| English A-B-C or Composition 4-5-6 or exemption from requirement (see page 5) | 0 to 15 |
| Mathematics 4 or 6 (with prerequisite) | 4 to 10 |
| French (see Junior College Requirements. page 7) | 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 |
| Drawing 61-62-63 | 6 |

Students who enter without either French or higher algebra, should register in their freshman year for Freshman English (see page 5). French, and chemistry. Students who enter with one or more years of French should register for Freshman English, French, and mathematics to complete the requirement, or elective.

### F. GENERAL COURSE PRELIMINARY TO THE LAW SCHOOL[1]

This course is designed to satisfy the requirements for admission to the Law School, which are 90 academic credits, in addition to the requirement in physical education, 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.[2] (See pp. 6 and 7.)

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 21.

### G. PRE-PHARMACY COURSE

For recommendations for one year's work preliminary to the College of Pharmacy, consult the bulletin of that college.

[1] For changes in this course for students who will enter the Law School in September, 1931, or later, see Law School bulletin.

[2] For the requirements in physical education and military drill, see page 5.

## 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.

For admission to the Senior College, a student must complete 90 credits, in addition to the requirement in physical education, with an average of one honor point per credit. The faculty will recommend for graduation, in any course of study (given entirely in this college), leading to the degree of bachelor of arts or bachelor of science, any student who has completed in addition to this requirement 84 credits, 84 honor points, and the work of the Advanced Course of the R.O.T.C.

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.

*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 90 credits, in addition to the requirement in physical education, with an average of one honor point per credit.[1]
   a. English A-B-C or Composition 4-5-6 or exemption from requirement.
   b. History 1-2.
   c. Zoology 1-2 and 3-4, 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

[1] For the requirements in physical education and military drill, see p. 5.

d. Electives to make a total of 90 credits and 90 honor points, in addition to the requirement for admission.

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 MEDICINE[1]

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 90 credits, in addition to the requirement in physical education, with an average of one honor point per credit.[2] (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, English A-B-C, or exemption from requirement. See page 5.
Zoology 5-6-7 (1-2 and 3-4, 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 (with prerequisite mathematics) 23 and 24, 33, 43 and 44. Course 34 optional.
German sufficient to secure a reading knowledge. Students may meet this requirement by passing two quarters' work in Medical German (German 31-32), or by taking a special examination after completing two college years of German. This examination is conducted by the German Department.[3]

The following subjects are recommended as electives: advanced zoology, (such as comparative anatomy), physics, chemistry, freehand drawing, Latin, French, 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.

[1] Only students who have completed the required work in the College of Science, Literature, and the Arts or some similar school before entering the professional school will be permitted to avail themselves of the privilege of securing the B.S. degree in a combined course.

[2] For the requirements in physical education and military drill, see page 5.

[3] A student who enters the Medical School before September, 1932, may substitute French for German. He may meet the requirement by passing two quarters of French 8-9-10 or by taking a special examination after completing 15 credits of French.

## 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
German 1-2-3
Mathematics 3 and 4, and Physics 3 and 4
Zoology 5-6-7 (or 1-2 and 3-4)

### *Second Year*

Inorganic Chemistry 11, if not already completed
Analytical Chemistry 7
Organic Chemistry 1-2
German 30-31-32
Physics 23 and 24, 33, 34 (optional), 43 and 44
Composition 4-5-6, English A-B-C, 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 GERMAN

### *First Year*

Inorganic Chemistry 1-2-3 or 4-5 and 11
German 30-31-32
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 and 3-4)

### *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, English A-B-C, 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 90 credits and 90 honor points in addition to the requirement for admission, 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 Medical School, 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 premedical 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. FIVE-YEAR COURSE IN ARTS AND ARCHITECTURE[1]

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 and bachelor of architecture at the end of five years. The degree of master of architecture may be taken 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 16 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.

## VIII. SIX-YEAR COURSE IN ARTS AND LAW, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND BACHELOR OF LAWS[1, 2]

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 135 credits in addition to the requirement in physical education, and an average of one honor point per credit for all credits earned.[3] (For each five honor points

[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 an alternative six-year course consult the bulletin of the Law School.

[3] For the requirement in physical education and military drill, see page 5.

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 MEDICINE[1]

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 135 credits in addition to the requirement in physical education, with an average of one honor point per credit for all credits earned.[2] (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. 19).[3]

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.

## X. FIVE-YEAR COURSE IN ARTS AND NURSING OR NURSING EDUCATION, LEADING TO THE DEGREES OF BACHELOR OF SCIENCE AND GRADUATE IN NURSING

See page 16 of this bulletin and the bulletin of the College of Education.

[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 the requirements in physical education and military drill, see page 6.

[3] For recommended electives and the restrictions governing them, see p. 19.

# 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 | 318MH |
| Architecture | 315E | Journalism | 13P |
| Astronomy | 337Ph | 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 Geometry | 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 | HS |
| German | 208F | Psychology | 112Psy |
| Greek | 112F | Romance Languages | 200F |
| History | 102OL | Scandinavian | 122F |
| Home Economics | 215HE | 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; EE, Electrical Engineering; F, Folwell; G, Greenhouse; HE, Home Economics, University Farm; HH, Haecker Hall, University Farm; HS, Health Service; 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. |
| 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.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 41f | Introd. to Anthropology ..... (5 cred.; soph., jr., sr.; prereq., 10 cred. sci. or soc. sci.) | VII | MTWThF | OPhAud | Mr. Jenks |
| 41w | Introd. to Anthropology ..... (See 41f) | VII | MTWThF | OPhAud | Mr. Jenks |
| 41s | Introd. to Anthropology ..... (See 41f) | I | MWThFS | 206OL | Mr. Wallis |
| *53* | *Cultural Anthropology: Technology* ..... (3 cred.; jr., sr.; prereq., 41) | *Not offered* | | | |
| 54w | Cultural Anthropology: Social Organization ..... (3 cred.; jr., sr.; prereq., 41) | VIII | MWF | 15F | Mr. Wallis |
| *56* | *Primitive Science* ..... (3 cred.; jr., sr.; prereq., 41) | *Not offered* | | | |
| 62w | Ethnology ..... (3 cred.; jr., sr.; prereq., 41) | IV | MWF | 15F | Mr. Jenks |
| *80* | *The American Indian*..... (3 cred.; jr., sr.; prereq., 41) | *Not offered* | | | |
| 106f | Prehistoric Man ..... (3 cred.; jr., sr.; prereq., 41) | III | MWF | 12F | Mr. Jenks |
| 107w | American Archeology ..... (3 cred.; jr., sr.; prereq., 41) | III | MWF | 15F | Mr. Jenks |
| 108s | Philippine Peoples ..... (3 cred.; jr., sr.; prereq., 41) | VII | MWF | 15F | Mr. Jenks |
| 110f | Physical Anthropology ..... (3 cred.; jr., sr.; prereq., 41) | III | TThS | 12F | Mr. Wallis |
| 112s | The American Negro ..... (3 cred.; jr., sr.; prereq., 41) | II | MWF | 15F | Mr. Jenks |
| 113s | Peoples of Europe ..... (3 cred.; jr., sr.; prereq., 41) | IV | MWF | 15F | Mr. Jenks |
| 114f | The American People ..... (3 cred.; jr., sr.; prereq., 41) | IV | MWF | 15F | Mr. Jenks |
| 121w | Advanced Phys. Anthropology... (3 cred.; jr., sr.; prereq., 110) | Ar | Ar | 12F | Mr. Wallis |
| 122f,123w-124s | Problems in Anthropology..... (Cred. ar.; jr., sr., grad.; prereq., three courses. For honors course students, permission of instructor) | Ar | Ar | 12F | Mr. Jenks, Mr. Wallis |
| 150* | Field Trip in Archeology..... (1 to 8 cred.; sen. col. stud. only; prereq., one sen. col. course) | Ar | Ar | Ar | Mr. Jenks |
| 161f | Primitive Religion ..... (3 cred.; jr., sr.; prereq., 41) | I | MWF | 12F | Mr. Wallis |

## 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 21-22-23, 31-32-33, Drawing 61-62-63, and 10 credits in philosophy, history, or French.)

* This course may be taken for credit only once.

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) | | NOTE.—Consult the bulletin of the College of Engineering and Architecture for program of hours, days, buildings, and instructors. | | |
| 31f-32w†-33s | Elements of Architecture ..... (15 cred.; soph., jr.; prereq., soph. standing) | | | | |
| 31w-32s†-33su | Elements of Architecture ..... (See 31f-32w-33s) | | | | |
| 74f-75w-76s | Freehand Drawing ..... (9 cred.; jr., sr.; prereq.. 23) | | | | |
| 81f | Stage Design ..... (2 cred.; jr., sr.; no prereq.) | | | | |
| 84-85-86f,w,s | Modeling ..... (6 cred.; jr., sr.; prereq., 23) | | | | |
| 90-91-92f,w,s | Illustration ..... (3 cred.; jr., sr.; prereq., 23 or equiv.) | | | | |
| 93-94-95f,w,s | Hand Print Process ..... (3 cred.; jr., sr.; prereq., 23 or equiv.) | | | | |

*Senior College Courses*

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 14f-15w-16s | History of Architecture ..... (6 cred.; jr., sr.; prereq., 33) | | NOTE.—Consult the bulletin of the College of Engineering and Architecture for program of hours, days, buildings, and instructors, and for additional courses. | | |
| 17f-18w-19s | History of Architecture ..... (6 cred.; jr., sr.; prereq., 15) | | | | |
| 27f-28w-29s | Freehand Drawing ..... (6 cred.; jr., sr.; prereq., 76) | | | | |
| 34-35-36f,w,s | Architectural Design ..... (12 cred.; jr., sr.; prereq., 33, 23, 62) | | | | |
| 37-38-39f,w,s | Architectural Design ..... (21 cred.; sr.; prereq., 36) | | | | |
| 51f-52w-53s | Building Construction ..... (6 cred.; jr., sr.; prereq., 33) | | | | |
| 70f,w,s | Pictorial Composition ..... (1 cred.; jr., sr.; prereq., 26 or equiv.) | | | | |
| 87f-88w-89s | Advanced Modeling ..... (6 cred.; jr., sr.; prereq., 86) | | | | |
| 121f-122w-123s | Freehand Drawing ..... (6 cred.; jr., sr.; prereq., 29) | | | | |
| 134-135-136f,w,s | Interior Design (Interior Architecture) ..... (21 cred.; sr.; prereq., 36) | | | | |
| 163s | History of Sculpture and Painting ..... (2 cred.; jr., sr.; prereq., 16) | | | | |
| 182f-183w-184s | Decoration and Allied Arts..... (9 cred.; sr.; prereq., 16, 23) | | | | |

† The entire course must be completed before credit is received for any quarter.

## ASTRONOMY

### *Major Adviser*

Professor Crump.

### *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,s | Descriptive Astronomy ..... (5 cred.; fr., soph., jr., sr.; no prereq.) | III<br>7-9 (fall)<br>7:30-9:30 p.m. (spring) | MTWF<br>W<br>W | 150Ph | |
| 51w | Astronomy ..... (3 cred.; jr., sr.; prereq., Math. 6 and 50 or equiv.) | IV | MWF | 166Ph | |
| 52w | Astrophysics ..... (4 cred.; prereq., 51 or 11 and Math. 6) | II | MTWF | Ph | |
| 53f,s | Stellar Astronomy ..... (4 cred.; prereq., 51 or 11 and Math. 6) | II | MTWF | Ph | |
| 101f-102w-103s | Practical Astronomy ..... (9 cred.; jr., sr., grad.; prereq., 11 or 51 and Math. 50) | Ar | Ar | Ph | |
| 211f-212w-213s | Seminar ..... (9 cred.; sr. by permission, grad.; prereq., 11 or 51, 52, 53, Math. 30) | Ar | Ar | Ph | |

## BACTERIOLOGY

### MEDICAL SCHOOL

### *Major Advisers*

Professors Larson, Henrici, and 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.)

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 | VII, VIII, IX | MWF | MH | Ar |
| | 2 | VI, VII, VIII, IX | TTh | MH | Ar |
| 41w | General Bacteriology ..... (See 41f) | | | | |
| | Sec. 1 | VII, VIII, IX | MWF | MH | Ar |
| | 2 | I, II, III | MWF | MH | Ar |
| 41s | General Bacteriology ..... (See 41f) | VII, VIII. IX | MWF | MH | Ar |
| 101f | Special Bacteriology for Medical Students ..... | I, II | ThS | MH | Dr. Larson |
| | (4 cred.; jr., sr.; prereq., 41) | I, II, III | T | | |
| 103w | Soil Microbiology ..... (5 cred.; jr., sr.; prereq., 41, and 15 cred. chem.) | I, II. III<br>I, II | TS<br>Th | MH | Dr. Skinner |
| 114s | Molds, Yeasts, and Actinomycetes (3 cred.; jr., sr.; prereq., 41) | VII, VIII | TTh | MH | Dr. Henrici |
| 116w | Immunity ..... (3 cred.; jr., sr.; prereq., 101 or 103) | VII, VIII | TTh | MH | Dr. Larson |
| 117s | Pathogenic Protozoa ..... (3 cred.; jr., sr.; prereq., 101 or 103) | VII, VIII | TTh | MH | Dr. Larson |
| 118w | Morphology and Taxonomy of Bacteria ..... (3 cred.; jr., sr.; prereq., 41) | VII, VIII | TTh | MH | Dr. Henrici |
| 119w | Bacteriological Chemistry ..... (2 cred.; jr., sr.; prereq., 101 or 103; Hum. Physiol. 100-101, or Agr. Biochem. 111-112) | VI | TTh | MH | Dr. Green |
| 120s | Bacterial and Virus Diseases Common to Man and Animals (3 cred.; jr., sr., grad.; prereq., 101) | VI, VII<br>VI | T<br>Th | MH | Dr. Green |
| 121w | Industrial Bacteriology ..... (3 cred.; jr., sr., grad.; prereq., 41) | I, II | TTh | MH | Dr. Halvorson |
| 122s | Industrial Bacteriology continued (3 cred.; jr., sr., grad.; prereq., 41) | I, II | TTh | MH | Dr. Halvorson |
| 150f-151w or 150w-151s | Advanced Bacteriology ..... (Cr. ar.; jr., sr., grad.; prereq., see instructor) | VII, VIII | TTh | MH | Ar |

## BOTANY

### *Major Advisers*

Professors Cooper, Rosendahl, and Tilden; Associate Professors Burr, Butters, and Harvey; Assistant Professor 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, 124, 125, 126, 127, or Plant Pathology 105-106-107.

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, 124, 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 | Mr. Huff |
| | 2 | VI | T | | |
| | | VI, VII | 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 | Mr. Huff |
| | Quiz Sec. 1 | I | T | | |
| | 2 | II | T | | |
| | 3 | III | W | | |
| 2w,s | Elem. Gen. Morph. of Plants... | III, IV | MWF | 1,4,5,8Bot | Mr. Huff |
| | (3 cred.; all; prereq., 1) | | | | |
| 5w | Elem. Plant Histology ..... | VI, VII, VIII | TTh | 1,4,5,8Bot | Mr. Butters |
| | (3 cred.; all; prereq., 1) | | | | |
| 7f | Taxonomy of Flowering Plants.. | I, II | MWF | 1,4,5,8Bot | Mr. Rosendahl |
| | (3 cred.; all; prereq., 1) | | | | |
| 7s | Taxonomy of Flowering Plants.. | | | | |
| | (See 7f) | | | | |
| | Sec. 1 | I, II | MWF | 1,4,5,8Bot | Mr. Rosendahl |
| | 2 | VI, VII, VIII | TTh | | |
| 12f,w,s | Morphology of Algae ..... | I, II | TThS | 1,4,5,8Bot | Miss Tilden |
| | (3 cred.; all; prereq., 1) | | | | |
| *13* | *Morphology of Fungi* ..... | *Not offered* | | | |
| | (3 cred., all; prereq., 1) | | | | |
| 21f | Elementary Ecology ..... | III, IV | MWF | 1,4,5,8Bot | Mr. Cooper |
| | (3 cred.; all; prereq., 1) | | | | |
| 21w,s | Elementary Ecology ..... | VI, VII, VIII | TTh | 1,4,5,8Bot | Mr. Cooper |
| | (See 21f) | | | | |
| 22f,w,s | Elem. Plant Physiology ..... | | | | |
| | (3 cred.; all; prereq., 1) | | | | |
| | Lect. | VI | TTh | 1,4,5,8Bot | Mr. Burr |
| | Lab. Sec. 1 | III, IV | TS | | |
| | 2 | VII, VIII | TTh | | |

* 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 |
|---|---|---|---|---|---|
| 23w | Bryophytes and Pteridophytes... (3 cred.; all; prereq., 2 or 12) | VI, VII | MWF | 1,4,5,8Bot | Mr. Huff |
| 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 | Mr. Butters |
| 101f,w | Elementary Biometry ..... (3 cred.; jr., sr., grad.; prereq., 18 cred., biol. sci.) | I, II | MWF | 202Bot | |
| *108* | *Pteridophytes* ..... (5 cred.; sr.; grad.; prereq., 18 cred. incl. 7 and 23) | *Not offered* | | | |
| 110w | Gymnosperms ..... (5 cred.; sr., grad.; prereq., 18 cred. incl. 7 and 63) | Ar | Ar | Ar | Mr. Butters |
| 113f-114w-115s* | Adv. Taxonomy of Flowering Plants ..... (9 cred.; jr., sr., grad.; prereq., 15 cred. incl. 7) | VI, VII, VIII | TTh | 215Bot | Mr. Rosendahl |
| 118 | Cytology ..... (5 cred.; jr., sr., grad.; prereq., 18 cred.) | Ar | Ar | Ar | Mr. Rosendahl |
| 124s-125su-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 | Th | 110Bot | Miss Tilden |
| | Lab. | III, IV | TS | | |
| 127s | Anatomy of Vascular Plants.... (5 cred.; jr., sr., grad.; prereq., 18 cred. incl. 5) | | | | |
| | Lect. | I | MWF | 215Bot | Mr. Butters |
| | Lab. | Ar | Ar | | |
| 131f | Field Ecology ..... (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 21) | VI, VII, VIII | MWF | 214Bot | Mr. Cooper |
| 132w | Ecological Anatomy ..... (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 21) | VI, VII, VIII | MWF | 214Bot | Mr. Cooper |
| 133s | Plant Geography of North America ..... (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 21) | VI, VII, VIII | MWF | 214Bot | Mr. Cooper |
| *134* | *Research Methods in Ecology*... (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 21) | *Not offered* | | | |
| *140* | *General Plant Physiology*..... (5 cred.; jr., sr., grad.; prereq., 22, elem. inorg. chem.) | *Not offered* | | | |
| 141f | Physico-chemical Principles in Plant Physiology ..... (5 cred.; jr., sr.; prereq., qual., quant., org., and phys. chem.) | | | | |
| | Lect. | 7:50 | MWF | 101Bot | Mr. Burr |
| | Lab. | II, III, IV | MF | | |

* Any quarter may be taken separately.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 142w | Photosynthesis ..... (5 cred.; sr., grad.; prereq., as for 141) | 7:50<br>II, III, IV | MWF<br>MF | 101Bot | Mr. Burr |
| 143s | Plant Metabolism ..... (5 cred.; sr., grad.; prereq., as for 141) | | | | |
| | Lect. | 7:50 | MWF | 101Bot | Mr. Burr |
| | Lab. | II, III, IV | MF | | |
| 144s | Plant Microchemistry ..... (5 cred.; sr., grad.; prereq., 22, 140, org. chem.) | Ar | Ar | Ar | Mr. Harvey |
| 145f,146w,147s* | Advanced Biometry ..... (9 cred.; sr., grad.; prereq., 101) | III, IV | MWF | 202Bot | |
| 149s,150su,151f* | Freshwater Algae ..... (3 to 10 cred. per qtr.; jr., sr., grad.; prereq., 15 cred. incl. 12, or consent of instructor) | VI, VII, VIII | TTh | 110Bot | Miss Tilden |

## 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 | Mr. Glockler |
| | Lab. | Sec. 1 | VI, VII, VIII | T | 290C | Mr. Glockler and assts. |
| | Quiz | Sec. 1 | VIII | Th | ArC | Mr. Glockler and assts. |
| | Lab. | Sec. 2 | VI, VII, VIII | Th | 290C | Mr. Glockler and assts. |
| | Quiz | Sec. 2 | VIII | T | ArC | Mr. Glockler 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. | | VI | MWF | 100C | Mr. Stephens |
| | Lab. | Sec. 1 | VI, VII, VIII | T | 210C | Mr. Stephens and assts. |
| | Quiz | Sec. 1 | VIII | Th | ArC | |
| | Lab. | Sec. 2 | VI, VII, VIII | Th | 210C | Mr. Stephens and assts. |
| | Quiz | Sec. 2 | VIII | T | ArC | |
| 6f-7w†-8s | Gen. Inorg. Chemistry ..... (15 cred.; those entering without chem., fr., soph., jr., sr.; no prereq.) | | | | | |
| | | Lect. | II | MWF | 225C | Miss Cohen |
| | | Lab. | I, II, III | ThS | 210C | Miss Cohen and assts. |
| 9f-10w† | Gen. Inorg. Chemistry ..... (10 cred.; fr., soph., jr., sr.; prereq., entr. cred. in chem.) | | | | | |
| | | Lect. | II | MWF | 100C | Mr. Sneed |
| | | Lab. | I, II, III | ThS | 290C | Mr. Sneed and assts. |
| 9w-10s†* | Gen. Inorg. Chemistry ..... (See 9f-10w) | | | | | |
| | Lect. | Sec. 1 | III | MWF | 225C | Miss Cohen, |
| | | Sec. 2 | III | MWF | 100C | Mr. Maynard |
| | Lab. | | VI, VII | 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 | Miss Cohen |
| | | Lab. | VI, VII, VIII, IX | F | 210C | Miss Cohen and assts. |

† Two quarters must be completed before credit is received for either quarter.

* Students who have failed in 1f or 6f may register in section 2 for this course without further prerequisite.

| No. | Title | | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|---|
| 11s | Qual. Chemical Anal. (pre-med. and pre-dent.) ..... (See 11f) | | | | | |
| | Lect. | | VI | MWF | 100C | Mr. Stephens |
| | Lab. | Sec. 1 | VI, VII, VIII, IX | T | 210C | Mr. Stephens and assts. |
| | Lab. | Sec. 2 | VI, VII, VIII, IX | Th | 210C | Mr. Stephens and assts. |
| 12f-13w† | Qual. Chemical Analysis ..... (10 cred.; all; prereq., 8 or 10) | | | | | |
| | Fall | Lect. | I | TThS | 325C | Mr. Maynard |
| | | Lab. | I, II, III | MW | 290C | |
| | Winter | Lect. | VI | WF | 490C | |
| | | Lab. | VII, VIII, IX | MWF | 290C | |
| 12s† | Qual. Chemical Anal. ..... (See 12f-13w†) | | | | | |
| | | Lect. | II | MWF | 100C | Mr. Sneed |
| | | Lab. | I, II, III | ThS | 290C | Mr. Sneed and assts. |
| 13f† | Qual. Chemical Anal. ..... (See 12f-13w†) | | | | | |
| | | Lect. | VI | WF | 490C | Mr. Heisig |
| | | 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 | Miss Cohen |
| 102w | Adv. Qual. Chemical Anal. .... (2 or 3 cred.; jr., sr., grad.; prereq., Anal. Chem. 1, 2, Org. Chem. 52) | | Ar | Ar | 290C | Mr. Sneed |
| 103f-104w-105s | Adv. Inorg. Chemistry ..... (3 to 9 cred.; jr., sr., grad.; prereq., Anal. Chem. 1, 2, Org. Chem. 52) | | IV | MWF | 111C | Mr. Sneed |
| 106f-107w-108s | Chemistry of the Rare Elements (3 cred.; jr., sr., grad.; prereq., quant. anal. or permission of instructor) | | Ar | Ar | Ar | Mr. Glockler |

## Analytical Chemistry

| | | | | | | |
|---|---|---|---|---|---|---|
| 1w-2s* | Quant. Analysis ..... (10 cred.; soph., jr., sr.; prereq., Inorg. Chem. 12-13) | | | | | |
| | | Lect. | VI | M | 325C | Mr. Geiger |
| | | Quiz | VI | W | 410C | |
| | | Rec. | VI | F | 315C | |
| | | Lab. | VII, VIII, IX | MWF | 310C | |

† Two quarters must be completed before credit is received for either quarter.
* Course 2s may precede 1w, if desired.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 7f | Quantitative Analysis (pre-med.) (4 cred.; pre-med. only; prereq., Inorg. Chem. 11 or 13) | | | | |
| | Lect. (Secs. 1, 2) | VI | M | 325C | Mr. Geiger |
| | Rec. (limit 35) Sec. 1 | VI | W | 315C | |
| | Lab. | VII, VIII, IX | MW | 310C | |
| | | VI, VII | F | 310C | |
| | Rec. (limit 35) Sec. 2 | VI | F | 315C | |
| | Lab. | VII, VIII, IX | MF | 310C | |
| | | VI, VII | W | 310C | |
| | Lect. Sec. 3 | VII | T | 325C | Mr. Sarver |
| | Rec. Sec. 3 | VI | Th | 325C | |
| | Lab. | VIII, IX | T | 310C | |
| | | VII, VIII, IX | Th | 310C | |
| | | I, II, III or II, III, IV | S S | 310C | |
| 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 | T | 315C | Mr. Sarver |
| | Lab. | VII, VIII, IX | T | 310C | |
| | | VI-IX | Th | 310C | |
| 131f | Application of Indicators ..... (3 cred.; prereq., Anal. Chem. 1 and 2 and Phys. Chem. 101, 102, 103) | | | | |
| | Lect. | Ar | Ar | ArC | Mr. Kolthoff |
| | Lab. | Ar | Ar | ArC | Mr. Kolthoff |
| 132w,s | Electrometric Titrations ..... (3 cred.; prereq., Anal. Chem. 1 and 2 and Phys. Chem. 101, 102, 103) | | | | |
| | Lect. | Ar | Ar | ArC | Mr. Kolthoff |
| | Lab. | Ar | Ar | ArC | |

## Organic Chemistry

| | | | | | |
|---|---|---|---|---|---|
| 1f-2w† | Elem. Organic Chemistry ..... (8 cred.; pre-dent., pre-med., prereq., Inorg. Chem. 11) | | | | |
| | Lect. (all secs.) | I | MWF | 100C | Mr. Lauer |
| | Lab. conference (all secs.) | II | Th | 225C | Mr. Lauer |
| | Quiz (all secs.) | I | Th | Ar | Ar |
| | Lab. Sec. 1 | I-IV | T | 390C | |
| | 2 | VI-IX | T | 390C | |
| | 3 | VI-IX | W | 390C | |
| 1w-2s† | Elem. Organic Chemistry ..... (See 1f-2w) | | | | |
| | Lect. | IV | MWF | 100C | Mr. Smith |
| | Lab. conference | IV | T | 100C | Mr. Smith |
| | Quiz | V | T | Ar | |
| | Lab. Sec. 1 | VI-IX | W | 390C | |
| | 2 | VI-IX | Th | 390C | |
| | 3 | I-IV | S | 390C | |
| 1s† | Elem. Organic Chemistry ..... (See 1f-2w) | For hours, see 1f-2w. | | | Mr. Lauer |

† Two quarters must be completed before credit is received for either quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 2f† | Elem. Organic Chemistry ..... (See 1f-2w) | For hours, see 1w-2s. | | | Mr. Smith |
| 51f-52w†-53s | Organic Chemistry ..... (10 or 15 cred.; jr., sr.; prereq., 15 cred. in college chem.) | | | | |
| | Lect. | III | MWF | 325C | Mr. Hunter |
| | Rec. 1 | III | Th | 111C | Mr. Lauer |
| | 2 | III | S | 111C | |
| | Lab. 1 | VII, VIII, IX | TTh(f) | 390C | Mr. Lauer |
| | | VI, VII, VIII | TTh(w,s) | | |
| | 2 | I, II, III | TTh | 390C | |
| 101f-102w-103s | Advanced Organic Chemistry... (3 cred. per qtr.; prereq., 53) | III | TThS | 325C | Mr. 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.) | | | | Mr. MacDougall |
| | Lect. | IV | MWF | 325C | |
| | Lab. | VI, VII, VIII | F | 190C | |
| | Rec. | IV | S | 115C | |
| 110f,w | Physical Chemistry (medic.).... (4 cred.; pre-med. and biol. students; prereq., Org. Chem. 2) | | | | |
| | Lect. | VI | TTh | 225C | Mr. Taylor |
| | | | F | 325C | |
| | Lab. Sec. 1 | I, II, III | MW | 190C | |
| | 2 | VII, VIII, IX | TTh | 190C | |
| 116f-117w-118s | Adv. Physical Chem. ..... (9 or 12 cred.; jr., sr., grad.; prereq., 103 and calculus) | Ar | Ar | Ar | Ar |
| 129s | Prin. of Colloidal Chemistry.. (2 cred.; sr., grad.; prereq., 102) | Ar | Ar | ArC | Mr. Reyerson |
| 130 | *Appl. of Colloidal Chemistry* ... (2 cred.; sr., grad.; prereq., 102) | *Not offered* | | | |
| 131f-132w-133s | Colloid Chemistry Lab. ..... (Cred. ar.; sr., grad.; prereq., 129 or 130) | Ar | Ar | Ar | Mr. Reyerson |
| 144s | Magnetochemistry ..... (3 cred.; jr., sr., grad.; prereq., 103) | Ar | Ar | Ar | Mr. Taylor |
| 161f-162w | Radioactivity ..... (2 cred. per qtr.; jr., sr., grad.; prereq., Phys. Chem. 103) | Ar | Ar | Ar | Mr. Lind |
| 164f,w,s | Radioactivity Laboratory ..... (Must be preceded or accompanied by 161) | Ar | Ar | Ar | Mr. Lind |

## Technological Chemistry

| | | | | | |
|---|---|---|---|---|---|
| 100f-101w-102s | Food Analysis ..... (9 cred.; jr., sr., grad.; prereq., Anal. Chem. 1-2) | | | | |
| | Lect. | Ar | Ar | Ar | Mr. Stoppel |
| | Lab. | VI, VII, VIII | TF | 217C | Mr. Stoppel |

† Two quarters must be completed before credit is received for either quarter.

## 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 | Mrs. 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 | Miss McGinnis |
| 80f | Child Psychology ..... (3 cred.; jr., sr.; prereq., Psy. 1-2) | I | MWF | 202OLa | Miss Shirley |
| 90w | Physical Development of the Young Child ..... (2 cred.; jr., sr.; prereq., Zool. 1-2, Psy. 1-2) | V | T and ar | 202OLa | Miss 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 | Miss Boyd |
| 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 | Mr. 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<br>VI, VII | M<br>WF | 202OLa | Miss 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 | Miss McGinnis |
| 173w-174s† | Technique and Practice of Parental Education ..... (6 cred.; sr., grad.; prereq., 170, and permission of instructor) | Ar | Ar | 204OLa | Miss 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) | III | TTh | 202OLa | Miss Goodenough |

* Offered fall and spring 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 either quarter.

## 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 | Mr. Firkins |
| 105f-106w-107s† | Criticism ..... (9 cred.; jr., sr., grad.; prereq., jr. coll. requirement in Eng. and foreign lang.) | VI | MWF | 113F | Mr. Firkins |
| 110w | Romantic Movement ..... (3 cred.; jr., sr., grad.; prereq., permission of instructor) | II | TThS | 113F | Mr. Firkins |
| 111s | The Novel in Europe, 1875-1925 (3 cred.; jr., sr., grad.; prereq., jr. coll. requirement in Eng. and foreign lang.) | II | MWF | 113F | Mr. Firkins |

## COMPARATIVE PHILOLOGY

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 101f-102w† | Science of Language..... (4 cred.; jr., sr., grad.; prereq., see note) | Ar | Ar | Ar | Mr. Klaeber |
| 103f | Universal Language ..... (2 cred.; jr., sr., grad.; prereq., see note) | Ar | Ar | Ar | Mr. Klaeber |
| 105s | Life of Words..... (2 cred.; jr., sr., grad.; prereq., see note) | VI | TTh | 205F | Mr. Klaeber |
| 108s | Comparative Phonetics ..... (3 cred.; jr., sr., grad.; prereq., see note) | III | MWF | 209½ | Mr. Kroesch |
| *109-110-111†* | *History of German Lang.* ..... (6 cred.; jr., sr., grad.; prereq., see note) | *Not offered* | | | |
| 141f-142w-143s† | Hist. Gram. of Eng. Lang..... (6 cred.; jr., sr., grad.; prereq., see note) | Ar | Ar | Ar | Mr. Klaeber |

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 | | |

† The entire course must be completed before credit is received for any quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 44f,w,s | Lettering ..... (1 cred.; all; no prereq.) | | | | |
| | Sec. 1 | IV | T | 36EE | Mr. Schuck, |
| | 2 | II | Th | 237EE | Mr. Levens |
| 45f,w,s | Alphabets ..... (2 cred.; soph., jr., sr.; no prereq.) | II | TTh | 206E | Mr. Kirchner |
| 61f,w | Projections ..... (2 cred.; soph.; prereq., Math. 3 or 5) | | | | |
| | Lect. | III | Th | 335EE | Mr. Kirchner, |
| | Lab.‡ | | | | Mr. Myers |
| 62w | Shades and Shadows ..... (2 cred.; prereq., 61) | | | | |
| | Lect. | III | Th | 335EE | Mr. Kirchner, |
| | Lab.‡ | | | | Mr. Myers |
| 63s | Perspective ..... (2 cred.; prereq., 61) | | | | |
| | Lect. | III | Th | 335EE | Mr. Kirchner, |
| | Lab.‡ | | | | Mr. Myers |
| 64f | The Graphic Arts: Introduction.. (2 cred.; jr., sr.; prereq., 15 cred. of econ.) | IV | MW | 5E | Mr. Kirchner |
| 65w | The Graphic Arts: Printing and Layouts ..... (2 cred.; jr., sr.; prereq., 15 cred. of econ.) | IV | MW | 5E | Mr. Kirchner |
| 66s | The Graphic Arts: Processes.... (2 cred.; jr., sr.; prereq., 15 cred. of econ.) | IV | MW | 5E | Mr. Kirchner |

## ECONOMICS

### SCHOOL OF BUSINESS ADMINISTRATION

*Major Advisers*

Professor Garver; Assistant Professor Myers.

*Major Sequence*

Prerequisites: 3, 6-7; or 1A, 1B, 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.

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;

‡ Consult bulletin of the College of Engineering and Architecture.

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; 195, Colonization; 107, Recent Social Legislation; 109, Government and Business; 111, Law of Public Utilities.

*Honors Course*

An Honors Course will be offered for the first time in 1931-32. This course will be open to seniors. Admission will be granted only to a student whose previous record demonstrates his ability to carry on independent study in the field of economics. Applications for this course should be made to one of the major advisers.

| No. | Title | | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|---|
| 1Af | Business Organization: Production ..... (5 cred.; fr. only; no prereq.) | | | | | |
| | | Lect. | IV | T | OLAud | Mr. Stevenson, |
| | | Sec. 1 | I | MWFS | 3F | Mr. Borak |
| | | 2 | I | MWFS | 206P | and others |
| | | 3 | II | MWFS | 3F | |
| | | 4 | II | MWFS | 206P | |
| | | 5 | III | MWFS | 3F | |
| | | 6 | III | MWFS | 6F | |
| | | 7 | IV | MWFS | 3F | |
| | | 8 | IV | MWFS | 110P | |
| | | 9 | V | MTWF | 109B | |
| | | 10 | V | MTWF | 6B | |
| | | 11 | VI | MWThF | 3F | |
| | | 12 | VI | MWThF | 202B | |
| | | 13 | VII | MWThF | 303B | |
| | | 14 | VIII | MWThF | 6B | |
| 1Aw | Business Organization: Production ..... (See 1Af) | | | | | |
| | | Lect. | IV | T | 166Ph | Mr. Stevenson, |
| | | Sec. 1 | II | MWFS | 3F | Mr. Borak, |
| | | 2 | III | MWFS | 206P | and others |
| | | 3 | V | MTWF | 202B | |
| | | 4 | VII | MWThF | 303B | |
| 1Bf | Business Organization: Marketing (5 cred.; fr. only; no prereq.) | | IV | MTWFS | 102B | Mr. Vaile and others |
| 1Bw | Business Organization: Marketing (See 1Bf) | | | | | |
| | | Lect. | IV | TS | OLAud | Mr. Vaile |
| | | Sec. 1 | I | MWF | 6B | and others |
| | | 2 | I | TThS | 303B | |
| | | 3 | II | MWF | 109B | |
| | | 4 | II | TThS | 206P | |
| | | 5 | III | MWF | 20Ph | |
| | | 6 | III | TThS | 303B | |
| | | 7 | IV | MWF | 206P | |
| | | 8 | IV | MWF | 3F | |
| | | 9 | V | MWF | 209B | |
| | | 10 | VI | MWF | 206P | |
| | | 11 | VI | MWF | 206OLa | |
| | | 12 | VII | MWF | 110P | |

| No. | Title | | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|---|
| 1Bs | Business Organization: Marketing (See 1Bf) | | | | | |
| | | Lect. | IV | TS | 301F | Mr. Vaile and others |
| | | Sec. 1 | II | MWF | 209B | |
| | | 2 | IV | MWF | 6B | |
| | | 3 | V | MWF | 6B | |
| | | 4 | VI | MWF | 206P | |
| 3w | The Mechanism of Exchange... (5 cred.; 3rd qtr. fr., soph., jr., sr.; no prereq.) | | | | | Mr. Stehman and others |
| | | Lect. | III | TTh | 150Ph | |
| | | Sec. 1 | I | TThS | 6B | |
| | | 2 | II | MWF | 209B | |
| | | 3 | III | MWF | 3F | |
| | | 4 | IV | MWF | 105F | |
| | | 5 | V | MWF | 6B | |
| | | 6 | VI | MWF | 209B | |
| | | 7 | VII | MWF | 209B | |
| 3s | The Mechanism of Exchange... (See 3w) | | | | | Mr. Stehman and others |
| | | Lect. | III | TTh | OLAud | |
| | | Sec. 1 | I | MWF | 3F | |
| | | 2 | I | TThS | 102B | |
| | | 3 | II | MWF | 202B | |
| | | 4 | II | TThS | 202B | |
| | | 5 | III | MWF | 209B | |
| | | 6 | IV | MWF | 202B | |
| | | 7 | IV | MWF | 206P | |
| | | 8 | V | MWF | 202B | |
| | | 9 | V | MWF | 209B | |
| | | 10 | VI | MWF | 209B | |
| | | 11 | VI | MWF | 109B | |
| | | 12 | VII | MWF | 209B | |
| | | 13 | VII | MWF | 202B | |
| | | 14 | VIII | MWF | 202B | |
| 4f | Principles of Economics..... (5 cred.; soph.; prereq., 1A, 1B and 3) | | | | | Mr. Hansen and others |
| | | Lect. | II | Th | OPhAud | |
| | | Sec. 1 | I | TThFS | 9F | |
| | | 2 | II | MWFS | 109B | |
| | | 3 | III | TThFS | 5F | |
| | | 4 | IV | MWFS | 104OPh | |
| | | 5 | V | MTWF | 209B | |
| | | 6 | VII | MWThF | 109B | |
| 4w | Principles of Economics..... (See 4f) | | III | MTWFS | 6B | Mr. Hansen and others |
| 4s | Principles of Economics..... (See 4f) | | | | | Mr. Hansen and others |
| | | Lect. | II | Th | 301F | |
| | | Sec. 1 | II | MWFS | 2F | |
| | | 2 | IV | MWFS | 111OL | |
| | | 3 | V | MTWF | 102B | |
| | | 4 | VI | MWThF | 104OPh | |

| No. | Title | | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|---|
| 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) | | | | | Mr. Hansen and others |
| | | Lect. | III | W | OPhAud | |
| | | Sec. 1 | I | TThFS | 5F | |
| | | 2 | II | MWFS | 15F | |
| | | 3 | IV | MWFS | 5F | |
| | | 4 | V | MTWF | 102B | |
| | | 5 | VI | MWThF | 6B | |
| | | 6 | VII | MWThF | 6B | |
| 6w-7s† | Principles of Economics—General Course ..... (See 6f-7w) | | | | | Mr. Hansen and others |
| | | Lect. | II | T | OPhAud | |
| | | Sec. 1 | I | TThFS | 9F | |
| | | 2 | II | MWFS | 5F | |
| | | 3 | IV | MWFS | 303B | |
| | | 4 | V | MTWF | 109B | |
| | | 5 | VI | MWThF | 102B | |
| 7f† | Principles of Economics—General Course ..... (2nd qtr. of 6-7. See 6f-7w) | | VI | MTWThF | 109B | Mr. Hansen and others |
| 14f‡ | Elements of Statistics ..... (5 cred.; soph., jr., sr.; prereq., 4 or 6-7) | | | | | Mr. Mudgett and others |
| | | Sec. 1 | I | MWThFS | 6B | |
| | | 2 | III | MTWFS | 109B | |
| | | 3 | IV | MTWFS | 6B | |
| | | 4 | VI | MTWThF | 303B | |
| 14w‡ | Elements of Statistics ..... (See 14f) | | | | | Mr. Mudgett and others |
| | | Sec. 1 | III | MTWFS | 109B | |
| | | 2 | IV | MTWFS | 302B | |
| | | 3 | VI | MTWThF | 109B | |
| | | 4 | VII | MTWThF | 301B | |
| 14s‡ | Elements of Statistics ..... (See 14f) | | | | | Mr. Mudgett and others |
| | | Sec. 1 | I | MWThFS | 6B | |
| | | 2 | II | MWThFS | 109B | |
| | | 3 | III | MTWFS | 6B | |
| | | 4 | III | MTWFS | 109B | |
| | | 5 | IV | MTWFS | 302B | |
| | | 6 | VI | MTWThF | 303B | |
| | | 7 | VII | MTWThF | 303B | |

† The entire course must be completed before credit is received for any quarter.
‡ No student may receive credit for both Economics 14 and Sociology 45.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 20f* | Elements of Accounting ..... (3 cred.; 3rd qtr. fr., soph.; no prereq.) | | | | Mr. Heilman and others |
| | Sec. 1 | I | MWF | 303B | |
| | 2 | I | TThS | 301B | |
| | 3 | II | MWF | 303B | |
| | 4 | II | TThS | 302B | |
| | 5 | III | TThS | 302B | |
| | 6 | III | TThS | 301B | |
| | 7 | IV | MWF | 302B | |
| | 8 | V | MWF | 302B | |
| | 9 | VI | MWF | 301B | |
| 20w* | Elements of Accounting ..... (See 20f) | | | | Mr. Heilman and others |
| | Sec. 1 | III | TThS | 302B | |
| | 2 | III | MWF | 302B | |
| | 3 | VI | MWF | 303B | |
| 20s* | Elements of Accounting ..... (See 20f) | | | | Mr. Heilman and others |
| | Sec. 1 | I | MWF | 301B | |
| | 2 | II | MWF | 302B | |
| | 3 | III | TThS | 302B | |
| | 4 | VI | MWF | 302B | |
| 25f-26w†¶ | Principles of Accounting ..... (6 cred.; soph., jr., sr.; prereq., 20) | | | | Mr. Heilman and others |
| | Sec. 1 | I | MWF | 301B | |
| | 2 | II | MWF | 302B | |
| | 3 | VI | MWF | 302B | |
| 25w-26s†¶ | Principles of Accounting ..... (See 25f-26w) | | | | Mr. Heilman and others |
| | Sec. 1 | I | MWF | 302B | |
| | 2 | I | TThS | 302B | |
| | 3 | II | MWF | 301B | |
| | 4 | II | TThS | 301B | |
| | 5 | III | MWF | 301B | |
| | 6 | IV | MWF | 301B | |
| | 7 | VI | MWF | 301B | |
| 25s†¶ | Principles of Accounting ..... (1st qtr. of 25-26. See 25f-26w) | | | | Mr. Heilman and others |
| | Sec. 1 | II | MWF | 303B | |
| | 2 | III | TThS | 303B | |
| 26f†¶ | Principles of Accounting ..... (2nd qtr. of 25-26. See 25f-26w) | | | | Mr. Heilman and others |
| | Sec. 1 | II | TThS | 303B | |
| | 2 | III | MWF | 301B | |
| 32f§-33w-34s†‡ | Secretarial Training: Typewriting (3 cred.; 3rd qtr. fresh., soph., jr.; no prereq.) | III<br>V | TThS<br>MW | <br>1B | Miss Donaldson |
| 32s§* | Secretarial Training: Typewriting (1st qtr. of 32-33-34. See 32f-33w-34s) | IV | MTWFS | 1B | Miss Donaldson |

* Students who have had high school training or other experience in bookkeeping and who pass the placement test may be exempted from this course and admitted to Economics 25.

† 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.

‡ Open for credit to pre-secretarial and pre-commercial education students only.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 33f* | Secretarial Training: Typewriting (2nd qtr 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-38w-39s*† | Secretarial Training: Shorthand (9 cred.; soph., jr.; prereq., 32) | | | | |
| | Rec. | II | TThS | 1B | Miss Donaldson |
| | Lab. Sec. 1 | II | MWF | 1B | |
| | 2 | III | MWF | 1B | |
| 40f-41w-42s*† | Secretarial Training: Dictation.. (9 cred.; soph., jr., sr.; prereq., 39) | | | | |
| | Rec. | I | MWF | 213B | |
| | Lab. | VII | TThF | 1B | Miss Donaldson |
| 54f¶ | Accounting Survey I ..... (3 cred.; jr., sr.; prereq., 4 or 6-7) | III | TThS | 213B | Mr. Heilman and others |
| 55w¶ | Accounting Survey II ..... (3 cred.; jr., sr.; prereq., 54) | III | TThS | 213B | Mr. Heilman and others |
| 85w¶ | Economics of Marketing ..... (3 cred.; jr., sr.; prereq., 4 or 6-7) | I | TThS | 102B | Mr. 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 | Mr. Garver |
| *105* | *History of Economic Ideas (The Classical Economists)* ..... (3 cred.; jr., sr., grad.; prereq., 101-102 or 103-104 or consent of instructor) | *Not offered* | | | |
| 106s | History of Economic Ideas (The Critics of the Classical Economists) ..... (3 cred.; jr., sr., grad.; prereq., 101-102 or 103-104 or consent of instructor) | VII | MWF | 102B | Mr. Hansen |
| *108* | *Marketing Organization: Agricultural Products* ..... (3 cred.; jr., sr., grad.; prereq., 85. Not open to agr. bus. students) | *Not offered* | | | |
| 113w-114s | Theory of Statistics ..... (6 cred.; jr., sr.. grad.; prereq., 14) | I | MWF | 102B | Mr. Mudgett |
| 124f | Comparative Banking, British Systems ..... (3 cred.; jr., sr., grad.; prereq., 141) | III | MWF | 213B | Mr. Myers |

* 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.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 125w | Comparative Banking, European Systems ..... (3 cred.; jr., sr., grad.; prereq., 141) | III | MWF | 213B | Mr. Myers |
| 127s | Comparative Banking, South American Systems ..... (3 cred.; jr., sr., grad.; prereq., 141) | II | MWF | 213B | Mr. Myers |
| 141f | Monetary and Banking Policy... (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7) | I | MWF | 102B | Mr. Marget, Mr. Myers |
| 141w | Monetary and Banking Policy... (See 141f) | I | MWF | 209B | Mr. Marget, Mr. Myers |
| 141s | Monetary and Banking Policy... (See 141f) | VI | MWF | 6B | Mr. Marget, Mr. Myers |
| 149f | Business Cycles ..... (3 cred.; sr., grad.; prereq., 141) | I | TThS | | Mr. Marget |
| 149w | Business Cycles ..... (See 149f) | | | | |
| | Sec. 1 | I | MWF | 109B | Mr. Marget, |
| | 2 | VII | MWF | 102B | Mr. Myers |
| 149s | Business Cycles ..... (See 149f) | III | MWF | 102B | Mr. Myers |
| 154s | Public Utilities ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Econ. 4 or 6-7) | III | TThS | 102B | Mr. Garver |
| 160w‡ | The Modern Corporation ..... (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7) | IV | MWF | 102B | Mr. 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 | Mr. Hansen |
| 161w | Labor Problems and Trade Unionism ..... (See 161f) | III | TThS | 209B | Mr. Stead |
| 161s | Labor Problems and Trade Unionism ..... (See 161f) | III | TThS | 202B | Mr. Hansen |
| 162w | Labor Movements ..... (3 cred.; jr., sr., grad.; prereq., 161) | IV | MWF | 202B | Mr. Hansen |
| 163w | Economic Aspects of Population and Immigration ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7) | III | TThS | 202B | Mr. Hansen |
| 164s | Labor Legislation and Social Insurance ..... (3 cred.; jr., sr., grad.; prereq., 161) | III | TThS | 209B | Mr. Stead |

‡ Not open to School of Business Administration students.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 166f | Contemporary Economic Problems (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7) | VII | MWF | 102B | Mr. Hansen |
| 172f* | Economics of Transportation... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7) | VIII | MWF | 102B | Mr. Butterbaugh |
| 176f | Commercial Policies ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7) | I | MWF | 202B | Mr. Blakey |
| 176s | Commercial Policies ..... (See 176f) | I | MWF | 202B | Mr. 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 | Mr. Blakey |
| 193s | State and Local Taxation ..... (3 cred.; jr., sr., grad.; prereq., 191-192) | III | MWF | 213B | Mr. 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, 141-142-143, 160.
Group B. Courses 81-82, 100, 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 105-106, 107-108, 126-127, 162.
Group E. Courses 58-59, 69, 109-110, 123-124-125, 126-127, 129, 150, 151.
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.

§ For a teacher's certificate, Course 22-23 is required.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| Af-Bw-Cs | Freshman English ..... | See Composition | | | |
| 21f-22w-23s* | Introducton to Literature ..... (15 cred.; all; prereq.§) | | | | |
| | Sec. 1 | III | MTWFS | 301F(f), 206OL(w), 133Ph(s) | Mr. Hessler |
| | 2 | VI | MTWThF | 301F | Miss Jackson |
| 31f-32w† | The English Novel ..... (6 cred.; all; prereq.§) | VII | MWF | 301F | Mr. Hillhouse |
| 33s | The Later English Novel..... (3 cred.; soph., jr., sr.; prereq.§) | VII | MWF | OPhAud | Mr. Beach |
| 40s | The Bible As Literature..... (3 cred.; soph., jr., sr.; prereq., §) | II | MWF | 301F | Mr. Powell |
| 51w | Spenser ..... (3 cred.; jr., sr.; prereq., 21-22 or 55-56) | VI | MTWF | 204F | Mr. Stoll |
| 53f | Seventeenth-Century Lyrists .... (4 cred.; jr., sr.; prereq., 21-22 or 55-56) | IV | MTWF | 204F | Mr. Moore |
| 55f-56w† | Shakespeare ..... (6 cred.; jr., sr.; prereq.‡) | | | | |
| | Sec. 1 | I | TThS | 205F | Mr. Bush, Miss Carr |
| | 2 | VI | MWF | 305F | Mr. Dunn |
| | 3 | VII | MWF | 305F | Miss Jackson |
| 55w-56s† | Shakespeare ..... (See 55f-56w) | | | | |
| | Sec. 1 | VI | MWF | 303F | Miss Atkins |
| | 2 | IV | MWF | 204F | Mr. Dunn, Mr. Hillhouse |
| 55s† | Shakespeare ..... (First qtr. of 55-56. See 55f-56w) | VI | MWF | 204F | Mr. Bush |
| 58f-59w† | Nineteenth-Century Prose ..... (6 cred.; jr., sr.; prereq., C or 23, or 31-32) | II | TThS | 204F | Mr. 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 | Mr. Stoll |
| 62s | Milton ..... (See 62f) | VII | MTWF | 205F | Mr. 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; the second and third quarters are required 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 | Mr. Hessler |
| 73f-74w† | American Literature ..... (6 cred.; jr., sr.; prereq.‡) | IV | MWF | 301F | Mr. McDowell, Mr. Nichols |
| 75f | Chaucer ..... (4 cred.; jr., sr.; prereq.‡) | | | | |
| | Sec. 1 | II | MTWF | 205F | Miss Carr |
| | 2 | V | MTWF | 204F | Mr. Hillhouse |
| 75s | Chaucer ..... (See 75f) | | | | |
| | Sec. 1 | II | MTWF | 205F | Mr. Dunn |
| | 2 | V | MTWF | 204F | Miss Carr |
| 77f-78w† | Classic Myths and the Classic Tradition in English Poetry.. (6 cred.; jr., sr.; prereq.‡) | III | MWF | 306F | Mr. Bush |
| *81-82†* | *Survey of Middle English*..... (6 cred.; jr., sr.; prereq.‡) | *Not offered* | | | |
| 100f | Old English ..... (4 cred.; jr., sr., grad.; prereq., 8 cred. above 50) | III | TThFS | 205F | Mr. Klaeber |
| *105-106†* | *Eighteenth-Century Poetry* ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50) | *Not offered* | | | |
| 107w-108s† | Eighteenth-Century Prose ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50) | VII | MWF | 204F | Mr. Moore |
| 109f-110w† | Romantic Poets ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50) | III | TThS | 204F | Mr. Beach |
| *111-112†* | *Seventeenth-Century Prose* ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50) | *Not offered* | | | |
| 123f-124w-125s† | Technique of the Novel ..... (9 cred.; sr., grad.; prereq., 8 credits above 50 and permission of instructor) | 4:00 to 6:00 | T | 205F | Mr. Beach |
| 126w-127s† | Drama, 1660-1880 ..... (6 cred., jr., sr., grad.; prereq., 8 credits above 50) | III | TThS | 205F | Mr. Hillhouse, Mr. Nichols |
| 129s | Modern Drama ..... (4 cred.; jr., sr., grad.; prereq., 55-56) | II | MTWF | 204F | Mr. Stoll |
| *133* | *Ballads* ..... (3 cred.; jr., sr., grad.; prereq., 8 credits above 50) | *Not offered* | | | |
| 136s | Advanced Shakespeare ..... (4 cred.; jr., sr., grad.; prereq., 55-56) | I | MTWF | 204F | Mr. Stoll |
| 140s | Advanced Chaucer ..... (4 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 75) | II | MTWF | 302F | Miss Carr |

† 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.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 141f-142w-143s† | Historical Grammar ..... (6 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 75 or 81-82) | Ar | Ar | Ar | Mr. Klaeber |
| 146f-147w† | Metrical Romances ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 75 or 81-82) | III | MWF | 204F | Miss Carr |
| *148-149†* | *Arthurian Romances* ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 75 or 81-82) | *Not offered* | | | |
| 150f | Victorian Poetry ..... (4 cred.; jr., sr., grad.; prereq., 8 credits above 50) | VI | MTWF | 205F | Mr. Stoll |
| 151s | Recent Poetry ..... (4 cred.; jr., sr., grad.; prereq., 8 credits above 50) | III | TWThF | 204F | Mr. Beach |
| *152-153†* | *Pre-Elizabethan Drama* ..... (6 cred.; jr., sr., grad.; prereq., 55-56) | *Not offered* | | | |
| 154w-155s† | American Novel ..... (6 cred.; jr., sr., grad.; prereq., 73-74) | VI | MWF | 205F | Mr. McDowell |
| 156f | The American Drama ..... (3 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 73-74) | IV | MWF | 303F | Mr. Nichols |
| 157w-158s† | Elizabethan Non-Dramatic Literature ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 51 or 70 or 55-56) | IV | MWF | 205F | Mr. Bush |
| *159* | *Colonial Literature in America..* (3 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 73-74) | *Not offered* | | | |
| 160w | History of English Language.... (2 cred.; jr., sr., grad.; prereq., 100) | VI | TTh | 205F | Mr. Klaeber |
| *162* | *Restoration Literature* ..... (4 cred.; jr., sr., grad.; prereq., 8 credits above 50) | *Not offered* | | | |
| 164s | Dante in English ..... (See Italian 164s) | | | | Mr. Brackney |
| 171f-172w-173s | Honors Course ..... (Credits arranged; prereq., permission of the department) | Ar | Ar | Ar | Mr. Dunn, Mr. McDowell, Mrs. Phelan, Miss Carr, Mr. Nichols |

† 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 65 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. 45) 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 in another college should consult the director of the course before registering.

Any student who receives an A in composition in Course A-B-C is exempted from any further requirement in English.

Any student who receives a B in any quarter of Course 4-5-6 may at his option elect the following quarter of Course A-B-C.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| Af-Bw-Cs | Freshman English ..... | I | MWThFS | Ar | Ar |
| | (15 cred.; all; prereq., placement test) | 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 ..... | II | MWThFS | Ar | Ar |
| | (2 qtrs. of A-B-C. See Af-Bw-Cs) | IV | MTWFS | | |
| | | VI | MTWThF | | |
| Cf | Freshman English ..... | II | MWThFS | Ar | Ar |
| | (3rd qtr. of A-B-C. See Af-Bw-Cs) | IV | MTWFS | | |
| | | VI | MTWThF | | |
| 4f-5w-6s | Freshman Composition ..... | | | | |
| | (9 cred.; all; prereq., placement test) | | | | |
| | Sec. 1 | I | MWF | Ar | Ar |
| | 2 | II | MWF | | |
| | 3 | II | TThS | | |
| | 4 | III | MWF | | |
| | 5 | III | TThS | | |
| | 6 | IV | MWF | | |
| | 7 | V | MWF | | |
| | 8 | VI | MWF | | |
| | 9 | VII | MWF | | |

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 4w-5s | Freshman Composition ..... (2 qtrs. of 4-5-6. See 4f-5w-6s) | | | | |
| | Sec. 1 | II | TThS | | |
| | 2 | V | MWF | | |
| | 3 | V | MWF | | |
| 4s | Freshman Composition ..... (First qtr. of 4-5-6. See 4f-5w-6s. For those only who have passed subfresh.) | Ar | Ar | Ar | |
| 5f-6w | Freshman Composition ..... (2 qtrs. of 4-5-6. See 4f-5w-6s) | III | TThS | 302F | Ar |
| 6f | Freshman Composition ..... (3rd qtr. of 4-5-6. See 4f-5w-6s) | II | MWF | 311F | Ar |
| 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 | Miss Atkins |
| | 3 | IV | MWF | 213F | Miss Armstrong |
| | 4 | IV | MWF | 302F | Mrs. McFadyen |
| | 5 | V | MWF | 304F | Miss Atkins |
| | 6 | II | TThS | 304F | Miss Gable |
| | 7 | III | TThS | 304F | Mr. Hessler |
| 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) | | | | |
| | Sec. 1 | II | MWF | 108F | Mrs. del Plaine |
| | 2 | V | MWF | 302F | Mrs. McFadyen |
| 18f-19w†‡ | Types of Writing ..... (6 cred.; soph., jr., sr.; prereq., A-B-C or 4-5-6 or exemption from requirement) | | | | |
| | Sec. 1 | I | MWF | 304F | Mr. Briggs |
| | 2 | III | MWF | 305F | Miss Armstrong |
| | 3 | V | MWF | 303F | Mrs. McFadyen |
| 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 | Mr. Nichols |
| | 2 | III | MWF | 302F | Mrs. del Plaine |
| | 3 | V | MWF | 304F | Miss Atkins |
| | 4 | III | TThS | 306F | Miss Gable |

† 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.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 31w | Technical Writing ..... | Consult College of Engineering bulletin | | | |
| 65s¶ | Source Materials: Shakespeare's England (or similar field).... (3 cred.; soph., jr., sr.; prereq., A-B-C, or 4-5-6 and 6 additional credits, or 10 credits in Eng. 21-22-23) | III | MWF | 306F | Mr. Hillhouse |
| 67f-68w†¶ | Imitative Writing ..... (6 cred.; jr., sr., not open to sophomores; prereq., average of B in two quarters of either 11-12, 20 or 65, or 18-19, 10 or 20) | IV | MWF | 304F | Mrs. del Plaine |
| 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, 20 or 65, or 18-19, 10 or 20) | VIII, IX | W | 304F | Mrs. Phelan |
| *86-87* | *Forms of English Verse*..... (6 cred.; jr., sr.; prereq., Eng. A-B-C or Comp. 4-5-6, and 6 additional credits, or 10 credits in 21-22-23) | *Not offered* | | | |
| 111f-112w-113s¶ | Essay Writing ..... (9 cred.; jr., sr., grad.; prereq., 11-12, or 18-19, and 20 or 65) | III | MWF | 304F | Mr. 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 | Mrs. Phelan |

## THE FINE ARTS

### *Major Adviser*

Assistant Professor Upjohn.

### *Major Sequence*

Prerequisites: Courses 1, 2, 3, 5, Architecture 21-22-23, and either History 1-2 or History 11-12-13.

A. History of Fine Arts. Courses 51, 52, 53, 54, 55, Architecture 27-28-29 or 87-88-89, Psychology 72, and 8 credits from the following related courses: Philosophy 103, Music 106-107-108, History 103, 105, 119, 120, 131-132, 133, 134.

B. Drawing and Painting. Architecture 27-28-29, 70, and 87-88-89 or 121-122-123; 9 credits from Courses 51 to 55, and 5 credits in the related courses listed in Sequence A.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f | History of Ancient Art ..... (3 cred.; all; no prereq.) | III | TThS | OPhAud | Mr. Upjohn |
| 2w | History of Architecture and Sculpture ..... (3 cred.; all; no prereq.) | III | TThS | OPhAud | Mr. Upjohn |
| 3s | History of Painting ..... (3 cred.; all; no prereq.) | III<br>IV | TThS<br>S* | OPhAud | Mr. Upjohn |

† 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 rules does not apply to Course 69-70-71.

