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Binding cover

The Bulletin of the University of Minnesota

*The Graduate School
Announcement for the Year
1921-1922*



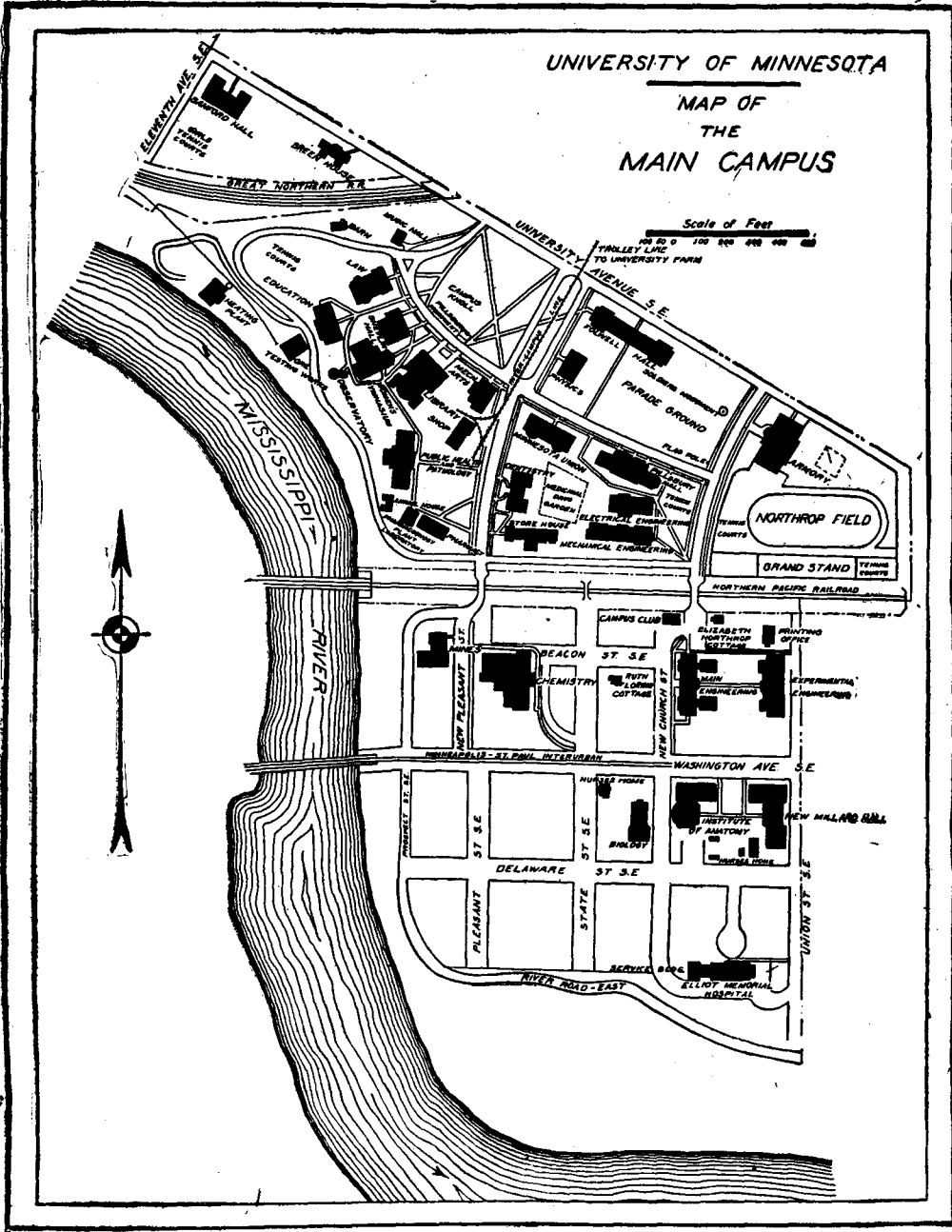
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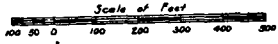
UNIVERSITY OF MINNESOTA

MAP OF
THE
MAIN CAMPUS

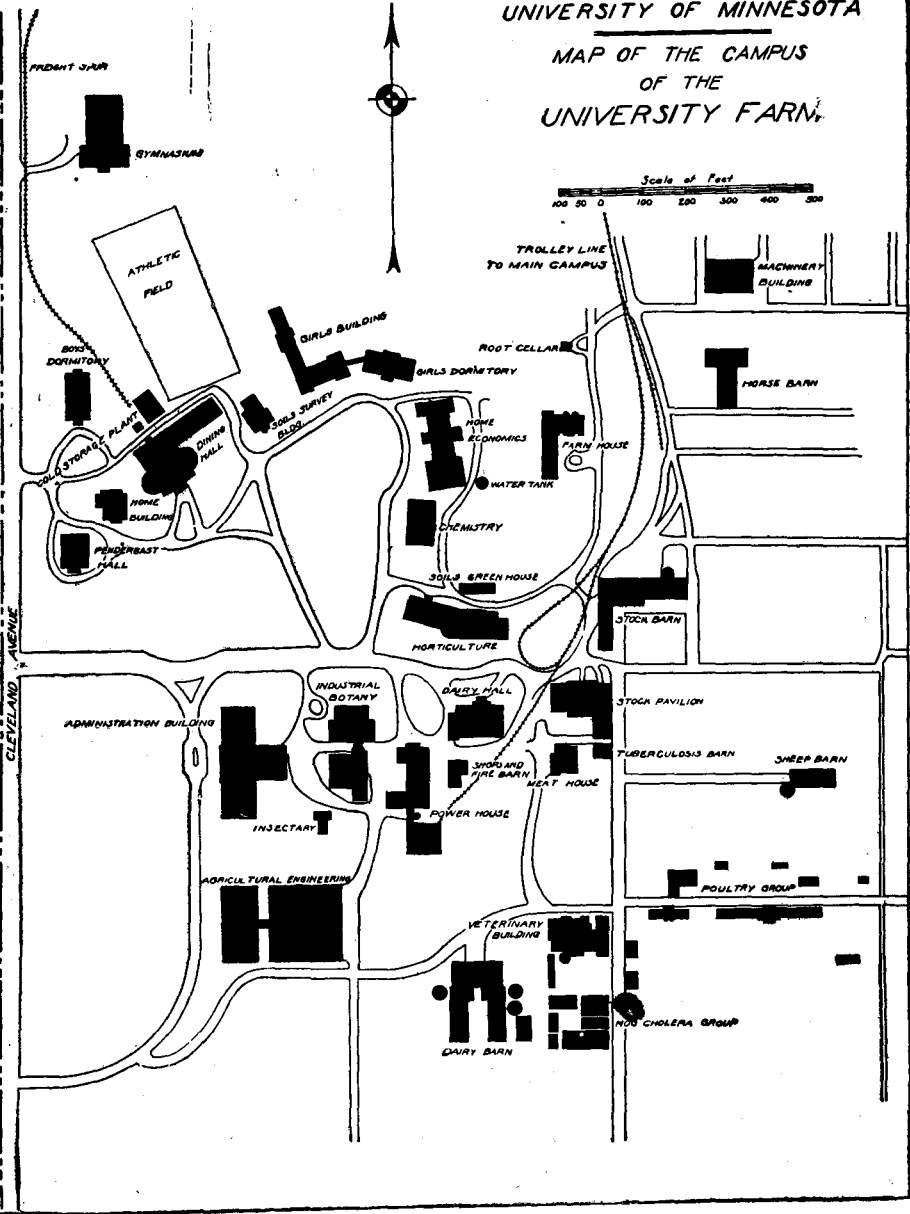


Area of Main Campus, 108.5 acres

UNIVERSITY OF MINNESOTA
 MAP OF THE CAMPUS
 OF THE
 UNIVERSITY FARM.



TROLLEY LINE
 TO MAIN CAMPUS



Area of University Farm, 422.56 acres

1921							1922													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	..	..	..	..	..	..	1
3	4	5	6	7	8	9	8	9	10	11	12	13	14	2	3	4	5	6	7	8
10	11	12	13	14	15	16	15	16	17	18	19	20	21	9	10	11	12	13	14	15
17	18	19	20	21	22	23	22	23	24	25	26	27	28	16	17	18	19	20	21	22
24	25	26	27	28	29	30	29	30	31	..	..	..	..	23	24	25	26	27	28	29
31	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	1	2	3	4	5
7	8	9	10	11	12	13	5	6	7	8	9	10	11	6	7	8	9	10	11	12
14	15	16	17	18	19	20	12	13	14	15	16	17	18	13	14	15	16	17	18	19
21	22	23	24	25	26	27	19	20	21	22	23	24	25	20	21	22	23	24	25	26
28	29	30	31	..	..	..	26	27	28	..	..	..	..	27	28	29	30	31	..	..
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	1	2	3	..	..	..	1	2	3	4	..	..	..	..	1	2	
4	5	6	7	8	9	10	5	6	7	8	9	10	11	3	4	5	6	7	8	9
11	12	13	14	15	16	17	12	13	14	15	16	17	18	10	11	12	13	14	15	16
18	19	20	21	22	23	24	19	20	21	22	23	24	25	17	18	19	20	21	22	23
25	26	27	28	29	30	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30
..
OCTOBER							APRIL							OCTOBER						
..	2	3	4	5	6	7	..	..	..	5	6	7	8	1	2	3	4	5	6	7
8	9	10	11	12	13	14	9	10	11	12	13	14	15	8	9	10	11	12	13	14
15	16	17	18	19	20	21	16	17	18	19	20	21	22	15	16	17	18	19	20	21
22	23	24	25	26	27	28	23	24	25	26	27	28	29	22	23	24	25	26	27	28
29	30	31	..	..	..	..	30	..	..	..	..	..	..	29	30	31	..	..	..	..
..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	1	2	3	4	5	6	..	..	..	1	2	3	4
6	7	8	9	10	11	12	7	8	9	10	11	12	13	5	6	7	8	9	10	11
13	14	15	16	17	18	19	14	15	16	17	18	19	20	12	13	14	15	16	17	18
20	21	22	23	24	25	26	21	22	23	24	25	26	27	19	20	21	22	23	24	25
27	28	29	30	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	3	..	..	..	..	..	1	2
4	5	6	7	8	9	10	4	5	6	7	8	9	10	3	4	5	6	7	8	9
11	12	13	14	15	16	17	11	12	13	14	15	16	17	10	11	12	13	14	15	16
18	19	20	21	22	23	24	18	19	20	21	22	23	24	17	18	19	20	21	22	23
25	26	27	28	29	30	31	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	31

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p. 2

CALENDAR FOR GRADUATE SCHOOL

1921-1922

1921			
September	26-October 1		Registration of graduate students Physical examination of all new students Payment of fees
September	28	Wednesday	Fall quarter beings, 8:30 a.m.
October	13	Thursday	Examinations in French and German for candidates for all advanced degrees
November	11	Friday	Armistice Day; a holiday
November	19	Saturday	Last day for filing subject-matter of Master's thesis
November	24	Thursday	Thanksgiving Day; a holiday
December	21	Wednesday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
1922			
January	4	Wednesday	Christmas vacation ends, winter quarter begins, 8:30 a.m.
January	12	Thursday	Examinations in French and German for candidates for all advanced degrees
February	22	Wednesday	Washington's Birthday; a holiday
March	9	Thursday	Examinations in French and German for candidates for all advanced degrees
March	23	Thursday	Winter quarter ends, spring vacation begins, 5:20 p.m.
March	29	Wednesday	Spring vacation ends, spring quarter begins, 8:30 a.m.
May	6	Saturday	Last day for filing thesis of candidates for all advanced degrees
May	20	Saturday	Last day for final written examinations for candidates for all advanced degrees
May	30	Tuesday	Memorial Day; a holiday
June	3	Saturday	Last day for oral examinations for candidates for advanced degrees
June	7	Wednesday	Last day for filing bond for publication of Doctor's thesis; last day for depositing binding fee for Master's thesis
June	11	Sunday	Baccalaureate service
June	13	Tuesday	Spring quarter closes, 5:20 p.m.
June	14	Wednesday	Fiftieth annual commencement

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THE GRADUATE SCHOOL

ORGANIZATION

The Graduate School has exclusive control of all graduate work carried on in the University. The graduate faculty is composed of those properly approved and qualified to offer courses carrying graduate credit. It determines the general educational policy of the Graduate School, and recommends candidates for degrees. The administration of the Graduate School is committed to the dean and an Executive Committee of seven members. They are assisted by group committees representing allied lines of work grouped together for administrative purposes. The groups are as follows:

- a. Social Sciences and Law
- b. Physical Sciences, Mathematics, and Engineering
- c. Biological Sciences
- d. Philosophy and Education
- e. Language and Literature
- f. Medicine
- g. Agriculture

The Executive Committee for the year 1921-1922 consists of the following members: Guy Stanton Ford, Ph.D., Dean of the Graduate School, chairman; George W. Dowrie, Ph.D., Social Sciences and Law; Henry A. Erikson, Ph.D., Physical Sciences, Mathematics and Engineering; Lee Irving Knight, Ph.D., Biological Sciences; Norman Wilde, Ph.D., Psychology, Philosophy, and Education; Joseph B. Pike, Languages and Literature; Julius P. Sedgwick, M.D., Medicine; Edward M. Freeman, Ph.D., Agriculture.

ADMISSION

Any graduate holding a Bachelor's degree or its equivalent from a reputable college or university will be admitted to the Graduate School without examination, and may register for such graduate work as he may be found prepared to enter upon, but he will not thereby be admitted to candidacy for either of the higher degrees until his case has been duly considered and approved.

All inquiries concerning admission to the Graduate School should be addressed to the dean. The student is advised to obtain and fill out an application for admission before presenting himself for registration.

If the rating of the institution from which he received his first degree is such that he will need a year or more of additional work before beginning graduate work at the University of Minnesota, he is advised to enter one of the undergraduate colleges of the University and obtain the preliminary training and an acceptable Bachelor's degree.

College graduates who simply desire to take additional work of undergraduate grade without a view to preparation for an advanced degree should register as unclassified students in the college giving the work.

REGISTRATION

Full directions concerning registration will be found in a booklet issued by the registrar's office for the information of new students. The essential document is an official transcript of the student's college record.

FEES

Tuition fees (per quarter).....	\$10.00
Deposit (first quarter only).....	2.00
Military deposit (required of all students taking drill).....	10.00
Minnesota Union or Shevlin Hall (per quarter).....	1.00
Post-office box (per quarter).....	.20
Special fees	
Examination for removal of condition.....	1.00
Examinations for credit (after the first six weeks in residence).....	5.00
Special examinations.....	5.00
Chemistry deposit.....	5.00

FELLOWSHIPS AND SCHOLARSHIPS

Four graduate fellowships have been established by the late Thomas H. Shevlin, of Minneapolis. These are awarded one each in the College of Agriculture, Forestry, and Home Economics, the School of Chemistry, the Medical School, and the College of Science, Literature, and the Arts. Each fellowship yields \$500 per annum. They are awarded annually. Candidates for these fellowships should file their applications before March 1 with the dean of the Graduate School.

Shevlin Fellows will devote their entire time to the graduate work for which they are registered, and may not engage in private tutoring or be required to render any service to the University.

THE ALBERT HOWARD SCHOLARSHIP

This scholarship, founded by Mr. James T. Howard, yields \$240 annually. The holder is expected to do graduate work in Liberal Arts.

THE CLASS OF 1890 FELLOWSHIP

On the twenty-fifth anniversary of its graduation the class of 1890 founded a fellowship yielding \$150 and exemption from tuition. This fellowship is open to graduates of the Colleges of Science, Literature, and the Arts, and Engineering and Architecture desiring to pursue advanced work. Applications should be filed with the dean of the Graduate School before March 1.

DEPARTMENTAL SCHOLARSHIPS

Besides the above stipends there are about seventy scholarships assigned to various departments, yielding \$225 and exemption from tuition and fees. The holders may be required to render service not to exceed ten hours a week in laboratory or office work, or not more than three hours in classroom assistance. Where these regulations are ob-

served, a qualified holder of one of these scholarships may become a candidate for the Master's degree on the basis of one year's work in residence.

Other assistantships and teaching fellowships, some yielding as high as \$1,000, are available, but the amount of work required is greater and the length of residence of the holder of one of these appointments would be increased proportionately.

Inquiries and requests for application blanks may be addressed to the dean of the Graduate School, or to the head of the department in question.

GRADUATE WORK IN THE SUMMER

Work of graduate character done in the summer session of the University of Minnesota under a member of the graduate faculty may be counted for residence credit for advanced degrees. The course work for the Master's degree may be completed in four summer sessions. Students working for the Master's degree in summer sessions must file the subjects of their theses before the completion of the first half of the required work.

An increasing amount of graduate work in fields of interest to high-school teachers is being offered in the summer session. The courses for any session may be found in the bulletin of the summer session.

Students who desire graduate credit for work in the summer must register with the dean of the Graduate School.

GRADUATE WORK IN MEDICINE

Graduate work in the laboratory departments and in the clinical branches leading to advanced degrees is offered by the University of Minnesota. This work is under the direction of the Graduate School, and candidates for admission and degrees must meet the requirements of the Graduate School as outlined in the preceding pages. The work is offered by members of the medical faculty in Minneapolis and by members of the graduate faculty on the Mayo Foundation at Rochester, Minnesota, where part or all of the residence work may be done. Several teaching fellowships supported by the University and others on the Mayo Foundation are open to qualified students pursuing graduate work in clinical medicine or in the laboratory branches. A special bulletin on graduate work in medicine is published and may be obtained from the registrar.

WORK IN THE LAW SCHOOL

Under certain properly approved conditions graduate students may offer courses in law as a minor for an advanced degree when their major work is in the Department of Political Science or Economics.

CHARACTER OF GRADUATE WORK

In general it should be noted that graduate courses are intensive in character and require more of the student's time than do undergraduate courses with corresponding credits.

Special prerequisites necessary for entrance to the various courses and also any special requirements for majors or minors, will be noted under the corresponding departmental statements in this bulletin. In all cases, the undergraduate work must be sufficient in quantity and quality to prepare the students for the desired graduate work. The student must secure a grade of B in order to have a course count for graduate credit.

STUDENT ORGANIZATIONS

There are two social organizations connected with the Graduate School. The Graduate Club includes as members all students registered in the Graduate School, and the graduate women's club, "Sheepskin," includes every woman graduate on the campus. The wives of graduate students are invited to join the Dames' Club. Further information concerning student organizations, etc., will be found in the bulletin of general information.

REQUIREMENTS FOR THE MASTER'S DEGREE

The degree of Master of Arts is, in general, conferred for advanced non-technical study; the degree of Master of Science for advanced technical study, such as agriculture, industrial chemistry, engineering, etc.

The requirements for the degrees of Master of Arts or Master of Science are covered in general by the statement that these degrees may be earned by properly qualified students only by at least one full academic year's work in residence at this University (three quarters). Students who have not had adequate preparation in the specific chosen field of work, or who are doing outside work in excess of ten hours a week, will require more than one year to attain the Master's degree.

Upon entrance to the Graduate School, the candidate, with the approval of the dean, will select his adviser in the field of his major work. With the approval of his adviser and the dean, he will also select a minor, and will outline a study program for the year.

Program of study.—A full program for a student who expects to meet the requirements in one academic year must cover the necessary courses in the fields of the major and minor and the preparation of a satisfactory thesis. The work must be selected from graduate courses offered in this bulletin and amounting to not less than 6 or more than 9 credit hours each quarter. In addition, thesis work (or courses upon which the thesis is based) should be carried to make a total of not less than 15 hours per week for three quarters.

The major.—The major work must be in a department in which the candidate has had at least three years of work (18 semester or 27 quarter

credits) if it be a department open to freshmen, or two years of work (12 semester or 18 quarter credits) if it be a department not open to freshmen. Part or all of this preliminary work may consist of designated prerequisite courses in the same or allied departments. Any special requirements will be noted in the corresponding departmental statement. At the end of the year, a final written examination (in addition to the usual course examinations) will be given in the major as noted below.

The minor.—The minor subject must be selected in a department in which the candidate has had at least one year's work (6 semester or 9 quarter credits), or he must have had in a closely allied department a year's work (6 semester or 9 quarter credits), which is actually designated as a prerequisite to the minor subject. Any special requirements will be noted in the corresponding departmental statements.

The choice of the minor must be in a department whose work can be logically related to that of the department in which the student is doing his major work.

The group committee may in exceptional cases allow the minor subject to be taken in the same department as that of the major.

The language requirement.—A reading knowledge of a foreign language, modern or ancient, the language to be determined by the major department, is required of candidates for the Master's degree, unless exemption is made in individual cases with the approval of the Executive Committee of the Graduate School. When no other statement is made in the departmental announcement in this bulletin, a knowledge of either French or German is expected. The candidate shall present to the dean of the Graduate School, not later than the close of the second quarter of residence, a certificate of proficiency in the designated language, signed by the professor in charge of the corresponding language department or his representative.

Candidates for the Master's degree in any departments in the language and literature group who register after September 1, 1922, will be required to have a reading knowledge of both French and German before they are recommended for the degree.

All examinations to meet the language requirement of the Graduate School unless otherwise arranged with the language departments shall be held on the days specified in the calendar at the beginning of this bulletin.

A candidate who fails in a language examination for an advanced degree shall not be given a second examination until the following quarter.

Approval of candidacy.—At the beginning of the third quarter, properly qualified candidates, whose theses subjects have been approved by the corresponding group committees, will be approved as candidates by vote of the Executive Committee of the Graduate School.

The Master's thesis.—Before the middle of the first quarter in residence the candidate should file at the office of the Graduate School the subject of his thesis. This subject must be approved by his adviser and by the corresponding group committee. It should be on a topic falling within the field of the major. It is expected that the candidate will devote

approximately one half his time to the preparation of the thesis, including courses on which the thesis is based. The thesis must be written in acceptable English and show ability to work independently, and give evidence of power of independent thought both in perceiving problems and making satisfactory progress toward their solution. Familiarity with the bibliography of the special field and correct citation of authorities are expected.

The thesis is required to be in triplicate in order to facilitate its consideration. One copy must be upon the specially required linen stock and the other two may be carbon copies on cheap paper. Samples in the dean's office of both the linen stock and carbon paper should be examined before the thesis is typewritten. The body of the thesis should be double spaced, but footnotes may be single spaced.

The thesis must be finished and three copies deposited in the office of the dean of the Graduate School at least six weeks before the candidate presents himself for his degree.

The thesis will be examined by a committee of three, appointed by the dean on the recommendation of the group committee. The student's adviser will, as a rule, be the chairman of this committee. Unanimous approval by this committee will be necessary for the acceptance of the thesis.

If the thesis is accepted, the candidate must deposit with the registrar, at least one week before commencement, the sum of one dollar for binding one copy of the thesis, which will be cataloged and deposited in the University Library.

Examinations.—All candidates for this degree will meet the regular requirements as to examinations, topics, reports, etc., of the classes in which they are registered. A special examination in the field of the minor is not required, but this does not excuse the candidate from the regular course examinations. Besides the usual course examinations, where such are given, the candidate for the Master's degree must pass a final written examination in the major and after the acceptance of the thesis, a final oral examination.

The final written examination will be held not later than four weeks before the end of the quarter in which he takes his degree. It will cover the work of the candidate in the field of the major, and may include any work fundamental thereto. This examination will be held by his instructors in the major department, the adviser acting as chairman.

If the final written examination is satisfactory, and the thesis accepted, the final oral examination of the candidate will be held, not later than two weeks before the end of the quarter in which he takes his degree. The adviser will act as chairman of the examining committee, which will include all the instructors with whom the candidate has taken work, the thesis committee, and, ex-officio, the head or chairman of the department in which the major work is done. Any member of the graduate faculty may attend as a visitor, and due notice shall be sent by the chairman of the committee to all members of the graduate faculty in the major and

minor departments. The final oral examination will cover all the work offered for the degree, and may include other work fundamental thereto. At the close of the examination, the committee will vote upon the candidate, taking into account all of his work. A majority vote is required for approval.

Candidates who are eligible for the "preliminary examination" for the Doctor's degree may substitute this examination for the final oral examination for the Master's degree, provided that all other requirements for the Master's degree have been met.

Reports.—Special blanks are provided for signed reports concerning the thesis and the final oral examinations. All reports must be filed in the office of the dean of the Graduate School at least one week before the end of the last quarter.

Candidates meeting the requirements as above outlined will be reported by the dean of the graduate faculty, who will by vote recommend to the Board of Regents those approved for degrees.

Candidates upon whom degrees are to be conferred are required to be present at commencement, unless especially excused by the dean of the Graduate School and the president of the University.

TABULAR SUMMARY OF REQUIREMENTS FOR

THE MASTER'S DEGREE

WORK	UNDER THE DIRECTION OF	DATE
Program, major and minor	Adviser and dean of the Graduate School.....	On entrance.
Approval of thesis subject	Adviser and group committee	Middle of first quarter in residence.
Language requirement....	Adviser and language department	Before close of second quarter.
Approval of candidacy...	Executive Committee.....	Beginning of third quarter.
Filing thesis.....	Dean of the Graduate School	At least six weeks before graduation.
Examination of thesis....	Thesis Committee.....	Before admission to final oral examination.
Final written examination in major	Major department members of the graduate faculty	Not later than four weeks before commencement and before final oral.
Final oral examination on all work.	Thesis Committee; all candidate's instructors; head of major department...	Not later than two weeks before commencement.
(Course examinations as required at the usual time.)		
Fee for binding thesis....	Registrar	One week before commencement.

THE ENGINEER DEGREES

Requirements.—Until and including 1923, the advanced professional degrees Civil Engineer, Mechanical Engineer, Electrical Engineer, and Chemical Engineer will be conferred upon the recommendation of the Graduate School faculty as a result of the satisfactory completion of the following requirements:

(a) A Bachelor's degree in the corresponding branch of engineering from an approved school.

(b) One academic year's study in residence (three quarters) at this University, including

(c) A thesis.

Students who have not had adequate preparation in the specific chosen field of work, or who are doing outside work in excess of twelve hours a week, will ordinarily require more than one year to attain the degree.

If the candidate's Bachelor's degree is in another branch of engineering than that in which the professional degree is sought, he must complete the equivalent of the subjects required for the Bachelor's degree in the new field before admission to candidacy for the desired degree.

Upon entrance to the Graduate School, the candidate, with the approval of the dean, will select his adviser in the field represented by the desired degree. With the approval of his adviser and the dean, he will also select a minor, and will outline a study program for the year.

Program of study.—A full program for a student who expects to meet the requirements in one academic year must cover the necessary courses in the fields of the major and minor and the preparation of a satisfactory thesis. The work must be selected from graduate courses offered in this bulletin and amounting to not less than 6 nor more than 9 credit hours each quarter. In addition, thesis work (or courses upon which the thesis is based) should be carried to make a total of not less than 15 hours per week for three quarters.

The major.—The major work must be in the field represented by the desired degree. At the end of the year, a final written examination (in addition to the usual course examinations) will be given in the major as noted below.

The minor.—The choice of the minor must be in a department whose work can be logically related to that of the department in which the student is doing his major work. However, the group committee may allow the minor subject to be taken in the same department as the major.

Approval of candidacy.—At the beginning of the third quarter, properly qualified candidates, whose thesis subjects have been approved by the group committee, will be approved as candidates by vote of the Executive Committee of the Graduate School.

The thesis.—Before the middle of the first quarter in residence the candidate should file at the office of the Graduate School the subject of his thesis. *This subject must be approved by his adviser and by the group committee.* It should be on a topic falling within the field of the major. It is expected that the candidate will devote approximately one half of his time to the preparation of this thesis, including courses on which the thesis is based. The thesis must be written in acceptable English and show ability to work independently, and give evidence of power of independent thought both in perceiving problems and making satisfactory progress toward their solution. Familiarity with the bibliography of the special field and correct citation of authorities are expected.

The thesis is required to be in triplicate in order to facilitate its consideration. One copy must be upon the specially required linen paper and the other two may be carbon copies on cheaper paper. Samples in the dean's office of both the linen stock and copy paper should be examined before the thesis is typewritten. The body of the thesis should be double spaced, but footnotes may be single spaced.

Three copies of the completed thesis must be in the office of the dean of the Graduate School at least two weeks before graduation.

The thesis will be examined by a committee of three, appointed by the dean, upon the recommendation of the group committee, two representing the major subject and one the minor. The student's adviser will, as a rule, be the chairman of this committee. Unanimous approval by this committee will be necessary for the acceptance of the thesis.

If the thesis is accepted, the candidate must deposit with the registrar, at least one week before commencement, the sum of one dollar for binding one copy of the thesis.

Examinations.—All candidates for these degrees will meet the regular requirements as to examinations, topics, reports, etc., of the classes in which they are registered. Besides the usual course examinations, where such are given, the candidate must pass a final written examination in his major work.

This examination will be held not later than two weeks before the end of the quarter in which he takes his degree. It will cover the work of the candidate in the field of the major, and may include any work fundamental thereto. This examination will be held by the instructors in the major department, the adviser acting as chairman.