* The fourth hour Saturday should be reserved for field trips.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 51 | Principles of the Fine Arts..... (3 cred.; all; no prereq.) | III | MWF | 124F | Mr. Upjohn |
| 40 | European Study ..... (3 cred.; all; prereq., permission of chairman) | Consult department | | | |
| 51w | Medieval Art ..... (3 cred.; jr., sr.; prereq., 1 and 2 and 10 cred. in approved courses in hist. or lit., or permission of instructor) | III | MWF | 124F | Mr. Upjohn |
| 52s | The Art of the Italian Renaissance ..... (3 cred.; jr., sr.; prereq., 2 and 3 and 10 cred. in approved courses in hist. or lit., or by permission of instructor) | III | MWF | 124F | Mr. Upjohn |
| 53 | *The Art of the Seventeenth Century* ..... (3 cred.; jr., sr.; prereq., as for 52) | *Not offered* | | | 2 |
| 54 | *The Art of the Eighteenth Century* ..... (3 cred.; jr., sr.; prereq., as for 52) | *Not offered* | | | |
| 55 | *The Art of the Nineteenth Century* ..... (3 cred.; jr., sr.; prereq., as for 52) | *Not offered* | | | |

## 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 53, 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.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f-2w† | Introduction to Human Geography ..... (10 cred.; fr.; no prereq.) | | | | |
| | Lect. | II | MWF | OLAud | Mr. Davis |
| | Sec. 1 | V | TTh | 103OL | |
| | 2 | VI | TTh | 103OL | |
| | 3 | VII | TTh | 103OL | |
| | 4 | VI | WF | 103OL | |
| | 5 | VII | WF | 103OL | |

† The entire course must be completed before credit is received for any quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 11f | Human Geography ..... (5 cred.; 3rd qtr. fr., soph., jr., sr.; no prereq.) | III | MTWFS | 103OL | Mr. Brown |
| 11w | Human Geography ..... (See 11f) | III | MTWFS | 103OL | Mr. Brown |
| 11s | Human Geography ..... (See 11f) | | | | |
| | Sec. 1 | I | MWThFS | 103OL | Mr. Dicken |
| | 2 | II | MWThFS | 103OL | Mr. Davis |
| | 3 | IV | MTWFS | 103OL | Mr. Brown |
| 41f | Geography of Commercial Production ..... (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 | Mr. Hartshorne |
| 41w | Geography of Commercial Production ..... (See 41f) | IV | MTWFS | 103OL | Mr. Hartshorne |
| 41s | Geography of Commercial Production ..... (See 41f) | III | MTWFS | 103OL | Mr. Hartshorne |
| 43f | Political Geography ..... (5 cred.; soph., jr., sr.; prereq., 1-2, or 11, or 41, or 10 cred. in hist. or pol. sci.) | II | MWThFS | 103OL | Mr. Hartshorne |
| 43s | Political Geography ..... (See 43f) | VI | MTWThF | 103OL | Mr. Hartshorne |
| 53f | Historical Geography ..... (3 cred.; jr., sr.; prereq., 11, or 15 cred. in hist.) | I | MWF | 103OL | Mr. Brown |
| 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.) | I | TThS | 103OL | Mr. Dicken |
| 101s | Geography of Europe ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in geog.) | III | TThS | 105OL | Mr. Dicken |
| 102w | Trade Routes and Trade Centers (3 cred.; jr., sr., grad.; prereq., 41) | II | TThS | 103OL | Mr. Hartshorne |
| 110s | Geography of South America.... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. to incl. 11 or 41) | I | TThS | 105OL | Mr. Brown |
| *111* | *Cartography* ..... (3 cred.; jr., sr., grad.; prereq., 10 cred. in sen. col. work in geog., geol., hist., or other subject in which the use of maps is necessary) | *Not offered* | | | |
| 120w | Geography of Asia ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. to incl. 11 or 41) | III | MWF | 105OL | Mr. Davis |

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 133w | Climatology ..... (3 cred.; jr., sr., grad.; prereq., 11) | I | MWF | 105OL | Mr. Brown |

NOTE.—The Courses 235, 241, 251, 252, 253 and 301, 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 at least two quarters of chemistry. Civil Engineering 9 and 10 are also required. (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, 101, 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., soph., jr., sr.; no prereq.) | | | | |
| | Lect. | I | WThFS | 210P | Mr. Thiel |
| | Lab. Sec. 1 | I, II | M | 212P | |
| | | II | WF | | |
| | Lab. Sec. 2 | VI, VII | MW | 212P | |
| 1f-3w*† | General Geology (Dynamic and Economic) ..... (10 cred.; fr., soph., ir., sr.; no prereq.) | | | | |
| | Lect. | III | TThFS | 110P | Mr. Emmons |
| | Lab. | III, IV or VI, VII | MW<br>TTh | 212P(fall), | 100P(winter) |

* 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 by Course 2.

¶ Girls may take trip only when there are enough for a separate section. They should consult a major adviser.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1w-2s*† | General Geology (Dynamic and Historical) ..... (See 1f-2w) | | | | |
| | Lect. | IV | MTWF | 110P | Mr. Dutton |
| | Lab. | VI, VII | WF | 212P | |
| 1w-3s*† | General Geology (Dynamic and Economic) ..... (See 1f-3w) | | | | |
| | Lect. | II | MWFS | 110P | Mr. Emmons |
| | Lab. | I, II | TTh | 212P | Mr. Matheson |
| 1s*† | General Geology (Dynamic and Historical or Economic)..... (First qtr. of 1-2 or 1-3. See 1f-2w) | | | | |
| | Lect. | III | MWThF | 110P | Mr. Park |
| | Lab. | III, IV | TS | 212P | |
| 2f*† | General Geology (Dynamic and Historical) ..... (2nd qtr. of 1-2. See 1f-2w) | | | | |
| | Lect. | III | MWThF | 206P | Mr. Matheson |
| | Lab. | III, IV | TS | 212P | |
| 4s | Geology of Minnesota ..... (5 cred.; all; prereq., 2 or 3) | IV | MTWFS | 210P | Mr. Thiel |
| 8f‡§ | Introductory Geology ..... (5 cred.; all; no prereq.) | II | MWThFS | 210P | Mr. Thiel |
| 8w‡§ | Introductory Geology ..... (See 8f) | IV | MTWFS | 210P | Mr. Thiel |
| 8s‡§ | Introductory Geology ..... (See 8f) | II | MWThFS | 210P | Mr. Thiel |
| 11f | Elements of Paleontology ..... (5 cred.; all; prereq., 1) | | | | |
| | Lect. | II | MWF | 105P | Mr. Stauffer |
| | Lab. | I, II | ThS | | |
| 15s¶ | Minerals and Rocks ..... (1 cred.; jr., sr.; prereq., 1 or 29) | Ar | Ar | 100P | Mr. Gruner |
| 23w-24s† | Elements of Mineralogy ..... (8 cred.; soph., jr., sr.; prereq., course in chem.) | | | | |
| | (Winter) Lect. | II | WF | 206P | Mr. Gruner |
| | Rec. | VII | T | 210P | |
| | Lab. Sec. 1 | VII, VIII | WF | 100P | |
| | 2 | III, IV | TS | 100P | |
| | (For other sections, see Mines bulletin) | | | | |
| | (Spring) Lect. | II | MWF | 206P | Mr. Gruner |
| | Rec. | IX | T | | |
| | Lab. Sec. 1 | VII, VIII | M | 100P | |
| | | VI, VII | T | | |
| | 2 | III, IV | M | | |
| | | VII, VIII | F | | |

* 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. Cannot be followed by Course 1 for credit. May be followed by Course 2 with instructor's permission.

§ Not open to students who have had 1.

¶ Does not count for a senior college course. Not open to sophomores. See Course Numbering, page 23.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 27s¶ | Outlines of Mineralogy ..... (1 cred.; jr., sr.; no prereq.) | Ar | Ar | 100P | Mr. Gruner |
| 61f | Blowpipe Analysis ..... (3 cred.; jr., sr.; prereq., 24) | Consult Mines program | | | Mr. Gruner |
| 73f | Economic Geology ..... (3 cred.; jr., sr.; prereq., 24) | VI | MWF | 110P | Mr. Schwartz |
| 85s | Field Work in Northern Minnesota ..... (4 cred.; jr., sr.; prereq., 2, 3, or 11) | Ar | Ar | Ar | Mr. Gruner, Mr. Thiel |
| 91f-92w-93s | Index Fossils of North America (9 cred.; jr., sr.; prereq., 2, 3, or 11) | | | | |
| | Lect. | I | F | 208P | Mr. Stauffer |
| | Lab. Sec. 1 | VI, VII | MW | 105P | |
| | 2 | VI, VII | TTh | | |
| 101f | Sedimentation ..... (3 cred.; jr., sr., grad.; prereq., 24) | IV | MWF | 210P | Mr. Thiel |
| 102w-103s | Micropaleontology ..... (6 cred.; jr., sr., grad.; prereq., 11 or 91) | II, III | TThS | 103P | Mr. Stauffer |
| 105f | Rock Study ..... (3 cred.; jr., sr., grad.; prereq., 24) | | | | |
| | Lect. | VI | TTh | 110P | Mr. Grout |
| | Lab. Sec. 1 | VII, VIII | T | 200P | |
| | 2 | III, IV | W | 200P | |
| 106w | Petrography ..... (3 cred.; jr., sr., grad.; prereq., 105) | VII, VIII | TTh | 200P | Mr. Grout |
| 107f-108w-109s | Paleontologic Practice ..... (9 cred.; jr., sr., grad.; prereq., 91-92-93) | Ar | Ar | 105P | Mr. Stauffer |
| 111f | Ore Deposits ..... (3 cred.; sr., grad.; prereq., 2, 3, or 11, and 105) | I | TThS | 110P | Mr. Emmons |
| 112w | Geology of Petroleum ..... (3 cred.; sr., grad.; prereq., 111) | I | TThS | 110P | Mr. Emmons |
| 113s | Prob. in Ore Deposits..... (3 cred.; sr., grad.; prereq., 112) | VI-IX | Th | Ar | Mr. Emmons |
| 119f | Physiography of the United States ..... (3 cred.; jr., sr., grad.; prereq., 2 or 3) | | | | |
| | Lect. | II | TThS | 206P | Ar |
| | Lab. | Ar | Ar | Ar | |
| 121f | Crystallography ..... (3 cred.; jr., sr.; prereq., Math. 7 and Inorg. Chem. 6-7-8 or 9-10) | Ar | Ar | 100P | Mr. 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 | Mr. Schwartz |

¶ Does not count for a senior college course. Not open to sophomores. See Course Numbering, page 23.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 127f | Geol. of Lake Superior Region.. (3 cred.; jr., sr., grad.; prereq., 124-125) | Ar | Ar | Ar | Mr. Thiel |
| 131f-132w-133s | Adv. Petrology ..... (9 cred.; jr., sr., grad.; prereq., 106) | | | | |
| | Lect. | III | TThS | 200P | Mr. Grout |
| | Lab. | Ar | F | 200P | |
| 137f | Testing Econ. Minerals ..... (3 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 105) | | | | |
| | Lect. | I | W | 200P | |
| | Lab. | VI, VII, VIII, IX | T | 200P | Ar |
| 140w-141s | Applied Petrography ..... (6 cred.; jr., sr., grad.; prereq., 131) | | | | |
| | Lect. | II | F | 200P | Mr. Grout |
| | Lab. | I, II | MW | Ar | |
| 144w-145s | Interp. of Geologic Maps ..... (6 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 124) | VIII, IX | TThF | Ar | Mr. Dutton |
| 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 | Mr. Schwartz |
| 150s* | Field Geol. (Black Hills)..... (Jr., sr., grad.) | Ar | Ar | Ar | Mr. Emmons, Mr. Schwartz |
| 151f-152w-153s | Adv. General Geology ..... (9 cred.; jr., sr., grad.; prereq., 2, 3, or 11) | III | MWF | 210P | Mr. Stauffer |
| 161w | Crystal Structure ..... (3 cred.; jr., sr., grad.; prereq., 121, elem. phys., and anal. geom.) | Ar | Ar | Ar | Mr. Gruner |
| 166f-167w | Mineralography ..... (6 cred.; sr., grad.; prereq., 111, 131) | Ar | Ar | 207P | Mr. Schwartz |

## GERMAN

### *Major Advisers*

Professors Burkhard and Kroesch.

### *Major Sequence*

Courses 50-51-52; 65, 66, and 67; 21 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.

* A maximum of 8 credits will be granted after field report is completed.

### *Sequence of Courses*

*For academic students.*—Without entrance German, 1, 2, 3, 4, other courses numbered 50 or above. With one year entrance German, 2, 3, 4, other courses numbered 50 or above. With two years entrance German, 3, 4, other courses numbered 50 or above. With four years entrance German, courses numbered 50 or above.

*For pre-medical students.*—The regular sequence for students without entrance German is 1, 2, 3A, 30-31-32. An alternate sequence, 1, 2, 3, 4A, 31-32 is intended for students who are unable to take 3A. Students with one year entrance German will take 2, 3A, 30-31-32 or 2, 3, 4A, 31-32; with two years entrance German, 3A, 30-31-32 or 3, 4A, 31-32; with three years entrance German, 4A, 31-32; with four years entrance German or 20 quarter credits, 30-31-32. In the last sequence 30 may be omitted with the consent of the department.

*For chemists.*—Without entrance German, 24-25-26. With two years entrance German, 25 or 26.

| No. | Title | | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|---|
| 1f* | Beginning A ..... (5 cred.; fr., 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., soph., jr., sr.; prereq., 1 or one yr. prep. German) | | | | | |
| | | Sec. 1 | II | MWThFS | 207F | Ar |
| | | 2 | IV | MTWFS | 113F | Ar |
| 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 |

* Credit is usually not given for more than one beginning language. See page 6.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 2s* | Beginning B ..... (See 2f) | | | | |
| | Sec. 1 | II | MWThFS | 209F | Ar |
| | 2 | VII<br>V | MTThF<br>W | 207F | Ar |
| 3f | Beginning C ..... (5 cred.; fr., soph., jr., sr.; prereq., 2) | | | | |
| | Sec. 1 | III | MTWFS | 209F | Ar |
| | 2 | IV | MTWFS | 104F | Ar |
| | 3 | VII | MTWThF | 209F | Ar |
| 3Af | Beginning C ..... (For pre-medics. See 3f) | IV | MTWFS | 205F | Ar |
| 3w | Beginning C ..... (See 3f) | | | | |
| | Sec. 1 | II | MWThFS | 207F | Ar |
| | 2 | IV | MTWFS | 113F | Ar |
| 3s | Beginning C ..... (See 3f) | | | | |
| | 1 | I | MWThFS | 209½F | Ar |
| | 2 | II | MWThFS | 209½F | Ar |
| | 3 | III | MTWFS | 212F | Ar |
| | 4 | IV | MTWFS | 207F | Ar |
| | 5 | VI | MTWThF | 207F | Ar |
| | Sec. 1 | I | MWThFS | 207F | Ar |
| | 2 | I | MWThFS | 209F | Ar |
| 3As | Beginning C ..... (For pre-medics. See 3f) | | | | |
| 4f | Intermediate German ..... (5 cred.; fr., 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 |
| 4Af | Intermediate German ..... (For pre-medics. See 4f) | II | MWThFS | 212F | Ar |
| 4w | Intermediate German ..... (See 4f) | | | | |
| | Sec. 1 | III | MTWFS | 209F | Ar |
| | 2 | IV | MTWFS | 104F | Ar |
| | 3 | VII | MTWThF | 209F | Ar |
| 4s | Intermediate German ..... (See 4f) | | | | |
| | Sec. 1 | II | MWThFS | 207F | Ar |
| | 2 | IV | MTWFS | 113F | Ar |
| 24f-25w-26s† | Chemical German ..... (12 cred.; chemists, miners; no prereq.) | | | | |
| | Sec. 1 | IV | MTWF | 209½F | Ar |
| | 2 | IV | MTWF | 217F | Ar |
| 30f-31w-32s† | Medical German ..... (9 cred.; pre-med.; prereq., 3A) | | | | |
| | Sec. 1 | I | MWF | 212F | Ar |
| | 2 | I | TThS | 212F | Ar |

* Credit is usually not given for more than one beginning language. See page 6.
† The entire course must be completed before credit is received for any quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 30w | Medical German ..... (3 cred.; see 30f) | IV | MWF | 212F | Ar |
| 31f-32w† | Medical German ..... (6 cred.; pre-med.; prereq., 4A or 30) | I | MWF | 205F | Ar |
| 31s† | Medical German ..... (1st qtr. of 31-32. See 31f-32w) | | | | |
| | Sec. 1 | I | MWF | 217F | Ar |
| | 2 | IV | MWF | 213F | Ar |
| 32f† | Medical German ..... (2nd qtr. of 31-32. See 31f-32w) | I | MWF | 108F | Ar |
| 50f-51w-52s† | Composition ..... (6 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German) | IV | TS | 213F | Mr. Lussky |
| 56f-57w† | Essay Writing ..... (6 cred.; jr., sr.; prereq., 52) | I | TThS | 114F | Mr. Pfeiffer |
| 61w | Epics and Ballads ..... (3 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German.) | III | MWF | 209½F | Mr. Lussky |
| 62s | Nineteenth-Century Prose ..... (5 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German) | III | MTWFS | 209F | Mr. Lussky |
| 63f | Modern Drama ..... (3 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German) | IV | MWF | 209F | Mr. Davies |
| 64w | Classic Drama ..... (3 cred.; jr., sr.; prereq., 4 or 63) | IV | MWF | 209F | Mr. Davies |
| 65f | Survey through Reformation.... (3 cred.; jr., sr.; prereq., 3 cred. above 60) | III | TThS | 209½F | Mr. Kroesch |
| 66w | Eighteenth-Century Survey ..... (3 cred.; jr., sr.; prereq., 3 cred. above 60) | III | TThS | 209½F | Mr. Burkhard |
| 67s | Nineteenth-Century Survey ..... (3 cred.; jr., sr.; prereq., 3 cred. above 60) | III | TThS | 209½F | Mr. Pfeiffer |
| 77s | Faust I ..... (3 cred.; jr., sr.; prereq., 64 and 3 additional cred. above 60) | IV | MWF | 209F | Mr. Burkhard |
| 108s | Phonetics ..... (3 cred.; sr., grad.; prereq., 9 senior college cred. in mod. lang.) | III | MWF | 209½F | Mr. Kroesch |
| *109-110-111†* | *Hist. of German Language*..... (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 | Mr. Kroesch |
| *140-141-142†* | *Early New High German Literature, 1500-1700* ..... (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60) | *Not offered* | | | |

† The entire course must be completed before credit is received for any quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 143f-144w-145s† | The Classical Period ..... (9 cred.; sr., grad.; prereq., 66 and 11 cred. above 60) | VIII, IX, X | W | 301Lib | Mr. Lussky |
| 153f-154w-155s† | Studies in German Literature of the Nineteenth Century: Austrian Drama ..... (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60) | VIII, IX, X | T | 301Lib | Mr. Burkhard |
| *161-162-163†* | *Lyric Poetry* ..... (9 cred.; sr., grad.; prereq., 66 or 67 and 11 cred. above 60) | *Not offered* | | | |
| 163f-164w-165s† | German and English Literary Relations, 16th, 17th, 18th Centuries ..... (9 cred.; sr., grad.; prereq., 66 and 11 cred. above 60) | VIII, IX, X | M | 301Lib | Mr. Davies |
| 170f-171w-172s | Young Germany ..... (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60) | VIII, IX, X | F | 301Lib | Mr. Pfeiffer |
| *215-216-217†* | *Middle High German*..... (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 109, 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 ..... (15 cred.; fr., soph., jr., sr.; no prereq.) | IV | MTWFS | 114F | Mr. Savage, Mr. Hays |
| 14f | History: Xenophon or Herodotus (3 cred.; all; prereq., 1-2-3) | III | TThS | 108F | Mr. Hays |
| 15w | History: Herodotus ..... (3 cred.; all; prereq., 1-2-3) | III | TThS | 108F | Mr. Savage |
| 16s | Epic Poetry: Homer ..... (3 cred.; all; prereq., 14 or 15) | III | TThS | 108F | Mr. Hays |
| 17f,w | Greek Sources (Everyday Greek) (2 cred.; soph., jr., sr.; prereq., 1 yr. of any foreign language) | VIII | TTh | 114F | Mr. Savage, Mr. Hays |
| 17s | Greek Sources (Everyday Greek) (See 17f,w) | I | TTh | 114F | Mr. Hays |
| 51f | Philosophy ..... (3 cred.; jr., sr.; prereq., any two of 14, 15, and 16) | Ar | Ar | 112F | Mr. Savage |

† The entire course must be completed before credit is received for any quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 52w | Oratory ..... (3 cred.; jr., sr.; prereq., any two of 14, 15, and 16) | Ar | Ar | 112F | Mr. Savage |
| 53s | Dramatic Poetry ..... (3 cred.; jr., sr.; prereq., 51 or 52) | Ar | Ar | 112F | Mr. Savage |
| *61-62†-63* | *Advanced Greek Composition....* (2 or 3 cred.; jr., sr.; prereq., 2 years of Greek) | *Not offered* | | | |
| 105f | Lyric Poetry ..... (3 cred.; sr., grad.; prereq., 53) | Ar | Ar | 112F | Mr. Savage |
| 106w* | Advanced Drama ..... (3 cred.; sr., grad.; prereq., 53 or 105) | Ar | Ar | 112F | Mr. Savage |
| 107w* | Advanced Prose ..... (3 cred.; sr., grad.; prereq., 51-52, or 51-53, or 52-53) | Ar | Ar | 112F | Mr. Savage |
| 108s§ | Advanced Epic Poetry ..... (3 cred.; sr., grad.; prereq., 105 or 106) | Ar | Ar | 112F | Mr. Savage |
| 109s§ | New Testament ..... (3 cred.; jr., sr., grad.; prereq., 51 and 52) | Ar | Ar | 112F | Mr. Hays |

*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 | Mr. Savage |
| 43f¶‡ | Greek Drama ..... (2 cred.; jr., sr.; no prereq.) | VII | TTh | 114F | Mr. Savage |
| 44w¶‡ | Greek Literature and Life..... (2 cred.; jr., sr.; no prereq.) | VII | TTh | 114F | Mr. Savage |
| 44s¶‡ | Greek Literature and Life..... (See 44w) | I | WF | 114F | Mr. Savage |
| 45f¶ | Greek Mythology ..... (2 cred.; jr., sr.; no prereq.) | I | WF | 114F | Mr. Savage |
| 45w¶ | Greek Mythology ..... (See 45f) | I | WF | 114F | Mr. 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 109 are offered alternately.

¶ Does not count in a major or minor sequence. Not open to sophomores. (See Course Numbering, page 23.)

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. Sec. 1 | II | TThS | OLAud | Mr. Ford |
| | | 2 | VI | MWF | OLAud | |
| | | Rec. Secs. | I | MTh | 2F, 25F | |
| | | | I | WS | 2F, 25F | |
| | | | II | MW | 2F, 25F | |
| | | | III | MTh | 2F, 25F | |
| | | | III | TF | 2F, 25F | |
| | | | III | WS | 2F, 25F | |
| | | | IV | MW | 2F, 25F | |
| | | | IV | TF | 2F, 25F | |
| | | | IV | TS | 111OL, 109OL | |
| | | | V | MW | 2F, 25F | |
| | | | V | TF | 2F, 25F | |
| | | | VI | MW | 2F, 25F | |
| | | | VI | TTh | 2F, 25F | |
| | | | VII | MW | 2F, 25F | |
| | | | VII | TTh | 2F, 25F | |
| 1w-2s | Modern World ..... | | | | | |
| | (See 1f-2w) | Lect. | I | TThS | 150Ph | Ar |
| | | Secs. | Ar. | | | |

† The entire course must be completed before credit is received for any quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 3s | Soc. and Econ. Hist. of Mod. Europe ..... (5 cred.; all; no prereq.) | | | | |
| | Lect. | II | TThS | OLAud | Mr. Heaton |
| | Secs. | Ar | Ar | | |
| 4f-5w† | England to 1815 ..... (10 cred.; fr., soph., jr., sr.; no prereq.) | | | | |
| | Lect. | VII | MW | OLAud | Mr. White |
| | Sec. 1 | I | MWF | 112OL | |
| | 2 | II | TThS | 209OL(fall) 9F(winter) | |
| | 3 | III | TThS | 209OL | |
| | 4 | VI | TThF | 112OL | |
| | 5 | VII | TThF | 221OL | |
| | 6 | VII | TThF | 6F | |
| 4s† | England to 1815..... (First qtr. of 4-5. See 4f-5w) | III | MTWFS | 209OL | Mr. White |
| 6s | England since 1815 ..... (5 cred.; all; prereq., 10 cred.) (Limit 60 students) | II | MWThFS | 221OL | Miss Thompson |
| 7f-8w† | American History ..... (10 cred.; soph., jr., sr.; no prereq.) | | | | |
| | Sec. 1 | I | MWThFS | 211OL | Mrs. Tyler |
| | 2 | I | MWThFS | 200OLa | Mr. Osgood |
| | 3 | VII | MTWThF | 206OLa | Mr. Osgood |
| | 4 | VII | MTWThF | 211OL | Mr. Stephenson |
| 9s | Recent American History..... (5 cred.; soph., jr., sr.; prereq., 10 cred. in hist. or pol. sci.) | | | | |
| | Sec. 1 | I | MWThFS | 211OL | Mrs. Tyler |
| | 2 | I | MWThFS | 200OLa | Mr. Osgood |
| | 3 | VII | MTWThF | 211OL | Mr. Stephenson |
| 11f-12w-13s†‡ | Medieval History ..... (10 cred.; mu. and int. dec. only; no prereq.) | | | | |
| | Lect. | IV | MF | 221OL | Miss Thompson |
| | Sec. 1 | IV* | W | 221OL | |
| | 2 | IV* | T | 221OL | |
| 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.; 3rd qtr. fr., soph., jr., sr.; prereq., 4-5) | II | MWThFS | 112OL | Mr. White |
| *80-81†* | *Introduction to Economic History* (6 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ., pol. sci. or sociol.) | *Not offered* | | | |
| 82f-83w | Economic History of the United States ..... (6 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ., pol. sci., or sociol.) | II | TThS | 221OL | Mr. 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 both 17 and 11-12-13.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 90w-91s† | History of Minnesota ..... (6 cred.; jr., sr.; prereq., 7-8*) | III | MWF | 9F | Mr. Blegen |
| 101f-102w† | French Revolution: Napoleonic Era ..... (6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci. incl. 10 cred. in hist.) | I | TThS | 111OL | Mr. Deutsch |
| 103w | Pol. Hist.: Greece ..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist. or major in Greek or Latin) | IV | MTWFS | 112OL | Mr. Deutsch |
| 104w | Near East: Modern ..... (3 cred.; jr., sr., grad.; prereq., 1-2 and 10 cred. in soc. sci.) | II | MWF | 111OL | Mr. Steefel |
| 105s | History of Rome..... (5 cred.; jr., sr., grad.; prereq., as for 103) | IV | MTWFS | 112OL | Mr. Deutsch |
| 106f-107w-108s§ | Europe, 1815-1914 ..... (9 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci.) | VII | MWF | 111OL | Mr. Steefel |
| 109s | Europe since 1914 ..... (3 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci.) | I | MWF | 111OL | Mr. Deutsch |
| 111w | European Background of American Immigration ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.) | VI | MWF | 111OL | Mr. Stephenson |
| 112s | American Immigration ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.) | VI | MWF | 211OL | Mr. Stephenson |
| 113f-114w-115s§ | Econ. Hist. of Europe since 1750 (9 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.) | III | TThS | 221OL | Mr. Heaton |
| *116-117-118§* | *Econ. Hist. of Europe, 1300-1750* (9 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.) | *Not offered* | | | |
| 119s | Renaissance and Reformation.... (5 cred.; jr., sr., grad.; prereq., 15 cred.) | III | MTWThF | 112OL | Ar |
| 120f | Medieval Civilization ..... (5 cred.; jr., sr., grad.; prereq., 15 cred.) | III | MTWThF | 112OL | Ar |
| *121* | *English Backgrounds and American Colonization* ..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in hist. or pol. sci.) | *Not offered* | | | |

* 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 |
|---|---|---|---|---|---|
| 122w | American Colonies in the 17th Century ..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.) | II | MWThFS | 112OL | Mr. White |
| 123f | European Expansion to 1815.... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.) | IV | MWF | 111OL | Mr. Willson |
| 124w | European Expansion since 1815 (3 cred.; jr., sr., grad.; prereq., same as 123) | IV | MWF | 111OL | Mr. 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 | Mr. Shippee |
| *127* | *Feudal Institutions* ..... (5 cred.; jr., sr., grad.; prereq., 15 cred.) | *Not offered* | | | |
| 128w | Rise of Nationalism in Europe.. (5 cred.; jr., sr., grad.; prereq., 15 cred.) | III | MTWThF | 112OL | Ar |
| 129s | Civil War and Reconstruction... (5 cred.; jr., sr., grad.; prereq., 15 cred., incl. 7-8) | II | MWThFS | 209OL | Mrs. Tyler |
| 130s | Introduction to the History of Russia ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Hist. 1-2 or 14-15-16) | III | MWF | 211OL | Mr. Steefel |
| 133f | Ancient Orient ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.) | IV | MTW | 211OL | Mr. Deutsch |
| *134* | *Ancient Civilization: Greek*..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 103 or 105 or 133, or major in Greek or Latin and consent of instr.) | *Not offered* | | | |
| *135* | *Ancient Civilization: Roman*.... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 103 or 105 or 133-134, or major in 105 or equiv., or major in Greek or Latin and consent of instr.) | *Not offered* | | | |
| 136f-137w† | Far Eastern Government and Politics ..... (6 cred.; jr., sr., grad.; prereq., 1-2 and 10 cred. pol. sci. or Pol. Sci. 3) | See Political Science 153-154 | | | |
| *138-139*† | *Far Eastern Diplomacy*..... (See Political Science 191-192) | *Not offered* | | | |
| 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 | Mr. Buck |

* May be taken at the same time.

† The entire course must be completed before credit is received for any quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 142w | West in Amer. Hist., 1815-1865 (3 cred.; jr., sr., grad.; prereq., see 141) | III | TThS | 211OL | Mr. Shippee |
| 143s | West in American History since 1865 ..... (3 cred.; jr., sr., grad.; prereq., see 141) | III | TThS | 211OL | Mr. Buck |
| 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 | Mr. Stephenson |
| 145f-146w | Canadian History ..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.) ..... | II | MWF | 110F | Ar |
| 149s | American Colonies in the 18th Century ..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci., or 15 cred. in hist.) | II | MWThFS | 102F | Mr. Osgood |
| 154w | Topics, Minnesota ..... (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8) | VI, VII | WF | 315Lib | Mr. Blegen |
| *162* | *Beginnings of Parliament*..... (Maximum of 5 cred.; sr., grad.; prereq., 20 cred., knowledge high school Latin) | *Not offered* | | | |
| *164* | *Studies in Crusades*..... (Maximum of 5 cred.; sr., grad.; prereq., 20 cred., knowledge high school Latin, consent of instr.) | *Not offered* | | | |
| 166f | Topics, Hist. of Immigration... (5 cred.; sr., grad.; prereq., 20 cred., consent of instr.) | VIII, IX | MW | 315Lib | Mr. 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 | Mr. Shippee |
| 169s | Topics in Economic History..... (3 cred.; sr., grad.; prereq., 20 cred. in hist. or econ.) | Ar | Ar | Ar | Mr. Heaton |
| 171f | Topics in Recent American History ..... (5 cred.; sr., grad.; prereq., 20 cred. incl. 9) | VIII, IX | WF | 328Lib | Mr. Blegen |
| 173s | Canada, 1760 to 1791..... (5 cred.; sr., grad.; prereq., 20 cred., consent of instr.) | VI, VII | TTh | 328Lib | Ar |
| 183s | Stuart Period ..... (5 cred.; sr., grad.; prereq., 20 cred. incl. 4-5) | VIII, IX | MW | 328Lib | Mr. Willson |
| 184s | Topics in Modern English History ..... (5 cred.; sr., grad.; prereq., 20 cred.) | VIII, IX | TTh | 315Lib | Mr. 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 | Miss Weller, Miss Little |
| 4s | Textiles (Ed., S., L., & A.).... (See 4f) | | | | | |
| | (Limited to 24) | Sec. 1 | VI, VII | MWF | 307,311HE | Miss Weller |
| | | 2 | VI, VII | MWF | 305HE | Miss Little |
| 11f,s | Clothing Planning and Construction A ..... (3 cred.; all; no prereq.) | | | | | |
| | | Sec. 1 | I, II | MWF | 304HE | Miss Little, Miss Gorham, Miss Sell |
| | (Limited to 24) | 2 | I, II, III | ThS | 304HE | Miss Little, Miss Gorham |
| | | 3 | VI, VII, VIII | TTh | 304HE | Miss Gorham, Miss Sell |
| 11w | Clothing Planning and Construction A ..... (See 11f) | | | | | |
| | | Sec. 1 | I, II | MWF | 304HE | Miss Little |
| | (Limited to 24) | 2 | VI, VII, VIII | TTh | 304HE | Miss Gorham |
| 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,s | Clothing Problems ..... (3 cred.; 3rd qtr. fr., soph., jr.; prereq., 3, 51) | | | | | |
| | | Lect. | VI, VII | Th | 313HE | Miss Weller, |
| | (Limited to 30) | Field Trips | VI, VII, VIII, IX | T | | Miss Gorham |
| 33w | Home Management Problems for Social Workers ..... (3 cred.; jr., sr.; no prereq.) | | VIII | MWF | 2OPh | Miss Studley |
| 50f | Color and Design I..... (3 cred.; no prereq.) | | | | | |
| | | Sec. 1 | I, II | MWF | 402HE | Miss Topp |
| | (Limited to 20) | 2 | I, II, III | ThS | 402HE | Miss Segolson |
| | | 3 | III, IV | MWF | 402HE | Miss Segolson |
| 50w | Color and Design I..... (See 50f) | | | | | |
| | | Sec. 1 | III, IV | MWF | 402HE | Miss Segolson |
| | | 2 | I, II | TThS | 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 |

| No. | Title | | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|---|
| 51f | Color and Design II..... (3 cred.; prereq., 50) (Limited to 20 each) | Sec. 1 | I, II | MWF | 401HE | Miss V. Goldstein |
| | | 2 | I, II | TThS | 401HE | Miss V. Goldstein |
| 51w | Color and Design II..... (See 51f) (Limited to 20 each) | Sec. 1 | III, IV | MWF | 401HE | Miss V. Goldstein |
| | | 2 | I, II | TThS | 401HE | Miss V. Goldstein |
| 51s | Color and Design II..... (See 51f) (Limited to 20 each) | Sec. 1 | VI, VII, VIII | TTh | 402HE | Miss V. Goldstein |
| | | 2 | I, II | MWF | 402HE | Miss V. Goldstein |
| 53f | Advanced Design ..... (3 cred.; soph., jr., sr.; prereq., 51 or 56) (Limited to 20) | | VI, VII | MWF | 402HE | Miss H. Goldstein |
| 53w | Advanced Design ..... (See 53f) (Limited to 20) | Sec. 1 | VI, VII | MWF | 402HE | Miss Segolson |
| | | 2 | I, II | MWF | 402HE | Miss H. Goldstein |
| 53s | Advanced Design ..... (See 53f) | Sec. 1 | I, II | TThS | 402HE | Miss Segolson |
| | | 2 | III, IV | MWF | 402HE | Miss Segolson |
| 56f | Applications of Color and Design (3 cred.; no prereq.) | | VI, VII, VIII | TTh | 402HE | Miss H. Goldstein |
| 70f | Nutrition Survey ..... (2 cred.; all; no prereq.) | | IV | WF | 203HE | Miss Biester |
| 70w | Nutrition Survey ..... (See 70f) | | III | TTh | 203HE | Miss Dinsmore |
| 70s | Nutrition Survey ..... (See 70f) | | VI | TTh | OPhAud | Miss Biester |
| 80f | Foods and Cookery ..... (5 cred.; prereq., Agr. Biochem. 3 and 4*) (Limited to 20) | | I, II | MTWThF | 209HE | Mrs. Niles |
| 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 | VII, VIII | MWF | 203,207HE | Mrs. Niles |

* Course 80 may be taken parallel with Agricultural Biochemistry 4.

### *Senior College Courses*

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 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 | Miss Weller |
| 131f | Home Management: House Planning and Equipment ..... (5 cred.; jr., sr.; prereq., 53) (Limited to 20) | III, IV | MTWFS | 401HE | Miss Morse |
| 131w | Home Management: House Planning and Equipment ..... (See 131f) (Limited to 20) | VI, VII | MTWThF | 401HE | Miss Morse |
| 131s | Home Management: House Planning and Equipment ..... (See 131f) | | | | |
| | Sec. 1 | III, IV | MTWFS | 401HE | Miss Morse |
| | (Limited to 20) 2 | VI, VII | MTWThF | 401HE | Miss Morse |
| 150f,w,s | Art History and Appreciation... (3 cred.; jr., sr.; prereq., permission of instructor) | VIII | MWF | 313HE | Miss H. Goldstein |

## 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 | Mr. Bird |
| 1w | How To Study ..... (See 1f) | | | | |
| | Sec. 1 | I | MWF | 104OPh | Mr. Schellenberg |
| | 2 | II | MWF | 104OPh | Mr. 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 |
|---|---|---|---|---|---|---|
| 1f | Physiol. Chemistry and Physiology (Pre-nursing)* ..... (7 cred.; all; no prereq.) | | | | | |
| | | Lect. | I | MWThFS | Ar | Dr. Greisheimer and others |
| | | Lab. | II, III, IV | T | | |
| | | Quiz | II | Th | | |
| 1s | Physiol. Chemistry and Physiology (Pre-nursing)* ..... (See 1f) | | | | | |
| | | Lect. | I | MTWFS | | |
| | | Lab. | I, II, III | Th | | |
| | | Quiz | II | T | | |
| 4f,w,s | Human Physiology ..... (4 cred.; all; prereq., 1 qtr. zool., 1 qtr. chem.) | | | | | |
| | Lect., dem., or rec. | | III, IV | MWF | 301MH | Dr. Lyon, Dr. 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) | | IV | M | MH | Dr. Rufe |
| | | | I | TThS | MH | and others |
| 59s | Human Physiology ..... (6 cred.; jr., sr.; prereq., Zool. 1-2 or 5-6-7; Inorg. Chem. 1-2-3 or 4-5) | | | | | |
| | | Lect. | I | TWThS | | Dr. King |
| | | Rec. | II | Th | | |
| | | Lab. | II, III, IV | TW | | |
| 60s | Physiology of Exercise ..... (4 cred.; jr., sr.; prereq., 4 and 57) | | | | | |
| | | Lect. | I | TThS | Ar | Dr. Loucks |
| | | Lab. | VI, VII, VIII | W | | |

* Students may register for lectures without laboratory.

| No. | Title | | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|---|
| 100w-101s‡ | Physiol. Chemistry ..... (10 cred.; jr., sr.; prereq., zool., org. chem., and physics) | | IV | MWF | 301MH | Dr. McClendon 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 | | Dr. Scott, |
| | | | VI | T | | Dr. Lyon, |
| | Rec. | Sec. A | III | TTh | | Dr. Greisheimer, |
| | | B | II | TS | | Dr. King, |
| | Lab. | Sec. A | VI, VII, VIII | M | | and others |
| | | | III, IV | F | | |
| | | B | III, IV | W | | |
| | | | VI, VII, VIII | F | | |
| 104w* | Physiol. of Nervous System, etc. (7 cred., lect. only, 4 cred.; jr., sr.; prereq., 103 or org. chem. and neurol.) | | | | | |
| | | Lect. | IV | MWF | 301MH | Dr. Lyon, |
| | | | III | S | | Dr. Scott, and others |
| | Rec. | Div. A | VI | M | | |
| | | B | II | T | | |
| | Lab. | Div. A | 9-11 | F | | |
| | | | I, II | S | | |
| | | B | 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 Casey.

### *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

* Students may register for lectures without laboratory.
‡ Div. A, B, primarily for medics; C primarily for others.

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.

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 prereq.) | | III | MWF | 301F | Mr. Ford |
| 5s | The American Newspaper ..... (See 5f) | | I | MWF | 301F | Mr. Ford |
| 13f | Introduction to Reporting ..... (3 cred.; soph. with average of C, jr., sr.; prereq., Eng. A-B-C, Comp. 4-5-6 or exemption) | | I | MWF | 206OLa | Mr. Desmond and others |
| 14w-15s† | Newspaper Reporting and Correspondence ..... (6 cred.; soph. with average of C, jr., sr.; prereq., 5 or 13 or practical experience, and Comp. 11-12 or 18-19§) | | I | MWF | 206OLa(w) 210P(s) | Mr. Desmond and others |
| 17s‡ | Newspaper Reference Library... (2 cred.; soph. with average of C, jr., sr.; prereq., 14) | | I | TTh | 20P | 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 | 10P | |
| | | 2 | I, II | T | 10P | |
| | | 3 | VII, VIII | Th | 10P | |
| 51f-52w† | Copy Reading and Newspaper Make-Up ..... (6 cred.; jr., sr.; prereq., 15) | | | | | |
| | Lect. | | III | TTh | 20P | Mr. Olson and others |
| | Lab. | Sec. 1 | IV, V | M | 10P | |
| | | 2 | IV, V | T | 10P | |
| | | 3 | VIII, IX | W | 10P | |
| | | 4 | I, II | Th | 10P | |
| | | 5 | VII, VIII | F | 10P | |
| 55s¶ | Advertising Typography ..... (3 cred.; jr., sr.; prereq., 41 or 51) | | | | | |
| | Lect. | | IV | T | 20P | Mr. Olson |
| | Lab. | Sec. 1 | VIII, IX | MW | 14P | |
| | | 2 | I, II | TTh | 14P | |
| | | 3 | VI, VII | TTh | 14P | |

† 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 |
|---|---|---|---|---|---|
| 56w¶ | Newspaper Typography ..... | | | | |
| 56w¶ | (3 cred.; jr., sr.; prereq., 41 or 51) | | | | |
| | Lect. | III | S | 20P | Mr. Olson |
| | Lab. Sec. 1 | VIII, IX | MF | 14P | |
| | 2 | I, II | TS | 14P | |
| | 3 | VI, VII | TTh | 14P | |
| | 4 | IV, V | WF | 14P | |
| 57f¶ | Magazine Typography ..... | | | | |
| | (3 cred.; jr., sr.; prereq., 41 or 51) | | | | |
| | Lect. | IV | T | 20P | Mr. Olson |
| | Lab. Sec. 1 | VIII, IX | MF | 14P | |
| | 2 | I, II | TS | 14P | |
| 58s | Advanced Typography ..... | VIII, IX | TTh | 14P | Mr. Olson |
| | (2 cred.; jr., sr.; prereq., 55, 56, or 57) | | | | |
| 60f-61w†-62s | The Community Newspaper..... | I | TThS | Ar | Ar |
| | (9 cred.; jr., sr.; prereq., 15) | | | | |
| 65f | Women's Departments ..... | I | TThS | 20P | Mr. Kildow |
| | (3 cred.; jr., sr.; prereq., 15 or 69) | | | | |
| 69s | The Writing of Special Articles | I | MWF | 206P | Mr. Kildow |
| | (3 cred.; jr., sr.; prereq., 15 or 41) | | | | |
| 70f-71w† | Trade and Technical Journals... | IV | MWF | 20P | Mr. Ford |
| | (6 cred.; jr., sr.; prereq., 15 or 69) | | | | |
| 73f-74w† | Newspaper and Magazine Articles | VI | MWF | 20P | Mr. Steward |
| | (6 cred.; jr., sr.; prereq., 15 or 41) | | | | |
| 75s | Law of the Press..... | III | TThS | 20P | Ar |
| | (3 cred.; jr., sr.; prereq., 52) | | | | |
| 76f | Critical Writing ..... | III | TThS | 10P | Mr. Ford |
| | (3 cred.; jr., sr.; prereq., 15 or 69) | | | | |
| 78s | Press Relations ..... | VI | MWF | 20P | Mr. Steward |
| | (3 cred.; sr.; prereq., 69 or 73) | | | | |
| 82s | Supervision of School Publications ..... | VIII | MWF | 20P | Mr. Kildow |
| | (3 cred.; jr., sr.; prereq., 41 or 51) | | | | |
| 95f | Editorial Administration ..... | III | MWF | 20P | Ar |
| | (3 cred.; sr.; prereq., 52) | | | | |
| 96s | Financial Writing ..... | I | TThS | 10P | Ar |
| | (3 cred.; sr.; prereq., 69 or 73, and 20 credits in econ., or bus. adm.) | | | | |
| 100f | Analysis of News Interests..... | II | TThS | 20P | Mr. Desmond |
| | (3 cred.; sr., grad.; prereq., 69 or 73, and 20 cred. in soc. sci.) | | | | |
| 101w | The Reporting of Public Affairs | II | TThS | 20P | Ar |
| | (3 cred.; sr., grad.; prereq., 52 and 10 cred. in pol. sci.) | | | | |

† 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.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 104s | Editorial Writing ..... (3 cred.; sr., grad.; prereq., 73, and 25 credits in soc. sci.) | II | TThS | 20P | Mr. Casey |
| 110f | History of Journalism..... (3 cred.; jr., sr., grad.; prereq., 41 or 51, 10 cred. in hist.) | II | MWF | 20P | Mr. Casey |
| 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 | 20P | Mr. Desmond |
| 112s | Current Newspaper Problems... (3 cred.; sr., grad.; prereq., 100 or 101 or 110) | II | MWF | 20P | Mr. Ford |
| 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 | 10P | Mr. Casey |
| 190f-191w-192s | Topics Course ..... (9 cred.; sr., grad.; prereq., 20 cred. and consent of instructor) | | | | |
| | Seniors Sec. 1 | VIII, IX | T | 20P | Mr. Casey |
| | Graduates 2 | VIII, IX | Th | 20P | |

## 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) 131, 122, 123, and Greek 51, 52, 53 or nine credits from the following: History 103, 105, 133, 134, 135, (c) 121, 132, 133, and Greek 51, 52, 53 or nine credits from the following: History 103, 105, 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.

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 ..... (10 cred.; fr., soph., jr., sr.; no prereq.) | IV | MTWFS | 110F | Mrs. Babcock |

† 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 page 6.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 3s | Caesar ..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2, or 1 yr. Latin) | IV | MTWFS | 110F | Mrs. Babcock |
| 11f | Virgil I ..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2, 3, or 2 yrs. Latin) | | | | |
| | Sec. 1 | III | MTWFS | 109F | Mrs. Babcock |
| | 2 | VI | MTWThF | 109F | Mr. Cram |
| 12w | Virgil II ..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2, 3, or 2 yrs. Latin) | | | | |
| | Sec. 1 | III | MTWFS | 109F | Mrs. Babcock |
| | 2 | VI | MTWThF | 109F | Mr. Cram |
| 13s | Ovid ..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2, 3, or 2 yrs. Latin) | III | MTWFS | 110F | Mrs. Babcock |
| 21f | Selections ..... (5 cred.; fr., soph., jr., sr.; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin) | IV | MTWFS | 109F | Mr. Pike |
| 22w | Selections and Survey ..... (5 cred.; fr., soph., jr., sr.; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin) | IV | MTWFS | 109F | Mr. Pike |
| 23s | Plautus and Terence ..... (5 cred.; fr., soph., jr., sr.; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin) | IV | MTWFS | 109F | Mr. 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*

| | | | | | |
|---|---|---|---|---|---|
| 51f | Pliny's Letters ..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.) | I | TThS | 109F | Mr. Cram |
| 52 | *Horace's Satires and Epistles*... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.) | *Not offered* | | | |
| 53s | Suetonius, Selected Lives..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.) | I | TThS | 109F | Mr. Cram |
| 62w | Horace's Odes and Epodes..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.) | I | TThS | 109F | Mr. Cram |
| 63 | *Apuleius* ..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.) | *Not offered* | | | |
| 71 | *Cicero's De Amicitia and De Senectute* ..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.) | *Not offered* | | | |
| 73s | Advanced Grammar and Composition* ..... (3 cred.; jr., sr.; prereq., any two of 51, 52, 53, or equiv.) | III | MWF | 109F | Mr. Pike |

* Required of students who expect a teaching recommendation.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| *121* | *Advanced Virgil* ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.) | *Not offered* | | | |
| 122w | Cicero's Letters ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.) | II | MWF | 109F | Mr. Pike |
| 123s | Medieval Latin ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.) | II | MWF | 109F | Mr. Pike |
| 131f | Juvenal ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.) | II | MWF | 109F | Mr. Pike |
| *132* | *Seneca's Epistles* ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.) | *Not offered* | | | |
| *133* | *Vulgar Latin* ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.) | *Not offered* | | | |
| *201-202-203* | *Grad. Seminar: Tacitus*..... (9 cred.) | *Not offered* | | | |
| 211f-212w-213s | Grad. Seminar: Lucretius..... (9 cred.) | VIII, IX | T | 314Lib | Mr. Pike |
| *221-222-223* | *Graduate Seminar: Cicero's Phil. Works* ..... (9 cred.) | *Not offered* | | | |
| *231-232-233* | *Graduate Seminar: Cicero's Rhetorical Works* ..... (9 cred.) | *Not offered* | | | |
| 241f-242w-243s | Graduate Seminar: Introduction to Classical Philology ..... (9 cred.) | VIII, IX | Th | 314Lib | Mr. Cram |

## LIBRARY METHODS

NOTE.—For the special course in library training, see page 10. 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 | Miss Firkins |
| | 2 | IV | MW | 3Lib | Mr. Russell, Miss Moen |
| | 3 | VI | MW | 5Lib | Miss Baker |

* 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, and 8 a placement test will be given at the *second meeting* of the class. Students who fail in this test will be advised to take a more elementary course. It is especially important to attend the first meeting of the class in order to obtain instructions concerning the test. Late registrants must take the test before entering class.

### *Junior College Courses*

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 3f* | Higher Algebra, Short Course... (4 cred.; all; prereq., 1 yr. elem. alg.) | III | MWThF | 133Ph | Ar |
| 3w* | Higher Algebra, Short Course... (See 3f) | IV | MTWF | 206OLa | Ar |
| 4f* | Trigonometry, Short Course.... (4 cred.; all; prereq., 3 or 5 or prep. higher alg.) | II | MTWF | 206OLa | Ar |
| 4w* | Trigonometry, Short Course.... (See 4f) | III | MWThF | 133Ph | Ar |
| 4s* | Trigonometry, Short Course.... (See 4f) | IV | MTWF | 206OLa | Ar |
| 5f | Higher Algebra ..... (5 cred.; all; prereq., 1 yr. elem. alg.) | | | | |
| | Sec. 1 | II | MWThFS | 133Ph | Ar |
| | 2 | VI | MTWThF | 166Ph | Ar |
| 5w | Higher Algebra ..... (See 5f) | VI | MTWThF | 166Ph | Ar |
| 5s | Higher Algebra ..... (See 5f) | I | MWThFS | OPhAud | Ar |
| 6f¶ | Trigonometry ..... (5 cred.; fr., soph., jr.. sr.: prereq., 3 or 5, or prep. higher algebra) | II | MWThFS | 104F | Ar |

* For pre-med. and pre-dent. students, and others who desire only the mathematics necessary in the first course in physics.

¶ See page 79 for footnote.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 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 | 206OLa | 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 | Ar |
| 20s | Mathematics of Investment..... (See 20w) | II | MWThFS | 133Ph | Mr. Hart |
| 21 | *Elements of the Mathematics of Life Insurance* ..... (3 cred.; all; prereq., 20) | *Not offered* | | | |
| 30f | Analytic Geometry ..... (6 cred.; all; prereq., 6 and 7) | I | MTWThFS | 105F | Mr. Underhill |
| 30w | Analytic Geometry ..... (See 30f) | I | MTWThFS | 104F | Ar |
| 30s | Analytic Geometry ..... (See 30f) | II | MTWThFS | 104F | Ar |
| 47 | *Mathematics for Students of Statistics I* ..... (5 cred.; soph., jr., sr.; prereq., 5 or prep. higher algebra) | *Not offered* | | | |
| 48 | *Mathematics for Students of Statistics II* ..... (5 cred.; soph., jr., sr.; prereq., 47, or 6 and 7, or 6 and 8) | *Not offered* | | | |
| 49 | *Mathematics for Students of Statistics III* ..... (3 cred.; soph., jr., sr.; prereq., 48) | *Not offered* | | | |
| | *Senior College Courses* | | | | |
| 50f | Calculus I ..... (5 cred.; jr., sr.; prereq., 30) | III | MTWFS | 105F | Mr. Jackson |

¶ 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 |
|---|---|---|---|---|---|
| 50w | Calculus I ..... (See 50f) | I | MWThFS | 105F | Mr. Underhill |
| 51w | Calculus II ..... (5 cred.; jr., sr.; prereq., 50) | III | MTWFS | 105F | Mr. Jackson |
| 51s | Calculus II ..... (See 51w) | I | MWThFS | 105F | Mr. Underhill |
| 52f | Calculus III ..... (5 cred.; jr., sr.; prereq., 51) | II | MWThFS | 101F | Mr. Underhill |
| 52s | Calculus III ..... (See 52f) | III | MTWFS | 105F | Mr. Jackson |
| 60s | Synthetic Metric Geometry ..... (3 cred.; jr., sr.; prereq., 30) | VI | MWF | 102F | Miss Gibbens |
| 62w | Theory of Equations I..... (3 cred.; jr., sr.; prereq., 50) | VII | MWF | 101F | Mr. Bussey |
| 63s | Theory of Equations II..... (3 cred.; jr., sr.; prereq., 62) | VII | MWF | 101F | Mr. Bussey |
| 70f | Hist. of Elem. Math. ..... (3 cred.; jr., sr.; prereq., 30) | VII | MWF | 101F | Mr. Hart |
| *71* | *Solid Analytic Geometry* ..... (3 cred.; jr., sr.; prereq., 50) | *Not offered* | | | |
| *102-103-104* | *Adv. Analytic and Synthetic Geometry* ..... (9 cred.; jr., sr., grad.; prereq., 50) | *Not offered* | | | |
| 106f | Differential Equations ..... (3 cred.; jr., sr., grad.; prereq., 51) | III | MWF | 101F | Miss Gibbens |
| 107w-108s | Advanced Calculus ..... (6 cred.; jr., sr., grad.; prereq., 52) | III | MWF | 101F | Mr. Underhill |
| *115-116-117* | *Differential Geometry* ..... (9 cred.; jr., sr., grad.; prereq., 51) | *Not offered* | | | |
| *118-119-120* | *Vector Analysis* ..... (9 cred.; jr., sr., grad.; prereq., 51) | *Not offered* | | | |
| 121f-122w-123s | Math. Theory of Statistics..... (9 cred.; jr., sr., grad.; prereq., 51 or 47, 48, 49) | Ar | Ar | Ar | Mr. Jackson |
| 141f | Projective Geometry ..... (3 cred.; jr., sr., grad.; prereq., 51) | III | TThS | 101F | Mr. Bussey |
| 142w | Theory of Invariants ..... (3 cred.; jr., sr., grad.; prereq., 51 or 62 or permission of instructor) | III | TThS | 101F | Mr. Underhill |
| 143s | Integral Equations ..... (3 cred.; jr., sr., grad.; prereq., 107) | III | TThS | 101F | Mr. Hart |
| 206f-207w-208s | Theory of Functions..... (9 cred.; sr., grad.; prereq., 106, 107-108, or Math. and Mech. 151, 152-153*) | Ar | Ar | Ar | Mr. Brink |

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

*See bulletin of the College of Engineering.

## 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 ..... (2 cred. per qtr.§; pre-dent. only; no prereq.) | VII. VIII, IX‡ | MW<br>MF | ME(f,w)<br>ME(s) | Mr. Koepke and others |

## 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 |
| | 8 | II | TThS | A | Ar |
| | 9 | III | TThS | 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) | | | |

‡ Students having conflicts with this program may register with one of the engineering or chemistry sections, with permission from Mr. Koepke.

§ Does not carry credit except for pre-dental students.

‖ For the amount of credit given for the work of the advanced R.O.T.C., see page 18.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 54f-55w | Second Year Advanced Course.. | Total of five hours selected from the following: | | | |
| | (Cred.‖; prereq., 51-52-53) | 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.. | VII,VIII,IX | T or W | A | Ar |
| | (Cred.‖; prereq., 51-52-53) | (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 6 and 7, 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.

* Unless exempted by placement tests. See Composition program.

§ 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.

‖ For the amount of credit given for the work of the Advanced R.O.T.C., see page 18.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f-2w-3s† | Harmony ..... (9 cred.; fr. mu.; no prereq.) | | | | |
| | Sec. 1 | II | MWF | 103Mu | Mr. Scott |
| | 2 | VI | MWF | 103Mu | Mr. 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 | Mr. Ferguson |
| 7f-8w-9s† | Ear Training ..... (3 cred.; fr., soph. mu.; no prereq.) | VI | TTh | Mu | Mr. Killeen, Miss Reeves, Miss Kendall |
| 7w-8s-9su | Ear Training ..... (See 7f-8w-9s) | VII | TTh | 103Mu | Miss Kendall |
| Af-Bw-Cs‡ | Piano ..... (6 or 12 cred.; no prereq.) | Ar | Ar | Mu | Ar |
| 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 |
| 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 ..... (3 cred.; jr., sr.) | 7:30 p.m. | W | MuAud | Mr. Pepinsky |
| 43f-44w-45s¶ | University Chorus‡ ..... (3 cred.; all mu., acad. jr., sr.; prereq., consent of director) | IX | T | MuAud | Mr. Killeen |
| 86f-87w-88s | Normal Piano ..... (6 cred.; jr.; prereq., 2 yrs. piano) | VII | MWF | 103Mu | Miss Reeves |
| 89f-90w-91s | Advanced Normal Piano ..... (6 cred.; sr.; prereq., 86-87-88) | VIII | MWF | 103Mu | Miss Reeves |
| 100f-101w-102s | Composition-Orchestration ..... (6 cred.; jr., sr.; prereq., 1-2-3, 4-5-6) | Ar | Ar | Mu | Mr. Ferguson |
| 103f-104w-105s | Analysis ..... (3 cred.; soph., jr., sr.; prereq., 1-2-3) | III | T | 4Mu | Mr. Pepinsky |

* Students majoring in music may take 4 years of orchestra.

† The entire course must be completed before credit is received for any quarter.

‡ Carries no credit for students majoring in piano. May be taken only with the consent of the instructor.

¶ Students may receive credit for 2 years of chorus.

| No. | Title | | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|---|
| 106f-107w-108s† | History of Music ..... (9 cred.; jr., sr.; prereq., 1-2-3) | | II | MWF | 4Mu | Mr. Ferguson |
| 109f-110w-111s | Bach and Beethôven ..... (9 cred.; sr.; prereq., 106-107-108) | | VII, VIII | TTh | 104Mu | Mr. Ferguson |
| 112f-113w-114s | Ensemble ..... (6 cred.; jr.) | | | | | |
| | Instrumental | Sec. 1 | II | TTh | 4Mu | Mr. Pepinsky |
| | Vocal | 2 | II | TTh | 104Mu | Miss Hull |
| 115f-116w-117s | Adv. Ensemble: Instrumental... (6 cred.; sr.; prereq., 112-113-114) | | IV | MW | 4Mu | Mr. Pepinsky |
| 121f-122w-123s | Romantic Movement ..... (6 cred.; jr., sr.; prereq., 106-107-108) | | VII | WF | 104Mu | Miss Kendall |
| 124f-125w-126s | Advanced Harmony ..... (6 cred.; jr.; prereq., 4-5-6) | | IV, V | T | 103Mu | Mr. Scott |
| *127-128-129* | *Advanced Composition* ..... (6 cred.; sr.; prereq., 100-101-102) | | *Not offered* | | | |

## ORIENTATION

| No. | Title | | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|---|
| 1f-2w† | Orientation ..... (10 cred.; entering freshmen; no prereq.) | | | | | |
| | | Lect. | III§ | Th | OLAud | |
| | | Sec. 1 | II | MWThFS | 6F | |
| | | 2 | III | MTWFS | 102F | |
| | | 3 | IV | MTWFS | 200OLa | |
| | | 4 | VI | MTWThF | 200OLa | |
| | | 5 | VII | MTWThF | 200OLa | |
| 1w-2s† | Orientation ..... (See 1f-2w) | | III | MTWFS | 6F | |

## 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 prereq.) | | | | | |
| | | Sec. 1 | I | MWThFS | 321F | Mr. Conger |
| | | 2 | II | MWThFS | 321F | Ar |

† The entire course must be completed before credit is received for any quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1w | Problems of Philosophy..... (See 1f) | | | | |
| | Sec. 1 | III | MTWFS | 321F | Mr. Swenson |
| | 2 | VII | MTWThF | 321F | Mr. Conger |
| 1s | Problems of Philosophy..... (See 1f) | IV | MTWFS | 321F | Mr. Conger |
| 2f | Logic ..... (5 cred.; soph., jr., sr.; no prereq.) | | | | |
| | Sec. 1 | III | MTWFS | 322F | Mr. Swenson |
| | 2 | IV | MTWFS | 321F | Ar |
| 2w | Logic ..... (See 2f) | VI | MTWThF | 321F | Ar |
| 2s | Logic ..... (See 2f) | | | | |
| | Sec. 1 | III | MTWFS | 321F | Ar |
| | 2 | VII | MTWThF | 321F | Ar |
| 3f | Ethics ..... (5 cred.; soph., jr., sr.; no prereq.) | I | MWThFS | 322F | Mr. Wilde |
| 3w | Ethics ..... (See 3f) | I | MWThFS | 321F | Ar |
| 3s | Ethics ..... (See 3f) | I | MWThFS | 322F | Mr. Wilde |
| 10s | Science and Religion..... (2 cred.; soph., jr., sr.; prereq., 10 cred. in phil. or a science) | VII | TTh | 204F | Mr. Swenson |
| 50f | Ancient Philosophy ..... (3 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.) | IV | MWF | 322F | Mr. Wilde |
| 51w | Medieval and Renaissance Philosophy ..... (3 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.) | IV | MWF | 322F | Mr. Wilde |
| 52s | Modern Philosophy ..... (3 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.) | IV | MWF | 322F | Mr. Wilde |
| 100f | History of Religions..... (3 cred.; jr., sr., grad.; prereq., 10 cred.) | II | TThS | 322F | Mr. Conger |
| 101w | Psychology of Religion ..... (3 cred.; jr., sr., grad.; prereq., 10 cred.) | II | TThS | 322F | Mr. Conger |
| 102s | Philosophy of Religion..... (3 cred.; jr., sr., grad.; prereq., 10 cred.) | II | TThS | 322F | Mr. Swenson |
| *103* | *Esthetics* ..... (3 cred.; jr., sr., grad.; prereq., 10 cred.) | *Not offered* | | | |
| 104s | History of Esthetic Theory..... (3 cred.; jr., sr., grad.; prereq., 10 cred.) | II | MWF | 322F | Mr. Swenson |

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 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 | Mr. Wilde |
| 115w | Contemporary Philosophy ..... (3 cred.; jr., sr., grad.; prereq., 50 or 51) | III | MWF | 322F | Mr. Conger |
| *120* | *Scandinavian Philosophy* ..... (3 cred.; jr., sr., grad.; prereq., 10 cred.) | *Not offered* | | | |
| *124* | *Political and Social Ethics*..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.) | *Not offered* | | | |
| 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 | Mr. Wilde |
| 135f-136w | Philosophy of Plato..... (6 cred.; jr., sr., grad.; prereq., 10 cred.) | VIII | MWF | 339Lib | Mr. Swenson |
| 141s | Metaphysics ..... (5 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2) | III | MTWFS | 322F | Mr. Conger |
| 147f-148w | Advanced Logic ..... (6 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2) | II | MWF | 322F | Mr. 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 | Mr. Wilde, Mr. Swenson, Mr. 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 | |
| | | (winter and spring only) | | | |
| | 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 | |
| 7f,8w,9s | Advanced Leaders ..... (3 cred.; soph., jr., sr.; prereq., 1-2-3) | | | | |
| | Lect. | IV | T | 206A | Mr. Keller |
| | Lab. | Ar | | | |
| 13f,14w,15s | Corrective Work ..... (3 cred.; by petition only) | | | 264S | Ar |
| | Sec. 1 | I | TThS | | |
| | 2 | II | TThS | | |
| | 3 | III | TThS | | |
| 16f,17w,18s | Drill Substitution ..... (No cred.; by petition only) | | | | |
| | Sec. 1 | I | MWF | | |
| | 2 | II | MWF | 264S | Ar |
| | 3 | III | MWF | | |
| | 4 | IV | MWF | | |
| | 5 | VI | MWF | | |
| | 6 | VII | 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.

Some under class of exercises courses for which fee of $1.00 in chgd provided that no student shall be charged more than 1.50 maximum fee regardless of no of courses he pursues.

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.) | | | | | |
| | | Lect. Sec. 1 | I | W | 201WGm | Ar |
| | | 2 | II | T | 201WGm | Ar |
| | | 3 | II | Th | 201WGm | Ar |
| | | 4 | III | Th | 201WGm | Ar |
| | | 5 | IV | M | 201WGm | Ar |
| | | 6 | IV | T | 201WGm | Ar |
| | | 7 | VI | W | 201WGm | Ar |
| | | 8 | VI | Th | 201WGm | Ar |
| | | Lab. Sec. 1 | II | MWF | 3,151,153WGm | Ar |
| | | 2 | III | MWF | 3,151,153WGm | Ar |
| | | 3 | III | TThS | 3,151,153WGm | Ar |
| | | 4 | IV | MWF | 3,151,153WGm | Ar |
| | | 5 | VI | MWF | 3,151,153WGm | Ar |
| | | 6 | VIII | MWF | 3,151,153WGm | Ar |
| 2w-3s* | Freshman Physical Education.... (See 1f) | | | | | |
| | | Sec. 1 | II | MWF | 3,151,153WGm | Ar |
| | | 2 | III | MWF | 3,151,153WGm | Ar |
| | | 3 | III | TThS | 3,151,153WGm | Ar |
| | | 4 | IV | MWF | 3,151,153WGm | Ar |
| | | 5 | VI | MWF | 3,151,153WGm | Ar |
| | | 6 | VIII | MWF | 3,151,153WGm | Ar |
| 4s‖ | Preliminary Hygiene (for nurses and transfer students) ..... (No cred.; no prereq.) | | II | T | 201WGm | Ar |
| 7f,8w* | Sophomore Gymnastics ..... (½ 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 |
| | | 3 | VII | WF | | Ar |
| 10f-11w* | Sophomore Orthopedic and Individual Gymnastics ..... (1 cred.; soph.; prereq., 1-2-3) | | | | | |
| | | Sec. 1 | II | MW | 3WGm | |
| | | 2 | IV | TS | 3WGm | |
| | | 3 | VI | TTh | 3WGm | |
| 12s | Sophomore Orthopedic and Individual Gymnastics ..... (See 10f-11w) | | IV | TS | 3WGm | Dr. Tolg |

* Students may enter any quarter.

‖ Students who have not completed the requirement in preliminary hygiene may register for this course or for Preventive Medicine 3.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 13f-14w-15s*¶ | Sophomore Natural Dancing.... (1½ cred.; soph.; prereq., 1-2-3) | VI | TTh | 151WGm | Miss Timberman |
| 13f,s | Sophomore Natural Dancing.... (See 13f. ½ credit) | II | TTh | 151WGm | Miss Timberman |
| 16f,17w | Sophomore Games and Folk Dancing ..... (½ cred.; soph.; prereq.. 1-2-3) | I | WF | 151WGm | Miss Dickson |
| 18s | Tennis ..... (½ cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | I | TTh | 151WGm | Ar |
| | 2 | IV | TS | 151WGm | Ar |
| | 3 | VI | TTh | 151WGm | Ar |
| | 4 | VII | WF | 151WGm | Ar |
| | 5 | VIII | TTh | 151WGm | Ar |
| 19f | Sophomore Hockey ..... (½ cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | V | MW | 151WGm | Ar |
| | 2 | VII | WF | 151WGm | Ar |
| | 3 | VIII | TTh | 151WGm | Ar |
| 20w | Sophomore Basket-Ball ..... (½ cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | V | MW | 151WGm | Ar |
| | 2 | VII | WF | 151WGm | Ar |
| | 3 | VII(3:00) | TTh | 151WGm | Ar |
| | 4 | VIII | TTh | 151WGm | Ar |
| 21s | Sophomore Baseball ..... (½ cred.; soph.; prereq., 1-2-3) | | | | |
| | | V | MW | 151WGm | Ar |
| 22f,s-23w¶§ | Sophomore Elem. Swimming.... (1 cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | II | TTh | 51WGm | Miss Starr and others |
| | 2 | III | MW | 51WGm | Ar |
| | 3 | IV | TS | 51WGm | Ar |
| | 4 | IV | MW | 51WGm | Ar |
| | 5 | VII | TTh | 51WGm | Ar |
| | 6 | VIII(3:30) | TTh | 51WGm | Ar |
| | 7 | VIII(4:00) | TTh | 51WGm | Ar |
| 22f,s-23w¶§ | 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 | III | TTh | 51WGm | Ar |
| | 2 | VIII½(4:00) | MW | 51WGm | Ar |
| | 3 | VI | MW | 51WGm | Ar |

* The spring quarter is not open to students who have not had the previous 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.

¶ The winter quarter is not open to students who have not had the fall quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 27f¶ | Sophomore Golf—Advanced .... (½ cred.; soph.; prereq., 1-2-3) | VI | TTh | Ar | Miss Kissock |
| 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 | 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 | Individual Projects in Physical Activity ..... (2 cred.; jr., sr.; prereq., 6 qtrs.) | Ar | Ar | | Ar |
| 43f-44w†-45s | Theory and Function of Play... (½ cred. fall, 3 cred. winter, ½ cred. spring; jr., sr.; prereq., 6 qtrs.) | | | | Miss Kissock |
| | Lab. | II | TTh | (fall) | |
| | Lect. | II | MWF | (winter) | |
| | Lab. | V | MW | (spring) | |
| 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; (Winter)—basket-ball, ice hockey; (Spring)—track, baseball, swimming | | | | |
| General Swimming ..... | IX | MTWTh | 51WGm | |

¶ Students must supply their own golf equipment. Golf course at university recreation field will be used for Course 27f. Student tickets 10 for $3.

* The winter quarter is not open to students who have not had the fall quarter.

§ No student may register for more than two quarters of swimming without permission. Course 22 is never closed for senior registration.

‖ Class meetings will be fifty minutes in length, since weather and ice conditions will cause omissions at times.

† 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.

## 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 five 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.

NOTE.—Courses in laboratory require separate registration.

### *Introductory Courses*

| No. | Title | | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|---|
| 3f | Elem. of Mechanics..... (3 cred.; all; prereq., Math. 4, or 6) | | | | | |
| | | Lect. | VIII | MWF | 150Ph | Mr. Erikson |
| | | Quiz | II | Th | 150Ph | |
| | | | or | | | |
| | | | IX | Th | 150Ph | |
| 3w | Elem. of Mechanics ..... (See 3f) | | | | | |
| | | Lect. | VIII | MWF | 150Ph | Mr. Erikson |
| | | Quiz | IX | F | 150Ph | |
| 3s | Elem. of Mechanics..... (See 3f) | | | | | |
| | | Lect. | III | TThS | 150Ph | Mr. Erikson |
| | | Quiz | IX* | F | 150Ph | |
| 4f | Elem. of Mechanics Lab..... (1 cred.; all; prereq., 3 or reg. in 3) | | | | | |
| | | Sec. 1 | VI, VII | T | 153Ph | Mr. Buchta |
| | | 2 | VIII, IX | T | 153Ph | and assts. |
| | | 3 | I, II | Th | 153Ph | |
| | | 4 | VIII, IX | Th | 153Ph | |
| 4w | Elem. of Mechanics Lab..... (See 4f) | | | | | |
| | | Sec. 1 | VI, VII | M | 153Ph | |
| | | 2 | I, II | T | 153Ph | |
| | | 3 | VI, VII | T | 153Ph | |
| | | 4 | VI, VII | Th | 153Ph | |
| | | 5 | VI, VII | F | 153Ph | |

* Students who take Inorganic Chemistry 10s laboratory at VIII, IX, MWF should try to arrange with Professor Erikson for another quiz hour.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 4s | Elem. of Mechanics Lab. ..... (Sec 4f) | | | | |
| | Sec. 1 | VI, VII | M | 153Ph | |
| | 2 | I, II | T | 153Ph | |
| | 3 | VI, VII | T | 153Ph | |
| | 4 | VI, VII | Th | 153Ph | |
| | 5 | VIII, IX | T | 153Ph | |
| 9s‡ | Acoustics ..... (3 cred.; all; no prereq.) | VIII | MWF | 133Ph | Mr. Buchta |
| 11s | Physics Survey ..... (3 cred.; all; no prereq.) | | | | |
| | Lect. | I | MWF | 166Ph | Mr. Erikson |
| | Quiz | IX | T | 166Ph | and others |
| 23f | Heat ..... (3 cred.; all; prereq., 3) | | | | |
| | Lect. | III | TThS | 166Ph | Mr. Miller |
| | Quiz | IX | T | 166Ph | Mr. Miller |
| 23w | Heat ..... (See 23f) | | | | |
| | Lect. Sec. 1 | II | MWF | 150Ph | Mr. Miller |
| | 2 | VI | MWF | 150Ph | |
| | Quiz Sec. 1 | II | Th | 150Ph | |
| | 2 | IX | Th | 150Ph | |
| 24f | Heat Laboratory ..... (1 cred.; all; prereq., 4, 23, or reg. in 23) | | | | |
| | Sec. 1 | I, II | T | 244Ph | Mr. Miller |
| | 2 | VI, VII | T | 244Ph | and assts. |
| | 3 | VIII, IX | Th | 244Ph | |
| | 4 | I, II | F | 244Ph | |
| | 5 | VIII, IX | F | 244Ph | |
| 24w | Heat Laboratory ..... (See 24f) | | | | |
| | Sec. 1 | I, II | T | 244Ph | Mr. Miller |
| | 2 | VIII, IX | Th | 244Ph | and assts. |
| | 3 | I, II | F | 244Ph | |
| | 4 | VIII, IX | F | 244Ph | |
| 33f | Optics ..... (3 cred.; all; prereq., 3) | | | | |
| | Lect. | I | TThS | 133Ph | Mr. Valasek |
| | Quiz | IX | F | 133Ph | |
| 33s | Optics ..... (See 33f) | | | | |
| | Lect. | I | TThS | 133Ph | Mr. Valasek |
| | Quiz | IX | F | 133Ph | |
| 34f,s | Optics Laboratory ..... (1 cred.; all; prereq., 4 and 33 or reg. in 33) | | | | |
| | Sec. 1 | VI, VII | Th | 236Ph | Mr. Valasek |
| | 2 | VI, VII | F | | and assts. |
| 43w | Electricity ..... (3 cred.; all; prereq., 3) | | | | |
| | Lect. | III | TThS | 166Ph | Mr. Zeleny |
| | Quiz | IX | M | 150Ph | Mr. Zeleny |

‡ Does not count as part of the pre-medical requirement in physics.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 43s | Electricity ..... (See 43w) | | | | |
| | Lect. Sec. 1 | II | MWF | 166Ph | Mr. 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 | Th | 231Ph | Mr. Zeleny |
| | 2 | VIII, IX | Th | 231Ph | and assts. |
| | 3 | VI, VII | M | 231Ph | |
| 44s | Electricity Laboratory ..... (See 44w) | | | | |
| | Sec. 1 | VI, VII | M | 231Ph | Mr. Zeleny |
| | 2 | VI, VII | T | 231Ph | and assts. |
| | 3 | VIII, IX | T | 231Ph | |
| | 4 | I, II | T | 231Ph | |

## *Intermediate Courses*

| | | | | | |
|---|---|---|---|---|---|
| 52f,w,s | Laboratory Arts ..... (3 cred.; jr., sr.; prereq., 16 cred. and approval of department) | VI, VII, VIII | TTh | 39Ph | Ar |
| 101f-103w-105s | Theoretical Physics ..... (15 cred.; jr., sr., grad.; prereq., 12 cred. in phys., Math. 51) | IV | MTWFS | 145Ph | Mr. Tate |
| 104 | *Precision Mechanics* ..... (3 cred.; jr., sr., grad.; prereq., 12 cred. and Math. 51) | *Not offered* | | | |
| 114f-116w-118s | Elem. Phys. Investigation..... (3 cred.; jr., sr., grad.; prereq., 104, Math. 51) | Ar | Ar | 160Ph | Ar |
| 115f-117w-119s | Problem Course ..... (3 cred.; jr., sr., grad.; prereq., 12 cred., Math. 51) | Ar | Ar | 145Ph | Mr. Buchta |
| 124s | Pyrometry and Heat..... (3 cred.; jr., sr., grad.; prereq., 23 and 24) | V-IX or Ar | MW | 245Ph | Mr. Miller |
| 134f,w | Experimental Optics ..... (3 cred.; jr., sr., grad.; prereq., 34) | VI, VII, VIII | MW | 79Ph | Mr. Valasek |
| 136w | Spectrum Analysis ..... (3 cred.; jr., sr., grad.; prereq., 34) | VI, VII, VIII | MW | 79Ph | Mr. Valasek |
| 144f | Electricity Measurements ..... (3 cred.; jr., sr., grad.; prereq., 43 and 44) | See 144f, Engineering program | | | Mr. Zeleny |
| 146w | Advanced Electricity Measurements ..... (3 cred.; by permission from instructor; prereq., 144) | Ar | Ar | 232Ph | Mr. Zeleny |
| 148w | Radioactivity ..... (3 cred.; jr., sr., grad.; prereq., 43, 44) | VI, VII, VIII | TTh | 145Ph | Mr. Erikson |

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 150f | Conduction through Gases..... (3 cred.; jr., sr., grad.; prereq., 144) | VI, VII, VIII | TTh | 145Ph | Mr. Erikson |
| 152s | X-Rays ..... (3 cred.; jr., sr., grad.; prereq., 43, 44) | I | TThS | 145Ph | Mr. 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; Geography 43, Political Geography; Psychology 1-2, General Psychology; and Sociology 45, Social Statistics.

A student majoring in political science is required to earn at least 33 credits in senior college courses, as follows: Course 81-82-83, required of all majors, 6 credits; also 9 credits in courses numbered from 101 to 140, 6 credits in courses numbered from 141 to 180, and 6 credits in courses numbered from 181 to 199, and enough additional credits from courses numbered from 101 to 199, and the following, to make 33 credits in senior college work. The additional courses which may be included with the consent of the major adviser are: Economics 105; 106; 154; 161; 162; 164; 176; 191-192; 193; History 124; 144; 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. 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. 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 Course 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 Mr. 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 National Government.. (5 cred.; soph., jr., sr., and fr. with 10 cred. in hist. or econ.; no prereq.) | | | | |
| | Lect. | IV | WF | OLAud | Mr. Young |
| | Sec. 1 | I | MWF | 221OL | |
| | 2 | I | TThS | 15F(f), 221OL(w), 221OL(s) | |
| | 3 | II | TThS | 111OL(f), 111OL(w), 200OLa(s) | |
| | 4 | III | TThS | 111OL(f,s), 3F(w) | |
| | 5 | VI | MWF | 209OL(f), 3F(w), 2F(s) | |
| | 6 | VII | MWF | 112OL | |
| Af-Bw‡† | Introduction to Government and Politics ..... (10 cred.; freshmen only, except by consent of instructor; no prereq.) | | | | |
| | Sec. 1 | III | MTWFS | 104F | Mr. Saunders |
| | 2 | IV | MTWFS | 9F | Mr. Lippincott |
| Aw-Bs‡† | Introduction to Government and Politics ..... (See Af-Bw) | VI | MTWThF | 209OL(w), 111OL(s) | Ar |
| 2w | State Government ..... (5 cred.; soph., jr., sr.; prereq.. 1) | | | | |
| | Lect. | IV | MW | 211OL | |
| | Sec. 1 | IV | TFS | 211OL | Mr. Field, |
| | 2 | II | TThS | 25F | Mr. Stene |
| 3f,w | Comparative European Government ..... (5 cred.; soph., jr., sr.; prereq., 1 or A-B) | II | MWThFS | 112OL(f), 209OL(w) | Mr. Lippincott |
| 11f,s | Municipal Government ..... (5 cred.; soph., jr., sr.; prereq., 1 or A-B) | | | | |
| | Lect. | I | MWF | 209OL | Mr. Anderson |
| | Sec. 1 | I | ThS | 201F(f), 209OL(s) | |
| | 2 | II | ThS | 2F(f), 111OL(s) | |

† The entire course must be completed before credit is received for any quarter.

‡ Alternative beginning course. Students who take this course should not take and will not receive credit for Courses 1, 2, or 15.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 15s | Elements of Political Science... (5 cred.; soph., jr., sr.; prereq., 1) | VI | MTWThF | 209OL | Mr. Lippincott |
| 25f,s | World Politics ..... (5 cred.; soph., jr., sr.; prereq., 1 or A-B, or Hist. 1-2) | III | MTWFS | 206OLa | Mr. Mills |
| 51-52-53 | Business Law ..... | (See bulletin of the School of Business Administration) | | | |
| 81f-82w-83s† | Readings in Political Science.... (6 cred.; jr., sr.; prereq., 15 cred.) | | | | Staff |
| 91f-92w-93s† | Readings and Theses for Honors (Jr., sr.; cred. ar.) | | | | Mr. Anderson, Mr. Saunders, and others |
| 101f-102w† | Constitutional Law I, II..... (6 cred.; jr., sr., grad.; prereq., 15 cred.) | VI | MWF | 221OL | Mr. Field |
| 103s | Constitutional Law III..... (3 cred.; jr., sr., grad.; prereq., 15 cred.) | VI | MWF | 221OL | Mr. Field |
| 104s | Problems in State Government... (3 cred.; jr., sr., grad.; prereq., 2) | III | TThS | 9F | Mr. Field |
| 105f-106w† | American Constitutional Development ..... (6 cred.; jr., sr., grad.; prereq., 15 cred. in pol. sci., or Hist. 7-8) | II | MWF | 211OL(f), 111OL(w) | Mr. 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 | Mr. Young |
| 108w | Legislative Power and Methods.. (3 cred.; jr., sr., grad.; prereq., 15 cred.) | II | TThS | 211OL | Mr. Young |
| 109s | Government and Business..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci.) | II | TThS | 211OL | Mr. Young |
| 111 | Law of Public Utilities..... (3 cred.; grad. and sr. of suitable prep.) | See Law School bulletin | | | |
| 113f-114w† | Administrative Law ..... (3 cred.; jr., sr., grad.; prereq., 15 cred.) | III | TThS | 9F | Mr. Field |
| 116s | Municipal Powers and Functions (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 11) | III | MWF | 111OL | Mr. Anderson |
| 119* | Jurisprudence ..... (2 cred.; grad., and sr. of suitable prep.) | See Law School bulletin | | | Mr. Rottschaefer |
| 131f-132w† | Principles of Public Administration ..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci.) | II | MWF | 12Lib | Mr. Lambie |

† The entire course must be completed before credit is received for any quarter.
* Second semester.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 133s | Problems in Public Administration ..... (3 cred.; jr., sr., grad.; prereq., 131-132) | II | MWF | 12Lib | Mr. Lambie |
| 137f | Municipal Administration ..... (3 cred.; jr., sr., grad.; prereq., 15 cred.) | IV | MWF | 12Lib | Mr. Lambie |
| 145w-146s† | Comparative Federal Government (6 cred.; jr., sr., grad.; prereq., 15 cred.) | 3:30-4:45 | WF | 12Lib | Mr. Saunders |
| 149f-150w† | Government and Politics of the British Empire ..... (6 cred.; jr., sr., grad.; prereq., 15 cred. or Hist. 109) | VI | MWF | 211OL | Mr. Mills |
| 153f-154w† | Far Eastern Government and Politics ..... (6 cred ; jr., sr., grad.; prereq., 3, or 10 cred. and Hist. 1-2) | VII | MWF | 209OL | Mr. Quigley |
| 161f-162w† | Current Political Thought. ..... (6 cred.; jr., sr., grad.; prereq., 20 cred.) | III | MWF | 209OL | Mr. Anderson |
| 163f | American Political Ideas..... (3 cred.; jr., sr., grad.; prereq., 15 cred.) | 3:30-4:45 | WF | 12Lib | Mr. Saunders |
| 165w | Develop. of Political Thought.... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in Phil. Same as Phil. 129) | I | MWThFS | 322F | Mr. Wilde |
| 169s | Problems of Democracy..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci., incl. 10 cred. in pol. sci.) | III | MWF | 221OL | Mr. Lippincott |
| 171s | Political Psychology ..... (3 cred.; jr., sr., grad.; prereq.§) | See Psychology 141 | | | |
| 175s | Political Parties ..... (3 cred.; jr., sr., grad.; prereq., 15 cred.) | VI | MWF | 111OL | Mr. Saunders |
| 176f-177w-178s† | Scope and Methods of Political Science ..... (3 cred.; grad., and sr. with approval of instructor) | 3:30-5:00 | Th | 12Lib | Mr. Anderson |
| 181w-182s† | International Law ..... (6 cred.; sr., grad.; prereq., 20 cred. in soc. sci., incl. 10 cred. in pol. sci.) | IV | MWF | 209OL | Mr. Quigley |
| 183f | International Organization ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.) | IV | MWF | 209OL | Mr. Quigley |
| *184* | *Problems in International Law*.. (3 cred.; sr., grad.; prereq., 181-182) | *Not offered* | | | |
| 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 | Mr. Shippee |

† The entire course must be completed before credit is received for any quarter.

§ 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.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 189s | Topics in American Foreign Relations ..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in hist. incl. 9, or 20 cred. in pol. sci.) | VIII, IX | TTh | 339Lib | Mr. Shippee |
| *191-192**† | *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) | *Not offered* | | | |
| 193s | Problems of the Pacific..... (3 cred.; jr., sr., grad.; prereq., 153-154 or 191-192) | VII | MWF | 209OL | Mr. Quigley |
| 195w | Colonization ..... (5 cred.; jr., sr., grad.; prereq., 15 cred. or 20 cred. in soc. sci. incl. 10 cred. in pol. sci.) | III | MTWThF | 111OL | Mr. Mills |
| 196s | Topics in Colonial Government.. (3 cred.; jr., sr., grad.; prereq., consent of instructor) | VI | MWF | 112OL | Mr. 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 |
|---|---|---|---|---|---|
| 3f,w,s‡ | Person. Hyg. and Elem. Sanita. (2 cred.; fresh., soph.; no prereq.; 3 sections for men, 40 each: 2 sections for women, 40 each) | IV(men)<br>IX(men)<br>IV(women) | TS<br>TTh<br>TS | * | Dr. Lees and others |
| 50f,w,s | Public and Personal Health..... (3 cred.; jr., sr.; prereq., Zool. 1-2 and Psy. 1-2 or permission of instructor) | V | MWF | * | Dr. O'Brien |
| 52w | Health Care of the Family..... (3 cred.; jr., sr.; prereq., Bact. 41, Hum. Physiol. 4) (Lab. sections limited to 20) | | | | |
| | Lect. | VI | M | * | Dr. Boynton and |
| | Lab. | VI, VII | WF | * | Miss Fisher |
| 53f,s | Elements of Preventive Medicine (3 cred.; jr., sr.; prereq., Psy. 1-2; Bact. 41 or equiv.) | II | MWF | * | Dr. Diehl |
| 57s | Health of Infant and Pre-school Child ..... (2 cred.; jr., sr.; prereq., Zool. 1-2, Psy. 1-2; or 50, or 53) | III | TTh | * | Dr. Boynton |

* Classroom schedule will be posted on bulletin board in Millard Hall, also published in the *Minnesota Daily* at the beginning of each quarter.

† 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.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 58w | Maternal and Child Hygiene.... (2 cred.; jr., sr.; prereq., 50 or 53) (For public health nurses only) | III | MW | * | Dr. Boynton |
| 59w | Social Hygiene ..... (1 cred.; jr., sr.; prereq., 50, 52, or 53, or permission of instructor) | VII | M | Ar | Dr. Owings |
| 60w | Tuberculosis and Its Control.... (2 cred.; jr., sr.; prereq., 50 or 52 or 53) | IV | TS | * | Dr. Myers |
| 61w | Mental Hygiene ..... (3 cred.; jr., sr.; prereq., 50 or 52 or 53, Psy. 1-2) | III | TThS | * | Dr. de Berry |
| 62f,s | Principles of Public Health Nursing and Special Fields.. (5 cred.; jr., sr.; public health nurses) | II<br>I | TTh<br>MWF | * | Miss Butzerin |
| 64f,w,s | Field Practice in Infant Welfare Nursing ..... (3 cred.; jr., sr.; prereq., 58 and 62) | Ar | Ar | Ar | Miss Butzerin, Miss Peck |
| 65f,w,s | Field Practice in School Nursing (2 cred.; jr., sr.; prereq., 62) | Ar | Ar | Ar | Miss Butzerin |
| 66f,w,s | Field Practice in County Nursing (2 cred.; jr., sr.; prereq., 62) | Ar | Ar | Ar | Miss Butzerin |
| 67f,w,s | Field Practice in a Tuberculosis Sanatorium ..... (2 cred.; jr., sr.; prereq., 60 and 62) | Ar | Ar | Ar | Dr. Mariette |
| 68f,w,s | Field Practice in Visiting Nursing ..... (5 cred.; jr., sr.; prereq., 62) | Ar | Ar | Ar | Miss Butzerin, Miss Houlton |
| 73w | Occupational Hygiene and Disease (2 cred.; jr., sr.; prereq., 53) | IV | MW | * | Dr. Myers |
| 80w | Health Supervision of the School Child ..... (3 cred.; jr., sr.; prereq., 50 or 52 or 53) | II | MWF | * | Dr. Diehl |
| 102w | Sanitation ..... (Cred. ar.; jr., sr., grad.; prereq., Bact. 101; Anal. Chem. 1-2 or 7; Org. Chem. 1-2 or 51-52-53; Phys. 24, 34, 44) | Ar | Ar | * | Mr. Whittaker |
| 103s | Public Health Bacteriology..... (3 cred. or ar.; jr., sr., grad.; prereq., Bact. 101, 116) | VII, VIII or ar | MWF or ar | * | Dr. McDaniel |
| 106f,w,s | Public Health Administration.... (Cred. ar.; jr., sr., grad.; prereq., 53 or 101) | Ar | Ar | Ar | Dr. Diehl |
| 107s | Sanitary Surveys ..... (2 cred.; jr., sr., grad.; prereq., 53 or 100) | Ar | Ar | Ar | Dr. Diehl |

* Classroom schedule will be posted on bulletin board in Millard Hall, also published in the *Minnesota Daily* at the beginning of each quarter.

## 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.) | | | | Mr. Elliott and others |
| | Sec. 1 | I | MWF | OLAud | |
| | 2 | III | MWF | OLAud | |
| 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 | Mr. 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 | Mr. Tinker and others |
| | 2 | III, IV | TS | 211Psy | |
| | 3 | VI, VII | TTh | 211Psy | |
| | 4 | VIII, IX | TTh | 211Psy | |
| | 5 | III, IV | MW | 211Psy | |

† The entire course must be completed before credit is received for any quarter.

‡ Offered VII MWF, VIII MWF.

§ Offered II MTWThFS, IV MTWThFS.

¶ A laboratory fee will be charged for the courses in Elementary Laboratory Psychology: $1 per quarter for Course 4-5, $2 for Course 7.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 7s¶ | Introd. Lab. Psychology..... (Identical with 4-5 combined. See 4f-5w) | | | | |
| | Sec. 1 | VI, VII | MTThF | 211Psy | Mr. Tinker |
| | 2 | III, IV | MTWF | 211Psy | and others |
| 9s | Introd. to Animal Psychology.... (3 cred.: soph., jr.; prereq., 1-2) | III | MWF | 109Psy | Mr. Heron |
| 15s | Psychology of Sensation..... (3 cred.; soph., jr., sr.; prereq., 1-2) | II | TThS | 211Psy | Mr. Tinker |
| 56w* | Psychology of Advertising..... (3 cred.; jr., sr.; prereq., 1-2, and Prin. of Econ.) | VII | MWF | 133Ph | Mr. Longstaff |
| 72f | Psychological Æsthetics ..... (3 cred.; jr., sr.; prereq., 1-2, and 4-5, or Music 1-2-3, or Art. Educ. 20-21 or 9 cred. fine arts) | III | MWF | 115Psy | Miss Hevner |
| 101f-102w†-103s | Experimental Psychology ..... (3 cred. per qtr.; cred. ar. for honors students; jr., sr., grad.; prereq., 1-2, and 4-5 or 7, or 8 cred. in physics) | VII<br>VIII | MWF<br>WF | 116Psy | Mr. Tinker |
| *108* | *Systems of Psychology*..... (3 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7) | *Not offered* | | | |
| 109f,s | 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 | Mr. Heron(f)<br>Mr. Tinker(s) |
| 114w-115s† | Human Behavior ..... (6 cred.: jr., sr., grad.; prereq., 1-2; 4-5 or 7, or Zool. 1-2) | II | TThS | 115Psy | Mr. Elliott |
| 124f | Psychology of Learning..... (3 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7) | IV | MWF | 109Psy | Mr. Heron |
| 125f-126w†-127s | Psy. of Individual Differences... (3 cred. per qtr.; cred. ar. for honor students; jr., sr., grad.; prereq., 1-2; 4-5 or 7, or Ed. Psy. 116-117) | II | MWF | 115Psy | Mr. 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 | Mr. Paterson |
| *137* | *Psychology of Learning*..... (3 cred.; jr., sr., grad.; prereq., 124 or equiv.) | *Not offered* | | | |
| 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 | Mr. Bird |

* Cannot be counted for a minor sequence.

† Two quarters must be completed before credit is received for any quarter.

¶ A laboratory fee will be charged for the courses in Elementary Laboratory Psychology: $1 for Course 4-5, $2 for Course 7.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 141s | Political Psychology ..... (3 cred.; jr., sr., grad.; prereq.‡) | III | TThS | 115Psy | Mr. 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) 301F(s) | Mr. Heron |
| 151f-152w†153s | Animal Psychology ..... (3 cred. per qtr.; cred. ar. for honor students; jr., sr., grad.; prereq., 1-2; 4-5 or 7, Zool. 1-2) | VI Lab. | MWF Ar | Ar | Mr. 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* | *Perception of Space*..... (3 cred.; jr., sr., grad.; prereq., 101-102 or permission of instructor) | *Not offered* | | | |
| *172* | *Reaction Time* ..... (3 cred.; jr., sr., grad.; prereq., 101-102 or permission of instructor) | *Not offered* | | | |

## ROMANCE LANGUAGES

### *Major Advisers*

Professors Olmsted, Searles, LeCompte, and Sirich; Associate Professor Arjona; Assistant Professor Clefton.

### *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.

#### ITALIAN

Courses 70; 71; 72; 73; 74; 159-160 or 161-162; 164; and at least 3 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.

† 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.

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., soph., jr., sr.; no prereq.) | II | MWThFS | 227F | Ar |
| | | IV | MTWFS | 227F | Ar |
| | | VI | MTWThF | 226F | Ar |
| | | VII | MTWThF | 202F | Ar |
| 1w-2s†* | 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., soph., jr., sr.; prereq., 1-2. or 2 yrs. high school French) | III | MTWFS | 226F | Ar |
| | | VII | MTWThF | 213F | Ar |
| 3w-4s | Intermediate French ..... | I | MWThFS | 202F | Ar |
| | (See 3f-4w) | VI | MTWThF | 213F | Ar |
| 3s | Intermediate French ..... | I | MWThFS | 213F | Ar |
| | (First qtr. of 3-4. See 3f-4w) | II | MWThFS | 227F | Ar |
| | | IV | MTWFS | 227F | Ar |
| | | VI | MTWThF | 226F | Ar |
| | | VII | MTWThF | 202F | Ar |
| 4f | Intermediate French ..... | II | MWThFS | 113F | Ar |
| | (2nd qtr. of 3-4. See 3f-4w) | IV | MTWFS | 124F | Ar |
| | | VI | MTWThF | 202F | Ar |
| 8f-9w-10s§ | Scientific French (pre-medic.)... | I | MWF | 201F | Ar |
| | (9 cred.; pre-med.; prereq., 3 or equiv.) | | | | |
| 20f | Oral and Written French..... | III | MTWFS | 303F | Mr. Boyer |
| | (5 cred.; all; prereq., 4 or 3 yrs. high school French) | VII | MTWThF | 227F | Mr. Frelin |
| 20s | Oral and Written French..... | I | MWThFS | 124F | Ar |
| | (See 20f) | III | MTWFS | 226F | Ar |
| | | VII | MTWThF | 213F | Mr. Frelin |

* Credit is usually not given for more than one beginning language. See page 6.

‡ Students entering in September, 1932, and thereafter must present German.

† 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 |
|---|---|---|---|---|---|
| 21f-22w-23s† | Survey of French Lit. ..... | II | TThS | 226F | Mr. Olmsted |
| | (9 cred.; all; prereq., 3-4 or 20 | III | MWF | 201F | Mr. Clefton |
| | or 4 yrs. high school French) | VII | MWF | 201F | Mr. Searles |
| 24w-25s† | Survey of French Lit..... | III | MTWFS | 303F | Mr. LeCompte |
| | (10 cred.; all; prereq., 3-4 or 20 | VII | MTWThF | 226F | Mr. Owens |
| | or 4 yrs. high school French) | | | | |
| 49f,w,s | French Pronunciation ..... | II | TThS | 303F | Mr. Owens |
| | (3 cred.; all; prereq., 3-4 or 4 yrs. high school French) | | | | |
| 53f | French Composition ..... | III | TThS | 201F | Mr. Boyer |
| | (3 cred.; jr., sr.*; prereq., 3-4) | VI | MWF | 201F | Mr. Borglum |
| 54w-55s | French Conversation ..... | III | TThS | 201F | Mr. Boyer |
| | (4 cred.; jr., sr.*; prereq., 53 or 20) | VI | MWF | 201F | Mr. Borglum |
| 62w | Practical French Phonetics..... | II | TThS | 203F | Miss Guinotte |
| | (3 cred.; jr., sr.*; prereq., 49) | | | | |
| 63f | Adv. French Composition..... | II | MWF | 203F | Miss Guinotte |
| | (3 cred.; jr., sr.*; prereq., 53 or 20 with a grade of B) | VII | MWF | 203F | Miss Guinotte |
| 64w-65s | Adv. French Conversation..... | II | MWF | 203F | Miss Guinotte |
| | (6 cred.; jr., sr.*; prereq., 54, 55 or 20 with a grade of B) | VII | MWF | 203F | Mr. Borglum |
| 80f-81w-82s | French Lit.: 19th Century..... | IV | MWF | 201F | Mr. Clefton |
| | (9 cred.; jr., sr.*; prereq., 21-22-23 or 24-25) | | | | |
| 100s | French Oral Diction..... | I | MWThF | 203F | Miss Guinotte |
| | (4 cred.; jr., sr., grad.; prereq., 62) | | | | |
| 103f-104w-105s† | French Syntax and Comp..... | VI | F | 217F | Mr. Sirich |
| | (3 cred.; jr., sr., grad.; prereq., 63) | | | | |
| 115f | Fr. Lit.: 17th Cent.: Formation of Classic Ideal ..... | IV | MTWF | 203F | Mr. Searles |
| | (4 cred.; jr., sr., grad.; prereq., 21-22-23, or 24-25) | | | | |
| 116w | Fr. Lit.: 17th Cent.: Molière, Racine, LaFontaine ..... | IV | MTWF | 203F | Mr. Searles |
| | (4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25) | | | | |
| 117s | Fr. Lit.: 17th Cent.: Moral and Didactic Literature ..... | IV | MTWF | 203F | Mr. Searles |
| | (4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25) | | | | |
| 118f-119w-120s | French Lit.: 18th Century..... | III | TThS | 217F | Mr. Sirich |
| | (9 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25) | | | | |
| *121-122-123* | *French Lit.: 16th Century.....* | *Not offered* | | | |
| | (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 | Mr. Boyer |
| | (4 cred.; jr., sr., grad.; prereq., 80-81-82 or 115-116-117, or 118-119-120) | | | | |

* 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.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 150f-151w-152s | French Dramatic Lit..... (6 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25) | III | TTh | 203F | Mr. Olmsted |
| 153s | Contemporary French Lyric Poetry (4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25) | VI | MTWTh | 217F | Mr. LeCompte |
| 157w | Modern French Novel..... (4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25) | VI | MTWTh | 217F | Mr. Boyer |
| 171f-172w-173s† | History of French Language.... (3 cred.; jr., sr., grad.; prereq., 63) | VIII | Th | 203F | Mr. LeCompte |
| 174f-175w-176s | Contemp. French Novel and Drama: Lectures in French.... (6 cred.; jr., sr., grad.; prereq., 53-54-55 (or 20); and 80-81-82) | IX | TTh | 201F | Mr. Boyer |

## ITALIAN

NOTE.—Students may receive credits for Italian 1-2 in addition to one other beginning language.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f-2w† | Beginning Italian ..... (10 cred.; fr., soph., jr., sr.; no prereq.) | IV | MTWFS | 226F | Mr. Brackney |
| 3s | Intermediate Italian ..... (First qtr. of 3-4. 10 cred.; fr., soph., jr., sr.; prereq., 1-2) | IV | MTWFS | 226F | Mr. Brackney |
| 4 | *Intermediate Italian* ..... (See 3s) | *Not offered* | | | |
| 70f | Survey of Italian Lit. ..... (3 cred.; jr., sr.*; prereq., 3-4‡) | II | TThS | 217F | Mr. Brackney |
| 71w | Modern Poetry (Leopardi, Carducci) ..... (3 cred.; jr., sr.*; prereq., 3-4‡) | II | TThS | 217F | Mr. Brackney |
| 72 | *Modern Drama (Giacosa, Bracco, Pirandello)* ..... (3 cred.; jr., sr.*; prereq., 3-4‡) | *Not offered* | | | |
| 73s | Boccaccio ..... (3 cred.; jr., sr.*; prereq., 3-4‡) | II | MWF | 217F | Mr. Brackney |
| 74 | *Petrarch* ..... (3 cred.; jr., sr.*; prereq., 3-4‡) | *Not offered* | | | |
| 159-160 | *Dante* ..... (6 cred.; jr., sr., grad.; prereq., one course above 50) | *Not offered* | | | |
| 161f-162w | The Sixteenth Century ..... (6 cred.; jr., sr., grad.; prereq., one course above 50) | II | MWF | 217F | Mr. Brackney |
| 164s | Dante (in English) ..... (3 cred.; jr., sr., grad.; prereq., French 21-22-23 or 24-25, or 8 cred. in Eng. above 50) | II | TThS | 212F | Mr. Brackney |

* 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.

‡ For students beginning Italian in the Senior College, 1-2 and permission of instructor.

## SPANISH

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f-2w†‖ | Beginning Spanish ..... | I | MWThFS | 226F | Ar |
| | (10 cred.; fr., soph., jr., sr.; no prereq.) | IV | MTWFS | 125F | Ar |
| | | VI | MTWThF | 212F | Ar |
| 1w-2s†‖ | Beginning Spanish ..... (See 1f-2w) | VII | MTWThF | 227F (winter) | Ar |
| | | VII | MTThF | (spring) | |
| | | V | W | (spring) | |
| 1s†‖ | Beginning Spanish ..... (First qtr. of 1-2) | II | MWThFS | 201F | Ar |
| 2f | Beginning Spanish ..... (2nd qtr. of 1-2. See 1f-2w) | III | MTWFS | 202F | Ar |
| 3f-4w | Intermediate Spanish ..... | II | MWThFS | 201F | Ar |
| | (10 cred.; fr., soph., jr., sr.; prereq., 1-2 or 2 yrs. high school Spanish) | VI | MTWThF | 102F | Ar |
| 3w-4s | Intermediate Spanish ..... (See 3f-4w) | III | MTWFS | 202F | Ar |
| 3s | Intermediate Spanish ..... | I | MWThFS | 226F | Ar |
| | (First qtr. of 3-4. See 3f-4w) | IV | MTWFS | 125F | Ar |
| | | VI | MTWThF | 212F | Ar |
| 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 | Mr. LeFort |
| | (3 cred.; jr., sr.*; prereq., 3-4) | | | | |
| 54w-55s | Spanish Conversation ..... | II | MWF | 304F | Mr. LeFort |
| | (4 cred.; jr., sr.*; prereq., 53 or 20) | | | | |
| 60f | Adv. Spanish Composition..... | VI | MWF | 203F | Mr. Arjona |
| | (3 cred.; jr., sr.*; prereq. 53 or 20 with grade of B) | | | | |
| 61w-62s | Adv. Spanish Conversation..... | VI | MWF | 203F | Mr. Arjona |
| | (6 cred.; jr., sr.*; prereq., 54-55 or 20 with grade of B) | | | | |
| 65f-66w-67s† | Survey of Spanish Lit. ..... | II | TThS | 109F | Mr. LeFort |
| | (9 cred.; jr., sr.*; prereq., 3-4) | | | | |
| 68w-69s† | Survey of Spanish Lit..... | VI | MTWThF | 227F | Mr. LeFort |
| | (10 cred.; jr., sr.*; prereq., 3-4) | | | | |
| 70w-71s | Latin American Culture and Development ..... | III | MWF | 108F | Mr. LeFort |
| | (6 cred.; jr., sr.*; prereq., 3-4) | | | | |
| 110f-111w-112s | Spanish Lit.: 19th Century..... | IV | MWF | 108F | Mr. Arjona |
| | (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69) | | | | |
| 115f-116w-117s | Spanish Lit.: 17th Century..... | II | TThS | 305F | Mr. Arjona |
| | (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69) | | | | |

* 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.

‖ Credit is usually not given for more than one beginning language. See page 6.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| *141* | *Modern Spanish Novel* ..... (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69) | *Not offered* | | | |
| 150s | Modern Spanish Drama ..... (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69) | VII | MTThF | 102F | Mr. Arjona |
| *156-157-158* | *Spanish Lit.: 16th Century*..... (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69) | *Not offered* | | | |
| 174f-175w-176s | Contemporary Spanish Literature: Lectures in Spanish ..... (6 cred.; jr., sr., grad.; prereq., 20 (or 53-54-55) and 65-66-67) | IX | TTh | 202F | Mr. Arjona |

## SCANDINAVIAN

NOTE.—Additional courses in Scandinavian literature will be announced later.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| *1-2*‖ | *Beginning Norwegian* ..... (10 cred.; fr., soph., jr., sr.; no prereq.) | *Not offered* | | | |
| *3* | *Intermediate Norwegian* ..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2, or 1 yr. high school) | *Not offered* | | | |
| *4-5* | *Adv. Norwegian (Survey)*..... (10 cred.; soph., jr., sr.; prereq., 1-2-3 or 2 yrs. high school) | *Not offered* | | | |
| 7f-8w‖ | Beginning Swedish ..... (10 cred.; fr., soph., jr., sr.; no prereq.) | II | MWThFS | 206F | Mr. Stomberg |
| 9s | Intermediate Swedish ..... (5 cred.; all; prereq., 7-8 or 1 yr. high school) | II | MWThFS | 206F | Mr. Stomberg |
| 10f-11w | Advanced Swedish ..... (10 cred.; soph., jr., sr.; prereq., 7-8-9 or 2 yrs. high school) | I | MWThFS | 110F | Mr. Stomberg |
| 12s | Ancient and Medieval Scandinavian History ..... (5 cred.; soph., jr., sr.; prereq., 10-11, or 4-5, or Hist. 1-2) | I | MWThFS | 110F | Mr. Stomberg |
| 45s | Scandinavian Mythology ..... (3 cred.; jr., sr.§; prereq., none) | IV | MWF | 206F | Mr. Stomberg |
| *101-102-103* | *Modern Norwegian Lit*..... (9 cred.; jr., sr., grad.; prereq., 4-5) | *Not offered* | | | |
| 104f-105w | Modern Scandinavian History... (6 cred.; jr., sr., grad.; prereq., 10-11-12, or 4-5, or 15 cred. in hist.) | IV | MWF | 206F | Mr. Stomberg |
| 107f-108w-109s | Modern Swedish Literature..... (9 cred.; jr., sr., grad.; prereq., 10-11) | VI | MWF | 206F | Mr. Stomberg |

‖ Credit is usually not given for more than one beginning language. See page 6.

§ Does not count as a senior college course. Not open to sophomores. See Course Numbering, page 23.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| *110* | *Ibsen* ..... (3 cred.; sr., grad.; prereq., 101-102-103) | *Not offered* | | | |
| *111-112-113* | *Old Norse (Icelandic)*..... (6 cred.; sr., grad.; prereq., consent of instructor) | *Not offered* | | | |
| 114f | Strindberg ..... (3 cred.; sr., grad.; prereq., 107-108-109) | Ar | Ar | Ar | Mr. Stomberg |
| *117* | *Earlier Norwegian Literature*.... (5 cred.; jr., sr., grad.; prereq., 4-5) | *Not offered* | | | |
| 130f-131w-132s | Danish Lit. of the 19th Century (9 cred.; jr., sr., grad.; prereq., 4-5) | Ar | Ar | Ar | Ar |
| *136* | *Björnson* ..... (3 cred.; sr., grad.; prereq., 101-102-103, or 130-131-132) | *Not offered* | | | |

## SOCIOLOGY AND SOCIAL WORK

### *Major Advisers*

Professors Chapin, Kirkpatrick, Vaile, and Willey; Mrs. Fenlason.

### *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, or 160; two of 121, 122, 123; two of 120, 140, 141; 110 or 112 or 114.

Sequence B. Applied sociology. Courses 52, 53, 54, 70, 94; 55 or 60; 126 or 130; two of 128, 133, 134, 138-139; two of 100, 101, 102, 103; two of 116, 119, or 160; 120 or 122.

Sequence C. Rural sociology. Courses as follows: two of 52, 53, 60; two of 100, 101, 102, 103; two of 116, 119, 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 11 to 13 of this bulletin.

### *Honors Course*

Students entering the Senior College in 1930-31 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 | Introd. to Sociology..... | | | | | |
| | (5 cred.; 3rd qtr. fr., soph., jr., sr.; no prereq.) | | | | | |
| | | Lect. | I | TTh | OLAud | Mr. Willey |
| | | Sec. 1 | I | MWF | 2OPh | and others |
| | | 2 | III | MWF | 104OPh | |
| | | 3 | IV | MWF | 109OPh | |
| | | 4 | V | MWF | 109OPh | |
| | | 5 | VI | MWF | 104OPh | |
| | | 6 | VII | MWF | 2OPh | |
| | | 7 | III | TThS | 109OPh | |
| | (Univ. Farm, 3 cred.) | 8 | IV | MWF | * | |
| 1s | Introduc. to Sociology..... | | | | | |
| | (See 1f) | | | | | |
| | | Lect. | I | TTh | OLAud | Mr. Willey |
| | | Sec. 1 | I | MWF | 2OPh | and others |
| | | 2 | II | MWF | 2OPh | |
| | | 3 | III | MWF | 104OPh | |
| | | 4 | IV | MWF | 109OPh | |
| | | 5 | V | MWF | 109OPh | |
| | | 6 | VI | MWF | 109OPh | |
| | | 7 | VII | MWF | 104OPh | |
| | | 8 | II | TThS | 104OPh | |
| | | 9 | III | TThS | 109OPh | |
| | | 10 | IV | MWF | * | |
| | (Univ. Farm, 3 cred.) | | | | | |
| 6f,w | Social Interaction ..... | | | | | |
| | (3 cred.; soph., jr., sr.; prereq.,1) | | | | | |
| | | Lect. | II | WF | OPhAud | Mr. Kirkpatrick |
| | | Sec. 1 | I | T | 2F | and others |
| | | 2 | II | M | 2OPh | |
| | | 3 | II | T | 104OPh | |
| | | 4 | IV | T | 109OPh | |
| 6s | Social Interaction ..... | | | | | |
| | (See 6f) | | | | | |
| | | Lect. | III | MF | OPhAud | Mr. Kirkpatrick |
| | | Sec. 1 | III | T | 104OPh | and others |
| | | 2 | III | W | 113F | |
| | | 3 | III | Th | 104OPh | |
| | | 4 | II | T | 2OPh | |
| 14f,w,s | Rural Sociology ..... | | | | | |
| | (3 cred.; soph., jr., sr.; prereq., 1) | | | | | |
| | | Lect | IV | MW | OPhAud | Mr. Zimmerman |
| | | Sec. 1 | III | S | 2OPh | and others |
| | | 2 | IV | F | 2OPh | |
| | | 3 | VI | Th | 109OPh | |
| | | 4 | VI | F | 2OPh | |

* Consult the bulletin of the College of Agriculture, Forestry, and Home Economics.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 45f,w* | Social Statistics ..... (5 cred.; soph., jr., sr.; prereq., 1) | VII | MTWThF | 109OPh | Mr. Vold |
| 49f,w,s | The Occurrence of the Socially Inadequate ..... (3 cred.; 3d qtr. soph., jr., sr.; prereq., 10 cred. in soc. or Soc. 1 and 10 cred. in soc. sci. or psy.) | I | MWF | 109OPh | Mrs. Fenlason |
| 52f,w,s | Elem. Case Work..... (3 cred.; jr., sr.; prereq., 49, 90 to be taken simultaneously) | I | TThS | 109OPh | Miss Vaile |
| 53f,w,s | Elem. of Criminology ..... (3 cred.; jr., sr.; prereq., same as for 49) | III | MWF | 109OPh | Mr. Vold |
| 54w | The History and Theory of Social Work ..... (3 cred.; jr., sr.; prereq., Soc. 49, 52 or simultaneously with 52) | I | MWF | 108F | Miss Salsberry |
| 55s | Social Aspects of Housing Problems ..... (3 cred.; jr., sr.; prereq., same as for 49) | I | MWF | 5F | Miss Salsberry |
| 60f,w | Social Protection of the Child.. (3 cred.; jr., sr.; prereq, 49 and 52) | VI | MWF | 109OPh | Mrs. Doyle |
| 70f,w | Group Work in the Community (3 cred.; jr., sr.; prereq., 49) | I | MWF | 15F | Miss Mead |
| 71f,w-72f,w | Elementary Field Training in Group Work ..... (2 cred.; jr., sr.; prereq., 49, 70, or simultaneously) | Ar | Ar | Ar | Miss Vaile, Miss Jones |
| 90f,w,s-91f,w,s-92f,w,s | Elementary Field Training in Case Work ..... (2 cred. each qtr.; jr., sr.; prereq., 49, and 52 simultaneously with 90) | | | | |
| | (Fall) Sec. 1 | I, II, III | MW | | Mrs. Iverson, Mrs. Fenlason |
| | 2 | I, II, III | WF | | |
| | 3 | VI, VII, VIII | MW | | |
| | 4 | VI, VII, VIII | WF | | |
| | 5 | VI, VII, VIII | TTh | | |
| | (Winter) Sec. 1 | II, III, IV | MW | | Mrs. Iverson, Mrs. Fenlason |
| | 2 | II, III, IV | WF | | |
| | 3 | VI, VII, VIII | MW | | |
| | 4 | VI, VII, VIII | WF | | |
| | 5 | VI, VII, VIII | TTh | | |
| | (Spring) Sec. 1 | VI, VII, VIII | MW | | Mrs. Iverson, Mrs. Fenlason |
| | 2 | VI, VII, VIII | WF | | |
| | 3 | II, III, IV | TTh | | |
| | 4 | VI, VII, VIII | TTh | | |
| 93f,s | The Social Heritage and the Individual ..... (3 cred.; jr., sr.; prereq., Soc. 1 and 15 cred. in soc. sci., ed., phil., or psy.) | II | TThS | 2OPh(f) 15F(s) | Mr. Finney |

* No student may receive credit for both Course 45 and Economics 14.

| No | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 94f | Essentials of Medicine for Social Workers ..... (3 cred.; jr., sr.; prereq., Soc. 49, 52, 90, 91) | IX | MWF | 20Ph | Med. Staff U.H. Miss Gardiner |
| 100f | Social Psychology ..... (3 cred.; jr., sr., grad.; prereq., Soc. 1, and 15 cred. in soc. sci., educ., phil., or psy.) | II | TThS | 109OPh | Mr. Kirkpatrick |
| 101w | Social Organization ..... (3 cred.; jr., sr., grad.; prereq., 4 courses in soc., or Soc. 1 and 15 cred. in soc. sci., educ., phil., or psy.) | II | TThS | 109OPh | Mr. Chapin |
| 102s | Social Control ..... (3 cred.; jr., sr., grad.; prereq., same as for 101) | II | MWF | 109OPh | |
| 103s | Sociology of Conflict ..... (3 cred.; jr., sr., grad.; prereq., same as for 101) | II | MWF | 110F | |
| 110f | Rural Organization ..... (3 cred.; jr., sr., grad.; prereq., same as for 101) | V | MWF | 104OPh | Mr. Zimmerman |
| 112w | The Rural Social Survey..... (2 cred.; jr., sr., grad.; prereq., same as for 101) | V | MW | 104OPh | Mr. Zimmerman |
| 114s | Rural Social Institutions..... (3 cred.; jr., sr., grad.; prereq., same as for 101) | I | MWF | * | Mr. Lundquist |
| 116w | The Newspaper As a Social Institution ..... (3 cred.; jr., sr., grad.; prereq., same as for 101) | IV | MWF | 104OPh | Mr. Willey |
| 119f | The Family ..... (3 cred.; jr., sr., grad.; prereq., same as for 101) | III | TThS | 104OPh | |
| 120f | Social Progress ..... (3 cred.; jr., sr., grad.; prereq., same as for 101) | II | MWF | 109OPh | Mr. Wallis |
| 121w | Advanced Statistical Methods... (3 cred.; jr., sr., grad.; prereq., 4 courses in soc., including 45 or its equivalent) | VII | MWF | 104OPh | Mr. Chapin |
| 122w-123s | Methods of Social Investigation.. (6 cred.; jr., sr., grad.; prereq., same as for 101) | VIII | MWF | 109OPh | |
| 126s | Technique of Leadership in Group Work ..... (3 cred.; sr., grad.; prereq., 70, 71) | I | TThS | 104OPh | Miss Mead |
| 128s | Principles of Administration, Publicity and Finance Applied to Social Work ..... (2 cred.; jr., sr., grad.; prereq., same as for 101) | VIII, IX | Th | 109OPh | Mr. Bradley |
| 130s | Advanced Case Work..... (2 cred.; sr., grad.; prereq., same as for 101 incl. 49 and 52) | VIII, IX | T | 109OPh | Mrs. Fenlason |

* Consult the bulletin of the College of Agriculture, Forestry, and Home Economics.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 131w | Rural Social Case Work..... (3 cred.; sr., grad.; prereq., 52, 90, 91) | III | TThS | 104OPh | Miss Vaile |
| *132* | *Juvenile Courts and Probation...* (2 cred.; jr., sr., grad.; prereq., 49, 52, 53) | *Not offered* | | | |
| 133f | Social Case Work in Health Problems ..... (3 cred.; sr., grad.; prereq., 52, 90, 91 and Prev. Med. 50, or 53, or simultaneously) | IX<br>IV | Th<br>S | 109OPh | Miss Gardiner |
| 134s | Legal Protection of the Child... (3 cred.; jr., sr., grad.; prereq., same as for 101 incl. 60) | I | MWF | 109F | Mr. Waite |
| 135s | Field Practice in Legal Protection of the Child..... (2 cred.; jr., sr., grad.; prereq., 90, open to students taking 134) | Ar | Ar | Ar | Miss Vaile, Mrs. Fenlason |
| 138w-139s | Mental Case Work..... (6 cred.; sr., grad.; prereq., 52, 90, 91 and Psy. 144-145, or Prev. Med. 61, or simultaneously) | I, II | S and ar | 2OPh | Miss Leahy |
| 140w | History of Social Theory..... (3 cred.; jr., sr., grad.; prereq., same as for 101) | II | MWF | 109OPh | Mr. Wallis |
| 141s | Contemp. Social Theory..... (3 cred.; jr., sr., grad.; prereq., same as for 101) | II | TThS | 109OPh | Mr. Wallis |
| *152* | *Seminar: Problems of Institutional Administration* ..... (2 cred.; sr., grad.; prereq., consent of director) | *Not offered* | | | |
| 153f,w,s-154f,w,s-155f,w,s | Advanced Field Training in Group or Case Work..... (3 cred per qtr.; jr., sr., grad.; prereq., 90 and 91) | Ar | Ar | Ar | Miss Vaile, Mrs. Fenlason |
| 160s | Population Problems ..... (3 cred.; jr., sr., grad.; prereq., 4 courses in soc., or Soc. 1 and 15 cred. in soc. sci., ed., phil., or psy.) | III | MWF | 2OPh | Mr. Chapin |

## 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) | | | | Mr. Rarig and others |
| | Sec. 1 | I | MWF | 308F | |
| | 2 | II | MWF | 308F | |
| | 3 | VI | MWF | 308F | |
| | 4 | I | TThS | 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 | MTWFS | 402F | |
| | 3 | VI | MTWThF | 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 | IV | MTWFS | 5F | |
| | 2 | III | MTWFS | 3F | |
| | 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 | |
| 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<br>VII, VIII | T<br>Th | OLAud | Ar |
| 61f | Speech Correction ..... (4 cred.; jr., sr.; prereq., 41-42-43 or 45-46; Psy. 1-2) | VI | MTThF | 306F | Miss Kennedy |
| 67s*¶ | Phonetics ..... (3 cred.; jr., sr.; prereq., 41-42-43 or 45-46) | II | MWF | 402F | Miss Kennedy |

* 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. Students in Education not majoring in Speech may receive credit for Course 41-42.

¶ Students intending to take Advanced Speech Correction should take Phonetics the preceding spring.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 71f-72w-73s*† | Elements of Play Production... (9 cred.; jr., sr.; prereq., 41-42-43 or 45-46) | III | MWF | 19Mu | Mr. Staadt |
| 81f-82w-83s* | Interpretative Reading ..... (9 cred.; jr., sr.; prereq., 41-42-43 or 45-46) | | | | |
| | Sec. 1 | IV | MWF | 308F | Mr. Rarig |
| | 2 | I | TThS | 308F | Mr. 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. Staadt |
| 97f,w,s | Intercollegiate Oratory and Debate ..... (3 cred.; jr., sr.; prereq.§) | Ar | Ar | 308F | Mr. 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 | Mr. 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 | Mr. Rarig |
| 121f-122w†* | Advanced Speech Problems..... (6 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46, Psy. 1-2) | II | TThS | 409F | 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 | Mr. Holmes |
| 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 | Miss Kennedy |

## ZOOLOGY

### *Major Advisers*

Professors Riley, Chapman, Minnich, Sigerfoos, and Wodsedalek; Associate Professor Ringoen; Assistant Professors Dawson, Eddy, Johnson, and Mickel.

### *Major Sequences*

Prerequisites: 1-2 and 3-4, 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, histology, parasitology, or protozoology, a major will consist of the respective one hun-

* 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. Miss Kennedy.

§ Open to the representative of the University in the Northern Oratoric League and to members of the intercollegiate debate squad.

dred 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, embryology and hematology 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 |
|---|---|---|---|---|---|---|---|
| 1f-2w† | General Zoology: Lectures..... | | | | | | |
| | (6 cred.; all) | | Sec. 1 | I | TThS* | 313Z | Mr. Wodsedalek |
| | Sections limited to 160 | | 2 | II | TThS | 313Z | Mr. Minnich |
| | | | 3 | III | TThS | 313Z | Mr. Wodsedalek |
| 1w-2s† | General Zoology: Lectures..... | | | | | | |
| | (See 1f-2w) | | Sec. 1 | II | MWF | 313Z | Ar |
| | Sections limited to 160 | | 2 | III | MWF | 313Z | Ar |
| 3f-4w† | General Zoology: Laboratory... | | | | | | |
| | (4 cred.; fr., soph., jr., sr., with or after 1-2. *Must be completed if zoology is offered as the required laboratory science.*) | | | | | | |
| | | | Sec. 1 | I, II | MWF | 101Z | Ar |
| | | | 2 | III, IV | MWF | 101Z | Ar |
| 3w-4s† | General Zoology: Laboratory.... | | | | | | |
| | (See 3f-4w) | | Sec. 1 | VI, VII | MWF | 101Z | Ar |
| | | | 2 | VIII, IX | MWF | 101Z | Ar |
| 5f-6w-7s† | General Zoology ..... | | | | | | |
| | (12 cred.; pre-medical and pre-dental students, fr., soph., jr., sr.; no prereq.) | | | | | | |
| | | Lab. | Sec. 1 | I, II | ThS | 101Z | Mr. Dawson |
| | (Pre-dental) | Lect. | | I | MWF | 313Z | |
| | | Lab. | 2 | III, IV | TS | 101Z | |
| | (Pre-medical) | Lect. | | IV | MWF | 313Z | Mr. Sigerfoos |
| | (Spring) | Lab. | | III, IV | WF | 101Z | |
| | | Lect. | | IV | MTS | 313Z | |
| 14f-15w-16s† | General Zoology ..... | | | See College of Agriculture bulletin. | | | |
| | (9 cred.; Agr., For.; no prereq.) | | | | | | |
| 17f-18w† | General Zoology ..... | | | See College of Agriculture bulletin. | | | |
| | (6 cred.; H.E.; no prereq.) | | | | | | |
| 21s‡ | Introd. to General Physiology... | | | VI, VII, VIII | MW | 10Z | Mr. Minnich |
| | (5 cred.; fr., soph., jr., sr.; prereq., 1-2, 3-4, chem. or phys. desirable) | | | VI, VII, VIII, IX | F | | |

* Section 1 is not open to first term freshmen in the fall quarter.

† The entire course must be completed before credit is received for any quarter.

‡ Not open to pre-medical or pre-dental students or to those who have had college physiology.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 22s | General Ecology ..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2, 3-4) | VI, VII, VIII<br>VI, VII, VIII, IX | MW<br>F | 211Z, 401Z | Mr. Chapman |
| 23f | Introd. Entomology ..... (5 cred.; soph., jr., sr.; prereq., 1-2, 3-4) | | | | |
| | Lect. | VI | MWF | 211Z | Ar |
| | Lab. | VI, VII, VIII | TTh | 208Z | |
| 24f | Introd. Animal Parasitology..... (5 cred.; soph., jr., sr.; prereq., 1-2, 3-4) | VI, VII, VIII | MWF | 208Z | Ar |
| 25w | Histology ..... (5 cred.; soph., jr., sr.; prereq., 1-2, 3-4, and permission of the head of the dept.) | VI, VII, VIII | MWF | 201, 211Z | Mr. Ringoen |
| 26w | Comp. Anatomy ..... (5 cred.; soph., jr., sr.; prereq., 1-2) | III, IV | MTWFS | 01Z | Mr. Johnson |
| 27w | Technique ..... .... (3 cred.; stud. in zool.; major and grad.; prereq., 20 cred.) | | | | |
| | Lect. | Ar | Th | 211Z | Miss Slider |
| | Lab. | Ar | Ar | 213Z | |
| 37f-38w-39s† | General Entomology ..... (9 cred.; soph., jr., sr.; prereq., 1-2, 3-4) | I, II | MWF | 208Z | Ar |
| 46w-47s† | Ornithology ..... (6 cred.; soph., jr., sr.; prereq., 1-2, 3-4 and permission of instructor) | VI, VII, VIII | MW | 314Z | Dr. Roberts |
| 75s | Nature Study ..... (3 cred.; jr., sr.; prereq., 20 cred. incl. 1-2, 3-4) | VI, VII, VIII | TTh | 213Z | Mr. Wodsedalek |
| 107f-108w | Protozoology ..... (6 cred.; jr., sr., grad.; prereq., 15 cred.) | I, II | TThS | Ar | Mr. Sigerfoos |
| 109f-110w-111s | Experimental Zoology ..... (9 cred.; jr., sr., grad.; prereq., 20 cred.) | IV | MWF | 10Z | Mr. Minnich |
| 117w-118w-119su | Ecology of Insects ..... (9 cred.; jr., sr., grad.; prereq., 15 cred.) | VI, VII, VIII | TTh | 401Z | Mr. Chapman |
| 120su | Advanced Ecology ..... (5 cred.; jr., sr., grad.; prereq., 117-118-119) | Ar | Ar | Ar | Mr. Chapman |
| 125f-126w-127s | Advanced Entomology ..... (9 cred.; jr., sr., grad.; prereq., 37-38-39) | Ar | Ar | 208Z | Ar |
| *139-140* | *Histol. and Develop. of Insects..* (6 cred.; jr., sr., grad.; prereq., 37-38-39) | *Not offered* | | | |
| 144f,s-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 | Ar |

† The entire course must be completed before credit is received for any quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 148f-149w-150s† | Histology and Organology..... (9 cred.; jr., sr., grad.; prereq., 15 cred. in zool., or 1-2, 3-4, and 1 yr. chem. Permission of head of dept. necessary) | III, IV | MWF | 201, 211Z | Mr. Ringoen |
| 181f-182w | Embryology ..... (6 cred.; jr., sr., grad.; prereq., 25 or equiv.) | VI, VII, VIII | TTh | 202Z | Mr. Ringoen |
| 183s | Genetics and Eugenics ..... (3 cred.; jr., sr., grad.; prereq., 1-2, 3-4 and 5 other cred. in zool. or bot. or psych.) | IV V | TS & Ar | 211Z | Mr. Wodsedalek |
| 197f-198w-199s | Problems ..... (5 or more cred.; jr., sr., grad.; prereq., 1-2, spec. requirements) | 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.

## DESCRIPTION OF NEW COURSES

### ANTHROPOLOGY

107. American Archeology.

150. Field Trip in Archeology. Investigation under the personal supervision of Mr. Jenks of the remains of primitive civilizations.