Reports.—Special blanks are provided for signed reports concerning the thesis and the final examination. All reports must be filed in the office of the dean of the Graduate School at least one week before the end of the last quarter.

Recommendation of the candidate for the degree requires the satisfactory completion of his major and minor courses, the acceptance of his thesis by the thesis committee, and the approval of a majority of the major instructors as a result of the final written examination.

Candidates meeting the requirements as above outlined will be reported by the dean to the graduate faculty, who will by vote recommend to the Board of Regents those approved for degrees.

Candidates upon whom degrees are to be conferred are required to be present at commencement, unless especially excused by the dean of the Graduate School and the president of the University.

TABULAR SUMMARY OF REQUIREMENTS FOR
THE ENGINEER DEGREES

WORK	UNDER THE DIRECTION OF	DATE
Program, major and minor	Adviser and dean of the Graduate School.....	On entrance.
Approval of thesis subject	Adviser and group committee	Middle of first quarter in residence.
Approval of candidacy....	Executive Committee.....	Beginning of third quarter.
Filing thesis	Dean of the Graduate School	At least two weeks before graduation.
Examination of thesis....	Thesis Committee	
Final written examination.	Major department members of the graduate faculty	Not later than two weeks before commencement.
(Course examinations as required at the usual times.)		
Fee for binding thesis....	Registrar	One week before commencement.

New requirements.—After June, 1923, the following new requirements for the Engineer degrees will replace the present ones. Prior to that time, candidates who so elect may be permitted to graduate under these new requirements.

The procedure will be analogous to that described above and will be announced in detail at a later time.

(d) A Bachelor's degree, from an approved school, in the corresponding branch of engineering.

(e) One full academic year of graduate engineering study (three quarters) in residence at this University. (Graduates of this University may be permitted to carry on this study in absentia under the direction of the faculty.)

(f) Four years of engineering experience in positions of responsibility, subsequent to receiving the Bachelor's degree. (If the graduate study is done in absentia, five years of experience are required.)

(g) A thesis of professional grade.

For graduates of this University, a Master's degree in the corresponding branch of engineering will be accepted as fulfilling the requirements of the year of graduate study.

The Engineer degree will not be granted in less than five years after receiving the Bachelor's degree.

MASTER OF SCIENCE IN ENGINEERING AND ARCHITECTURE

The requirements and procedure for the degree of Master of Science in Civil, Mechanical, Electrical, or Chemical Engineering or Architecture will correspond to those outlined for this degree in other subjects. The language requirement will be waived in all of these cases except Chemical Engineering, in which German is required.

DOCTOR'S DEGREE

In the Graduate School, one Doctor's degree, Doctor of Philosophy (Ph.D.) is conferred by the University of Minnesota. This degree is granted, not on the basis of successful completion of a definite amount of prescribed work but solely in recognition of the candidate's high attainments and ability in this special field, to be shown, first, by the preparation of a thesis, and second, by successfully passing the required examinations covering both the general and the special fields of the candidate's subjects as detailed later.

Candidates for the Doctor's degree must devote at least three years¹ of graduate study to approved subjects. The first two years or the last year must be spent in residence at the University of Minnesota.

A member of the staff of instruction above the rank of instructor will not be permitted to enroll for a Doctor's degree at this University. There is no objection, however, to his registering for graduate work at this University and credit so obtained may be presented elsewhere.

PROGRAM OF WORK

First year.—Upon entrance to the Graduate School, the student shall select his adviser with the approval of the dean. With the approval of his adviser he shall submit to the dean a program covering his first year's work.

Second and third years.—Before beginning the work of the second year, the student shall submit to his adviser and the group committee for approval a tentative outline of his work for the second and third years, including both the major and minor subjects. This program is then to be submitted to the dean for final approval.

Language requirements.—Before admission to the preliminary examination, the student must present to the dean of the Graduate School statements from the French and German departments, certifying that the applicant has a reading knowledge of those languages. The substitution of other foreign languages of greater service in the major field may be permitted by the executive committee on recommendation of the group committee. In addition, a knowledge of other languages may be required in certain cases, as the candidate's major department may prescribe. The student's adviser or his representative shall attend the language examinations and provide literature in the major field from which the test passages are selected. For the dates of these language examinations consult the calendar at the beginning of this bulletin.

THE MAJOR WORK

The major work must be in a department in which the candidate has had, in his undergraduate study, at least three years of work (18

¹ This time requirement will be met in three years only by those students who devote all their time to graduate study. Students who merely devote the intervals of professional or other regular employment to graduate study will need to extend their total period of work over a longer period of time. Credit for such work will be given in proportion to the amount of time actually spent in the pursuit of graduate work.

semester or 27 quarter credits) if it be a department open to freshmen, or two years of work (12 semester or 18 quarter credits) if it be a department not open to freshmen. Part or all of this preliminary work may consist of designated prerequisite courses in the same or allied departments.

During the period of work for the Doctor's degree a student shall spend not less than two thirds of his time² on the major subject, including the work on the thesis. During the last two years, he shall carry an average of at least one course per quarter in his major outside the work from which his thesis is developed.

At the close of the second year's work, and before admission to the preliminary examination, the student must obtain the written recommendation of the major department members of the graduate faculty. Such written recommendations should state that in view of the work already done by the applicant, the department is convinced of his probable capacity and ability to meet all the requirements for the degree, including the thesis, the subject of which must be stated.

In the case of a student who comes for the last year of residence only, provision for the examination will be made by the dean and the major department.

THE MINOR WORK

The minor work must be selected in a department in which the student is prepared to pursue courses advanced enough in character to be included in the group designated "For Undergraduate and Graduate Students," and numbered 100 or above.

The choice of the minor must be in a department the work of which can be logically related to that of the department in which the student is doing his major work.

In exceptional cases, the dean and the group committee may allow the minor subject to be taken in the same department as that of the major or in two related departments.

Not less than one sixth of the total work of the three years shall be devoted to the minor subjects and all of this work shall be completed and certified to by the department in which the minor is taken before admission to the preliminary examination.

THESIS

The thesis, for which the accumulation of material may well be started not later than the beginning of the second year, must give evidence of originality and power of independent investigation, and embody results of research, which form a real contribution to knowledge as well as exhibit mastery of the literature of the subject and familiarity with the sources of knowledge. The matter must be presented with a fair degree of literary skill.

Not later than six weeks before the commencement at which he expects to take the degree, the student shall deposit at the dean's office

² In estimating the distribution of time, a week of 15 credit hours may be assumed.

his thesis, typewritten, in triplicate copy to facilitate reading by the thesis committee. No special size or form is required since it is to be printed subsequently.

The dean will appoint a thesis committee with the student's adviser as chairman. The duty of this committee will be to read the thesis and vote upon its acceptance. Unanimous approval by this committee will be necessary to such acceptance.

Printing of the thesis.—If the thesis be accepted, the student shall deposit with the registrar, not later than one week before graduation, a sufficient bond or such sum of money as is needed to print one hundred copies of the thesis for the use of the University and as many additional copies as the candidate may require for himself. If the thesis is to be published elsewhere, reprints will be acceptable, if bound with covers in the special form required by the University.

EXAMINATIONS

Preliminary.—After the language examinations (see p. 16) and at least one calendar year before the degree is conferred, a preliminary examination of the student shall be given by a committee appointed by the dean and including the student's adviser as chairman, a representative of the group committee other than his adviser, the chairman or head of the major department, a representative of the minor department, and such other members as the dean may consider advisable. Certificates of the proficiency in French and German and completion of the minor and the recommendation of the major departments shall be required before admission to this examination. The examination shall cover graduate work previously taken by the student, and *may include any work fundamental thereto*. This examination shall be in addition to the usual course examinations. It may be written or oral, or both, at the discretion of the committee. Only after the successful completion of this examination may the student be enrolled as a candidate for the Doctor's degree. Students failing to pass this preliminary examination may be excluded from candidacy for the degree and in any case shall not be reexamined until at least one quarter has passed.

Final written.—After the thesis is presented, and at least four weeks before graduation, there shall be a written examination in the major subject, to be given by the members of the graduate faculty in the major department. This examination shall cover all the work done in the major, and *may include any work fundamental thereto*.

Final oral.—After successful completion of the written examination and acceptance of the thesis and not less than two weeks before graduation, the final oral examination shall be given. This examination shall be conducted by a committee consisting of the adviser as chairman, of a majority of the members of the graduate faculty of the department in which the major work was done and at least three other members of the graduate faculty appointed by the dean. At least one member of this committee shall be from a group other than the one in which the major

GENERAL INFORMATION

department is included. This examination is to cover all the work offered for the degree and *may include any work fundamental thereto*, and shall not exceed three hours.

The date of the final oral examination shall be publicly announced and the examination shall be open to any member of the graduate faculty. Upon completion of the examination, a formal vote of the committee shall be taken, and an affirmative vote of at least two thirds of the members shall be necessary for recommendation of the candidate for the degree.

Reports.—Special blanks are provided for signed reports concerning the thesis and the final oral examinations. All reports must be filed in the office of the dean of the Graduate School at least one week before graduation.

Candidates meeting the requirements as above outlined will be reported by the dean of the graduate faculty, who will by vote recommend to the Board of Regents those approved for degrees.

Candidates upon whom degrees are to be conferred are required to be present at commencement, unless especially excused by the dean of the Graduate School and the president of the University.

TABULAR SUMMARY OF REQUIREMENTS FOR THE DOCTOR'S DEGREE

WORK	UNDER THE DIRECTION OF	DATE
FIRST YEAR		
Major	} Adviser and dean of Graduate School.....	} On registration.
Minor		
SECOND YEAR		
Tentative program of entire second and third years' work.	Adviser, group committee, and dean of Graduate School	Before beginning work of second year.
Major, including thesis...	As for tentative program	
Minor	Adviser and minor department	} Before admission to preliminary examination.
Language	Adviser and language department	
Recommendation	By major department.....	
Preliminary examination..	Special committee.....	One calendar year before degree is to be conferred.
THIRD YEAR		
Major, including thesis...	Advisers, group committee, and dean of Graduate School	
Filing of thesis.....	Dean	Six weeks before taking the degree.
Examination of thesis....	Thesis committee	Before admission to final oral examination.
Final written examination	Major department members of the graduate faculty	Four weeks before taking degree and before final oral examination.
Final oral examination....	Advisers, majority of members of major department, and other members appointed by dean of Graduate School....	Not later than two weeks before taking the degree.
Bond for publication of thesis	Registrar	Not later than one week before taking the degree.

DEPARTMENTAL STATEMENTS

• AGRICULTURAL BIOCHEMISTRY

Professors ROSS AIKEN GORTNER, CLYDE H. BAILEY; Associate Professor LEROY S. PALMER; Assistant Professors CLARENCE A. MORROW, JOHN J. WILLAMAN.

Prerequisites.—For major work, credit in general chemistry and qualitative analysis, in organic chemistry, in quantitative analysis, and at least 10 quarter credits in biological science. The work presented as prerequisite must be satisfactory to the instructor with whom the student wishes to work.

For minor work, credit in general chemistry and qualitative analysis, in organic chemistry, and 10 quarter credits of biological science. Minors should be arranged only after consultation with the instructors concerned.

Candidates for the Master's degree must have a reading knowledge of German or French. (In special cases, where other languages are needed for the development of the thesis, Russian, Italian, or the Scandinavian languages may be substituted.)

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101f,su-102w,su. AGRICULTURAL QUANTITATIVE ANALYSIS. Includes estimation of inorganic and organic constituents of biological products, proximate analysis of foods and feeding stuffs, use of the polariscope, immersion refractometer, colorimeter and nephelometer, viscosimeter, and other special apparatus. Prerequisite: quantitative analysis. Three credits each quarter. V, VI, VII; MWF; 7Ch. MR. MORROW.

103s. 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. V, VI, VII; MWF; 7Ch. MR. PALMER.

108s. 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. Prerequisite: organic chemistry. Three credits. I; MWF; 201Ch. MR. BAILEY.

110s,su.¹ FLOUR LABORATORY METHODS. A laboratory course in methods of analyses of wheat and its products; milling test of wheat, baking and special tests of flour. Designed to train students for research and control work in the cereal industry. Prerequisite: Course 101-102 or food analysis. Five credits. V, VI, VII, VIII; MWF; 7Ch. MR. BAILEY.

¹ Offered in alternate summers. Not offered in 1922.

- 111f,su-112w,su. PHYTOCHEMISTRY. An advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes and pigments, and their physico-chemical relations to the vital processes involved in growth and nutrition. Prerequisites: organic chemistry, biology 1 year. Three credits each quarter. III; MWF; 201Ch. MR. MORROW.
- 113f,su-114w,su. BIOCHEMICAL LABORATORY METHODS. A laboratory course paralleling the lectures in 111-112, using recent methods for the investigation of biologically important compounds with especial reference to the detection and estimation of such compounds in cells or tissues. Prerequisites: Courses 111-112, 113-114; or 103 or 110. Three or 5 credits each quarter. V, VI, VII; TTh; 7Ch. MR. MORROW.
- 116f,w,s,su. THE CHEMISTRY OF VITAMINES AND DEFICIENCY DISEASES. Lectures, consultation, and library work on special nutritional problems accompanied by chemical and biological studies of food materials from the standpoint of their vitamine content. Prerequisites: Courses 111-112, 113-114 or physiologic chemistry. Three or 5 credits. (Because of the limitations of laboratory facilities, students planning to register for this course should make arrangements with the instructor in advance of registration.)
- 118f,w,s,su. LABORATORY PROBLEMS IN BIOCHEMISTRY. Special laboratory work in the preparation and isolation of pure compounds which occur in living cells, in the study of biochemical reactions, and in special methods of identification or determination of biochemical products. Prerequisites: Courses 111-112, 113-114; or 103 or 110. Three or 5 credits. MR. GORTNER, MR. BAILEY, MR. PALMER, MR. MORROW, MR. WILLAMAN.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f,w,s,su. SEMINAR. Regular meetings for the discussion of methods of research, formulation of research problems, and reviews of current literature. Required of all majoring in this division and of all minor-ing for Doctor's degree. One credit. MR. GORTNER.
- 203f,w,s,su. RESEARCH PROBLEMS. Special work on particular research problems other than the student's major thesis. Facilities are provided for biochemical investigations and for advance studies in plant, animal, or human nutrition. Three or 5 credits. MR. GORTNER, MR. BAILEY, MR. PALMER, MR. MORROW, MR. WILLAMAN.
- 205f,w,s,su. SPECIAL TOPICS IN BIOCHEMICAL LITERATURE. Library work followed by the preparation of written reports upon either the historical development or the current literature of special biochemical problems. A reading knowledge of German is necessary and of French desirable. Prerequisite: Course 206, 207, or 208. Three credits. MR. GORTNER.

- 206f. COLLOIDS. Lectures dealing with the colloidal state, the preparation and properties of colloidal solutions, and the relation of these to biochemical processes. Prerequisites: Course III-III2, or physical chemistry. Three credits. II; MWF; 351Ch. MR. GORTNER.
- 207f. ENZYMES. Lectures dealing with the nature of enzyme action, including methods of preparation and investigation of enzymes, their physical and chemical properties and their methods of action. Prerequisites: Course III-III2, or physiologic chemistry. Three credits. III; MWF; 351Ch. MR. WILLAMAN.
- 208w. PROTEINS. Lectures on the composition, structure, biochemical reactions, and functions of the protein and amino acids, with special emphasis upon those which are concerned in plant growth and metabolism, animal food, and industrial processes. Prerequisite: Course III-III2, or advanced organic chemistry. Three credits. II; MWF; 351Ch. MR. GORTNER.
- 209w. CARBOHYDRATES. A lecture and library course on the synthesis, structure, reactions, and functions of carbohydrates, with especial reference to those which are of plant or animal origin and which play a rôle in biochemical or industrial processes. Prerequisite: Course III-III2, or advanced organic chemistry. Three credits. II; TThS; 351Ch. MR. MORROW, MR. WILLAMAN.
- 212w,su. SPECIAL TOPICS IN NUTRITIONAL CHEMISTRY. A course comprising lectures, independent library study, and oral presentation by students, of special assigned topics in animal nutrition. A reading knowledge of German is essential and French desirable. Prerequisite: physiologic chemistry or equivalent. Three credits.

AGRICULTURAL EDUCATION

(See Education.)

AGRONOMY AND FARM MANAGEMENT

Professors ANDREW BOSS, HERBERT K. HAYES; Associate Professor ALBERT C. ARNY.

Prerequisites.—In farm crops and plant-breeding, for major work, Courses 121, 122, 131, 132, or their equivalents, and a reading knowledge of German or French. For minor work, two years of botany, one year of zoology, and the elementary courses in farm crops.

In farm management, for major work, Courses 103 and 104, or their equivalent, and at least 6 credits in elementary and agricultural economics. For minor work, at least 12 credits in the elementary agricultural sciences (as Farm Crops 1, Soils 3, and Animal Husbandry 3 and 7). Exemption from the language requirement for the Master's degree may be made in individual cases.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 102f,w,s,su. FARM MANAGEMENT II. A course in which the business side of farming is emphasized. Special attention is given to farm organization and equipment. Prerequisites: Farm Crops 1, Economics 5, Animal Husbandry 6 or 8, Soils 2. Three credits. MR. BOSS.
- 103w,s. FARM MANAGEMENT II. A continuation of Course 102. Special attention is given to farm operation. Prerequisites: same as above and Agronomy and Farm Management 102. Three credits. MR. BOSS.
- 104s. FARM MANAGEMENT III. An advanced course, covering cost of production studies, farm business analysis, farm practice, and farm management literature. Prerequisites: Agronomy and Farm Management 102 and 103. Three credits. MR. BOSS.
- 121f. CEREAL CROPS. An advanced study of the cereal crops. Structure, group classification, improvement, growing, and utilization. Brief score-card practice and a limited amount of placing on intrinsic value included. Prerequisites: Farm Crops 1, botany 10 credits. Three credits. MR. ARNY.
- 122w. CORN AND POTATO CROPS. A study of the corn and potato crops similar to that outlined for cereal crops. Prerequisites: Farm Crops 1, botany 10 credits. Three credits. MR. ARNY.
- 123s. FORAGE AND FIBER CROPS. A study of the forage crops through assigned reading, laboratory, and field work. Following the study of each crop some attention is given to score-card practice and comparative placing of representative samples. Prerequisites: Farm Crops 1, botany 10 credits. Three credits. MR. ARNY.
- 131f. PRINCIPLES OF GENETICS. Given jointly by the Divisions of Agronomy and Farm Management and Horticulture. Same as Horticulture 109. Lectures and laboratory designed to familiarize students with underlying principles of breeding. Heredity, variation, biometry, and evolution. Prerequisites: Botany 10 credits, animal biology 10 credits. Three credits. MR. HAYES, MR. DORSEY.
- 132s,su. FARM CROPS PLANT-BREEDING. Applied genetics is emphasized. Methods of breeding each of the important agricultural crops, with special attention to experiment-station investigations and to methods used by plant breeders. Prerequisite: Agronomy and Farm Management 131. Three credits. MR. HAYES.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201Af. RESEARCH IN PLANT-BREEDING. Problems in field and laboratory technic, correlation and inheritance of particular characters of farm crops. May be taken as major or minor work. Students majoring in plant-breeding are required to continue study during at least one summer. Prerequisites: Agronomy and Farm Management 131, 132. MR. HAYES.

- 203f,w,s. GENETICS SEMINAR. A discussion of the broader problems, applied biology, and the recent advances in genetic work. Weekly meetings throughout the year. Prerequisite: Agronomy and Farm Management 131. Maximum of 3 credits. MR. HAYES, MR. DORSEY.
- 205Ar. RESEARCH IN FARM MANAGEMENT. Research problems in organization and operation of large farm enterprises, and in farm management surveys of a certain territory, or of special types of farming. Prerequisites: 9 credits in farm management. MR. BOSS.
- 207Ar. COST OF PRODUCTION STUDIES. Research problems in determining the cost of producing farm products. Prerequisites: 9 credits in farm management. MR. BOSS.
- 209Ar. RESEARCH IN FARM CROPS. Research work in farm crops. It is desirable that students remain during one summer to work out research problems. Prerequisites: 9 credits in farm crops. MR. ARNY.
- 211Ar. TOPICS IN PLANT-BREEDING LITERATURE. Library studies and written reports upon historical development of plant-breeding and current literature of special problems. Practice is given in preparing reviews and abstracts. Prerequisite: Agronomy and Farm Management Course 132. Maximum of 6 credits. MR. HAYES.
- 213f,w,s. FARM-CROPS SEMINAR. One meeting each week during the second and third quarters for the discussion of current literature and for reports of thesis problems. Prerequisites: 9 credits in farm crops. Maximum of 3 credits. MR. ARNY.
- 214Ar. SPECIAL TOPICS IN FARM CROPS LITERATURE. Library work with written summaries, either on the historical development or on the current literature of special farm-crops problems, including the making of abstracts, reviews, and bibliographies. Prerequisites: Agronomy and Farm Management Courses 121f, 122w, 123s, and a reading knowledge of German. Maximum 6 credits. MR. ARNY.

ANATOMY

Professors CLARENCE M. JACKSON, JOHN B. JOHNSTON, THOMAS G. LEE, RICHARD E. SCAMMON; Associate Professor ANDREW T. RASMUSSEN.

Prerequisites.—The Institute of Anatomy offers excellent facilities to students who wish to take advanced work or to pursue investigations in anatomy.

The prerequisite work for all students for major or minor in the Department of Anatomy includes general zoology (animal biology), 6 credits, and advanced zoology or elementary courses in anatomy (including histology, embryology, and neurology), 6 credits. In addition each student desiring a major in anatomy must have had the elementary courses in that branch of anatomy in which he desires to specialize—gross anatomy, histology, embryology, or neurology.

For the description of courses, see the special bulletin on graduate work in medicine.

ANIMAL BIOLOGY

Professors HENRY F. NACHTRIEB, HAL DOWNEY, JOHN B. JOHNSTON, WILLIAM A. RILEY, CHARLES P. SIGERFOOS; Associate Professor ELMER J. LUND; Assistant Professors ROYAL N. CHAPMAN, OSCAR W. OESTLUND.

Prerequisites.—For major work, Course 1-2 and at least 18 credits of advanced work approved by the department; for minor work, Course 1-2 or the equivalent.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 109f-110w.† GENERAL PHYSIOLOGY. A thoro survey of fundamental physiological processes in organisms. Based on Bayliss's *Principles of General Physiology*. Laboratory, lectures, and reading. Ten credits. V-VIII MWF; 10AB. MR. LUND.
- 117f-118w-119s. ECOLOGY OF INSECTS.† General principles of ecology with special reference to the insects of Minnesota. Lectures, laboratory, assigned reading, and field work. Nine credits. V-VII; TTh; 208-210AB. MR. CHAPMAN.
- 124su. ADVANCED ECOLOGY. Similar to Course 117-118-119 with special field work. Five credits. V, VI; MTWThF; 208-210AB. MR. CHAPMAN.
- 125f-126w-127s.† ADVANCED ENTOMOLOGY. Advanced work in the lines of morphology and classification of insects, with lectures on the history of entomology. Nine credits. III, IV; TThS; 208-210AB. MR. OESTLUND.
- 130w. BIOLOGY AND TAXONOMY OF THE APHIDIDAE. Intensive study of the natural history, bibliography, and classification of the Aphididae. Three credits. III, IV; MWF; 208-210AB.
- 139†-140.† HISTOLOGY AND DEVELOPMENT OF INSECTS. Lectures and laboratory work on the histology, embryonic, and postembryonic development of insects. Six credits. III,IV; MWF; 208-210AB. MR. RILEY.
- 144f-145w-146s.† ANIMAL PARASITES AND PARASITISM. Lectures and laboratory work. Origin and biological significance of parasitism; the structure, life history, and economic relations of representative parasites. Second half devoted primarily to the relation of insects to diseases of man and animals. Nine credits. V-VII; WF; 208-210AB. MR. RILEY.
- 149f-150w-151s.† BLOOD OF VERTEBRATES. A comparative study of blood and blood-forming organs of vertebrates. A portion of time to be devoted to research. Nine credits. VI, VII; ar.; 201,211AB. MR. DOWNEY.

† All quarters must be completed before credit will be given.

- 181f-182w.† GENERAL EMBRYOLOGY. Principles and laws of animal development in connection with origin and development of germ cells, sex chromosomes, fertilization, cleavage, blastula, gastrula, germ layers, establishment of the vertebrate body; circulatory, excretory, and nervous systems in vertebrates. Six credits. V,VI; MWF; 201,211AB. MR. NACHTRIEB.
- 183s.† GENETICS AND EUGENICS. Facts and theories of heredity and the application of the laws governing natural inheritance for the improvement of the race. Lectures, references, quizzes, and demonstrations. Three credits. III; MWF; 211AB. MR. NACHTRIEB.
- 197f-198w-199s. PROBLEMS. Advanced work in some special line. Nine or 18 credits. MR. NACHTRIEB, MR. DOWNEY, MR. JOHNSTON, MR. RILEY, MR. SIGERFOOS, MR. LUND, MR. CHAPMAN, MR. OESTLUND.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-204. RESEARCH IN ENTOMOLOGY. MR. RILEY, MR. CHAPMAN, MR. OESTLUND.
- 213-216. RESEARCH IN BIOLOGICAL OXIDATIONS. MR. LUND.
- 217f-218w-219s. RESEARCH IN THE PHYSIOLOGY OF THE LOWER ORGANISMS with special reference to the Protozoa. MR. LUND.
- 225-228. RESEARCH ON THE GROSS AND MICROSCOPIC ANATOMY OF THE GANOIDS. MR. NACHTRIEB.
- 229-232. RESEARCH IN ANIMAL HISTOLOGY. MR. DOWNEY.
- 233-236. RESEARCH IN VERTEBRATE CONNECTIVE TISSUE WITH SPECIAL REFERENCE TO THE CELLULAR ELEMENTS. MR. DOWNEY.
- 237-238. RESEARCH IN VERTEBRATE HEMATOLOGY. MR. DOWNEY.
- 245-248. COMPARATIVE NEUROLOGY. A study in the structure and functions of the nervous system of vertebrate animals and of the evolution of the chief nervous mechanisms. Prerequisites: two years in comparative or human anatomy. MR. JOHNSTON.
- 249-252. RESEARCH IN NEUROLOGY. MR. JOHNSTON.
- 253-254. DYNAMICS OF PROTOPLASM AND CELLS. Physical and chemical interpretation of the structure of living protoplasm, and vital processes such as permeability, secretion, enzyme action, regeneration, stimulation, and energy transformation in the living cell. Research accompanied by lectures. MR. LUND.

† All courses must be completed before credit will be given.

ANIMAL HUSBANDRY

Professors WALTER H. PETERS, EVAN F. FERRIN; Assistant Professor PHILLIP A. ANDERSON.

Prerequisite.—Exemption from the language requirements for the Master's degree may be made in individual cases.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f. ADVANCED LIVESTOCK-JUDGING. Competitive judging of all types, breeds, and classes of livestock, supplemented by visits to nearby stock farms. Three credits. VI, VII; MWF; center arena, St. (F). MR. FERRIN.
- 102S. HORSE HUSBANDRY. Stud-farm management; the selection of foundation stock and the breeding, feeding, and marketing of horses. Horsepower; factors determining a horse's efficiency for work. Three credits. II; TTh; 3St.(F) and V,VI,VII; F, center St.(F). MR. PETERS.
- 103S. BEEF-CATTLE HUSBANDRY. The management of purebred and grade herds of beef cattle; sales and shows, building equipment, labor. Practice in fitting cattle for show and sale, animal photography, preparation of feeds, and the care of cattle. Three credits. III; MW; 3St.(F) and V, VI, VII; T; BB. MR. CARNES.
- 104S. SHEEP HUSBANDRY. The care and management of purebred sheep, study of pedigrees, registrations, fitting for show purposes, marketing, practice in shearing, blocking, feeding, and caring for lambs. Three credits. IV; WF; 3St.(F) and V, VI, VII; M; center St.(F). MR. ANDERSON.
- 105S. SWINE HUSBANDRY. Cost of producing pork; equipment; swine types; purebred vs. market hogs; building a breeding herd; feeding; marketing breeding stock; herd management; pedigree studies; fitting and showing. Barn work and feeding practice. Three credits. III; TS; 3St. (F) and V, VI, VII, Th; center St.(F). MR. FERRIN.
- 106W. ADVANCED MEATS. Practice work in dressing animals and cutting carcasses, giving particular attention to conformation as related to dressing percentage and the carcass; also a study of the chemical composition of meat. Three credits. V, VI, VII; WF; Meat Shop. MR. ANDERSON.
- 107S. MEAT PROBLEMS. The wholesale cuts and grades of meat, the packing industry and utilization of by-products, special problems and visits to meat-packing establishments. IV; TS; and V, VI, VII; W; Meat Shop. MR. ANDERSON.
- 108S. SEMINAR. Special assignments and review of investigations pertaining to the livestock industry. Three credits. II; MWF; 3St.(F). MR. PETERS.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201s. **ADVANCED STUDY OF LIVESTOCK-BREEDING.** Studies of the methods followed in the building up of breeds of livestock and distinguished blood lines within the breeds. Review of scientific literature on livestock-breeding. Three to 10 credits. MR. PETERS.
202. **ADVANCED LIVESTOCK FEEDING.** Special problems in livestock-feeding considered in detail. A study of experimental results bearing upon these questions and review of scientific literature applicable to them. Three to 10 credits. MR. FERRIN.
203. **THE MARKETING OF LIVESTOCK.** A study of the methods used in the selling of commercial livestock in the principal markets of the world. The selling of purebred livestock. Three credits. MR. PETERS.
204. **MANAGEMENT OF LIVESTOCK FARMS.** A study of the economic factors entering into the problems of managing large livestock farms. Three credits. MR. PETERS.
205. **EXPERIMENTAL METHODS.** Theory, plan, and conduct of experimental work in animal husbandry. Factors affecting results, sources of error, interpretation of data. Three credits. MR. FERRIN.