### COMPARATIVE LITERATURE

111. The Novel in Europe, 1875-1925. Authors such as Dostoievski, Thomas Mann, Björnson, Undset, D'Annunzio, Valdès, Bourget, Loti, Proust, Barbusse, Hardy, Bennett, Galsworthy, Conrad, Lewis, will be studied.

### FINE ARTS

1. History of Classic Art. Illustrated lectures and reading on the development of the major arts from the earliest times to the fall of Rome.

2. History of Architecture and Sculpture. Development of these two major branches of art from the rise of Christianity to modern times.

3. History of Painting. An introductory historical survey of painting from the late middle ages to the present time.

5. Appreciation of the Fine Arts. Discussion of the elements of the fine arts.

40. European Study. Observations in museums during the summer supplemented by reading. Consent of the instructor and directions for this work must be secured before going abroad.

51. Medieval Art. Chiefly architecture and sculpture of Gothic cathedrals.

52. Art of the Italian Renaissance.

† The entire course must be completed before credit is received for any quarter.

GEOGRAPHY

53. Historical Geography. The geography of selected districts of the United States during past periods of history, the successive adjustments of man to the pre-existent natural environment being presented in chronological order.

GERMAN

61. Epics and Ballads. Epics and ballads from classical and modern authors.
170-171-172. Young Germany (Gutzkow, Grunermann, Haine).

HISTORY

3. Economic and Social History of the Modern World.
10. Europe since 1914.

HOME ECONOMICS

33. Home Management Problems for Social Workers. The management of the home in relation to the economic and social status of the family, special consideration being given to the dependent family.

HUMAN PHYSIOLOGY

60. Physiology of Exercise.

MATHEMATICS

141. Projective Geometry.
142. Theory of Invariants. Algebraic properties of invariants and covariants of binary and ternary forms; applications; symbolic notation.
143. Integral Equations.

PHYSICS

11. Survey of Physics. The field of general physics from the standpoint of general rather than technical interest. The fundamental principles of physics presented in non-mathematical terms. Consequences and applications of these principles illustrated by experiment.

POLITICAL SCIENCE

176-177-178. Scope and Methods of Political Science. The field of political science; relation to other studies; types of approach; research methods and technique; bibliography. Problems of teaching at the college level.
196. Topics in Colonial Government. Problems of colonial administration and development.

PSYCHOLOGY

72. Psychological Esthetics. The psychology of esthetic experience. An analysis of the capacity for enjoying and originating beauty. Emphasis upon experimental studies.

SOCIOLOGY

54. The History and Theory of Social Work. A consideration of the historical backgrounds of the modern social work movement and the evolution of the theory underlying it.
93. The Social Heritage and the Individual. An analysis of the mental interdependence of individuals in their common utilization of the social heritage. Stresses the implications of this not only for sociology but for the other social sciences as well, including education.
94. Essentials of Medicine for Social Workers. A discussion of diseases most often encountered in social work, with a consideration of their social implications. Open only to training course majors.
131. Rural Social Case Work. Primarily a course for students wishing to specialize in social work in the rural field.

# INDEX

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

## *Division of Library Instruction Announcement for the Year 1930-1931*

*Vol. XXXIII No. 10 March 12 1930*

*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, Reference, and Selection of Books

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

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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 Public 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 demand from school officials, library boards, and librarians and from 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. It 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 college 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. The College of Science, Literature, and the Arts accepts only library training students in senior standing. The College of Education will credit a minor of library training during the junior year. (See pages 6-7.) School of Business Administration students desiring library instruction credits must be in senior standing. Persons not eligible for regular registration may be admitted as unclassed students according to college regulations or 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 in library training are, for full time students, $40 per quarter for residents of Minnesota and $45 per quarter for non-residents. Unclassed 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, one of one year 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. Credit for courses in library instruction will also be given in the School of Business Administration. Permission for such credit must be obtained from the dean of the School of Business Administration.

A special course in Hospital Library Work, involving a fifth year of work, is outlined on pages 7-8.

# DESCRIPTION OF COURSES

## 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. (See also p. 3.) 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. 1. 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.; Sec. 1, MW II, 3Lib.; Sec. 2, MW IV, 3Lib.; Sec. 3, MW VI, 5Lib.) Miss Firkins, Mr. Russell, Miss Baker, 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, except as specified on pages 6-7.

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.; Sec. 1, MWF I, Ed. students; Sec. 2, MWF IV.) 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 IV; 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. 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; TThS I; 5Lib.) Miss Baldwin, Miss Wood.

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.; MWF II; 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 exhibits, etc. (1 cred.; prereq., 9 cred. in library methods; T III; 5Lib.) Mr. Walter.

Lib.Meth. 119f. Current Library Problems. Discussion of typical problems and conditions in American libraries. (3 cred.; prereq., 9 cred. in library methods or simultaneously with Lib.Meth. 101, 102, 104; MWF II; 5Lib.) Mr. Walter.

Lib.Meth. 120w. Current Library Problems. Further discussion of typical library problems, library buildings, library surveys, etc. (3 cred.; prereq., Lib.Meth. 119; MWF II; 5Lib.) Mr. Walter.

Lib.Meth. 121w. Library Work with Children. Administration of children's rooms and book selection. (3 cred.; prereq., 9 cred. in library methods or 6 cred. and one three-credit course in library training simultaneously with 121; MWF I; 5Lib.) Miss McGregor.

Lib.Meth. 122s. Library Work with Children. Further discussion of administration of children's rooms and book selection. (3 cred.; prereq.. Lib.Meth. 121; MWF I; 5Lib.) Miss McGregor.

Lib.Meth. 123f. Selection of Books for Adults. Principles of selection and criticism of representative books. Criticism and preparation of book lists. (2 cred.; ThS III; 5Lib.) Miss Hutchinson.

Lib.Meth. 124w. Selection of Books for Adults. Further discussion of books and aids to book selection. (2 cred.; prereq., Lib.Meth. 123; ThS III; 5Lib.) Miss Hutchinson.

Lib.Meth. 125s. Selection of Books for Adults. (2 cred.; prereq.; Lib. Meth. 124; ThS III; 5Lib.) Miss Hutchinson.

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 of bacheior of science. The specific requirements for the three years of preliminary work may be found in the bulletin 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.

Students from other institutions desiring a degree in library training must meet the same specific requirements which students of the University of Minnesota must meet.

## 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. Students also qualify for the Minnesota high school general certificate for teaching academic subjects in junior and senior high schools by completing one teaching major or two teaching minors. It will be wisest to choose majors and minors in the fields of English and history. Students who complete eighteen credits selected from Courses 102f, 104f, 107s, 108s, 112w, 114s, 121w and 122s will satisfy the requirements for a minor in library training. (See pp. 4-6 for description of courses.)

### *Freshman Year*

| Fall | Credits | Winter | Credits | Spring | Credits |
|---|---|---|---|---|---|
| English | 5 | English | 5 | English | 5 |
| Modern World | 5 | Modern World | 5 | History | 5 |
| Language | 5 | Language | 5 | Language | 5 |
| | 15 | | 15 | | 15 |

### *Sophomore Year*

| Fall | Credits | Winter | Credits | Spring | Credits |
|---|---|---|---|---|---|
| Science | 5 | Science | 5 | Elective | 5 |
| Language | 5 | Elective[1] | 7 | Elective | 5 |
| Psychology | 3 | Psychology | 3 | Elective | 5 |
| Elective | 2 | | | | |
| | 15 | | 15 | | 15 |

[1] Electives should be chosen to meet the requirements of one teaching major or two teaching minors. See College of Education bulletin, Part I.

### *Junior Year*

| Fall | Credits | Winter | Credits | Spring | Credits |
|---|---|---|---|---|---|
| 102 Cataloging | 3 | 112 Reference | 3 | (6 credits selected from 107, 108, 114) | |
| 103 Classification | 3 | 121 Library Work with Children | 3 | 107 Library Administration | 3 |
| 55 Ed. Psy. | 3 | Ed. Ad. 65 The High School | 3 | 108 Library Administration | 3 |
| Continuation of required elective academic courses | 6 | Continuation of required elective academic courses | 6 | 114 Book Selection for Adolescents | 3 |
| | 15 | | 15 | T. 15 Technique of H. S. Instruction | 3 |
| | | | | Continuation of required elective academic courses | 6 |
| | | | | | 15 |

### *Senior Year*

| Fall | Credits | Winter | Credits | Spring | 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 credits—fall, winter, spring (see pp. 4-6).

Elective[1]—9 credits.

[1] At least 2 credits must be chosen from approved Education courses. See College of Education bulletin, Part I.

## 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 pp. 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. Both cities have organized hospital library service under the direction of their public libraries.

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.

| 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 Methods | 116 | Hospital Library Administration | 1 | 1 |
| Library Methods | 117 | Literature for Use of Hospital Groups (six hours weekly of required reading) | 1 | 9 |
| Library Methods | 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

## *Course in Medical Technology for Laboratory Technicians*

## *1930-1932*

*Vol. XXXIII No. 39 August 27 1930*

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# COURSE IN MEDICAL TECHNOLOGY

The University of Minnesota offers a four-year course in Medical Technology. Graduates of accredited high schools may enter at the beginning of any quarter. The rules for admission and registration are those of the College of Science, Literature, and the Arts. The first two years are essentially the same as the pre-medical requirement. The last two years are spent in the Medical School and laboratories of the University Hospitals. No short course is offered. Opportunities for practical work are limited to regularly enrolled students at the University who have completed the prerequisites as outlined in this bulletin.

*Credits and honor points.*—At least 90 credits, including physical education and military drill with an average of one honor point per credit, shall be earned in the first two years (Science, Literature, and the Arts), and 90 credits and 90 honor points in the last two years (Medical School).

*Degrees.*—Upon satisfactory completion of the prescribed course the degree of bachelor of science will be conferred by the Board of Regents.

*Requirements.*—Well-trained laboratory technicians are in demand. Positions may be secured in physicians' offices, clinics, hospitals, research laboratories, and medical schools. As a general rule a student, who is able to do things with her hands, likes routine work, and excels in scientific subjects, will make a good technician. Ability to cook and sew is an excellent asset for would-be technicians. Men are not advised to take the course because of limited opportunities for employment at the present time. The regular course in medicine, followed by graduate study, is advised for men and women who wish to become pathologists. Students desiring to specialize in bacteriology, anatomy, parasitology, hematology, or chemistry are advised to do graduate work as fellows (see bulletin of Graduate School) after completion of the course in medical technology.

*Course.*—The following guide has been prepared for the assistance of the student in registering. The committee in charge consists of William A. O'Brien, M.D., chairman, W. P. Larson, M.D., and S. Marx White, M.D. Further information may be obtained by addressing the chairman at the University Hospitals, University of Minnesota, Minneapolis, Minnesota.

*Advanced standing.*—Students who have completed required subjects elsewhere may receive advanced standing. Transcripts of such records should be sent to the university examiner, University of Minnesota, for approval before attempting to register.

*Abbreviations.*—(S.L.A.) Science, Literature, and the Arts College, (M.S.) Medical School refer to special school bulletins where detailed information is to be found. Consult the bulletin of general information for fees, estimated living expenses, registration details, etc.

Before registering be sure to note prerequisites.

## THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

The required courses are listed below. High school physics is a prerequisite, but Physics 11, Survey of Physics, may be taken after admission.

1. English A-B-C, or Composition 4-5-6, or exemption from requirement
2. Zoology 5-6-7 or 1-2 and 3-4, 24[1], 25[1]
3. Inorganic Chemistry 1-2-3 or 4-5; 11
4. Analytical Chemistry 7
5. Organic Chemistry 1-2
6. A reading knowledge of Scientific French or German
7. Bacteriology 41[1]
8. Human Physiology 4[1]

1. (S.L.A.) English: Freshman Composition 4f-5w-6s, 9 credits, or Freshman English Af-Bw-Cs, 15 credits, or exemption from requirement. (See special announcement.)
2. (S.L.A.) Zoology: General Zoology 1f-2w (3f-4w) 10 credits, or 5f-6w-7s, 12 credits.
3. (S.L.A.) Chemistry: (a) General Inorganic Chemistry 1f-2w-3s, 12 credits, or 4f-5w, 8 credits; (b) Qualitative Chemical Analysis 11f,s, 4 credits; (c) Quantitative Analysis 7f,w,s, 4 credits; (d) Elementary Organic Chemistry 1f-2w, or 1w-2s or 1s-2f, 8 credits.
4. (S.L.A.) Physics: High school physics is a prerequisite, but Physics 11s, 3 credits, may be taken as a substitute after admission.
5. (S.L.A.) Foreign Language: French or German, reading knowledge of medical literature, scientific French 8, 9, and 10 (any two) or by transfer of credits from elsewhere (15 credits of French, grade C) followed by special examination; German 31-32, or two years of college German or equivalent.
6. (S.L.A.) *Electives.*—
   Sociology and Social Work: Introduction to Sociology 1f,w,s, 5 credits.
   Psychology: German Psychology 1f-2w or 1w-2s, or 1s-2s, 6 credits.
   Anatomy: Human Anatomy 5s, 4 credits, and others.
7. (S.L.A.) Physical education and military drill, swimming tests, etc. (See special requirement.)
8. (S.L.A.) The following subjects in the Medical School should be taken in the sophomore year if possible: (1) Zoology 24f, (2) Zoology 25w, (3) General Bacteriology 41f,w,s, (4) Human Physiology 4f,w,s. This allows the student to spend the entire senior year in practical work which is very desirable. Electives may be postponed until the junior year if they interfere with this program.

[1] Need not be taken during the first two years.

## THE MEDICAL SCHOOL

1. (S.L.A.) Zoology: Introduction Animal Parasitology 24f, 5 credits.
2. (S.L.A.) Zoology: Histology 25w, 5 credits. (Prerequisite to Hematology.)
3. (M.S.) Bacteriology: General Bacteriology 41f,w,s, 5 credits.
4. (M.S.) Physiology: Human Physiology 4f,w,s, 4 credits.
5. (M.S.) Anatomy: Hematology 165f-166w, 6 credits.
6. (M.S.) Bacteriology: Special Bacteriology for Medical Students 101f, 4 credits.
7. (M.S.) Bacteriology: Immunity 116w, 3 credits.
8. (M.S.) Human Physiology: Physiological Chemistry 100w-101s, 10 credits.
9. (M.S.) *Electives.*—
   Preventive Medicine and Public Health: Public and Personal Health 50f,w,s, 3 credits.
   Physiology: Pathological Chemistry 155f, 156w, 157s, 3 credits a quarter.
10. (M.S.) Practical Work: Blood, urine, feces, gastric analysis, blood chemistry, spinal fluid, tissues, electrocardiography, bacteriology, serology, basal metabolism, radiology in the laboratories of the University Hospitals. Arrange with Dr. O'Brien. 3 quarters, 45 credits.

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

## *Department of Music*
## *Announcement for the Years*
## *1929-1931*

*Vol. XXXII No. 31 May 18 1929*

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*Minneapolis, Minnesota*

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# 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 *Aïda*, 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.

## 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 | $20.00 |
| Non-residents | 30.00 |
| Credit hour tuition fee (unclassed students, auditors, and others carrying less than full work) | |
| Residents of Minnesota | 1.75 |
| Non-residents | 2.50 |
| Incidental fee (per quarter) | 6.00 |
| Deposit (first quarter only) | 5.00 |
| Military deposit (required of all students taking military drill) | 10.00 |
| Special fees | |
| Examination for removal of condition | 1.00 |
| Examination for credit (after the first quarter in residence) | 5.00 |
| Special examination | 5.00 |
| Practice teaching fee for Grade and High School Methods (per quarter) | 1.00 |
| Graduation fee | 10.00 |
| Music fees, per quarter (for each course in practical music) | |
| Two lessons per week (one-half hour) | 65.00 |
| One lesson per week | 35.00 |
| Practice fees | |
| Organ (per hour) | |
| Small | .20 |
| Large | .40 |
| Piano (six hours per week) per quarter | 5.00 |
| ($.50 per quarter for each additional hour per week) | |

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:

| *Amount Presented for Entrance* | *Amount Required in Junior College* |
|---|---|
| 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 |

### FIRST YEAR

| Fall | Credits | Winter | Credits | Spring | 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 YEAR§

| *Major Sequence A* | | *Major Sequence B* | | *Major Sequence C* | |
|---|---|---|---|---|---|
| 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 YEAR§

| *Major Sequence A* | | *Major Sequence B* | | *Major Sequence C* | |
|---|---|---|---|---|---|
| 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.

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, 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.

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.

Af-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 appraisement 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*

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# 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

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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

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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

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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

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### COMMITTEE ON PUBLIC HEALTH NURSING

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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

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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.

[1] A 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 90 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 Home Economics 40 | Child Welfare / Child Training | 3 |
| 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 55
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]

[1] All 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. Childs.

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,su. 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 DEPARMENTS 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*
## *1930-1931*

*Vol. XXXIII* *No. 30* *July 5 1930*

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*Act of October 3, 1917, authorized July 12, 1918*

# FRESHMAN WEEK

All entering freshmen are *required* to be in attendance at the University during the Freshman Week period from 8:30 a.m., Wednesday, September 24, until noon on Saturday, September 27, to take part in a program arranged by the University. *Those who have not completed their psychological and English tests (given at the high schools last May), must report for these tests on Monday, September 22.* It is recommended that as many others as possible present themselves for registration on Monday, September 22, in order to avoid inconvenience and delay incident to the congestion on the last day. A special handbook of Freshman Week is sent to applicants for admission; it may be obtained from the registrar of the University upon request.

Entering freshmen who are not residents of either Minneapolis or St. Paul are urged to arrive a sufficient time prior to the beginning of Freshman Week to enable them to arrange for board and room. Beginning at 8:30 Wednesday morning, freshmen will have their time fully occupied with required activities which will give them little opportunity for making such arrangements.

Events during the Freshman Week period will follow a definite schedule which, for students entering Engineering, Architecture, or Chemistry, will include the following:

a. Matriculation
b. Physical examination
c. Registration and payment of fees
d. Special required lectures
e. Placement tests in
    Mathematics
    Chemistry
    English
f. Examinaton in algebra
g. Classification and preparation of study program

Attendance at each of the above events is taken by means of coupons which are issued in book form to students when they matriculate at the registrar's office.

Besides the required activities it is suggested that new students during their leisure time visit not only the buildings and laboratories of the engineering and chemistry group, but acquaint themselves with other buildings and points of interest on both the main and farm campuses. Information booths for their convenience will be located at various points on both campuses.

In the evenings, musical and social entertainments are arranged with the co-operation of the Student Council and various religious bodies. Students are urged to attend.

## 1930

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# UNIVERSITY CALENDAR

## 1930-31

### *Fall Quarter*

| | | | |
|---|---|---|---|
| 1930 | | | |
| September | 18 | Thursday | Payment of fees closes, except for new students |
| September | 22 | Monday | Entrance tests |
| September | 22-26 | | Examinations for removal of conditions |
| | | | Physical examinations |
| September | 24-27 | | Freshman Week |
| September | 26 | Friday | Registration day[1] for the College of Engineering and Architecture, and the School of Chemistry |
| | | | Payment of fees for new students closes |
| September | 29 | Monday | Fall quarter classes begin, 8:30 a.m.[2] |
| October | 16 | Thursday | Senate meeting, 4:30 p.m. |
| November | 1 | Saturday | Homecoming Day |
| November | 4 | Tuesday | General Election Day; a holiday |
| November | 5 | Wednesday | Mid-quarter grades due |
| November | 11 | Tuesday | Armistice Day; a holiday |
| November | 27 | Thursday | Thanksgiving Day; a holiday |
| December | 4 | Thursday | State Day Convocation |
| December | 15-18 | | Final examination period |
| December | 18 | Thursday | Commencement Convocation |
| | | | Senate meeting, 4:30 p.m. |
| | | | Fall quarter ends, 5:20 p.m. |
| December | 26 | Friday | Payment of fees closes for all students in residence fall quarter[3] |

### *Winter Quarter*

| | | | |
|---|---|---|---|
| 1931 | | | |
| January | 2 | Friday | Entrance tests |
| January | 3 | Saturday | Registration day for all students in the College of Engineering and Architecture, and the School of Chemistry |
| | | | Payment of fees for new students closes at 12 m. |
| January | 5 | Monday | Winter quarter classes begin, 8:30 a.m.[2] |
| February | 10 | Tuesday | Mid-quarter grades due |
| February | 12 | Thursday | Lincoln's Birthday; a holiday |

[1] Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 20. 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 a.m. at University Farm.

[3] New students must pay fees on dates announced for registration.

| | | | |
|---|---|---|---|
| February | 19 | Thursday | Charter Day Convocation<br>Senate meeting, 4:30 p.m. |
| February | 23 | Monday | (Sunday February 22 Washington's Birthday) a holiday |
| March | 18-21 | | Final examination period |
| March | 19 | Thursday | Commencement Convocation<br>Payment of fees closes for all students[1] in residence winter quarter |
| March | 21 | Saturday | Winter quarter ends, 5:20 p.m. |

*Spring Quarter*

| | | | |
|---|---|---|---|
| March | 27 | Friday | Entrance tests |
| March | 28 | Saturday | Registration day for all students in the College of Engineering and Architecture, and the School of Chemistry<br>Payment of fees for new students closes at 12 m. |
| March | 30 | Monday | Spring quarter classes begin, 8:30 a.m.[2] |
| April | 3 | Friday | Good Friday; a holiday |
| May | 6 | Wednesday | Mid-quarter grades due |
| May | 14 | Thursday | Cap and Gown Day Convocation<br>Senate meeting, 4:30 p.m. |
| May | 30 | Saturday | Memorial Day; a holiday |
| June | 7 | Sunday | Baccalaureate service |
| June | 8 | Monday | Fifty-ninth annual commencement |
| June | 10-13 | | Final examination period |
| June | 13 | Saturday | Spring quarter closes, 5:20 p.m. |

*Summer Quarter*

| | | | |
|---|---|---|---|
| June | 15-16 | | Registration, first term |
| June | 17 | Wednesday | Classes begin, 8:00 a.m. |
| July | 4 | Saturday | Independence Day; a holiday |
| July | 25 | Saturday | Registration and payment of fees for second term closes at 12 m. First term closes |
| July | 27 | Monday | Second term classes begin |
| August | 29 | Saturday | Second term closes |

*Entrance Examinations*

Entrance examinations for admission to the College of Engineering and Architecture and School of Chemistry 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 19.

[1] New students must pay fees on dates announced for registration.
[2] First hour classes begin at 8:15 a.m. 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)

### AERONAUTICAL ENGINEERING

John D. Akerman, B.S.(Aero.E.), Professor of Aeronautical Engineering

Charles Boehnlein, B.S., M.E., Assistant Professor of Aerodynamics

Claud C. Gage, B.S.(Aero.E.), Instructor in Aeronautical Engineering

### 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 of Agricultural Experiment Station

Lewis F. Garey, M.S., Assistant Professor of Farm Management

Don S. Anderson, B.S.(Agr.), 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

Chester L. Berggren, B.S.(Agr.), Instructor in Farm Buildings

J. Grant Dent, Instructor in Mechanical Training

Jesse H. Neal, M.S.(A.E.), Instructor in Drainage and Irrigation
Loren W. Neubauer, B.S.(C.E.), Instructor in Mechanical Drawing
Lawrence H. Schoenleber, M.S.(Ag.E.), Instructor in Land Clearing

AGRONOMY AND PLANT GENETICS

Herbert K. Hayes, D.Sc., Professor of Plant Genetics and Chief of Division
Albert C. Arny, M.S., Associate Professor of Agronomy

ANIMAL HUSBANDRY

Walter H. Peters, M.Agr., Professor of Animal Husbandry and Chief of Division

ARCHITECTURE

Frederick M. Mann, M.S.(Arch.), C.E., Professor of Architecture and Head of the School of Architecture
Leon E. Arnal, Architecte Diplôme Government France, Professor of Architectural Design
Robert T. Jones, B.S.(Arch.), Professor of Architectural Construction
[1]Roy C. Jones, M.S.(Arch.), Professor of Architectural Design
S. Chatwood Burton, M.A., Associate Professor of Fine Arts
Rhodes Robertson, B.A., M.Arch., Associate Professor of Architectural Design
Harley F. McKee, M.A.(Arch.), Assistant Professor of Architectural Design
Elmer E. Young, Assistant Professor of Fine Arts
David J. Deneen, B.S.(Arch.), Instructor in Architecture
Ivan Doseff, B.S., Instructor in Drawing and Painting
Ruth Carter, 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
Leon H. Sault, B.S.(C.E.), Lecturer in Estimating
Arthur R. Nichols, B.S.(Arch.), Lecturer in Landscape Architecture

ART EDUCATION

Ruth Raymond, M.A., Professor of Art Education and Chairman of the Department

ASTRONOMY

Clifford C. Crump, Ph.D., Professor of Astronomy and Chairman of the Department

BOTANY

Carl O. Rosendahl, Ph.D., Professor of Botany and Acting Chairman of the Department
William S. Cooper, 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, B.S., Ph.D., Associate Professor of Botany
Ned L. Huff, M.A., Assistant Professor of Botany

[1] Absent on leave, 1930-31.

INORGANIC CHEMISTRY

M. Cannon Sneed, Ph.D., Professor of Inorganic Chemistry and Chief of the Division
Lloyd H. Reyerson, Ph.D., Professor of Inorganic Chemistry
Lillian Cohen, Ph.D., Associate Professor of Inorganic Chemistry
George Glockler, Ph.D., Associate Professor of Inorganic Chemistry
Hervey H. Barber, Ph.D., Assistant Professor of Inorganic Chemistry and Superintendent of Supply and Equipment
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
Angus F. Cameron, B.A., Assistant in Inorganic Chemistry
Oliver W. Cass, M.S., Assistant in Inorganic Chemistry
Henry M. Davis, M.S., Assistant in Inorganic Chemistry
Nylene Eckles, B.A., Assistant in Inorganic Chemistry
Donald Fuller, B.Ch.E., Assistant in Inorganic Chemistry
Keren E. Gilmore, M.A., Assistant in Inorganic Chemistry
Gordon H. Guest, M.A., Assistant in Inorganic Chemistry
Maurice G. Larian, M.S., Assistant in Inorganic Chemistry
Byron E. Lauer, B.S., Assistant in Inorganic Chemistry
Sidney E. Miller, B.S., Assistant in Inorganic Chemistry
John Rehner, Jr., B.S.(Ch.E.), Assistant in Inorganic Chemistry
Marvin A. Spielman, B.S., Assistant in Inorganic Chemistry
F. Lowell Taylor, B.S.(Chem.), Assistant in Inorganic Chemistry
Edward M. Van Duzee, B.Ch.E., Assistant in Inorganic Chemistry
Samuel H. Weidman, M.S., Assistant in Inorganic Chemistry
Grant W. Smith, B.S., Shevlin Fellow

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
Ernest B. Sandell, B.S., Assistant in Analytical Chemistry
Vernon A. Stenger, M.S., Assistant in Analytical Chemistry
August Willman, M.A., 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
William F. Filbert, B.S., Assistant in Organic Chemistry
Donovan E. Kvalnes, B.A., Assistant in Organic Chemistry

Carl M. Langkammerer, B.Ch.E., Assistant in Organic Chemistry
Frank H. Stodola, B.Ch.E., Assistant in Organic Chemistry
Robert V. Yohe, B.A., Assistant in Organic Chemistry

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, Ph.D., Assistant Professor of Physical Chemistry
Charles P. Roe, B.Ch., Assistant in Physical Chemistry
Edward C. Truesdale, M.A., Assistant in Physical Chemistry
Samuel Yuster, B.S., Assistant in Physical Chemistry
Charles Rosenblum, B.S., duPont Fellow

TECHNOLOGICAL CHEMISTRY

Everhart P. Harding, Ph.D., Associate Professor of Technological Chemistry
Arthur E. Stoppel, Ph.D., Assistant Professor of Technological Chemistry
Frederick C. Beyer, B.Ch.E., Assistant in Technological Chemistry
Raymond R. Chelberg, B.S., Assistant in Technological Chemistry
L. Wallace Cornell, B.S., Assistant in Technological Chemistry

CHEMICAL ENGINEERING

Charles A. Mann, Ph.D., Professor of Chemical Engineering and Chief of the Division
George H. Montillon, Ph.D., Associate Professor of Chemical Engineering
Ralph E. Montonna, Ph.D., Associate Professor of 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
Fred C. Lang, C.E., Professor of Highway Engineering
John I. Parcel, B.A., B.S.(C.E.), Professor of Structural 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
Robert N. Lohn, B.C.E., Teaching Fellow in Civil Engineering
Eldred B. Murer, B.S.(C.E.), Research Fellow in Structural Engineering
Albert L. Nowicki, C.E., Research Fellow in Civil Engineering
Nordahl T. Rykken, B.C.E., Research Fellow in Structural Engineering

DAIRY HUSBANDRY

Clarence H. Eckles, D.Sc., Professor of Dairy Husbandry and Chief of Division
Willes B. Combs, M.S., Professor of Dairy Husbandry

DRAWING AND DESCRIPTIVE GEOMETRY

William H. Kirchner, B.S., Professor of Drawing and Descriptive Geometry and Head of the Department

Robert W. French, B.S.(C.E.), Professor of Drawing and Descriptive Geometry
Leon Archibald, B.Sc., Assistant Professor of Drawing and Descriptive Geometry
Henry C. T. Eggers, B.S.(Eng.), 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
Charles L. Brainard, B.S.(Arch.), Instructor in Drawing and Descriptive Geometry
Fred T. Cruzen, B.S.(E.E.), Instructor in Drawing and Descriptive Geometry
J. George Dean, B.S.(C.E.), Intsructor in Drawing and Descriptive Geometry
Lloyd J. Quaid, B.S.(E.E.), 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
George Filipetti, Ph.D., Professor of Economics and Adviser in Engineering Pre-Business and Industrial Administration Courses
Roy G. Blakey, Ph.D., Professor of Economics
Frederic B. Garver, Ph.D., Professor of Economics
Alvin H. Hansen, Ph.D., Professor of Economics
Arthur W. Marget, Ph.D., Professor of Economics and Banking
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
Walter R. Myers, Ph.D., Assistant Professor of Finance
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
Richard Graves, M.A., Instructor in Insurance
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
[1]William T. Ryan, E.E., Professor of Electric Power Engineering
Franklin W. Springer, E.E., Professor of Electrical Engineering

[1] Absent on leave, 1930-31.

Henry E. Hartig, B.S.(E.E.), Ph.D., Associate Professor of Telephone and Telegraph Engineering
John H. Kuhlman, B.A., E.E., Associate Professor of Electrical Design
....., Associate Professor of Radio Engineering
Loyst C. Caverley, M.S.(E.E.), Assistant Professor of Electric Power Engineering
Elmer W. Johnson, B.S., M.E., E.E., Assistant Professor of Electric Power Engineering
Milo E. Todd, B.A., E.E., Assistant Professor of Electric Power Engineering
Carl Everett Swanson, B.S.(E.E.), Instructor in Electrical Engineering
Marvin O. C. Johnson, B.E.E., Teaching Fellow in Electrical Engineering
William D. McIlvaine, B.E.E., Teaching Fellow in Electrical Engineering
C. Irwin Vigness, B.E.E., Teaching Fellow in Electrical Engineering

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
Luther N. Becklund, B.A., Instructor in English
Ledru O. Guthrie, M.A., Instructor in English
Clifford I. Haga, B.A., Instructor in English
Paul Mahon, B.A., Instructor in English
John Rusinko, M.A., Instructor in English

FORESTRY

Henry Schmitz, 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
Fred B. Gerstung, B.A., Instructor in German

HORTICULTURE

William H. Alderman, B.S.A., Professor of Horticulture and Chief of Division
Wilfrid G. Brierley, M.S., Associate Professor of Horticulture
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
Lorenz G. Straub, Ph.D., Associate Professor of Hydraulics
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
William M. McClintock, M.A., Assistant Professor of Mathematics and Mechanics
Forrest E. Miller, M.S.(Ag.E.), Assistant Professor of Mathematics and Mechanics
Roderick W. Siler, B.S., Assistant Professor of Mathematics and Mechanics
Charles L. Barker, M.A., M.S., Instructor in Mathematics and Mechanics
Leo Branovan, M.S., Instructor in Mathematics and Mechanics
John A. Henry, B.S.(C.E.), Instructor in Mathematics and Mechanics
Frank B. Lindsay, B.A., Instructor in Mathematics and Mechanics
Glenn H. Peebles, M.S., Instructor in Mathematics and Mechanics
....., Instructor in Mathematics and Mechanics
Max Scherberg, B.S.(Ch.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, B.S., M.E., Professor of Mechanical Engineering and Director of the Experimental Engineering Laboratories
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, B.S., E.E., Associate Professor of Internal Combustion Engines
John Flodin, M.E., M.A., M.S., Assistant Professor of Machine Design
William H. Richards, Assistant Professor of Woodworking
....., Assistant Professor of Internal Combustion Engines
Axel B. Algren, B.S.(M.E.), Instructor in Mechanical Engineering and Assistant Director of the Experimental Engineering Laboratories
Thomas P. Hughes, B.S., Instructor in Forging
Jarl E. Larson, B.S.(Mar.E. and Naval Arch.), Instructor in Steam Engineering
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
....., Instructor in Heat Engines
....., Instructor in Machine Design
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

Ralph L. Dowdell, Met.E., Ph.D., Assistant Professor of Metallography and Head of the Department

Henry S. Jerabek, M.S., Instructor in Metallography

Arthur C. Forsyth, Met.E., M.S., Instructor in Metallography

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

Murray T. Davenport, Captain, Infantry, Assistant Professor of Military Science and Tactics

William A. Ellis, Captain, Infantry, Assistant Professor of Military Science and Tactics

Emil Krause, Captain, Infantry, Assistant Professor of Military Science and Tactics

William G. Walker, Captain, Infantry, Assistant Professor of Military Science and Tactics

Porter P. Wiggins, Captain, Infantry, Assistant Professor of Military Science and Tactics

Vincent J. Conrad, First Lieutenant, Infantry, Assistant Professor of Military Science and Tactics

Richard A. Ericson, First Lieutenant, Coast Artillery Corps, Assistant Professor of Military Science and Tactics

Harlan N. Hartness, First Lieutenant, Infantry, 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

Hewitt W. Richmond, First Lieutenant, Coast Artillery Corps, Assistant Professor of Military Science and Tactics

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

Clayton A. Peterson, Sergeant, Infantry, Instructor in Military Science and Tactics

Frank C. Esenther, Sergeant, Infantry, Instructor in Military Science and Tactics

PHYSICAL EDUCATION FOR MEN

Herbert O. Crisler, Ph.B., Professor of Physical Education and Director of Physical Education and Athletics

[1]Fred W. Luehring, Ph.M., Professor of Physical Education

Louis J. Cooke, M.D., Associate Professor of Physical Education and Assistant Director of Physical Education and Athletics

Louis F. Keller, M.A., Associate Professor of Physical Education

David MacMillan, B.S., Assistant Professor of Physical Education

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

Ralph Piper, B.Phys.Ed., Instructor in Physical Education

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 Christensen, B.S., Instructor in Physical Education for Women

Josephine Dickson, B.S., Instructor in Physical Education for Women

Elizabeth Graybeal, Ph.B., Instructor in Physical Education for Women

Jean Speirs Helgeson, B.S., Instructor in Physical Education for Women

Florence A. Mahoney, M.S., Instructor in Physical Education for Women

Catherine Snell, 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

[1]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

E. L. Hill, Ph.D., Assistant Professor of Theoretical Physics

PHYSIOLOGIC CHEMISTRY

Jesse F. McClendon, Ph.D., Professor of Physiologic Chemistry

Allan Hemingway, Ph.D., Assistant Professor of Physiologic Chemistry

[1] Absent on leave, 1930-31.

Jesse W. Cavett, 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
J. Arthur Myers, Ph.D., M.D., Associate Professor of Preventive Medicine and Public Health
William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine
Harry DeWitt Lees, M.D., Assistant Professor of 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
Helen Thompson, M.A., Instructor in Rhetoric
Marjorie Thurston, M.A., Instructor in 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
Luverne C. Ramsland, M.A., Teaching Assistant in Speech

# 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. Chemistry is required for admission to the School of Chemistry.

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 or one-half unit; solid geometry, one-half unit; Latin, two units; German or French, two units; chemistry, one unit; physics, one unit; 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.

*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, ½ to 2 units; English and American history, ½ or 1 unit each; economics and sociology, ½ unit each; American government, commercial geography, and history of commerce, ½ or 1 unit each.

Group D Mathematics: elementary algebra and plane geometry, 1 unit each; unified mathematics, 2 units; higher algebra, ½ or 1 unit; solid geometry and trigonometry, ½ unit each.

Group E Natural sciences: biology, physics, and chemistry, 1 unit each; botany and zoology, ½ or 1 unit each; physiology, astronomy, and geology, ½ 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 permitted altho a full regular program of work will not usually be obtainable.

## 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 regulations governing registration and scholastic work.

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 7 days after the beginning of the quarter.

## FEES 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. Fellows, 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, including laboratory fee of $2.00 | 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 lack not more than twelve credits of required work of his sophomore year, to be allowed to register for any junior or senior courses in his curriculum.

## 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 Advanced Inorganic Chemistry 103-104-105, Chemical Engineering 101-102-103, 131-132, Physical Chemistry 101-102-103, and Technological Chemistry 105 and 106.

2. They will be held regularly at the beginning of the fall, winter, spring, and summer 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 the courses specified in Rule 1.

### 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 of interior architecture, the requirements are 195 credits, including all required courses, plus 93 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.

*The Albert Moorman Memorial Fellowship in Architecture.*—This covers the traveling expenses of the recipient on a trip to study notable examples of architecture in this country. It is awarded for excellence in architectural design as determined by competition in the senior class.

*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. Certain prizes are awarded to students in Engineering only, such as the prizes of the Northwestern Section of the American Society of Civil Engineers. The Tau Beta Pi and Pi Tau Sigma honorary engineering fraternities also offer prizes. 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. The chemistry faculty offers a prize to seniors.

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, Magney and Tusler of Minneapolis, Mr. William A. French of Minneapolis, and the Alpha Alpha Gamma Sorority.

*Loan Funds.*—Various loan funds are available from which worthy students may obtain financial assistance after they have been in attendance a sufficient length of time to establish satisfactory records of accomplishment.

## RESERVE OFFICERS TRAINING CORPS

The War Department has established at this University units of infantry, coast (anti-aircraft) 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



## SCHOOL OF CHEMISTRY



### 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 26. The freshman year for Architecture, Architectural Engineering, and Landscape Architecture is shown on page 32 and in Chemistry and Chemical Engineering on page 36.

*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 are required to present chemistry for admission.

*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. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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 |
| | *Winter Quarter* | | | | |
| 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 |
| | *Spring Quarter* | | | | |
| 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 |

† Hygiene course for women is included in Phys.Ed. 1f for Women.

## 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 pre-

liminary 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; a fourth year is desirable.

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, practical flight training is important for aeronautical engineers and students are urged to take advantage of their opportunities to obtain it. Special arrangements have been made for seniors to take this instruction and obtain a government license.

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 26.

SOPHOMORE YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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 |
| | *Winter Quarter* | | | | |
| M.&M. 25 | Integral Calculus | 5 | 5 | .. | .. |
| Phys. 23 | Heat | 3 | 1 | 3 | .. |
| Phys. 24 | Heat Laboratory | 1 | .. | .. | 2 |
| Draw. 29 | Drafting | 2 | .. | .. | 6 |
| Aero.E. 2 | Auto and Airplane Engines | 3 | 3 | .. | .. |
| M.E. 14 | Machine Shop Practice | 3 | .. | .. | 8 |
| Mil. Sci. 5 | Second Year Basic Course | 0 | .. | .. | 3 |
| | *Spring Quarter* | | | | |
| 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 |

* For permissible substitute, see page 55.

## JUNIOR YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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. 33 | Elementary Mechanical Laboratory | 2 | .. | .. | 6 |
| | *Winter Quarter* | | | | |
| 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 | 2 | .. | 3 |
| M.E. 34 | Mechanical Laboratory | 2 | .. | .. | 6 |
| | *Spring Quarter* | | | | |
| 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. 32 | Thermodynamics | 3 | 2 | .. | 3 |

## SENIOR YEAR

| | | | | | |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| E.E. 46 | Electric Power | 4 | 3 | .. | 2 |
| M.E. 150 | Internal Combustion Engines | 3 | 3 | .. | .. |
| Met. 152 | Metallography | 3 | .. | 2 | 3 |
| Aero.E. 115 | Airplane Stresses | 3 | 2 | .. | 2 |
| Aero.E. 120 | Airplane Design | 2 | 1 | .. | 3 |
| Aero.E. 140 | Aeronautical Laboratory | 2 | .. | .. | 6 |
| Aero.E. 190 | Seminar | 1 | 1 | .. | .. |
| | *Winter Quarter* | | | | |
| E.E. 47 | Electric Power | 4 | 3 | .. | 2 |
| M.E. 151 | Internal Combustion Engines | 3 | 3 | .. | .. |
| M.E. 156 | Design of Internal Combustion Engines | 2 | .. | .. | 6 |
| Aero.E. 121 | Airplane Design | 4 | 2 | .. | 6 |
| Aero.E. 141 | Aerodynamics Laboratory | 2 | .. | .. | 6 |
| Aero.E. 191 | Seminar | 1 | 1 | .. | .. |
| | *Spring Quarter* | | | | |
| 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 26.

### SOPHOMORE YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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. |
|---|---|---|---|---|---|
| | *Winter Quarter* | | | | |
| 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 | 0 | .. | .. | 3 |
| | *Spring Quarter* | | | | |
| 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 | 0 | .. | .. | 3 |
| | JUNIOR YEAR | | | | |
| | *Fall Quarter* | | | | |
| M.&M. 128 | Strength of Materials | 5 | 5 | .. | .. |
| Ag.E. 37 | Rural Sanitation | 3 | .. | 3 | .. |
| Econ. 8 | General Economics | 3 | 3 | .. | .. |
| Geol. 5 | Engineering Geology | 3 | .. | 3 | .. |
| Ag.E. 122 | Power Machinery | 3 | .. | 2 | 3 |
| | *Winter Quarter* | | | | |
| M.&M. 86* | Hydraulics with Laboratory | 3 | 2 | .. | 2 |
| Econ. 9 | General Economics | 3 | 3 | .. | .. |
| Ag.E. 7 | Farm Structures I | 3 | 1 | 1 | 3 |
| Ag.E. 42 | Principles of Irrigation | 3 | 1 | 2 | .. |
| or | | | | | |
| Soils 8 | Physical Properties of Soils | 3 | .. | 1 | 4 |
| M.E. 23 | Mechanism and Kinematics | 3 | 2 | 1 | .. |
| | Elective to complete program. | | | | |
| | *Spring Quarter* | | | | |
| A.H. 15 | Fundamentals of Livestock Production | 3 | .. | 2 | 4 |
| C.E. 42 | Structural Engineering | 3 | .. | .. | 7 |
| D.H. 7 | Elements of Dairying | 3 | .. | 3 | .. |
| M.E. 27 | Machine Design | 3 | .. | 1 | 6 |
| Econ. 28 | Business Law | 3 | 3 | .. | .. |
| | Elective to complete program. | | | | |
| | SENIOR YEAR | | | | |
| | *Fall Quarter* | | | | |
| Ag.Econ. 102 | Farm Management: Organization | 3 | .. | 3 | .. |
| C.E. 51 | Highways and Pavements | 3 | .. | 2 | 3 |
| C.E. 144 | Reinforced Concrete | 3 | .. | 2 | 5 |
| | Electives to complete program. | | | | |

* For permissible substitutes, see page 55.

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Winter Quarter* | | | | |
| Ag.E. 121 | Steam Boilers and Engines | 3 | .. | 3 | .. |
| Ag.E. 133 | Applied Electricity | 3 | .. | 1 | 6 |
| 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 | .. | .. |
| G.E. 193 | Engineering Practice | 2 | .. | 2 | .. |
| Rhet. 22 | Public Speaking | 3 | 3 | .. | .. |
| | 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.

| Course No. | Title | Credits |
|---|---|---|
| | *Farm Structures* | |
| Ag.E. 5f | Farm Building Construction | 3 |
| Ag.E. 40f,s | Mechanical Training I | 3 |
| Ag.E. 67s | Farm Structures II | 3 |
| Ag.E. 112f,w,s | Farm Building Problems | 3–18 |
| For. 27w | Farm Woodlots and Windbreaks | 3 |
| Hort. 77w | Principles of Landscape Design | 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 |
| | *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. 102f,w,s | Advanced Drainage Problems | 3–12 |
| 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 |

## 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. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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 |
| | *Winter Quarter* | | | | |
| 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 |
| | *Spring Quarter* | | | | |
| 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, Courses Phys. Ed. 1, 2, 3 in place of Mil. Sci. 1, 2, 3 and 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 63).

For freshman year, see page 32.

## SOPHOMORE YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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 |
| | *Winter Quarter* | | | | |
| 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 |
| | *Spring Quarter* | | | | |
| 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

| | | | | | |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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. | | | | |
| | *Winter Quarter* | | | | |
| 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. | | | | |

*For permissible substitutes, see page 55.

†Women take Phys. Ed. for Women in place of Mil. Sci. 4, 5, 6.

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Spring Quarter* | | | | |
| Arch. 19 | Architectural History | 2 | .. | 2 | .. |
| Arch. 29 | Freehand Drawing | 2 | .. | .. | 6 |
| Arch. 39 | Architectural Design, Grade II | 7 | .. | .. | 21 |
| C.E. 41 | Reinforced Concrete | 3 | .. | .. | 6 |
| | Elective. | | | | |
| | SENIOR YEAR | | | | |
| | *Fall Quarter* | | | | |
| 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 32.

### SOPHOMORE YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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. |
|---|---|---|---|---|---|
| | *Winter Quarter* | | | | |
| 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 |
| | *Spring Quarter* | | | | |
| 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 | | | | |
| | *Fall Quarter* | | | | |
| M.&M. 128 | Strength of Materials | 5 | 5 | .. | .. |
| M.&M. 141 | Materials Testing Laboratory | 2 | 1 | .. | 3 |
| C.E. 31 | Stresses in Structures | 2 | .. | 1 | 2 |
| Arch. 17 | Architectural History | 2 | .. | 2 | .. |
| Arch. 47 | Building Construction | 2 | .. | .. | 6 |
| Chem. 1 | Inorganic Chemistry | 4 | .. | 3 | 4 |
| | *Winter Quarter* | | | | |
| 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 |
| | *Spring Quarter* | | | | |
| 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‡ | | | | |
| | *Fall Quarter* | | | | |
| 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 years 1930-31, Arch. 17-18-19, two credits per quarter, are added to the senior year.

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Winter Quarter* | | | | |
| 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* | | | | |
| | *Spring Quarter* | | | | |
| 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 the first two quarters of the 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 winter of his sophomore year.

### REGULAR FRESHMAN YEAR

For students satisfying the requirements of higher algebra and solid geometry.

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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 | .. |
| | *Winter Quarter* | | | | |
| 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 |
| | *Spring Quarter* | | | | |
| 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 |

* For permissible substitutes, see page 55.

† Women take Phys. Ed. for women, courses Phys.Ed. 1, 2, 3 in place of Mil. Sci. 1, 2, 3 and P.H. 12.

REGULAR SOPHOMORE YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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 |
| | *Winter Quarter* | | | | |
| 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 |
| | *Spring Quarter (Chemistry)* | | | | |
| M.&.M. 84* | Technical Mechanics | 5 | 5 | .. | .. |
| Anal. Chem. 2 | Quantitative Analysis | 5 | 1 | 1 | 10 |
| Physics 43 | Electricity | 3 | 1 | 3 | .. |
| Physics 44 | Electricity Laboratory | 1 | .. | .. | 2 |
| German 26 | Chemical German | 4 | 4 | .. | .. |
| Mil. Sci. 6† | Second Year Basic Course | .. | .. | .. | 3 |
| | *Spring Quarter (Chemical Engineering)* | | | | |
| M.&M. 84* | Technical Mechanics | 5 | 5 | .. | .. |
| Anal. Chem. 2 | Quantitative Analysis | 5 | 1 | 1 | 10 |
| Chem. E. 80 | Chemical Engineering Materials | 1 | .. | 2 | .. |
| Physics 43 | Electricity | 3 | 1 | 3 | .. |
| Physics 44 | Electricity Laboratory | 1 | .. | .. | 2 |
| German 26 | Chemical German | 4 | 4 | .. | .. |
| Mil. Sci. 6 | Second Year Basic Course | 0 | .. | .. | 3 |

†Women take Phys. Ed. in place of Mil. Sci. 4, 5, 6.

* For permissible substitutes, see page 55.

## 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 year see page 36.

JUNIOR YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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 |
| | Electives to complete program.‡ | | | | |

‡ For list of suggested electives in other colleges see page 55. A total of 15 elective credits must be taken in Chemistry for graduation.

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Winter Quarter* | | | | |
| 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 |
| | Electives to complete program.† | | | | |
| | *Spring Quarter‡* | | | | |
| Org. Chem. 53 | Organic Chemistry | 5 | 1 | 3 | 6 |
| Phys. Chem. 103 | Physical Chemistry | 5 | 1 | 3 | 6 |
| 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 | | | | |
| | *Fall Quarter* | | | | |
| Chemistry 96 | Thesis (in any division) | 5 | .. | .. | 15 |
| Tech. Chem. 100 | Food Analysis | 3 | .. | 1 | 6 |
| | Electives to complete program.† | | | | |
| | *Winter Quarter* | | | | |
| Chemistry 97 | Thesis | 5 | .. | .. | 15 |
| Tech. Chem. 101 | Food Analysis | 3 | .. | 1 | 6 |
| | Electives to complete program.† | | | | |
| | *Spring Quarter* | | | | |
| 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 55. 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. E. 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 17½ 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 thoro 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 thoroly

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, alkalies, 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 36 and 37.

JUNIOR YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| Chem. E. 101 | Unit Processes | 3 | .. | 5 | .. |
| 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 |
| Physics 33 | Optics | 3 | 1 | 3 | .. |
| | *Winter Quarter* | | | | |
| Chem. E. 131 | Industrial Inorganic Chemistry | 4 | 1 | 4 | .. |
| 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. 38 | Heat Engines | 4 | .. | 3 | 4 |
| | *Spring Quarter* | | | | |
| Chem. E. 102 | Unit Processes | 3 | 3 | .. | .. |
| Chem. E. 132 | Industrial Organic Chemistry | 4 | 1 | 4 | .. |
| Org. Chem. 53 | Organic Chemistry | 5 | 1 | 3 | 6 |
| M.E. 28 | Machine Design | 3 | .. | 1 | 6 |
| M.E. 39 | Heat Engines | 3 | .. | 2 | 4 |
| 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 | .. | .. |

* For permissible substitutes, see page 55.

SUMMER SESSION

Summer practice consisting of Chem. E. 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.

SENIOR YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| Chem. E. 103 | Unit Process Problems | 3 | 3 | .. | .. |
| Phys. Chem. 101 | Physical Chemistry | 5 | 1 | .. | ... |
| E.E. 43 | Electric Power | 3 | .. | 3 | 2 |
| Met. 160 | Metallography | 3 | .. | 2 | 3 |
| | Electives to complete program.* | | | | |
| | *Winter Quarter* | | | | |
| Chem. E. 104 | Unit Process Problems | 3 | 3 | .. | .. |
| Chem. E. 121 | Chemical Engineering Economics | 3 | 1 | 2 | .. |
| Phys. Chem. 102 | Physical Chemistry | 5 | 1 | 3 | 6 |
| E.E. 44 | Electric Power | 3 | .. | 3 | 2 |
| | Electives to complete program.* | | | | |
| | *Spring Quarter* | | | | |
| Chem. E. 187 | Inspection Trip, spring vacation | 2 | .. | .. | .. |
| Chem. E. 117 | Chemical Engineering Equipment Design | 3 | .. | .. | 6 |
| Phys. Chem. 103 | Physical Chemistry | 5 | 1 | 3 | 6 |
| E.E. 45 | Electric Power | 3 | .. | 3 | 2 |
| | Electives to complete program.* | | | | |

* See page 55 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 26.

## SOPHOMORE YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | ***Fall Quarter*** | | | | |
| 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 55.

### *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. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| C.E. 121 | Railway Engineering | 3 | .. | 1 | 6 |
| C.E. 134 | Statically Indeterminate Structures | 3 | 2 | .. | 2 |
| 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. | | | | |
| | *Winter Quarter* | | | | |
| C.E. 124 | Transportation | 3 | 3 | .. | .. |
| C.E. 131 | Bridge Analysis | 3 | .. | .. | 6 |
| 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. | | | | |
| | *Spring Quarter* | | | | |
| 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. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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 55.

† 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. |
|---|---|---|---|---|---|
| | *Winter Quarter* | | | | |
| C.E. 124 | Transportation | 3 | 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. | | | | |

* For list of elective courses in other colleges, see page 55.

## 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 gaduation. 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 Administration 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 26.

### SOPHOMORE YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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 55.
§ For permissible substitute, see page 55.

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Winter Quarter* | | | | |
| 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. | | | | |
| | *Spring Quarter* | | | | |
| 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 | | | | |
| | *Fall Quarter* | | | | |
| M.&M. 129 | Hydraulics | 4 | 4 | .. | .. |
| M.&M. 143 | Hydraulics Laboratory | 1 | .. | .. | 2 |
| E.E. 111 | Electrical Engineering | 4 | 4 | .. | .. |
| E.E. 112 | Electrical Engineering Laboratory | 2 | .. | .. | 4 |
| Phys. 144 | Electrical Measurements | 3 | 1 | 1 | 4 |
| | *One or more electives. | | | | |
| | *Winter Quarter* | | | | |
| M.&M. 127 | Technical Mechanics (Dynamics) | 5 | 5 | .. | .. |
| E.E. 113 | Electrical Engineering | 4 | 4 | .. | .. |
| E.E. 114 | Electrical Engineering Laboratory | 2 | .. | .. | 4 |
| M.E. 23 | Mechanism and Kinematics | 3 | 3 | .. | .. |
| | *One or more electives. | | | | |
| | *Spring Quarter* | | | | |
| M.&M. 128 | Strength of Materials | 5 | 5 | .. | .. |
| M.&M. 141 | Materials Laboratory | 2 | .. | 1 | 3 |
| E.E. 115 | Electrical Engineering | 4 | 4 | .. | .. |
| E.E. 116 | Electrical Engineering Laboratory | 2 | .. | .. | 4 |
| Phys. 33 | Optics | 3 | 1 | 3 | .. |
| | *One or more electives. | | | | |
| | SENIOR YEAR | | | | |
| | *Fall Quarter* | | | | |
| E.E. 121 | Alternating Current Machinery | 3 | 3 | .. | .. |
| E.E. 122 | Electrical Engineering Laboratory | 2 | .. | .. | 4 |
| E.E. 132 | Electrical Design† | 2 | 2 | .. | .. |
| M.E. 138 | Heat Engines† | 3 | 2 | .. | 3 |
| | *One or more electives. | | | | |

§ For permissible substitute, see page 55.
* For list of elective courses in other colleges, see page 55.
† See (†) footnote, page 45.

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Winter Quarter* | | | | |
| E.E. 123 | Alternating Current Machinery | 3 | 3 | .. | .. |
| E.E. 124 | Electrical Engineering Laboratory | 2 | .. | .. | 4 |
| E.E. 134 | Electrical Design† | 2 | 2 | .. | .. |
| M.E. 139 | Heat Engines† | 3 | 2 | .. | 3 |
| | *One or more electives. | | | | |
| | *Spring Quarter* | | | | |
| E.E. 125 | Alternating Current Machinery | 3 | 3 | .. | .. |
| E.E. 126 | Electrical Engineering Laboratory | 2 | .. | .. | 4 |
| E.E. 136 | Electrical Design†‡ | 2 | 2 | .. | .. |
| M.E. 155 | Internal Combustion Engines | 3 | 2 | .. | 3 |
| | *One or more electives. | | | | |

* For list of elective courses in other colleges, see page 55.

† Students specializing in chemistry, physics, or electrical communications may substitute electives in that department for courses E.E. 132, 134, 136 and M.E. 138, 139, and 155. Such specialization requires at least 18 credits of elective work in chemistry or the same number in physics; in electrical communications the requirement is courses E.E. 61-63-65, 161-162-163, 164-165-166, a total of 21 credits.

‡ 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, 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 93 credits and 93 honor points.

## Courses Required in the First Two Years

| | Credits |
|---|---|
| English A-B-C | 0 to 15 |
| Mathematics 4 or 6 (with prerequisite) | 4 to 10 |
| French (see Junior College Requirements, page 7, S. L. A. bulletin) | 0 to 20 |
| History 11-12-13 | 10 |
| Physics 3 and 4 and any one of the continuations, 23, 33, 43, with laboratory | 8 |
| or | |
| Chemistry 1-2-3 or 4-5 | 8 to 12 |
| Architecture 21-22-23 | 6 |
| Architecture 31-32-33 | 15 |
| Drawing 61-62-63 | 6 |
| Physical Education | 3 |

## For Those Who Enter without High School French, Chemistry, or Higher Algebra

### FRESHMAN YEAR

| Fall | Credits | Winter | Credits | Spring | Credits |
|---|---|---|---|---|---|
| English A* | 5 | English B | 5 | English C | 5 |
| French 1 | 5 | French 2 | 5 | French 3 | 5 |
| Chemistry 1 | 4 | Chemistry 2 | 4 | Chemistry 3 | 4 |
| Phys. Ed. 1 | ½ | Phys. Ed. 2 | ½ | Phys. Ed. 3 | ½ |

### SOPHOMORE YEAR

| | | | | | |
|---|---|---|---|---|---|
| French 4 | 5 | Math. 5 | 5 | Math. 4 | 4 |
| | | | | or | |
| Arch. 21 | 2 | Arch. 22 | 2 | Math. 6 | 5 |
| Arch. 31 | 5 | Arch. 32 | 5 | Arch. 23 | 2 |
| Draw. 61 | 2 | Draw. 62 | 2 | Arch. 33 | 5 |
| Hist. 11 | 3 | Hist. 12 | 3 | Draw. 63 | 2 |
| Phys. Ed. | ½ | Phys. Ed. | ½ | Hist. 13 | 4 |
| | | | | Phys. Ed. | ½ |

## For Those Who Enter with Higher Algebra and Two Years of French

### FRESHMAN YEAR

| Fall | Credits | Winter | Credits | Spring | Credits |
|---|---|---|---|---|---|
| English A* | 5 | English B | 5 | English C | 5 |
| Mathematics | 4 or 5 | French | 5 | French | 5 |
| Phys. Ed. 1 | ½ | Phys. Ed. 2 | ½ | Phys. Ed. 3 | ½ |
| Elective | 5 | Elective | 5 | Elective | 5 |

### SOPHOMORE YEAR

| | Credits |
|---|---|
| Architecture 21-22-23 | 6 |
| Architecture 31-32-33 | 15 |
| History 11-12-13 | 10 |
| Chemistry or physics | 8 to 15 |
| Drawing 61-62-63 | 6 |
| Physical Education | 1½ |

Electives to complete a total of 93 for the two years.

* See English requirement, page 5, A, Science, Literature, and the Arts bulletin, Part II.

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. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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 | | | |
| | *Winter Quarter* | | | | |
| 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 | | | |
| | *Spring Quarter* | | | | |
| 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

| | | | | | |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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 | | | |
| | *Winter Quarter* | | | | |
| 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 | | | |
| | *Spring Quarter* | | | | |
| 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 32.

### SOPHOMORE YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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. 21 | Elementary Ecology | 3 | .. | .. | 6 |
| 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. 7 | Taxonomy of Flowering Plants | 3 | .. | 1 | 5 |
| 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 | | | |

* For permissible substitutes, see page 55.

† Given by special arrangement.

## JUNIOR YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *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 | Elementary Design and 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. 74 | Principles of Landscape Design | 3 | .. | 1 | 4 |
| Phys. 23 | Heat | 3 | 1 | 3 | .. |
| Phys. 24 | Heat Laboratory | 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 | Woody Plants and Garden Flowers | 2 | .. | 1 | 2 |
| Phys. 43 | Electricity | 3 | 1 | 3 | .. |
| Phys. 44 | Electricity Laboratory | 1 | .. | .. | 2 |

## SENIOR YEAR

| | | | | | |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| Arch. 160 | History of Landscape Architecture | 2 | .. | 2 | .. |
| C.E. 14 | Surveying | 3 | .. | .. | 8 |
| C.E. 51 | Highways and Pavements | 3 | 2 | .. | 3 |
| C.E. 144 | Reinforced Concrete | 3 | 2 | .. | 2 |
| For. 1 | General Forestry | 3 | .. | 3 | .. |
| or | | | | | |
| Soils 4 | Soils | 3 | .. | 2 | 2 |
| | One or more electives. | | | | |
| | *Winter Quarter* | | | | |
| G.E. 81 | Estimating | 3 | 3 | .. | .. |
| Hort. 75 | Landscape Problems | 3 | .. | 1 | 4 |
| Phys. 33 | Optics | 3 | 1 | 3 | .. |
| Phys. 34 | Optics Laboratory | 1 | .. | .. | 2 |
| Sp.35 | Public Speaking | 3 | 3 | .. | .. |
| | One or more electives. | | | | |
| | *Spring Quarter* | | | | |
| Ag.E. 31 | Principles of Drainage | 3 | 1 | 2 | .. |
| C.E. 172 | City Planning | 3 | .. | 3 | .. |
| Engl. 31 | Technical Writing | 3 | 3 | .. | .. |
| Hort. 76 | Landscape Construction | 3 | .. | 1 | 4 |
| | One or more electives. | | | | |

## RECOMMENDED ELECTIVES

| | | |
|---|---|---|
| Arch. 44f,45w,46s | Building Construction ..... per quarter | 2 |
| 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 26.

SOPHOMORE YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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. 19 | Mechanical Technology | 1 | .. | 2 | .. |
| Tech. Chem. 1† | Power Plant Chemistry | 3 | 1 | 1 | 6 |
| C.E. 19§ | Surveying | 3 | 1 | .. | 7 |
| Mil. Sci. 4 | Second Year Basic Course | 0 | .. | .. | 3 |
| | *Winter Quarter* | | | | |
| M.&M. 25 | Integral Calculus | 5 | 5 | .. | .. |
| Phys. 23 | Heat | 3 | 1 | 3 | .. |
| Phys. 24 | Heat Laboratory | 1 | .. | .. | 2 |
| M.E. 14 | Machine Shop Practice | 3 | .. | .. | 8 |
| Phys. 33† | Optics | 3 | 1 | 3 | .. |
| Mil. Sci. 5 | Second Year Basic Course | 0 | .. | .. | 3 |
| Sp. 35‡ | Fundamentals of Speech | 3 | 3 | .. | .. |

† 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.

§ Surveying may be taken in either the fall or spring quarter.

‡ Fundamentals of Speech may be taken in either the winter or spring quarter.

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Spring Quarter* | | | | |
| 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. 20 | Kinematics | 2 | .. | .. | 6 |
| M.E. 50† | Auto and Airplane Engines | 3 | 3 | .. | .. |
| Mil. Sci. 6 | Second Year Basic Course | 0 | .. | .. | 3 |
| | *Elective. | | | | |
| | JUNIOR YEAR | | | | |
| | *Fall Quarter* | | | | |
| 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. 33 | Elementary Mechanical Laboratory | 2 | .. | .. | 6 |
| | *One or more electives. | | | | |
| | *Winter Quarter* | | | | |
| M.&M. 128 | Strength of Materials | 5 | 5 | .. | .. |
| M.&M. 141 | Materials Laboratory | 2 | .. | 1 | 3 |
| M.E. 23 | Machine Design | 3 | .. | 2 | 6 |
| M.E. 31 | Thermodynamics | 3 | 2 | .. | 3 |
| M.E. 34 | Mechanical Laboratory | 2 | .. | .. | 6 |
| | *One or more electives. | | | | |
| | *Spring Quarter* | | | | |
| M.&M. 129 | Hydraulics | 4 | 4 | .. | .. |
| M.&M. 143 | Hydraulics Laboratory | 1 | .. | .. | 2 |
| M.E. 24 | Machine Design | 3 | 3 | .. | .. |
| M.E. 35 | Elementary Steam and Power Laboratory | 2 | .. | .. | 6 |
| M.E. 63 | Heating and Ventilation | 3 | 1 | 2 | .. |
| M.E. 32 | 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. 171 | Production Factors | 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. | | | | |

* For list of elective courses in other colleges, see page 55.