ANTHROPOLOGY¹

Professor ALBERT ERNEST JENKS; Professorial Lecturer RUBY BAUGHMAN.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

108. **PHILIPPINE PEOPLES.** Comparative study of the four large ethnic and cultural groups of people in the Philippine Islands; policy of the insular government as it affects American home interests in the Orient. (Not offered in 1921-22.) MR. JENKS.
- 110s. **PHYSICAL ANTHROPOLOGY AND AMALGAMATION.** Theory of evolution as applied to natural and cultural man. Eugenics in theory, law, and practice. Studies in the amalgamation of races. MR. JENKS.
112. **THE AMERICAN NEGRO.** Development of the American Negro; his characteristics, conditions, and developing tendencies. Negro and immigrant adjustments. Prerequisites: three courses. Three credits. (Not offered in 1921-22.) MR. JENKS.
- 113f. **THE AMERICAN PEOPLE—OLDER IMMIGRANTS.** Characteristics, contributions, and distribution of the older immigrant peoples in America, their modification and importance to us. Prerequisites: three courses. Three credits. MR. JENKS.
- 114w. **THE AMERICAN PEOPLE—NEWER IMMIGRANTS.** Characteristics, contributions, and distribution of the newer immigrant peoples in America, their modification and importance to us. Prerequisites: three courses. Three credits. MR. JENKS.

¹ Courses in Americanization alone may not be offered for a major for an advanced degree.

- 115s. AMERICAN PEOPLE—AMERICANISMS AND ASSIMILATION. Essential and unique historical Americanisms, and their value and virility for the future in America. Conditions and facts of assimilation. Prerequisites: three courses. Three credits. MR. JENKS.
- 123f-124w. PROBLEMS IN ANTHROPOLOGY. An advanced course of method and independent research. Six credits. MR. JENKS.
- 128f,s. TECHNIC OF TEACHING ADULTS. Methods of teaching adults—the foreign-speaking, the illiterate, the fatigued. Prerequisites: three courses. Three credits. MISS BAUGHMAN.
- 129w. METHODS OF AMERICANIZATION. Practical methods of Americanization in use in the United States, together with facts and conditions of their success and failure. Prerequisites: Course 128. Three credits. MR. JENKS, MISS BAUGHMAN.
- 130s. ORGANIZATION OF AMERICANIZATION WORK. Existing Americanization organizations of federal, state, municipal, and neighborhood groups. Methods of organizing new groups and of interorganic coöperation. Prerequisite: Course 128. Three credits. MR. JENKS.
- 131f-132w-133s. SUPERVISED AMERICANIZATION WORK. Practical field work among foreign peoples in our vicinity. Prerequisites: three courses. Nine credits. MISS BAUGHMAN.
- 141f-142w-143s. PRINCIPLES OF ADULT ELEMENTARY EDUCATION. Language study as a fundamental tool in assimilation of peoples; ethnic peculiarities of language habit; racial bases for development of subject-matter; problems of adult language-habit substitution; voluntary versus compulsory nationalization of language. Prerequisite: Course 128. MISS BAUGHMAN.
- 150f-151w-152s. FIELD PROBLEMS IN AMERICANIZATION. An advanced course of method and independent research. Prerequisite: Course 128. Six credits. MISS BAUGHMAN.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 204s. SEMINAR IN ANTHROPOLOGY. Individually directed research. Prerequisites: three courses. Three credits. MR. JENKS.

ARCHITECTURE

Professor FREDERICK M. MANN.

- 119f,w,s. SPECIAL RESEARCHES IN ARCHITECTURAL HISTORY. Prerequisite: completion of undergraduate, architectural history. Five credits or less per quarter. MR. MANN.
- 139f,w,s. ADVANCED ARCHITECTURAL DESIGN. Prerequisite: completion of undergraduate design. Ten credits or less per quarter. MR. ARNAL.

ASTRONOMY

Professor FRANCIS P. LEAVENWORTH; Assistant Astronomer WILLIAM O. BEAL.

The Astronomical Observatory contains a ten and one-half inch refracting telescope furnished with a third lens for converting it into a photographic telescope; a five-inch star camera; a filar micrometer; a spectroscope by Brashear; a meridian circle and zenith telescope; a Repsold photographic measuring machine; a chronograph, and astronomical clocks.

Prerequisites.—For major work, Course 51-52-53 and Mathematics 50; for minor work, Mathematics 50 and 3 credits in astronomy.

Exemptions from the language requirement for the Master's degree may be made in individual cases.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101f-102w-103s. 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 method of least squares. Prerequisite: Mathematics 50. Three or 6 credits. V; MWF. MR. LEAVENWORTH.

111f-112w-113s. CELESTIAL MECHANICS. Prerequisite: Mathematics 51. Three credits. MR. BEAL.

140w. METHOD OF LEAST SQUARES. The combination and adjustment of observations and the discussion of their precision as applied especially to engineering, physics, and astronomy. Prerequisite: Mathematics 51. Three credits. IV; MWF. MR. LEAVENWORTH.

COURSES PRIMARILY FOR GRADUATE STUDENTS

201f-202w-203s. ADVANCED PRACTICAL ASTRONOMY. Prerequisite: Astronomy 101-102. Three credits. MR. LEAVENWORTH.

204f-205w-206s. ASTROPHOTOGRAPHY. Photography of the heavenly bodies, measurement of plates, determination of positions, parallax, etc. Prerequisite: Astronomy 102. Three credits. MR. LEAVENWORTH.

208f-209w-210s. CALCULATION OF ORBITS. Prerequisite: Mathematics 51. Three credits. MR. BEAL.

BACTERIOLOGY AND IMMUNOLOGY

Professors WINFORD P. LARSON, EDWARD C. ROSENOW; Associate Professors ARTHUR T. HENRICI, ARTHUR SANFORD.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

105f. HOUSEHOLD BACTERIOLOGY. The decay, fermentation, and putrefaction of food-stuffs; molds; canning; bacterial food-poisoning; bacteriology of the cleansing processes. Prerequisite: general bacteriology. Forty-four hours; 3 credits. VI, VII; TTh. MISS BENTON.

- 114s. THE HIGHER BACTERIA. Study of morphology, cultivation, and classification of actinomycetes, yeasts, and molds. Study of the mycoses. Prerequisites: general and special bacteriology. Forty-four hours; 3 credits. V, VI; TTh. DR. HENRICI.
- 116w. COURSE IN IMMUNITY. Laws of hemolysis. Quantitative relationship between antigen and antibody. Wassermann reaction. Opsonins. Vaccines. Precipitin reaction. Blood-grouping. Abderhalden reaction. Anaphylaxis. Fifth- and sixth-year medical students. Limited to ten students. Forty-four hours, 3 credits. VI, VII; TTh. DR. LARSON.
- 117s. PATHOGENIC PROTOZOA. Study of parasitic protozoa in man, including spirochaets; their morphology and life history; intermediate hosts as agents in the spread of disease; cultural methods. Prerequisites: general and special bacteriology; Animal Biology 45 and 107. Forty-four hours; 3 credits. VI, VII; TTh. DR. LARSON.
- 118f. MORPHOLOGY AND TAXONOMY OF BACTERIA. Cytology of bacteria; their origin and systematic position; consideration of morphological, biochemical, and immunological characters as data for classification; variations and mutations in bacteria; the biometrical method as applied to bacteriology. Prerequisites: general and special bacteriology. Forty-four hours; 3 credits. V, VI; TTh. DR. HENRICI.
- 119f. BACTERIOLOGICAL CHEMISTRY. Chemical analyses of bacteria; physical agents influencing bacterial metabolism (salinity, hydrogen-ion concentration, surface tension, etc.); factors stimulating enzyme production; protein, carbohydrate and fat metabolism of bacteria; nitrogen fixation. Prerequisites: general and special bacteriology; physiologic chemistry or phytochemistry. Sixty-six hours; 4 credits. Hours to be arranged.
- 120w. CONTINUATION OF 119f. Bacterial toxins; "split proteins"; bacterial activity in the alimentary tract; pigment production; autolysis of bacteria; immunochemistry; permeability of bacterial cells; behavior of bacteria toward electricity. Sixty-six hours; 4 credits. Hours to be arranged.
- 150f-151w (or 150w-151s). ADVANCED BACTERIOLOGY. An advanced course giving additional work in bacteriology and the opportunity of working out special problems. Limited to ten students. Forty-four hours; 3 credits. Hours to be arranged. DR. LARSON, DR. HENRICI.

COURSES PRIMARILY FOR GRADUATE STUDENTS

201. RESEARCH IN BACTERIOLOGY. Graduate students of the necessary preliminary training may elect research, either as majors or minors, in bacteriology. Hours and credits arranged. DR. LARSON, DR. HENRICI.
203. SEMINAR IN BACTERIOLOGY. One credit.

BOTANY

Professors C. OTTO ROSENDAHL, ELIAS J. DURAND, LEE I. KNIGHT, JOSEPHINE E. TILDEN; Associate Professor FREDERIC K. BUTTERS; Assistant Professors WILLIAM S. COOPER, RODNEY B. HARVEY.

Note: For courses in plant pathology and mycology, see Department of Plant Pathology.

Prerequisites.—For major work, 36 quarter credits in botany; for minor work 20 credits.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 107W. MORPHOLOGY AND TAXONOMY OF THE BRYOPHYTES. A special study of the structure and classification of the liverworts and mosses. MR. DURAND.
- 108W. MORPHOLOGY AND TAXONOMY OF THE PTERIDOPHYTES. An intensive study of lycopods, ferns, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. MR. BUTTERS.
- 110W. MORPHOLOGY AND TAXONOMY OF THE GYMNOSPERMS. An intensive study of cycads, conifers, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. MR. BUTTERS.
- 113f-114w-115s. ADVANCED TAXONOMY. An advanced course in which special attention is given to the taxonomy and difficult natural groups, involving systematic principles and practice, rules of nomenclature, systems of classification, etc. V, VI; MWF; 202AB. MR. ROSENDAHL.
- 118w-119s. CYTOLOGY. A survey of cell structure and the various phenomena of division, fusion, and metamorphosis, together with a review of the history of cytological investigations. Methods of cytological research indicated in the laboratory. I, II; MWF; 202AB. MR. ROSENDAHL.
123. MORPHOLOGY AND TAXONOMY OF THE ALGAE; MYXOPHYCEAE. Advanced studies in selected groups of the blue-green algae. Lectures, reports, discussions of current literature, and laboratory work. (Not offered in 1921-22.) MISS TILDEN.
124. MORPHOLOGY AND TAXONOMY OF THE ALGAE; CHLOROPHYCEAE. Advanced studies in selected groups of the green algae. Lectures, reports, discussions of current literature, and laboratory work. (Not offered in 1921-22.) MISS TILDEN.
- 125W. MORPHOLOGY AND TAXONOMY OF THE ALGAE; PHAEOPHYCEAE. Advanced studies in selected groups of the brown algae. Lectures, reports, discussions of current literature, and laboratory work. V, VI, VII; TTh; 104AB. MISS TILDEN.

- 126f. MORPHOLOGY AND TAXONOMY OF THE ALGAE: RHODOPHYCEAE. Advanced studies in selected groups of the red algae. Lectures, reports, discussions of current literature, and laboratory work. V, VI, VII; TTh; 104AB. MISS TILDEN.
- 131f. FIELD ECOLOGY. A careful study 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. MR. COOPER.
- 132w. ECOLOGICAL ANATOMY. The individual plant and its parts as related to environment; greenhouse and microscopic study of special plant forms of structures, their causes and significance. III, IV; MTWFS; G. MR. COOPER.
- 133s. FOREST GEOGRAPHY OF NORTH AMERICA. Preliminary discussion of the principles of plant distribution followed by a detailed study of the forest regions of North America, by means of reading, discussion, lantern slides, distribution maps, microscopic work, written reports. Should be preceded by Field Ecology, but not necessarily. V, VI; MWF; G. MR. COOPER.
- 141f. ADVANCED PLANT PHYSIOLOGY: PHYSICAL PHASES OF PLANT PHYSIOLOGY. A course dealing with the intake of materials and their translocation, also the energy relations of the plant. I, II; TWThFS; G. MR. KNIGHT, MR. HARVEY.
- 142w. ADVANCED PLANT PHYSIOLOGY: PLANT METABOLISM. A course dealing with the synthesis of plant food, its transformation and utilization by the plant. I, II; TWThFS; G. MR. KNIGHT.
- 143s. ADVANCED PLANT PHYSIOLOGY: PLANT METABOLISM AND GROWTH. Continuation of Course 142, also introducing certain fundamental phases of growth. I, II; TWThFS; G. MR. KNIGHT, MR. HARVEY.
- 144s. PLANT MICROCHEMISTRY. A study of the localization of materials of physiologic importance in the plant and their relation to physiologic processes. Time arranged. MR. HARVEY.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202-203. RESEARCH PROBLEMS IN THE MORPHOLOGY OF VASCULAR PLANTS. MR. BUTTERS.
- 205-206-207. RESEARCH PROBLEMS IN THE TAXONOMY OF ANGIOSPERMS. MR. ROSENDAHL.
- 209-210-211. RESEARCH PROBLEMS IN ALGAE. (Not offered in 1921-22.) MISS TILDEN.
- 213-214-215. RESEARCH PROBLEMS IN EMBRYOLOGY. MR. DURAND.
- 217-218-219. SPECIAL RESEARCH PROBLEMS IN THE TAXONOMY AND DISTRIBUTION OF ALGAE. (Not offered in 1921-22.) MISS TILDEN.

- 221-222-223. RESEARCH PROBLEMS IN ECOLOGY. MR. COOPER.
224. RESEARCH METHODS IN PLANT PHYSIOLOGY. (Not offered in 1921-22.) MR. KNIGHT, MR. HARVEY.
- 225-226-227. RESEARCH PROBLEMS IN PLANT PHYSIOLOGY. MR. KNIGHT, MR. HARVEY.
- 229-230-231. RESEARCH PROBLEMS IN CYTOLOGY. MR. ROSENDAHL.
- 233-234-235. SEMINAR. Students may register for one-hour seminar credit per quarter in any of the above research subjects.

CHEMISTRY

Professors PAUL H. M.-P. BRINTON, GEORGE B. FRANKFORTER, WILLIAM H. HUNTER, CHARLES A. MANN, CHARLES F. SIDENER; Associate Professors EVERHART P. HARDING, FRANK H. MACDOUGALL, M. CANNON SNEED; Assistant Professors LILLIAN COHEN, ISAAC W. GEIGER, LAWRENCE M. HENDERSON, GEORGE H. MONTILLON.

Prerequisites.—

A. Chemistry as a major subject for the Doctor's degree. All candidates who choose chemistry as a major subject must offer the following courses or their equivalent as prerequisites: at least 12 quarter credits in general inorganic chemistry and qualitative analysis, at least 10 credits in quantitative analysis, and at least 10 credits in organic chemistry. All candidates must present at least one year in college physics or one year of college mathematics.

Each student who specializes in a particular branch of chemistry must complete certain advanced courses in connection with his choice. The completion of the course, however, does not satisfy the requirements made of the candidate for a higher degree; he must show a maturity acquired by intensive personal study of the literature and of the methods of chemistry.

B. Chemistry as a minor. It is not possible to state exactly those courses which will be required in each case. If the major is not chosen in chemistry, the usual prerequisites will be at least 12 credits of general inorganic chemistry and qualitative analysis and 5 credits of quantitative analysis or 5 credits of organic chemistry. The choice of the particular courses to be presented in fulfillment of the minor will be made after consultation with the head of the department in which the major work falls. Either Course 120-121 or Course 135-136 will be acceptable as a minor for the Master's degree, or for not more than one half of a minor for the Doctor's degree, if the student is not taking major work in chemistry.

Students choosing a branch of chemistry for their major work may choose physical chemistry for their minor work, but may not choose any other branch except by special permission of the group committee.

C. Candidates for the Master's degree must have a reading knowledge of German or French. A knowledge of German will be of more advantage to the candidate.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

GENERAL INORGANIC CHEMISTRY

- 101s. HISTORY OF CHEMISTRY. The 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. Prerequisite: Chemistry 35-36. Two credits. MISS COHEN.
- 102w. ADVANCED QUALITATIVE ANALYSIS. This course includes an analysis of minerals, alloys, paints, and the methods of detecting some of the rarer elements. Two or three credits. MR. SNEED.
- 103w. ADVANCED INORGANIC CHEMISTRY. A discussion of special subjects of inorganic chemistry, such as valency, oxidation and reduction, complex ions, etc. Prerequisites: Chemistry 20-21, 35-36. Two credits. (Not offered in 1921-22.) MR. SNEED.
- 104s. ADVANCED INORGANIC CHEMISTRY. A discussion of certain elements and compounds such as cobalt, silver, mercury, tungsten, and their derivatives. Three credits. II; TThS; 115C. MR. SNEED.

ANALYTICAL CHEMISTRY

- 120-121s. QUANTITATIVE ANALYSIS. Discussion of the general principles, methods, and procedures of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned for analysis and attention given to proper laboratory practice. Five credits per quarter. Lect. V; M; 315C. Rec. V; F; 315C. Lab. V-VIII; WF; 310C. VI-VIII; M; 310C. MR. SIDENER, MR. GEIGER.
- 123f. IRON AND STEEL ANALYSIS. The rapid technical methods for the determination of the common constituents of iron ore, iron, and steel discussed and compared, and typical problems assigned for laboratory practice. One lecture and eight laboratory hours per week. Three credits. Lect. V; T; 315C. Lab. VI-VIII; T; 310C. V-VIII; Th; 310C. MR. SIDENER, MR. GEIGER.
- 124w. MINERAL AND ORE ANALYSIS. A course in the rapid technical methods for the determination of important constituents in minerals, ores, and slags. One lecture and eight laboratory hours per week. Prerequisite: Chemistry 121s. Three credits. Lect. V; T; 315C. Lab. VI-VIII; T; 310C. V-VIII; Th; 310C. MR. BRINTON, MR. SIDENER, MR. GEIGER.
- 125s. SPECIAL PROBLEMS IN QUANTITATIVE ANALYSIS. Selection may be made to meet the particular needs of the student from the following: silicate analysis, non-ferrous alloy analysis, industrial water analysis, problems in electro-analysis, etc. Prerequisite: Chemistry 121s. Two or three credits. Lect. V; Th; 315C. Lab. VI-VIII; Th; 310C. V-VIII; T; 310C. MR. SIDENER.

126s. **SANITARY WATER ANALYSIS.** Lectures and laboratory practice in the chemical examination of potable waters. Three or six hours laboratory work per week. Prerequisite: Chemistry 121s. One or two credits. Lect. V; T; 315C. Lab. VI-VII; T; 310C. V-VII; Th; 310C. MR. SIDENER.

ORGANIC CHEMISTRY

130s. **INTERMEDIATE ORGANIC CHEMISTRY.** A continuation of Chemistry 35-36. Chiefly aromatic series. May be accompanied by appropriate laboratory work in Chemistry 137s. III; MWF; 325C. Lab. ar. MR. HUNTER.

131f. **ORGANIC ANALYSIS.** Practice in the identification of organic compounds, and the modern methods of quantitative organic analysis. Three credits. MR. LAUER.

133s. **REAGENTS IN ORGANIC CHEMISTRY.** A discussion of typical reagents used in organic reactions: their limits of applicability, methods of use, and types of substances with which they react. Two credits. May be accompanied by appropriate laboratory work in Chemistry 137. MR. SMITH.

134w. **THE TERPENES.** A discussion of the chemistry of the terpenes including the bicyclic compounds and their important substitution products. Two credits. May be accompanied by appropriate laboratory work in Chemistry 137w. MR. FRANKFORTER.

135f-136w. **ORGANIC CHEMISTRY.** Full discussion of aliphatic and aromatic series with preparation of some of the more important compounds. Certain other work of special nature will also be required. Offered to graduate students taking their minor in chemistry. Lect. III; MWF; 325C. Lab. V-VII; TTh; 10C. MR. HUNTER.

137f,w,s-138f,w,s. **ADVANCED ORGANIC CHEMISTRY LABORATORY WORK.** Difficult preparations and problems. It is intended primarily to supplement the students' knowledge of the methods of organic chemistry. Students who desire appropriate laboratory work for other advanced courses may also register for this course.

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 Graduate School instructor in the Division of Organic Chemistry.

191f-192w-193s. **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 Chemistry 137f-138w-139s. III; TThS; 325C. MR. HUNTER.

194f-195w-196s. ORGANIC CHEMISTRY SEMINAR. One hour a week. One credit. Open only to students taking research in organic chemistry. MR. HUNTER.

PHYSICAL CHEMISTRY

140f-141w-142s. PHYSICAL CHEMISTRY. A general survey of the subject. Three lectures and one recitation. Laboratory work three or six hours per week. Three, four, or five credits per quarter, depending on amount of laboratory work. Lect. IV; MWF; 305C. Rec. IV; S; 115C. Lab. V-VII; F; 117C. MR. MACDOUGALL.

143f-144w,145s. THERMODYNAMICS AND CHEMISTRY. A detailed study of the principles of thermodynamics and their application to physical and chemical phenomena. Three credits per quarter. II; TThS; 315C. MR. MACDOUGALL.

146f-147w-148s. KINETIC THEORY AND ATOMISTICS. Chemical phenomena studied from the atomistic or molecular point of view; therefore takes up the kinetic theory of gases and liquids, the kinetic interpretation of chemical equilibrium, reaction velocity, catalysis, structure of the atom, etc. Three credits per quarter. (Not offered in 1921-22.) MR. MACDOUGALL.

149f. PRINCIPLES OF COLLOIDAL CHEMISTRY. Two credits. (Not offered in 1921-22.) MR. REYERSON.

150w. APPLICATION OF COLLOIDAL CHEMISTRY. Two credits. MR. REYERSON.

151s. RADIOCHEMISTRY. The occurrence, methods of isolation, and physico-chemical properties of the radioactive substances, together with a brief consideration of the chemical, geological, and biological bearing of the subject. Two credits. (Not offered in 1921-22.) MR. HENDERSON.

152f-w-s. LABORATORY COURSE IN RADIOCHEMISTRY. To accompany or follow Course 151s. Credits as arranged. MR. HENDERSON.

153f-154w-155s. ADVANCED PHYSICAL CHEMISTRY LABORATORY. To accompany or follow any of the advanced courses in physical chemistry. Credits as arranged. MR. MACDOUGALL.

159f,w,s. PHYSICAL CHEMISTRY SEMINAR. One hour a week. For students taking advanced courses in physical chemistry. One credit per quarter. MR. MACDOUGALL, MR. HENDERSON, MR. REYERSON.

TECHNOLOGICAL CHEMISTRY

161-162-163. FOOD ANALYSIS. A course including the chemical analysis of the various food materials and food products and the detection of food adulterants. Prerequisite: 3 credits per quarter. MR. HARDING.

164. EXACT GAS ANALYSIS. Prerequisite: Chemistry 21. One or two credits. MR. HARDING.

166. MICROCHEMISTRY. The precipitation, examination, and identification of minute quantities of substances and the examination of food materials, fibers, etc., by means of the microscope. One or two credits. MR. HARDING.
- 167f-168w-169s. METHODS OF TECHNICAL ANALYSIS. The work in this course will cover a wide range of topics. The time allotted to each is indicated by the credit allowed. MR. HARDING.

CHEMICAL ENGINEERING

- 171s. CHEMICAL MACHINERY. Principles and materials of construction, operation, and uses of chemical machinery. Lectures and recitations. Laboratory work in operating and testing. Visits to chemical plants. Prerequisites: Chemistry 21, 35-36. Five credits. MR. MANN.
- 172f. INDUSTRIAL INORGANIC CHEMISTRY. Operations common to chemical industries, chemistry involved, apparatus used, marketing of products, utilization of by-products, trade journals. Topics: acids and alkalies, salts, chlorine, ammonia, glass, pigments, etc. Lectures, recitations. Five credits. MR. MANN.
- 173w. INDUSTRIAL ORGANIC CHEMISTRY. Similar to above but covering organic field. Destructive distillation of coal, wood, oil; explosives, dyes, paper, vegetable and animal oils, fats and waxes, soap, sugar, starch, leather, etc. Lectures and recitations. Prerequisite: Chemistry 172. Five credits. MR. MANN.
- 174f. CHEMICAL MANUFACTURE. (Inorganic.) Manufacture of technical products on a scale large enough to afford data for the determination of cost of manufacture. Use of semi-plant scale equipment. Technical trade journals used. Prerequisite: Chemistry 171. Two or more credits. MR. MANN.
- 175w. CHEMICAL MANUFACTURE. (Organic.) Similar to above but covering the organic field. Prerequisite: Chemistry 171. Two or more credits. MR. MANN.
- 176f-177w. APPLIED ELECTROCHEMISTRY. Application of the electric current to chemical processes. Laws and phenomena of electrochemistry, batteries, electroplating, electro-furnace construction and operation, and electrolytic and electric-furnace products. Four credits each. MR. MANN, MR. MONTILLON.
- 183f. CHEMISTRY OF EXPLOSIVES. The history and development of modern explosives, their manufacture and uses. Lectures, required reading, and reports. Four credits. MR. FRANKFORTER.
- 184s. ORGANIC DYESTUFFS. The technical chemistry of commercial dyes and their intermediates. Five credits. MR. FRANKFORTER.

- 185s. **ADVANCED CHEMICAL MANUFACTURE.** Special problems in making some of the more difficultly made chemicals on a large scale using the industrial chemistry laboratory. MR. MANN, MR. MONTILLON.
- 186s. **GAS MANUFACTURE AND DISTRIBUTION.** Fundamental principles of manufacture of coal gas, carburetted water gas and other industrial fuel gases and the apparatus for manufacture and distribution. Three credits. MR. MONTILLON.

COURSES PRIMARILY FOR GRADUATE STUDENTS

290. **JOURNAL CLUB AND SEMINAR.** The Journal Club and Seminar meets every two weeks throughout the year. At its meetings are given reports on research work in progress in the School of Chemistry, recent literature and topics of interest in advanced work in chemistry. All graduate students are required to attend.
- 301f-302w-303s. **RESEARCH WORK IN INORGANIC CHEMISTRY.** Credits to be arranged. MR. SNEED, MR. HENDERSON, MR. REYERSON.
- 321f-322w-323s. **RESEARCH WORK IN QUANTITATIVE ANALYSIS.** Credits to be arranged. MR. BRINTON, MR. SIDENER, MR. GEIGER.
- 331f-332w-333s. **RESEARCH WORK IN ORGANIC CHEMISTRY.** Credits to be arranged. MR. FRANKFORTER, MR. HUNTER, MR. SMITH.
- 341f-342w-343s. **RESEARCH WORK IN PHYSICAL CHEMISTRY, INCLUDING WORK IN ELECTROCHEMISTRY, RADIOCHEMISTRY, AND COLLOIDS.** Credits to be arranged. MR. MACDOUGALL, MR. HENDERSON, MR. REYERSON.
- 361f-372w-373s. **RESEARCH WORK IN TECHNOLOGICAL CHEMISTRY.** Credits to be arranged. MR. HARDING.
- 371f-372w-373s. **RESEARCH WORK IN CHEMICAL ENGINEERING—INDUSTRIAL INORGANIC AND INDUSTRIAL ORGANIC CHEMISTRY—APPLIED ELECTROCHEMISTRY AND ELECTRIC-FURNACE WORK AND CHEMICAL MANUFACTURE.** Credits to be arranged. MR. FRANKFORTER, MR. MANN.

CIVIL ENGINEERING

Professors FREDERICK H. BASS, ALVIN S. CUTLER, FREDERICK M. MANN, JOHN I. PARCEL; Associate Professor FRANK B. ROWLEY; Assistant Professor GEORGE A. MANEY.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

For prerequisites see bulletin of College of Engineering and Architecture.

- 121f. **RAILWAY ENGINEERING.** Design and construction of railroad buildings and structures; culverts, wooden trestles, switches, crossovers, crossing frogs, etc. Method of computing earthwork, and estimates and reports. Distribution of material by means of mass diagram. Three credits. MR. CUTLER.

- 122w. 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. Three credits. MR. CUTLER.
- 123s. RAILWAY ENGINEERING. Lectures, office work, and field inspection. Design and operations of various types of yards and terminals, and terminal facilities, including the hump, engine house, coal and water station. Signalling and interlocking. Three credits. MR. CUTLER.
- 124w. TRANSPORTATION. Railway, highway, ocean, and inland waterway transportation, motive power and car equipment, operating problems, railway, water, and joint terminal problems, typical design and equipment. Cost and value of service, valuation, regulation, present systems, and organizations. Three credits. MR. CUTLER.
- 125s. TRANSPORTATION. Specific illustrative problems: Twin City and Mississippi Valley traffic situation, Mississippi River experiment, New York Barge Canal, Great Lakes traffic, St. Lawrence River project, Panama Canal status. Rapid transit, motor transport. Aerial transport. Three credits. MR. CUTLER.
- 131f. BRIDGE ANALYSIS. Stresses in simple span railway bridge trusses of the larger type. Baltimore, Petit, Whipple, and "K" trusses. Four credits. MR. MANEY.
- 132w. BRIDGE DESIGN. Design and detail drawing of railway plate girder viaduct. Three credits. MR. MANEY.
- 133s. BRIDGE DESIGN. Complete design and detail drawing of railway pin truss span. Three credits. MR. MANEY.
- 161f. HYDROLOGY. Rainfall, evaporation, transpiration, percolation, run-off. Flood and low-water flows of streams. Storage for use in water supply, water power, irrigation, and navigation. Mass curves and frequency curves. Three credits. MR. BASS.
- 162w. WATER-SUPPLY ENGINEERING. Sources of water supply; quality of water. Laboratory methods of testing water; wells, surface-water intakes, conduits and pipe lines, distribution systems, and purification plants. Selection of pumping machinery and motive power. Three credits. MR. BASS.
- 163s. SANITARY ENGINEERING. Quantities of sewage and storm water; precipitation and run-off. Sanitary sewer system for a small community; storm-water system for a city district. Stream pollution and sewage disposal. Three credits. MR. BASS.

- 164w-165s. WATER POWER. Types of low, medium, and high-head developments. Details of developments. Spillway dams; hollow reinforced concrete dams, arch dams, high masonry dams, movable dams. Turbine settings and characteristics. Three credits. MR. BASS.
- 171f. BUILDING SANITATION. The location and orientation of buildings; lighting, ventilation, water supply, plumbing, sewage, and refuse disposal. Two credits. MR. BASS.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 221f-222w-223s. RAILWAY ADMINISTRATION. An analysis of railway organization and methods of management and operation. Principles of valuation and rate-making. Three credits. MR. CUTLER.
224. RAILWAY TERMINALS AND YARDS. A continuation of Course 123. Three credits. MR. CUTLER.
- 261s. WATER AND SEWAGE PURIFICATION. Continuation of Course 163. Design of water purification and sewage disposal. Three to five credits. MR. BASS.
262. WATER-SUPPLY PROBLEMS. Continuation of Course 162. Three to five credits. MR. BASS.
- 251s. HIGHWAY LABORATORY. Investigations in coöperation with State Highway Department. Three to five credits. MR. LANG.
252. HIGHWAY ADMINISTRATION. Problems of highway administration and finance. Three to five credits. MR. LANG.
271. BUILDING SANITATION. A design course in the sanitation of buildings. Heating and ventilating, plumbing, lighting. Housing problems. Three to five credits. MR. BASS, MR. ROWLEY.
272. CITY-PLANNING. The physical elements of the city; topography, drainage, geology. Public works and structures. Street arrangements; rapid transit; railroad terminals. City-districting. Subsurface structures. Esthetic features of the city; the civic center; parks; boulevards; public buildings. Three to five credits. MR. BASS, MR. MANN.
- 231f-232w-233s. STATICALLY INDETERMINATE STRUCTURES. General theory deflections and statically indeterminate stresses and their application to continuous girders, swing bridges, arches, redundant members, secondary stresses, and wind stresses in office buildings. Three to five credits per quarter. MR. PARCEL, MR. MANEY.
- 234f-235w-236s. ADVANCED STRUCTURAL DESIGN. Fundamental theory of stresses applied to special problems. Stress distribution in girders, riveted joints. Bending of straight bar. Built-up compression members. Impact and fatigue. Relative economy in design. Comparative study of specifications. Three to five credits per quarter. MR. PARCEL.

- 237-238. STRUCTURAL LABORATORY. Similar to 243, but dealing mainly with experimental problems in structural steel. Strain gauge study of actual stress distribution in beams, columns, and riveted joints. Three to five credits per quarter. MR. MANEY, MR. LAGAARD.
- 243-244. CEMENT AND CONCRETE LABORATORY. Laboratory technic and experimental investigation of special problems in cement, concrete, and reinforced concrete. Three to five credits per quarter. MR. LAGAARD.
- 245f-246w-247s. REINFORCED CONCRETE ANALYSIS. Critical review of the literature of reinforced concrete and study of the advanced theory. Study of test data and analysis of stresses in reinforced concrete structures. Three to five credits per quarter. MR. MANEY, MR. LAGAARD.
- 280f-281w-282s. CIVIL ENGINEERING RESEARCH. Original work along lines of plain and reinforced concrete, structural steel, hydraulics, municipal and transportation problems. Investigations, reports, tests, designs. Five credits per quarter. MR. BASS, MR. PARCEL, MR. CUTLER, MR. MANEY, MR. LAGAARD, MR. LANG.

COMPARATIVE LITERATURE

Professor OSCAR W. FIRKINS.

COURSES

- 101-102-103.† DRAMA. An outline of the history of drama, starting with rapid reviews of primitive, oriental, and classical drama and leading to authors so recent as Ibsen, Hauptmann, Brieux, Tolstoi, Shaw, and Galsworthy. Lectures and readings. VII; MWF; 113F. MR. FIRKINS.
- 105-106-107.† PRINCIPLES OF CRITICISM. Various literary forms such as the lyric, epic, drama, short story, and novel discussed and illustrated. Discussion of such principles as clearness, correctness, precision, unity, taste, beauty, art, style, humor, truth, and feeling. Lectures and reading. III; TThS; 113F. MR. FIRKINS.
110. THE INTERNATIONAL ROMANTIC MOVEMENT IN EUROPE (1775-1825). The movement will be studied in French, English, and German literature (Chateaubriand, De Stael, Hugo, Byron, Shelley, Keats, Goethe, and Heine). II; TThS; 113F. MR. FIRKINS.
203. THE ARTHURIAN LEGEND. MR. FIRKINS.
206. FRENCH AND ENGLISH LITERARY CRITICISM: from the sixteenth century to the present time. MR. FIRKINS.

COMPARATIVE PHILOLOGY

Professor FREDERICK KLAEBER; Assistant Professor SAMUEL KROESCH.

Prerequisites.—This department besides offering courses in the general principles of linguistic science, affords an opportunity for elementary studies

in comparative Indo-European philology, and more particularly the investigation of Old Germanic dialects. Related courses in English philology will be found under English Language and Literature.

As a matter of course, candidates for the Master's degree must have a knowledge of Latin and German; candidates for the Doctor's degree must have a knowledge of Greek also.

Students are advised to confer with the department before selecting courses.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101f-102w. GENERAL INTRODUCTION TO THE SCIENCE OF LANGUAGE. Prerequisite, 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 Old English. Six credits. VI; TTh; 205F. MR. KLAEBER.

103f. UNIVERSAL LANGUAGE. Comparison of families of languages grammatically and lexically. Movement for creation of an international language. Consideration of Volapük, Esperanto, Ido, etc. Prerequisites same as for Course 101. Three credits. VI; TS; 205F. MR. KLAEBER.

105s. THE LIFE OF WORDS. Etymology, and semasiology. Growth of vocabulary; change of words in form and meaning. Prerequisites same as for Course 101. Three credits. VI; TTh; 205F. MR. KLAEBER.

108f. COMPARATIVE PHONETICS. A study of speech sounds and the nature of their production with especial reference to English, French, and German. Open to students of the modern languages. Prerequisites: 2 credits in other than elementary courses. This course is identical with German 108. Three credits. Hours to be arranged. MR. KROESCH.

109f-110w-111s. HISTORY OF THE GERMAN LANGUAGE. Lectures, discussions, assigned readings. This course is identical with German 109-110-111. Nine credits. (Not offered in 1921-22.) MR. KLAEBER.

141f-142w-143s. HISTORICAL GRAMMAR OF THE ENGLISH LANGUAGE. I. Sounds and spelling. II. Accidence and syntax. Nine credits. (Not offered in 1921-22.) MR. KLAEBER.

COURSES PRIMARILY FOR GRADUATE STUDENTS

202. COMPARATIVE GRAMMAR OF THE GREEK, LATIN, AND GERMANIC LANGUAGES. A general survey of the field of Indo-Germanic philology will be included. MR. KLAEBER.

203-204. GOTHIC. The relation of Gothic to other Germanic dialects will be particularly emphasized. Study of the grammar (Braune, J. Wright, Streitberg), reading of texts (Stamm-Heyne-Wrede's *Ulfilas*, or Streitberg's *Gotische Bibel*), discussion of problems. MR. KLAEBER.

205. URGERMANISCHE GRAMMATIK. Lectures and study of standard works. (Brugmann, Kluge, Noreen, Streitberg, et al.) MR. KLAEBER.
206. COMPARATIVE PHONOLOGY OF ENGLISH AND GERMAN. Elements of phonetics; history of English and German sounds; orthography. MR. KLAEBER.
- 207-208. OLD SAXON. Old Saxon grammar; interpretation of the *Heliand* and *Genesis*. MR. KLAEBER.
- 209-210. OLD HIGH GERMAN. Braune's *Althochdeutsche Grammatik*; Braune's *Althochdeutsche Lesebuch*. This course is identical with German 209-210. MR. KLAEBER.
- 211-212. RESEARCH SEMINAR. Competent graduate students will be advised and assisted in research along special lines. MR. KLAEBER.

DAIRY HUSBANDRY

Professors CLARENCE H. ECKLES, JOSEPH R. KEITHLEY; Assistant Professor ALLAN B. RAYBURN.

Students taking their major in dairy husbandry are exempted from the language requirements for the Master's degree.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f. MILK PRODUCTION. Problems of the dairy farmer, such as characteristics and adaptations of dairy breeds; selection and management of dairy herd; selection of sire; calf-raising; dairy barns. Laboratory work, comparative judging, and study of breed type. IV; MTWF; 40DH. MR. ECKLES.
- 102s. MARKET MILK. Lectures and laboratory work. Classes of market milk; transportation and marketing; sanitary inspection; equipment of plants; problems of public control. VI, VII; MWF; 39DH. MR. KEITHLEY.
- 103w. DAIRY STOCK-FEEDING. Application of the principles of nutrition to special problems of feeding the dairy cow and growing the young animals. Use of feeding standards; characteristics of various feeding stuffs; formulation of rations for various purposes. III; MWF; 30DH. MR. ECKLES.
- 104f. ADVANCED STUDY OF DAIRY BREEDS. Practice in comparative judging of dairy cattle representing different breeds and ages; selection and valuation of cattle according to type and pedigree; a study of important strains and families; visits to purebred herds. III; S; V, VI; TTh; 40DH. MR. RAYBURN.
- 105f-106w-107s. SEMINAR. 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. II; S; 30DH. MR. ECKLES.

COURSES PRIMARILY FOR GRADUATE STUDENTS

202f-203w-204s. RESEARCH IN DAIRY HUSBANDRY. Facilities offered for study and investigation of subjects pertaining to dairy cattle. Students are allowed to assist at times with investigations under way in the experiment station. Arranged to meet the needs of individual student. 30DH. MR. ECKLES.

205f-206w-207s. DAIRY PRODUCTS. Opportunity and facilities are offered for the study and investigation of problems concerning common dairy products. The work is arranged to meet the needs of the individual student. MR. KEITHLEY.

ECONOMICS

Professors GEORGE W. DOWRIE, JOHN D. BLACK, ROY G. BLAKEY, FREDERICK B. GARVER, NORMAN S. B. GRAS; Associate Professors ALVIN H. HANSEN, BRUCE D. MUDGETT, CLARE L. ROTZEL; Assistant Professors Z. CLARK DICKINSON, CLARENCE L. HOLMES, J. WARREN STEHMAN; Professorial Lecturer J. FRANKLIN EBERSOLE.

Candidates for higher degrees will be accepted as majors in economics in the following fields: general economics; money and banking, public finance, public utilities, economic theory, economic history, labor; agricultural economics; marketing, land economics, farm finance, economics of agricultural production, agricultural prices.

GENERAL ECONOMICS

Prerequisites.—For major work, 27 quarter credits for those offering Economics 1-2, or Economics 20-21, or their equivalent; 18 quarter credits for those not presenting one of these courses or an equivalent. These credits should include Money and Banking, Statistics, and Accounting. Candidates not presenting these fundamental courses upon registration in the Graduate School may be required to complete them in addition to the regular course requirements for the degree.

Majors and minors.—Major and minor work for the Master's degree may both be taken in economics if the candidate presents a program of courses properly complementing each other and not too closely related, if approved by the Executive Committee of the Graduate School faculty. Agricultural economics and economic history will usually be considered satisfactory as majors or minors distinct from general economics.

Required courses.—All candidates for the Master's degree must complete Economics 103-104, or Economics 203-204-205, or its equivalent. Other courses will be required according to the field in which the candidate is working. Ordinarily at least one full graduate seminar must be carried throughout the year.

Language requirement.—Candidates for the Master's degree in economics are required to have a reading knowledge of a foreign language only when the thesis is written in the following fields: money and banking, public finance, economic theory, economic history, and labor.

AGRICULTURAL ECONOMICS

Prerequisites.—For major work 18 quarter credits. If, however, these credits do not include courses in Money and Banking, Statistics, and Accounting, these may be required in addition to the regular course requirements for the degree. Farm Management II and III may be included as economics prerequisites.

Majors and minors.—Upon approval of the graduate faculty, candidates doing their graduate work in agricultural economics may take their minor in general economics.

Language requirements.—Candidates for the Master's degree in agricultural economics must have a reading knowledge of a foreign language only when the thesis is in land economics or farm finance.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 103f-104w. VALUE AND DISTRIBUTION. An advanced course in economic theory devoted chiefly to the study of recent theories of wages, interest, rent, and profits. Assigned readings and reports on current problems in distribution. Six credits. VII; MWF; 102MA. MR. GARVER.
- 105s. HISTORY OF ECONOMIC IDEAS. History of economic thought; scope and logical methods, relation to other social sciences; methods of investigation and instruction. Assigned readings, reports, and class discussion. Three credits. VII; MWF; 102MA. MR. GARVER.
- 106w,^s* LAND ECONOMICS. Land as a factor of production, urban land utilization; rents and land values; land classification; land exchange. MR. BLACK.
- 107f.¹ LAND TENURE. (See College of Agriculture bulletin.)
- 112f. BUSINESS STATISTICS. Application of statistical methods in analyzing the internal and external aspects of business operations; internal aspects involving analysis of production, markets, etc., within business units; external aspects, dealing with general business conditions. Three credits. II; TThS; 202MA. MR. MUDGETT.
- 113w. THEORY OF STATISTICS. The calculation and use of various constants of importance in the analysis of statistical data; averages, measures of dispersion and correlation, partial correlation; and the theory of errors. Three credits. II; TThS; 213MA. MR. MUDGETT.
- 116.¹ ECONOMICS OF AGRICULTURAL PRODUCTION. (See College of Agriculture bulletin.)
- 117w.¹ PRICES OF FARM PRODUCTS. (See College of Agriculture bulletin.)

¹ Given at the University Farm.

* Section on main campus.

- 118f-119w-120s. ECONOMIC HISTORY OF EUROPE AND THE UNITED STATES, 1750 TO THE PRESENT. (See History 113-114-115.)
- 121f-122w-123s. ECONOMIC HISTORY OF EUROPE, 1300-1750. (See History 116-117-118.)
- 131f-132w-133s. COST ACCOUNTING. First quarter: general principles of cost accounting and their application to selling, banking, mining, farming, etc. Following quarters: continuation of principles with attention to various cost systems and specific industries; practical experience through constructive problems. Nine credits. (1) II; TThS; 109MA. (2) III; TThS; 109MA. MR. NOBLE.
- 134f-135w. AUDITING. Preparation for the conduct of an audit; the auditor's report and certification, and legal responsibilities. Text-book, assigned readings, class discussions, and lectures. Four credits. II; MWF; 209MA.
- 136s. INCOME TAX ACCOUNTING. The consideration of the accounting problems arising out of the administration of taxes on incomes and excess profits. Two credits. II; MWF; 202MA.
- 137f-138w-139s. ACCOUNTING PRACTICE AND PROCEDURE. Intensified study of numerous subjects discussed in Principles' course. First quarter treats partnerships, municipal accounts, bankruptcy, etc.; second quarter, corporation accounts in all phases; third quarter, retail, wholesale, department store, branch, commission, and consignment accounts. Nine credits. (1) II; MWF; 109MA. (2) III; MWF; 109MA. MR. HEILMAN.
- 143f-144w. MONEY AND BANKING. Relation to industrial system. Monetary principles with special reference to United States. American banking and bank organization, principles of commercial banking, non-commercial banking, relation of government to banking, comparative study of leading foreign systems. Eight credits. Lect. IV; T, (1) VII; MTW; 209MA. (2) II; MWF; 102MA. (3) III; MFW; 202MA. (4) II; TThS; 209MA. (5) III; TThS; 102MA. (6) V; MWF; 102MA. MR. DOWRIE, MR. EBERSOLE, MR. STEHMAN.
- 145s. INTERNATIONAL EXCHANGE. Theory of international exchange, pars of exchange with gold, silver, and paper standard countries; the rates of exchange; financing imports and exports; bankers' bills; futures, arbitrage; specie movements; the present foreign-exchange situation. Three credits. II; TThS; 102MA. MR. DOWRIE.
- 146w,s. INVESTMENTS. Sources of demand and supply of capital; bond houses and stock exchanges as marketing media, criteria for personal selection of prime investments; government, municipal, corporation, and real estate loans; and the use of bond tables. Three credits. VIII; MTW; 209MA. MR. EBERSOLE.

- 147f. **BANK ADMINISTRATION.** The modern commercial bank from the manager's point of view. Legal problems, department functions, profit-making methods, credits. Adjustment of bank policy to prospective business conditions. Lectures and laboratory work in local banks. Three credits. VIII; MTW; 209MA. MR. EBERSOLE.
- 149S. **BUSINESS CYCLES.** American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression, and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. Three credits. VIII; MTW; 209MA. MR. EBERSOLE.
- 150S.¹ **FARM FINANCE.** The financial needs of typical farmers. Present facilities for supplying them; institutions, their organization and operation, interest rates, defects, and proposed remedies. The financing of the various farmers' organizations. The farmer as an investor. Three credits. MR. DOWRIE.
- 153W. **THE TRUST PROBLEM.** Social and legal aspects of the corporation. The development of the trust and the regulatory policy of the government. Three credits. II; MWF; 213MA.
- 154S. **PUBLIC UTILITIES.** Economic and legal bases of classification. Relative advantages of public ownership and regulation. Central and municipal regulation compared. The basis of rates; relative rates; rates and service. Summary of the theories of valuation. Three credits. II; MWF; 102MA.
- 160S. **ECONOMIC MOTIVES.** Psychological approach to certain problems of economic theory, e.g., analysis of wants and consumption, "desire for wealth," valuation, pecuniary and other motives of producers—savers, inventors, entrepreneurs, laborers. Possibilities of redirecting motives. Three credits. VI; MWF; 202MA. MR. DICKINSON.
- 161f. **LABOR PROBLEMS AND TRADE UNIONISM.** Origin of the labor problem; conditions of labor in American industries; structure, aims, policies, and methods of trade and industrial unionism and employers' associations; collective bargaining and shop committees; mediation and arbitration; injunctions; labor legislation. Three credits. Lect. IV; MW; 202MA. (1) IV; F; 202MA. (2) IV; F; 209MA. (3) IV; T; 102MA. MR. HANSEN.
- 162W. **THE LABOR MOVEMENT IN AMERICA.** The conditions, class alignments, and philosophies underlying American labor movements from 1820 to 1920; the historical development of various labor organizations, labor parties and labor programs; the single-tax movement; reconstruction proposals. Three credits. IV; MWF; 202MA. MR. HANSEN.

¹ Given at the University Farm.

167w-168s. INDUSTRIAL RELATIONS. Labor (personnel) policy in business management. Problems and methods as to employment, promotion, training, health and safety, employee's service, employee's representation, wages, hours, stability of work, and working conditions. Studies of actual business practice, written reports by students. Six credits. II; TThS; 209MA. MR. DICKINSON.

169s. THE LABOR AND SOCIALIST MOVEMENT IN EUROPE. A theoretical analysis and historical survey of utopian socialism, Marxian socialism, evolutionary socialism, anarchism, syndicalism, sovietism, guild socialism, state socialism, coöperation, and labor parties, especially as found in Germany, France, England, and Russia. Three credits. I; MWF; 202MA. MR. HANSEN.

176f. COMMERCIAL POLICIES. Theory of international commerce; 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. Three credits. I; MWF; 202MA. MR. BLAKEY.

177w. FOREIGN TRADE. Nature and methods of foreign trade. Character of the foreign trade of the United States and leading countries of the world; organization for foreign trade. Three credits. I; MWF; 202MA. MR. BLAKEY.

180f-181w-182s. SEMINARS FOR SENIORS AND GRADUATES. Intensive study of problems in respective fields of specialization. In 1921-22 seminars will be offered in the following:

No.	Title	Hour	Day	Building
A.	Accounting	VII½-VIII	TTh	303MA
B.	Business Finance.....	VII½-VIII	TTh	213MA
C.	Marketing	VI-VII½	TTh	213MA
D.	Labor and Industrial Relations.....	ar	ar	ar
E.	Public Utilities and Transportation.....	ar	ar	ar
F.	Statistics	ar	ar	ar
G.	Secretarial Administration	ar	ar	ar

191f-192w. PUBLIC FINANCE. National government revenues, expenditures, and debts. This includes a study of the principles and various forms of taxation, budgetary legislation and control, war and emergency financing, the shifting and incidence of taxes and fiscal reforms. Six credits. III; MWF; 209MA. MR. BLAKEY.

193s. STATE AND LOCAL TAXATION. Principles and problems, e.g., state and local taxation of lands, mineral resources, forests, corporations, incomes, inheritances; also studies of classification, separation, local option, exemption, double taxation, evasion, assessment, centralized administration. Three credits. III; MWF; 209MA. MR. BLAKEY.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 203f-204w-205s. SEMINAR IN ECONOMIC THEORY. Intensive study of a limited field in economic theory. Individual investigation, reports, and group discussion. The subject for 1921-22 will be the theory of distribution. Nine credits. VII½-VIII; TTh; 104MA. MR. GARVER.
- 210f-211w-212s. SEMINAR IN ECONOMIC HISTORY. (See Department of History.)
- 219f-220w-221s.¹ SEMINAR IN AGRICULTURAL ECONOMICS. (See College of Agriculture bulletin.)
- 261f-262w-263s. SEMINAR FOR GRADUATES EXCLUSIVELY. Research to be arranged with individual instructors in the various fields of economics. Six credits. To be arranged.

EDUCATION

Professors MELVIN E. HAGGERTY, LEONARD V. KOOS, WILFORD STANTON MILLER, MARVIN GORDON NEALE, ASHLEY V. STORM, FLETCHER H. SWIFT; Assistant Professors HERMIONE L. DEALEY, ALBERT M. FIELD, ROSS L. FINNEY, MARVIN J. VAN WAGENEN; Professorial Lecturer FREDERICK KUHLMAN.

Prerequisites.—For major work, at least 6 quarter credits in psychology and in addition to this a total of not less than 18 quarter credits of undergraduate work in education.

Exemption from the language requirement for the Master's degree may be made in individual cases.

Departmental conferences.—Every alternate Monday all graduate students majoring in Education are expected to meet with the departmental staff from 7:30 to 9:00 p.m. for conference regarding subjects of original investigation. This work carries no credit.

NOTE.—Candidates for the University state teacher's certificate may offer Course 101, 102, or 103 in place of Education I.

SUGGESTED COURSE FOR ALL CANDIDATES FOR DEGREES

- 208f. METHODS OF EDUCATIONAL RESEARCH. A study of the methods employed in treatment and presentation of educational problems. Suggested for all candidates for degrees. Two credits. III, IV; S; 113Ed. MR. SWIFT.

AGRICULTURAL EDUCATION

Prerequisites.—For major or minor work, 12 credits in agricultural education and preparation in agricultural subjects satisfactory to the Department of Agricultural Education and the Graduate Committee of the Department of Agriculture. Exemption from the language requirement for the Master's degree may be made in individual cases.

¹ Given at the University Farm.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 131w,s,su. METHODS IN TEACHING HIGH-SCHOOL AGRICULTURE. Method in teaching as distinctly related to teaching agriculture in the high school. Organization of subject-matter, and the selection and manipulation of devices. Supervised study. Special emphasis on the home project as a method of instruction. Five credits. III; MTWThFS; 317Ad(F) MR. FIELD.
- 151f,s. ORGANIZATION AND MANAGEMENT. Organization and management of work in secondary schools, particularly of Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and coordination of work. Five credits. IV; MTWFS; 317Ad(F). MR. STORM.
- 161f,w,s. FUNDAMENTALS OF AGRICULTURE. Essential for principals and superintendents of schools in which agriculture is taught, and valuable for students of other colleges whose time for agriculture is limited. Agricultural college experts will give work in their special fields. Three credits. MR. FIELD.
- 162f,w,s. FUNDAMENTALS OF AGRICULTURE. Continuation of Course 161. Credit is given for either course separately, but there is no duplication of subject-matter and both should be taken to obtain a fundamental knowledge of agriculture. Three credits. MR. FIELD.
- 176s,su. ADVANCED VISUAL PRESENTATION. Continuation of 175. Further work in design and construction of charts and lantern slides. Special study of motion-picture machines. Actual practice in effective use of visual aids in lecture and recitation.
- 191f-192w-193s. SEMINAR. For graduate students and seniors specializing in agricultural education. Critical studies of important problems in agricultural education; opportunity for individual investigation and research; review and interpretation of current educational literature. Weekly meetings throughout year. Two to six credits. 209Ad(F). MR. STORM, MR. FIELD.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. ADVANCED SEMINAR. A departmental seminar devoted to an intensive, critical, and constructive study of the broader administrative problems and policies in the field of agricultural education. Opportunity for independent investigation and research. One to 2 credits per quarter. 209Ad(F). MR. STORM, MR. FIELD.
- 221f,w,s. GRADUATE PROBLEMS. Making investigations, gathering data, and formulating plans regarding agricultural education. Three credits. 209Ad(F). MR. STORM, MR. FIELD.

EDUCATIONAL ADMINISTRATION

- 113f. HIGH-SCHOOL CURRICULUM. A study of types of programs of study, curricula, subjects of study, constants, variables, electives, distribution of subject-matter by years and units. Three credits. II; TThS; 102Ed. Mr. Koos.
- 119w. ELEMENTARY-SCHOOL CURRICULUM. A study of the principles underlying the organization of subject-matter for courses in the elementary school including a critical examination of curricula, syllabi, and school texts in the light of their function in the teaching and administration of the curriculum. Prerequisites: Education I and 3. Three credits. VII; MWF; 102Ed.
- 119Tf. ELEMENTARY-SCHOOL CURRICULUM. (Same as above for teachers.) Two credits. I, II; S; 113Ed.
- 121f. ORGANIZATION AND SUPERVISION OF THE ELEMENTARY SCHOOL. A course dealing with important problems of organization, management, and supervision of elementary education, including such topics as systems of class organization, promotion schemes, programs, marking systems, records, attendance. Prerequisites: Education I and 3. Three credits. VIII; MWF; 102Ed.
- 121Tw-122Ts. ORGANIZATION AND SUPERVISION OF THE ELEMENTARY SCHOOL. (Same as above for teachers.) Four credits. I, II; S; 113Ed.
- 124f-125w-126s. EDUCATIONAL ADMINISTRATION. The present status and tendencies in the organization and administration of state and city school systems with interpretations. Nine credits. VIII; MWF; 205Ed.
- 160f-161w-162s. THEORY OF SUPERVISION. Factors conditioning quality of teaching and relation of supervision thereto; purpose and function of supervision; factors conditioning quality of supervision; status of supervision and importance thereof; technic of supervision; testing efficiency of supervision. Prerequisite: Education II or equivalent. Six credits. III, IV; S; 102Ed.
- 164w. PROBLEMS OF HIGH-SCHOOL ADMINISTRATION. A study of elimination from school, secondary vocational education, the marketing system, classification of students, high-school library, social organization and extra-curricular activities, community relationships, teaching schedule, building costs. Prerequisites: Education I and 3. Three credits. II; TThS; 102Ed. Mr. Koos.
- 167f-168w. JUNIOR HIGH SCHOOL. A study of the special purposes of this institution and the appropriate reorganizations to achieve them; the history of the movement. Prerequisites: Education I and 3. Four credits. VIII, IX; Th; 102Ed. Mr. Koos.