† See (†) footnote, page 50.

‡ See (‡) footnote, page 52.

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *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 55.

‡ The following courses are accepted for this requirement: M.E. 121f-122w-123s, Advanced Engineering Design; M.E. 135f, 136w, Design of Steam Machinery; M.E. 137s, Design of Power Plant Units; M.E. 156f,w-157w,s-158s, Design of Internal Combustion Engines; M.E. 242f, 243w, Power Plant 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 26.

### SOPHOMORE YEAR

| Course No. | Title | Credits | Rec. | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Fall Quarter* | | | | |
| 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. | | | | |

* For electives in other colleges, see page 55.

§ For permissible substitutes, see page 55.

| Course No. | Title | Credits | Rec | Lect. | Lab. |
|---|---|---|---|---|---|
| | *Winter Quarter* | | | | |
| 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. | | | | |
| | *Spring Quarter* | | | | |
| 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. 6 | Second Year Basic Course | 0 | .. | .. | 3 |

## JUNIOR YEAR‡

(In the School of Business Administration)

| | Credits |
|---|---|
| Strength of Materials (M. & M. 85f)§ | 4 |
| Principles of Accounting (Econ. 26) | 3 |
| Business Law (Bus. Adm. 51-52-53) | 9 |
| Corporation Finance (Bus. Adm. 155) | 3 |
| Money and Banking—Advanced Course (Bus. Adm. 142) | 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 (Econ. 140) | 3 |
| Labor Problems (Econ. 161) | 3 |
| Personnel Administration (Bus. Adm. 167) | 3 |
| Public Finance (Bus. Adm. 58) | 3 |
| The Economics of Public Utilities (Bus. Adm. 165) | 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 (Hist. 80-81) | 3 to 6 |
| Finance Management (Bus. Adm. 156) | 3 |
| Theory of Statistics (Econ. 113-114) | 3 |
| Geography of Commercial Production (Econ. 75) | 5 |
| Fire and Marine Insurance (Bus. Adm. 60) | 3 |
| Casualty Insurance (Bus. Adm. 61) | 3 |

† 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.

‡ In addition to the required courses in the junior and senior years, the student must earn approximately 10 credits per year.

* For electives in other colleges, see page 55.

§ For permissible substitute, see page 55.

### B. *Engineering*

| | Hours |
|---|---|
| Auto and Airplane Engines (M.E. 50) | 3 |
| Gas Manufacture and Distribution (Ch.E. 41) | 3 |
| Civil Engineering Practice (C.E. 53) | 3 |
| Contracts and Specifications (G.E. 101) | 3 |
| Estimating (G.E. 81) | 3 |
| Technical Writing (Engl. 31) | 3 |

## 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 |
|---|---|---|
| | *Fall Quarter* | |
| Econ. 8 | General Economics | 3 |
| | *Winter Quarter* | |
| Econ. 9 | General Economics | 3 |
| | *Spring Quarter* | |
| Econ. 28 | Business Law | 3 |

### JUNIOR YEAR

| | | |
|---|---|---|
| | *Fall Quarter* | |
| Econ. 29 | Principles of Accounting | 3 |
| | *Winter Quarter* | |
| Bus. Adm. 89 | Production Management | 3 |
| | *Spring Quarter* | |
| Bus. Adm. 155 | Corporation Finance | 3 |

### SENIOR YEAR

| | | |
|---|---|---|
| | *Fall Quarter* | |
| Bus. Adm. 67 | Market Administration | 3 |
| Econ. 161 | Labor Problems and Trade Unionism | 3 |
| | *Winter Quarter* | |
| Bus. Adm. 71 | Traffic Management | 3 |
| Bus. Adm. 167 | Personnel Administration | 3 |
| | *Spring Quarter* | |
| Bus. Adm. 130 | Cost Accounting | 3 |
| Bus. Adm. 165 | The Economics of Public Utilities | 3 |

## SUBSTITUTIONS

In order that students who are irregular may avoid delays on account of program conflicts or other difficulties, the following substitutions will be approved by petition. Additional credits thus earned may be applied as elective credits.

| Course | Cred. | Substitute Course | Cred. |
|---|---|---|---|
| Draw. 4 | 2 | Draw. 1 | 3 |
| 5 | 2 | 2 | 3 |
| 6 | 2 | 3 | 3 |
| 4 and 5 and 6 | 6 | 7 and 8 | 6 |
| 26 | 2 | 28 | 2 |
| 28 | 2 | 26 | 2 |
| M.&M. 84 | 5 | M.&M. 26 and 127 | 10 |
| 85 | 4 | 128 and 141 | 7 |
| 86 | 3 | 129 and 143 | 5 |
| 91 | 4 | 24 and 25 | 10 |
| 92 | 4 | 26 or 84 | 5 |
| 93 | 4 | 85 or 128 | 4 or 5 |
| M.E. 16 | 2 | 17 | 2 |
| 16 | 2 | 14 and 15 | 6 |
| 17 | 2 | 16 | 2 |

## ELECTIVE COURSES IN OTHER COLLEGES

For detailed schedules of classes see the programs of respective departments.

| Course No. | Title | Credits | Prerequisites |
|---|---|---|---|
| Ast. 11f,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. 8f,w,s | Introductory Geology | 5 | None |
| Geol. 23w-24s | Elements of Mineralogy | 8 | Chemistry |
| 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 preparation |
| 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 | 10 | None (Int. Arch. only) |
| Italian 1f-2w | Beginning Italian | 10 | None |
| Jour. 5w,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) |

| Course No. | Title | Credits | Prerequisites |
|---|---|---|---|
| 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. 2w | State Government | 5 | Pol. Sci. 1 |
| Pol. Sci. 11f,s | Municipal Government | 5 | Pol. Sci. 1 |
| Psy. 1f,w,s-2w,s | 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 |
| Sp. 41f,w-42w,s-43f,s | Fundamentals of Speech | 9 | Engl. 6 |

# DESCRIPTIONS OF COURSES

## AERONAUTICAL ENGINEERING

1f—Aviation. Airplanes, their structure and rigging. Instruments. 3 cred.; prereq., M.&M. 12. Mr. Gage.

(1) I MWF; 202ME (2) III TThS; 202ME

2w—Auto and Airplane Engines. Principles and types. Electrical systems. Lubrication and cooling. Carburetors. Accessories. (Open only to aeronautical engineers or by petition.) 3 cred.; prereq., 1. Mr. Gage.

(1) I TThS; 202ME (2) III MTTh; 110Ex

3s—Aviation. Aerial navigation. Communications. Handling of sea planes and land planes. 3 cred.; prereq., 1 and 2. Mr. Gage.

(1) I TTh, II S; 202ME (2) I F, III ThS; 254ME

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; III MWF; 107E. 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, and reg. in M.&M. 127; 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 M; 217E

116w—Advanced Airplane Stresses. Theory and design of monocoque fuselages. Multispar and unit construction wings. Analysis and design of seaplane hulls and floats. 3 cred.; prereq., 115. Mr. Wise.

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. Akerman.

| | | |
|---|---|---|
| 120f | Lect. IV S; 202ME | Lab. VII-IX T; 251ME |
| 121w | Lect. II T; 202ME | Lab. VII-IX WF; 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 WF; Ex. Messrs. Akerman and Gage.

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; II-IV MW; Ex. Mr. Boehnlein.

155s—Flight Training for Aeronautical Engineers. Dual and solo flying with various types of aircraft under government regulations. Students may qualify for pilot's license. Open only to senior aeronautical engineers and by special permission. 2 cred.; prereq., junior year in residence at University of Minnesota.

156s—Dual Flight Instruction for Aeronautical Engineers under Government Regulations. Open only to senior aeronautical engineers and by special permission. 1 cred.; prereq., junior year in residence at University of Minnesota.

160s—Airships. Theory and design. Rigid and non-rigid types. Stresses. Performance. 3 cred.; prereq., 83, 102, M.&M. 128. Mr. Akerman.

Lect. II TS; 254ME Lab. I-III W; 151ME

170s—Air Transport. Economic Problems. Airports and airways. Lighting for night flying. 2 cred.; prereq., open to seniors; IV MW; 252ME. Mr. Gage.

190f-191w-192s—Seminar. Readings, reports, conferences, and discussions. 1 cred. per qtr.; prereq., 102. Mr. Akerman.

190f III M; 202ME 192s I S; 252ME
191w IV T; 202ME

## AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

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; 302HH(UF)
Lab. (1) VI-VII T; 311HH(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; 302HH(UF) Lab. VI-VII T; 311HH(UF)

## AGRICULTURAL ENGINEERING

### FARM BUILDINGS

5f—Farm Building Construction. Instruction and practice in framing, construction, and painting of farm buildings. 3 cred.; no prereq. Messrs. White and Berggren.

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)

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.

112f,w,s—Farm Building Problems. Investigations in building materials, methods of construction, cost and efficiency of farm buildings. 3-18 cred.; prereq., 67; ar.; 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. VI-VIII W; 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. Construction, operation, and care of simple steam engines and boilers. 3 cred.; prereq., Phys. 23, 24; II TThS; 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. Schoenleber.

31f,w,s—Principles of Drainage. Elementary principles and practice of soil erosion control and 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, 1930-31, 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.

102f,w,s—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. 3-12 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. Arny.

## 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

### HISTORY

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.; no prereq.; 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.

219f,w,s—Special Researches in Architectural History. 5 cred. or less per qtr.; prereq., completion of undergraduate architectural history; III MW; ar. Mr. Mann.

### FINE ARTS

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) VII-IX TTh; 417 E (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,su-25f,w,s,su-26f,w,s,su—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 25s-26s I-III TS; 417E

27f,w,s,su-28f,w,s,su-29f,w,s,su—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
27s-28s-29s (1) I-III MW; 417E (2) II-IV MW; 417E

40su—Painting. Still life, head and figure, landscape. 3 or 6 cred.; prereq., evidence of elementary ability; VI-VII MWF; 405E. Mr. Burton.

41su—Sculpture. Modeling in clay. Head, figure, and composition. 3 or 6 cred.; prereq., evidence of elementary ability; I-III MWF; 405E. Mr. Burton.

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. Mr. Burton.

84f,s-85f,s-86f,s VI-VIII MW; 405E 84w-85w-86w VII-IX WF; 405E

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., 23; 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., 23; VI-VIII T; 405E. Mr. Burton.

121f,w,s,su-122f,w,s,su-123f,w,s,su—Freehand Drawing. Advanced life drawing, painting, or modeling and decoration. 2 cred. per qtr.; prereq., 29; VI-VIII MW; 417E. 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., Arch. 16; IV T; 206E, I F; 320 E. 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,su-222f,w,s-223f,w,s—Life Drawing and Figure Composition. 2 cred. per qtr.; prereq., completion of undergraduate freehand drawing; hrs. ar. Mr. Burton.

287f,w,s-288f,w,s-289f,w,s—Advanced Modeling. Continuation of Arch. 89. 2 cred. per qtr.; prereq., 89; hrs. ar.; 405E. Mr. Burton.

## DESIGN

31f,w,su-32w,s,su-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, Havens, and Heath.

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 Lab. II-IV MWF; 225E

33s Lect. IV TS; 305E
Lab. (1) II-IV MWF; 309E (3) VII-IX TTh, I-III S; 309E
(2) VI-VIII MWF; 309E

*34f,w,s,su-35f,w,s,su-36f,w,s,su—Architectural Design, Grade I. Long and short problems under individual criticism dealing in general with the elements of plan and elevation. Sketch problems dealing with composition. 4 cred. per qtr.; prereq., 23, 62. Messrs. Robertson and Deneen.

(Arch.) (f,w) VII-IX MWF, VI-VIII T; 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. McKee.

*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. Mr. Arnal.

131f-132f-133f I-II MWF, VI-IX MTWThF, I-IV S; 317E
131w-132w-133w III-IV TWF, VI-IX MTWThF, I-IV S; 317E
131s-132s-133s III-IV WF, VI-IX MTWThF, I-IV S; 317E

239f,w,s—Advanced Architectural Design. 10 cred. or less per qtr.; prereq., completion of undergraduate design; VI-IX MTWThF, I-IV S; 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.

Lect. I MW; 320E
Quiz. (1) III M; 320E (3) III Th; 5E(f), 215E(s), I F; 320E(w)
(2) II W; 320E

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

* 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.

heavy construction. 2 cred. for 47-48, 3 cred. for 49; prereq., 35. Mr. Deneen.

47f VI-VIII TTh; 225E
48w VI-VIII TTh, II-IV S; 225E
49s VI-VIII T, 225E. II-IV W; 302E

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; 136E(f), 5E(w), 4E(s). Mr. R. T. Jones.

240f,w,s. Technology of Building Materials. 3 cred. per qtr.; prereq., 49 or 143; hrs. ar. Mr. R. T. Jones.

## 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.; no prereq.; 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; IV TF; 320E. Miss Carter.

180su. Architecture and Decoration. History and appreciation of interior architecture, furniture, and decoration. Illustrated lectures and research. 2 cred.; no prereq.; IV TWF. Mr. Mann.

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, 23; II TThF. Miss Carter.

243f,w,s—Advanced Interior Decoration Design. 10 cred. or less per qtr.; prereq., 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.

* 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.

162w—Landscape Design. Theory and practice. Lecture and design problems. 2 cred.; prereq., 39; I 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; 205E. Mr. Mann.

## ART EDUCATION

20f-21w-22s—Principles of Harmony in Form and Color. Color theories of Munsell, Wilson, Sargent and others discussed and exemplified, with analysis of color harmonies and original work therein. Applications of color harmonies in design 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. Miss Raymond.

## ASTRONOMY

Ast. 51w—General Astronomy. Survey of the general principles and fundamental facts of astronomy, illustrated by laboratory apparatus, lantern slides, 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. IV MWF; 166Ph. Mr. Crump.

## BOTANY

1f,w,s—General Botany. Structure, physiology, life histories, and evolution of plants. Lectures and quizzes. 4 cred.; no prereq. Mr. Huff.

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| 1f | Lect. Bot. Aud. | (1) III TThS | (2) VI T, VI-VII Th |
| | Quiz Bot. Aud. | (1) III 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.

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| 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.

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| 21f | III-IV MWF; 1, 4, 5, 8 Bot. |
| 21w,s | VI-VIII TTh; 1, 4, 5, 8 Bot. |

## INORGANIC CHEMISTRY

1f,su-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. Glockler and Pervier.

(1) (Pre-med., pre-dent.)
Lect. VI MWF; 225C
Quiz (a) VIII Th; ar C
(b) VIII T; ar C
Lab. (a) VI-VIII T; 290C
(b) VI-VIII Th; 290C

(2) (Agr., jr. arch. engr.) fall, winter
Lect. VII MWF; 225C
Lab. VIII-IX MW; 210C

(2) (Agr., jr. arch. engr.) spring
Lect. VII MF, IV S; 225C
Lab. VIII-IX MF; 210C

4f,su-5w,su—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, Heisig, and Maynard.

4f (Engrs.)
Lect. (1) VIII M, I ThS; 100C
(2) IV T, 225C, VI Th, IV S; 100C
(3) IV T, 225C, VI Th, IV S; 100C
(4) VIII M, I ThS; 100C
Quiz IX Th; 100C
Lab. (1) V-VII W; 110C
(2) II-IV M; 110C
(3) V-VII M; 110C
(4) II-IV W; 110C

(Pre-med., pre-dent)
Lect. (5) VI MWF; 100C
Quiz VIII Th; ar C or
VIII T; ar C
Lab. (a) VI-VIII T; 210C
(b) VI-VII Th; 210C

5w (Engrs.)
Lect. (1) I TThS; 100C
(2) IV T, 225C, VI Th, IV S; 100C
(3) I TThS; 100C
Quiz VIII M; 100C
Lab. (1) III-V T; 110C
(2) II-IV M; 110C
(3) I-III W; 110C

(Pre-med., pre-dent.)
Lect. (4) VI MWF; 100C
Quiz VIII Th; ar C or
VIII T; ar C
Lab. (a) VI-VIII T; 210C
(b) VI-VIII Th; 210C

6f,su-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,su-10w,s,su—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; 100C
(2) (Chem., S. L. A.) II MWF; 100C
Lab. VIII-IX MWF; 110C
I-III ThS; 290C

9w-10s Lect. (1) III MWF; 225C.
Lab. VI-VII MWF; 210C, 290C
(2) III MWF; 100C

11f,s,su—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. VI-IX F; 210C
11s Lect. VI MWF; 110C
Lab. (a) VI-IX T; 210C — (b) VI-IX Th; 210C

*12f,s,su-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; 225C — Lab. I-III MW; 290C
12s Lect. II MWF; 100C — Lab. I-III ThS; 290C
13f Lect. VI WF; 490C — Lab. VII-IX WF, VI-VIII M; 290C
13w Lect. VI WF; 490C — Lab. VII-IX MWF; 290C

14f,su-15w—General Inorganic Chemistry. (Engrs., miners, pharm., and phys. ed.) 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. Reyerson and Barber.

(Engrs.)
Lect. II TThS; 100C
14f Lab. (1) VIII-IX T, VI-IX Th; 110C
(2) II-IV MW; 110C
15w Lab. (1) VI-IX T, VI-VII Th; 110C
(2) I-III MW; 110C
Quiz VIII F; 100C
(Miners)
Lect. II TThS; 100C — Lab. VIII-IX T, VI-IX Th; 110C
(Pharm., phys. ed.)
Lect. I MWF; 225C — Lab. VI-VIII TTh; 290C

16s—Qualitative Chemical Analysis. (Engrs., miners, and pharm.) 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.

(Engrs. who entered with h.s. chem.)
Lect. (1) I TThS; 100C — Lab. (1) VII-IX M, III-V T; 110C
(2) IV T, 225C, VI Th, IV S; 100C — (2) I-IV M, VII-VIII F; 110C
(3) I TThS; 100C — (3) I-III WF; 110C
(Engrs. who entered without h.s. chem.)
Lect. (4) II TThS; 100C — Lab. (4) I-III WF; 110C
(5) II TThS; 100C — (5) VII-IX TTh; 110C
(Miners)
Lect. II TThS; 100C — Lab. VI-VII Th, VI-IX F; 110C
(Pharm.)
Lect. I MWF; 225C — Lab. VI-VIII TTh; 290C

17s,su—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.

* Course 12f may be taken by students registered in the College of Engineering and Architecture in place of 16s.

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,su—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; hrs. 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.

134f-135w-136s—Seminar: Modern Problems in Inorganic Chemistry. 1 cred.; prereq., Anal. Chem. 1 and 2 and Phys. Chem. 103. Mr. Sneed.

301f,su-302w-303s—Research in Inorganic Chemistry. Credits to be arranged. Messrs. Sneed, Reyerson, and Glockler.

## ANALYTICAL CHEMISTRY

1w,su-2s,su—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.

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| 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) VII-IX MWF; 310C |

7f,w,s,su—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.

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|---|---|---|---|
| 7f | Lect. | (1, 2) VI M; 325C | (3) VII T; 325C |
| | Rec. | (1) (limit 35) VI W; 315C<br>(2) (limit 35) VI F; 315C | (3) VI Th; 325C |
| | Lab. | (1) VII-IX MW, VI-VII F; 310C<br>(2) VII-IX MF, VI-VII W; 310C | (3) VIII-IX T, VII-IX Th, 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.

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|---|---|
| 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,su-97w-98s—Senior Thesis. Open to seniors. 5 cred. per qtr. Messrs. Kolthoff, Geiger, and Sarver.

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; 325, 310C. Mr. Geiger.

123f,su-124w,su-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. 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 of $p_h$ Determinations. 3 cred.; prereq., 1, 2 and Phys. Chem. 103. Mr. Kolthoff.

132w-133s—Electrometric Measurements and Titrations. Application of potentiometric and conductometric methods in analytical work. 3 cred.; prereq., 1, 2 and Phys. Chem. 103. Mr. Kolthoff.

134f-135w-136s—Seminar: Modern Problems in Analytical Chemistry. 1 cred.; prereq., 1, 2 and Phys. Chem. 103. Mr. Kolthoff.

201f-202w-203s—Selected Topics in Analytical Chemistry. 3 cred.; prereq., 1, 2 and 123. Mr. Kolthoff.

301f,su-302w-303s—Research in Quantitative Analysis. Cred. ar. Messrs. Kolthoff, Geiger, and Sarver.

## ORGANIC CHEMISTRY

1f,w,s,su-2f,w,s,su—Elementary Organic Chemistry. (Pre-med., pre-dent., pharm.) 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.

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| 1f,s-2w | Lect. | I MWF; 100C | |
| | Lab. | Conference II Th; 225C | |
| | Quiz | I Th; ar | |
| | Lab. | (1) I-IV T; 390C | (3) VI-IX W; 390C |
| | | (2) VI-IX T; 390C | |
| 1w-2f,s | Lect. | IV MWF; 100C | |
| | Lab. | Conference IV T; 100C | |
| | Quiz | V T; ar | |
| | Lab. | (1) VI-IX W; 390C | (3) I-IV S; 390C |
| | | (2) VI-IX Th; 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.

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| Lect. | III MWF; 325C | |
| Rec. | (1) IV T; 111C | (3) III S; ar |
| | (2) III Th; 111 C | |
| Lab. | (1) I-III TTh; 390C | (2) (s) VI-VIII TTh; 390C |
| | (2) (f,w) VII-IX 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; 315C. 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. (Not offered in 1930-31.)

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; II MWF; 315C. 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, Lauer, and Stephens.

## 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 to 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. Taylor.

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. Taylor.

129s—Principles of Colloidal Chemistry. 2 cred.; prereq., 101. Mr. Reyerson.

130s—Application of Colloidal Chemistry. 2 cred.; prereq., 101. (Not offered in 1930-31.)

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. Mr. Taylor.

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. (Not offered in 1930-31.)

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; II TThS; 115C. Mr. MacDougall.

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,su-302w-303s—Research in Physical Chemistry, including work in electrochemistry, photo- and radio-chemistry, and colloids. Cred. ar. Messrs. Lind, MacDougall, Reyerson, Glockler, and Taylor.

## TECHNOLOGICAL CHEMISTRY

1f,w,s,su—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. Stoppel.

1f Lect. II T; 215C
Rec. II Th; 215C
Lab. (1) I-III MF; 10C (2) I-III W, II-IV S; 10C

1w Lect. III T; 215C
Rec. III Th; 215C
Lab. II-IV MF; 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,su—Gas and Fuel Analysis. The chemical analysis of solid 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. II S; 215C
Rec. (1) IV S; 215C (2) VI W; 215C
Lab. (1) II-IV T, I-III Th; 10C (2) VII-IX W, VI-VIII F; 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. Mr. Harding.

Lect. II S; 215C
Rec. (1) IV S; 215C (2) II W; 215C
Lab. (1) II-IV T, I-III Th; 10C (2) VI-VIII MW; 10C

107f,w,s,su—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,su-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 and Architecture who have completed one year of chemistry. Lectures and recitations. 3 cred. Mr. Montillon.

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.

80s—Chemical Engineering Materials. The technology, physical and chemical properites, and economic considerations of materials used in the construction of chemical engineering equipment and plants. Ferrous and non-ferrous metals and alloys, woods, brick, concrete and ceramic materials, textiles, rubber, protective materials, etc. 1 cred.; prereq., Inorg. Chem. 13; III TTh; 225C. Mr. Mann.

96f-97w-98s—Senior Thesis. Open to seniors. 5 cred. per qtr.

101f,su—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. 3 cred.; prereq., Anal. Chem. 1, 2, Chem. Eng. 80. Messrs. Mann and Ruth.

102s,su—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. 3 cred.; prereq., 101; II MWF; 325C. Mr. Montillon.

103f—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. 3 cred.; prereq., 101; II MWF; 325C. Mr. Montillon.

104w—Unit Process Problems. Problems in leaching and dissolving, countercurrent extraction, gas absorption, and distillation. Drying by air, steam, and direct heat dryers. 3 cred.; prereq., 101; II MWF; 325C. Mr. Montillon.

111f-112w-113s—Design of Chemical Engineering Equipment and Plants. Laying out of plants and design of equipment based on collected data for the same. Class room and laboratory work. 2 cred. per qtr.; prereq., Chem. Eng. 104. Mr. Montillon.

117s—Chemical Engineering Equipment Design. Fundamental principles in the design of simple chemical engineering equipment. Laboratory work. 3 cred.; prereq., Chem. E. 104. Messrs. Montonna and Ruth.

Lect. IV T; 410C Lab. VI-IX TTh; 410C

121w—Chemical Engineering Economics. The economic and business considerations controlling chemical engineering industries. Statistical analysis of the characteristics of these industries. Raw and finished products. Principles of plant location, layout and design. Unit operation costs. Principles of management operation and control. Lectures and recitations. 3 cred.; prereq., Chem. Eng. 132; III MWF; 111C. Mr. Montonna.

131w—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; 325C. Messrs. Mann and Montonna.

132s—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; 325C. 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; 315C. 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. Mr. Montillon.

150s—Unit Process Laboratory. Operation and testing of chemical engineering equipment. Laboratory work and reports. 1 cred.; prereq., Chem. Eng. 101. Mr. Ruth.

Lab. (1) VI-VIII M; 90C (3) I-III S; 90C
(2) VI-VIII W; 90C (4) Arranged

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, Montillon, 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. Mr. Montillon.

Lect. I MWF; 111C 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,su-302w-303s—Research in Chemical Engineering. Unit processes, applied electrochemistry and electric furnace work, and chemical manufacture. Cred. ar. Messrs. Mann, Montillon, and Montonna.

## CIVIL ENGINEERING

### SURVEYING

9f—Principles of transit and stadia surveying and leveling; field problems, computation and platting of traverses, adjustment of instruments. Open to students in Geology. 3 cred.; prereq., Math. 6; VI-IX WF; 101E. Mr. Cutler.

10s—Triangulation, stadia and plane table surveys, computation and platting of topographic surveys. 3 cred.; prereq., 9; VI-IX WF; 7E. Mr. Zelner.

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. III Th; 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; 104E (2) III W; 21E
Lab. (1) II-IV T, VII-VIII T, VI-VII F; 217E (3) VI-IX W, VI-VIII Th; 217E
(2) VII-IX M, III-IV W, VIII-IX F; 217E

13s—Surveying. Adjustments of instruments, profile and differential leveling, transit surveys, circular curves. 3 cred.; prereq., 12. Messrs. Cutler and Boon.

Lect. III Th; 21E
Lab. (1) I-IV T, II-IV S; 1E (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 platted. 3 cred.; prereq., 13. Mr. Zelner.

(1) VI-IX TW; 229E (3) VI-IX M, I-IV T; 225E
(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. Precise, trigonometric, and barometric leveling. Theory and use of sextant. 2 cred.; prereq., 14. Mr. Zelner.

(1) II-III ThF; 21E (2) II-III MT; 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. I 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 junior and senior engineers. 3 cred.; VI-IX TTh; 7E. Messrs. Cutler and Zelner.

19f,s—Surveying. (M.E.) Short course including problems in chaining, transit and tape surveys; differential, trigonometric and profile leveling, computations and platting of notes, etc. 3 cred.; prereq., M.&M. 12. Messrs. Cutler and Boon.

19f Lect. (1) I Th; 21E (2) I F; 21E
Lab. (1) I-III M, I-IV W; 229E (2) VI-IX M, VI-VIII Th; 229E
19s Lect. VI T; 21E Lab. VI-IX M; 21E, I-III Th; 217E

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; 229E
(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 W; 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; 7E
Lab. (1) II-IV TW; 227E (2) VI-VIII T, I-III Th; 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 bridge trusses for fixed and moving loads. 2 cred.; prereq., M.&M. 26, Dr. 23. Mr. Parcel.

Lect. (1) III Th; 4E (2) I Th; 7E
Lab. (1) I-II S; 201E (3) VIII-IX F; 227E
(2) VIII-IX Th; 201E

32w—Stresses in Structures. Analysis of simple span bridge trusses. Standard engine loadings and equivalent uniform loads. Laboratory tests of structural members. 3 cred.; prereq., 31, M.&M. 141. Messrs. Parcel and C. A. Hughes.

Lect. II 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, M.&M. 128. Mr. Parcel.

Lect. VI Th; 21E
Lab. (1) VIII-IX W, III-IV F; 229E; III-IV M; Ex
(2) VIII-IX Th, I II W; 227E; 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. 141. Mr. Wise.

Lect. II F; 205E Lab. II-III MW; 229E

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. I W; 21E 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.

Lect. 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. C. A. Hughes.

39w—Structural Design. (Arch.) General principles of structural design. Girders, columns, and roof trusses. 3 cred.; prereq., 38; I-II TThF; 229E. Mr. C. A. 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; 5E; III-IV F; 320E. Mr. C. A. 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. Mr. Wise.

Lect. IV T, III Th; 7E Lab. VI-IX T, VII-IX W; 227E

131w,su—Bridge Analysis. Stresses in Simple span bridges of the larger type and in cantilevers, arches, and continuous bridges. 3 cred.; prereq., 134; VIII-IX MTh, III-IV F; 229E. Mr. Parcel.

132s,su—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,su—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,su—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., 142 or 142a; II-III M, VI-IX F; 217E. Mr. Wise.

141f,su—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) VIII-IX M, I-II Th, III-IV S; 227E (2) VI-VII M, III-IV T, VIII-IX F; 217E

141(a)f,su—Reinforced Concrete. Similar to 141 with problems of special interest to students in architectural engineering. 3 cred.; prereq., M.&M. 128; VI-VII M, III-IV T, VIII-IX F; 217E. Mr. Wise.

142w,su—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, II-III Th; 227E (2) VIII-IX MT, VI-VII F; 227E

142(a)w,su—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 and 128, or M.&M. 127 and 128; IV MW; 215E; VIII-IX Th; 201E. Mr. Wise.

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. C. A. Hughes.

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| 146f | Lect. III MTh; 110Ex | Lab. VI-IX W; Ex |
| 146w | Lect. VIII-IX F; 110Ex | Lab. VI-IX W; Ex |
| 146s | Lect. III WTh; 209Ex | Lab. VI-IX Th; 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, M.&M. 128. Mr. Wise.

148f-149w-150s—Advanced Concrete. Short research problems in concrete. 2 cred. per qtr.; prereq., 146; ar. Mr. C. A. Hughes.

234f-235w-236s—Advanced Theory of Structures. Analysis and design of continuous bridges, suspension bridges, reinforced concrete and steel arches, arched dams, tall building frames, flat slab floors, secondary stresses, and studies of connections and details. 3 to 5 cred. per qtr.; prereq., 132, 142. Messrs. Parcel and Wise.

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. Mr. C. A. Hughes.

245f-246w-247s—Seminar. Special topics in the higher Theory of Structures. 3 to 6 cred. per qtr.; prereq., 134, 142. Messrs. Parcel and Wise.

## HIGHWAY ENGINEERING

51f—Highways and Pavements. Elementary course with field inspection, relating to the economies, location, construction, and maintenance of highways and pavements. 3 cred.; prereq., 12. Mr. Lang.

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| 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; 227E (2) VI-VIII Th; 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.

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| 164f | Lect. I T; 107E | Lab. III-IV M, VI-IX W; 227E |
| 164w | Lect. II M; 135E | Lab. VI-IX Th, II-III W; 227E |
| 164s | Lect. II W; 21E | Lab. III-IV W, 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.

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| 162f | Lect. III M; 107E | Lab. VIII-IX M, II-III W, VI-VII F; 217E |
| 162w | Lect. III MW; 5E | Lab. VIII-IX T; 229E |

163w,s—Water Supply and Sewerage. 3 cred.; prereq., 162. Mr. Bass.

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| 163w | Lect. I WF; 7E | Lab. II-III Th, II-IV F; 217E |
| 163s | Lect. II TTh; 104E | 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. II WF; 5E. 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 MTTh; 21E

172s—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

7f,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. 3 cred.; no prereq.; III TWS; 100HH(UF). Mr. Combs.

## 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 Quaid.

1f (1) I-II MWF, VII F; 455C
(2) VIII-IX M, II-III T, IV W, I-II S; 455C
(3) VI-VII T, III W, VII-VIII Th, III-IV F; 455C
(4) VIII-IX TW, III Th, III-IV S; 455C
(5) VI-VII MWF, I Th; 455C

1w (1) I-II MWF, VIII Th; 455C
(2) I-II TS, III W, III-IV F; 455C
(3) VIII-IX MWF, I Th; 455C
(4) III-IV T, VIII-IX T, VI-VII Th, IV S; 455C
(5) VI-VII MWF, III Th; 455C

1s VIII-IX MWTh, VIII F; 443C

2w,s,su—Engineering Drawing. 3 cred.; prereq., 1. Messrs. Schuck, Archibald, Potter, Williams, Cruzen, and Shultz.

2w (1) I-II MWF, VIII Th; 417C
(2) I-II TS, III W, III-IV F; 417C
(3) VIII-IX MWF, I Th; 417C
(4) III-IV TS, VIII-IX T, VI-VII Th, IV S; 417C
(5) VI-VII MWF, III Th; 417C

2s (1) I-II MWF, VIII F; 455C
(2) I-II TS, III W, III-IV F; 455C
(3) VIII-IX MW, I Th, VI-VII Th; 455C
(4) III-IV TS, III Th, VIII-IX Th; 455C
(5) III-IV M, VI-VII MF, VI W; 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) IV TS, VI Th; 203E
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; 417C (5) III-IV M, VI-VII MF, VI W; 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) III-IV MWF; 443C (2) VII-VIII MWF; 443C
5w III-IV MW, V-VI T; 443C
6s III-IV MTF; 445C

7w,su-8s,su—Engineering Drawing and Descriptive Geometry. (Chem. and chem. engr.) 3 cred. per qtr.; prereq., solid geometry. Messrs. Eggers and Schuck.

7w VIII-IX MTWF; 445C
8s VII-IX M, III-IV W, VI-VIII F; 445C

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 MWFS; 136E (4) VIII TWTh, IX F; 215E
(2) VII MTWTh; 106E (5) VI MTWF; 203E
(3) IV MWF, III Th; 22E (6) III MWF, IV S; 238EE
10w IX MTWF; 106E

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. Potter and Archibald.

21f,w,s,su—Drafting (C.E.). Drawing of structures and machines. Detail, assembly, 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 MFS; 201E
21s I-II MWF; 201E

* For permissible substitutions, see page 55.

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 MTF; 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) VIII-IX MWF; 101E (2) VIII-IX TTh, III-IV S; 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 conventions, circuit diagrams, the development of simple formulas, and graphical methods. 2 cred.; prereq., 26. Messrs. Eggers, Schuck, and Shultz.

(1) VII-VIII WF, VI-VII Th; 201E (2) I-II TThS; 201E

28f,w,s,su*—Drafting (Aero.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) VI-VII MTTh; 201E (3) VIII-IX M, VI-VII WF; 201E
(2) VI-VII MW, III-IV S; 201E
28w VIII-IX MWF; 1E
28s VIII-IX MTh, III-IV S; 201E

29w,s,su—Drafting (Aero.E.). Application of elementary formulas in the proportioning 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) III-IV W, VI-VII TTh; 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

* For permissible substitute, see page 55.

of particular interest to dental and medical students. 2 cred. per qtr.; no prereq. Mr. Kirchner.

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; 5E (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; 205E. 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., 1, M.&M. 12. Messrs. Eggers, Schuck, and Cruzen.

51w III MWF; 36EE
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. draw., M.&M. 26; I MF; 206E. Messrs. Kirchner, Eggers, and Levens.

57f I MW; 206E
58w-59s I MW; 5E

61f,w—Projections. Elementary principles of descriptive geometry and their application to architectural problems of projections and intersections. 2 cred.; no prereq. Messrs. Kirchner and Myers.

61f Lect. III Th; 335EE
Lab. (1) VI-VIII W; 225E (3) VI-VIII F; 225E
(2) II-IV W; 225E (4) VI-VIII Th; 217E

61w* Lect. VI T; 205E Lab. I-III S; 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) II-IV M; 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) VI-VIII Th; 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. in the School of Business Administration; prereq., 15 cred in econ.; IV MW; 5E. Mr. Kirchner.

65w—The Graphic Arts. Layouts. Printing art, its history and development. Analysis of the standard type faces. Type, composition, imposition. Study of specimens of fine printing. Exercises: simple layouts, including lettering

* Must register also in Draw. 62.

associated with type. Open to students in the School of Business Administration. 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. Open to students in the School of Business Administration. 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. Mr. Kirchner.

86f,w,s—Anatomical Drawing. 3 cred. per qtr.; prereq., 43 or equivalent. Mr. Kirchner.

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,s—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.

3w Lect. III TTh; 150Ph
Rec. (1) I TThS; 6B
(2) II MWF; 209B
(3) III MWF; 3F
(4) IV MWF; 105F
(5) V MWF; 6B
(6) VI MWF; 209B
(7) VII MWF; 209B

3s Lect. III TTh; OLAud
Rec. (1) I MWF; 3F
(2) I TThS; 102B
(3) II MWF; 202B
(4) II TThS; 202B
(5) III MWF; 209B
(6) IV MWF; 202B
(7) IV MWF; 206P
(8) V MWF; 202B
(9) V MWF; 209B
(10) VI MWF; 209B
(11) VI MWF; 109B
(12) VII MWF; 209B
(13) VII MWF; 202B
(14) VIII MWF; 202B

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. Westbrook.

(1) I MWF; 107E
(2) II MWF; 107E
(3) III MWF; 135E
(4) IV MWF; 203E

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.

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| 14f | (1) I MWThFS; 6B | (3) IV MTWFS; 6B |
| | (2) III MWThFS; 109B | (4) VI MTWThF; 303B |
| 14w | (1) III MTWFS; 109B | (3) VI MTWThF; 109B |
| | (2) IV MTWFS; 302B | (4) VII MTWThF; 301B |
| 14s | (1) I MWThFS; 6B | (5) IV MTWFS; 302B |
| | (2) II MWThFS; 109B | (6) VI MTWThF; 303B |
| | (3) III MTWFS; 6B | (7) VII MTWThF; 303B |
| | (4) III MTWFS; 109B | |

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.

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| 20f | (1) I MWF; 303B | (6) III TThS; 301B |
| | (2) I TThS; 301B | (7) IV MWF; 302B |
| | (3) II MWF; 303B | (8) V MWF; 302B |
| | (4) II TThS; 302B | (9) VI MWF; 301B |
| | (5) III TThS; 302B | |
| 20w | (1) III TThS; 302B | (3) VI MWF; 303B |
| | (2) III MWF; 302B | |
| 20s | (1) I MWF; 301B | (3) III TThS; 302B |
| | (2) II MWF; 302B | (4) VI MWF; 302B |

25w,s-26f,s—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.

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| 25w-26s | (1) I MWF; 302B | (5) III MWF; 301B |
| | (2) I TThS; 302B | (6) IV MWF; 301B |
| | (3) II MWF; 301B | (7) VI MWF; 301B |
| | (4) II TThS; 301B | |
| 25s | (1) II MWF; 303B | (2) III TThS; 303B |
| 26f | (1) II TThS; 303B | (2) III MWF; 301B |

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 week. 3 cred.; no prereq. Mr. Heilman.

29f I MWF; 5E
29s I MWF; 339EE

149f,w,s—Business Cycles. Analysis of factors involved in business fluctuations. Comparison of theories of the cause of prosperity and depression. Introduction to the statistical data and methods of business forecasting. 3 cred.; sr., grad.; prereq., 3 and 8, 9. Messrs. Marget and Myers.

149f I TThS; 202B
149w (1) I MWF; 109B (2) VII MWF; 102B
149s III MWF; 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 III TThS; 209B
161s III TThS; 202B

## BUSINESS ADMINISTRATION

51f-52w-53s—Business Law. 3 cred. per qtr.; prereq., 9 cred. in econ. or pol. sci. Mr. Young.

Lect. IV TS; 150 OPh
Rec. (1) I M; ar (5) II T; ar
(2) II M; ar (6) III T; ar
(3) III M; ar (7) IV M; ar
(4) I T; ar

58f,w,s§—Elements of Public Finance. Public expenditures, revenues, and debts. Special attention is given to tax principles, practices, and burdens. This is a condensed course given especially for Business Administration students. 3 cred.; jr., sr.; prereq., 8, 9; IV MWF; 209B. Mr. Blakey.

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. I TThS; (f) 109B; (w) 209B; (s) 202B. Mr. Vaile.

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.

71f II TThS; 202B
71w,s VI MWF; 202B

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. Ostlund.

89f II MWF; 209B
89w II MWF; 202B
89s I MWF; 209B

100f,w,s—Report Writing. 1 cred.; jr., sr. Mr. Heilman.

100f VI T; 209B
100w IV T; 202B
100s VI T; 6B

§ Credit may not be received for both Econ. 191-192 and B.A. 58.
† Students may not receive credit for both Econ. 172 and Bus. Adm. 71.

101f,w-102w,s†‡—Advanced General Economics. A study of some of the more important theoretical problems of economics: competitive and monopoly prices; equilibrium prices and costs; theories of valuation of producers' goods; capital earnings and interest rates; profits. 3 cred. per qtr.; sr.; prereq., 8, 9. Mr. Garver.

101f-102w (1) II TThS; 209B (2) III MWF; 202B (3) IV MWF; 109B
101w-102s I TThS; 109B

109f,w,s—Business Policy. This course is devoted to the study of problems of a general administrative character. Cases involving broad business policies are presented for class discussion and reports. These cases involve questions of valuation, budgetary control, industrial promotions, and combinations and reorganization. 3 cred.; sr., grad.; prereq., 101, 102. Mr. Stevenson.

109f,w VII MWF; (f) 202B; (w) 109B
109s II MWF; 6B

130f,s—Cost Accounting. (General survey.) 3 cred.; prereq., 29; I TThS; 303B. Mr. Ostlund.

132w—Cost Accounting. 5 cred.; prereq., 29. II TWThFS; 303B. Mr. Ostlund.

133s—Accounting Systems. 3 cred.; prereq., 131, 132; II TThS; 303B. Mr. Ostlund.

139f,w,s—Advanced General Accounting. A course intended particularly for the general student of business. Interpretation of accounts and statements, statement preparation, and analysis. Utilization of the statements by the executive. The use of budgets in business. Accounting methods and statements in a number of business fields. 3 cred.; jr., sr., grad.; prereq., 25, 26. Mr. Heilman.

139f IV MWF; 303B
139w,s III MWF; 303B

142f,w,s—Money and Banking. Advanced Course. 3 cred.; jr., sr., grad.; prereq., 3 and 8, 9. Mr. Marget.

142f (1) II MWF; 202B (2) VI MWF; 209B
142w (1) II TThS; 6B (2) IV MWF; 6B
142s II TThS; 6B

155f,w,s—Corporation Finance. 3 cred.; prereq., 8, 9; III MWF; 102B(f,w), 202B(s). Mr. Stehman.

165f,w—The Economics of 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; III TThS; 202B(f), 102B(w). Mr. Garver.

167w—Personnel Administration. Managerial policy for various types of organization of labor. Special attention to job analysis, employment, incentives, and regulation of employment. 3 cred.; prereq., 8, 9; I TThS; 202B. Mr. Stead.

180-181(G)—Senior Topics Course—Production Management. Selected problems in management; studies in the technique of executive control in manufacturing enterprises; field research and surveys in the organization and methods of management of Northwest industrial concerns. Prereq., 89, 130. Mr. Filipetti.

(See School of Business Administration bulletin, Part II.)

† The entire course must be completed before credit is received for any quarter.
‡ Credit may not be received for both B.A. 101-102 and B.A. 107.

## ELECTRICAL ENGINEERING†

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. Mr. Todd.

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| 11f | Lect. | (1) III T; 335EE; III ThS; 138EE | (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) VIII-IX M; 21EE |
| | | (2) VI-VII W; 21EE | (6) VI-VII Th; 21EE |
| | | (3) II-III T; 21EE | (7) I-II W; 21EE |
| | | (4) II-III S; 21EE | (8) I-II M; 21EE |
| 13w | Lect. | (1) III T; 335EE; III ThS; 139EE | (3) I T; 335EE; I ThS; 237EE |
| | | (2) III T; 335EE; III ThS; 238EE | (4) I T; 335EE; I ThS; 238EE |
| | Lab. | (1) VI-VII M; 21EE | (5) VIII-IX T; 21EE |
| | | (2) VI-VII W; 21EE | (6) VIII-IX Th; 21EE |
| | | (3) III-IV T; 21EE | (7) VI-VII T; 21EE |
| | | (4) VIII-IX F; 21EE | (8) VI-VII Th; 21EE |
| 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) VIII-IX M; 21EE | (5) VI-VII M; 21EE |
| | | (2) II-III S; 21EE | (6) VI-VII W; 21EE |
| | | (3) I-II M; 21EE | (7) VIII-IX Th; 21EE |
| | | (4) VI-VII Th; 21EE | (8) I-II F; 21EE |

111f-113w-115s—Electrical Engineering. Alternating-current circuits and direct-current machines. 4 cred. per qtr.; prereq., 11, 13, 15. Messrs. Bryant and Johnson.

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| 111f-113w | (1) MWThF; 335EE | (2) II MTWF; 335EE |
| 115s | (1) I MWF, II S; 335EE | (2) II MTWF; 335EE |

112f-114w-116s—Electrical Engineering Laboratory. Taken with Courses 111, 113, 115. Experimental study of alternating-current circuits. Operation and characteristics of direct-current machinery. 2 cred. per qtr.; prereq., reg. in 111, 113, 115.

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| 112f | (1) VI-IX T; 107EE | (3) VI-IX Th; 107EE |
| | (2) VI-IX W; 107EE | (4) VI-IX F; 107EE |
| 114w | (1) VI-IX M; 107EE | (3) VI-IX W; 107EE |
| | (2) VI-IX T; 107EE | (4) VI-IX F; 107EE |
| 116s | (1) VI-IX M; 107EE | (3) VI-IX T; 107EE |
| | (2) VI-IX W; 107EE | (4) VI-IX Th; 107EE |

121f-123w-125s—Alternating Current Machinery. Theory of alternating-current machinery. 3 cred. per qtr.; prereq., 115, 116. Mr. Johnson.

(1) III MWF; 237EE (2) IV MWF; 237EE

122f-124w-126s—Electrical Engineering Laboratory. Operating characteristics of alternating-current machinery. 2 cred. per qtr.; prereq., 116 and reg. in 121, 123, 125.

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| 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-128w-129s—Transient Electrical Phenomena. Mathematical study of electric circuits during sudden changes of conditions. Classical and operational methods of analysis applied to electric circuits and machines, and use of the oscillograph in the analysis of these problems. 3 cred. per qtr.; prereq., reg. in 121, 123, 125; IV TS, VI Th; 339EE. Mr. Bryant.

† In courses continuing through three quarters, the work of each quarter is prerequisite for following quarters.

138w-139s—Slow Transients. Short-circuit currents in power networks, unbalanced loads in polyphase circuits, transformers and motors, harmonics, stability of power systems under steady state conditions. 3 cred. per qtr.; prereq., reg. in 123; III TThS; 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. Kuhlmann.

132f (1) IV T, III S; 237EE (2) II TS; 237EE
134w-136s (1) IV TS; 237EE (2) II TS; 237EE

232w-234s-236f—Electrical Design. Special problems. 2 cred. per qtr.; prereq., 132, 134, 136. Mr. Kuhlmann.

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.

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. Mr. Caverley.

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. Mr. Caverley.

Lect. I TThS; 138EE Lab. III-IV T; 107EE

43f-44w-45s—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. Caverley.

43f Lect. III TThS; 139EE
Lab. (1) I-II T; 107EE (2) I-II S; 107EE
44w Lect. II TTh, III S; 138EE
Lab. (1) VI-VII Th; 107EE (2) I-II S; 107EE
45s Lect. III TThS; 138EE
Lab. (1) I-II T; 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) I-II(f), II-III(w,s) 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. Mr. Todd.

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.

142w—Electrical Transmission. Consideration involved in the designing and building of transmission lines. Kelvin's law and its limitations. Transmis-

sion line as a mechanical structure. Lightning arresters. 2 cred.; prereq., reg. in 123; III TTh; 237EE.

144w—Railway Electrical Engineering. Principles of mechanics applied to electric train movements. 2 cred.; prereq., 42 or 45 or 48 or 115; IV WF; 238EE. Mr. Johnson.

145s—Railroad Electrification. Reasons for electrification. Study of European and American systems. Results of electrification. 2 cred.; prereq., 144; I WF; 238EE. Mr. Johnson.

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; IV W, III S; 339EE. 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 1930-31.)

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

64f-65w-66s—Elements of Communication. Theoretical and laboratory study of communication circuits and apparatus. Simplex, duplex, multiplex telegraph systems. Speed of transmission. Magneto, common battery, manual, automatic telephone systems. 2 cred. per qtr.; prereq., reg. in 111, 113, 115. Mr. Hartig.

Lect. III T; 238EE

Lab. (1) VI-VII W; 307EE
(2) VIII-IX W; 307EE
(3) VI-VII Th; 307EE
(4) VIII-IX Th; 307EE
(5) VI-VII F; 307EE

164f-165w-166s—Electric Communication. Telephone circuits at audio and carrier frequencies. Theoretical and laboratory study of circuits having distributed constants. Use of hyperbolic functions. Wave filters, balancing networks, equalizers, repeaters. 2 or 3 cred. per qtr.; prereq., reg. in 121, 123, 125. 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 1930-31.)

RADIO ENGINEERING

161f-162w-163s—Radio Communication. Theoretical and laboratory study of radio transmitting and receiving circuits and apparatus. Amplifiers, detectors, oscil-

lators. Electromagnetic waves in free space and on antenna systems. 3 cred. per qtr.; prereq., reg. in 121, 123, 125.

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

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 1930-31.)

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.

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 1930-31.)

149s—Protection Engineering. The application of relays, circuit breakers, lightning arrestors and other protective equipment to power circuits for apparatus protection and isolation of faults. Calculation of fault currents. Effect of fault condition on system stability. 3 cred.; prereq., reg. in 125. Mr. Johnson.

156s—Vacuum Tube Study. Two, three, four, and five electrode vacuum tubes. Thyration, kenotron, grid glow, photo electric tubes, etc. Theoretical study of apparatus and circuits with demonstrations. 2 cred. Open to seniors only. Mr. Hartig.

191f-192w-193s—Seminar. Weekly discussion of current electrical periodicals. 1 cred. per qtr.; prereq., 111.

211s—Advanced Circuit Analysis. Circuit analysis using Heaviside's *Operational Calculus*. 2 cred.; open to grad.; prereq., M.&M. 151. Mr. Hartig.

291f-292w-293s—Graduate Seminar. Discussion problems and results of research work. 1 cred. per qtr.; prereq., 126. (Not offered in 1930-31.)

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, Becklund, Guthrie, Haga, Mahon, and Rusinko.

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| 4f | (1) II TThS; 107E | (10) VIII MWF; 106E |
| | (2) II TThS; 135E | (11) VI MWF; 107E |
| | (3) VII MF, VI Th; 107E | (12) VI MWF; 136E |
| | (4) VII MF, VI Th; 136E | (13) VI MWF; 106E |
| | (5) III WFS; 107E | (14) III TTh, I S; 107E |
| | (6) III WFS; 335EE | (15) III TTh, I S; 135E |
| | (7) III WFS; 320E | (16) III TTh, I S; 7E |
| | (8) VIII MWF; 107E | (17) IV MWF; 107E |
| | (9) VIII MWF; 136E | (18) IV MWF; 104E |
| 4w | (1) IV MWF; 136E | (2) IX MWF; 107E |
| 5w | (1) II TThS; 107E | (9) VII T, III ThS; 107E |
| | (2) II TThS; 135E | (10) VII T, III ThS; 135E |
| | (3) II TThS; 238EE | (11) I TThS; 107E |
| | (4) I MWF; 203E | (12) I TThS; 135E |
| | (5) I MWF; 135E | (13) III MWF; 107E |
| | (6) I MWF; 215E | (14) III MWF; 104E |
| | (7) IV MWF; 107E | (15) VI MWF; 107E |
| | (8) IV MWF; 135E | (16) VI MWF; 205E |
| 5s | (1) VIII M, III ThS; 206E | (2) IV MWF; 215E |
| 6s | (1) II TThS; 107E | (8) IV MWF; 107E |
| | (2) II TThS; 135E | (9) IV MWF; 135E |
| | (3) II TThS; 21E | (10) VI MThF; 107E |
| | (4) III TS, II W; 107E | (11) VI MThF; 135E |
| | (5) III TS, II W; 135E | (12) VI MThF; 205E |
| | (6) I MWF; 107E | (13) I TThS; 107E |
| | (7) I MWF; 203E | (14) I TThS; 203E |

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.; IV MWF; (w) 138EE, (s) 21E. Mr. Richardson.

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. 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. Zelner.

11f I T; N M Aud first six weeks, then 100C
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 I MWF; 36EE
81w IV 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; 139EE.

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; 139EE.

112f-113w-114s—Rates for Public Utility Properties. Determination of the rate base and depreciation amount for transportation, gas, water, electric power and telephone utilities operating expenses, the rate structure for particular utilities, service and discrimination. 3 cred. per qtr.; open only to senior and graduate students in engineering. Mr. Bryant.

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; 252ME

## 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. Occurence, 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. (Not offered in 1930-31.)

## GERMAN

24f-25w-26s—Chemical German. Pronunciation, reading, sentence analysis, and translation. 4 cred. per qtr.; no prereq.
(1) IV MTWF; 209½F (2) IV MTWF; 209F

## 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. Messrs. Alderman and Brierley.
Lect. (1) II MW; 102Hr(UF)
Lab. (1) I-II 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., 10 cred. Bot.; 3Hr(UF).

71f—Elementary Landscape Design and Plant Materials. A study of the elementary principles of landscape design; the identification of evergreen and deciduous trees and shrubs and vines, with special emphasis on their fall and winter characters and their uses in landscape design. Lectures, outdoor and indoor laboratories, special field trips. 3 cred.; prereq., Bot. 9; II Th, I-II TS; 107Hr(UF). Mr. Longley.

72s—Woody Plants and Garden Flowers. Deciduous and evergreen trees, shrubs and vines from their winter and spring characters, with special emphasis on their flower characters; herbaceous annuals, biennials, perennials, including bulbs and their uses in landscape planting. Lectures, indoor and outdoor laboratories, with special field trips. 2 cred.; prereq., Bot. 9; IV T, III-IV S; 107Hr(UF). Mr. Longley.

74w—Principles of Landscape Design. The composition of the various elements used in landscape gardening, methods of presentation. Lectures and problems. 3 cred.; prereq., Arch. 21 or Ag.E. 3 and Hort. 71; VIII T, VI-VII TTh; 107Hr(UF). Mr. Longley.

75w—Landscape Problems. Continuation of Course 74. 3 cred.; ar.; 305En(UF). Mr. Longley.

* Given by special arrangement.

76s—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 resorts. 3 cred.; prereq., 71; III T, VI-VII TTh; 107Hr(UF). Mr. Longley.

## MATHEMATICS AND MECHANICS

### MATHEMATICS

Entering freshmen will register for Course 11 if they have had high school higher algebra; otherwise for Course 9. The first three weeks in Course 11 are devoted to a review of high school algebra. All students who are below grade at the end of this review must drop back to Course 9 for the remainder of the quarter regardless of previous credit.

9f,w,s,su—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.

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| 9f | (1) III MTWFS; 3E | (7) IV MTWFS; 3E |
| | (2) III MTWFS; 4E | (8) IV MTWFS; 4E |
| | (3) V MTWFS; 3E | (9) I MWThFS; 3E |
| | (4) V MTWFS; 4E | (10) VI MTWThF; 104E |
| | (5) II MTWThF; 3E | |
| | (6) VII MTWThF; 3E | |
| 9w | (1) III MWThFS; 3E | (3) V MTWFS; 136E |
| | (2) II MTWThF; 3E | |

10f,w,s,su—Solid Geometry. See 10f,w,s,su under Department of Drawing and Descriptive Geometry.

11f,w,s,su—College Algebra. Theory of quadratic equations, interpretation of complex results, graphical representation, indeterminate equations, ratio, proportion, variation, progressions, series, undetermined coefficients, binominal theorem, logarithms, theory of equations, Horner's method. 5 cred.; prereq., higher algebra.

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| 11f | (1) III MTWFS; 21E | (7) VII MTWThF; 22E |
| | (2) III MTWFS; 22E | (8) IV MTWFS; 21E |
| | (3) V MTWFS; 21E | (9) IV MTWFS; 205E |
| | (4) II MTWThF; 21E | (10) I MWThFS; 104E |
| | (5) II MTWThF; 22E | (11) I MWThFS; 22E |
| | (6) VII MTWThF; 21E | (12) VI MTWThF; 4E |
| 11w | (1) III MWThFS; 4E | (7) VI MTF, VIII WTh; 3E |
| | (2) III MWThFS; 7E | (8) IV MTWFS; 3E |
| | (3) V MTWFS; 3E | (9) IV MTWFS; 4E |
| | (4) V MTWFS; 4E | (10) I MTWThF; 3E |
| | (5) II MTWThF; 4E | (11) I MTWThF; 4E |
| | (6) II MTWThF; 215E | (12) VII MTWF, VI Th; 3E |
| 11s | (1) III MWThFS; 3E | (4) VII MWThF, VI T; 3E |
| | (2) V MTWFS; 3E | (5) IV TWFS, VI Th; 3E |
| | (3) II MTWThF; 3E | |

12f,w,s,su—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

12w (1) III MWThFS; 22E
(2) V MTWFS; 21E
(3) II MTWThF; 22E
(4) VI MTF, VIII WTh; 4E
(5) IV MTWFS; 21E
(6) I MTWThF; 21E
(7) I MTWThF; 22E
(8) VII MTWF, VI Th; 4E
(9) VII MTWF, VI Th; 22E

12s (1) III MWThFS; 4E
(2) V MTWFS; 4E
(3) II MTWThF; 215E
(4) VII MWThF, VI T; 205E
(5) IV TWFS; VI Th; 4E
(6) I MTWThF; 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
(2) VIII MTWThF; 205E
(3) III MTWThF; 104E
(4) III MTWThF; 136E
(5) V MTWFS; 106E

13w (1) II MTWThF; 136E
(2) VI MTWThF; 136E

13s (1) III MWThFS; 5E
(2) V MTWFS; 106E
(3) II MTWThF; 22E
(4) VII MWThF, VI T; 22E
(5) IV TWFS, VI Th; 22E
(6) I MTWThF; 22E

24f,w,s,su—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
(2) IV MTWFS; 106E
(3) I MTWThF; 106E
(4) VI MTWF, II S; 22E
(5) III MTWThF; 106E
(6) VIII MTWThF; 203E
(7) III MTWThF; 215E

24w (1) VI MTWF, II S; 104E
(2) VII MTWThF; 106E
(3) III MTWThF; 106E
(4) IV MTWFS; 104E
(5) 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

25w (1) VI MTWF, II S; 106E
(2) IV MTWFS; 205E
(3) I MTWThF; 106E
(4) VII MTWThF; 136E
(5) III MTWThF; 136E
(6) III MTWThF; 203E

25s (1) VII MWF, VI TTh; 136E
(2) II MTWThF; 203E
(3) III MTWFS; 104E
(4) VIII MWThF, V S; 215E
(5) IV MTWFS; 104E

91f,w*—Calculus (Arch., Pre-bus.). Short course, derivatives, maxima and minima, integration of simple forms, definite integrals, areas. 4 cred.; prereq., 13. Mr. Wilcox.

91f VI MWF, III Th; 3E
91w II MWThF; 36EE

* For permissible substitute, see page 55.

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 1930-31.)

254f-255w-256s—Modern Analysis. Based on Whittaker and Watson's text. 3 cred. per qtr.; prereq., 153. (Not offered in 1930-31.)

261f-262w-263s—Functions of a Complex Variable. Elliptic functions and integrals with applications. 3 cred. per qtr.; prereq., 153. (Not offered in 1930-31.)

264f-265w-266s—Advanced Topics in Functions of Complex Variable. 3 cred. per qtr.; prereq., 263. (Not offered in 1930-31.)

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.

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| 26f | (1) V MTWFS; 215E | (2) II MTWThF; 215E |
| 26w | II MTWThF; 106E | |
| 26s | (1) VII MWF, VI TTh; 104E<br>(2) II MTWThF; 106E<br>(3) III MTWFS; 136E | (4) VIII MWThF, V S; 203E<br>(5) IV MTWFS; 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 or 91. Mr. Doeringsfeld.

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| 84f | II MWF, VI TTh; 7E |
| 84s | III MWFS, I Th; 215E |

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 and Doeringsfeld.

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| 127f | (1) III MTWThF; 104E<br>(2) I MTWThF; 205E | (3) II MTWThF; 203E |
| 127w | (1) II MWThF; 104E, II S; 22E<br>(2) III MTWThF; 205E | (3) IV MTWFS; 106E<br>(4) V MTWFS; 205E |
| 127s | (1) II MTWThF; 136E | (2) III MTWThF; 106E |

161f-162w-163s—Advanced Technical Mechanics. Special problems in the dynamics of machinery; vibration, balancing, whirling shafts, rapidly rotating

* For permissible substitute, see page 55.

disks, dynamical stability, gyroscope. 3 cred. per qtr.; prereq., 127. Mr. Wilcox.

161f IV MWF; 36EE
162w I MWF; 36EE
163s I MWF; 206E

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 1930-31.)

MATERIALS

85f*—Strength of Materials with Laboratory. (Ch.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) I MTWThF; 136E (3) II MTWThF; 203E
(2) III MTWThF; 215E

128s (1) II MTWThF ;110Ex (3) IV MTWFS; 205E
(2) V MTWF, III S; 203E (4) III MTWThF; 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) VI F; 110Ex (2) VI M; 110Ex
Lab. (1) VII-IX F; Ex (3) VII-IX T; Ex
(2) II-IV T; Ex

141w Lect. (1) VI W; 110Ex (2) VI Th; 110Ex
Lab. (1) I-III S; Ex (3) VII-IX T; Ex
(2) VII-IX M; Ex (4) VII-IX F; Ex

141s Lect. (1) VI T; 110Ex (2) VI W; 110Ex
Lab. (1) VI-VIII F; Ex (3) VII-IX W; Ex
(2) VII-IX Th; Ex (4) VII-IX M; 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.

* For permissible substitute, see page 55.

294f-295w-296s—Mathematical Theory of Elasticity. 3 cred. per qtr.; prereq., 128, 153. (Not offered in 1930-31.)

### 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. II MF; 7E
Lab. (1) VI-VII W; Ex (2) I-II Th; 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. Mr. Straub.

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| 129f | (1) II MWFS; 205E<br>(2) III MWThF; 205E | (3) IV MWFS; 209Ex |
| 129w | (1) I MTWF; 205E | (2) IV MWFS; 215E |
| 129s | (1) II MTFS; 206E | (2) IV MTWF; 203E |

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. Mr. Straub.

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| 143f | (1) III-IV S; Ex<br>(2) VI-VII T; Ex | (3) I-II S; Ex |
| 143w | (1) VIII-IX Th; Ex<br>(2) VIII-IX T; Ex | (3) VIII-IX F; Ex |
| 143s | (1) VIII-IX M; Ex<br>(2) VI-VII Th; Ex | (3) I-II Th; Ex<br>(4) VI-VII W; 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.