- 174w. PUBLIC-SCHOOL FINANCE. A critical study of problems of federal and state aid to public schools; sources, methods, principles, needed reforms. Students are strongly advised to take as preparation or in conjunction with this course Economics 191f-192w Public Finance, and Education 126f-127w Methods of Educational Research. Two credits. VI; TTh; 102Ed. MR. SWIFT.
- 175s. CITY SCHOOL FINANCE. A study of the sources of city school funds and their expenditure; analysis of unit costs on various bases; comparative cost-accounting systems, budgets, records, and reports. Three credits. VII; MWF; 102Ed.
- 178f-179w. SCHOOL SURVEYS. A study of the literature and methods of school surveys, as a basis for the investigation of practical problems in school administration and supervision. Six credits. VIII; MWF; 203Ed.
- 180s. THE JUNIOR COLLEGE. A study of this institution as an upward extension of the secondary school. Problems considered are the forces giving rise to the movement, special purposes, sources of student body, financial responsibilities involved, curriculum, faculty, relationships to schools below and above. Prerequisites: Education 1, 3 and 113 or 164. Two credits. VIII, IX; Th; 102Ed. MR. KOOS.
- 205f-206w-207s. SEMINAR IN EDUCATIONAL ADMINISTRATION. Prerequisites: Education 124-125-126, 160-161-162; ar; 111Ed.
- 215f-216w-217s. SEMINAR IN PUBLIC EDUCATION IN THE UNITED STATES. Research course devoted to intensive study of certain factors determining the problem of public education in the United States. The following may be considered typical problems: school support, school supervision, administration units. Prerequisites: Education 1 or 101-102-103 and 3. Six credits. VIII, IX; M. MR. SWIFT.
- 218f-219w-220s. SEMINAR IN SECONDARY-SCHOOL PROBLEMS. Six credits. ar; 111Ed. MR. KOOS.

EDUCATIONAL PSYCHOLOGY

- 106f-107w-108s. ADVANCED EDUCATIONAL PSYCHOLOGY. Advanced work in genetic psychology, origin and nature of human organism, development and control of instincts. Methods of measuring rate of learning; typical learning experiments. Group and individual differences, and their relations to educational practice. Prerequisite: 55 or equivalent. Nine credits. III; MWF. MR. VAN WAGENEN.
- 111s. EDUCATIONAL DIAGNOSIS. The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure based on the results of the test. Prerequisite: Education 55 or equivalent. Three credits. II; MWF. MR. VAN WAGENEN.

- 111Tf-112Tw. EDUCATIONAL DIAGNOSIS. (Same as above for teachers.)
Four credits. I, II; S. MR. VAN WAGENEN.
- 126f-127w. STATISTICAL METHODS. A study of statistical and other methods as applied to educational investigation. This course is ordinarily required of all candidates for advanced degrees. Four credits. VIII, IX; T. MR. VAN WAGENEN.
- 128s. REVIEW OF STATISTICAL STUDIES. A survey of statistical studies in education with special reference to the methods employed and the reliability of the results obtained. Prerequisite: Education 126-127. Two credits. VIII, IX; T. MR. VAN WAGENEN.
- 134f-135w-136s. MENTAL TESTS AND MENTAL DIAGNOSIS. Study of mental variation in children, its nature, degrees, causes, and effects. A laboratory course in the study of individual differences by means of mental tests. Methods of treating superior and subnormal children. Prerequisite: Education 55 or equivalent. Six credits. VI, VII; TTh. Miss Dealey.
- 134f-135w-136s. MENTAL TESTS AND MENTAL DIAGNOSIS. A three-credit course for teachers of subnormal children. Demonstration and practice in mental diagnosis. Careful study made of different groups and systems of mental tests, and other clinical methods with discussion of general theory involved. Prerequisite: Education 55 or equivalent. Three credits. I, II; S. MR. KUHLMAN.
- 138w-139s. EXPERIMENTAL EDUCATION. A laboratory course designed to train students in the use of experimental methods in the study of educational problems, particularly in the field of the psychology of learning. Prerequisite: Education 55 or equivalent. Four credits. VIII, IX; MW. MR. VAN WAGENEN.
- 149f-150w-151s. PSYCHO-EDUCATIONAL CLINIC. Conducted in cooperation with the Department of Sociology and the Medical School clinics in pediatrics and nervous and mental diseases. Students will receive systematic instruction in giving psychological examinations and in scientific interpretation of data. Prerequisite: Education 134-135-136. Three to 9 credits. 11:30-1:30; MWF; Millard Hall. MISS DEALEY.
- 149f-150w-151s. PSYCHO-EDUCATIONAL CLINIC. For teachers of subnormal children. Conducted in cooperation with the public schools. Examinations will be made in the schools by both the group and individual methods, and results studied in relation to medical and school data. Prerequisite: Education 134-135-136. Three credits. 1:00-3:00; F; ar. MR. KUHLMAN.

- 153f-154w-155s. RESEARCH PROBLEMS. Intended for properly prepared students who desire to pursue special investigation in the field of educational psychology. Prerequisites: advanced courses necessary to pursue problems. Consult instructor. Credits and hours arranged. MR. HAGGERTY, MR. VAN WAGENEN.
- 156s. PSYCHOLOGY OF VOCATIONAL EDUCATION. A practical course covering psychological facts and principles involved in vocational education and in industrial and commercial administration. Attention given to matters of personnel, acquisition of skill, motivation of workers, and efficiency of administration. Prerequisite: Education 55 or equivalent. Two credits. I, II; S; Psy. MISS DEALEY.
- 184f-185w-186s. MENTAL DEFICIENCY. Survey of mental deficiency in children and adults. Physical traits including study of brain defects, causes and heredity; psychology of mental deficiency; social problems of feeble-mindedness. Subject treated with reference to the training of defectives. Prerequisite: Education 55 or equivalent. Six credits. III, IV; S. MR. KUHLMAN.
- 197f. SEMINAR: PROBLEMS OF SUBNORMALITY. Phases of subnormality studied intensively. Review of the important literature and original investigation. Students required to make reports on assigned topics and submit a paper on some problem at the close of the quarter. Two credits. VIII, IX; F. MR. KUHLMAN.
- 201f-202w-203s. SEMINAR IN EDUCATIONAL PSYCHOLOGY. A research course for graduate students. Required of all students writing theses in educational psychology. Six credits. Ar; 203Ed. MR. HAGGERTY.

HISTORY OF EDUCATION

- 101f. FOUNDATIONS OF MODERN EDUCATION. Historical analysis and interpretation of the more important elements in modern education derived from the Hebrews, Greeks, Romans, Middle Ages, and Renaissance. Prerequisites: psychology 6 credits and 6 credits in the Department of History. Three credits. VII; MWF; 205Ed. MR. SWIFT.
- 102w. HISTORY OF MODERN SECONDARY AND HIGHER EDUCATION. A survey of existing types of American and European secondary and higher schools, followed by a historical study of their origin, aims, growth. Prerequisites: psychology 6 credits and 6 credits in the Department of History. Three credits. VII; MWF; 205Ed. MR. SWIFT.
- 103s. HISTORY OF MODERN ELEMENTARY EDUCATION. The institutions, theories, and problems of modern elementary education in the light of their history. Emphasis upon the rise of state systems and upon the history of modern educational reform. Prerequisites: same as for Courses 101 and 102. Three credits. VII; MWF; 205Ed. MR. SWIFT.

- 129W-130S. EDUCATIONAL CLASSICS. An intensive study of selected writings of educational leaders: first quarter, Plato, Aristotle, Quintilian, Comenius, Locke; second quarter, Rousseau, Pestalozzi, Herbart, Froebel, and Dewey. Prerequisite: Education I or 101-102-103. Six credits. VI; MWF; 205Ed. MR. SWIFT, MISS ALEXANDER.
- 131W-132S. COMPARATIVE SCHOOL SYSTEMS. A survey of the existing school systems of France, England, Germany, Denmark. Emphasis upon present problems. Special reference to educational conditions in the United States. Students may register for either quarter. Prerequisite: Education I or 101-102-103. Six credits. III; MWF; 102Ed. MISS ALEXANDER.
- 148Tf. PUBLIC EDUCATION IN THE UNITED STATES. Evolution of American ideals, institutions, and practices in elementary and secondary education. Emphasis upon movements of the early nineteenth century. Development of the state school systems and the rise of the high school. Prerequisites: 10 credits in education, psychology, or both. Two credits. I, II; S; 205Ed. MR. SWIFT.
- 211-212-213. SEMINAR IN HISTORY OF EDUCATION. Historical investigation of educational problems. Designed to train students in methods of historical investigation; problems to be selected somewhat upon the basis of students' interest. Prerequisites: Education 101-102-103 or its equivalent and 6 credits in the Department of History. Six credits. MR. SWIFT.

ELECTRICAL ENGINEERING

Professors GEORGE D. SHEPARDSON, FRANK W. SPRINGER; Associate Professor WILLIAM T. RYAN; Assistant Professor EDWIN R. MARTIN.

Prerequisites.—For major work, 12 credits in the department; for minor work, 6 credits in physics.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 111f-113W-115S. ELECTRICAL MACHINERY. Electrical engineering measuring instruments and their use; units; theory of dynamo-electric machinery; methods of regulation; construction and operation of generators and motors; methods of testing. Prerequisite: one year of physics. Three credits per quarter. MR. SPRINGER.
- 112f-114W-116S. ELECTRICAL MACHINERY LABORATORY. To be taken with Course 111-113-115. Experimental study of alternating currents, of instruments, operation, and characteristic curves of generator and motor. Lectures and practice. Prerequisite: Physics 12-13. Two credits per quarter. MR. SPRINGER, MR. MARTIN.
- 121f-123W-125S. ALTERNATING CURRENTS. Phenomena, measurement, and use of alternating currents; theory of line, transformer, generator, and motor; types of apparatus. Prerequisite: Electrical Engineering 115. Three credits per quarter. MR. RYAN.

- 122f-124w-126s. ALTERNATING CURRENTS LABORATORY. To be taken with Course 121-123-125. Experimental study of alternating currents, regulation and efficiency tests of alternators, transformers, motors, and rotaries. Prerequisite: Electrical Engineering 116. Two credits per quarter. MR. SPRINGER.
- 127w. TRANSIENT ELECTRICAL PHENOMENA. Mathematical study of the electric circuit containing resistance, inductance, and capacity. Abnormal currents and voltage upon switching circuits containing iron core inductances. Prerequisite: Electrical Engineering 121. Two credits. MR. JANSKY.
- 128s. TRANSIENT ELECTRICAL PHENOMENA. Current and voltage distribution in circuits containing distributed resistance, inductance, and capacity. Distortion in telephone lines and its correction. Prerequisites: Electrical Engineering 123, 127. Two credits. MR. JANSKY.
- 132f-134w-136s. ELECTRICAL DESIGN. The design of direct and alternating generators and motors, and alternating current transformers; complete working drawings and specifications to accompany each design. Prerequisite: Electrical Engineering 115. To be taken with Course 121-123-125. Two credits per quarter. MR. KUHLMAN.
- 141f. CENTRAL STATIONS. Lectures, recitations, and assigned problems and readings, treating of the operation, design, and construction of electric power generating stations. Prerequisite: Electrical Engineering 115. Two credits. MR. RYAN.
- 142w. ELECTRICAL TRANSMISSION. Consideration involved in the selection of conductors in actual practice; Kelvin's law and its limitations; the transmission line as a mechanical structure; lightning arresters; study of particular high-tension lines. Prerequisite: Electrical Engineering 141. Two credits. MR. RYAN.
- 144w. RAILWAY ELECTRICAL ENGINEERING. History, development, economics, principles of mechanics applied to electric-train movements, motor characteristics, control systems, substations, railway problems, speedtime curves, and time schedules. Lectures and recitations. Prerequisite: Electrical Engineering 115 or 45. Two credits. MR. MARTIN.
- 145s. STEAM RAILROAD ELECTRIFICATION. Reasons for electrification, study of European and American systems, trolley and third-rail construction, variation in locomotive design, performance as compared to steam locomotives, electrical features, results of electrification as service and economy. Lectures, assignments. Prerequisite: Electrical Engineering 144. Two credits. MR. MARTIN.
- 151f or w. ELECTRIC LIGHTING. Principles of vision; photometers and measurement of light; methods and calculations of illumination;

- various sources of light; development of electric illuminations; distribution systems. Lectures, problems, and laboratory practice. Prerequisite: one year in physics. Two credits. MR. SHEPARDSON, MR. MARTIN.
- 152f or w. PHOTOMETRIC LABORATORY. Photometric studies of incandescent and arc electric lamps, gas and oil lamps. Bench and radial photometers and illuminometers. To be taken with Electrical Engineering 151. One or two credits. MR. SHEPARDSON, MR. MARTIN.
- 161f. RADIO COMMUNICATION. Phase relations in high-frequency circuits. Mathematical theory of damped wave transmitting and receiving circuits. Inductance and capacity measurements using damped waves. The electron tube as a detector and amplifier. Signal corps apparatus. Prerequisite: registration in Electrical Engineering 121. Two or three credits. MR. JANSKY.
- 162w. RADIO COMMUNICATION. Theory and measurement of logarithmic decrement. Undamped wave transmitting and receiving circuits. Heterodyne reception. The arc, high-frequency generator, and electron tube as sources of high-frequency power. High-frequency measurements, using undamped waves. Prerequisite: Electrical Engineering 161. Two or three credits. MR. JANSKY.
- 163s. RADIO COMMUNICATION. Mathematical theory of the electron tube and its use in the radio circuit. Design of electron tube oscillator and amplifier circuits. Radio telephony, modulation, carrier frequencies. Direction-finding apparatus and selective circuits for interference elimination. Prerequisite: Electrical Engineering 162. Two or three credits. MR. JANSKY.
- 164f. TELEGRAPH AND TELEPHONE APPARATUS. Theoretical and experimental study of apparatus used for signaling, telegraphy, and telephony. Lectures and laboratory. Prerequisite: to be taken with Course 121. Two credits. MR. SHEPARDSON, MR. SWENSON.
- 165w-166s. TELEGRAPH AND TELEPHONE CIRCUITS. Theoretical and experimental study of telegraph and telephone circuits and the phenomena of long-line transmission. Applications of hyperbolic functions. Phantoms, loading, repeaters. Inductive disturbances, transpositions. Multiplex telephony. Prerequisite: Course 164. Two credits per quarter. MR. SHEPARDSON, MR. SWENSON.
- 167f-168w-169s. RADIO-STATION OPERATION. For men already proficient, licensed radio operators. Includes maintaining schedule in the radio station and the interpretation of the data obtained on radio-communication methods and apparatus. Open only to a limited number by permission. One credit per quarter. MR. JANSKY.

- 183f-184w-185s. ELECTRICAL LABORATORY. Efficiency tests and special problems. Prerequisite: Electrical Engineering 126. Credits as arranged. MR. SHEPARDSON, MR. SPRINGER.
- 186w or s. TENSION AND HIGH-FREQUENCY TESTING. Low-frequency pressure up to 320,000 volts and high-frequency to several million volts applied to the study of dielectric phenomena, testing of high-tension transmission cables, transformer oil, insulators, etc. Prerequisite: Electrical Engineering 124. Two credits. MR. SPRINGER.
- 191f-192w-193s. JOURNAL-READING. Weekly discussion of current electrical periodicals. Prerequisite: Electrical Engineering 115 or equivalent. No graduate credit. MR. SHEPARDSON.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 229f. TRANSIENT AND HIGH-FREQUENCY PHENOMENA. Transient phenomena in coupled circuits. Distribution of current and flux in conductors at high and low frequencies. Change of resistance with frequency. Theoretical study of special problems. Prerequisites: Electrical Engineering 125, 128. Two credits. MR. JANSKY.
- 232f-234w-236s. ELECTRICAL DESIGN. Special problems. Prerequisites: Electrical Engineering, 125, 136. Credits as arranged. MR. RYAN, MR. KUHLMAN.
- 237s. ELECTRIC POWER TRANSMISSION DESIGN. Preparation of detailed plans and specifications for the construction of high voltage transmission lines and distributing systems. Economic, electrical, and mechanical principles and calculations. Overhead and underground lines. Transmission line supports. MR. RYAN.
- 251w-253s. ILLUMINATING ENGINEERING. Lectures and laboratory work. Investigation of performance of electric and gas lamps, reflectors and diffusers; luminous efficiency, distribution, color characteristics, physiological phenomena; methods of determining location, kind, and quality of lights for obtaining desired illumination. Prerequisite: Electrical Engineering 151. Two credits per quarter. MR. SHEPARDSON.
- 281w-282s. ADVANCED ALTERNATING CURRENT MEASUREMENTS. Vector treatment of circuit networks. Bridge circuits for the measurement of resistance, inductance and capacity at audio and radio frequencies. Prerequisite: Electrical Engineering 126. Two credits per quarter. MR. JANSKY.
- 284f-285w-286s. PRECISE ELECTRICAL ENGINEERING MEASUREMENTS. Lectures and laboratory work. Precise measurements of resistance, voltage, current self-induction, and capacity; standardization of measuring instruments. Open to a limited number subject to approval. Prerequisites: Electrical Engineering 123, 124. One or two credits. MR. SPRINGER.

- 271f-272w-273s. GRADUATE THESIS. An investigation of an approved problem in electrical engineering. The major work of the graduate year will center about the thesis, which should constitute a real contribution to knowledge. Three to nine credits per quarter.
- 275f-276w-277s. ELECTRICAL ENGINEERING RESEARCH. Investigation of special problems in laboratory or library. Prerequisite: Electrical Engineering 126. Two to four credits per quarter. MR. SHEPARDSON, MR. SPRINGER, MR. RYAN, MR. MARTIN, MR. JANSKY, MR. KUHLMAN.
- 294f-295w-296s. ELECTRICAL IGNITION AND AUTOMOBILE ELECTRICAL ACCESSORIES. Oscillographic, rotating mirror, rotating gap, and electrical measurements applied to the study of ignition apparatus; characteristics of automobile accessories, such as generators, starters, controllers, etc. Laboratory and lectures. Prerequisite: Electrical Engineering 121 or equivalent. Two credits per quarter. MR. SPRINGER.

ENGLISH AND RHETORIC

Professors RICHARD BURTON, FREDERICK KLAEBER, ELMER E. STOLL,¹ JOSEPH M. THOMAS; Associate Professors JOSEPH W. BEACH, CECIL A. MOORE; Assistant Professors CHARLES N. NICHOLS,¹ ANNA H. PHELAN, EMERSON G. SUTCLIFFE.

Before registering for graduate courses, students should consult with the director of graduate work for the two departments, Professor Cecil A. Moore.

COURSES IN ENGLISH

Prerequisite.—For major work, not less than 27 credit hours in the subject, including satisfactory introductory courses in Old English and Shakespeare.

For minor work, not less than 27 credit hours in the subject.

In cases where the nature of the work to be undertaken by candidates for the Master's degree warrants it, another foreign language may be substituted for French or German.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f. INTRODUCTION TO MIDDLE ENGLISH. An outline of Middle English grammar, including the interpretation of selected texts. Prerequisites: English 4 and 6. Once a week, two hours. Two credits. V; TTh; 212F. MR. KLAEBER.
- 103s. BEOWULF. An introduction to the Old English poem, with reading of considerable portions of the text. Prerequisites: English 4, and either 6 or 8. Four credits. V; MWF; 205F. MR. KLAEBER.

¹ Absent on leave.

- 105f-106w. EIGHTEENTH-CENTURY POETRY. The rise of naturalism and romanticism. English poetry from Pope to Burns, with special reference to the rise and growth of naturalism and romanticism. Prerequisites: any two of Courses 4, 6, and 8. Six credits. VII; MWF; 204F. MR. MOORE.
- 107f-108w. EIGHTEENTH-CENTURY PROSE. Lectures on eighteenth-century prose and prose writers, with readings by the students and essays on approved topics; special study of fiction and the essay. Prerequisites: any two of Courses 4, 6, and 8. Six credits. (Not given in 1921-22.) MR. MOORE.
- 109f-110w. THE ROMANTIC POETS OF THE NINETEENTH CENTURY. The romantic school of poets from Wordsworth to Keats and the influence of the French Revolution. Prerequisites: any two of Courses 4, 6, and 8. Six credits. III; TThS; 204F. MR. BEACH.
- 111w-112s. SEVENTEENTH-CENTURY PROSE. General survey of prose of the century to 1660. Prerequisites: any two of Courses 4, 6, and 8. Course 3-4 in history is a desirable prerequisite. Six credits. III; MWF; 204F. MR. MOORE.
- 123f-124w-125s. STUDIES IN VICTORIAN NOVELISTS. George Meredith; or, in alternate years, Thomas Hardy and Henry James. Meredith in 1921-22. Prerequisites: any two of Courses 4, 6, and 8. Nine credits. 4 to 6 o'clock; T; 205F. MR. BEACH.
- 129f. MODERN DRAMA. Contemporary drama from 1870 to the present; the new impulse in dramatic literature under the stimulus of latter-day thought. Prerequisites: English 8, and either 4 or 6. Four credits. II; MWThF; 301F. MR. BURTON.
- 131s. FORMAL SATIRE. A detailed examination of non-dramatic satire in poetry and prose from the Restoration to the death of Pope, with special emphasis upon Butler, Dryden, Swift, and Pope. Prerequisites: any two of Courses 4, 6, and 8. Four credits. (Not given in 1921-22.) MR. MOORE.
- 133f. THE ENGLISH AND SCOTTISH POPULAR BALLADS. The study of a large number of traditional ballads, English and foreign, and the study of ballad style and origins. Prerequisites: any two of Courses 4, 6, and 8. Three credits. (Not given in 1921-22.) MR. STOLL.
- 136s. ADVANCED SHAKESPEARE. Shakespeare's development traced to the end. A careful analysis of four plays. Problems in the interpretation of Shakespeare's dramatic methods. Prerequisites: English 8, and either 4 or 6.¹ Four credits. I; MTThF; 205F.

¹ In case the student has received a grade of B or higher in the elementary course in Shakespeare or Chaucer he is permitted to enter the corresponding advanced course without further prerequisite.

- 140S. ADVANCED STUDY OF CHAUCER. Further study of the *Canterbury Tales* and of the minor poems. Prerequisites: English 6, and either 4 or 8.¹ Four credits. IV; MTWF; 205F.
- 141f-142w-143S. HISTORICAL GRAMMAR OF THE ENGLISH LANGUAGE. Sounds and spelling. Accidence and syntax. This course is identical with Comparative Philology 141-142-143. Prerequisites: English 4, and either 6 or 8. Six credits. (Not given in 1921-22.) MR. KLAEBER.
- 145W. MEDIEVAL ALLEGORY. A general introduction to the allegory as a type of literature with special consideration of the more important examples, both religious and secular, in Middle English. Prerequisites: English 6, and either 4 or 8. Four credits. (Not given in 1921-22.)
- 146f-147W. THE METRICAL ROMANCES. A study of the more important Middle English romances: designed as an introduction to the great stories of love and chivalry current in the Middle Ages, particularly those connected with Arthur and the Round Table. Prerequisites: English 6, and either 4 or 8. Six credits. (Not given in 1921-22.)
- 150S. VICTORIAN POETRY. The poetry of the Victorian era, aside from Browning's and Tennyson's. The principal names are: Matthew Arnold, the Rossettis, Fitzgerald, and Swinburne. Prerequisites: any two of Courses 4, 6, and 8. Four credits. (Not given in 1921-22.) MR. STOLL.
- 151S. RECENT POETRY. Poetry in England and America since the death of Queen Victoria. The main tradition and tendencies now prevailing. Prerequisites: any two of Courses 4, 6, and 8. Four credits. III; TWThS; 213F. MR. BEACH.
- 152S. PRE-ELIZABETHAN DRAMA. A study of the late medieval and the Renaissance drama, moralities, interludes, and farces up through the earlier years of the Elizabethan period. Prerequisites: English 8, and either 4 or 6. Four credits. (Not given in 1921-22.)
- 155S. THE AMERICAN NOVEL. A study in the beginnings of the American novel and short-story and their development to about 1865. Among the writers included are Charles Brockden Brown, Irving, Cooper, Poe, Hawthorne, Thomas Bailey Aldrich. Prerequisites: either 8 credits in any two of 4, 6, and 8, or 4 credits and 44-45. Four credits. (Not given in 1921-22.). MR. MOORE.
- 160S. MEDIEVAL DRAMA. The origin of the drama in the church service, and the miracle plays. Prerequisites: any two of Courses 4, 6, and 8. Four credits. VII; MWThF; 205F.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f. OLD ENGLISH. Comparative study of Anglo-Saxon (Old English) grammar and reading of prose texts. Once a week, two hours. Three credits. MR. KLAEBER.

¹ In case the student has received a grade of B or higher in the elementary course in Shakespeare or Chaucer he is permitted to enter the corresponding advanced course without further prerequisite.

- 202w-203s. OLD ENGLISH POETRY. Critical reading of poems. Once a week, two hours. Six credits. MR. KLAEBER.
208. PIERS THE PLOWMAN. A study of critical problems relating to the text and authorship of *Piers the Plowman*. Three credits. (Not offered in 1921-22.)
- 209f-210w-211s. THE MIDDLE ENGLISH LYRIC. A study of the lyrical verse, both secular and religious, written during the Middle English period. The attempt will be made to distinguish the more important types and to trace their development and interrelations. (Not given in 1921-22.)
- 213f-214w-215s. SEMINARY IN EIGHTEENTH-CENTURY DRAMA. Special attention will be given to the rise and progress of sentimental comedy and domestic tragedy. Nine credits. (Not given in 1921-22.) MR. MOORE.
- 225f-226w-227s. SEMINARY IN ELIZABETHAN DRAMA. Elizabethan and Jacobean dramatists, from Lyly to Shirley. Problems assigned may involve Shakespeare, and in general his contemporaries will be studied less for their own sake than for the light they shed upon him. Nine credits. (Not given in 1921-22.) MR. STOLL.
- 228f-229w-230s. SEMINARY IN EIGHTEENTH-CENTURY NOVEL. The rise and development of the novel as a form of literature; the use made of the novel as a medium for religious, social, and political theory. Nine credits. MR. MOORE.
218. SEMINARY IN THE RESTORATION DRAMA. The drama from the Restoration to the rise of sentimental comedy. Special attention given to the comedy of manners (from Etherege to Farquhar) and its relation to the life of the time. Nine credits. (Not given in 1921-22.) MR. STOLL.
- 234-235-236. SEMINARY IN MIDDLE ENGLISH LITERATURE. Nine credits.
For Mr. Firkins' courses see Comparative Literature.

COURSES IN RHETORIC

Prerequisites.—For major work, not less than 18 credits in rhetoric and 12 credits in English. For minor work, not less than a minor in rhetoric. In cases where the nature of the work to be undertaken by candidates for the Master's degree warrants it, Greek or Latin may be substituted for French or German.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

100w-101s. VERSIFICATION. The nature of poetry and a detailed analysis of English meters and of the various English verse forms. The theory accompanied by criticism of current poetry, and practice in writing verse. Open to those who have taken 11-12-13 or 15-16-17, and have taken or are taking nine hours in the historical study of English poetry. Six credits. (Not given in 1921-22.) MR. NICHOLS.

103f-104w-105s. STUDIES IN STRUCTURE AND STYLE. Theory of structure and style; rhetorical analysis of standard English prose; themes based on personal observation, current reading, and investigation; preparation of essays with particular classes of readers in view. Prerequisite: Rhetoric 11-12-13, or 15-16-17. Nine credits. VI; MWF; 304F. MR. RUUD.

107f. IMITATIVE WRITING. The principles of structure, diction, and style, which underly the work of leading English writers; application of these principles in both imitative and original compositions. Open to those who have taken 11-12-13 or 15-16-17 and have received a grade of A or B in at least one quarter. Four credits. IV; MTWF; 304F. MRS. PHELAN.

109w-110s. SHORT-STORY WRITING. The technic of the short story accompanied by constructive work in story-writing. Open to those who have taken 11-12-13 or 15-16-17 and have received a grade of A or B in at least one quarter. Six credits. IV; MWF; 304F. MRS. PHELAN.

111f-112w-113s. ESSAY-WRITING. Practice in biographical, critical, informal essays. Papers; reading; exercises. Prerequisite: Rhetoric 11-12-13 or 15-16-17. Nine credits. III; MWF; 304F. MR. SUTCLIFFE.

115f-116w-117s. DRAMATIC TECHNIC. Principles of plotting, characterization, climax, dialog, and scenario-making. Writing of three plays—two original, one dramatized short story. Required reading, laboratory work, criticisms of local productions. Open to those who have taken 11-12-13, and have taken or are taking English 129. III; TThS; 304F.

119f-120w-121s. SEMINAR IN WRITING. For a limited number of advanced students who write with facility, and who desire personal criticism and direction. Criticism of manuscripts submitted for inspection, with lectures upon the fundamental principles of English composition. Open with special permission to seniors and graduate students who have completed Course 11-12-13 or 15-16-17, and nine additional hours in rhetoric. Nine credits. V, VI; T; 304F. MR. THOMAS.