291f-292w-293s. Hydrodynamics. Prereq., 129, 153; 3 cred. per qtr. Mr. Brooke.

## MECHANICAL ENGINEERING

### MACHINE CONSTRUCTION

1su—Machine Woodworking. Operation and setting up of woodworking machinery; care and manipulation of adjustable parts. Layout and plan of course and equipment for high school or junior college, including problems in cabinet making and wood construction. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Richards.

* For permissible substitute, see page 55.

2su—Bench Work. Bench and vise work in metal chipping, filing, scraping, fitting, polishing, and layout practice; planning of courses of study for school work. 2 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Rogers.

3su—Elementary Machine Shop Practice. Lathe, shaper, planer, and drill press manipulation; the grinding, care, and kinds of cutting tools. Layout of courses and exercises for high school courses. This course can be arranged to include part of 2su. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Rogers.

4su—Wood Turning. Operation and adjustment of the lathe; care and manipulation of wood turning hand tools. Turning between centers, face plate, and check work. Plan and arrangement of projects suitable for a high school course. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Richards.

5su—Wood Finishing. Preparatory treatment of wood surfaces, color mixing, application of oil and acid stains, shellacking, varnishing, enameling, rubbing, and finishing. Polychrome projects, layout, building up of design, application and blending of colors. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Richards.

6su—Pattern Practice. Pattern layout. Partings, draft, shrinkage and finish allowance. Building and assembly of materials, core prints and core boxes, color symbols. The relation of pattern and foundry practice. Industrial problems and methods, lectures and notes. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Richards.

7su—Advanced Machine Shop. Advanced lathe work, milling machine operation. Production work. Gear calculation, and cutting. Precision grinding. Layout of typical course. 2 to 4 cred.; prereq., 3; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Rogers.

11f,w,s,su—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 woodworking tools and machinery. Inspection trips and reports. 2 cred.; no prereq. Mr. Richards.

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| 11f | Lect. | (1) IV S; 154ME | (4) VI Th; 202ME |
| | | (2) IX F; 202ME | (5) III W; 202ME |
| | | (3) VI F; 202ME | (Pre-dent.) IX M; 202ME |
| | Lab. | (1) VII-IX T, V-VI M | (4) V-VI T, II-IV F |
| | | (2) I-III Th, VII-VIII F | (5) I-III M, I-II W |
| | | (3) V-VI W, I-III S | (Pre-dent.) VII-VIII M, VII-IX W |
| 11w | Lect. | (1) VI S; 202ME | (4) IX F; 202ME |
| | | (2) IX T; 202ME | (5) III M; 202ME |
| | | (3) VI Th; 202ME | (Pre-dent.) IX M; 202ME |
| | Lab. | (1) V-VI M, VI-VIII F | (4) V-VI W, I-III F |
| | | (2) VII-VIII T, I-III Th | (5) I-II M, I-III W |
| | | (3) V-VI T, I-III S | (Pre-dent.) VII-VIII M, VII-IX W |
| 11s | Lect. | (1) IV S; 202ME | (4) IV M; 202ME |
| | | (2) IX W; 202ME | (5) III W; 202ME |
| | | (3) III S; 202ME | (Pre-dent.) IX M; 202ME |
| | Lab. | (1) VII-IX T, V-VI F | (4) I-III M, IV-V W |
| | | (2) VII-VIII W, I-III Th | (5) I-II W, I-III F |
| | | (3) III-V T, I-II S | (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.

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| 12f | Lect. | (1) IV S; 153ME | (5) I M; 153ME |
| | | (2) I Th; 153ME | (Chem.) II T; 153ME |
| | | (3) VI F; 153ME | (Pre-dent.) IX W; 153ME |
| | | (4) VI Th; 153ME | |
| | Lab. | (1) VII-IX T, V-VI M | (5) II-III M, I-III W |
| | | (2) II-III Th, VII-IX F | (Chem.) III-IV T, VII-IX Th |
| | | (3) V-VI W, I-III S | (Pre-dent.) VII-IX M, VII-VIII W |
| | | (4) V-VI T, II-IV F | |
| 12w | Lect. | (1) IV S; 153ME | (5) III M; 153ME |
| | | (2) IX T; 153ME | (Chem.) III T; 153ME |
| | | (3) VI Th; 153ME | (Pre-dent.) IX M; 153ME |
| | | (4) IX F; 153ME | |
| | Lab. | (1) V-VI M, VI-VIII F | (5) I-II M, I-III W |
| | | (2) VII-VIII T, I-III Th | (Chem.) I-II T, VII-IX Th |
| | | (3) V-VI T, I-III S | (Pre-dent.) VII-VIII M, VII-IX W |
| | | (4) V-VI W, I-III F | |
| 12s | Lect. | (1) IV S; 153ME | (5) III W; 153ME |
| | | (2) IX W; 153ME | (Chem.) IX Th; 153ME |
| | | (3) III S; 153ME | (Pre-dent.) IX M; 153ME |
| | | (4) IV M; 153ME | |
| | Lab. | (1) VII-IX T, V-VI F | (5) I-II W, I-III F |
| | | (2) VII-VIII W, I-III Th | (Chem.) I-II T, VI-VIII Th |
| | | (3) III-V T, I-II S | (Pre-dent.) VII-VIII M, VII-IX F |
| | | (4) I-III M, IV-V W | |

13f,w,s—Forge Practice. Lectures and discussions on modern forge and drop forge practices, industrial welding methods, steels and their treatment. Practice in welding, hardening, tempering, and die forging. Plants inspection and reports. 2 cred.; no prereq. Mr. Hughes.

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| 13f | Lect. | (1) III Th; 153ME | (5) I W; 153ME |
| | | (2) IX F; 153ME | (Chem.) IX Th; 153ME |
| | | (3) V F; 153ME | (Pre-dent.) IX M; 153ME |
| | | (4) III T; 153ME | |
| | Lab. | (1) VII-IX T, V-VI M | (5) I-III M, II-III W |
| | | (2) I-III Th, VII-VIII F | (Chem.) II-IV T, VII-VIII Th |
| | | (3) V-VI W, I-III S | (Pre-dent.) VII-VIII M, VII-IX W |
| | | (4) V-VI T, II-IV F | |
| 13w | Lect. | (1) VI Th; 153ME | (5) III W; 153ME |
| | | (2) III Th; 153ME | (Chem.) IX Th; 153ME |
| | | (3) I T; 153ME | (Pre-dent.) IX W; 153E |
| | | (4) IV F; 153ME | |
| | Lab. | (1) V-VI M, VI-VIII F | (5) I-III M, I-II W |
| | | (2) VII-IX T, I-II Th | (Chem.) I-III T, VII-VIII Th |
| | | (3) V-VI T, I-III S | (Pre-dent.) VII-IX M, VII-VIII W |
| | | (4) V-VI W, I-III F | |
| 13s | Lect. | (1) VI W; 153ME | (5) III F; 153ME |
| | | (2) III Th; 153ME | (Chem.) VI Th; 153ME |
| | | (3) I S; 153ME | (Pre-dent.) IX F; 153ME |
| | | (4) I M; 153ME | |
| | Lab. | (1) VII-IX T, V-VI F | (5) I-III W, I-II F |
| | | (2) VII-IX W, I-II Th | (Chem.) I-II T, VII-IX Th |
| | | (3) III-V T, II-III S | (Pre-dent.) VII-IX M, VII-VIII 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.

(1) IV-V T, I-IV W, III-IV S
(2) VI-IX MW
(3) VI-IX TF
(4) I-IV MF

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.

(1) I-IV TW
(2) VI-IX WF
(3) VI-IX M, VIII-IX Th, I-II S
(4) I-IV MF

16f,su*—Machine Shop Practice. Elementary course in machine work arranged especially for students in electrical engineering. 2 cred.; prereq., 11, 12, 13. Mr. Rogers.

(1) VI-IX M, V-VI T
(2) I-III MF
(3) VII-IX WF
(4) VII-IX T, II-IV S

17f,w,s,su*—Machine Shop Practice. (Chem., chem. engr., and pre-bus.) 2 cred.; no prereq. Mr. Rogers.

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| 17f | Lect. VII Th; 202ME | Lab. II-IV T, VIII-IX Th |
| 17w | Lect. III T; 202ME | Lab. I-II T, VII-IX Th |
| 17s | Lect. IV S; 252ME | Lab. VII-IX W, VI-VII 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.

20su—Furniture Making. Details of designs and construction. Doweling, mortise, and tenon work. Bending and setting of shapers. Value and materials used in built-up work. Laying of veneers. Layout of a course in high school furniture making. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. 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.

114su—General Metal Work. Special arrangements for individual needs. Care and use of metal working tools. Arrangements may be made for precision grinding, gear cutting, tool making, heat treatment, and acetylene welding. Planning equipment and projects for a high school course. 2 to 4 cred.; no prereq.; ar. Mr. Rogers.

## MACHINE DESIGN

20s—Kinematics. Instant centers, centroids, point paths, gear tooth profiles, cam construction, velocity diagrams. Lectures and drafting. 2 cred.; prereq., Dr. 3. Mr. Martenis.

(1) II-III Th, VIII-IX F, I-II S; 255ME
(2) I-III T, VI-VIII Th; 255ME
(3) VI-IX W, VI-VII F; 255ME

* For permissible substitute, see page 55.

21f—Elementary Machine Design. Screws, rivets, machine keys, cottered joints and connections, hubs and rims of rotating parts. Factors of safety, drawing room systems and conventions. Lectures and drafting. 2 cred.; prereq., 20. Mr. Martenis.

(1) VII-IX W, II-IV S; 151ME (2) VI-VIII TF; 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., 20 and M.&M. 24. Mr. Martenis.

(1) I TThS; 252ME (2) III MWF; 252ME

23w—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) II MW; 254ME (2) I TTh; 254ME
Lab. (1) II-IV T, VII-IX W; 255ME (2) VI-VII Th, I-III S; 255ME

24s—Machine Design. Design of machines and hoisting equipment with reference to complex stresses. Lectures and recitations. 3 cred.; prereq., M.&M. 128. Mr. Flodin.

(1) III MWF; 252ME (2) II WThS; 252ME

26w—Mechanism and Kinematics. (E.E., Aero.E., and Ag.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., M.&M. 24. Mr. Martenis.

(1) IV TS, VI Th; 252ME (4) II MWF; 252ME
(2) I TThS; 252ME (5) IV MWF; 252ME
(3) III TThS; 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., 26. Mr. Martenis.

Lect. (1) I T; 254ME (2) VI M; 254ME
Lab. (1) VI-VIII T, I-III S; 255ME (2) VI-VIII ThF; 255ME

28s—Machine Design. (Chem.E.) Screw fastenings, riveted joints, belting, shafting, bearings, machine frames, pulleys, etc. Lectures, drafting, and problems. 3 cred.; prereq., M.&M. 84.

Lect. I S; 254ME
Lab. (1) VI-VIII WF; 151ME (2) VI-VIII M, II-IV S; 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; 255ME
123s VII-IX MW; 255ME

## 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) IV MWF; 154ME (3) III MWF; 154ME
(2) II MWF; 154ME (4) III TThS; 154ME

31w-32s—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. per qtr.; prereq., 30. Mr. DuPriest.

31w (1) III WF, VI-VIII F; 154ME (3) III TTh, VI-VIII M; 154ME
(2) II WF, VI-VIII Th; 154ME (4) I TTh, VI-VIII T; 154ME

32s (1) III T, II Th, VI-VIII Th; 154ME (3) II MW, VI-VIII F; 154ME
(2) III MW, VI-VIII W; 154ME (4) III ThS, VI-VIII T; 154ME

33f—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-VII T, VI-IX F; Ex (4) VI-IX M, VI-VII W; Ex
(2) VI-IX Th, I-II S; Ex (5) VI-VII M, VI-IX W; Ex
(3) VI-VII Th, I-IV S; Ex (6) VI-IX T, VI-VII Th; Ex

34w—Mechanical Laboratory. Calibration of tachometers, pyrometers, steam flowmeters. Valve setting. Flow of steam through orifices. Test of steam trap, surface condenser, simple steam engine. Inspection trip. 2 cred.; prereq., 33. Mr. Larson.

(1) VI-IX M, II-III Th; Ex (3) VI-IX W, I-II S; Ex
(2) I-II M, VI-IX F; Ex (4) VI-VII W, I-IV S; Ex

35s—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., 34. Mr. Larson.

(1) VI-IX W, VI-VII F; Ex (3) VI-IX M, VI-VII T; Ex
(2) VI-VII W, VI-IX F; Ex (4) VI-VII M, VI-IX T; Ex

36f—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., Phys. 23; VI-IX Th. Mr. Shoop.

38w-39s—Heat Engines. (Chem. E.) 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 38w; 3 cred. for 39s; prereq., Phys. 23. Mr. Nielsen.

38w Rec. IV MWF; 215Ex
Lab. (1) II-V T; Ex (2) VI-IX F; Ex

39s Rec. IV WF; 215Ex
Lab. (1) VI-IX M; Ex (2) VI-IX F; Ex

135f—Design of Steam Machinery. Piping systems, boiler and engine details, settings, valve gears, governors, turning moment diagrams, flywheel weights, etc. 2 cred.; prereq., 32; VII-IX MTh; 255ME. Mr. Shoop.

136w—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.

137s—Design of Power Plant Units. Treatment of condensers, air pumps, cooling towers, stage evaporators, reheaters, etc. 2 cred.; prereq., 136; II-IV TF; 255ME. Mr. Shoop.

138f-139w—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 TTh; 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) (f) VI-VIII Th; Ex (4) VI-VIII M; Ex
(2) (w) I-III S; 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
Lab. (1) VI-IX W; Ex (2) I-IV S; Ex
140w,s Rec. I TThS; 209Ex Lab. VI-IX W; Ex

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., 32; IV 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., 30; IV MWF; 254ME. Mr. Shoop.

145w—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 MThF; 209Ex. 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., 30; IV MWF; 209Ex. 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., 36; 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., 32. Mr. Shoop.

(1) I-IV, VI-VII T; Ex (2) III-IV, VI-IX T; Ex

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., 32. 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., 137. 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.; open to sophomores. Mr. Robertson.

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| 50f | (1) III TThS; 209Ex (M.E. only)<br>(2) IV TW, VI Th; 110Ex (M.E. only) | (3) I MWF; 110Ex |
| 50w | (1) I TThS; 110Ex (M.E. only) | (2) IV MWF; 110Ex |
| 50s | (1) I MWF; 110Ex | (2) IV MWF; 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 MThF; 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—Aero 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., 139. Mr. Robertson.

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| Rec. | (1) II TTh; 215Ex<br>(2) II WF; 215Ex | (3) III WF; 110Ex<br>(4) III WF; 215Ex |
| Lab. | (1) VI-VIII F; Ex<br>(2) VI-VIII M; Ex | (3) I-III S; Ex<br>(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 VII-IX W, I-III S; 251ME
156w-157w,s-158s II-IV 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. Mr. Robertson.

(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. Rowley.

Lect. III ThS; 215Ex
Rec. (1) II W; 209Ex (2) II M; 209Ex

163f—Heating and Ventilation. (Arch. E.) 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; 252ME; VI-IX W; 255ME. Mr. Rowley.

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. Rowley.

165f,w—Advanced Heating and Ventilation. Special selected problems. 3 cred.; prereq., 63; I MWF; 252ME. Mr. Rowley.

166s—Compressed Air and Refrigerator Machinery. (a) Air compressors and motors; power transmission by compressed air. (b) Principles of refrigera-

tion. 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; 202ME. Mr. Nielsen.

167w—Advanced Heating and Ventilation. 3 cred.; prereq., 165; IV MWF; 154ME. Mr. Rowley.

265f,w,s—Advanced Heating and Ventilation. Taken in connection with research work in the laboratory. Credits to be arranged; prereq., 63; open to grad. only. Mr. Rowley.

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; 202ME. 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. Mr. Koepke.

(1) III MWF; 254ME (2) IV MWF; 202ME

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; I MWF; 154ME. 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,w VII-IX MTh; 151ME
185s II-IV TF; 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,w VII-IX MTh; 151ME
186s II-IV TF; 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. Locomotive 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.

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| 190f | (1) IV S; 254ME | (2) IV S; 110Ex |
| 191w | (1) IV S; 154ME | (2) IV S; 209Ex |
| 192s | (1) IV S; 154ME | (2) IV S; 254ME |

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, Rowley, 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. E.E. 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

152f—Metallography for Aeronautical Engineers. Principles; metallography of iron and steel with special references to alloy steels, and light alloys used in airplane construction. Laboratory work and demonstrations. 3 cred.; prereq., sr. Aero.E. Messrs. Dowdell and Jerabek.

Lect. I TS; 315M Lab. VII-IX 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. M.E. Messrs. Dowdell and Jerabek.

Lect. III ThS; 315M
Lab. (1) VII-IX W; 307M (2) VII-IX F; 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. Mr. Jerabek.

Lect. III ThS; 315M
Lab. (1) VII-IX W; 307M (2) VII-IX F; 307M

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.

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.

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.
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.

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.

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.

201f-202w-203s—Advanced Metallography for Graduate Students. Intended primarily for research work.

## 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., 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., 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., 3; I F, III TThS; 108M. Mr. Pease.

107w—Metallurgy of the Base Metals. 4 cred.; prereq., 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., 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; 108M. 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; 108M. Messrs. Christianson and Pease.

## 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. Students registered in Electrical Engineering are assigned to the Signal Corps, all others are assigned to the Coast Artillery. 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 (Anti-aircraft) Artillery, and Signal Corps. The Signal Corps is open to Electrical Engineers only.

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. The National Defense Act and the R.O.T.C., military courtesy and discipline, military hygiene and first aid, radio code, drill and command. No cred.; no prereq.

| | | |
|---|---|---|
| 1f | (1) I MWF; A | (2) IX MWF; A |
| 2w | (1) I MWF; 305EE<br>(2) VII MWF; 335EE | (3) IX MWF; 335EE |
| 3s | (1) VII-IX T; A | (2) VII-IX W; A |

4f-5w-6s—Second Year Basic Course, R.O.T.C.

Infantry. Practical instruction in school of the platoon and company; com-

mand 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. Drill and command, radio code and radio procedure, Signal Corps tactics, crytography, message centers, army organization, pistol and personal equipment. No cred.; no prereq.

| | | |
|---|---|---|
| 4f-5w | Coast Artillery | |
| | (1) I TThS; A | (2) II TThS; A |
| | Signal Corps | |
| | (1) III MWF; 321EE | (3) IX MWF; 321EE |
| | (2) VII MWF; 321EE | |
| 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. Map reading and sketching, Signal Corps tactics, drill and command, communication engineering. 3 cred. per qtr.; prereq., 4-5-6.

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|---|---|---|
| 51f-52w | Coast Artillery. Major Shippam. | |
| | Rec. (1) IV MWF; A | (2) II MWF; A |
| | Lab. (1) VIII-IX W; A | (2) VIII-IX M; 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 | IV W, VI MF, I-II T; 321EE | |
| 52w | VI MWF, I-II T; 321EE | |
| 53s | VII-IX T, VII-VIII W; 138EE | |

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, 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. Military history and policy, administration and supply, military law, field engineering, drill and command, communication engineering (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 | |
| | II WF; 321EE | |
| 56s | II W; 321EE, VII-IX T; A | |

## 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, Penwell, Piper, and McKusick.

(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

Note.—Sections limited to 60 men.

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 instructor's permission. Mr. Keller.

Lect. IV T; A Lab. Ar

10f-11w-12s—Minor Sports. Study of nature and function of play; use of leisure time; rules, theory, technique, and values of different sports. Fall: advanced swimming, indoor baseball. Winter: winter sports, wrestling, squash racquets. Spring: soccer, golf, handball. Lecture one hour, practice three hours. 2 cred. per qtr.; prereq., 1-2-3 or permission. Mr. Keller.

Lect. IV S; A Lab. IV MWF; A

16f-17w-18s—Drill Substitution. By petition in substitution for military science. Examiner, Dr. L. J. Cooke. No cred.; no prereq.

(1) II MWF; A
(2) III MWF; A
(3) IV MWF; A

30s—Athletic Training and First Aid. Principles governing conditioning of men for various sports; diet, sleep, exercise, bathing, massage. Overtraining; its cause, diagnosis, prevention, and cure. Prevention and first aid treatment of common athletic injuries. 2 cred.; no prereq.; I MWF; A. Dr. Cooke.

## PHYSICAL EDUCATION FOR WOMEN

This department aims to promote the physical efficiency of the women students. It gives physical examination 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 neuro-muscular activity leading toward organic strength, nervous stability, conscious motor control, correct bodily mechanics, skill in handling the body in physical recreation, and the development of that valuable social quality known as good sportsmanship; cooperates 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.

* Course 1-2-3 carries a total of three credits. The entire course must be completed before credit is received for any quarter.

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.

† Course 1 may be offered as a substitute for Preventive Medicine 12s.

Work in this department is required of all newly entering students (see Courses 1-2-3) and of all sophomores, who are permitted as free a choice among the sophomore courses as their physical condition permits (see "sophomore" courses; students who cannot swim must register for Course 22-23 during sophomore years). Physical examination or consultations are required annually of all students.

Women students in the College of Engineering and Architecture and the School of Chemistry take physical education instead of military science and tactics in the freshman and sophomore years and without numerical credit.

STATEMENT OF FEES

Elementary physical training $2.50 a quarter. All other exercise courses, including swimming, $2 a quarter. Maximum fee paid by a student in physical education, $3.50 a quarter.

1f-2w-3s—Freshman Physical Education. Apparatus and floor work, hygiene, orthopedic exercise, folk dancing, sports. Individual health consultations. ½ cred. per qtr.; no prereq. Required of all new students.

| | | | |
|---|---|---|---|
| 1f | Lect. | (1) I W; 201WGm | (5) IV M; 201WGm |
| | | (2) II T; 201WGm | (6) IV T; 201WGm |
| | | (3) II Th; 201WGm | (7) VI W; 201WGm |
| | | (4) III Th; 201WGm | (8) VI Th; 201WGm |
| | Lab. | (1) II MWF; 3,151,153WGm | (4) IV MWF; 3,151,153WGm |
| | | (2) III MWF; 3,151,153WGm | (5) VI MWF; 3,151,153WGm |
| | | (3) III TThS; 3,151,153WGm | (6) VIII MWF; 3,151,153WGm |
| 2w | Lab. | (1) II MWF; 3,151,153WGm | (4) IV MWF; 3,151,153WGm |
| | | (2) III MWF; 3,151,153WGm | (5) VI MWF; 3,151,153WGm |
| | | (3) III TThS; 3,151,153WGm | (6) VIII MWF; 3,151,153WGm |
| 3s | Lab. | (1) II MWF; 3,151,153WGm | (4) IV MWF; 3,151,153WGm |
| | | (2) III MWF; 3,151,153WGm | (5) VI MWF; 3,151,153WGm |
| | | (3) III TThS; 3,151,153WGm | (6) VIII MWF; 3,151,153WGm |

4s—Preliminary Hygiene. For nurses and transfer students. No cred.; no prereq.; II T; 206OLa.

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. Dr. Tolg.

| | | |
|---|---|---|
| 10f-11w | (1) II MW; 3WGm | (3) VI TTh; 3WGm |
| | (2) IV TS; 3WGm | |
| 12s | IV TS; 3WGm | |

13f-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

† The winter quarter is not open to students who have not completed Phys. Ed. 22.

‡ Students may enter course any quarter.

* The spring quarter is not open to students who have not had either fall or winter quarter course.

rhythmic movements prompted by the imagination. No cred.; prereq., 1-2-3. Miss Timberman.

13f (1) VI TTh; 151WGm (2) II TTh; 151WGm
14w VI TTh; 151WGm
14s II TTh; 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 Dickson.

18s—Tennis. No cred.; prereq., 1-2-3.

(1) I TTh; 151WGm (4) VII WF; 151WGm
(2) IV TS; 151WGm (5) VIII TTh; 151WGm
(3) VI TTh; 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) V MW; 151WGm (3) VIII TTh; 151WGm
(2) VII WF; 151WGm
20w (1) V MW; 151WGm (3) VII TTh; 151WGm
(2) VII WF; 151WGm (4) VIII TTh; 151WGm
21s (1) V MW; 151WGm (2) VII WF; 151WGm

22f,w,s-23w†—Sophomore Elementary Swimming. 22, elementary; 23, low intermediate. No cred.; prereq., 1-2-3.

22f,s-23w (1) II TTh; 51WGm (5) VII TTh; 51WGm
(2) III MW; 51WGm (6) VIII (3:30) TTh; 51WGm
(3) IV TS; 51WGm (7) VIII (4:00) TTh; 51WGm
(4) IV MW; 51WGm
22f,w,s VII MW; 51WGm

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 Kissock.

27f VI TTh; ar
27s (1) I TTh; ar (2) II 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

† 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.

§ The winter quarter is not open to students who have not had the fall or spring quarters. No student may register for more than two quarters of swimming without permission. Course 22 is never closed to senior registration.

¶ Students must supply their own golf equipment. Golf course at University. Recreation field will be used for 27f. Student tickets 10 for $3.

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) II TTh; ar (2) VII WF; 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, 9, 23, 33, 43. Course 4 should be taken in conjunction with this course. 3 cred.; prereq., M.&M. 12 or equiv. Mr. Erikson.

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|---|---|---|
| 3f | Lect. (1) II MWF; 150Ph | (2) VI MWF; 150Ph |
| | Quiz (1) II Th; 150Ph | (2) IX Th; 150Ph |
| 3w | Lect. VIII 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 | (1) VIII-IX, F; 153Ph | (8) VI-VII, Th; 153Ph |
| | (2) III-IV, T; 153Ph | (9) VI-VII, F; 153Ph |
| | (3) VIII-IX, M; 153Ph | (10) VI-VII, W; 153Ph |
| | (4) I-II, S; 153Ph | (11) VI-VII, M; 153Ph |
| | (5) I-II, W; 153Ph | (12) I-II, F; 153Ph |
| | (6) I-II, T; 153Ph | (13) III-IV, S; 153Ph |
| | (7) I-II, M; 153Ph | |
| 4w,s | (1) VI-VII, T; 153Ph | (3) I-II, Th; 153Ph |
| | (2) VII-IX, T; 153Ph | (4) VIII-IX, Th; 153Ph |

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 T; 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 | (1) VI-VII, M; 244Ph | (3) VI-VII, T; 244Ph |
| | (2) VIII-IX, M; 244Ph | (4) VIII-IX, T; 244Ph |
| 24w | (1) III-IV, W; 244Ph | (8) VIII-IX, F; 244Ph |
| | (2) III-IV, T; 244Ph | (9) VI-VII, F; 244Ph |
| | (3) VIII-IX, M; 244Ph | (10) VI-VII, W; 244Ph |
| | (4) I-II, S; 244Ph | (11) I-II W; 244Ph |
| | (5) I-II M; 244Ph | (12) III-IV F; 244Ph |
| | (6) I-II, T; 244Ph | (13) III-IV S; 244Ph |
| | (7) VI-VII, M; 244Ph | |

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.

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|---|---|---|
| 33f | Lect. (1) I TThS; 133Ph | Quiz IX F; 133Ph |
| | (2) IV MWF; 133Ph | |
| 33w | Lect. I TThS; 133Ph | Quiz VIII Th; 133Ph |
| 33s | Lect. I TThS; 133Ph | Quiz IX F; 133Ph |

‖ Class meetings will be fifty minutes in length, since weather and ice conditions will cause omission at times.

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 T; 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 | (1) VI-VII, T; 231Ph | (3) VI-VII, W; 231Ph |
| | (2) VIII-IX, T; 231Ph | |
| 44s | (1) VIII-IX F; 231Ph | (8) III-IV S; 231Ph |
| | (2) III-IV T; 231Ph | (9) I-II S; 231Ph |
| | (3) VI-VII F; 231Ph | (10) II-III Th; 231Ph |
| | (4) III-IV M; 231Ph | (11) VIII-IX Th; 231Ph |
| | (5) I-II W; 231Ph | (12) VI-VII W; 231Ph |
| | (6) VIII-IX M; 231Ph | (13) VI-VII Th; 231Ph |
| | (7) I-II M; 231Ph | |

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. II Th; 166Ph | | Quiz V M; 166Ph |
| Lab. | (1) VI-VII TTh; 231Ph | (4) VI-VII W, I-II S; 231Ph |
| | (2) VIII-IX T, III-IV S; 231Ph | (5) VIII-IX M, VI-VII F; 231Ph |
| | (3) III-IV T, VIII-IX Th; 231Ph | |

For other electives in the Department of Physics see the bulletin of the College of Science, Literature, and the Arts.

## PHYSIOLOGIC CHEMISTRY

100w,su—Physiologic Chemistry. Metabolism of proteins, fats, carbohydrates in health and disease. 5 cred.; prereq., physics and Organic Chemistry 53. Messrs. McClendon, Hemmingway, and Cavett.

Lect. IV MWF; 214MH

Lab. (a) I-III TTh; 310MH (c) VI-VIII TTh; 310MH

(b) I-III FS; 310MH

101s,su—Physiologic Chemistry. Application of physical chemistry to physiology. 5 cred.; prereq., Physiology 100 and physical chemistry. IV MWF; 214MH. Mr. McClendon.

## PREVENTIVE MEDICINE AND PUBLIC HEALTH

3f,w,s—Personal Hygiene and Elementary Sanitation. 2 cred.; no prereq. Dr. Lees.

(1) IV TS (2) IX TTh

12s—Hygiene and First Aid. Required of all male freshmen in Engineering Architecture, and Chemistry. 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. 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. Dr. Diehl.

73w—Occupational Hygiene and Disease. 2 cred.; prereq., 53; IV MW. Dr. Meyers.

NOTE.—Classroom schedule for courses in Preventive Medicine and Public Health will be posted on bulletin board in Millard Hall and published in the *Minnesota Daily* at the beginning of each quarter.

## RHETORIC

### (College of Agriculture)

22f,w,s—Public Speaking. Practical course in fundamentals of speech making. 3 cred.; prereq., 6. Mr. Routledge.

22f,s III MWF; 311En(UF)
22w (1) I MWF; 311En(UF) (2) II MWF; 311En(UF)

23f,w,s—Public Speaking. 5 cred.; prereq., 6; 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.; no prereq. 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 mechanical composition, moisture equivalent, and hygroscopic coefficient. (Given only in alternate years. Not offered in 1930-31.) 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; 237EE. 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 1930 - 1932*

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# CURRICULA

# THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

## FACULTY

### ADMINISTRATION

Lotus Delta Coffman, Ph.D., LL.D., President
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.; Assistant Professors Cornelia Kennedy, Ph.D., W. Martin Sandstrom, Ph.D.; Instructors Ivan D. Jones, B.A., Charles F. Rogers, M.S.

### AGRICULTURAL EDUCATION

Professors Ashley V. Storm, Ph.D., Frank W. Peck, M.S.; Associate Professor Albert M. Field, Ph.D.; Instructor Victor E. Nylin, M.S.

### AGRICULTURAL ENGINEERING

Professors William Boss, Harry B. Roe, B.S. in Eng.; Associate Professor Mark J. Thompson, M.S.; Assistant Professors Julius Romness, M.S., Arthur J. Schwantes, B.S., James B. Torrance, B.S. in Agr., Arthur G. Tyler, Hall B. White, M.S.; Instructors Chester L. Berggren, B.S., Josephine Brudwick, B.S., J. Grant Dent, Jesse H. Neal, M.S., Loren W. Neubauer, B.S. in C.E., Lawrence H. Schoenleber, M.S. in Ag. En.

### AGRONOMY AND PLANT GENETICS

Professor Herbert K. Hayes, D.Sc.; Associate Professor Albert C. Arny, M.S.; Assistant Professors Harvey E. Brewbaker, Ph.D., Frederick J. Stevenson, Ph.D., Extension Specialist Ralph F. Crim, B.S. in Agr.

### ANIMAL HUSBANDRY

Professors Walter H. Peters, M.Agr., Evan F. Ferrin, M.Agr.; Associate Professor Laurence M. Winters, M.S.; Assistant Professors Philip A. Anderson, B.S. in Agr., Alfred L. Harvey, M.S.; Extension Specialists William E. Morris, B.S.A., Henry G. Zavoral, B.S.A.

### DAIRY HUSBANDRY

Professors Clarence H. Eckles, D.Sc., Willis B. Combs, M.S.; Professor Emeritus Theophilus L. Haecker; Associate Professors Harold Macy, Ph.D., William E. Petersen, Ph.D.; Assistant Professor Thor W. Gullickson, M.S.; Instructors Nat N. Allen, B.S., Henry B. Morrison, B.S.; Assistants Elmer F. Hubbard, B.S., Addison Miller, B.S.; Extension Specialists Charles C. Geddes, Edwin A. Hanson, B.S. in Agr., Ramer Leighton, 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., Maurice C. Tanquary, Ph.D.; Assistant Professors Maynard S. Johnson, Ph.D., Clarence E. Mickel, Ph.D., August L. Strand, Ph.D., Ralph W. Dawson, Ph.D.; Instructor Harvey G. Ahrens, M.S.

### FARM MANAGEMENT AND AGRICULTURAL ECONOMICS

Professors Oscar B. Jesness, Ph.D., Andrew Boss, D.Sc., Warren C. Waite. Ph.D.; Associate Professors Edwin C. Johnson, Ph.D., George A. Pond. Ph.D.; Assistant Professors Rex W. Cox, M.S., Lewis F. Garey, M.S.. Dorothea D. Kittredge, M.A.; Instructors George B Clarke, M.S., Percy M. Lowe, M.A., Lloyd L. Ullyot, B.S.; Extension Specialists William L. Cavert, Ph.D., Raymond L. Donovan, B.S., Daniel C. Dvoracek, B.S.

### FORESTRY

Professors Henry Schmitz, Ph.D., John H. Allison, Ph.B., .F., Edward G. Cheyney, B.A., Raphael Zon, B.A., B.S., F.E.; Assistant Professors Randolph M. Brown, M.F., Thorwald S. Hansen, B.S., M.F., Louis W. Rees, Ph.D.

### HOME ECONOMICS

Professor Wylle B. McNeal, M.A.; Associate Professors Alice Biester. M.A., Alice M. Child, M.A., Harriet I. Goldstein, Jane Leichsenring, Ph.D., Marion Weller, B.A.; Assistant Professors nces Dunning, M.S., Mildred King, M.A., Amy P. Morse, B.A., Ethel L. Phelps. Ph.D., Lucy A. Studley, M.A.; Instructors Carlotta M Brown, Anna Gertrude Dinsmore, M.A., Sparkle V. Furnas, B.S., Vetta Goldstein. Ethel R. Gorham, M.A., Myrna Hovlid, B.S., Hope H. Hunt, M.S., Caroline Little, M.A., Kathryn B. Niles, B.S., Ruth F Segolson, B.S. I. Irene Sell, M.S., Ph.B., Helen J. Topp, B.S.

### HOME ECONOMICS EDUCATION

Professor Wylle B. McNeal, M.A.; Associate Professors Clara . Brown. M.A., Harriet I. Goldstein; Assistant Professor Ella J. Ro. M.S

### HORTICULTURE

Professor William H. Alderman, B.S.; Associate Professor Wilfred G. Brierley, Ph.D.; Assistant Professors Troy M. Currence Ph.D., Fred A. Krantz, Ph.D., Lewis E. Longley, M.S., Arthur N. W Ph.D.; Instructors Ernest Angelo, M.S., Arthur E. Hutchins, B.S.; Assistant Louis Sando; Extension Specialist Roger S. Mackintosh, M.S.

### MILITARY SCIENCE AND TACTICS

Professor John H. Hester, Major, Infantry; Assistant Professors William G. Guthrie, Major, Medical Corps, Willis Shippam, Major Coast Artillery, William C. Webb, Jr., Major, Dental Corps, Gray T Davenport, Captain, Infantry, William A. Ellis, Captain, Infantry. Emil Krause, Captain, Infantry, William G. Walker, Captain, Infantry. Porter P. Wiggins, Captain, Infantry, Vincent J. Conrad 1st Lieu

tenant, Infantry, Richard A. Ericson, 1st Lieutenant, Coast Artillery, Harlan N. Hartness, 1st Lieutenant, Infantry, Rex W. Minckler, 1st Lieutenant, Signal Corps, Hewitt W. Richmond, 1st Lieutenant, Coast Artillery; Instructors Alfred Brandt, Master Sergeant, Coast Artillery, Harry E. Strider, Master Sergeant, Signal Corps, Aubrey R. Dunkum, Technical Sergeant, Infantry, John Coop, Sergeant, Infantry, Frank C. Esenther, Sergeant, Infantry, Ernest R. Mylk, Sergeant, Coast Artillery, Clayton A. Peterson, Sergeant, Infantry, Charles G. Sears, Sergeant, Infantry.

### PHYSICAL EDUCATION FOR MEN

Associate Professors Louis J. Cooke, M.D., Louis F. Keller, B.A.

### PHYSICAL EDUCATION FOR WOMEN

Professor J. Anna Norris, M.D.; Assistant Professors May S. Kissock, M.A., Alice J. H. Tolg, M.D.; Instructors Josephine Dickson, B.S., Helen M. Starr, B.S., Alice Timberman, B.S.

### PLANT PATHOLOGY

Professors Edward M. Freeman, Ph.D., Elvin C. Stakman, Ph.D.; Associate Professors Rodney B. Harvey, Ph.D., Julian J. Leach, Ph.D.; Assistant Professors Jonas J. Christensen, Ph.D., Alvin H. Larson, B.S. in Agr., Herman A. Rodenhiser, Ph.D.; Instructors Clyde Christensen, B.S., Louise Dosdall, Ph.D., Irvin L. Forbes, M.S., Frank H. Kaufert, B.S., Arthur F. Verrall, M.S.; Extension Specialist Raymond C. Rose, M.S.

### POULTRY HUSBANDRY

Professor Arthur C. Smith, B.S.; Extension Specialist Cora E. Cooke, B.S.

### PUBLICATIONS AND RURAL JOURNALISM

Professor William P. Kirkwood, M.A.

### RHETORIC

Assistant Professors Robert C. Lansing, M.A., William J. Routledge, B.A.; Instructors Helen Thompson, M.A., Marjorie H. Thurston, 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., D.Sc., Willard L. Boyd, D.V.S.; Associate Professor Howard C. H. Kernkamp, D.V.M.; Assistant Professor Charles R. Donham, M.S., D.V.M.; Instructor Walter L. Nilson, D.V.M.

## MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

### ARCHITECTURE

Assistant Professor Elmer E. Young; Instructor Ivan Doseff, B.S.

ART EDUCATION

Professor Ruth Raymond, M.A.; Assistant Professor Robert S. Hilpert, B.S.; Instructors Cornelia Clousing, B.S., Leah M. Hanley, B.S., Josephine Lutz, B.A.

BACTERIOLOGY AND IMMUNOLOGY

Instructor Charles E. Skinner, Ph.D.

BOTANY

Professors William S. Cooper, Ph.D., C. Otto Rosendahl, Ph.D., Josephine Tilden, M.S.; Associate Professors George O. Burr, Ph.D., Frederic K. Butters, Ph.D.; Assistant Professor Ned L. Huff, M.A.

CHILD WELFARE INSTITUTE

Professor John E. Anderson, Ph.D.; Associate Professors Josephine C. Foster, Ph.D., Florence L. Goodenough, Ph.D., Esther McGinnis, Ph.D.; Assistant Professor Edith Boyd, M.D.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

Assistant Professor Wesley E. Peik, Ph.D.

EDUCATIONAL PSYCHOLOGY

Professor Wilford S. Miller, Ph.D.; Assistant Professor Marvin J. Van Wagenen, Ph.D.

GEOLOGY AND MINERALOGY

Professor William H. Emmons, Ph.D.; Associate Professors John W. Gruner, Ph.D., George A. Thiel, Ph.D.; Instructor Carl Dutton, M.A.

HISTORY AND PHILOSOPHY OF EDUCATION

Associate 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.; Assistant Professors Esther Griesheimer, Ph.D., M.D., Joseph T. King, Ph.D., M.D., Redding Rufe, B.S., M.D.; Instructor Milo M. Loucks, Ph.D.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

Professor Harold S. Diehl, M.A., M.D.; Assistant Professors Ruth E. Boynton, M.S., M.D., Harry D. Lees, M.D.; Instructor Hally J. Fisher, R.N.

PSYCHOLOGY

Professor Richard M. Elliott, Ph.D.

SOCIOLOGY AND SOCIAL WORK

Assistant Professor Gustave A. Lundquist, Ph.D.

ZOOLOGY

Assistant Professors Ralph W. Dawson, Ph.D., Samuel Eddy, Ph.D.

# 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 registrar's office, University Farm, St. Paul.

Admission is either by certificate (in the case of graduates of accredited schools) or by examination.

For details of admission requirements 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. 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 technical 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 or in a well-organized dairy manufacturing plant.

## 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. The amount of additional time required to complete the work 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 quarter 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 a minimum of 90.

The following is a general list of electives applicable in one or more of the specialization fields. These subjects are, of course, not equally applicable in all fields. Sociology, psychology, economics, physics, history, advanced mathematics, technical business, 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 surveying are recommended.

### *Home Economics in Junior Colleges*

In planning the work in the junior college with the idea of transferring to one of the home economics curricula the prospective transfer student should keep these facts in mind.

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.

Credit may be allowed for such courses as listed above and for elective credits not listed.

## 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 the placement test in English. Those failing to pass the test will be required to do extra work in composition until their disability is removed. Students with exceptionally high scores may be exempted from part or all of the courses in freshman rhetoric.

## PLACEMENT TESTS

The college 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 |
| 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 Requirement | Honor Point Requirement | Degree Conferred |
|---|---|---|---|
| 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 | 193 | 193 | 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 two honor points per credit 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 con-

ditions 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.

### TEACHER'S CERTIFICATES

Students expecting to receive certificates to teach 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 a 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 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 32.)

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
2. Agricultural Education[1]
3. Animal Industry
4. Agricultural Sciences and Plant Industry
5. Agricultural Engineering

Several suggested curricula have been arranged which students are advised to follow. These curricula are:

1. General Agriculture
2. Agricultural Education[1]
3. Agricultural Engineering
4. Animal Husbandry
5. Dairy Husbandry
6. Dairy Products
7. Farm Management
8. Fur Farming
9. Horticulture
10. Landscape Gardening

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
2. Agricultural Economics and Farm Management
3. Agronomy
4. Animal Husbandry
5. Dairy Husbandry
6. Entomology and Economic Zoology
7. Horticulture
8. Plant Pathology and Botany
9. Soils
10. Veterinary Medicine

B. Agricultural Science Curriculum. This curriculum provides opportunities for specializing in the following fields of work:

1. Agricultural Biochemistry
2. Agronomy
3. Entomology and Economic Zoology
4. Horticulture
5. Nutrition
6. Plant Breeding
7. Plant Pathology
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
2. Farm Machinery
3. Reclamation

[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 33 to 38.)

The curriculum in Forestry provides an opportunity in the junior and senior years to major in one of the following fields:

1. General Forestry
2. Commercial Lumbering
3. Forest Technology
4. Grazing
5. Forest Sciences

## HOME ECONOMICS

(See pages 39 to 47.)

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
2. Foods and Nutrition
3. Textiles and Clothing
4. Dietitians
5. Institution Management

The following teacher's curricula are also offered jointly with the College of Education:

6. General Home Economics
7. Home Economics Extension
8. Foods and Nutrition
9. Textiles and Clothing
10. Related Art

## 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 48 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

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 26.

### Required Courses

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. Modifications in the requirements 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 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.

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. 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 year 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 Assembly. A course of lectures 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. 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: 5f, Farm Building Construction, 3; 13f,s, Gas Engines, 3; 28w, Land Clearing, 3; 31w,s, Principles of Drainage, 3; 37f,s, 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 substituted 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.

[1]Agron. 1f,w. General Farm Crops, 3

[1,4]An. Husb. 10f,w-11w,s, 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.

[1,4]Dy. Husb. 1f,s, Elements of Dairying, 5

[1]Hort. 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.

[2]Rhet. 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.

[3]Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10 (Inorg. Chem. 10 cred.)

Agr. Econ. 1f,w, Principles of Economics I, 3

Agr. Econ. 2w,s, Agricultural Economics II, 5 (Agr. Econ. 1)

[1]Agr. 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.)

Zool. 14f-15w-16s, General Zoology, 9

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[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.

[4] Students who expect to major in landscape gardening may substitute for these courses 11 credits in freehand drawing and architectural design with the approval of the chief of the Division of Horticulture.

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)
Soils 4f, Soils 3 (Inorg. Chem. 10 cred.)
Soils 5s, Soil Fertility, 3 (Inorg. Chem. 10 cred.)

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 4 (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. Agricultural Education
3. Animal Industry, including
   Animal Husbandry
   Dairy Husbandry
   Poultry Husbandry
   Veterinary Medicine

4. Agricultural Sciences and Plant Industry, including
   - Agricultural Biochemistry
   - Agronomy and Plant Genetics
   - Entomology and Economic Zoology
   - Horticulture
   - Plant Pathology and Botany
   - Soils
5. Agricultural Engineering

B. Groups from which electives only may be chosen

1. Forestry
2. Home Economics
3. Military Science and Tactics
4. Physical Education
5. Rural Publications and Journalism
6. 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 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. It is included, with only a few substitutions, in the curricula in animal husbandry, dairy husbandry, and in horticulture.

| JUNIOR YEAR | SENIOR YEAR |
|---|---|
| ***Fall Quarter*** | |
| Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8) | Agr. Econ. 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. 6f, Judging Dairy Cattle, 1 (An. Husb. 10-11) |
| Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.) | Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1) |
| An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11) | Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.) |
| Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements) | Soc. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1) |
| Electives, 2 or 5 | |
| ***Winter Quarter*** | |
| Agron. 132w, Farm Crops Plant Breeding, 3 (Agron. 131) | Agr. Econ. 141w,[1] Marketing Organization: Dairy and Poultry Products, 3 (Agr. Econ. 40) |
| An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2) | Agr. Econ. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102) |
| Ent. 3f,w, Economic Entomology, 3 (Zool. 16) | Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3) |
| Electives, 8 | An. Husb. 112w, Animal Breeding, 3 (Agron. 131) |
| | Vet. 9w, Veterinary Studies, 3 (Bact. 41) |
| | Electives, 2 |
| ***Spring Quarter*** | |
| Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2) | Vet. 10s, Veterinary Studies, 3 (Vet. 9) |
| Agr. Eng. 12s, Field Machinery, 3 | Electives, 14 |
| 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 to 3 | |

## 2. Agricultural Education

### PREPARATION FOR TEACHING AGRICULTURE

Students who have completed the required work of the freshman and sophomore years of the College of Agriculture, or equivalent, may prepare to teach agriculture in the public schools by completing the junior and senior years in a combined curriculum of the College of Education and the College of Agriculture.

The agricultural requirements can be fulfilled by the major, minor, and elective plan (Method I) as shown on page 17, or by completing the suggested curriculum below.

The education requirements can be fulfilled by completing satisfactorily 24 quarter credits in Agricultural Education courses some of which are required courses. The courses now required are 11, 42, 181, 182, 183.

[1] Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

It is recommended that electives be chosen from the courses in Agricultural Education or from such of the subject-matter courses as will best complete a well-balanced and well-distributed preparation. In addition to those found in the suggested curriculum below may be mentioned Agr. Eng. 12; Agron. 122, 132; For. 27; Pl. Path. 9; Poult. 1; Pub. and Rur. Journ. 19. Recommended electives in Agr. Ed.: Agr. Ed. 141, 154, 161; Ed. Ad. 65T.

Graduates of the University of Minnesota completing these agriculture and education requirements will be eligible for the Minnesota "high school standard special" certificate for teaching agriculture and the sciences in high schools or elementary schools of this state.

The following curriculum may serve as a guide to students desiring a well-balanced preparation for teaching agriculture and the agricultural sciences, for serving as county agent, or for practical farming.

| JUNIOR YEAR | SENIOR YEAR |
|---|---|
| *Fall Quarter* | |
| Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.) | Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2) |
| An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11) | Agr. Ed. 181f, Teaching Agriculture, 5 (See Part II) |
| Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1) | Agr. Econ. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4) |
| Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements) | Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 10-11) |
| Electives, 3 or 6* | Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.) |
| *Winter Quarter* | |
| Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.) | Agr. Ed. 182w, Teaching Agriculture, 5 (See Part II) |
| An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2) | Agr. Econ. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102) |
| Ent. 3f,w, Economic Entomology, 3 (Zool. 16) | Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.) |
| Vet. 9w, Veterinary Studies, 3 (Bact. 41) | Electives, 6* |
| Electives, 5 | |
| *Spring Quarter* | |
| Agr. Ed. 11f,w,s, Principles of Vocational Education, 3 | Agr. Ed. 42f,w,s, Supervised Teaching Experience, 3 (See Part II) |
| Agr. Eng. 40f,s, Mechanical Training I, 3 | Agr. Ed. 183s, Teaching Agriculture, 5 (See Part II) |
| Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.) | Electives, 9* |
| An. Husb. 8s, Fundamentals of Feeding and Management, 5 | |
| Vet. 10s, Veterinary Studies, 3 (Vet. 9) | |

### 3. 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 28 and 29.

* At least 3 of the elective credits listed in the junior and senior years must be chosen in Agricultural Education.

JUNIOR 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

*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

*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. 37f,s, Rural Sanitation, 3
An. Husb. 8s, Fundamentals of Feeding and Management, 5

SENIOR YEAR

*Fall Quarter*

Agr. Eng. 19f, Elementary Surveying, 3 (Agr. Eng. 3, 11 or equiv.)
Agr. Eng. 24f, Agricultural Physics I, 4 (Agr. Eng. 11, 23 or equiv.)
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 10-11)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
Elective, 1

*Winter Quarter*

Agr. Econ. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Agr. Eng. 25w, Agricultural Physics II, 4 (Agr. Eng. 24)
An. Husb. 112w, Animal Breeding, 3 (Agron. 131)
Sociol. 14f,w, Rural Sociology, 3 (Sociol. 1 or sr. class.)
Electives, 4

*Spring Quarter*

Agr. Econ. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102)
Agr. Econ. 142s, Marketing Organization: Fruits and Vegetables, 3 (Agr. Econ. 40)
Agr. Eng. 14s, Elementary Farm Power, 3 (Agr. Eng. 13)
Electives, 8

## 4. 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

*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

SENIOR YEAR

*Fall Quarter*

Agr. Econ. 40f,s, Principles of Marketing Organizations, 3 (Agr. Econ. 2)
Agr. Econ. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
An. Husb. 7f, Meats, 3 (An. Husb. 2-3)
An. Husb. 101f, Advanced Stock Judging, 3 (An. Husb. 4)
Vet. 6f, Physiology of Reproduction 4 (Vet. 2-3-4)
Elective, 1

*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. 112w, Animal 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. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102)
Agr. Econ. 143,[1] Marketing Organization: Livestock and Meats, 2 (Agr. Econ. 40)
Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
An. Husb. 6w, Livestock Feeding, 5 (Agr. Biochem. 15)
Electives, 4

*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)
Vet. 4s, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 3)
Electives, 5

An. Husb. 102s, Horse Husbandry, 3 (An. Husb. 2-3) or
An. Husb. 103s, Beef Cattle Husbandry, 3 (An. Husb. 2-3) or
An. Husb. 104s, Sheep Husbandry, 3 (An. Husb. 2-3) or
An. Husb. 105s, Swine Husbandry, 3 (An. Husb. 2-3) or
An. Husb. 113s, Livestock Management, 3 (An. Husb. 2-3)
Electives, 14

## 5. 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)
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)
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 10-11)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
Vet. 2f, Comparative Anatomy and Physiology of Domestic Animals, 3

Agr. Econ. 40f, Principles of Marketing, 3 (Agr. Econ. 2)
Agr. Econ. 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*

An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
Dy. Husb. 3w, Dairy Bacteriology, 3 (Bact. 41)
Geol. 8f,w,s, Introductory Geology, 5
Vet. 3w, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 2)
Electives, 2

Agr. Econ. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102)
An. Husb. 112w, Animal 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)
Poult. 1f,w, Poultry, 3

[1] Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

*Spring Quarter*

Agr. Econ. 101s, Farm Management, 3 (Agron. 1, Agr. Econ. 2)
Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)
Dy. Husb. 104s, Dairy Stock Selection, 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. 104s, Types of Farming, 3 (Agr. Econ. 103)
Agr. Eng. 40f,s, Mechanical Training I, 3
Animal Husbandry 105s, Swine Husbandry, 3 (An. Husb. 2-3)
Dy. Husb. 107s, Seminar III, 1 (3 courses in dy. husb.)
Electives, 6

### 6. 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, 40, 102, 103, 131, 140, 141, 142
Agr. Eng. 24, 25, 40, 121
Dy. Husb. 2, 4, 101, 102, 105, 107, 110, 111, 112, 113, 115
The minor may be in Agricultural Economics or Agricultural Biochemistry.

### 7. General Curriculum in Farm Management and Agricultural Economics

Opportunities for majoring in farm management and agricultural economics are offered in various lines. The best selection and sequence of courses depend upon the particular line which the student intends to follow. Students interested in majoring in this field are requested to consult with the division in working out a program of courses suited to their needs.

### 8. Curriculum in Fur Farming

Fur farming has recently developed into an established type of farming industry in Minnesota. The growth has been so rapid that it has not been possible to assemble and classify the experiences of successful and unsuccessful farms or to obtain by careful experimental investigations the same kind of scientific information which long established types of farming, such as dairy husbandry, enjoy. There is, nevertheless, an insistent demand for college training in this field, and within the colleges of the University many courses of study are available which contribute valuable information or basic principles of use to prospective fur farmers.

The Minnesota Agricultural Experiment Station is using every available opportunity to develop experiments and to collect information on this new type of agricultural industry. The following curriculum is offered as the best available at present in the University of Minnesota. While only a limited number of subject-matter courses deal directly with the practical phases of fur farming, all of the suggested courses have at least an indirect bearing on this type of farming. A completely detailed curriculum cannot

be suggested at present and the student must build his course by the open elective method under the guidance of an adviser. The subject-matter courses of the junior-senior years have been carefully selected from all university departments offering information and training applicable or basic to fur farming.

FRESHMAN-SOPHOMORE YEARS

Same as for Technical Agricultural curriculum. Substitutions may be made for one or more of the following courses upon the approval of the adviser: Agron. 1, Hort. 6, An. Husb. 10-11, Dy. Husb. 1.

Major, minor, and elective courses may be selected from the following:

JUNIOR YEAR

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
Agr. Econ. 7s, Natural Resources, 3
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
Ent. 3f,w, Economic Entomology. 3 (Zool. 16)
Ent. 4s, Economic Vertebrate Zoology, 3 (Zool. 14-15)
Ent. 8f, Varieties and Habits of Fur Bearing Animals, 3 (Zool. 9 cred.)
Vet. 2f-3w-4s, Comparative Anatomy and Physiology of Domestic Animals, 9
Vet. 6f, Physiology of Reproduction, 4 (Vet. 2-3-4)
Vet. 12w, Infectious Diseases, 3 (Vet. 2-3-4, Bact 41)
Zool. 24f, Introduction to Animal Parasitology, 5 (Zool. 14-15-16)

SENIOR YEAR

Agr. Biochem. 116w, Advanced Animal Nutrition, 3 (Agr. Biochem. 15, and 111 or physiologic chem.)
Agr. Biochem. 117f,w,s, Laboratory Problems in Animal Nutrition, 3 (Agr. Biochem. 116, instructor's permission)
Agr. Econ. 101s, Farm Management, 3 (Agr. Econ. 2, Agron. 1)
Agr. Econ. 102f,w, Farm Management: Organization, 3 (Agr. Econ. 2, Agron. 1, Soils 4)
An. Husb. 112w, Animal Breeding, 3 (Agron. 131)
Zool. 144f,s-145w-146s, Animal Parasites and Parasitism, 9 (15 cred. in zool. or Zool. 1-2 and 1 yr. chem.)
Special lectures on fur farming will be arranged if possible.

Electives are suggested from the following departments:

Agricultural Economics, Agricultural Engineering, Bacteriology, Economics, Entomology and Economic Zoology, Horticulture, Plant Pathology and Botany, Poultry Husbandry, Soils, and Zoology

9. 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 | SENIOR YEAR |
|---|---|
| *Fall Quarter* | |
| Agron. 121f[1], Grain Crops, 3 (Agron. 1, Bot. 9 cred.) | Agr. Econ. 13f,s, Gas Engines 3, or Agr. Eng. 40f,s, Mechanical Training. 3 |
| Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.) | Hort. 93f, Judging Horticultural Crops, 2 (Hort. 6 or 32) |
| Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements.) | Hort. 107f, Orchard Management, 3 (Hort. 6, Bot. 9 cred.) |
| Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.) | Hort. 135f, Truck Crops and Potatoes I, 3 (Hort. 32, Bot. 9 cred.) |
| Electives, 3 or 6 | Hort. 193f, Horticultural Seminar, 1 (Hort. 9 cred.) |
| | Electives, 5 |

[1] Agronomy 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.) may be substituted for this course.

### *Winter Quarter*

Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Hort. 121w, Small Fruit Culture, 3 (Hort. 6 or 32, Bot. 9 cred.)
Hort. 56w, Plant Propagation and Nursery Practice, 3 (Bot. 9 cred.)
Electives, 8

Agr. Econ. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Hort. 110w, Horticultural Crop Breeding, 3 (Agron. 131)
Hort. 137w, Truck Crops and Potatoes II, 3 (Hort. 32, Bot. 9 cred.)
Hort. 194w, Horticultural Seminar, 1 (Hort. 193)
Electives, 7

### *Spring Quarter*

Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Bot. 22f,w,s, Elementary Plant Physiology, 3 (Bot. 1)
Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of the general requirements.)
Hort. 72s, Woody Plants and Garden Flowers, 2 (Bot. 9 cred.)
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, 3 or 6

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)
Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)
Electives, 8

## 10. Landscape Gardening

A suggested curriculum for students majoring in landscape gardening. Slight deviations may be allowed on recommendation of adviser.

### JUNIOR YEAR — *Fall Quarter*

Agr. Eng. 19f, Elementary Surveying, 3 (Agr. Eng. 3, 11, or equiv.)
Arch. 31f,w,s, Elements of Architecture, 5
Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of general requirements.)
Hort. 71f, Plant Materials I, 2 (Bot. 9 cred.)
Hort. 93f, Judging Horticultural Crops, 2 (Hort. 6 or 32)
Electives, 2 or 5

### SENIOR YEAR — *Fall Quarter*

Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
Arch. 14f, History of Architecture, 2 (Arch. 33)
Hort. 193f, Horticultural Seminar, 1 (Hort. 9 cred.)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Electives, 6

### *Winter Quarter*

Arch. 32w,s, Elements of Architecture, 5 (Arch. 31)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Hort. 56, Plant Propagation and Nursery Practice, 3 (Bot. 9 cred.)
Hort. 74w, Landscape Design, 3 (Hort. 71, Arch. 21 or Agr. Eng. 3)
Electives, 3

Arch. 15w, History of Architecture, 2 (Arch. 14)
Hort. 110w, Horticultural Crop Breeding, 3 (Agron. 131)
Hort. 191w, Special Problems, 3 (Hort 190)
Hort. 194, Horticultural Seminar, 1 (Hort. 9 cred.)
Electives, 8

[1] Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

*Spring Quarter*

Arch. 33s, Elements of Architecture, 5 (Arch. 32)
Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of general requirements.)
Hort. 50s, Floriculture, 3
Hort. 72s, Woody Plants and Garden Flowers, 2 (Bot. 9 cred.)
Electives, 4 or 7

Arch. 16s, History of Architecture, 2 (Arch. 15)
Hort. 76s, Landscape Construction, 3 (Hort. 71)
Hort. 192s, Special Problems, 3 (Hort. 191)
Hort. 195s, Horticultural Seminar, 1 (Hort. 9 cred.)
Pl. Path. 112s, Diseases of Fruit Crops, 3 (Pl. Path. 1 or 10) or
Pl. Path. 114s, Advanced Forest Pathology, 3 (Pl. Path. 1 or 10)
Electives, 5

## 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
2. Agronomy and Plant Genetics
3. Animal Husbandry
4. Dairy Husbandry
5. Entomology and Economic Zoology
6. Farm Management and Agricultural Economics
7. Horticulture
8. Plant Pathology and Botany
9. Soils
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 Assembly. A course of lectures 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, 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. 1f,s, General Botany, 4 and 6 cred. selected from the following: Bot. 2, 5, 7, 12, 13, 21, 22; 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. 1f,s, General Botany, 4 and 6 cred. selected from the following: Bot. 2, 5, 7, 12, 13, 21, 22; 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
   b. Agronomy
   c. Entomology and Economic Zoology
   d. Horticulture
   e. Nutrition
   f. Plant Breeding
   g. Plant Pathology
   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 21 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. 12s, Field Machinery, 3
Agr. Eng. 13f,s, Gas Engines, 3
Agr. Eng. 19f-20s, Surveying, 6 (Draw. 3 or M. & M. 12, or equiv.)
Agr. Eng. 31w,s, Principles of Drainage, 3
Agr. Eng. 40f,s, Mechanical Training I, 3
Agron. 1f,w, General Farm Crops, 3
Hort. 6f, Fruit Growing, 3
M. & M. 24f,w,s, Differential Calculus, 5 (M. & M. 13)
M. & M. 25f,w,s, Integral Calculus, 5 (M. & M. 24)
M. & M. 84f,s, Technical Mechanics, 5 (M. & M. 25)
Phys. 3f,w,s, Elements of Mechanics, 3 (M. & M. 12 or equiv.)
Phys. 4f,w,s, Elements of Mechanics Laboratory, 1 (3 or parallel)
Phys. 23f,w, Heat, 3 (Phys. 3)
Phys. 24f,w, Heat Laboratory, 1 (Phys. 23 or parallel)
Phys. 43f,w,s, Electricity, 3 (Phys. 3)
Phys. 44f,w,s, Electricity Laboratory, 1 (Phys. 43 or parallel)
Soils 4f, Soils, 3 (Inorg. Chem. 10 cred.)
Soils 8w, Physical Properties of Soils, 3 (Soils 4) or Agr. Eng. 42w, Principles of Irrigation, 3

| JUNIOR YEAR | SENIOR YEAR |
|---|---|
| *Fall Quarter* | |
| Agr. Eng. 37f,s, Rural Sanitation, 3 | Agr. Econ. 102f,w, Farm Management Organization, 3 (Agr. Econ. 2, Soils 4) |
| Agr. Eng. 122f, Power Machinery, 3 (Agr. Eng. 12, 13) | C. E. 51f, Highways and Pavements, 3 (Agr. Eng. 20) |
| Econ. 8f, General Economics, 3 | C. E. 144f, Reinforced Concrete, 3 (M. & M. 85) |
| Geol. 5f, Engineering Geology, 3 | Electives, 8 |
| M. & M. 128f, Strength of Materials, 4 (M. & M. 84) | |
| Electives, 2 | |
| *Winter Quarter* | |
| Econ. 9w, General Economics 3 (Econ. 8) | Agr. Econ. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102) |
| Agr. Eng. 7w, Farm Structures I, 3 (Draw. 3 or equiv.) | Agr. Eng. 121w, Steam Boilers and Engines, 3 (Phys. 23, 24) |
| Agr. Eng. 42w, Principles of Irrigation, 3 | Agr. Eng. 133w, Applied Electricity, 3 (Phys. 43, 44 or equiv.) |
| M. & M. 86w, Hydraulics with Laboratory, 3 (M. & M. 84) | Electives, 8 |
| M. E. 23w, Mechanism and Kinematics, 3 (Draw. 27, M. & M. 24) | |
| Electives, 2 | |
| *Spring Quarter* | |
| An. Husb. 15s, Fundamentals of Livestock Production, 3 | Agr. Eng. 150s, Seminar, 2 (Agr. Eng. 102, 112, 125) |
| C. E. 42s, Structural Engineering, 3 (M. & M. 85) | B. A. 67s, Market Administration, 3 (Econ. 8-9) |
| Dy. Husb. 7s, Elements of Dairying, 3 | G. E. 193s, Engineering Practice, 2 (sr. class.) |
| Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3) | Pol. Sci., 28s, Business Law, 3 |
| M. E. 27s, Machine Design, 3 (M. E. 23) | Electives, 9 |
| Electives, 2 | |

RECOMMENDED ELECTIVES

1. *Farm Structures*
Agr. Eng. 5, 67, 112; For. 27; Rhet. 22; M.E. 164
2. *Farm Mechanics*
Agr. Eng. 14, 15, 28, 40, 101, 123, 125, 126; Rhet. 22
3. *Reclamation*
Agr. Eng. 28, 40, 101, 102, 103, 104; C.E. 161; 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. In the junior and senior years the student will register in both the School of Business Administration and the College of Agriculture, Forestry, and Home Economics. At least 90 credits and honor points equal to the number of credits are required for admission to the junior class. For definition of "honor point" see page 11. Approximately one third of the last two years is elective and may include

approved courses in any college as well as advanced courses in agriculture and economics. The fees for the first two years are those for the College of Agriculture, Forestry, and Home Economics. For the last two years the fees are those of the School of Business Administration.

### FRESHMAN YEAR

The freshman year consists of the regular freshman courses outlined on pages 15 and 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.

2. *Freshman courses* which were not completed during the freshman year.

3. *General courses*

Agr. Econ. 1f, Principles of Economics I, 3
Agr. Econ. 2w, Principles of Economics II, 5 (Agr. Econ. 1)
Agr. Econ. 8s, Rural Economics, 3 (Agr. Econ. 1)
Agr. Econ. 50s, Farm Finance, 5 (Agr. Econ. 2)
[1]Econ. 20, Elements of Accounting, 3
Econ. 25w-26s, Principles of Accounting, 6
Psychology 1f-2w, 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

1. *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)

2. *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

1. *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)

[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.

*2. Special Requirements*

Agr. Econ. 135s, Methods of Price Analysis, 3 (Agr. Econ. 30, 191)
Agr. Econ. 150s, Advanced Farm Finance, 3 (Agr. Econ. 50 or Econ. 3)
Agr. Econ. 170s, Land Economics, 3 (Agr. Econ. 110)

## E. 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 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 and 16 except that English 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-2w,s, Principles of Economics I-II, 8
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-2w, General Psychology (for business students) 6
Zool. 14f-15w-16s, General Zoology, 9

### JUNIOR YEAR

Agr. Econ. 40f,s, 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, 191)
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, 6 (Jour. 104, 110)
Pub. and Rur. Jour. 10f-11w-12s, Agricultural Journalism, 9 (Jour. 13-14-15, 51-52)
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.

For students majoring in home economics, Jour. 65 is recommended.

# CURRICULA IN FORESTRY

The curriculum is made up of 204 credit hours of work including:

1. Required courses, 137 to 154 credit hours, which every student must complete.

2. Elective courses, 50 to 67 credit hours, distributed according to several methods described below (pages 35 to 38).

(For explanation of terms and course numbers, see page 13.)

## REQUIRED COURSES

Required courses, 137 to 154 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. 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.

Students selecting a major in commercial lumbering, forest technology, grazing, and forest sciences will be permitted to make certain substitutions in the forestry courses included in these requirements.

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 Assembly. A course of lectures 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, 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. 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

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. s. chem.). Those required to take Chem. 1-2-3 are exempt.
Math. 3f,w, Higher Algebra, 4. Students presenting higher algebra for entrance may omit this course and substitute 4 credits elective.
Math. 4f,w, Trigonometry, 4 (Math. 3 or equiv.)
[1]Rhet. 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)

Transfer students who enter the University as juniors may substitute electives for this requirement. All others must complete the Itasca Park work before the beginning of the sophomore year unless given permission on petition to defer it one year. In no case will such students be permitted to register for junior work before completing the summer camp requirement.

Bot. 3su, Forest Botany, 1
Ent. 13su, Field Zoology, 1
For. 2su, Field Dendrology, 1
For. 5su, Field Silviculture, 2
For. 6su, Field Mensuration, 1

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.
Agr. Econ. 1f,w, Principles of Economics I, 3
Agr. Econ. 2w,s, Principles of Economics II, 5 (Agr. Econ. 1)
Agr. Eng. 19f-20s, Surveying, 6 (Math. 4)
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. 6)
Geol. 1f,w,s, General Geology, 5 or Geol. 29f, General Physiography, 5
Pl. Path. 10f,s, Forest Pathology, 5 (Bot. 9 cred.)
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, 3 (Rhet. 3)
Zool. 14f-15w, General Zoology, 6

JUNIOR YEAR

1. *Sophomore courses* which were not completed during the sophomore 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.
Agr. Eng. 24f-25w, Agricultural Physics, 8 (Math. 4 or Agr. Eng. 11, 23 or equiv.)
Ent. 6w, Forest Protection against Insects, 4 (Zool. 16 or Ent. 13)
For. 28w, Logging, 3
For. 33f-34w, Wood Structure and Identification, 6 (For. 3-4)
For. 126f, Silvics, 3
For. 127w, Silviculture, 3 (For. 126)
For. 130f, Forest Valuation, 5
For. 131w, Forest Policy and Administration, 5
3. *Special courses* selected from one of the major groups (page 35 to 38) and electives to make from 15 to 18 credit hours per quarter. Full work for the year consists of 51 credit hours.

[1] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 77.

Students who have completed 1 full year of work at an accredited Junior College, or 2 years work in any other Junior College may enter Itasca Park only

### 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. 134f-135w, Forest Problems, 4 (sr. class.)
For. 140f, Forest Working Plans, 3 (For. 128, 132) or For. Protection (class of 1931) not req. for class of 1932

## ELECTIVE COURSES

Elective courses, 50 to 67 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 time 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.

### 1. 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. 31s, Logging Laboratory, 1 reduced to 1931
For. 37s, Forest Protection, 3 (For. 127) replaced 7 or 13
For. 128s, Silviculture Laboratory, 7 (For. 127)
For. 132s, Forest Regulation Laboratory, 7 (For. 130)

The major will be selected from the following:

Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10 or Agr. Biochem. 3-4
Agr. Econ. 25f,w, Principles of Accounting, 4
Agron. 131f,w, Principles of Genetics, 3
Bact. 41f,w,s, General Bacteriology, 5
Bot. 7s, Taxonomy of Flowering Plants, 3

3-1-31 OM

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
Bus. Adm. 72f, Transportation Services, 3
Bus. Adm. 73w, Transportation Charges, 3
Econ. 26f,w,s, Principles of Accounting, 4
For. 20w, Grazing, 3
For. 101w, Advanced Dendrology, 3
For. 111f-112w, Advanced Forest Mensuration, 6
For. 122f-123w, Forestry Seminar, 2
For. 125s, Wood Preservation, 3
For. 129f, American Silvicultural Practice, 3
For. 136f, Forest Economics, 3
Geog. 11f,w,s, Human Geography, 5
Geog. 33, Climatology, 3 Geog. 133 Fall 1932
Geog. 41f,w,s, Geography of Commercial Production, 5
Geog. 71f, Geography of North America, 3
Geol. 2w-3s, General Geology, 10
Math. 7f,w,s, College Algebra, 5
Math. 30f,w,s, Analytical Geometry, 6
Math. 50f, Calculus I, 5
Math. 51f, Calculus II, 5
Math. 52s, Calculus III, 5
Org. Chem. 51f-52w-53s, Organic Chemistry, 15
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. 90f, Agricultural Statistics, 5
Agr. Eng. 5f, Farm Building Construction, 3
Bus. Adm. 73w, Transportation Charges, 3
Bus. Adm. 89f,w,s, Production Management, 3
Bus. Adm. 155w,s, Corporation Finance, 3
Econ. 26f,w,s, Principles of Accounting, 4
Econ. 141f,w,s, Monetary and Banking Policy, 3
Econ. 149f,w,s, Business Cycles, 3
Econ. 154f,w,s, Public Utilities, 3
Econ. 161f,w, Labor Problems and Trade Unionism, 3
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. 111f-112w, Advanced Forest Mensuration, 6
For. 114f-115w-116s, Mechanical and Physical Properties of Woods, 9
For. 136f, Forest Economics, 3
Geog. 11f,w,s, Human Geography, 5

### 3. Forest Technology

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, Introduction to Organic and Biochemistry, 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,w,s, 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. 119w-120s, 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, Introduction to Organic and Biochemistry, 6
Agr. Econ. 90f, Agricultural Statistics, 5
An. Husb. 10f,w-11w,s, Types and Market Classes of Livestock, 6
An. Husb. 112w, Animal 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. Students selecting a forest science major will be permitted to make certain substitutions in the general forestry requirements.

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. Required only for teachers' curr. begin. fall 1932

## PLACEMENT EXAMINATIONS

Examinations are given during Freshman Week covering the content of H.E. 11, 70, and 80. Students who have had previous courses in home economics in high school or elsewhere are urged to take these examinations. Those who make sufficiently high scores will be permitted to substitute electives for a part of this work.

## 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. 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 Assembly. A course of lectures offered only in the fall quarter.

H. E. 3f,w,s, Textiles, 5

H. E. 50f,w,s,51w,s,f, Color and Design, 6

H. E. 70f,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.

Phys. Ed. 1f-2w-3s, Elementary Physical Training, 3

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. 17f-18w, General Zoology, 6

### SOPHOMORE YEAR

Phys. Ed. 22f, Sophomore Elementary Swimming. Not required of those who can pass the swimming test in their freshman year.

Agr. Biochem. 3f,w-4w,s, Introduction to Organic and Biochemistry, 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. 80f,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)

Electives.—Enough elective credits should be selected to make, with the required work of the freshman and sophomore years, a total of 96 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.

[1] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 77.

### 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. 3f,w,s, Principles of Economics, 5
H. E. 83f,w,s, Food Management, 3 (H. E. 70, 80 or 81, 85 or parallel)
H. E. 85f,w,s, Food Marketing, 2 (Agr. Econ. 3 or parallel H. E. 80 or 81)
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) or Rhet 24 begin Sp 1931

2. *Additional courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 41 to 47.
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. 83, Agr. Econ. 1 or 3 or parallel, H. E. Ed. 40 or parallel)
H. E. 35f,w,s, Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 34 or parallel, 83, H. E. Ed. 40, Prev. Med. 52, home exp. in foods and cookery). Students may be required to substitute other work for this course at the discretion of the division.
H. E. 170f,w,s, Nutrition of the Family, 3 (Agr. Biochem. 4, H. E. 70, 80 or 81, Physiol. 4)
H. E. 171f,w,s, Child Nutrition, 3 (H. E. 170, H. E. Ed. 40)

2. *Additional courses* are prescribed by the curriculum of the line of specialization lected. See special requirements on pages 41 to 47.
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 193 credit hours required for graduation ~~exclusive of~~ physical education. incl. 4 cr in

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.

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.

### 1. 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 or 3)
An. Husb. 111w, Utilization of Meats, 3 or
H. E. 75f,w, Dietetics Laboratory, 2 (H. E. 170 or equivalent or parallel) and
H. E. 179w,s, Readings in Nutrition, 2 (H. E. 170)
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, 175)
H. E. 175f,w, Nutrition II, 4 (H. E. 73)
H. E. 182f,w,s, Experimental Cookery, 3 (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, 33, 73, 74; German 1-2-3, 4, 24, 25, 26, 27, 28, 29; Hist. 1-2; 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 or 3)
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, 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 3 or parallel)
H. E. 115f,w, Clothing Economics, 2 (H. E. 15 or equiv., Agr. Econ. 1 or 3)

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)
H. E. 154s, Advanced Costume Design, 3 (H. E. 13, 53, 55 recommended)
Bus. Adm. 69s, Retail Store Management, 3 (Agr. Econ. 1 or 3)
Psy. 56w, Psychology of Advertising, 3 (Psy. 1-2 and Agr. Econ. 1 or 3)

Group B

Agr. Biochem. 2f, Quantitative Methods, 5 (Inorg. Chem. 10 cred.)
Bot. 1f,s, General Botany, 4
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, Quantity Cookery, 4 (H. E. 83)
H. E. 63f,w,s, Institution Experience, 3 (H. E. 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,w, Dietetics Laboratory, 2 (H. E. 170 or equiv. or parallel)
H. E. 79s, Selected Problems for Dietitians, 3 (H. E. 170 or equiv.)
~~H. E. 156f,w,s, Hospital Social Service, 3 (H. E. 170 or parallel, 175)~~ H. E. 178 f. w. s. Clinical Problems in Nutr. 2 cr. (H E 170, 75, 71 or parallel)
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, 4 (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.* or H. E. 177 H. E. 71, 1 cr. no prerq.

### 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 or 3)
Econ. 1f,w,s, Business Organization: Marketing, 3 — a. H 111 req. in 1931-32
Econ. 161f,w, Labor Problems and Trade Unionism, 3 (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. 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)

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. (Bus. Law)
*Group B.*—Agr. Eng. 34, 35; Child Wel. 60; Econ. 3, 149; Eng. 31-32-33, 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 a 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

[1] See scholarship requirements for admission to the College of Education, page 11

who expects to teach home economics and who expects to obtain the university endorsement for a certificate must sign a 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 or 3)
Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
Agr. Ed. 11f,w,s, Educational Psychology, 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. Psy. 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, 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)
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. 142f,w, Educational Measurement in Home Economics, 2 (H. E. Ed. 42, Ed. Psy. 55 or Agr. Ed. 11)
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 fourteen credits.

*Group A.*—Anthropol. 41; Hist. 1-2 or 2-3, Pol. Sci. 1.

*Group B.*—Astron. 11; Bot. 1; Child Wel. 60, 80, 90, 120; Ed. Psy. 60; Eng. 31-32-33, 73-74; Geog. 11; H. E. 55, 57, 61, 102, 136, 175, 182, 186, 195, 154, 73, 75, 179, 173; H. E. Ed. 147; Jour. 13, 41, 65, 69, 73-74, 82; 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, Educational Psychology, 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 hist.) or
Ed. Ad. 65f,w,s, The High School, 3 (Ed. Psy. 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, 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)
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; Anthropol. 41; Child Wel. 60; Agr. Econ. 25; Hist. 1-2; H. E. 57, 61, 75, 173, 179, 182, 195; Jour. 13, 41, 65, 69; Pol. Sci. 1; 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 or 3)
Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
Agr. Ed. 11f,w,s, Educational Psychology, 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. Psy. 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, 175) or
H. E. 175f,w, Nutrition II 4 (H. E. 73) or
H. E. 75f,w, Dietetics Laboratory, 2 (H. E. 170 or equivalent or parallel) and H. E. 179w,s, Readings in Nutrition, 2 (H. E. 170)
H. E. 182f,w,s, Experimental Cookery, 3 (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. 142f,w, Educational Measurements in Home Economics, 2 (H. E. Ed. 42, Ed. Psy. 55 or Agr. Ed. 11)
H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Thirteen additional credits from the following courses must be completed.

Agr. Biochem. 2, 106, 108; Agr. Eng. 34. 35; Eng. 31-32-33, 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 or 3)
Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
Agr. Ed. 11f,w,s, Educational Psychology, 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. Psy. 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, 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 3 or parallel)
H. E. 115f,w, Clothing Economics, 2 (H. E. 15 or equiv., Agr. Econ. 1 or 3)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51)
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. 142f,w, Educational Measurements in Home Economics, 2 (H. E. Ed. 42, Ed. Psy. 55 or Agr. Ed. 11)
H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Nine 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, Educational Psychology, 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. Psy. 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, 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)
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.*

### 11. 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 continuing with graduate study after graduation. 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. Introduction to Organic and Biochemistry. 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

See Farm Management and Agricultural Economics.

## AGRICULTURAL EDUCATION

### COLLEGE OF EDUCATION

11. Educational Psychology. The main facts and principles of educational psychology and 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 1930-31.)

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 Course. 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.

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.

144. Course Organization and Instruction for the Individual in Vocational Agriculture. Subject-matter content for the individual should be based on farm activities. Individuals should progress according to abilities and needs. Accepting these principles, this course includes selection and organization of content, administration, and teaching technique.

154. Rural Education and Community Leadership. The school as a community center, and organizing educational, social, and recreational activities, clubs, festivals, fairs, and other desirable features of rural community life, such as future farmers of America.

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. Teaching Agriculture. Special methods course dealing with conducting a high school agriculture department. Observations of class work, apprentice teaching, curriculum organization, supervised farm practice and use of the farm and community for teaching purposes.

182. Teaching Agriculture. Special methods course dealing with conducting a high school agriculture department. Fundamentals of method in teaching as related to teaching agriculture in high school. Organizing subject-matter. Selection and manipulation of devices.

183. Teaching Agriculture. Organization and administration of agriculture in secondary schools including all day, part time, and evening school instruction. Special emphasis on equipment, text and reference books, extension work, and organizations.

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.

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 soil erosion control and 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.
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; electric wiring; harness repair; etc.
41. Mechanical Training II. Instruction and laboratory practice in mechanical trades embracing metal work, tool sharpening, painting, wood finishing, 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.
112. Farm Building Problems. Investigations in the utility and durability of building materials. Methods of construction, costs and efficiency of farm buildings.

121. Steam Boilers and Engines. Study of the construction, operation, and care of simple steam engines and boilers.
122. Power Machinery. Study of 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. Study of types and construction of machinery and equipment suited to various farm operations.
133. 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.
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.
121. Grain Crops. Structure, function, culture, improvement, and uses of corn, wheat, oats, barley, rye, flax, and buckwheat.
122. Grain and Hay Grading. Development of grades, study of grading methods, and actual practice in grading grain and hay samples according to federal standards. Training in judging grain and hay on quality basis.
123. Forage Crops. A study of the structure, function, culture, and improvements and uses of forage crops including meadow and pasture management.
124. Problems in Farm Crops. Through the use of the problem method, the student is given opportunity to deal with important phases of agronomy.
131. Principles of Genetics. Fundamental principles of breeding, heredity, variation, biometry, and evolution.
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.

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.

12. Meat Selection and Utilization. Lectures on the characteristics and peculiarities of meat as secured from different food animals. A comparative study of carcass value and utilization of parts. Score card and meat judging practice.

15. Fundamentals of Livestock Production. Basic principles involved in the breeding, feeding, and management of 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.)
112. Animal 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.
113. Livestock Management. Management problems in market stock and in purebred livestock production. Buildings and equipment, keeping herd records, buying and selling, sanitation and health problems. A general course covering horses, beef cattle, sheep, and hogs.

## ANTHROPOLOGY

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

41. Introduction to 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.

## 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. 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. Physico-chemical Principles in Plant Physiology.
142. Photosynthesis.
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.

60. 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.

80. Child Psychology. A survey of child development with special reference to nursery school and kindergarten education.

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. 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 Young 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.
3. Dairy Bacteriology. Same as Course 2, without laboratory.
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.
7. Elements of Dairying. Same as Course 1, without laboratory. For graduates of the School of Agriculture.
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; formulation of rations.
104. Dairy Stock Selection. For students interested in breeding pure bred dairy cattle. Selection by type, pedigree, production records. Evaluation of breeding animals and formulation of breeding plans. The application of genetics to practical breeding. Visits to pure bred 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.
110. Dairy Products III. The manufacture of ice cream with special reference to the chemical and physical processes involved. Organization, construction, equipment, and operation of such factories. Laboratory exercises and lectures.
111. Dairy Products I. The manufacture of butter with special reference to the chemical and bacteriological processes involved. Organization, construction, equipment, and operation, in such factories. Laboratory exercises to illustrate these processes.
112. Dairy Products II. The manufacture of cheese, condensed and powdered milks 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. Advanced Dairy Bacteriology. Investigations of specific problems on the bacteriology of milk and dairy products.

## ECONOMICS

### SCHOOL OF BUSINESS ADMINISTRATION

For 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.
111. Educational Measurements in the Elementary School.

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, 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 course in general entomology see 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.
5. Economic Entomology. Same as Course 3 only more inclusive.
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 case of certain species.
9. Elementary Bee Science. Classification, structure of *Apis mellifica*. Development and life-history of the queen, worker, and drone. Organization of the colony. Colony instincts and activities. Breeding, swarming, hibernation.
10. 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.
11. Advanced Beekeeping I. Problems of the commercial beekeeper. Out apiaries. Management. Marketing. Organization of the industry. Grading of bee products. Bee disease control.
12. Advanced Beekeeping II. Queen breeding, races of bees, package bees, nuclei, increase.
13. Field Zoology. For Forestry freshmen at Itasca Park.
23. Introductory Entomology. General characters, classification, and habits of insects.
24. Introductory Parasitology. An elementary course dealing with parasitic Protozoa, worms and arthropods and their relation to diseases of man and animals.

37-38-39. General Entomology. Leads up to discussion of the principles of taxonomy and their application to the classification of insects. Textbook, lectures, quizzes, and laboratory.

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 animals.

175. 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.

176-177. Advanced Economic Entomology. A critical consideration of the principles of insect control and the history of their development.

195. Introduction to Research. Preparation for investigational work in lines of entomology, parasitology, ecology, economic zoology, or bee-keeping. Advanced laboratory, field, and library work; training in preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible.

## FARM MANAGEMENT AND AGRICULTURAL ECONOMICS

1. Principles of Economics I. For students in Agriculture and Forestry.

2. Principles of Economics II. For students in Agriculture and Forestry.

3. Principles of Economics. For students in Home Economics.

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.

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.

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.

110-111. Economics of Agricultural Production. The principles of production economics applied to agriculture, special emphasis being placed upon comparative advantage and localization of production.

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.

191. Advanced Agricultural Statistics. Analysis of agricultural data by methods of correlation, partial and multiple correlation.

See also courses in Economics and Business Administration.

## 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.

6. 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.

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 and yield tables, and growth of trees and stands.

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. Farm Wood Lots 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 principles and general methods of operation in the United States, and the modifications required by forest management.

29. Sawmill, and Woodworking Machinery. Sawmills, woodworking machinery, and the processes in the primary manufacture of lumber products.

30. Wood Seasoning. The theory and practice of air seasoning and kiln drying of wood.

31. Logging Laboratory. The student will spend at least one week in an approved logging camp and make a complete report of the operation.

32. Forest Reports. This course is intended to assist the forester in the collection, selection, arrangement, and presentation of scientific data in the form of reports through practice writing and individual conferences.

33-34. Wood Structure and Identification. Structure, classification, and identification of the domestic commercial woods. Lectures, laboratory.

37. Forest Protection. The protection of forest from fire—fire prevention, and fire suppression. The causes of forest fires and their elimination, climate and fires, fire fighting and fire legislation.

48. Forest Products. 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 some important 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.

111-112. Advanced Forest Mensuration. Continuation of Course 8 with special emphasis on the construction of alinement charts, and correlation as applied to problems in forest mensuration.

113. Wood Pulp and Paper. Cellulose and its properties. Methods of production of wood pulp and paper products. Lectures, reading, reports.

114. Mechanical and Physical Properties of Wood I. Study of moisture in relation to hardness, strength, stiffness, density, shrinkage, swelling, absorption, humidity, etc. Lecture.

115-116. Mechanical and Physical Properties of Wood II. Study of strength in relation to grain, density, structure, etc. Calculation of stresses, strains, etc. Lecture and laboratory.

119-120. Advanced Wood Structure. A detailed study of the elements and structure of native and foreign economic woods. Preparation, sectioning, 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. Silviculture 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. Forest 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.

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.

140. Forest Working Plans. A study of methods of regulating and allotting the cut from a forest under management. Preparation of a working plan. Lectures and reports.

## 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. Intermediate German.
24-25-26. Chemical German.
30-31-32. 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

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 design; 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.

33. Home Management Problems for Social Workers. The management of the home in relation to the economic and social status of the family, special consideration being given to the dependent family.

34. Home Management: Operation and Maintenance, Lectures. Discussion of the managerial aspects of homemaking with special emphasis upon problems involved in the use of time, energy, and money.

35. Home Management: Operation and Maintenance, Laboratory. Actual experience in a home management house with various household management problems including the care and behavior of a child of preschool 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 Design. 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 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. Offered in 1930-31.)

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. Problems in Income Management. An intensive study of problems relating to management of individual and family incomes. 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.
186. Special Food Problems. A continuation of experimental cookery involving advanced individual problems. Reading and discussions of recent experimental work in 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

Students expecting to receive a teacher's 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. 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. Problems of measurement in home economics; home economics tests and scales; construction and evaluation of objective tests.
143. Home Economics Curricula. The objectives of home economics in the junior and senior high schools; recent surveys and other investigations used in determining curricular content; home economics courses of study.
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.
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. Elementary Landscape Design and Plant Materials. The elementary principles of landscape design; identification of evergreen and deciduous trees, shrubs, and vines, with special emphasis on their fall and winter characters and their uses in landscape design. Lectures, outdoor and indoor laboratories, field trips.
72. Woody Plants and Garden Flowers. Deciduous and evergreen trees, shrubs and vines, from their winter and spring characters; with special emphasis on their flower characters; herbaceous annuals, biennials, perennials, including bulbs and their uses in landscape planting; spring and summer characteristics; use in landscape gardening. Lectures, indoor and outdoor laboratories, field trips.
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 for 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.
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.

121. 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.

135. Truck Crops and Potatoes I. 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. Truck Crops and Potatoes II. Continuation of Course 135.

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.

[1] For special and practice fees for these courses see bulletin of general information.

## 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.

## 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.
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 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 is required of all newly entering students (see Courses 1-2-3), 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, 43, 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.
4. Preliminary Hygiene. One lecture a week. The most essential aspects of the care of the personal health.
7-8. Sophomore Gymnastics.
9. Sophomore Archery.
10-11-12. Sophomore Orthopedic and Individual Gymnastics.
13-14-15. Sophomore Natural Dancing.
16-17. Sophomore Games and Folk Dancing.
18. Tennis.
19. Sophomore Hockey.
20. Sophomore Basket-Ball.
21. Sophomore Baseball.
22-23. Sophomore Elementary Swimming.
24. Sophomore Horseback Riding.
25-26. Sophomore Intermediate Swimming.
27. Sophomore Golf.
28-29. Sophomore Advanced Swimming.
30. Sophomore Life Saving and Water Sports.
31. Sophomore Skating.

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.
59. Human Physiology. Intermediate course.

60. Physiology of Exercise. 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 description 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.
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 1930-31.)
113. Diseases of Vegetable Crops. A detailed study of diseases of potatoes and other vegetable crops. Lectures, reference, laboratory, and greenhouse work. (Given in alternate years. Not offered in 1930-31.)
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 1930-31.)
116. Pathologic Histology. A study of the histological changes in diseased plants. Lectures, laboratory, and reference work. (Given in alternate years. Offered in 1930-31.)
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 1930-31.)
118. Bacterial Diseases of Plants. Bacteria as plant pathogens; representative types with particular reference to technique used in studying bacterial diseases of plants. Lectures, laboratory, and greenhouse work. (Given in alternate years. Not offered in 1930-31.)

119. Principles of Plant Disease Control. Methods of plant disease control by means of exclusion, eradication, protection, and immunization. Lectures, laboratory, and reference work. (Given in alternate years. Offered in 1930-31.)
160. Plant Microchemistry. The localization, identification, and function of plant constituents. Lectures, demonstrations, and laboratory.
161. Transport, Storage, and Ripening of Fruits and Vegetables. The effects of temperature, respiration, packing, etc., on storage life.

## POLITICAL SCIENCE

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. American Government.
2. State Government.
51-52-53. Business Law. (See bulletin of the School of Business Administration.)

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.
6. Poultry Problems. Special problems and research in the field of poultry industry.
101. Advanced Poultry Breeding. Principles of genetics applied to poultry breeding; a survey of inheritance in the fowl; fecundity, physiology of reproduction in the fowl.

## PREVENTIVE MEDICINE AND PUBLIC HEALTH

### MEDICAL SCHOOL

3. Personal Hygiene and Elementary Sanitation.
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. Tuberculosis and Its Control.
61. Mental Hygiene.
73. Occupational Hygiene and Disease.
80. Health Supervision of School Child.
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, news articles, supplementary reading.

11. Argumentation. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating.
22. Public Speaking. (3-hour course.) A practical course in fundamentals of speech making.
23. Public Speaking. (5-hour course.)
24. Advanced Public Speaking. Types of audiences, persuasion, voice, extemporaneous speeches for special occasions.
28. Play Production. History of the theater, theories of acting, staging, etc. A survey of the problems confronting the producer of amateur plays.
29. Advanced Play Production. Continuation of 28. Problems of directing, staging, and make-up. Study of representative one-act plays. Each student is required to produce one one-act play. A practical course for teachers.
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.
53. Elementary French Composition.
54-55. Elementary French Conversation.

*Spanish*

1-2. Beginning Spanish.
3-4. Intermediate Spanish.
20. Oral and Written Spanish.
53. Spanish Composition.
54-55. Spanish Conversation.
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.
135. Rural Social Case Work.

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 problem 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.
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.

## 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] Includes studies in anatomy, physiology, and the

[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.

causes, prevention and treatment of common diseases of domestic animals. Designed especially for students desiring a brief course in animal diseases.

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.

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 59.

Credit is given for acceptable work done at any approved seaside laboratory.

14-15-16. Generol Zoology. Structure, physiology, embryology, classification, and evolution of animals. Third quarter is devoted to the Arthropoda, principally the Insecta.

17-18. General Zoology. A six-hour course for students in home economics.

21. Introduction to General Physiology.

22. General Ecology.

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.

130-140. Histology and Development of Insects.

144-145-146. Animal Parasites and Parasitism.

148-149-150. Histology and Organology.

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 1930-1931*

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# 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 Assembly; Mil. Sci. 1-2-3; Agr. Eng. 13, 28, 31, or 37; 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; Math. 5 cred.; Rhet. 1, 2, 3.

*Sophomore year.*—Mil. Sci. 4-5-6; Agr. Biochem. 7-8; Agr. Econ. 1, 2; Agr. Eng. 3, 23; Bact. 41; Zool. 14-15-16.

*Junior year.*—Rhetoric 11 or 31, 22; Soils 4, 5.

### ELECTIVE COURSES

#### *General Curriculum in Agriculture*

*Junior year.*—Agr. Biochem. 15; Agr. Econ. 40; Agr. Eng. 12; Agron. 121, 123, 131, 132; An. Husb. 2-3, 8; Ent. 3; Hort. 6 or 32.

*Senior year.*—Agr. Econ. 102, 103, 141; Agr. Eng. 7; An. Husb. 112; Dy. Husb. 6, 101; Pl. Path. 1; Sociol. 14; Vet. 9-10.

#### *Agricultural Education*

*Junior year.*—Agr. Educ. 11; Agr. Eng. 40; Agron. 121, 123, 131; An. Husb. 2-3, 8; Dy. Husb. 101; Ent. 3; Hort. 6; Vet. 9-10.

*Senior year.*—Agr. Econ. 40, 102, 103; Agr. Ed. 42, 181, 182, 183 and 3 additional credits; Dy. Husb. 6; Pl. Path. 1; Sociol. 14.

#### *General Curriculum in Agricultural Engineering*

*Junior year.*—Agr. Econ. 40; Agr. Eng. 5, 7, 12, 13, 31, 37; Agron. 121, 122; An. Husb. 2-3, 8; Ent. 3; Pl. Path. 1.

*Senior year.*—Agr. Econ. 102, 103, 142; Agr. Eng. 14, 19, 24, 25; Agron. 131; An. Husb. 112; Dy. Husb. 6, 101; Sociol. 14.

#### *General Curriculum in Animal Husbandry*

*Junior year.*—Agr. Biochem. 15; Agr. Eng. 12; Agron. 122, 123, 131; An. Husb. 2-3, 4, 112; Ent. 3; Pl. Path. 1; Vet. 2-3-4.

*Senior year.*—Agr. Econ. 40, 102, 103, 143; Agr. Eng. 7; An. Husb. 6, 7, 101, and one of the following: 102, 103, 104, 105 or 113; Vet. 6.

#### *General Curriculum in Dairy Husbandry*

*Junior year.*—Agr. Biochem. 15; Agr. Econ. 101; Agron. 123, 131; An. Husb. 2-3; Dy. Husb. 3, 6, 101, 104; Geol. 8; Sociol. 1; Vet. 2-3-4.

*Senior year.*—Agr. Econ. 40, 102, 103, 104; Agr. Eng. 40; Agron. 121; An. Husb. 105, 112; Dy. Husb. 103, 105, 106, 107; Ent. 3; Pl. Path. 1; Poult. 1.

#### *General Curriculum in Dairy Products*

Arrange with adviser on major-minor plan.

#### *General Curriculum in Farm Management and Agricultural Economics*

Arrange with adviser on major-minor plan.

### *Curriculum in Fur Farming*

Major and minor to be selected from the following:

*Junior year.*—Agr. Biochem. 15; Agr. Econ. 7; Agron. 131; Ent. 3, 4, 8; Vet. 2-3-4, 6, 12; Zool. 24.

*Senior year.*—Agr. Biochem. 116, 117; Agr. Econ. 101, 102; An. Husb. 112; Zool. 144-145-146.

### *General Curriculum in Horticulture*

*Junior year.*—Agr. Econ. 40; Agron. 121, 131; Bot. 22; Ent. 3; Hort. 6, 32, 56, 72, 121; Pl. Path. 1, 112 or 113.

*Senior year.*—Agr. Econ. 102, 142; Agr. Eng. 12, or Agron. 132; Agr. Eng. 13 or 40; Hort. 93, 107, 110, 135, 137, 193-194; Sociol. 14.

### *Landscape Gardening*

*Junior year.*—Agr. Eng. 19; Arch. 31-32-33; Ent. 3; Hort. 6, 32, 50, 56, 71, 72, 74, 93.

*Senior year.*—Agron. 131; Arch. 14-15-16; Hort. 76, 110, 191-192, 193-194-195; Pl. Path. 1, 112 or 114.

### *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) Agricultural Education, (c) Animal Industry, (d) Agricultural Sciences, and Plant Industry, (e) 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 assembly; Mil. Sci. 1-2-3; 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. 12, 13, 19-20, 31, 40; Agron. 1; Hort. 6; M. & M. 24, 25, 84; Phys. 3, 4, 23, 24, 43, 44; Soils 4, 8.

*Junior year.*—Econ. 8, 9; Agr. Eng. 7, 37, 42, 122; An. Husb. 8; C. E. 37; Dy. Husb. 7; Geol. 5; M. & M. 86, 128; M. E. 23, 27.

*Senior year.*—Agr. Eng. 121, 126, 133, 150; B. A. 67; Agr. Econ. 102, 103; C. E. 51, 144; Econ. 85; G. E. 193.

## 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; Agr. Econ. 1, 2, 8; Engl. 11-12; Jour. 13, 14-15; Psy. 1-6; Zool. 14-15-16.

*Junior year.*—Agr. Econ. 40, 90, 110-111; Jour. 51-52, 57, 69; Sociol. 1, 14.

*Senior year.*—Agr. Econ. 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; Agr. Econ. 1, 2, 8, 50; Econ. 20, 25-26; Psy. 1-6; Zool. 14-15-16.

*Junior year.*—Agr. Econ. 30, 40, 90, 110-111, 131, 141, 142; Bus. Adm. 51-52-53, 100, 141.

*Senior year.*—Agr. Econ. 135, 150, 170, 191; Bus. Adm. 58, 71, 101-102, 139, 149.

## FORESTRY

### REQUIRED COURSES

*Freshman year.*—Freshman assembly; Mil. Sci. 1-2-3; 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. 3, 4; (summer at Itasca Park).

*Sophomore year.*—Mil. Sci. 4-5-6; Agr. Econ. 1, 2; Agr. Eng. 19-20, 23; For. 7-8; Geol. 1 or 29; Pl. Path. 10; Rhet. 11 or 22 or 31; Zool. 14-15.

*Junior year.*—Agr. Eng. 24-25; Ent. 6; For. 28, 33-34, 126, 127, 130, 131.

*Senior year.*—For. 134-135, 140.

### ELECTIVE COURSES

See elective groups in Part I of the bulletin.

## HOME ECONOMICS

### REQUIRED COURSES

#### GROUP I

*Freshman year.*—Freshman assembly; Phys. Ed. 1-2-3; Inorg. Chem. 1-2-3 or 9-10: H.E. 3, 50-51, 70; Rhet. 1, 2, 3; Sociol. 1; Zool. 17-18.

*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.*—Agr. Econ. 3; 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.*—Agr. Econ. 126, An. Husb. 111 or H. E. 75 and 179, 73, 173, 175, 182, 186 or 187.

### *Curriculum in Textiles and Clothing*

The same as those listed under Group I adding the following:
*Junior and senior years.*—Agr. Econ. 126; H. E. 11, 13, 17 or 18, 102, 115.

### *Curriculum for Dietitians*

The same as those listed under Group I adding the following:
*Junior and senior years.*—Agr. Biochem. 2; Agr. Econ. 25; H. E. 60, 61, 63, 65, 73, 75, 79, 156, 163, 173, 175, 176, 179, 182.

### *Curriculum in Institution Management*

The same as those listed under Group I adding the following:
*Junior and senior years.*—Agr. Econ. 25, 126; Econ. 1, 161; H. E. 60, 61, 63, 65, 163, 182.

### *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.*—Agr. Econ. 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.*—Agr. Econ. 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.*—Agr. Econ. 126; H.E. 73, 173 or 175 or 75 and 179, 182, 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.*—Agr. Econ. 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
Ad, Administration
Ag, Agronomy
B, *School of Business Administration
BB, Beef Barn
BCh, Biochemistry
Bo, *Botany
C, *Chemistry
CWI, *Child Welfare Institute
Da, Old Dairy Hall
DB, Dairy Barn
DiH, Dining Hall
E, *Main Engineering
Ed, *Education
En, Agricultural Engineering
F, *Folwell Hall
G, *Greenhouse
Gy, Gymnasium
HE, Home Economics
HH, Haecker Hall
Hr, Horticulture
IA, *Institute of Anatomy
Lib, *Library
MH, *Millard Hall
MS, Meat Shop
Mu, *Music
OL, *Old Library
OLa, *Old Law
OPh, *Old Physics
P, *Pillsbury Hall
Ph, *Physics
PP, Plant Pathology
Psy, *Psychology
S, *Stadium
So, Soils
St, Stock Pavilion
Ve, Veterinary
WGm, *Women's Gymnasium
WH, Women's Hall
Z, *Zoology

*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.

MWF.
24 limit.

Quant Meth.

# PROGRAM

## 1930-31

## AGRICULTURAL BIOCHEMISTRY

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 2f - 20. | Quantitative Methods ..... (5 cred.; jr., sr.; prereq., Inorg. Chem. 10 cred.) | VI, VII, VIII, IX | MWF | 108BCh | Mr. Rogers |
| 3f-4w | Introduction to Organic and Biochemistry ..... (6 cred.;† soph., jr., sr.; prereq., Inorg. Chem. 10 cred.) limited to 90. | II | TThS | 203HE | Mr. Bailey |
| 3w-4s | Introduction to Organic and Biochemistry ..... (Same as 3f-4w) / no limit on this section. | I | TThS | 203HE | Mr. Sandstrom |
| 7f-8w | General Agricultural Biochemistry .. (10 cred.; soph., jr., sr.; prereq., Inorg. Chem. 10 cred.) | | | | |
| | Lect. | II | TThS | 113BCh | Mr. Rogers |
| | Lab. | VII, VIII, IX | MW | 102BCh | Mr. Jones |
| 7w-8s | General Agricultural Biochemistry .. (Same as 7f-8w) | | | | |
| | Lect. | III | TThS | 113BCh | Mr. Rogers |
| | Lab. | VII, VIII, IX | MF | 108BCh | Mr. Jones |
| 15f | Principles of Animal Nutrition ..... (3 cred.; jr., sr.; prereq., 7-8) | III | TThS | 116BCh | Mr. Palmer |
| 101f-102w | Agricultural Quantitative Analysis .. (6 cred.; jr., sr.; prereq., 7-8) | VI, VII, VIII | MWF | 208BCh | Mr. Bailey |
| 103s | Dairy Chemistry ..... (5 cred.; jr., sr.; prereq., 7-8) | | | | |
| | Lect. | VI | MWF | 116BCh | Mr. Palmer |
| | Lab. | VII, VIII, IX | MWF | 208BCh | Mr. Palmer |
| 106f,w,s | Biochemistry in Industry ..... (1 cred.;‡ jr., sr.; prereq., org. chem.) | Ar | Ar | Ar | Mr. Bailey |
| 108s | Chemistry of Wheat and Wheat Products ..... (3 cred.; jr., sr.; prereq., 3-4 or 7-8) | I | MWF | 211BCh | Mr. 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 | Mr. Bailey |
| 111f-112w | Biochemistry ..... (6 cred.; sr.; prereq., Zool. or Bot., 9 cred., org. chem.) | III | MWF | 113BCh | Mr. Gortner |
| | | VI | Th | 113BCh | Mr. Sandstrom |
| 113f-114w-115s | Biochemical Laboratory Methods .... (6 cred.; sr.; prereq., quant. anal., parallel 111-112) | VI, VII, VIII | T | 202, | |
| | | VII, VIII, IX | Th | 208BCh | Mr. Sandstrom |
| 116w | Advanced Animal Nutrition ..... (3 cred.; jr., sr.; prereq., 15 and 111 or physiologic chem.) | III | TThS | 211BCh | Mr. Palmer, Miss 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.

Subst. of Ag. Bio 7 (sec. lect only) for Ag. Bio 3 approved for fall quarter 1930. B.- 9/2 filled out.
Dean Freeman - 9-25-30.

| 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 | Mr. Palmer, Miss 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 ECONOMICS

See Farm Management and Agricultural Economics.

## AGRICULTURAL EDUCATION

### COLLEGE OF EDUCATION

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 11f,w,s | Educational Psychology ..... (3 cred.; jr., sr.; no prereq.) | II | TThS | 202Ad | Mr. Field |
| 21f,s | Vocational Education ..... (3 cred.; jr., sr.; no prereq.) | IV | TThS | 202Ad | |
| 41 | Apprentice Teaching ..... (2 cred.; jr., sr.; prereq., 11) | Not offered in 1930-31 | | | |
| 42f,w,s | Supervised Teaching Experience .... (3 cred.; jr., sr.; no prereq.) | Ar | Ar | Ar | Mr. Field, Mr. Nylin |
| 64w,s | Survey of Agriculture ..... (3 cred.; no prereq.) | Ar | Ar | Ar | Mr. Field and others |
| 75 | Visual Presentation ..... (3 cred.; jr., sr.; prereq., 11) | Not offered in 1930-31 | | | |
| 81s | Extension Work ..... (3 cred.; jr., sr.; prereq., 6 cred. in farm mgt., 6 cred. in farm crops, 15 cred. in an. ind., 6 cred. in agr. ed.) | VI | MWF | 202Ad | Mr. Peck, Mr. Storm |
| 82f,w,s | Agricultural Extension Field Course (3 to 10 cred.; jr., sr.; prereq., 81) | Ar | Ar | Ar | Mr. Peck, Mr. Storm, Mr. Field |
| 135 | The Curriculum in Vocational Agriculture ..... (3 cred.; sr.; prereq., 11) | Ar | Ar | Ar | |
| 141w,s | Supervised Practice in Vocational Agriculture ..... (3 cred.; sr.; prereq., 11) | Ar | Ar | Ar | Mr. Field |
| 144w | Course Organization and Instruction for the Individual in Vocational Agriculture ..... (2 cred.; sr.; prereq., 11) | Ar | Ar | Ar | Mr. Field |
| 154 | Rural Education and Community Leadership ..... (3 cred.; sr.; prereq., 11) | Ar | Ar | Ar | Ar |
| 161f,w,s | Vocational Education in Agriculture (3 cred.; jr., sr.; prereq., 11, 181-182-183) | Ar | Ar | Ar | Ar |
| 162f,w,s | The Basis of Vocational Teaching Technique ..... (3 cred.; jr., sr.; prereq., 11, 181-182-183) | Ar | Ar | Ar | Ar |

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 164f,w,s | Fundamentals of Agriculture ..... (3 cred.; jr., sr.; prereq., 11 or Ed. Psy. 55) | Ar | Ar | Ar | Ar |
| 171w,s | Problems in Procedure ..... (3 cred.; sr.; prereq., 42 or equiv. teaching experience) | Ar | Ar | Ar | Mr. Storm, Mr. Field |
| 176s | Problems in Visual Presentation .... (3 cred.; jr., sr.; prereq., 75) | Ar | Ar | Ar | Mr. Field |
| 181f | Teaching Agriculture ..... (5 cred.; jr., sr.; prereq., 11) | III | MTWThS | 202Ad | Mr. Storm, Mr. Field, 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 | Mr. Storm, Mr. Field |

## AGRICULTURAL ENGINEERING

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 3f,s | Mechanical Drawing ..... (2 cred.; no prereq.) | III, IV | MWF | 303En | Mr. Neubauer |
| 5f | Farm Building Construction ..... (3 cred.; no prereq.) | | | | |
| | Lect. | VII | WF | 41En | Mr. White. |
| | Lab. | VII, VIII, IX | M | 48En | Mr. Berggren |
| 7w | Farm Structures I ..... (3 cred.; jr., sr.; prereq., 3) | | | | |
| | Lect. | IV | TS | 305En | Mr. White |
| | Lab. | VII, VIII, IX | M | 305En | Mr. White |
| 12s | Field Machinery ..... (3 cred.; jr., sr.; no prereq.) | | | | |
| | Lect. | I | MW | 216En | Mr. Schwantes |
| | Lab. | VI, VII, VIII | W | | |
| 13f,s | Gas Engines ..... (3 cred.; no prereq.) | VI, VII, VIII | TTh | 216,37En | Mr. Torrance |
| 14s | Elementary Farm Power ..... (3 cred.; prereq., 13) | VI, VII, VIII | MF | 216,37En | Mr. Torrance |
| 15f | Ignition and Carburation ..... (3 cred.; prereq., 13) | | | | |
| | Lect. | III | MW | 216En | Mr. Torrance |
| | Lab. | III, IV | F | | |
| 19f | Elementary Surveying ..... (3 cred.; prereq., 3, Math. 4, or equiv., or Draw. 3 and M.&M. 12) | | | | |
| | Lect. | II | T | 215En | Mr. Roe |
| | Lab. | VI, VII, VIII | WF or TTh | 215,305En | Mr. Neal |
| 20s | Advanced Surveying ..... (3 cred.; prereq., 19) | | | | |
| | Lect. | VI | M | 215En | Mr. Roe, |
| | Lab. | VII, VIII, IX | MF | 305En | Mr. Neal |

11w. Applied Math ~~III~~ M T. W. F. S. 105 Eng. Neal
(5 credit)

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 23f | General Physics ..... (5 cred.; no prereq.) | | | | |
| | Lect. | III | TThS | 101En | Mr. Romness |
| | Sec. 1 Lab. | I, II | ThS | 102En | Mr. Romness |
| | 2 | VI, VII | TTh | 102En | Mr. Tyler |
| 23s | General Physics ..... (Same as 23f) | | | | |
| | Sec. 1. Lect. | III | TThS | 101En | Mr. Romness |
| | 2 | IV | MWF | 101En | Mr. Romness |
| | Sec. 1 Lab. | I, II | WF | 102En | Mr. Romness |
| | 2 | I, II | TS | 102En | Mr. Romness |
| | 3 | VI, VII | TTh | 102En | Mr. Tyler |
| | 4 | VI, VII, VIII, IX | M | 102En | Mr. Tyler |
| | 5 | VI, VII, VIII, IX | W | 102En | Mr. Tyler |
| | 6 | III, IV | MW | 102En | Mr. Tyler |
| | 7 | III, IV | TS | 102En | Mr. Tyler |
| 24f | Agricultural Physics I ..... (4 cred.; prereq., 23, Math. 4 or equiv.) | | | | |
| | Lect. | III | MWF | 101En | Mr. Romness |
| | Lab. | VI, VII, VIII | M or F | 102En | |
| 25w | Agricultural Physics II ..... (4 cred.; prereq., 24) | | | | |
| | Lect. | I | TThS | 101En | Mr. Romness |
| | Lab. | VI, VII, VIII | M or W | 102En | |
| 28w | Land Clearing ..... (3 cred.; jr., sr.; no prereq.) | I | TThS | 103En | Mr. Schoenleber |
| 31w,s | Principles of Drainage ..... (3 cred.; no prereq.) | III | TThS | 215En | Mr. Roe, Mr. Neal |
| 34w | Household Mechanics ..... (4 cred.; prereq., 23 or equiv.) | I, II | MWF | 103En | Mr. Romness |
| 35s | Household Physics ..... (4 cred.; prereq., 23 or equiv.) | I, II | MWF | 101,103En | Mr. Romness |
| 37f,s | Rural Sanitation ..... (3 cred.; no prereq.) | I | TThS | 101En | Mr. Tyler |
| 40f,s | Mechanical Training I ..... (3 cred.; no prereq.) | I, II | MWF | 20,106En | Mr. Dent |
| 41w | Mechanical Training II ..... (3 cred.; no prereq.) | I, II | MWF | 20,106En | Mr. Dent |
| 42w | Principles of Irrigation ..... (3 cred.; no prereq.) | Ar | Ar | Ar | Mr. Roe |
| 67s | Farm Structures II ..... (3 cred.; jr., sr.; prereq., 7) | I, II | TThS | 305En | Mr. White |
| 101f | Drainage Engineering and Works ... (3 cred.; prereq., 31, M.&M. 86) | Ar | Ar | Ar | Mr. Roe |
| 102 | Advanced Drainage Problems ..... (3 cred.; sr.; prereq., 101) | Ar | Ar | Ar | Mr. Roe |
| 103s | Irrigation Engineering and Works .. (3 cred.; prereq., 42, M.&M. 86) | Ar | Ar | Ar | Mr. Roe |
| 104w | Drainage Administration and Law .. (3 cred.; prereq., 101) | Ar | Ar | Ar | Mr. Neal |
| 112f,w,s | Farm Building Problems ..... (3 to 18 cred.; sr.; prereq., 67) | Ar | Ar | Ar | Mr. Boss |
| 121w | Steam Boilers and Engines ..... (3 cred.; prereq., Phys. 23, 24) | II | TThS | 216En | Mr. Boss |

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 122f | Power Machinery ..... (3 cred.; prereq., 12, 13) | | | | |
| | Lect. | VI | WF | 106En | Mr. Schwantes |
| | Lab. | VII, VIII, IX | W | 49En | |
| 123s | Farm Power ..... (3 cred.; prereq., 122) | | | | |
| | Lect. | I | TTh | 216En | Mr. Schwantes, |
| | Lab. | VI, VII, VIII | T | 49En | Mr. Torrance |
| 125w | Farm Machinery Design ..... (3 cred.; jr., sr.; prereq., 122, M.E. 27) | VI, VII, VIII | MW | 106En | Mr. Schwantes |
| 126s | Selection of Farm Equipment ..... (3 cred.; prereq., 14, 122) | | | | |
| | Lect. | III | MW | 106En | Mr. Schwantes |
| | Lab. | III, IV | F | 49En | |
| 133w | Applied Electricity ..... (3 cred.; prereq., Phys. 43, 44) | | | | |
| | Lect. | VI | M | | |
| | Lab. | VII, VIII, IX | M | 101En | Mr. Romness |
| | | VI, VII, VIII | F | | |
| 141w | Land Clearing II ..... (3 cred.; prereq., 28) | Ar | Ar | Ar | Mr. Thompson |

## AGRONOMY AND PLANT GENETICS

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f,w | General Farm Crops ..... (3 cred.; no prereq.) | III, IV | MWF | 100Ad | Mr. Arny |
| 121f | Grain Crops ..... (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.) | VI, VII, VIII | TTh | 100Ad | Mr. Wilson |
| 122w | Grain and Hay Grading ..... (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.) | VI, VII, VIII | TTh | 100Ad | Mr. Wilson |
| 123s | Forage Crops ..... (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.) | VI, VII, VIII | TTh | 100Ad | Mr. Arny |
| 124w,s | Problems in Farm Crops ..... (3 cred.; jr., sr.; prereq., 1) | Ar | Ar | Ar | Mr. Wilson |
| 131f,w | Principles of Genetics ..... (3 cred.; soph., jr., sr.; prereq., Bot. or Zool. 9 cred.) | | | | |
| | Lect. | I | ThS | 102Ad | Mr. Stevenson |
| | Lab. | I, II | T | 102Ad | Mr. Stevenson |
| 132w | Farm Crops Plant Breeding ..... (3 cred.; jr., sr.; prereq., 131) | VI, VII, VIII | TTh | 102Ad | Mr. Stevenson |
| 134f,w | Laboratory Problems in Genetics .... (3 cred.; jr., sr.; prereq., 131 or parallel) | Ar | Ar | 303Ag | Mr. Brewbaker |

## ANIMAL HUSBANDRY

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 2f-3w | Types and Breeds of Livestock ..... (6 cred.; soph., jr., sr.; prereq., 10-11) | I, II | MWF | WSt | Mr. Winters |
| 4s | Livestock Judging ..... (3 cred.; jr., sr.; prereq., 2-3) | III, IV | MWF | CSt | Mr. Harvey |

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 6w | Livestock Feeding ..... (5 cred.; jr., sr.; prereq., Agr. Biochem. 15) | III | MTWFS | 3St | Mr. Ferrin |
| 7f | Meats ..... (3 cred.; jr., sr.; prereq., 2-3) | VI, VII, VIII | TTh | MS | Mr. Anderson |
| 8s | Fundamentals of Feeding and Management ..... (5 cred.; sr.; no prereq.) | I | MTWThF | 3St | Mr. Ferrin |
| 9s | Pedigrees and Herd Books ..... (3 cred.; jr., sr.; prereq., 112) | II | TThS | 3St | Mr. Winters |
| 10f-11w | Types and Market Classes of Livestock ..... (6 cred.; no prereq.) | I, II | MWF | CSt | Mr. Harvey |
| 10w-11s | Types and Market Classes of Livestock ..... (Same as 10f-11w) | I, II | TThS | CSt | Mr. Harvey |
| 12s | Meat Selection and Utilization ..... (3 cred.; jr., sr.; no prereq.) | VI, VII, VIII | TTh | MS | Mr. Anderson |
| 15s | Fundamentals of Livestock Production (3 cred.; jr., sr. in prof. Agr. Eng.; no prereq.) | I | TThS | WSt | Mr. Peters |
| 101f | Advanced Stock Judging ..... (3 cred.; sr.; prereq., 4) | VI, VII | MWF | CSt | Mr. Harvey |
| 102s | Horse Husbandry ..... (3 cred.; jr., sr.; prereq., 2-3) | | | | |
| | Lect. | II | TTh | WSt | Mr. Harvey |
| | Lab. | VI, VII, VIII | F | WSt | |
| 103s | Beef Cattle Husbandry ..... (3 cred.; jr., sr.; prereq., 2-3) | | | | |
| | Lect. | III | MW | WSt | Mr. Peters |
| | Lab. | VI, VII, VIII | T | BB | |
| 104s | Sheep Husbandry ..... (3 cred.; jr., sr.; prereq., 2-3) | | | | |
| | Lect. | IV | WF | 3St | Mr. Anderson |
| | Lab. | VI, VII, VIII | M | CSt | |
| 105s | Swine Husbandry ..... (3 cred.; jr., sr.; prereq., 2-3) | | | | |
| | Lect. | III | TS | 3St | Mr. Ferrin |
| | Lab. | VI, VII, VIII | Th | CSt | |
| 106w | Advanced Meats ..... (3 cred.; jr., sr.; prereq., 7) | VI, VII, VIII | WF | MS | Mr. Anderson |
| 107s | Meat Problems ..... (3 cred.; sr.; prereq., 106) | | | | |
| | Lect. | IV | TS | MS | Mr. Anderson |
| | Lab. | VI, VII, VIII | W | MS | |
| 108f-109w-110s | Seminar ..... (3 cred.; jr., sr.; prereq., 2-3) | IX | T | 3St | Mr. Peters |
| 111w | Utilization of Meats ..... (3 cred.; Home Econ. students; no prereq.) | III | ThS | MS | Mr. Anderson |
| | | III. IV | T | MS | |
| 112w | Animal Breeding ..... (3 cred.; jr., sr.; prereq., Agron. 131) | IV | MWF | 3St | Mr. Winters |
| 113s | Livestock Management ..... (3 cred.; jr., sr.; prereq., 2-3) | | | | |
| | Lect. | II | TTh | Wst | Mr. Peters |
| | Lab. | VI, VII, VIII | F | CSt | |

Same as A. H. 5.
Truck Gardening
offered 1929-30.

# 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 | Mr. Young |
| | 3 | VI-VIII | MW | 417E | Mr. Doseff |
| | 4 | II-IV | TS | 405E | Mr. Doseff |
| 21w* | Freehand Drawing ..... | II-III | T | | |
| | (See 21f) | VI-VIII | Th | 417E | Mr. Doseff |
| 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 | Mr. 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 | 417E | Mr. Doseff |
| | | I-III | S | 417E | Mr. Young |
| | 2 | II-IV | MF | | |
| | 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 ..... | III, IV | M | 203AOPh | Miss Raymond |
| | (3 cred.; no prereq.) | | | | |
| 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 | Miss Raymond |
| | Lab. | I | MWF | 207OPh | |

* 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.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 29f-30w-31s* | Sketch, Course II ..... (3 cred.; soph., jr., sr.; prereq., 7, 8, 9) | | | | |
| | Sec. 1 | I, II | S | 203AOPh | Miss Raymond |
| | 2 | II, III | F | 203OPh | Miss Raymond |
| | 3 | III, IV | F | 203OPh | Miss Raymond |

For additional courses see the bulletin of the College of Education.

## BACTERIOLOGY AND IMMUNOLOGY

### MEDICAL SCHOOL

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 41f,w,s* | General Bacteriology ..... (5 cred.; soph., jr., sr.; prereq., chem. and biol.) | VII, VIII, IX | MWF | Ar | |
| 103w* | Soil Microbiology ..... (5 cred.; jr., sr.; prereq., 41) | I, II, III<br>I, II | TS<br>Th | MH<br>MH | Dr. Skinner |
| 121w* | Industrial Bacteriology ..... (3 cred.; jr., sr.; prereq., 41) | I, II | TTh | Ar | Ar |
| 122s* | Industrial Bacteriology (cont'd) .... (Same as 121) | I, II | TTh | MH | Ar |

For additional courses see the bulletin of the Medical School.

## 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 | BoAud | Mr. Huff |
| | Sec. 1 Quiz | VII | Th | | |
| | 2 | VII | T | | |
| | | V | T | | |
| 1s* | General Botany ..... (4 cred.; students in H.E.; no prereq.) | | | | |
| | Lect. | III | TThS | BoAud | Mr. Huff |
| | Sec. 1 Quiz | I | T | | |
| | 2 | II | T | | |
| | 3 | III | W | | |
| 2w,s* | Elementary General Morphology of Plants ..... (3 cred.; all; prereq., 1) | III, IV | MWF | 1,4,5,8Bo | Mr. Huff |
| 3su | Forest Botany ..... (1 cred.; no prereq.) | Given at Itasca Park | | | Mr. Rosendahl |
| 5w* | Elementary Plant Histology ..... (3 cred.; all; prereq., 1) | VI, VII, VIII | TTh | 1,4,5,8Bo | Mr. Butters |
| 7f,w* | Taxonomy of Flowering Plants ..... (3 cred.; all; prereq., 1) | I, II | MWF | 1,4,5,8Bo | Mr. Rosendahl |
| 7s* | Taxonomy of Flowering Plants ..... (Same as 7f,w) | | | | |
| | Sec. 1 | I, II | MWF | 1,4,5,8Bo | Mr. Rosendahl |
| | 2 | VI, VII, VIII | TTh | 1,4,5,8Bo | |

* Offered on the Minneapolis campus.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 12f,w,s* | Morphology of Algae ..... (3 cred.; all; prereq., 1) | I, II | TThS | 1,4,5,8Bo | Miss Tilden |
| 21f* | Elementary Ecology ..... (3 cred.; all; prereq., 1) | III, IV | MWF | 1,4,5,8Bo | Mr. Cooper |
| 21w,s* | Elementary Ecology ..... (Same as 21f) | VI, VII. VIII | TTh | 1,4,5,8Bo | Mr. Cooper |
| 22f,w,s* | Elementary Plant Physiology ..... (3 cred.; all; prereq., 1) | | | | |
| | Lect. | VI | TTh | 1,4,5,6Bo | Mr. Burr |
| | Sec. 1 Lab. | III, IV | TS | | |
| | 2 | ~~VI~~ VII | Th | | |

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 | Mrs. Foster |
| 60f* | Modern Aspects of Child Study ..... (2 cred.; jr., sr.; prereq., 6 cred. in psy. or ed.) | VI | TTh | 202OLa | Miss McGinnis |
| 80f* | Child Psychology ..... (3 cred.; jr., sr.; prereq., Psy. 1-2) | I | MWF | 202OLa | Mr. Anderson |
| 90w* | Physical Development of the Young Child ..... (2 cred.; jr., sr.; prereq., Psy. 1-2, Zool. 1-2) | V | T and Ar | 202OLa | Dr. Boyd |
| 120s* | Health Care of Young Child ..... (2 cred.; sr.; prereq., 50-51 and permission of instructor) | V | T and Ar | 202OLa | Dr. Boyd |
| 130s | The Development of the Young Child (3 cred.; sr., grad.; prereq., 15 cred. in psy. or equiv. and permission of instructor) | I | TThS | 202OLa | Mr. 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<br>VI, VII | M<br>WF | 202OLa | Miss 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 sociol. or prev. med.) | VI | MWF | 202OLa | Miss McGinnis |
| 173w-174s* | Technique and Practice of Parental Education ..... (6 cred.; sr., grad.; prereq., 170 and permission of instructor) | Ar | Ar | 204OLa | Miss 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 | Miss Goodenough |

* Offered on the Minneapolis campus.

## DAIRY HUSBANDRY

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f,s | Elements of Dairying ..... (5 cred.; no prereq.) (Limited to 35) | | | | |
| | Lect. | III | TWS | 100HH | Mr. Combs, |
| | Lab. | III, IV | MF | | Mr. Morrison |
| 2w | Dairy Bacteriology ..... (5 cred.; soph., jr., sr.; prereq., Bact. 41) (Limited to 12) | VI, VII, VIII | MWF | 210HH | Mr. Macy |
| 3w | Dairy Bacteriology ..... (3 cred.; soph., jr., sr.; prereq., Bact. 41) | VI | MWF | 210HH | Mr. Macy |
| 4s | Dairy Products Practice ..... (3 cred.; soph., jr., sr.; prereq., 1) | Ar | Ar | Ar | Mr. Combs |
| 6f | Judging Dairy Cattle ..... (1 cred.; jr., sr.; prereq., An. Husb. 10-11) | VI, VII, VIII | Th | DB | Mr. Gullickson |
| 7f,s | Elements of Dairying ..... (3 cred.; students with credits in Dairy Husb. in School of Agr.) | III | TWS | 100HH | Mr. Combs |
| 101f | Milk Production ..... (5 cred.; jr., sr.; prereq., 1) | IV | MTWFS | 210HH | Mr. Eckles |
| 102s | Market Milk ..... (3 cred.; jr., sr.; prereq., 1, 2) | IV | MW | 210HH | Mr. Macy |
| | | VI, VII, VIII | Th | | |
| 103w | Dairy Stock Feeding ..... (3† cred.; sr.; prereq., 101, Agr. Biochem. 15) | III | MWF | 210HH | Mr. Eckles |
| 104s | Dairy Stock Selection ..... (3 cred.; jr., sr.; prereq., 6, 101) | VI, VII, VIII | MW | 210HH | Mr. Petersen, |
| | | VI | F | 210HH | Mr. Allen |
| 105f | Seminar I ..... (1 cred.; sr.; prereq., 3 courses in dy. husb.) | II | S | 214HH | Mr. Eckles |
| 106w | Seminar II ..... (Same as 105f) | II | S | 214HH | Mr. Eckles |
| 107s | Seminar III ..... (Same as 105f) | II | S | 214HH | Mr. Eckles |
| 110w | Dairy Products III ..... (3 cred.; jr., sr.; prereq., 1) | IV | TS | 210HH | Mr. Combs |
| | | VI, VII, VIII | T | | |
| 111f | Dairy Products I ..... (3 cred.; jr., sr.; prereq., 1, 2 or 3) | IV | TS | 100HH | Mr. Combs, |
| | | VI, VII, VIII | T | | Mr. Hubbard |
| 112s | Dairy Products II ..... (3 cred.; jr., sr.; prereq., 1, 2 or 3) | IV | TS | 210HH | Mr. Combs, Mr. Miller |
| | | VI, VII, VIII | T | 210HH | Mr. Combs, Mr. Morrison |
| 113s | Technical Control ..... (3 cred.; sr.; prereq., 111 or 112) | I, II, III | TTh | 210HH | Mr. Combs, Mr. Macy, Mr. Morrison |
| 114su | Problems in Dairy Husbandry ..... | (See bulletin of Summer Session) | | | |
| 115s | Advanced Dairy Bacteriology ..... (3 cred.; sr.; prereq., 111 or 112) | Ar | Ar | Ar | Mr. Macy |

† Only two credits allowed those who have completed An. Husb. 8.