COURSES PRIMARILY FOR GRADUATE STUDENTS

201f-202w-203s. SEMINAR IN RHETORIC. (Graduate seminar but open to seniors taking the Honors Course.) Lectures, discussions, reports on special problems of rhetorical theory. Study of critical theory beginning with Plato and Aristotle, and laying emphasis on the more important English and French writers. Prerequisites: Course 11-12-13 or 15-16-17 and 9 additional credits in rhetoric. For those who are specializing in rhetoric and composition. Nine credits. (Not given in 1921-22.) MR. THOMAS.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors WILLIAM A. RILEY, ARTHUR G. RUGGLES, FREDERIC L. WASHBURN; Associate Professor WILLIAM MOORE; Assistant Professors ROYAL N. CHAPMAN, HARRY H. KNIGHT, OSCAR W. OESTLUND.

Prerequisites.—Eighteen credits in animal biology and entomology.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

117f-118w-119s. GENERAL ECOLOGY OF INSECTS. General ecology with special reference to the insects of Minnesota. Frequent field trips. Lectures, laboratory, and field work. V-VII; TTh; 208-10AB. MR. CHAPMAN.

125f-126w-127s. ADVANCED GENERAL ENTOMOLOGY. Advanced work in the lines of morphology and classification of insects with lectures on the history of entomology. Lectures and laboratory. III, IV; TThS; 208-10AB. MR. OESTLUND.

130w. BIOLOGY AND TAXONOMY OF THE APHIDIDAE. Intensive study of the natural history, bibliography, and classification of the Aphididae. Additional work is offered under 175. III, IV; MWF; 208-10AB. MR. OESTLUND.

139-140. HISTORY 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 under 197. II-VI; TTh, and ar; 321Adm (F). MR. RILEY.

144f-145w-146s. 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. V-VII; WF; 208-10AB. MR. RILEY.

150su. 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. Ar; Insectary (F). MR. MOORE.

197f,w,s,su. INTRODUCTION TO RESEARCH. Preparation for investigational work in lines of entomology, parasitology, or economic zoology. Advanced laboratory, field, and library work; training in the preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible. MR. RILEY, parasitology, insect morphology; MR. RUGGLES, general economic entomology; MR. WASHBURN, economic vertebrate zoology; MR. MOORE, insecticides; MR. KNIGHT, MR. OESTLUND, systematic entomology.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-204. RESEARCH IN ENTOMOLOGY. MR. RILEY, MR. OESTLUND, MR. CHAPMAN, MR. KNIGHT.
- 205-208. RESEARCH IN ECONOMIC ENTOMOLOGY. MR. RUGGLES.
- 209-212. RESEARCH IN ECONOMIC VERTEBRATE ZOOLOGY. MR. WASHBURN.
- 213-216. RESEARCH IN PARASITOLOGY AND MEDICAL ENTOMOLOGY. MR. RILEY.
- 225-228. RESEARCH IN INSECTICIDES. MR. MOORE.

EXPERIMENTAL ENGINEERING

Professors FRANK B. ROWLEY, WILLIAM E. BROOKE, WILLIAM F. HOLMAN; Associate Professor CHARLES F. SHOOP; Assistant Professors GEORGE A. MANEY, GEORGE C. PRIESTER.

NOTE: Experimental work relating to various branches of engineering may be carried on in the Experimental Engineering laboratories. The following courses are offered by the departments indicated. Work of a special character, such as advanced research, may be arranged through consultation with the director, Professor Rowley.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- M. M. 141f. MATERIALS-TESTING LABORATORY. Investigation of the physical properties of various metals and engineering materials (wood, cement, ropes, etc.). Standard methods of testing. One credit. MR. BROOKE, MR. HOLMAN, MR. PRIESTER.
- M. M. 143s. HYDRAULIC LABORATORY. Experimental and demonstrational work. Pressure head, Piezometer tubes, gages, stability of flotation, Bernouilli's theorem. Benturi meter, flow through orifices, over weirs, and through pipes. Open channels, gaging, impact on vanes, pumps, and hydraulic machines. One credit. MR. BROOKE, MR. HOLMAN, MR. PRIESTER.
- M. M. 144w. MATERIALS-TESTING LABORATORY. Investigation of physical properties of metals and engineering materials (wood, cement, ropes, etc.), supplemented by lectures and materials of construction and methods of testing. Mining and Metallurgical Engineers. Four actual hours. MR. BROOKE, MR. HOLMAN.
- M. E. 181w. ADVANCED GENERAL LABORATORY. Indicator practice, valve-setting, separating and throttling calorimeters, tests of steam engines, gas engines, pumps, air compressors, blowers, turbines, boilers, and power plant. Four actual hours. MR. ROWLEY, MR. SHOOP.
- M. E. 182f. ADVANCED STEAM LABORATORY. Tests of steam turbines, flow of steam through nozzles and pipes. Tests of compound and triple expansion engines, condensers, superheaters, and boilers. Two credits. MR. SHOOP.

- M. E. 183w. POWER- AND GAS-ENGINE LABORATORY. Tests of gas, gasoline, and hot air engines, gas producers. Power and lighting plants. Two credits. MR. ROWLEY, MR. ROBERTSON.
- M. E. 184s. ADVANCED ENGINEERING LABORATORY. Opportunity will be offered for carrying on investigations in connection with tests of complete power plants, refrigerators, air compressors, blowers, and fans. Also automobile testing and gas-engine investigations. Two credits. MR. ROWLEY, MR. SHOOP.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- C. E. 237w-238s. STRUCTURAL LABORATORY. Similar to 243, but dealing mainly with experimental problems in structural steel. Strain gauge study of actual stress distribution in beams, columns, and riveted joints. MR. LAGAARD, MR. MANEY.
- C. E. 243w-244s. CEMENT AND CONCRETE LABORATORY. Laboratory technic and experimental investigation of special problems in cement, concrete, and reinforced concrete. MR. LAGAARD.
- C. E. 251. HIGHWAY LABORATORY. Investigations in coöperation with State Highway Department. MR. LANG.
- C. E. 263. HYDRAULIC LABORATORY. Study of special hydraulic problems in laboratory, drafting-room, and field.
- M. E. 287-288-289. RESEARCH IN MECHANICAL ENGINEERING. Courses may be elected which involve investigations in connection with steam and gas engines, heating, and ventilating. Reports, special problems, and related tests. Three to 9 credits. MR. ROWLEY, MR. SHOOP.

FORESTRY

Professors EDWARD G. CHEYNEY, JOHN H. ALLISON; Associate Professor JOHN P. WENTLING.

Prerequisites.—For major work, 27 credits in forestry, three quarters of botany or equivalent. For minor work, 9 credits in the department.

Exemptions from the language requirement for the Master's degree may be made in individual cases.

The choice in subject must be made by the candidate and approved by the chief of the division and instructor. The facilities of the forest experiment stations at Cloquet and Itasca are available to students taking this work.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101w. ADVANCED DENDROLOGY. A continuation of Courses 2 and 5 with special studies in classification and distribution. Prerequisites: 10 credits in botany and 8 credits in dendrology. Three credits. W; ar. MR. WENTLING.

- 106w. RESEARCH METHODS IN SYLVICULTURE. The fundamental principles upon which silviculture is based, methods used at experiment stations in solving problems in forestation, protection and management. Prerequisites: 9 credits in silviculture. Three credits. I; MWF.
- 107f. USES OF WOOD I. A study of the economic hard and soft woods, both domestic and foreign, from standpoint of regions of production, distribution centers, qualities, amounts, and prices in relation to the wood-using industries. Lectures, reading, reports. Prerequisite: 17f-18w. Three credits. II; MWF. MR. WENTLING.
- 108w. USES OF WOOD II. Continuation of Course 107 dealing with industries and the woods used. Kinds, grades, qualities, properties, requirements for each product. Use, reuse, distribution of product. Regions of production and relation to other industries. Lectures, reading, reports. Prerequisite: 107. Three credits. IV; MWF. MR. WENTLING.
- 109s. 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. Open only on completion of 107 and 108. Three credits. IV; MWF; 303Hr. MR. WENTLING.
- 110w. MECHANICAL AND PHYSICAL PROPERTIES OF WOOD. Study of strength as related to density, quality, etc. Wood stresses, failures, and methods of testing timbers. V, VI; WF. MR. WENTLING.
111. ADVANCED WOOD STRUCTURE. Study of wood elements and structures as related to seasoning, mechanical failures, penetration or preservatives, etc. V, VI; MWF; 303Hr. MR. WENTLING.
112. ADVANCED FOREST MENSURATION. Continuation of 10 with special emphasis on tree forms, the development of the formula used in study of volume and growth of trees. MR. HANSEN.
- 113w. ADVANCED FOREST BY-PRODUCTS. A detailed study of methods of production of wood pulp and paper products, naval stores, tannins, oils, wood-distillation products, etc. Lectures, reading, reports. Prerequisites: 33-34, Chem. 3 or 10 and Chem. 36. Ar; 302Hr.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202. RESEARCH PROBLEMS IN SCIENCE AND PRACTICE OF SYLVICULTURE. MR. WENTLING.
- 203-204. RESEARCH PROBLEMS IN MANAGEMENT AND WORKING PLANS. MR. ALLISON.
- 205-206. LUMBER MARKETS AND PRICES. A careful study of the regions of production and the centers of distribution of different kinds and grades of lumber, together with the prices of the same in the various markets. MR. CHEYNEY.
- 207f-208w-209s. RESEARCH IN WOOD TECHNOLOGY. MR. WENTLING.

GEOLOGY AND MINERALOGY

Professors WILLIAM H. EMMONS, FRANK F. GROUT, CLINTON R. STAUFFER;
Assistant Professor THOMAS M. BRODERICK.

Prerequisites.—For major work in:

General geology and economic geology, Courses 1, 2, 21, 22; a knowledge of general chemistry. Course 105 must be carried along with other graduate work.

Petrology, Courses 1, 2, 21, 22, elementary chemistry and physics.

Paleontology, 1, 2, 57, 58, 59, or 1, 2, 91-92-93. Animal biology is a desirable antecedent.

Geography, 1, 2, 29, 114, 37. For minor work, Geology 29, 114, 37.

Exemptions from the language requirements for the Master's degree may be made in individual cases. Students who are deficient in modern languages are advised to take a language along with their other graduate work. Examinations in French and German are required of candidates for service on the United States Geological Survey.

101f. PRINCIPLES OF STRATIGRAPHY. Origin and structure of sedimentary deposits; the interpretation of these in relation to paleogeography; field work in connection with Cambrian and Ordovician problems. Three credits. (Not offered in 1921-22.)

105f. ELEMENTS OF ROCK STUDY. The occurrence and genesis of igneous, sedimentary, and metamorphic rocks; their mineral and chemical composition; their structure, texture, and alteration. The classification and description of rocks. Prerequisite: Course 22 or 25. Three credits. V, VI; TTh; 110P. MR. GROUT.

106w. PETROGRAPHY. The identification and study of minerals and rocks by topical methods; the study of igneous rocks, crystalline schists, and metamorphic rocks. The origin and classification of rocks. Prerequisite: Course 105. Three credits. V, VI; TTh; 110P. MR. GROUT.

107f-108w-109s. 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. Prerequisite: Course 59. Nine credits. V, VII; MWF; 105P. MR. STAUFFER.

111f. ORE DEPOSITS. The nature, distribution, and genesis of ore deposits of the United States; relations of ore deposits to geologic structure; the deformation and superficial alteration of ore deposits. Prerequisites: Courses 2, 105. Three credits. I; TThS; 110P. MR. EMMONS.

112w. GEOLOGY OF PETROLEUM. First part treats deposits of metals, giving special attention to those outside of the United States. Second half treats the nature, origin, and distribution of petroleum and discusses the various oil fields of the world. Prerequisite: Course III. Three credits. I; TThS; 110P. MR. EMMONS.

- 113s. PROBLEMS IN ORE DEPOSITS. Field excursions, map work, lectures on field and laboratory methods. Prerequisite: Course 112. Three credits. V, VIII; T; 110P. MR. EMMONS.
- 124w-125s. STRUCTURAL AND METAMORPHIC GEOLOGY. The conditions, processes, and results, of metamorphism; structural features resulting from deformation under varying conditions of load. Prerequisites: Courses 2, 105. Six credits. III; MWF; 200aP. MR. SCHWARTZ.
- 131f-132w-133s. 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. Prerequisite: Course 106. Nine credits. Hours to be arranged. 200P. MR. GROUT.
- 137w. 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. Prerequisites: Courses 2, 105. Three credits. Lect. VIII; W; 200P. Lab. V, VIII; T; 200P. MR. GROUT.
- 140w-141s. APPLIED PETROGRAPHY. Determination of ore and gangue minerals, microscopic studies of paragenesis of ores and other mineral associations. Practical problems in mining and geology, settled by microscopic and optical examination. Prerequisite: Course 131. Six credits. Hours to be arranged. 200P. MR. GROUT.
- 144w-145s. CONSTRUCTION AND INTERPRETATION OF GEOLOGIC MAPS. Methods of geological examination; study and problems in construction and interpretation of geologic maps. Prerequisite: Course 2. Six credits. Hours to be arranged. 104P. MR. ALLISON.
- 150s. FIELD GEOLOGY. Detailed, systematic work, conforming to official surveys. Preparation of geologic maps, structure sections, reports; paragenesis of ores and their relations to geologic structures. Field for 1921, Black Hills, South Dakota. Reports to be written week before college opens. For prerequisites see members of the department. Ten credits. MR. EMMONS, MR. SCHWARTZ.
- 151f-152w-153s. ADVANCED GENERAL GEOLOGY. Geologic processes and their results; development of the North American continent. Prerequisite: Course 2. Nine credits. IV; MWF; 104P. MR. STAUFFER.
- 166w-167s. MINERALOGRAPHY. Methods of studying opaque minerals and application of the methods to problems in ore genesis and history. Prerequisite: Course 111. Six credits. Hours to be arranged. 103P. MR. BRODERICK, MR. SCHWARTZ.

COURSES PRIMARILY FOR GRADUATE STUDENTS

211. ADVANCED PALEONTOLOGY. Selected groups of fossils. Class work supplemented by reference reading and thesis. Three credits. MR. STAUFFER.

214. SEMINAR IN ORE DEPOSITS. Three credits. MR. EMMONS.
- 215s. GEOLOGY AND ORE DEPOSITS OF THE WESTERN HEMISPHERE. Open to graduate students and to those undergraduates who have had Course III f. Offered in spring quarter, 1922. Three credits. MR. EMMONS.
- 216s. GEOLOGY AND ORE DEPOSITS OF THE EASTERN HEMISPHERE. Open to graduate students and to those undergraduates who have had Course III f. Offered in spring quarter 1923. Three credits. MR. EMMONS.
220. GLACIAL GEOLOGY. Hours to be arranged. The drift sheets, glacial lakes, the gorge of St. Anthony Falls, the Dalles of the St. Croix, and other problems. Lectures, reference reading, and field work.
241. FIELD COURSE IN GEOLOGY. To be arranged with individual students upon application to the department. Credit will be given for field work done satisfactorily as prescribed in the joint announcement of various universities.
- 243-244. RESEARCH COURSE IN GEOLOGY. Advanced work in general geology; chiefly individual work on selected subjects. Data and collections of material gathered in the course of field work studied under instructor. Methods follow standards of federal and state surveys. MR. EMMONS, MR. STAUFFER.
246. PRE-CAMBRIAN GEOLOGY. The problems of pre-Cambrian correlation and structure; the pre-Cambrian stratigraphy of North America. Given in alternate years. Three credits.
247. GEOLOGY AND EXPLORATION OF LAKE SUPERIOR REGION. The geology of the Lake Superior iron district. The methods used in the exploration of iron ore; interpretation of drill cores; cartographic expression of drill data; models of drilled areas. The principles of magnetic surveying. Three credits.
- 251-252. ORIGINAL PROBLEMS. Morphology and physical measurements of minerals. Three credits each. MR. GROUT.
- 253-254. RESEARCH COURSE IN ORE DEPOSITS. Advanced work in ore deposits; chiefly individual work on selected subjects. Collections of material gathered in field work studied under direction of instructor. As far as practicable, methods follow standards of federal and state surveys. Three credits each. MR. EMMONS, MR. GROUT.
- 263-264. RESEARCH COURSE IN PETROLOGY. Advanced work in petrology; individual work in selected subjects. Collections of material gathered in course of field work studied under direction of instructor. As far as practicable, methods follow standards of federal and state surveys. Three credits each. MR. EMMONS, MR. GROUT.

GERMAN

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, JAMES DAVIES, SAMUEL KROESCH.

Prerequisites.—For major work, 27 Senior College quarter credits or equivalent. For minor work, 18 Senior College credits or equivalent. For courses in Germanic Philology see the statement of the Department of Comparative Philology.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

100f-101w-102s. MIDDLE HIGH GERMAN. Phonology, morphology, and syntax. Translation into the modern German. Nine credits. V; MWF; 212F. MR. KROESCH.

104f-105w-106s. HISTORY OF THE GERMAN LANGUAGE. Lectures, discussions, assigned readings. This course is identical with Comparative Philology 109-110-111. Nine credits. (Not offered in 1921-22.) MR. KLAEBER.

107f. HISTORICAL GERMAN GRAMMAR. Phonology, inflection, word-formation, syntax. Intended primarily for prospective teachers of German. Three credits. MR. KROESCH.

108w. 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. Three credits. MR. KROESCH.

150f-151w-152s. DIE NOVELLE. A study of the technic and development. Assigned readings and reports. Nine credits. (Not offered in 1921-22.) MR. BURKHARD.

153f-154w-155s. ASPECTS OF GERMAN LITERATURE OF THE NINETEENTH CENTURY. The subject of the course will be announced from year to year. Subject for 1921-22: Hebbel, Ludwig, Anzengruber. Nine credits. V, VI, VII; Th; 209F. MR. BURKHARD.

160f-161w-162s. LYRIC POETRY OF THE EIGHTEENTH AND NINETEENTH CENTURIES. Historical review of the best lyric poetry and chief writers. Nine credits. V, VI, VII; F; 209F. MR. DAVIES.

COURSES PRIMARILY FOR GRADUATE STUDENTS

225f-226w-227s. LITERARY PROBLEMS. Subject for 1920-21: Literary Movements of the Nineteenth Century. Nine credits. V, VI, VII; W; 209F. MR. SCHLENKER.

230f-231w-232s. FAUST SEMINAR. Nine credits. (Not offered in 1921-22.) MR. SCHLENKER.

GREEK

Professor CHARLES ALBERT SAVAGE.

Prerequisites.—For major work, Courses 105, 106, 107, or their equivalent. For minor work, Courses 51 (Philosophy), 52 (Oratory), 53 (Dramatic Poetry), or their equivalent.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 105f. LYRIC POETRY. Selection from the elegiac, iambic, lyric, and bucolic poets. Three times a week. Prerequisites: Greek 51 and 53, or 52 and 53. Three credits. MR. SAVAGE.
- 106w. ADVANCED DRAMA. Aeschylus, Sophocles, or Aristophanes. Special attention given to the development of the drama, and to the literary form of dramatic representation of the plays read. Three times a week. Prerequisite: Greek 53 or 105 or equivalent. Three credits. MR. SAVAGE.
- 107w. ADVANCED PROSE. Selections from the Greek historians, or from Plato, or from the orators. Alternates with 106. Equivalent prerequisites.
- 108s. ADVANCED EPIC POETRY. A course of rapid reading in the *Iliad* or the *Odyssey*. The object of this course is to secure as intimate an acquaintance as is possible, at first hand, with Homer. Three times a week. Prerequisite: Greek 105 or 106. Three credits. MR. SAVAGE.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202-203. ORATORY (advanced). A study of the development of oratorical style among the Greeks. Twice weekly, one, two, or three quarters. MR. SAVAGE.
- 204-205-206. DRAMATIC POETRY (advanced). The reading and critical study of representative Greek plays. Twice weekly, one, two, or three quarters. Alternates with 201-202-203. MR. SAVAGE.
- 207-208-209. SEMINAR IN PHILOSOPHY OR ORATORY. Once a week, one, two, or three quarters. MR. SAVAGE.
- 210-211-212. GREEK HISTORY (advanced). Selected readings from Greek historians. Once a week, one, two, or three quarters. Alternates with 207-208-209. MR. SAVAGE.

HISTORY

Professors GUY STANTON FORD, CLARENCE WALWORTH ALVORD, SOLON J. BUCK, WILLIAM STEARNS DAVIS, NORMAN SCOTT BRIEN GRAS, SAMUEL BANNISTER HARDING, ALBERT BEEBE WHITE¹; Associate Professors AUGUST CHARLES KREY, LESTER BURRELL SHIPPEE, MASON WHITING TYLER, QUINCY WRIGHT (Political Science).

¹ Absent on leave, 1921-22.

Prerequisites.—Of the four fields in which general survey courses in history are usually given, namely, ancient, American, English, and European students entering upon graduate work in history will usually be expected to have covered two or three courses, with credit not exceeding 18 hours. For the other 9 hours, they should have a more advanced course in one of these fields and a second course in some field of history in which intensive work is done with the beginnings of investigation. In meeting these requirements consideration will be given to work done from the historical point of view in others of the social sciences, especially political science. The department attaches considerable importance to adequate preparation in the foreign languages, which may be used by the student in the course of advanced and research work. An especially good equipment here will be taken into consideration in weighing the student's preparation for graduate work.

AMERICAN HISTORY

- 112s. HISTORY OF AMERICAN IMMIGRATION. Settlement and development of typical racial stocks in America. Contributions of European immigrants to American life; social, political, and religious activity; reaction to American conditions. Attention to political history: Native American and Know-Nothing parties, etc. Prerequisites: 20 credits in social-science group. Five credits. V; MWThF; 111Lib. MR. STEPHENSON.
- 125w. (Pol. Sci.) AMERICAN DIPLOMATIC HISTORY. Attention to the principles and policies guiding American diplomacy in its stages of development as well as to the methods pursued and the personality of American diplomats. Prerequisites: 20 credits in social-science group, including 10 credits in political science or History 5-6. Four credits. III; MWFS; 102MA. MR. WRIGHT.
- 127s. (Pol. Sci.) AMERICAN FOREIGN RELATIONS. Such topics as the Monroe Doctrine, freedom of the seas, the open door, arbitration, disarmament, will be considered with particular reference to the future policy of the United States. Prerequisites: 20 credits in social-science group, including 10 credits in political science or History 5-6. Four credits. III; MWFS; 102MA. MR. WRIGHT.
- 140s. RECENT AMERICAN HISTORY. A study of American development from 1876 to the present time. Particular attention is paid to the economic, social, and international aspects of the period. Prerequisites: 20 credits in social science, including Political Science 1, or History 5-6. Five credits. I, TWThFS; 111Lib. MR. SHIPPEE.
- 141f. THE WEST IN AMERICAN HISTORY TO 1815. The westward movement of population and civilization; its political, economic, and social aspects; effects upon national development. Prerequisites: 20 credits in social-science group, including History 5-6. Three credits. VII; MWF; 112Lib. MR. BUCK.

- 142w. THE WEST IN AMERICAN HISTORY, 1815-65. The settlement of the Mississippi Valley, and the beginnings of Pacific coast expansion; significance in general American development. This course, while offered separately, follows, and is calculated to form a natural sequence to History 141. Prerequisites: 20 credits in social science including History 5-6. Three credits. VII; MWF; 112Lib. MR. SHIPPEE.
- 144-145.† HISTORY OF MINNESOTA. The settlement and development—political, economic, and social—of a typical American commonwealth. Prerequisites: 15 credits in social science including History 5-6. Six credits. (Not offered in 1921-22.) MR. BUCK.
- 146w-147s.† CONSTITUTIONAL HISTORY OF THE UNITED STATES. A study of the evolution of American constitutional government through legislation, judicial interpretation, administrative rule and custom. Prerequisites: 15 credits in history or 10 credits in history and 10 in social science including 5 credits in political science. Six credits. IV; MWF; 112Lib. MR. SHIPPEE.
- 148f-149w-150s.† BRITISH EMPIRE IN THE EIGHTEENTH CENTURY. A study of imperial politics, including the development of the English colonies in America and the American Revolution. Prerequisites: 20 credits in the social sciences, including 10 credits in history. Nine credits. II; MWF; 218aLib. MR. ALVORD.
- 153s. THE WEST IN AMERICAN POLITICS SINCE 1865. An intensive study of independent parties and radical or progressive political movements. Prerequisites: 25 credits in history including 5-6. Five credits. VI, VII; WF; 218aLib. MR. BUCK.
154. SELECTED TOPICS IN THE HISTORY OF MINNESOTA. Students taking this course are expected to do a portion of their work in the library of the Minnesota Historical Society. Prerequisites: 25 credits in history including 5-6. (Not given in 1921-22.) Five credits. MR. BUCK.
- 155f. UNITED STATES, 1850-65. An intensive study of the period beginning with the Compromise of 1850 and extending through the Civil War; consideration of social and economic questions as well as political issues. Prerequisites: 25 credits in history including History 5-6. Five credits. VI, VII; WF; 218aLib. MR. SHIPPEE.
156. THE RECONSTRUCTION PERIOD. An intensive study of the period after the close of the Civil War. This course follows History 155 as a natural sequence. Prerequisites: 25 credits in history, including 5-6. (Not given in 1921-22.) Five credits. MR. SHIPPEE.
- 160w. SELECTED TOPICS IN LATER AMERICAN COLONIAL HISTORY. Prerequisites: 25 credits in social science, including History 5-6 or 148-149-150. Five credits. VII, VIII; MW; 218aLib. MR. ALVORD.

† All quarters must be completed before credit is given.

- 166f. SELECTED TOPICS IN THE HISTORY OF IMMIGRATION. Competent students will be guided in research. Prerequisites: 25 credits in social science and consent of instructor. Five credits. VI, VII; TTh; ar. MR. STEPHENSON.
- 208f-209w-210s. SEMINAR IN AMERICAN HISTORY. Graduate students only. Ar. MR. ALVORD, MR. BUCK, MR. SHIPPEE, MR. STEPHENSON.
- See also: 113-114-115† under Economic History; 121-122† under English History, and 111 under European History.

ANCIENT HISTORY

- 103f. THE NEAR EAST, OLD ORIENT. Origin of Egyptians, Babylonians, Assyrians, and Persians, and main features of their political history and civilization. History of the Hebrews discussed so far as it bears upon general oriental problems. Prerequisites: 20 credits in social-science group. Five credits. VII; MWF; 111Lib. MR. DAVIS.
- 105s. HISTORY OF ROME.* Roman institutions, especially those which affected the later world. Conquest of Roman world; founding of the Roman Empire, and history of empire up to the period of its decline. Prerequisites: 20 credits in social-science group. Five credits. III; MTThFS; 111Lib. MR. DAVIS.
- 133f. POLITICAL HISTORY OF GREECE. With special reference to the reaction upon cultural progress. Prerequisites: 20 credits in history or a major in Greek or Latin. Five credits. III; MTThFS; 111Lib. MR. DAVIS.
- 134w. ANCIENT CIVILIZATION, GREECE. Social and intellectual life of Greece. Prerequisites: 20 credits in history, or a major in Greek or Latin. Three credits. VII; MWF; 111Lib. MR. DAVIS.
- 135s. ANCIENT CIVILIZATION, ROME. Social and intellectual life of Rome. The course will begin with a survey of political history. Prerequisites: 20 credits in history, or a major in Greek or Latin. Three credits. VII; MWF; 111Lib. MR. DAVIS.

ECONOMIC HISTORY

- 113-114-115.† ECONOMIC HISTORY OF EUROPE AND THE UNITED STATES, 1750 TO THE PRESENT. The industrial revolution and significant results for transportation, agriculture, tariff, and labor. Prerequisites: 20 credits in history or economics, or both. (Not given in 1921-22.) Nine credits. MR. GRAS.
- 116f-117w-118s.† ECONOMIC HISTORY OF EUROPE, 1300-1750. The chief interests are the manor; the town; the metropolis; national economic regulation; developments in agriculture, commerce, manufacture, and

* NOTE. Students who took History 135 in the year 1920-21 may not elect History 105 without consent of instructor.

† All quarters must be completed before credit is given.

economic thought, leading up to the industrial revolution. Prerequisites: 20 credits in history or economics, or history and economics combined. Nine credits. II; TThS; III Lib. MR. GRAS.

169. ECONOMIC HISTORY OF THE UNITED STATES SINCE THE CIVIL WAR. The chief emphasis is on the growth of manufacture and commerce, and government regulation. (Not offered in 1921-22.) Prerequisites: 25 credits in history or economics, or history and economics combined. Five credits. MR. GRAS.

205-206-207. SEMINAR IN ECONOMIC HISTORY. Ar. MR. GRAS.

ENGLISH HISTORY

- 109f-110w. ENGLISH HISTORY, 1815-1920. Assigned readings and lectures. Emphasis placed upon party history, the colonies, foreign relations, the social-democratic movement, and especially British foreign policy preceding the World War. Prerequisites: 20 credits in social-science group. Six credits. IV; MWF; III Lib. MR. TYLER.

- 121w-122s.† ENGLISH BACKGROUNDS AND THE AMERICAN COLONIES. Studies in the transfer of English civilization, and its early modifications and development in America. Some account taken of the contrasting French settlements. Prerequisites: 20 credits in history or political science. Six credits. II; TThS; II2 Lib. MR. HARDING.

- 162f. THE BEGINNINGS OF PARLIAMENT. Parliamentary beginnings from the Norman Conquest to the reign of Edward I, based wholly on original sources. Prerequisites: 25 credits in history, including 3-4; knowledge of at least high-school Latin. Five credits. (Not given in 1921-22.)

183. ENGLAND IN THE SEVENTEENTH CENTURY. Topics in the reign of Charles II. Critical study from source material. Prerequisites: 25 credits, including History 3-4. MR. HARDING.

See also courses in Economic History.

EUROPEAN HISTORY

- 101f-102w.† THE FRENCH REVOLUTION AND NAPOLEONIC ERA. French conditions in the eighteenth century before 1774; events between 1774 and 1789 which precipitated revolution in France; reform work of the early revolution; Napoleon and the Empire. Prerequisites: 20 credits in social science including 10 credits in history. Reading knowledge of French desirable. Six credits. I; MWF; III Lib. MR. FORD.

- 104w. THE NEAR EAST, MODERN. The Saracen Empire, Turkey, the Balkan States and European diplomacy in the East since the beginning of the Middle Ages. Prerequisites: 20 credits including 10 credits in history. Five credits. III; MTThFS; III Lib. MR. DAVIS.

† All quarters must be completed before credit will be given.

- 107f-108w. EUROPE, 1848-1914. The development of Europe in its various phases—political, social, and economic—from the Revolution of 1848 to the outbreak of the World War. Prerequisites: 20 credits in social science; if History 1-2 is not offered as a prerequisite, consent of instructor must be obtained. A reading knowledge of French or German will be helpful. Eight credits. VI; MTThF; III Lib. MR. TYLER.
- 111w. EUROPEAN BACKGROUND OF AMERICAN IMMIGRATION. The history of the movement of population from Europe to America in the nineteenth century, with the emphasis on the economic, political, social, and religious forces. Prerequisites: 20 credits in social-science group. Five credits. V; TWThF; III Lib. MR. STEPHENSON.
- 119s. THE RENAISSANCE AND REFORMATION. The Renaissance and Reformation as general European movements with especial emphasis upon the work of individual men and upon ideas rather than upon politics and institutions. Prerequisites: 20 credits in history. Five credits. IV; MTWFS; III Lib. MR. KREY.
- 120f. MEDIEVAL CIVILIZATION. A study of the social and intellectual development of Europe from the period of the German migrations to the end of the thirteenth century. Prerequisites: 20 credits in history. Five credits. IV; MTWFS; III Lib. MR. KREY.
- 157w-158s. SELECTED TOPICS IN NINETEENTH-CENTURY HISTORY. A detailed study of selected topics in the history of the nineteenth century. Discussion based on a wide range of reading. Prerequisites: 25 credits in social science including History 107-108 or 101-102. A reading knowledge of French or German will be required. Ten credits. VI, VII; TTh; 218a Lib. MR. FORD, MR. TYLER.
- 164w. STUDIES IN THE CRUSADES. Problems connected with the Crusades. Prerequisites: 25 credits in history; knowledge of at least high-school Latin. Five credits. MR. KREY.
- 201f-202w-203s. HISTORICAL BIBLIOGRAPHY AND CRITICISM. Required of candidates for advanced degrees in history who do not present evidence of similar training elsewhere. I; S; III Lib. MR. FORD, MR. WHITE, and others.

HOME ECONOMICS

Professor MILDRED WEIGLEY; Associate Professor ALICE BIESTER.

Prerequisites.—For major work, 27 credits including Courses 13, 22, and 45 in Home Economics or their equivalent, 10 credits in general chemistry, 5 credits in organic chemistry, 5 credits in quantitative analysis, and 15 credits in biological science. For minor work 9 credits in the department and any additional prerequisite work needed to pursue the courses selected.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 103f,w,s. DIETETICS. 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. Three to 5 credits. MISS BIESTER.
- 105w. EXPERIMENTAL COOKERY. An experimental study of special problems in food and food preparation. Three to 5 credits. MISS CHILD.
- 108f,w,su. NUTRITION. This course includes a study of the various types of digestion, bile, blood, milk, and urine. Five credits. MISS BIESTER, MISS MUMFORD.
- 109s. ADVANCED NUTRITION. Quantitative methods applicable to the problems of human metabolism. Opportunity is offered for the individual investigation of selected problems pertaining to metabolism. Three to 5 credits. MISS BIESTER.
- 122f,w. ADVANCED TEXTILES. An experimental study of special problems in textiles, with a consideration of means for obtaining standardization. Three credits. MISS WELLER.
- 123f,w,s. CLOTHING ECONOMICS. General consideration of the economic problems in clothing production; women's responsibility for conditions in textiles and clothing industries; study of the budget for clothing and household textiles; hygiene and standardization of dress. Two credits. MISS WELLER.
- 131f,w,s. HOME MANAGEMENT: HOUSE-PLANNING AND EQUIPMENT. House-planning, house-furnishing and equipment; construction and furnishing budgets. Types of domestic architecture; site; floor-plans; building materials; details of construction; heating; ventilating; lighting; plumbing; walls; rugs; furniture; color; hangings; pictures; gardens. Five credits. MISS MORSE.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 110s. SPECIAL PROBLEMS IN DIETETICS. An intensive study of problems relating to diet involving assigned readings, discussions, and field work. Three credits. MISS BIESTER.
- 111s. SPECIAL PROBLEMS IN FOODS AND COOKERY. A continuation of experimental cookery with more advanced problems. Three credits. MISS CHILD.
- 151w. INSTITUTION MANAGEMENT. Lectures and discussions of the problems involved in institution management; organization; service; institution-planning, decoration, and equipment; budgets, and the study of different types of institutions. Four credits. MISS TREAT.
- 203-204. HOME ECONOMICS PROBLEMS. Opportunity is offered for the investigation of selected problems in home economics. Five credits. MISS BIESTER.

205-206-207. HOME ECONOMICS SEMINAR. A critical study of selected topics and recent advances in home economics involving outside reading, oral and written reports. Two credits each. MISS BIESTER.

HORTICULTURE

Professors WILLIAM H. ALDERMAN, HERBERT K. HAYES; Associate Professors WILFRID G. BRIERLEY, LEROY CADY, MAXWELL J. DORSEY.

Prerequisites.—For major work, 15 credits; for minor work, 9 quarter credits in the department in addition to two years in botany and one year in entomology.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 107f. ORCHARD MANAGEMENT. A detailed study of the various operations in orchards and berry fields. Operating costs and profits. Lectures, laboratory, and individual problems. Prerequisite: Horticulture 6. Three credits. MR. BRIERLEY.
- 109f. PRINCIPLES OF GENETICS. Lectures and laboratory work designed to familiarize the student with the underlying principles of breeding. Heredity, variation, biometry, and evolution are emphasized. Same as Agronomy 103. Prerequisites: botany, 10 credits, animal biology, 10 credits. Three credits. MR. DORSEY, MR. HAYES.
- 110w. HORTICULTURE CROP-BREEDING. Applied genetics is 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. Prerequisite: Horticulture 109 or Agronomy 103. Three credits. MR. DORSEY.
- 111f. SYSTEMATIC POMOLOGY. A study of fruit varieties. Classification, description, identification, and elements of judging. Lectures, laboratory, and a survey of the literature. Prerequisites: Horticulture 6. MR. ALDERMAN, MR. BRIERLEY.
- 151f. ADVANCED FLORICULTURE. Lectures, assigned readings, laboratory, and special problems dealing with the culture, botany, and history of florists' plants and methods of greenhouse management. Prerequisites: Horticulture 50, botany, 10 credits. Three credits. MR. CADY.
- 131f. ADVANCED VEGETABLE PRODUCTION. A study of the business of vegetable-gardening, special problems, variety improvement, production of seed, investigation and research, reviews and reports on recent literature. Prerequisite: Horticulture 32. Three credits. MR. TAPLEY.
- 132f. SYSTEMATIC OLERICULTURE. The origin, botany, varieties, and types of the different vegetables, their characteristics and adaptation to different cultural and market conditions, identification and classification studies, judging, and exhibiting. Prerequisite: Horticulture 52. Three credits. MR. TAPLEY.

- 133w. COMMERCIAL TRUCK-GROWING. Truck-growing centers of the United States, cultural methods used in producing various truck crops, special machinery and equipment, market methods, shipping points. Adaptation of truck crops to Minnesota, commercial production for canneries; handling; shipping to market. Prerequisite: Horticulture 90. Three credits. MR. TAPLEY.
- 135w. POTATO PRODUCTION. A study of the origin, botany, regional distribution, economic importance, group classification, standardization of varieties according to soil, climate, and markets. Identification, exhibiting, judging, cultural methods, seed selection and certification, marketing and utilization. MR. KRANTZ.
- 191w-192s. SPECIAL PROBLEMS. A study of problems based upon the work given in the preceding courses. Two to 4 credits per quarter. MR. ALDERMAN.
- 193f-194w-195s. HORTICULTURAL SEMINAR. Reports and discussions of problems and investigational work. Required of graduate students. One credit per quarter. Horticultural staff.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s-204su. FRUIT-GROWING RESEARCH. Special problems in fruit culture or disposal. Students will be required to continue the work over at least one summer to arrange for concentration on problems at the most appropriate season. Open to those who have specialized in fruit-growing. Three to 6 credits per quarter. MR. ALDERMAN, MR. BRIERLEY.
- 209f-210w-211s-212su. FRUIT-BREEDING RESEARCH. Consists of (a) some thesis problem, (b) development of laboratory technic in breeding. Work involves reading in genetics, cytology, biometry. Students required to continue work over one summer. Open to limited number specializing in fruit-breeding. Three to 6 credits per quarter. MR. DORSEY.
- 213f-214w-215s. GENETICS SEMINAR. Given jointly by the Division of Horticulture and the Division of Agronomy and Farm Management. A discussion of the broader genetic problems, applied biology, and the recent advances in genetic work. Weekly meetings throughout the year. MR. DORSEY, MR. HAYES.
- 231f-232w-233s-234su. VEGETABLE-GROWING RESEARCH. Special problems in vegetable culture. Students will be required to continue the work over at least one summer. Open to those who have specialized in vegetable growing. Three or 6 credits per quarter. MR. TAPLEY.
- 242w. METHODS AND INTERPRETATION OF HORTICULTURAL RESEARCH. A critical analysis of the more important horticultural investigations, together with a study of methods and organization of research work in horticulture. Two credits. MR. ALDERMAN.

LATIN.

Professor JOSEPH B. PIKE.

Prerequisites.—Any four of Courses 21-53, and 6 credits in addition selected from standard courses. A reading knowledge of French, German, or Greek is required of candidates for the Master's degree.

The degree of Master of Arts: For a major in Latin, Course 211-212-213, and in addition one course each quarter selected from Courses 121-133. The student will be expected to choose for his thesis some problem connected with one of these courses. Besides, a minor is to be carried throughout the year in one of the following departments: Comparative Philology, English, German, Greek, History, Romance Languages, or Scandinavian. For a minor in Latin, Course 211-212-213 or one course each quarter selected from Courses 121-133.

Candidates for the degree of Doctor of Philosophy in Latin will be expected to spend at least three years in preparation and will carry each quarter in addition to one seminar course and one of the courses listed below, one course in advanced Greek (i.e., in advance of two years of preparatory Greek). A knowledge of Greek and Roman history, Greek and Roman literature, and a special knowledge of a particular Latin author, or group of authors, will be required.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 121f. **ADVANCED VERGIL.** Selection from Books 7-12 of the *Aeneid*. Prerequisites: any two of Courses 51-53 or an equivalent. Three credits. MR. PIKE.
- 122w. **CICERO'S LETTERS.** Prerequisites: any two of Courses 51-53 or an equivalent. Three credits. (Not offered in 1921-22.) MR. PIKE.
- 123s. **MEDIEVAL LATIN.** Selected documents illustrating the conflict between church and state in the middle ages. Selections from *History of the Franks*, by Gregory of Tours. Prerequisites: any two of Courses 51-53 or an equivalent. Three credits. (Not offered in 1921-22.) MR. PIKE.
- 131f. **JUVENAL.** Selection from Juvenal's work. Prerequisites: any two of Courses 51-53 or an equivalent. Three credits. Alternates with Course 121. (Not offered in 1921-22.) II; MWF; 107F. MR. PIKE.
- 132w. **SENECA'S EPISTLES.** Prerequisites: any two of Courses 51-53 or an equivalent. Three credits. Alternates with Course 122. II; MWF; 107F. MR. PIKE.
- 133s. **PETRONIUS AND VULGAR LATIN.** Selections from Petronius and the *Peregrinatio Sanctae Silviae*. The relation of vulgar Latin to literary Latin will be discussed. Prerequisites: any two of Courses 51-53 or an equivalent. Alternates with Course 123. Three credits. II; MWF; 107F. MR. PIKE.

201f-202w-203s. ANNALS OF TACITUS. (Graduate seminar, but open to students who register for honors in Latin.) Prerequisites: seven years of Latin or any two of Courses 51-53. Three credits. (Not offered in 1921-22.) VII, VIII; Th; 108F. MR. PIKE.

211f-212w-213s. LUCRETIUS. (Graduate seminar, but open to students who register for honors in Latin.) Prerequisites: seven years of Latin or any two of Courses 51-53. Three credits. MR. PIKE.

MATHEMATICS AND MECHANICS

Professors WILLIAM E. BROOKE, WILLIAM H. BUSSEY, WILLIAM F. HOLMAN, DUNHAM JACKSON, WILLIAM H. KIRCHNER, FRANCIS P. LEAVENWORTH; Associate Professors RAYMOND W. BRINK, WILLIAM L. HART, ROYAL R. SHUMWAY, ANTHONY L. UNDERHILL, HANS H. DALAKER.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

Courses offered by members of the faculty of the College of Science, Literature, and the Arts.

102f-103w-104s. ADVANCED ANALYTIC AND SYNTHETIC GEOMETRY. Three credits per quarter. MR. BUSSEY.

106f-107w-108s. ADVANCED CALCULUS AND DIFFERENTIAL EQUATIONS. Three credits per quarter. MR. JACKSON.

140w. METHOD OF LEAST SQUARES. Three credits. MR. LEAVENWORTH. (This course is identical with Astronomy 140.)

Courses offered by members of the faculty of the College of Engineering and Architecture.

131f-132w-133s. TECHNICAL MECHANICS. Three credits in fall and winter quarters. Two credits in spring quarter. MR. HOLMAN, MR. DALAKER.

134f-135w. STRENGTH OF MATERIALS. Two credits in fall quarter. Three credits in winter quarter. MR. HOLMAN.

136s. HYDRAULICS. Four credits. MR. HOLMAN.

141f. MATERIALS-TESTING LABORATORY. One credit. MR. HOLMAN.

143s. HYDRAULICS LABORATORY. One credit. MR. HOLMAN.

151f-152w-153s. DIFFERENTIAL EQUATIONS AND ADVANCED CALCULUS APPLIED TO ENGINEERING PROBLEMS. Three credits per quarter. MR. DALAKER.

COURSES PRIMARILY FOR GRADUATE STUDENTS

Courses offered by members of the faculty of the College of Science, Literature, and the Arts.

206f-207w-208s. THEORY OF FUNCTIONS OF REAL AND COMPLEX VARIABLES. Three credits per quarter. MR. BRINK.

221f-222w-223s. THE CALCULUS OF VARIATIONS. Three credits per quarter. MR. UNDERHILL.

230f. MODERN THEORIES OF INTEGRATION. Three credits. MR. JACKSON.

Courses offered by members of the faculty of the College of Engineering and Architecture.

231w-232s. APPROXIMATION BY POLYNOMIALS AND TRIGONOMETRIC SUMS. Three credits per quarter. MR. JACKSON.

254f-255w-256s. MODERN ANALYSIS. Three credits per quarter. MR. DALAKER.

257f-258w-259s. DYNAMICS. Three credits per quarter. MR. BROOKE.

The following courses have been offered from time to time in the past, and similar courses, or other courses of corresponding grade, will be provided at any time when there is sufficient demand for them.

Courses offered by members of the faculty of the College of Science, Literature, and the Arts.

DIFFERENTIAL GEOMETRY.

PROJECTIVE GEOMETRY.

MODERN HIGHER ALGEBRA.

THE MATHEMATICS OF SMALL VIBRATIONS.

THE THEORY OF NUMBERS.

THE GALOIS THEORY OF EQUATIONS.

HIGHER PLANE CURVES.

ADVANCED DIFFERENTIAL EQUATIONS.

EXTERIOR BALLISTICS.

THE CALCULUS OF FINITE DIFFERENCES.

Courses offered by members of the faculty of the College of Engineering and Architecture.

ADVANCED DESCRIPTIVE GEOMETRY.

PERSPECTIVE.

VECTOR ANALYSIS.

ADVANCED TECHNICAL MECHANICS.

FOURIER'S SERIES AND SPHERICAL HARMONICS.

MECHANICAL ENGINEERING

Professors JOHN J. FLATHER, WILLIAM S. HOLMAN, FRANK B. ROWLEY; Associate Professors JOHN V. MARTENIS, CARL SHIPLEY,* CHARLES F. SHOOP; Professorial Lecturer JOHN H. ROWEN.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

110f. TOOL DESIGN. Design of tools for manufacturing interchangeable parts; jigs and milling fixtures. Three credits. MR. SHIPLEY.

* Absent on leave.

- 111w. TOOL CONSTRUCTION. Construction of tools, jigs, and fixtures for manufacturing interchangeable parts. Three credits. MR. SHIPLEY.
- 131f-132w-133s. ADVANCED ENGINEERING DESIGN. Original design, including machinery for changing size and form, cranes, pumping, transmission machinery, and engineering appliances. Lectures, problems, and drawing-room practice. Three credits per quarter. MR. FLATHER, MR. ROWEN.
- 135f. STEAM-ENGINE DESIGN. Calculations and working drawings for a high speed automatic or Corliss steam engine. Theoretical diagrams; inertia forces; determination of details. Three credits. MR. FLATHER.
- 136w. GAS-ENGINE DESIGN. Calculations and working drawings for a gas motor, heavy duty tractor, truck, marine, or other service. Theoretical diagrams and details of parts. Three credits. MR. ROWLEY.
- 144f. HEAT ENGINES. Elementary thermodynamics. Properties of steam. Types and details of steam engines; valve gears; governors; compound engines. Condensers and air pumps. Three credits. MR. SHOOP.
- 145w. HEAT ENGINES. Continuation of Course 144. Combustion and fuels; boilers; smoke prevention. Selection of engines and boilers. Three credits. MR. SHOOP.
- 146s. HEAT ENGINES. Elementary study of steam turbines and gas engines. Courses 144, 145, 146 are accompanied by three hours' work in laboratory each week. Three credits. MR. SHOOP.
- 150w. GAS ENGINES AND PRODUCERS. Laws of gases; gas cycles. Otto, semi-Diesel, and Diesel engines. Mechanism of various types. Carburetion, governing, cooling lubrication. Principles of design. Gas producers; types, suction, pressure, blast furnace. By-products recovery. Three credits. MR. ROWLEY.
- 151f. THERMODYNAMICS. The mechanical theory of heat as applied to steam, oil, gas, and hot-air engines and allied power-plant machinery and accessory equipment, including compressors, injectors, reheaters, and refrigerating apparatus. Three credits. MR. SHOOP.
- 152w. STEAM TURBINES. Theory and practice applied to various types. Thermodynamics and mechanical analysis of problems involved in the design of nozzles, blades, rotors, bearings, and governors. Condition of operation; systems of transmission; lubrication; economy; field of service. Three credits. MR. SHOOP.
- 153s. HEATING AND VENTILATING. Principles of heating and ventilating. Construction and operation of heating apparatus. Steam, hot water, exhaust, vacuum, and fan systems. Lectures, recitations, and designs. Four credits. MR. MARTENIS.

- 156s. COMPRESSED AIR AND REFRIGERATING MACHINERY. (a) Air compressors and motors; power transmission by compressed air. (b) Principles of refrigeration. Various types of refrigerating machines, refrigerants, application to ice-making, cold storage, cooling of air, liquids, and solids. Lectures and recitations. Three credits. MR. ROWEN.
- 163f-164w-165s. POWER-PLANT MANAGEMENT. Operation and maintenance of boilers, engines, gas producers, gas engines, steam turbines, and accessory apparatus. Smoke prevention. Flue-gas analysis. Daily logs and power costs. Three credits per quarter. MR. ROWEN.
- 181w. EXPERIMENTAL LABORATORY. Indicator practice, valve-setting, separating and throttling calorimeter, tests of steam engine, gas engine, pump, air compressor, turbine, boiler, and power plant. Two credits. MR. ROWLEY, MR. SHOOP.
- 182f. POWER AND STEAM LABORATORY. Tests of steam turbines, flow of steam through nozzles and pipes. Tests of compound and triple expansion engines, condensers, superheaters, and boilers. Two credits. MR. SHOOP.
- 183w, POWER AND GAS-ENGINE LABORATORY. Tests of gas, gasoline, and hot-air engines, gas producers. Power and lighting plants. Two credits. MR. ROWLEY, MR. ROBERTSON.
- 184s. ENGINEERING LABORATORY. Opportunity will be offered for carrying on investigations in connection with tests of complete power plants, refrigerators, air compressors, blowers, and fans. Also automobile-testing. Two credits. MR. ROWLEY, MR. SHOOP, MR. ROWEN.
- 190f-191w-192s. COLLOQUIUM. Reading of assigned articles in current technical press. Preparation of synopsis and presentation of principal features. Arranged for seniors. One credit per quarter. MR. FLATHER.
- 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. Two credits. MR. FLATHER.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 223f,w,s. INDUSTRIAL MANAGEMENT. Shop and factory organization and management; cost and wage systems. Depreciation of equipment. Machine burden. Time studies. Three credits. MR. FLATHER.
- 224w,s. INDUSTRIAL MANAGEMENT LABORATORY. An advanced course in shop practice with especial reference to production. Time studies; stores and follow-up systems. Investigations in local factories. Lectures, assigned reading, practice, and reports. Three credits. MR. FLATHER.

- 225s. INDUSTRIAL MANAGEMENT PROBLEMS. Special investigations of practical problems and suggested methods of procedure. Lectures, assigned reading, and reports. Three credits. MR. FLATHER.
- 226w. SAFETY ENGINEERING. A study of the methods employed to promote safety in the factory; fire hazards, fire protection; automatic sprinkler apparatus; workmen's compensation laws. Two credits. MR. SHIPLEY.
- 237s. GAS-TRACTOR DESIGN. Selection of wheel sizes; horsepower, weight, and drawbar pull. Bearing pressure; ratios and strength of gearing. Details of principal parts. Three credits.
- 255f,w,s. ADVANCED HEATING AND VENTILATING. An advanced course for post-seniors. To be taken in connection with research work in the laboratory, Course 287. Three credits. MR. ROWLEY.
- 257s. MECHANICAL EQUIPMENT OF BUILDINGS. Appliances used; heating, ventilating, plumbing systems; piping for fire protection, compressed air, gas, and vacuum cleaning; elevators. Choice of systems. Theory and practice of designing and detailing layouts. Equipment designs for various types of buildings. Three credits. MR. MARTENIS, MR. ROWLEY.
- 262f. POWER ENGINEERING. Advanced study and application of engines, stokers, boilers, coal-handling equipment and accessories. Layout of manufacturing shops. Routing of work, transmission systems and selection of motors, factory lighting and heating. Lectures, recitations, drawing-room work. Three credits. MR. FLATHER, MR. ROWEN.
- 266w-267s. POWER-PLANT DESIGN. Problems, designs, and estimates for power plants and central stations. Selection of motive powers, relative advantages of steam and producer gas plants, choice of engines and boilers; pumps, shafting, piping, and accessories. Three credits per quarter. MR. FLATHER.
- 271f. RAILWAY TECHNOLOGY. The practical details of construction of locomotives. A systematic course of visits to the various railroad shops in the vicinity. Lectures and recitations. One credit.
- 272f-273w-274s. RAILWAY DESIGN AND LOCOMOTIVE CONSTRUCTION. Locomotive and car details. Construction of locomotives; frames, springs, equalizing arrangements, running gear, linkages, brakes, trucks, lubrication. Boilers, grates, flues, smokebox, stacks; riveted joints, staying. Engine details; heat insulation, cylinder proportions. Lectures, assigned readings. Four credits per quarter.
- 278s. LOCOMOTIVE ROAD-TESTING. Tests on locomotives and trains. Dynamometer car and drawbar pull. Three credits. MR. FLATHER and assistants.

- 287-288-289. ENGINEERING RESEARCH. Courses may be elected which involve investigations in connection with lubrication, steam and gas engines, heating and ventilating, refrigeration. Reports, special problems, and related tests. Three to 9 credits per quarter. MR. FLATHER, MR. HOLMAN, MR. ROWLEY, MR. SHOOP, MR. ROWEN.
- 293W. AERONAUTICAL ENGINEERING. Design of aerial propellers, aeroplane engines. Application of theory of propellers and gasoline engines to aeroplanes. Includes calculations and drawings for high-speed multi-cylinder light-weight engine; balancing reciprocating parts; uniform torque; theoretical diagrams, etc. Three credits. MR. FLATHER.
- 294S. AEROPLANE DESIGN. Calculations and drawings for a given aeroplane; stability, strength, propulsion, and motive power required. Three credits. MR. FLATHER.
- 295W. CONTRACTS AND SPECIFICATIONS. A study of engineering specifications. Classes of specifications; essential features; clauses; details. Bids and bidders, engineering contracts. Examples. Lectures, recitations, and practice in writing specifications. Three credits. MR. FLATHER.

MEDICINE

(Including General Medicine, Dermatology, and Nervous and Mental Diseases)

Professors REGINALD FITZ,* ARTHUR S. HAMILTON, THOMAS B. HARTZELL, HENRY S. PLUMMER,* LEONARD G. ROWNTREE,* WALTER D. SHELDON,* JOHN H. STOKES,* S. MARX WHITE; Associate Professors GEORGE B. EUSTERMAN,* JOHN P. SCHNEIDER, HERBERT Z. GIFFIN, WILLIS S. LEMON,* ARCHIBALD H. LOGAN,* ROBERT D. MUSSEY,* HENRY L. ULRICH; Assistant Professors ERNEST T. F. RICHARDS, WALTER M. BOOTHBY,* DORR F. HALLENBECK,* NORMAN M. KEITH,* WILLIAM A. PLUMMER,* LEDA J. STACY,* RUSSELL M. WILDER,* HENRY M. WOLTMANN.*

The graduate work in the Department of Medicine is designed to prepare students for practice of the specialty of internal medicine, research in the problems of general medicine, and for the specialty of nervous and mental diseases, as the case may be, and to train men as teachers in their respective fields. Prospective students who have had no special work in addition to that of the undergraduate course in physiology, physiologic chemistry, therapeutics, experimental medicine, or pathology are advised to devote a year or more to these subjects before entering the regular three-year graduate course. Throughout the course it is recommended that a minor be carried in one or more of the following departments: Physiology, Pharmacology, Pathology, Immunology, and Pediatrics. For students

* Appointed on the Mayo Foundation.

specializing in nervous and mental diseases, minors in anatomy and psychology are especially valuable, and for those desiring it, work would be arranged in the Department of Ophthalmology and Oto-Laryngology, giving a special opportunity to study lesions of the eye occurring in systematic disorders. In the Medical School, during at least the third year of the three-year fellowship, the fellow acts as an officer of the clinic with definite responsibility in the care of patients in the University Hospital.

METALLOGRAPHY

Associate Professor OSCAR E. HARDER.

Prerequisites.—For major work, adequate preparation in the sciences fundamental to metallography (chemistry, physics, geology, technical subjects), the general requirements being fulfilled. For minor work, the prerequisites to the courses to be pursued.