## EDUCATIONAL ADMINISTRATION AND SUPERVISION

### COLLEGE OF EDUCATION

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 119f* | The Elementary School Curriculum .. (3 cred.; sr.; prereq., 10 cred. in educ. incl. Educ. Psy. 55 or 56) | I | MWF | Ar | Mr. Peik |
| 119Tf-120Tw* | The Elementary School Curriculum .. (Same as 119f) | I, II | S | Ar | Mr. 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 | Mr. Miller |
| 111s* | Educational Measurements in the Elementary School ..... (3 cred.; jr., sr.; prereq., 55 or equiv.) | II | MWF | Psy | Mr. 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 or equiv.) | VI, VII | MWF | 302Ad | Mr. Ruggles |
| 4s | Economic Vertebrate Zoology ..... (3 cred.; soph., jr., sr.; prereq., Zool. 14-15 or equiv.) | VI, VII | MWF | 302Ad | Mr. Johnson |
| 5f,w | Economic Entomology ..... (5 cred.; soph., jr., sr.; prereq., Zool. 16 or equiv.) | VI, VII, VIII | MWF | 302Ad | Mr. Ruggles |
| 6w | Forest Protection Against Insects .... (4 cred.; soph., jr., sr.; prereq., Zool. 16 or equiv.) | VI, VII, VIII | TTh | 307Ad | |
| 8f | Varieties and Habits of Fur Bearing Animals ..... (3 cred.; soph.; jr.; sr.; prereq., Zool. 9 cred.) | VI, VII, VIII | TTh | 307Ad | Mr. Johnson |
| 9f,w,s | Elementary Bee Science ..... (3 cred.; all; no prereq.) | | | | |
| | Sec. 1 | IV | MWF | 307Ad | Mr. Ahrens |
| | 2 | V | MWF | 307Ad | Mr. Ahrens |
| 10f,w | Industrial Beekeeping ..... (3 cred.; all; no prereq.) | V<br>2 hrs. ar. | TTh | 307Ad | Mr. Ahrens |
| 10s | Industrial Beekeeping ..... (Same as 10f,w) | | | | |
| | Sec. 1 | IV<br>2 hrs. ar. | TS | 307Ad | Mr. Ahrens |
| | 2 | V<br>2 hrs. ar. | TS | 307Ad | Mr. Ahrens |

* Offered on the Minneapolis campus.

f. offered by spec arr. ok Dr. Riley - Dean Freeman

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 11w,s | Advanced Beekeeping I ..... (3 cred., all; prereq., 9 or 10) | Ar | Ar | Ar | Mr. Tanquary |
| 12s | Advanced Beekeeping II ..... (3 cred.; all; prereq., 11) | Ar | Ar | Ar | Mr. Ahrens |
| 13su | Field Zoology ..... (1 cred.; no prereq.) | Given at Itasca Park | | | Mr. Dawson |
| 23f* | Introductory Entomology ..... (5 cred.; soph., jr., sr.; prereq., Zool. 14-15 or equiv.) | | | | |
| | Lect. | VI | MWF | 211Z | Mr. Mickel |
| | Lab. | VI, VII, VIII | TTh | 208Z | |
| 24f* | Introductory Parasitology ..... (5 cred.; soph., jr., sr.; prereq., Zool. 14-15 or equiv.) | VI, VII, VIII | MWF | 208Z | Mr. Riley |
| 37f-38w-39s* | General Entomology ..... (9 cred.; soph., jr., sr.; prereq., Zool. 9 cred.) | I, II | MWF | 208Z | Mr. Mickel |
| 117w-118s-119su* | General Ecology of Insects ..... (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.) | VI, VII, VIII | TTh | 401Z | Mr. Chapman |
| 125f-126w-127s* | Advanced General Entomology ..... (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.) | III, IV | TThS | 208Z | Mr. Mickel |
| 139f-140w* | Histology and Development of Insects (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.) | I, II and ar | TTh | 208Z | Mr. Riley |
| 144f,s-145w-146s* | Animal Parasites and Parasitism .... (3 to 9 cred.; jr., sr.; prereq., Zool. 9 cred.) | VI, VII, VIII | WF | 208Z | Mr. Riley |
| 175f | Insecticides and Their Action ..... (3 cred.; sr.; prereq., inorg. and org. chem.) | I | MWF | 302Ad | Mr. Strand |
| 176w-177s | Advanced Economic Entomology .... (6 cred.; sr.; prereq.. 3. 5, or 6, Zool. 117-118-119) | I | MWF | 302Ad | Mr. Ruggles |
| 195f,w,s,su | Introduction to Research ..... (5 or more cred.; sr.; prereq., 37-38-39 and other work as prescribed by the division) | Ar | Ar | Ar | Mr. Chapman, Mr. Riley, Mr. Ruggles, Mr. Tanquary, Mr. Mickel, Mr. Strand |

## FARM MANAGEMENT AND AGRICULTURAL ECONOMICS

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f | Principles of Economics I (Agriculture) ..... (3 cred.; soph., jr., sr.; no prereq.) | I | MWF | 302HH | Mr. Clarke |
| 1w | Principles of Economics I ..... (Same as 1f) | | | | |
| | Sec. 1 (Agriculture) | I | TThS | 108Da | Mr. Lowe |
| | 2 (Forestry) | III | TThS | 302HH | Mr. Clarke |

* Offered on the Minneapolis campus.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 2w | Principles of Economics II (Agriculture) | I | MTWThF | 302HH | Mr. Clarke |
| | (5 cred.; soph., jr., sr.; prereq., 1) | | | | |
| 2s | Principles of Economics II ..... | | | | |
| | (Same as 2w) | | | | |
| | Sec. 1 (Agriculture) | I | MTWThF | 302HH | Mr. Clarke |
| | 2 (Forestry) | II | MTWThF | 108Da | Mr. Lowe |
| 3f | Principles of Economics (Home Economics) ..... | | | | |
| | (5 cred.; soph., jr., sr.; no prereq.) | | | | |
| | Sec. 1 | II | MTWThF | 108Da | Mr. Lowe |
| | 2 | III | MTWThF | 108Da | Mr. Lowe |
| 3w,s | Principles of Economics (Home Economics) ..... | II(w) | MTWThF | 108Da | Mr. Lowe |
| | | III(s) | MTWThF | 108Da | Mr. Lowe |
| 7s | Natural Resources ..... | II | MWF | 312HH | Mr. Boss |
| | (3 cred.; jr., sr.; no prereq.) | | | | |
| 8s | Rural Economics ..... | III | TThS | 302HH | Mr. Jesness |
| | (3 cred.; soph., jr., sr.; prereq., 1 or 3) | | | | |
| 25f,w | Principles of Accounting ..... | | | | |
| | (4 cred.; soph., jr., sr.) | | | | |
| | Lect. | II(f) | MWF | 311HH | Mr. Ullyot |
| | | II(w) | TThS | 311HH | |
| | Sec. 1 Lab. | III, IV | S | 311HH | |
| | 2 | VIII, IX | W | 311HH | |
| 30f | Prices of Farm Products ..... | II | TThS | 302HH | Mr. Cox |
| | (3 cred.; jr., sr.; prereq., 2) | | | | |
| 40f,s | Principles of Marketing Organization | I(f) | MWF | 312HH | Mr. Cox |
| ★ | (3 cred.; soph., jr., sr.; prereq., 2) | II(s) | TThS | 312HH | Mr. Cox |
| 50s | Farm Finance ..... | I | MTWThF | 312HH | Mr. Johnson |
| | (5 cred.; soph., jr., sr.; prereq., 2) | | | | |
| 90f | Agricultural Statistics ..... | | | | |
| | (5 cred.; soph., jr., sr.; prereq., 2) | | | | |
| | Lect. | III | TThS | 312HH | Mr. Kittredge |
| | Lab. | Ar | Ar | | |
| 101s | Farm Management ..... | II | TThS | 311HH | Mr. Pond |
| | (3 cred.; jr., sr.; prereq., 2, Agron. 1) | | | | |
| 102f | Farm Management: Organization .... | | | | |
| | (3 cred.; sr.; prereq., 2, Agron. 1, Soils 4) | | | | |
| | Lect. | II | MW | 302HH | Mr. Garey |
| | Sec. 1 Lab. | VI, VII | T | 311HH | |
| | 2 | II, III | F | 302HH | |
| 102w | Farm Management: Organization .... | I | MW | 311HH | Mr. Garey |
| | (Same as 102) | VII, VIII | Th | 311HH | |
| 103w | Farm Management: Operation ..... | II | MW | 302HH | Mr. Garey |
| | (3 cred.; sr.; prereq., 102) | VI, VII | T | 311HH | |
| 103s | Farm Management: Operation ..... | I | MW | 311HH | Mr. Garey |
| | (Same as 103w) | VII, VIII | Th | 311HH | |
| ~~104s~~ | ~~Types of Farming ..... (3 cred.; sr.; prereq., 103)~~ | ~~III~~ | ~~MWF~~ | ~~311HH~~ | ~~Mr. Boss~~ |
| 110f-111w | Economics of Agricultural Production I and II ..... | I | TThS | 312HH | Mr. Johnson |
| | (6 cred.; jr., sr.; prereq., 2) | | | | |
| 126s | Economics of Consumption ..... | | | | |
| | (3 cred.; jr., sr.; prereq., 1 or 3) | | | | |
| | Sec. 1 | I | MWF | 109HH | Mr. Waite |
| | 2 | II | MWF | 109HH | |

★ 470. Mktg acct list II MWF. 311 H.H.
(4 cr soph. jr. sr. lab arrange
prereq. Ag. Econ 25.)

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 131w | Market Prices ..... (3 cred.; jr., sr.; prereq., 40) | III | TThS | 312HH | Mr. Waite |
| 135s | Methods of Price Analysis ..... (3 cred.; sr.; prereq., 30, 191) | III | TThS | 312HH | Mr. Waite |
| 140f | Marketing Organization: Staples .... (3 cred.; soph., jr., sr.; prereq., 40) | III | MWF | 312HH | Mr. Johnson |
| 141w | Marketing Organization: Dairy and Poultry Products ..... (3 cred.; jr., sr.; prereq., 40) | II | TThS | 312HH | Mr. Jesness |
| 142s | Marketing Organization: Fruits and Vegetables ..... (2 cred.; jr., sr.; prereq., 40) | III | MW | 312HH | Mr. Cox |
| 143w | Marketing Organization: Livestock and Meats ..... (2 cred.; jr., sr.; prereq., 40) | IV | TS | 312HH | Mr. Johnson |
| 144f | Co-operative Organization ..... (3 cred.; jr., sr.; prereq., 40) | II | TThS | 312HH | Mr. Jesness |
| 150s | Advanced Farm Finance ..... (3 cred.; jr., sr.; prereq., 50 or Econ. 3) | VI, VII½ | WF | 312HH | Mr. Johnson |
| 170s | Land Economics ..... (3 cred.; jr., sr.; prereq., 110) | VII, VIII½ | TTh | 302HH | Mr. Johnson |
| 191w | Advanced Agricultural Statistics ... (3 cred.; jr., sr.; prereq., 90) | IV | MWF | 312HH | Mrs. Kittredge |

For additional courses see Economics and the bulletin of the School of Business Administration.

## FORESTRY

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f | General Forestry ..... (3 cred.; no prereq.) | III | TThS | 102Hr | Mr. Cheyney |
| 2su | Field Dendrology ..... (1 cred.; no prereq.) | Given at Itasca Park | | | |
| 3w | Dendrology ..... (3 cred.; no prereq.) | III | MWF | 301Hr | Mr. Schmitz |
| 4s | Dendrology ..... (4 cred.; no prereq.) | | | | |
| | Lect. | III | MWF | 301Hr | Mr. Schmitz |
| | Lab. | II, III | S | 301Hr | Mr. Rees |
| 5su | Field Silviculture ..... (2 cred.; no prereq.) | Given at Itasca Park | | | Mr. Cheyney |
| 6su | Field Mensuration ..... (1 cred.; no prereq.) | Given at Itasca Park | | | Mr. Allison |
| 7f-8w | Forest Mensuration ..... (10 cred.; all; prereq., 9) | | | | |
| | Lect. | II | MWThF | 302Hr | Mr. Brown |
| | Sec. 1 Lab. | VII, VIII, IX | M | 302Hr | |
| | 2 | I, II, III | S | 302Hr | |
| 20w | Grazing ..... (3 cred.; soph., jr., sr.; no prereq.) | II | TThS | 301Hr | Mr. 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.‡) | IV | MWF | 301Hr | Mr. Cheyney |

† Arrangements for this course must be made in advance.
‡ Not open to students majoring in Forestry.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 28w | Logging ..... (3 cred.; jr., sr.; no prereq.) | III | MWF | 302Hr | Mr. Brown |
| 29f | Sawmill and Woodworking Machinery (3 cred.; soph., jr., sr.) | IV | MWF | 302Hr | Mr. Cheyney |
| 30s | Wood Seasoning ..... (3 cred.; jr., sr.; prereq., 33-34) | I | TThS | 301Hr | Mr. Rees |
| 31s | Logging Laboratory ..... (1 cred.; jr., sr.; no prereq.) | Given at Cloquet | | | Mr. Brown |
| 32f,w | Forest Reports ..... (2 cred.; soph., jr., sr.; no prereq.) | Ar | Ar | Ar | Mr. Cheyney |
| 33f-34w | Wood Structure and Identification .. (6 cred.; jr., sr.; prereq., 3-4) | VI, VII, VIII | WF | 303Hr | |
| 37s w. | Forest Protection ..... (3 cred.; jr., sr.; prereq., 127) | Given at Cloquet | | | Mr. Hansen |
| 48w | Forest Products ..... (3 cred.; no prereq.) | I | TThS | 301Hr | Mr. Allison |
| 50s | House and Furniture Woods ..... (2 cred.;‡ soph., jr., sr.; no prereq.) | III, IV | TS | 303Hr | Mr. Rees |
| 101w | Advanced Dendrology ..... (3 cred.; jr., sr.; prereq., 3-4) | I | MWF | 301Hr | Mr. Rees |
| 107f | Uses of Wood I ..... (3 cred.; sr.; prereq., 33-34) | IV | MWF | 301Hr | Mr. Rees |
| 108w | Uses of Wood II ..... (3 cred.; sr.; prereq., 33-34) | IV | MWF | 303Hr | Mr. Rees |
| 109s | Uses of Wood III ..... (3 cred.; sr.;§ prereq., 107, 108) | VI, VII, VIII | TTh | 303Hr | Mr. Rees |
| 111f-112w | Advanced Forest Mensuration ..... (6 cred.; sr.; prereq., 8) | Ar | Ar | Ar | Mr. Brown |
| 113f | Wood Pulp and Paper ..... (3 cred.; jr., sr.; prereq., 33-34, Chem. 3 or 10) | III | MWF | 301Hr | Mr. Allison |
| 114f-115w | Mechanical and Physical Properties of Wood ..... (6 cred.; sr.; prereq., 33-34) | I, II | TThS | 303Hr | Mr. Rees |
| 116s | Mechanical and Physical Properties of Wood ..... (3 cred.; sr.; prereq., 33-34) | I, II | MWF | 303Hr | Mr. Rees |
| 119w | Advanced Wood Structure ..... (3 cred.; sr.; prereq., 33-34) | VI, VII, VIII | TTh | 303Hr | Mr. Rees |
| 120s | Advanced Wood Structure ..... (3 cred.; sr.; prereq., 33-34) | VI, VII, VIII | WF | 303Hr | Mr. Rees |
| 122f-123w | Forestry Seminar ..... (2 cred.; sr.; no prereq.) | IX | W | 302Hr | Mr. Schmitz, Mr. Allison, Mr. Cheyney |
| 125s | Wood Preservation ..... (3 cred.; jr., sr.; prereq., 33-34) | IV | MWF | 301Hr | Mr. Schmitz |
| 126f | Silvics ..... (3 cred.; jr., sr.; no prereq.) | IV | TThS | 301Hr | Mr. Cheyney |
| 127w | Silviculture ..... (3 cred.; jr., sr.; prereq., 126) | III | TThS | 301Hr | Mr. Cheyney |
| 128s | Silviculture Laboratory ..... (7 cred.; jr., sr.; prereq., 127) | Given at Cloquet | | | Mr. Cheyney |
| 129f | American Silvicultural Practice ..... (3 cred.; jr., sr.; prereq., 127) | III | MWF | 302Hr | Mr. Cheyney |
| 130f | Forest Valuation ..... (5 cred.; jr., sr.; no prereq.) | I | MTWThF | 301Hr | Mr. Allison |

‡ Not open to students majoring in Forestry.
§ Open only to those majoring in Forest Products.

Ar. Reading Course

w. II, III,

May also program [illegible] arranged.
Mr. Cheyney. 10-1-30.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 131w | Forest Policy and Administration ... (5 cred.; jr., sr.; no prereq.) | IV | MTWFS | 302Hr | Mr. Allison |
| 132s | Forest Regulation Laboratory ..... (7 cred.; jr., sr.; prereq., 130) | Given at Cloquet | | | Mr. Allison |
| 134f-135w | Forest Problems ..... (4 cred.; sr. class) | Ar | Ar | Ar | Mr. Schmitz |
| 136f | Forest Economics ..... (3 cred.; jr., sr.; prereq., 131, Agr. Econ. 2) | II | MWF | 301Hr | Mr. Allison |
| 140f | Forest Working Plans ..... (3 cred.; sr.; prereq., 128, 132) | III | TThS | 301Hr | Mr. 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.) | | | | |
| | Lect. | I | WThFS | 210P | Mr. Thiel |
| | Sec. 1 Lab. | I, II | M | 212P | |
| | | II | WF | | |
| | 2 | VI, VII | MW | 212P | |
| 1f-3w*†‡ | General Geology ..... (Same as 1f-2w) | | | | |
| | Lect. | III | TThFS | 110P | Mr. Emmons |
| | Lab. | III, IV or | MW | 212P | |
| | | VI, VII | TTh | 212P | |
| 1w-2s*†‡ | General Geology ..... (Same as 1f-2w) | | | | |
| | Lect. | IV | MTWF | 110P | Mr. Dutton |
| | Lab. | VI, VII | TTh | 212P | |
| 1w-3s*†‡ | General Geology ..... (Same as 1f-2w) | | | | |
| | Lect. | II | MWFS | 206P | Mr. Dutton |
| | Lab. | I, II | TTh | 212P | Mr. Emmons |
| 1s-2f*†‡ | General Geology ..... (Same as 1f-2w) | | | | |
| | Lect. | III(s) | MWThF | 110P | Mr. 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 | Mr. Thiel |
| | 2 (w) | IV | MTWFS | 210P | |

* 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. Cannot be followed by Geol. 1 for credit.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 23w-24s* | Elements of Mineralogy ..... (8 cred.; soph., jr., sr.; prereq., course in chem.) | | | | |
| | Lect. (w) | II | WF | 110P | Mr. Gruner |
| | Rec. | VII | T | 110P | |
| | Sec. 1 Lab. | VII-VIII | WF | 100P | |
| | 2 | III-IV | TS | 100P | |
| | Lect. (s) | II | MWF | 206P | Mr. Gruner |
| | Rec. | IX | T | | |
| | Sec. 1 Lab. | VII-VIII | M | 100P | |
| | | VI-VII | T | | |
| | 2 | 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 Education ..... (5 cred.; jr., sr.; prereq., 6 cred. in psy.) | IV | MTWFS | 204Ed | Miss Alexander |
| 3f,w,s* | Educational Sociology ..... (3 cred.; jr., sr.; prereq., 6 cred. in psy.) | III | MWF | OLaAud | Mr. Finney |
| 5s | Public Education in the United States (3 cred.; jr., sr.; prereq., 6 cred. in psy.) | VIII | MWF | 203HE | Miss Alexander |

For additional courses see the bulletin of the College of Education.

## HOME ECONOMICS

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 3f | Textiles ..... (5 cred.; no prereq.) | | | | |
| | Sec. 1 | I, II | MWThFS | 311,307HE | Miss Weller, Miss Little |
| | (Limited to 24 each) 2 | III, IV | MTWFS | 311,307HE | Miss Little |
| 3w | Textiles ..... (Same as 3f) | | | | |
| | Sec. 1 | I, II | MTWThF | 311,307HE | Miss Weller, Miss Little |
| | (Limited to 24 each) 2 | III, IV | MTWFS | 311,307HE | Miss Little |
| 3s | Textiles ..... (Same as 3f) (Limited to 24) | I, II | MTWThF | 311,307HE | Miss 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 | Miss Weller, |
| | 2 (s) | VI, VII | MWF | 305HE | Miss Little |

see 2. III TF  W T. WF  II  F. S. Miss, Mc Neal. 22, 4 29

* Offered on the Minneapolis campus.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 11f,s | Clothing Planning and Construction. A (3 cred.; no prereq.) | | | | |
| | Sec. 1 | I, II | MWF | 304HE | Miss Gorham, Miss Little, Miss Sell |
| | (Limited to 24 each) 2 | I, II, III | ThS | 304HE | Miss Gorham, Miss Little |
| | 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, 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,s | Clothing Problems ..... (3 cred.; 3d qtr. fr., soph., jr.; prereq., 3, 51) | | | | |
| | (Limited to 30) Lect. | VI, VII | Th | 313HE | Miss Gorham |
| | Field trip | VI, VII, VIII, IX | T | 313HE | |
| 17w | Advanced Clothing ..... (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 24) | III, IV | MWF | 305HE | Miss Carlotta Brown, Miss Gorham |
| 17s | Advanced Clothing ..... (Same as 17w) (Limited to 24) | I, II | TThS | 305HE | Miss Carlotta Brown, Miss Gorham |
| 18f,s | Commercial Clothing Manufacture ... (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 15) | VI, VII, VIII | MWF | 305HE | Miss Gorham |
| 33w* | Home Management Problems for Social Workers ..... (3 cred.; jr., sr.; no prereq.) | VIII | MWF | 2OPh | Miss Studley |
| 34f,w | Home Management: Operation and Maintenance, Lectures ..... (3 cred.; jr., sr.; prereq., 83, Agr. Econ. 3 or parallel, H.E.Ed. 40 or parallel) | VIII | MWF | 203HE | Miss Studley |
| 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, 34 or parallel) | I and other hours | S | 213HE | Miss Studley |
| 44w | Home Economics Extension Work .. (3 cred.; sr.; prereq., H.E.Ed. 42, 49 or parallel) | V 4 consecutive hours to be arranged on T, W, Th, or F p.m. | MW | 213HE | Miss Newton, Miss Hadley |

* Offered on the Minneapolis campus.

Conv. 4-10-3

S Reserve I T.S.

16 s are bulletin notice.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 50f | Color and Design ..... | | | | |
| | (3 cred.; no prereq.) | | | | |
| | Sec. 1 | I, II | MWF | 402HE | Miss Topp |
| | (Limited to | | | | |
| | 20 each) 2 | I, II, III | ThS | 402HE | Miss Segolson |
| | 3 | III, IV | MWF | 402HE | Miss Segolson |
| 50w | Color and Design ..... | | | | |
| | (Same as 50f) | | | | |
| | Sec. 1 | III, IV | MWF | 402HE | Miss Segolson |
| | (Limited to | | | | |
| | 20 each) 2 | I, II | TThS | 402HE | Miss Segolson |
| 50s | Color and Design ..... | | | | |
| | (Same as 50f) | | | | |
| | Sec. 1 | I, II | MWF | 402HE | Miss Topp |
| | (Limited to | | | | |
| | 20 each) 2 | VI, VII | MWF | 402HE | Miss Topp |
| 51f | Color and Design ..... | | | | |
| | (3 cred.; all; 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 ..... | | | | |
| | (Same as 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 ..... | | | | |
| | (Same as 51f) | | | | |
| | Sec. 1 | VI, VII, VIII | TTh | 402HE | Miss V. Goldstein |
| | (Limited to | | | | |
| | 20 each) 2 | I, II | MWF | 401HE | Miss V. Goldstein |
| 53f | Advanced Design ..... | VI, VII | MWF | 402HE | Miss H. Goldstein |
| | (3 cred.; soph., jr., sr.; prereq., 51 or 56) | | | | |
| | (Limited to 20) | | | | |
| 53w | Advanced Design ..... | | | | |
| | (Same as 53f) | | | | |
| | Sec. 1 | VI, VII | MWF | 402HE | Miss H. Goldstein |
| | (Limited to | | | | |
| | 20 each) 2 | I, II | MWF | 402HE | |
| 53s | Advanced Design ..... | | | | |
| | (Same as 53f) | | | | |
| | Sec. 1 | I, II | TThS | 402HE | Miss Segolson |
| | 2 | III, IV | MWF | 402HE | Miss Segolson |
| 55f | Decorative Needlework and Other Crafts ..... | VI, VII, VIII | TTh | 401HE | Miss Morse |
| | (3 cred.; prereq., 53 or parallel) | | | | |
| | (Limited to 20) | | | | |
| 56f | Applications of Color and Design ... | VI, VII, VIII | TTh | 402HE | Miss H. Goldstein |
| | (3 cred.;† no prereq.) | | | | |

† Intended for students in Science, Literature, and the Arts. Open to students in Home Economics only by permission of chief of division.

Dana 10-17-32

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 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 | Miss King |
| 61f,s | Quantity Cookery ..... (4 cred.; 3d qtr. soph., jr., sr.; prereq. 83) | | | | |
| | (Limited to 12) Lect. | I | S | 106HE | Miss King |
| | Lab. | I, II, III | TTh | DiH | |
| 61w | Quantity Cookery ..... (Same as 61f,s) | | | | |
| | Lect. | I | S | 106HE | Miss King |
| | Sec. 1 Lab. | I, II, III | TTh | DiH | |
| | (Limited to 12) 2 | VI, VII, VIII | MW | DiH | |
| 63f,w,s | Institution Experience ..... (3 cred.; 3d qtr., soph., jr., sr.; prereq., 83) | | | | |
| | Lect. | III | T(f,s) Th(w) | Ar | Miss Dunning |
| | (Limited to 12) Lab. | IV, V | MWF | Ar | |
| 65w | Institution Equipment ..... (2 cred.; jr., sr.; prereq., 61 or parallel, 63 or parallel) | | | | |
| | Lect. | IX | W | | Miss Hunt |
| | Lab. | VI, VII, VIII | F | | |
| 70f | Nutrition Survey ..... (2 cred.; all;¶ no prereq.) (Limited to 60) | IV | WF | 203HE | Miss Biester |
| 70w | Nutrition Survey ..... (Same as 70f) (Limited to 60) | III | TTh | 213HE | Miss Dinsmore |
| 70s* | Nutrition Survey ..... (Same as 70f) (Limited to 60) | VI | TTh | Ar | Miss Biester |
| 73f | Nutrition I ..... (4 cred.; soph.,§ jr., sr.; prereq., Agr. Biochem. 4, H.E. 80 or 81, Physiol. 4) (Limited to 24) | III, IV | MTWF | 211,213HE | Miss Dinsmore |
| 73s | Nutrition I ..... (Same as 73f) (Limited to 24) | VI, VII, VIII | MWF | 211, 213HE | Mrs. Furnas |
| 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 Dinsmore |
| 79s | Selected Problems for Dietitians .... (3 cred.; sr.; prereq., 170 or equiv.) | II | MWF | 313HE | Miss Biester |
| 80f | Foods and Cookery ..... (5 cred.; prereq., Agr. Biochem. 3, parallel 4) | I, II | MTWThF | 209HE | Mrs. Niles |

* Offered on the Minneapolis campus.

§ Open to sophomores only in their third quarter.

¶ Open to juniors and seniors in home economics only with consent of instructor.

| 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 | 209HE | Miss Hovlid, Mrs. Niles |
| 81w | Foods and Cookery ..... (3 cred.; soph., jr., sr.; by examination; prereq., same as 80f) (Limited to 20) | I, II | MWF | 207HE | Mrs. Niles |
| 83f,w | Food Management ..... (3 cred.; soph., jr., sr.; prereq., 70, 80 or 81, 85 or parallel) (Limited to 20) | III, IV | MWF | 203,207HE | Mrs. Niles |
| 83s | Food Management ..... (Same as 83f,w) | | | | |
| | Sec. 1 | III, IV | MWF | 203,207HE | Mrs. Niles |
| | (Limited to 20 each) 2 | VII, VIII | MWF | 203,207HE | Mrs. Niles |
| 85f,w | Food Marketing ..... (2 cred.; prereq., 80 or 81, Agr. Econ. 3 or parallel) | VI<br>VI, VII, VIII | T<br>Th | 207,203HE | Miss Hovlid |
| 85s | Food Marketing ..... (Same as 85f,w) | | | | |
| | Sec. 1 | VI<br>VI, VII, VIII | T<br>Th | 207,203HE | Miss Hovlid |
| | 2 | VI<br>VI, VII, VIII | M<br>W | 207,203HE | |
| 89s | Camp Cookery ..... (2 cred.; no prereq., not open to students in H.E.) (Limited to 20) | VI, VII | TTh | 105HE | Miss Child |
| 102f,s | Advanced Textiles ..... (3 cred.; jr., sr.; prereq., 3, Agr. Biochem. 3-4, Agr. Econ. 3 or parallel) (Limited to 16) | VI, VII, VIII | TTh | 307,311HE | Miss Phelps |
| 107w | Textile Analysis and Related Problems (3 cred.; jr., sr.; prereq., 102, Agr. Biochem. 2) | VI, VII, VIII | MWF | 311HE | Miss Phelps |
| 115f,w | Clothing Economics ..... (2 cred.; jr., sr.; prereq., 15 or equiv., Ag. Econ. 3) | III | TTh | 203HE | Miss Weller |
| 131f | Home Management: House Planning and Equipment ..... (5 cred.; jr., sr.; prereq., 53) (Limited to 20) | III, IV | MTWFS | 401HE | Miss Morse |
| 131w | Home Management: House Planning and Equipment ..... (Same as 131f) (Limited to 20) | VI, VII | MTWThF | 401HE | Miss Morse |
| 131s | Home Management: House Planning and Equipment ..... (Same as 131f) | | | | |
| | Sec. 1 | III, IV | MTWFS | 401HE | Miss Morse |
| | (Limited to 20 each) 2 | VI, VII | MTWThF | 401HE | |

2 sect. (6 wks each) I II T.Th.S.



| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 136 | Problems in Income Management ... (3 cred.; sr.; prereq., 34, 35, 170, Agr. Econ. 126 or parallel) | VIII | MWF | 112HE | Miss Studley |
| 150f,w,s | Art History and Appreciation ..... (3 cred.; jr., sr.; prereq., 51) | VIII | MWF | 313HE | Miss H. Goldstein |
| 152w | Advanced Interior Design ..... (3 cred.; jr., sr.; prereq., 53, 131, 150) | I, II | MWF | 401HE | Miss Morse |
| 154s | Advanced Costume Design ..... (3 cred.; jr., sr.; prereq., 13, 53, 55 recommended) | I, II | TThS | 401HE | Miss H. Goldstein |
| Cancel. 9-30-31 ~~156f,w,s~~ | ~~Hospital Social Service ..... (3 cred.; jr., sr.; prereq., 170 or parallel, 175) (Limited to 8)~~ | ~~VI, VII, VIII~~ | ~~TTh~~ | ~~Ar~~ | ~~Miss Tebbets, Miss Dinsmore, Miss Hunt~~ |
| Divided into H.E 178 & 71 | | ~~3 hrs. to be arranged~~ | | | |
| 163s | Institution Management Problems ... (3 cred.; sr.; prereq., 61, 63) | | | | |
| | Lect. | III | TTh | 106HE | Miss Dunning |
| | Lab. | III, IV | S | DiH | |
| 170f,s | Nutrition of the Family..... (3 cred.; jr., sr.; prereq., 70, 80 or 81, Agr. Biochem. 4, Physiol. 4) | | | | |
| | Sec. 1 | I | MWF | 313HE | Mrs. Furnas |
| | (Limited to 25 each) 2 | III | MWF | 313HE | Miss Dinsmore |
| 170w | Nutrition of the Family..... (Same as 170f,s) (Limited to 25) | I | MWF | 313HE | Mrs. Furnas |
| 171f,w,s | Child Nutrition ..... (3 cred.; jr., sr.; prereq., 170, H.E. Ed. 40) (Limited to 25) | | | | |
| | Lect. | III | MW | 213HE | Miss Leichsenring, Miss Dinsmore |
| | Lab. | III, IV | F | 213HE | |
| | | IV | Ar before completing registration | | |
| 173s | Nutrition in Disease ..... (3 cred.; sr.; prereq., 170, 175) | I | 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 | Mrs. Furnas |
| 176w | Advanced Nutrition ..... (4 cred.; jr., sr.; prereq., 73, Agr. Biochem. 2) (Limited to 12) | | | | |
| | Lect. | I | T | 313HE | Miss Biester |
| | Lab. | II, III, IV | TS | 311HE | Mrs. Furnas |
| | | I, II, III | Th | 311HE | |
| w. limit 12 ok. 177s | Digestion and Metabolism ..... (3 cred.; sr.; prereq., 175, Agr. Biochem. 2) (Limited to 6) | VI, VII, VIII | TTh | 213HE | Miss Leichsenring |

178 f, w, s, Clinical Problems in Nutr. lect ~~VI~~ I.
(2 cr, fr, sr, prerq. H.E. 170. lab, ~~VI VII VIII~~
175, 71 or parallel
Limit 8, Miss Hunt

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 179w | Readings in Nutrition ..... (2 cred.; jr., sr.; prereq., 170) | IV | MW | 213HE | Mrs. Furnas |
| 179s | Readings in Nutrition ..... (Same as 179w) | I | TTh | 213HE | Mrs. Furnas |
| 182f,w,s | Experimental Cookery ..... (3 cred.; jr., sr.; prereq., 80) (Limited to 12) | VI, VII | MWF | 107HE | Miss Child |
| 186f,s | Special Food Problems ..... (3 cred.; sr.; prereq., 182) | (f) ~~I, II, III~~ (s) VI, VII, VIII | TTh<br>TTh | 107HE<br>107HE | Miss Child |
| 187f,s | Special Food Problems ..... (5 cred.; sr.; prereq., 182, Agr. Biochem. 2) | (f) I, II, III<br>4 hrs. to be arranged<br>(s) VI, VII, VIII<br>4 hrs. to be arranged | TTh<br><br>TTh | 107HE<br><br>107HE | Miss Child |
| 195s | Home Economics Survey ..... (2 cred.; sr.; no prereq.) | Ar | Ar | Ar | Miss McNeal |

## 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 | Mrs. Foster |
| 40w* | Child Training ..... (Same as 40f.s) | IV | MWF | 202OLa | Mrs. Foster |
| 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 | Miss Rose |
| 49f,w,s† | Observation and Teaching: General Home Economics ..... (8 cred.; sr.; prereq.,‡ 42) | | | | |
| | Lect. | IX | TTh | 213HE | Miss Rose |
| | Teaching | Ar | Ar | Ar | Miss Rose and others |
| 141f | Vocational Education in Home Economics ..... (2 cred.; sr.; prereq., 42) | Ar | Ar | Ar | Miss Clara Brown, Miss Rose |
| 142f | Educational Measurements in Home Economics ..... (2 cred.; sr.; prereq., 42, Ed. Psy. 55 or Agr. Educ. 11) | VIII | TTh | 213HE | Miss Clara Brown |
| 142w, S. | Educational Measurements in Home Economics ..... (Same as 142f) | VII | TTh | 213HE | Miss Clara Brown |
| 143f,w,s | Home Economics Curricula ..... (2 cred.; jr., sr.; prereq., 42 or parallel) | VIII | TTh | 106HE | Miss Clara Brown, Miss Rose |

* 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.

142 A. VII T.Th.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 147w | Organization and Methods for Related Art Teaching ..... (3 cred.; jr., sr.; prereq., 42 or parallel; H.E. 53, 131 or parallel) | III | TThS | 313HE | Miss H. Goldstein |
| 149f,w,s | Research Problems ..... (Cred. ar.; sr; permission of instructor) | Ar | Ar | Ar | Miss McNeal, Miss Clara Brown |

## HORTICULTURE

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 6f | Fruit Growing ..... (3 cred.; no prereq.) Lect. | II | MW | 102Hr | Mr. Alderman |
| | (Laboratory sections limited to 20 each) Sec. 1 Lab. | I, II | F | 8Hr | Mr. Brierley, Mr. Angelo |
| | 2 | VII, VIII | M | 8Hr | |
| 32s | Vegetable Growing ..... (3 cred.; no prereq.) Lect. | II | MW | 102Hr | Mr. Krantz |
| | (Limited to 30) Lab. | I, II | F | 8Hr | Mr. Hutchins |
| 50s | Floriculture ..... (3 cred.; no prereq.) | III | MWF | 8aHr | Mr. Longley, Mr. Sando |
| 56w | Plant Propagation and Nursery Practice ..... | I | TTh | 8aHr | Mr. Longley |
| | (3 cred.; jr., sr.; prereq., Bot. 9 cred.) | I, II | S | 8Hr | Mr. Longley, Mr. Sando |
| 71f | Elementary Landscape Design and Plant Materials ..... | II | Th | 107Hr | Mr. Longley |
| | (3 cred.; prereq., Bot. 9 cred.) | I, II | TS | 107Hr | |
| 72s | Woody Plants and Garden Flowers | ~~IV~~ I | T | 107Hr | Mr. Longley |
| | (2 cred.; prereq., Bot. 9 cred.) | ~~III, IV~~ I-II | S | 107Hr | |
| 74w | Principles of Landscape Design .... | VIII | T | 107Hr | Mr. Longley |
| | (3 cred.; jr., sr.; prereq., 71, Arch. 21 or Agr. Eng. 3) | VI, VII | TTh | 107Hr | |
| 75f,w,s | Landscape Problems ..... | Ar | Ar | Ar | Mr. Longley |
| 76s | Landscape Construction ..... | III | T | 107Hr | Mr. Longley |
| | (3 cred.; sr.; prereq., 71) | VI, VII | TTh | 107Hr | |
| 93f | Judging Horticultural Crops ..... (2 cred.; soph., jr., sr.; prereq., 6 or 32) | VI, VII, VIII | M | 8aHr | Mr. Brierley, Mr. Krantz, Mr. Longley |
| 107f | Orchard Management ..... | IV | TS | 103Hr | Mr. Brierley |
| | (3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.) | VI, VII | W | 8Hr | |
| 110w | Horticultural Crop Breeding ..... (3 cred.; jr., sr.; prereq., Agron. 131) | III | TThS | 106Hr | Mr. Wilcox |
| 111f | Systematic Pomology ..... (3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.) | VI, VII, VIII | TTh | 8aHr | Mr. Brierley |
| 121w | Small Fruit Culture ..... (3 cred.; soph., jr., sr.; prereq., 6 or 32, Bot. 9 cred.) | I | MWF | 102Hr | Mr. Brierley |
| 135f | Truck Crops and Potatoes I ..... (3 cred.; jr., sr.; prereq., 32, Bot. 9 cred.) | Ar | Ar | Ar | Mr. Currence |

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 137f | Truck Crops and Potatoes II ..... (3 cred.; jr., sr.; prereq., 32, Bot. 9 cred.) | Ar | Ar | Ar | Mr. Krantz |
| 190f-191w-192s | Special Problems ..... (6-12 cred.; jr., sr.; prereq., instructor's permission) | Ar | Ar | Ar | Mr. Alderman and staff |
| 193f-194w-195s | Horticultural Seminar ..... (3 cred.; jr., sr.; prereq., 9 cred.) | Ar | Ar | Ar | Horticultural staff |

## INORGANIC CHEMISTRY

### SCHOOL OF CHEMISTRY

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f-2w* | General Inorganic Chemistry ..... (8 cred.; no prereq.) | | | | |
| | Lect. | VII | MWF | 100C | Mr. Pervier |
| | Lab. | VIII, IX | MW | 210C | |
| 3s* | General Inorganic Chemistry ..... (4 cred.; prereq., 1-2) | | | | |
| | Lect. | VII | MF | 325C | Mr. Pervier |
| | | IV | S | 325C | |
| | Lab. | VIII, IX | MF | 210C | |
| 9f-10w* | General Inorganic Chemistry ..... (10 cred.; prereq., 1 yr. h. s. chem.) | | | | |
| | Lect. | VII | MWF | 225C | Mr. Reyerson |
| | Lab. | VIII, IX | MWF | 110C | |

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 ..... (4 cred.; all; prereq., 1 yr. elem. alg.) | III | MWThF | 133Ph | Ar |
| 3w* | Higher Algebra, Short Course ..... (Same as 3f) | IV | MTWF | 206OLa | Ar |
| 4f* | Trigonometry, Short Course ..... (4 cred.; all; prereq., 3 or 5, or prep. higher alg.) | II | MTWF | 206OLa | Ar |
| 4w* | Trigonometry, Short Course ..... (Same as 4f) | III | MWThF | 133Ph | Ar |
| 4s* | Trigonometry, Short Course ..... (Same as 4f) | IV | MTWF | 206OLa | Ar |
| 5f* | Higher Algebra ..... (5 cred.; all; prereq., 1 yr. elem. alg.) | | | | |
| | Sec. 1 | II | MWThFS | 133Ph | Ar |
| | 2 | VI | MTWThF | 166Ph | Ar |
| 5w* | Higher Algebra ..... (Same as 5f) | VI | MTWThF | 166Ph | Ar |
| 5s* | Higher Algebra ..... (Same as 5f) | I | MWThFS | OPhAud | Ar |

* Offered on the Minneapolis campus.

| 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 | 206OLa | 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 enrolment in R.O.T.C.) | V, VI | MWF | A | Ar |
| | | soph freshmen. | | | |
| .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 | MWF | A | Ar |
| | | III | MWF | A | Ar |
| | | VI | MWF | A | 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) (Additional 2-hour period to be arranged) | VII, VIII, IX | T or W | A | Ar |
| :54f-55w* | Second Year Advanced Course .... (6 cred.; sr.; prereq., 51-52-53) | II | MWF | A | Ar |
| | | III | MWF | A | Ar |
| | (Additional 2-hour period to be arranged for each section) | VI | MWF | A | Ar |
| | | VIII | MWF | A | Ar |
| :56s* | Second Year Advanced Course ..... (3 cred.; sr.; prereq., 54-55) (Additional 2-hour period to be arranged) | VII, VIII, IX | T or W | A | Ar |

* 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 | 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 | |
| 4f* | Freshman Hygiene ..... (Cred.†) | IV | T | 202S | |
| 7f-8w-9s* | Advanced Leaders ..... (3 cred.; soph., jr., sr.; prereq., 1-2-3) | | | | |
| | Lect. | IV | T | 206A | Mr. 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 .... | I | MWF | 206A | Dr. Cooke |

For additional courses see the bulletin of the College of Education.

## PHYSICAL EDUCATION FOR WOMEN

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f | Freshman Physical Education ..... (1 cred.; required of all students; no prereq.) | | | | |
| | Sec. 1 Lect. | I | W | 201WGm | Ar |
| | 2 | II | T | 201WGm | Ar |
| | 3 | II | Th | 201WGm | Ar |
| | 4 | III | Th | 201WGm | Ar |
| | 5 | IV | M | 201WGm | Ar |
| | 6 | IV | T | 201WGm | Ar |
| | 7 | VI | W | 201WGm | Ar |
| | 8 | VI | Th | 201WGm | Ar |
| | Sec. 1 Lab. | II | MWF | 3,151,153WGm | Ar |
| | 2 | III | MWF | 3,151,153WGm | Ar |
| | 3 | III | TThS | 3,151,153WGm | Ar |
| | 4 | IV | MWF | 3,151,153WGm | Ar |
| | 5 | VI | MWF | 3,151,153WGm | Ar |
| | 6 | VIII | MWF | 3,151,153WGm | Ar |

* 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.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 2w† | Freshman Physical Education ..... | | | | |
| | (Same as 1f) | | | | |
| | Sec. 1 Lab. | II | MWF | 3,151,153WGm | Ar |
| | 2 | III | MWF | 3,151,153WGm | Ar |
| | 3 | III | TThS | 3,151,153WGm | Ar |
| | 4 | IV | MWF | 3,151,153WGm | Ar |
| | 5 | VI | MWF | 3,151,153WGm | Ar |
| | 6 | VIII | MWF | 3,151,153WGm | Ar |
| 3s† | Freshman Physical Education ..... | | | | |
| | (Same as 1f) | | | | |
| | Sec. 1 Lab. | II | MWF | 3,151,153WGm | Ar |
| | 2 | III | MWF | 3,151,153WGm | Ar |
| | 3 | III | TThS | 3,151,153WGm | Ar |
| | 4 | IV | MWF | 3,151,153WGm | Ar |
| | 5 | VI | MWF | 3,151,153WGm | Ar |
| | 6 | VIII | MWF | 3,151,153WGm | Ar |
| 4s | Preliminary Hygiene (for nurses and transfer students) ..... | II | T | 206OLa | Ar |
| | (No cred.; no prereq.) | | | | |
| 7f,8w† | Sophomore Gymnastics ..... | IV | TS | 153WGm | Ar |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| 9s | Sophomore Archery ..... | | | | |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | II | MW | 151WGm | Ar |
| | 2 | IV | TS | | Ar |
| 10f-11w† | Sophomore Orthopedic and Individual Gymnastics ..... | | | | |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | II | MW | 3WGm | Ar |
| | 2 | IV | TS | 3WGm | Ar |
| | 3 | VI | TTh | 3WGm | Ar |
| 12s | Sophomore Orthopedic and Individual Gymnastics ..... | IV | TS | 3WGm | Dr. Tolg |
| | (Same as 10f-11w) | | | | |
| 13f-14w-15s‡ | Sophomore Natural Dancing ..... | VI | TTh | 151WGm | Miss Timberman |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| 13f,s | Sophomore Natural Dancing ..... | II | TTh | 151WGm | Miss Timberman |
| | (Same as 13f-14w-15s) | | | | |
| 16f,17w† | Sophomore Games and Folk Dancing | I | WF | 151WGm | Miss Dickson |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| 18s | Tennis ..... | | | | |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | I | TTh | 151WGm | Ar |
| | 2 | IV | TS | 151WGm | Ar |
| | 3 | VI | TTh | 151WGm | Ar |
| | 4 | VII | WF | 151WGm | Ar |
| | 5 | VIII | TTh | 151WGm | Ar |
| 19f | Sophomore Hockey ..... | | | | |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | V | MW | 151WGm | Ar |
| | 2 | VII | WF | 151WGm | Ar |
| | 3 | VIII | TTh | 151WGm | Ar |

† Students may enter any quarter.
‡ The spring quarter is not open to students who have not had the previous quarter.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 20w | Sophomore Basket-Ball ..... | | | | |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | V | MW | 151WGm | Ar |
| | 2 | VII | WF | 151WGm | Ar |
| | 3 | VII (3:00) | TTh | 151WGm | Ar |
| | 4 | VIII | TTh | 151WGm | Ar |
| 21s | Sophomore Baseball ..... | | | | |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | V | MW | 151WGm | Ar |
| | 2 | VII | WF | 151WGm | Ar |
| 22f,s-23w§‡ | Sophomore Elem. Swimming ..... | | | | |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | II | TTh | 51WGm | Miss Starr |
| | 2 | III | MW | 51WGm | and others |
| | 3 | IV | TS | 51WGm | |
| | 4 | IV | MW | 51WGm | |
| | 5 | VII | TTh | 51WGm | |
| | 6 | VIII (3:30) | TTh | 51WGm | |
| | 7 | VIII½ (4:00) | TTh | 51WGm | |
| 22f,w,s | Sophomore Elem. Swimming ..... | VII | MW | 51WGm | |
| | (Same as 22f,s-23w) | | | | |
| 24f,s‖ | Sophomore Horseback Riding ..... | | | | |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | VIII | TTh | Ar | Miss Starr |
| | 2 | IX | TTh | Ar | |
| 25f,s-26w§¶ | Sophomore Intermed. Swimming .... | | | | |
| | (No cred., soph.; prereq., 1-2-3 elementary swimming test) | | | | |
| | Sec. 1 | III | TTh | 51WGm | Ar |
| | 2 | VIII½ (4:00) | MW | 51WGm | Ar |
| | 3 | VI | MW | 51WGm | Ar |
| 27f** | Sophomore Golf—Advanced ..... | VI | TTh | Ar | Miss Kissock |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| 27s** | Sophomore Golf—Elementary ..... | | | | |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | I | TTh | Ar | |
| | 2 | II | TTh | Ar | |
| | 3 | II | MW | Ar | |
| 28f,s-29w§¶ | Sophomore Advanced Swimming ... | VIII | MW | 51WGm | Miss Starr |
| | (No cred.; soph.; prereq., 1-2-3, inter. swim. test) | | | | |
| 30s | Sophomore Life Saving and Water Sports ..... | IX | MW | 51WGm | Miss Starr |
| | (No cred.; soph.; prereq., 1-2-3, Adv. swim. test) | | | | |
| 31w†† | Sophomore Skating ..... | | | | |
| | (No cred.; soph.; prereq., 1-2-3) | | | | |
| | Sec. 1 | II | TTh | Ar | |
| | 2 | VII | WF | Ar | |

‡ The spring quarter is not open to students who have not had the previous quarter.

§ Winter quarter is not open to students who have not had the previous quarter.

¶ No student may register for more than two quarters of swimming without permission. Course 22 is never closed for registration.

‖ 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.

** 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 fifty minutes in length, since weather and ice conditions will cause omissions at times.

## 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 | Dr. Lyon, Dr. 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<br>IV | TThS<br>M | 214MH | |
| 59s* | Human Physiology ..... (6 cred.; jr., sr.; prereq., same as 57) | | | | |
| | Lect. | I<br>IV | TThS<br>MF | 310MH | Dr. Lyon, Dr. King, Dr. Loucks, and others |
| | Lab. | II, III, IV | T | | |
| | Quiz | II | T | | |
| 60s | Physiology of Exercise ..... (4 cred.; jr., sr.; prereq., 4) | | | | |
| | Lect. | I | TThS | | |
| | Lab. | VI, VII, VIII | W | | |
| 100w-101s* | Physiologic Chemistry ..... (10 cred.; jr., sr.; prereq., org. chem., phys.) (Div. A and B primarily for medical students) | | | | |
| | Lect. | IV | MWF | | Dr. McClendon, Dr. Rufe, and others |
| | Lab. Div. A | I, II, III | TTh | 310MH | |
| | 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 | Mr. Stakman, Mr. Forbes, Mr. Rodenhiser |
| 7w-8s | Weeds and Grasses ..... (6 cred.; soph., jr., sr.; prereq., Bot. 9 cred.) | III<br>IV | TThS<br>TS | 100PP<br>100PP | Mr. Larson |
| 9f | Weeds and Seed Testing ..... (3 cred.; soph., jr., sr.; prereq., Bot. 9 cred.) | III<br>IV | TThS<br>TS | 100PP<br>100PP | Mr. Larson |
| 10f | Forest Pathology ..... (5 cred.; soph., jr., sr.; prereq., Bot. 9 cred.) | VII, VIII, IX | MWF | 106,107PP | Mr. Stakman, Mr. Verrall |
| 10s | Forest Pathology ..... (Same as 10f) | I<br>I, II | MWF<br>TThS | 107PP<br>106,107PP | Mr. Verrall, Mr. Kaufert, Mr. C. Christensen |
| 12w | Seed Problems ..... (3 cred.; jr., sr.; prereq., 9) | Ar | Ar | Ar | Mr. Larson |

* Offered on the Minneapolis campus.

2-5 cr. (2 cr. for lecture only. Dr. Dean & Freeman. 10-3-30.



| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 105f-106w-107s | Mycology ..... (9 cred.; jr., sr.; prereq., 1, 10, or equiv.) | Ar | Ar | Ar. | Mr. Freeman, Miss Dosdall |
| 110w | Principles of Pathology ..... (4 cred.; jr., sr.; prereq., 1 or 10, Bact. 41) | III, IV | MWF | 106,107PP | Mr. Stakman, Mr. Rodenhiser |
| 111w | Diseases of Cereal Crops ..... (3 cred.; jr., sr.; prereq., 1 or 10) | VI, VII | MWF | 106,107PP | Mr. Christensen |
| 112s | Diseases of Fruit Crops ..... (3 cred.; jr., sr.; prereq., 1 or 10) | VI, VII | MWF | 106,107PP | Mr. Leach |
| 113 | Diseases of Vegetable Crops ..... (3 cred.; jr., sr.; prereq., 1 or 10) | Not offered in 1930-31 | | | |
| 114 | Advanced Forest Pathology ..... (3 cred.; jr., sr.; prereq., 1 or 10) | Not offered in 1930-31 | | | |
| 116f | Pathologic Histology ..... (3 cred.; jr., sr.; prereq., 1 or 10) | III, IV | MWF | 106,107PP | Mr. Leach |
| 117 | Diseases of Forage and Fiber Crops (3 cred.; jr., sr.; prereq., 1 or 10) | Not offered in 1930-31 | | | |
| 118 | Bacterial Diseases of Plants ..... (3 cred.; jr., sr.; prereq., 1 or 10) | Not offered in 1930-31 | | | |
| 119s | Principles of Plant Disease Control .. (3 cred.; jr., sr.; prereq., 1 or 10) | Ar | Ar | Ar | Mr. Rodenhiser |
| 160w | Plant Microchemistry ..... (3 or 5 cred.; sr.; prereq., org. chem. or phytochem.) | Ar | Ar | Ar | Mr. Harvey, Mr. Larson |
| 161w | Transport, Storage, and Ripening of Fruits and Vegetables ..... (3 cred.; sr.; prereq., plant physiol. 5 cred.) | Ar | Ar | Ar | Mr. Harvey |

## POULTRY HUSBANDRY

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1f,w | Poultry ..... (3 cred.; no prereq.) | VI | MWF | 102Ve | Mr. Smith |
| 2w | Poultry Judging ..... (3 cred.; prereq., 1) | VI, VII, VIII | TTh | 102Ve | Mr. Smith |
| 4s | Incubating and Brooding ..... (3 cred.; no prereq.) | VI | MWF | 102Ve | Mr. Smith |
| 5s | Advanced Poultry Judging ..... (3 cred.; prereq., 2) | VI, VII, VIII | TTh | 102Ve | Mr. Smith |
| 6s | Poultry Problems ..... (1 cred.; jr., sr.; prereq., 1) | Ar | Ar | Ar | Mr. Smith |
| 101w | Advanced Poultry Breeding ..... (3 cred.; jr., sr.; prereq., 2, Agron. 131) | Ar | Ar | Ar | Mr. Hutt |

## 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.) | | | | |
| | Sec. 1, 2 | IV | TS | Ar | Dr. Boynton, |
| | 3 (men) | IX | TTh | Ar | Dr. Lees, and others |

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* Offered on the Minneapolis campus.

| 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 | Dr. Boynton |
| | Sec. 1 Lab. | VI, VII | TTh | WH | Miss Fisher |
| | 2 | VI, VII | MF | WH | |
| | 3 (s only) | III, IV | TS | WH | |
| 57s* | Health of Infant and Pre-school Child (2 cred.; jr., sr.; prereq., Zool. 1-2, Psy. 1-2, or 50, or 53) | III | TTh | Ar | |
| 80w* | Health Supervision of the School Child ..... (3 cred.; jr., sr.; prereq., 50, 52 or 53) | II | MWF | Ar | Dr. 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 | Mr. Elliott |
| | 2 | III | MWF | OLAud | |
| 1w-2s* | General Psychology ..... (Same as 1f-2w) (Limited to 40) | IX | MWF | Psy115 | |

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 | Mr. Kirkwood |
| 19w | Publicity ..... (3 cred.; soph., jr., sr.; prereq., Journ. 13-14-15) | I | TThS | 105En | Mr. 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 | Miss Thurston |
| | 2 | II | MWF | 310En | Miss Thompson |
| | 3 | III | MWF | 310En | Miss Thompson |
| | 4 | IV | MWF | 308En | Miss Thurston |
| | 5 | III | TThS | 308En | Miss Thurston |
| | 6 | I | MWF | 310En | Miss Thompson |
| | 7 | II | MWF | 308En | Miss Thurston |
| 1w | Rhetoric I ..... (Same as 1f) (Limited to 35) | VI | MWF | 311En | |

* Offered on the Minneapolis campus.

† The full course must be completed before credit will be given.

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 1s | Rhetoric I ..... | III | TThS | 307En | Mr. Lansing |
| | (Same as 1f) | | | | |
| 2w | Rhetoric II ..... | | | | |
| | (3 cred.; prereq., 1) | | | | |
| | (Limited to 35 each) | | | | |
| | Sec. 1 | II | MWF | 310En | Miss Thompson |
| | 2 | III | TThS | 308En | Miss Thurston |
| | 3 | II | TThS | 310En | Miss Thompson |
| | 4 | III | MWF | 310En | Miss Thompson |
| | 5 | I | MWF | 308En | Miss Thurston |
| | 6 | IV | MWF | 308En | |
| 2s | Rhetoric II ..... | II | TThS | 308En | Miss Thurston |
| | (Same as 2f) | | | | |
| | (Limited to 35) | | | | |
| 3f | Rhetoric III ..... | IV | MWF | 310En | Mr. Lansing |
| | (3 cred.; prereq., 2) | | | | |
| | (Limited to 35) | | | | |
| 3w | Rhetoric III ..... | I | TThS | 307En | Mr. Lansing |
| | (Same as 3f) | | | | |
| | (Limited to 35) | | | | |
| 3s | Rhetoric III ..... | | | | |
| | (Same as 3f) | | | | |
| | (Limited to 35 each) | | | | |
| | Sec. 1 | II | MWF | 310En | Miss Thompson |
| | 2 | IV | MWF | 307En | Mr. Lansing |
| | 3 | I | MWF | 308En | Miss Thurston |
| | 4 | I | TThS | 310En | Miss Thompson |
| | 5 | II | TThS | 310En | Miss Thurston |
| | 6 | III | TThS | 310En | Miss Thompson |
| 11f | Argumentation ..... | I | MWF | 307En | Mr. Lansing |
| | (3 cred.; soph., jr., sr.; prereq., 3, 22 recommended) | | | | |
| | (Limited to 30) | | | | |
| 11w | Argumentation ..... | III | MWF | 307En | Mr. Lansing |
| | (Same as 11f) | | | | |
| | (Limited to 30) | | | | |
| 11s | Argumentation ..... | II | MWF | 307En | Mr. Lansing |
| | (Same as 11f) | | | | |
| | (Limited to 30) | | | | |
| 22f,s | Public Speaking ..... | III | MWF | 311En | Mr. Routledge |
| | (3 cred.; soph., jr., sr.; prereq., 3) | | | | |
| | (Limited to 20) | | | | |
| 22w | Public Speaking ..... | | | | |
| | (Same as 22f,s) | | | | |
| | (Limited to 20) | | | | |
| | Sec. 1 | I | MWF | 311En | Mr. Routledge |
| | 2 | II | MWF | 311En | |

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 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 |
| 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 | Mr. Lansing |
| 31w | Survey of English Literature I .... (Same as 31f) (Limited to 40) | II | MTWFS | 308En | |
| 31s | Survey of English Literature I ..... (Same as 31f) (Limited to 40) | III | MTWFS | 308En | |
| 32f | Survey of English Literature II .... (3 cred.; soph., jr., sr.; prereq., 3) (Limited to 35) | III | TThS | 310En | Miss Thompson |
| 33w,s | Modern Literature ..... (3 cred.; soph., jr., sr.; prereq., 3) | IV | MWF | 310En | Mr. Lansing |
| 34f | Books and Reading ..... (1 cred.; soph., jr., sr.; no prereq.) | IV | T | 310En | Miss Thompson |

## 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 | Mr. Lundquist |
| 1 cons. 14f,w | Rural Sociology ..... (3 cred.; soph., jr., sr.; prereq., 1 or sr. class) | I | MWF | 204Da | Mr. 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.) | II | MWF | 204Da | Mr. 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.

For correction in Soil 1, w + s. see letter fr Mr. Willey 6-18-30

## SOILS

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 4f | Soils ..... (3 cred.; soph., jr., sr.; no prereq.) | | | | |
| | Lect. | III | TTh | 204So | Mr. Rost |
| | Lab. | VIII,IX | T | 201So | |
| 5s | Soil Fertility ..... (3 cred.; soph., jr., sr.; no prereq.) | | | | |
| | Lect. | II | TTh | 204So | Mr. Alway, |
| | Lab. see 2. | VIII, IX | T | 201So | Mr. Rost |
| | see 1. | I II | S | | |

| No. | Title | Hour | Day | Bldg. | Instructor |
|---|---|---|---|---|---|
| 8w | Physical Properties of Soils ..... (3 cred.; soph., jr., sr.; prereq., 4) | VI, VII, VIII | TTh | 201So | Mr. McMiller |
| 101f | Chemical Analysis of Soils ..... (3 to 5 cred.; jr., sr.; prereq., 5, Quant. Anal.) | Ar | Ar | Ar | Mr. Rost |
| 102w,s | Special Problems in Soils ..... (Cred. assigned according to amount of work; jr., sr.; prereq., 101 or 108) | Ar | Ar | Ar | Mr. Alway, Mr. Rost |
| 104 | Soil Surveying ..... (3 cred.; jr., sr.; prereq., 108) | Ar | Ar | Ar | |
| 107w | Fertilizers and Manures ..... (2 cred.; jr., sr.; prereq., 4, 5) | IV | TS | 204So | Mr. Rost |
| 108w | Physical Properties of Soils ..... (3 cred.; jr., sr.; prereq., 4) | VI, VII, VIII | TTh | 201So | Mr. 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)<br>I (w and s) | MWF<br>TThS | 103Ve<br>103Ve | Mr. Nilson<br>Mr. Kernkamp |
| 6f | Physiology of Reproduction ..... (4 cred.; jr., sr.; prereq., 2-3-4) | IV | MTWF | 103Ve | Mr. Boyd |
| 9w-10s | Veterinary Studies ..... (6 cred.;‡ jr., sr.; prereq., Bact. 41) | III | TThS | 102Ve | Mr. Donham |
| 12w | Infectious Diseases ..... (3 cred.; jr., sr.; prereq., 2-3-4, Bact. 41) | I | MWF | 103Ve | Mr. Fitch |
| 101w-102s | Advanced Anatomy of Domestic Animals ..... (6 cred.; jr., sr.; prereq., 2 or equiv.) (Limited to 9) | Ar | Ar | Ar | Mr. Kernkamp |
| 103w-104s | Advanced Comparative Physiology .. (6 cred.;§ jr., sr.; prereq., 3-4 or equiv.) | Ar | Ar | Ar | Mr. Nilson |

## 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 | 101,313Z | Mr. Dawson |
| 17f-18w* | General Zoology (H.E.) ..... (6 cred.;§ no prereq.) | VII, VIII, IX | TTh | 101,313Z | Mr. Eddy |

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.

§ The full course must be completed before credit will be given.