Exemption from the language requirements for the Master's degree may be made in individual cases.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 150W. METALLOGRAPHY FOR ELECTRICAL ENGINEERS. Principles of metallography, including pyrometry, thermal analysis, constitution diagrams, microscopic and photomicrographic technic; study of typical alloys with special reference to electrical resistance, conductivity, magnets, etc. Laboratory work and demonstrations. Two lectures, three laboratory hours per week. Three credits. MR. HARDER, MR. DOWDELL.
- 151S. ADVANCED METALLOGRAPHY FOR ELECTRICAL ENGINEERS. Continuation of 150. 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. Two lectures, three laboratory hours per week. Prerequisite: Course 150. Three credits. MR. HARDER, MR. DOWDELL.
- 153f-154w-155S. METALLOGRAPHY. (Long course for metallurgical engineers.) Theory of metallic alloys. Metallographic technic. Properties of metals and alloys. Metallography of iron and steel and commercial alloys. Technical metallography. Three lecture, four laboratory hours per week each quarter. Prerequisites: Chemistry 20w, Physics 5s. Five credits per quarter. MR. HARDER, MR. DOWDELL.
- 156W. METALLOGRAPHY FOR MECHANICAL ENGINEERS. Principles of metallography, including pyrometry, thermal analysis, constitution diagrams, microscopic and photomicrographic technic; metallography and heat treatment of iron and steel. Laboratory work. Two lecture, three laboratory hours per week. Three credits. MR. HARDER, MR. DOWDELL.
- 157S. ADVANCED METALLOGRAPHY FOR MECHANICAL ENGINEERS. Continuation of 156. 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. Two lecture, three laboratory hours per week. Three credits. Prerequisite: Course 156. MR. HARDER, MR. DOWDELL.
- 159w. DENTAL METALLOGRAPHY. Study of the dental alloys from the standpoint of metallography. Lectures, recitations, and demonstrations, taking up the most important metals and alloys, with special reference to those used in dentistry. Prerequisite: Chemistry 21-22. Two credits. One lecture, two laboratory hours per week. MR. HARDER, MR. DOWDELL.
- 160f. METALLOGRAPHY FOR CHEMICAL STUDENTS. Principles of metallography, including constitution diagrams, preparation and standardization of thermocouples, preparation and thermal analysis of alloys, their microscopic examination and the making of photomicrographs; typical alloy systems such as iron carbon (steel and cast iron), some non-ferrous alloys. Prerequisite: Chemistry 20w. Two lectures and two laboratory hours per week. Three credits. MR. HARDER, MR. DOWDELL.
- 161w. ADVANCED METALLOGRAPHY FOR CHEMICAL STUDENTS. Metallography and heat treatment of iron and steel, including alloy steels, commercial uses of various steels, and engineering specifications. Prerequisite: Course 160. Two lecture and two laboratory hours per week. Three credits. MR. HARDER, MR. DOWDELL.
- 162s. ADVANCED METALLOGRAPHY FOR CHEMICAL STUDENTS. Metallography of the non-ferrous metals with a study of the constitution diagrams, properties, and uses of important commercial alloys. Prerequisite: Course 160. Two lecture and three laboratory hours per week. Three credits. MR. HARDER, MR. DOWDELL.
- 163f-164w-165s. ADVANCED METALLOGRAPHY. Technical and scientific research. The study of steel rails, automobile and locomotive parts, tool steels, etc. Special problems in metallography with outside reading. Seminar work in the recent advances in metallography. Prerequisites: Courses 151, 155, 157, or equivalent. MR. HARDER.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. ADVANCED METALLOGRAPHY FOR GRADUATE STUDENTS. Intended primarily for research work. Hours and credits to be arranged. MR. HARDER.

OBSTETRICS AND GYNECOLOGY

Professor JENNINGS C. LITZENBERG; Associate Professor FRED L. ADAIR;
Assistant Professor LEE W. BARRY.

For courses of study offered, see special bulletin of graduate work in medicine.

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Professor WILLIAM R. MURRAY; Associate Professors FRANK E. BURCH, WILLIAM D. BENEDICT,* GORDON B. NEW,* Assistant Professor HORACE NEWHART.

For courses of study offered, see special bulletin of graduate work in medicine.

PATHOLOGY AND PUBLIC HEALTH

Professors ELEXIUS T. BELL, HAROLD E. ROBERTSON,* JOHN SUNDWALL, LOUIS B. WILSON;* Associate Professors WILLIAM C. MACCARTY, ARTHUR H. SANFORD.*

Prerequisites.—Graduate students who desire to take their major or minor work in pathology must present credits in the following subjects: physics, 8 credits; general and organic chemistry, 12 credits; zoology, 6 credits; and a reading knowledge of German.

In addition, students who elect their major work in pathology must present credits for the equivalent of the first two years' work of the Medical School of this University.

For courses of study offered, see special bulletin of graduate work in medicine.

PEDIATRICS

Professor JULIUS PARKER SEDGWICK; Associate Professors WALTER R. RAMSEY, FREDERICK C. RODDA; Assistant Professors EDGAR J. HUENKENS, MAX SEHAM, ROOD TAYLOR.

For courses of study offered, see special bulletin of graduate work in medicine.

PHARMACOLOGY AND THERAPEUTICS

Professor ARTHUR D. -HIRSCHFELDER; Associate Professor EDGAR D. BROWN.

For courses of study offered, see special bulletin of graduate work in medicine.

PHILOSOPHY

Professors NORMAN WILDE, DAVID F. SWENSON; Assistant Professor GEORGE P. CONGER.

Prerequisites.—For a major, 18 credits; for a minor, 9 credits of work in the department are prerequisites.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

100f-101w-102s. PHILOSOPHY OF RELIGION. Religion as an interpretation and evaluation of life. Fall quarter: survey of historical and psychological phenomena of various religions; winter and spring quarters:

* Appointed on the Mayo Foundation.

- critical discussion of esthetic, ethical, and religious attitudes toward life, including a presentation of speculative idealism and the philosophy of Christianity as a transcendental ethical religion. The three quarters form a unit, but each may be taken separately. Prerequisites, 10 credits. Nine credits. I; TThS; 322F. MR. SWENSON.
- 106w. PHILOSOPHY OF EDUCATION. A discussion of philosophically formulated ideals of education, with an attempt to reach a positive philosophy of educational values. Prerequisites: 10 credits in philosophy or education. Three credits. II; MWF; 322F. MR. SWENSON.
- 108w-109s. HISTORY OF ETHICS. Survey of the chief ideals of conduct from Socrates to the present day. Emphasis will be laid both on the historical conditions and also on the elements of permanent value from the main ethical standpoints. Prerequisites: 15 credits in any social science or 10 in philosophy. Six credits. (Not offered in 1921-22.)
- 120w. SCANDINAVIAN PHILOSOPHY. The philosophical thought of the nineteenth century in Scandinavian countries, including a comparative study of Boström and Kierkegaard. Prerequisites: 10 credits. Three credits. (Not offered in 1921-22.) MR. SWENSON.
- 124f. POLITICAL AND SOCIAL ETHICS. The fundamental aspects of society and the state, considered from the point of view of ethics. Prerequisites: 20 credits in any social science, or 10 in philosophy. Five credits. I; T-S; 322F. MR. WILDE.
- 129w. MODERN POLITICAL THOUGHT. The state in modern political philosophy, its nature, basis, and authority. Individualism and socialism in the eighteenth and nineteenth centuries. The idea of democracy. Prerequisites: 10 credits in philosophy or 20 in any social science. Three credits. I; TThS; 322F. MR. WILDE.
- 135f-136w. 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. Prerequisites: 10 credits. Four credits. VI; TTh; 316F. MR. CONGER.
- 141f. METAPHYSICS. A critical study of the fundamental metaphysical concepts, ontological and cosmological, that constitute the framework of reality. Prerequisites: 10 credits including Philosophy 2. Three credits. MR. SWENSON.
- 147f. 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. Prerequisites: 10 credits including Philosophy 2. Three credits. (Not offered in 1921-22.) MR. SWENSON.
- 151f-152w-153s. KANT AND HIS SUCCESSORS. A critical study of German idealism. Prerequisites: 15 credits. Six credits. (Not offered in 1921-22.)

161f-162w-163s. SEMINAR IN PHILOSOPHY. Individual investigation in philosophy. Studies in either ancient or modern philosophy and ethics; critical and constructive studies of logic, metaphysics, or ethics. Character of work and general topics for year ascertained by consultation with department. Prerequisites: 20 credits in philosophy. Nine credits. MR. WILDE.

PHYSICS

Professors HENRY A. ERIKSON, W. FRANCIS G. SWANN, JOHN T. TATE, ANTHONY ZELENY; Assistant Professor LOUALLEN F. MILLER.

Prerequisites.—For major work, differential and integral calculus and two years of physics of college grade. For minor work, one year of college physics.

A student majoring in physics is required to take Courses 101-103-105 and 102-104-106 unless excused by the department upon satisfactory evidence through examination at entrance. A course of general reading as outlined by the department in each individual case is also required.

All students majoring in physics are required to take a brief course in Physical Manipulation offered by the department. This course is taken without credit.

For the Master's degree a reading knowledge of French or German is required. It is desirable that this requirement be fulfilled before graduate work is begun.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101f-103w-105s. THEORETICAL PHYSICS. Intensive analytical survey of fundamental principles of mechanics, sound, heat, light, electricity, and magnetism, designed to supplement the general course and to prepare the student for the more specialized graduate courses. Four lectures a week. Prerequisites: Courses 21, 31, 41, Mathematics 51. Twelve credits. IV; MTWF; 2Ph. MR. TATE.

102f-104w-106s. EXPERIMENTAL PHYSICS. Comprehensive course extending through the year; fundamental and standard methods of precise measurements as exemplified by the representative experiments in mechanics, sound, heat, light, and electricity. This course may be begun any quarter. Two three-hour sessions a week. Prerequisites: Courses 22, 32, 42. Nine credits. (1) V-VII; MW; 2Ph. (2) V-VII; TTh; 2Ph. MR. TATE, MR. POWER.

111f-113w-115s. ELEMENTS OF MATHEMATICAL PHYSICS. A study of the fundamental principles and standard methods involved in the mathematical analysis of physical problems. Three lectures a week. Prerequisites: Course 105, Mathematics 51. Nine credits. MR. FRAYNE.

112f-114w-116s. ELEMENTARY PHYSICAL INVESTIGATION. The experimental or theoretical study of physical phenomena the nature or laws of which are not as yet understood. Two three-hour sessions a week. Nine credits. Prerequisites: Course 106, Mathematics 51. MR. ERIKSON, MR. TATE, MR. ZELENY.

- 122s. PYROMETRY AND HEAT. An experimental study of pyrometry, heat quantity, heat transfer, hygrometry, and gas liquefaction. Prerequisites: Courses 22 and 42. Three credits. One lecture and 2 three-hour sessions in the laboratory a week. V-VIII; TTh; 9Ph. MR. MILLER.
- 132w. APPLIED OPTICS. Special experimental work in spectrometry, optical instruments, photometry, absorption, polarized light. Prerequisite: Course 32. Two three-hour laboratory periods a week. Three credits. VII-VIII; TTh; 3Ph. MR. VALASEK.
- 142f. ELECTRICAL MEASUREMENTS. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux. Prerequisite: Course 42. Three credits. Three two-hour laboratory sessions a week. See engineering program. MR. ZELENY.
- 146w. ELECTRICAL MEASUREMENTS OF PRECISION. Precision measurements of electromotive force, current, resistance, capacity, inductance, and magnetic flux. Use of apparatus of highest precision. Special problems. Three two-hour laboratory periods a week. Prerequisites: Course 142. Three credits. MR. ZELENY.
- 145f-147w-148s. RADIOACTIVITY. An analytical study of the theories and methods of investigation supplemented by laboratory technic. Prerequisites: Course 106, Mathematics 51. Nine credits. V-VII; TTh; 15Ph. MR. ERIKSON.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f. ADVANCED ANALYTICAL MECHANICS. Kinematics of particles and of rigid bodies; the formulation of the general principles of dynamics and their application to the motion of particles and of rigid bodies. Application of mechanical principles to non-mechanical problems. Three lectures a week. Prerequisites: Physics 101-103-105, Mathematics 51. Three credits. MR. TATE.
- 203w. THEORY OF ELASTICITY. Analysis of strain and stress; energy of strain; equations of wave motion; applications to sound and to electromagnetic oscillations. Three lectures a week. Prerequisites: Physics 201. Three credits. MR. TATE.
- 205s. HYDRODYNAMICS. Equations of Euler and Lagrange; irrotational motion; motion of solids through fluids; vortex motion; waves and tides; motion of viscous fluid. Three lectures a week. Prerequisites: Physics 201. Three credits. MR. TATE.
- 212f-214w-216s. RESEARCH. Under the special direction of individual members of the staff.
- 221f. THERMODYNAMICS: KINETIC THEORY OF GASES. The classical theory of thermodynamics and applications to special problems: application of statistical mechanics to gases; relation to thermodynamics; theory

of effusion, specific heats, dissociation, viscosity, conduction of heat, diffusion, transfer problems in general. Three lectures a week. Prerequisites: Physics 101-103-105; Mathematics 51. Three credits. MR. TATE.

223W. THEORY OF THERMAL RADIATION. Application of thermodynamics and statistical mechanics to thermal radiation; Planck's quantum hypothesis and applications to specific heats and allied problems. Three lectures a week. Prerequisites: Physics 221. Three credits. MR. TATE.

225S. THEORIES OF ATOMIC STRUCTURE. The quantum theories and their application to the study of X-rays, radioactivity, resonance and ionization potentials, photo-electricity; spectrum series and fine structure; resonance spectra; Stark effect. Three lectures a week. Prerequisites: Physics 221-223. Three credits. MR. TATE.

231f-233w-235S. THEORETICAL OPTICS. Geometrical optics and optical instruments. Theory of interference, diffraction and polarization. Properties of electromagnetic waves. Electron theory of dispersion, absorption, double refraction, optical rotation, magneto and electro-optics. Radiation and its transformation and resonance radiation. Theory of moving media. Three lectures a week. Prerequisites: Physics 101-103-105, Mathematics 106-107-108. MR. VALASEK.

241f-243w. MATHEMATICAL THEORY OF ELECTRICITY AND MAGNETISM. Fundamental mathematical theorems and processes of analysis applicable to potential theory; electric images; polarized media; magnetism; magnetic shells and their relation to electric currents; current flow in waves and infinite media; dynamical theory of electromagnetism. Three lectures a week. Prerequisites: Physics 101-103-105, Mathematics 106-107-108. Six credits. MR. SWANN.

242f-244w. THEORY OF ELECTRIC OSCILLATIONS. Fundamental laws of electrodynamics; free and forced vibrations in electrical circuits, tuning, damping; theory of radio instruments; energy losses in coils, condensers, etc.; electron tubes and circuits containing them; electromagnetic radiation. Three lectures a week. Prerequisites: Physics 101-103-105, Mathematics 106-107-108. Six credits. MR. SWANN.

245S. FUNDAMENTALS OF ELECTRON THEORY. The Maxwell Lorentz equations; solutions in terms of retarded potentials; equations expressing conservation of energy and momentum; electromagnetic mass; systems in uniform rectilinear motion; radiation from electrons. Three lectures a week. Prerequisites: Physics 231-243. Three credits. MR. SWANN.

246S. MEASUREMENTS ON ELECTRICAL OSCILLATIONS. Determination of characteristic curves of electron tubes; use of wave meter; measurement of high frequency resistance; verification of the laws of oscillating circuits in general. Three two-hour laboratory sessions a week. Prerequisites: Physics 242-244. Three credits. MR. SWANN.

247f. THEORY OF RELATIVITY. Historical survey; the special theory; Minkowski's four dimensional analysis; application to electromagnetic theory; determination of equations of motion of electrons and to gravitation; the general theory; theory of tensors; Einstein's law of gravitation with application. Three lectures a week. Prerequisites: Physics 241-243-245, Mathematics 106-107-108. Three credits. MR. SWANN.

248w-249s. ELECTRON THEORY OF MATTER. Conduction of electricity in metals and allied phenomena; electromagnetic theory and heat radiation; thermionics; atomic structure; theory of diamagnetism; theory of paramagnetism; Weiss's theory of ferromagnetism. Three lectures a week. Prerequisite: Physics 247. Six credits. MR. SWANN.

PHYSIOLOGY AND PHYSIOLOGIC CHEMISTRY

Professors ELIAS P. LYON, JESSE F. MCCLENDON, FREDERICK H. SCOTT; Associate Professors RICHARD O. BEARD, EDWARD C. KENDALL, FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETIBONE.

Prerequisites.—The Department of Physiology is well equipped for the various types of physiologic investigation. The library facilities are good.

For a minor in physiology, general zoology, general and organic chemistry, and college physics are prerequisites. (In exceptional cases high-school physics may be accepted.) For a major, physical chemistry is desirable.

In addition, each student majoring in physiology or physiologic chemistry must have had the general courses, Physiology 100, 101, 103, 104, or the equivalent.

For courses of study offered, see special bulletin of graduate work in medicine.

PLANT PATHOLOGY AND BOTANY

Professors EDWARD M. FREEMAN, ELVIN C. STAKMAN; Assistant Professor JULIAN G. LEACH.

NOTE: For courses in botany including plant physiology see Department of Botany.

Prerequisites.—The minimum requirement is (a) three years (27 credits) in botany, one year (9 credits) of which shall be mycology; (b) general bacteriology one quarter (4 credits) or some equivalent; (c) one year (9 credits) in plant pathology—preferably two years (18 credits).

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

105f-106w-107s. MYCOLOGY. A general study of the morphology, taxonomy, and biology of fungi. Lecture, laboratory, greenhouse, and field work. Prerequisites: Botany 7 and 11 or equivalent. Three credits per quarter. MISS DOSDALL.

- 108f-109w. **METHODS.** Plant pathological methods, including mycological and bacteriological technic. Lecture, laboratory, field, and greenhouse work. Special problems. Prerequisites: Course 1 and Bacteriology 6. Three credits per quarter. MR. STAKMAN, MR. LEACH.
- 110s. **PRINCIPLES OF PATHOLOGY.** Comparative biology of plant pathogens; pathological plant anatomy, parasitism, biologic specialization, resistance, and immunity. Prerequisites: Course 1 and Bacteriology 6. Three credits. MR. STAKMAN.
- 111w,su. **DISEASES OF FIELD CROPS.** Detailed study of diseases of cereal and forage crops, including symptomology, etiology, and practical methods of control. Laboratory, lecture, and field work. Prerequisite: Course 1. MR. STAKMAN, MR. BARKER.
- 112s,su. **DISEASES OF FRUIT AND VEGETABLE CROPS.** Special study of diseases of fruit and vegetable crops, especially those important in Minnesota. Laboratory, lecture, and field work. Prerequisite: Course 1. MR. LEACH.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 203f-204w-205s. **SPECIAL PROBLEMS.** Special assignment of work in laboratory and field problems in pathological research. MR. FREEMAN, MR. STAKMAN.
- 207f-208w-209s. **RESEARCH IN MYCOLOGY.** Research work along following suggested lines: taxonomy of natural groups; fungous flora of particular regions, localities, or habitats; investigation of fungi involved in special industrial or natural processes; morphology or physiology of special forms. Prerequisite: Course 105-106-107. For minor or major. Three credits per quarter. MR. FREEMAN, MR. STAKMAN.
211. **HISTORY OF PLANT PATHOLOGY.** Development of important mycological, pathological and physiological researches; historical basis of modern science of plant pathology. Three credits per quarter. MR. STAKMAN.
213. **SEMINAR.** Assigned topics with special reference to current pathological problems. Historical review of literature on special problems and critical study of current literature. Two credits per quarter. MR. FREEMAN, MR. STAKMAN.

POLITICAL SCIENCE

Professors CEPHAS D. ALLIN, JEREMIAH S. YOUNG, ROY G. BLAKEY (Economics), NORMAN WILDE (Philosophy), SOLON J. BUCK (History); Associate Professors WILLIAM ANDERSON, ROBERT E. CUSHMAN, ALVIN H. HANSEN (Economics), QUINCY WRIGHT, LESTER B. SHIPPEE (History), MASON W. TYLER (History); Assistant Professor HAROLD S. QUIGLEY.

Prerequisites.—For major work, 18 credits; for minor work, 13 credits.

Professional courses.—The attention of those who are preparing themselves for the public service is called to the special training courses outlined on pages 32-34 of the bulletin of the College of Science, Literature, and the Arts. Further information may be had from the chairman of the department.

Bureau for Research in Government.—This bureau is organized to conduct and direct special investigations into practical politics and administrative problems, national, state, and local. Mr. Anderson will act as director, but all members of the staff will take part in the work of the bureau. Advanced and graduate students are strongly urged to take advantage of its facilities.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 107-108. (History.) EUROPE, 1848-1904. The development of Europe in its various phases—political, social, and economic—from the Revolution of 1848 to the outbreak of the World War. Identical with History 107-108. Prerequisites: 10 credits. A reading knowledge of French or German will be helpful. MR. TYLER.
- 109-110. (History.) ENGLISH HISTORY, 1850-1920. Assigned readings and lectures. Emphasis placed upon party history, the colonies, foreign relations, the social-democratic movement, and especially British foreign policy preceding the World War. Identical with History 109-110. Prerequisites: 10 credits.
111. GOVERNMENT OF MINNESOTA. The development and present organization of the state government; its relation to the local government; the growth of the state constitution; present problems and proposed changes. (Not offered in 1921-22.) MR. ANDERSON.
- 115s. MUNICIPAL PROBLEMS. A specialized course in modern, legal, administrative, and functional problems of cities. The content of the course will change from year to year, keeping abreast of municipal progress. II; TThS; 213MA. MR. ANDERSON.
117. MUNICIPAL ENGINEERING. (Same as Civil Engineering 53.3s.)
- 121f-122w. INTERNATIONAL LAW. Nature, sources, and sanction of international law. The law of peace, war, and neutrality, with special attention to diplomatic and consular practice. Emphasis upon the application of principles to concrete cases. IV; MTWF; 213MA. MR. WRIGHT.
- 123s. DEVELOPMENT OF INTERNATIONAL LAW AND ORGANIZATION. The classics in international law, systems of international relations, international administrative organizations, and league of nations. IV; MTWF. MR. WRIGHT.
- 125w. AMERICAN DIPLOMATIC HISTORY. Attention to the principles and policies guiding American diplomacy in its stages of development as well as to the methods pursued and the personalities of American diplomats. III; MTWF. MR. WRIGHT.

- 127s. AMERICAN FOREIGN RELATIONS. Such topics as the Monroe Doctrine, freedom of the seas, the open door, arbitration, disarmament, will be considered with particular reference to the future policy of the United States. III; MTWF; 102MA. MR. WRIGHT.
- 129f. FAR EASTERN POLITICS. The principal factors in the social and political life of Japan and China; their relations with each other and with western powers. VI; MWF. MR. QUIGLEY.
- 141f. PROBLEMS IN STATE GOVERNMENT AND CONSTITUTIONAL LAW. A selected group of current problems in state government will be studied intensively in their constitutional and political aspects. Assigned readings and reports. V; MWF. MR. CUSEMAN.
145. 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. (Not offered in 1921-22.) MR. YOUNG.
- 146-147. (History.) CONSTITUTIONAL HISTORY OF THE UNITED STATES. A study of the evolution of American constitutional government through legislation, judicial interpretation, administrative rule, and custom. Identical with History 146-147. V; MWThF; 213MA. MR. SHIPPEE.
- 151w. CONSTITUTIONAL LAW: THE AMERICAN FEDERAL SYSTEM. Judicial interpretation of the constitution; power of judicial review; separation of government powers; relation of state and national governments; construction of national powers; jurisdiction of courts. V; MWThF; 213MA. MR. CUSEMAN.
- 152s. CONSTITUTIONAL LAW: FUNDAMENTAL RIGHTS AND IMMUNITIES. Privileges and immunities of citizenship; protection of civil and political rights; the obligation of contracts; due process of law and equal protection of the law. V; MWThF; 209MA. MR. CUSEMAN.
153. (History.) THE WEST IN AMERICAN POLITICS SINCE 1865. An intensive study of independent parties and radical or progressive political movements. Identical with History 153. MR. BUCK.
154. NATIONAL AND STATE ADMINISTRATION. The principles of American administrative organization and the operation of administrative departments, and of important administrative boards and commissions. (Not offered in 1921-22.) MR. YOUNG.
- 155w. COMPARATIVE ADMINISTRATIVE LAW. Administration as a science; origin and development; an analysis of the administrative systems of the United States, England, France, and Germany, with special reference to the law of officers, the merit system, and special administrative tribunals. II; TThS. MR. YOUNG.

- 157f. POLICE POWER. Nature of the police power; constitutional aspects of social and economic legislation, including safety, order, morals, and protection against business fraud and oppression; the fundamental rights under the police power. II; TThS; 102MA. MR. YOUNG.
- 158s. GOVERNMENT AND BUSINESS. Governmental powers; laissez-faire versus regulation; protection against fraud and oppression; restraint of trade and manipulation of prices; protection of debtors; business affected by a public interest; qualified property; compulsory benefits; conservation of natural wealth; vested rights; confiscatory legislation; administration of business legislation; reaction of war emergency measures on permanent policy. II; TThS; 102MA. MR. YOUNG.
161. COMPARATIVE FEDERAL GOVERNMENT. Ancient and modern federal unions, especially the constitutions of the United States, Switzerland, Canada and Australia, the South African Union, and the proposals for British imperial federation. (Not offered in 1921-22.) MR. ALLIN.
- 165f-166w. GOVERNMENT OF THE BRITISH EMPIRE. Law and custom of the British constitution. IV; MWF. MR. ALLIN.
- 167s. BRITISH POLITICS. Parties, party leaders, and policies. The relation of English and imperial politics. IV; MWF; 213MA. MR. ALLIN.
169. (Economics.) THE LABOR AND SOCIALIST MOVEMENT IN EUROPE. A theoretical analysis and historical survey of utopian socialism, Marxian socialism, evolutionary socialism, anarchism, syndicalism, sovietism, guild socialism, state socialism, coöperation, and labor parties, especially as found in Germany, France, England, and Russia. Identical with Economics 169. MR. HANSEN.
- 171f. MUNICIPAL CORPORATIONS. The legal basis of municipal government; the relation of the city to the state; home rule. The city as a legal entity; its powers, duties, and liability for torts. II; MWF; 102MA. MR. ANDERSON.
181. MODERN POLITICAL THOUGHT. Identical with Philosophy 129. The state in modern political philosophy, its nature, basis, and authority. Individualism, and socialism in the eighteenth and nineteenth centuries. The idea of democracy. MR. WILDE.
185. POLITICAL AND SOCIAL ETHICS. Identical with Philosophy 124. The fundamental aspects of society and the state, considered from the point of view of ethics. MR. WILDE.
- 191-192. (Economics.) PUBLIC FINANCE. National government revenues, expenditures, and debts. This includes a study of the principles and various forms of taxation, budgetary legislation and control, war and emergency financing, the shifting and incidence of taxes and fiscal reforms. Identical with Economics 191-192. MR. BLAKEY.

193. (Economics.) STATE AND LOCAL TAXATION. Principles and problems, e.g., state and local taxation of lands, mineral resources, forests, corporations, income, inheritances; also studies of classification, separation, local option, exemption, double taxation, evasion, assessment, centralized administration. Identical with Economics 193. MR. BLAKEY.

• COURSES PRIMARILY FOR GRADUATE STUDENTS

201f-202w-203s. SEMINAR IN PUBLIC LAW. VII-VIII; T; 104MA. MR. YOUNG, and others.

211f-212w-213s. SEMINAR IN MODERN GOVERNMENT AND POLITICAL THEORY. VII-VIII; T; 104MA. MR. ALLIN, and others.

221f-222w-223s. SEMINAR IN LOCAL GOVERNMENT AND ADMINISTRATION. VII-VIII; T; 104MA. MR. ANDERSON, and others.

NOTE: A student registered in a seminar course will be expected to complete a satisfactory piece of research before receiving credit for the course.

The Bureau for Research in Government is designed to give all possible assistance in the conducting of such research, but is not intended to relieve the student of his personal responsibility.

PSYCHOLOGY

Associate Professors RICHARD M. ELLIOTT, WILLIAM S. FOSTER, DONALD H. PATTERSON, HERBERT WOODROW,¹ KARL S. LASHLEY; Assistant Professor MILDRED W. LORING; Professorial Lecturer HARRY MILES JOHNSON.

Prerequisites.—For either major or minor work, 12 credits.

101f-102w.† EXPERIMENTAL PSYCHOLOGY. The theory and technic of the leading methods of experimental investigation in human psychology. One lecture, 4 laboratory hours per week. Six credits. VI; MWF; VII; WF; 116Psy. MISS LORING.

108w-109s.† ADVANCED GENERAL PSYCHOLOGY. A systematic presentation of the laws of the normal adult mind, based upon study of experimental results. Lectures, recitations, and reports. Six credits. II; MWF; 109Psy. MR. PATTERSON.

114w-115s.† HUMAN BEHAVIOR. An analysis from the point of view of the objective school of psychologists. Six credits. II; TThS; 109Psy. MR. ELLIOTT.

119f-120w.† ANIMAL BEHAVIOR. The development of reaction systems in animals, with emphasis upon the application of studies of animals to the solution of general problems in physiological psychology. One lecture, 6 laboratory hours per week. Six credits. VI; MWF; VII; WF; 109Psy. MR. LASHLEY.

† All quarters must be completed before credit will be given.

¹ Absent on leave, 1921-22.

- 121s. **NEURO-PSYCHOLOGY.** Specialization of functions in the nervous system in relation to behavior. Discussion from the standpoint of psychology of current theories of integration and localization. Two lecture, 3 laboratory hours per week. Three credits. VI; MWF; VII; WF; 109Psy. MR. LASHLEY.
- 125f-126w.† **DIFFERENTIAL PSYCHOLOGY.** Important distinguishing characteristics (psychological) of individuals and groups. Emphasis on experimental and statistical methods of discovering differences and of making comparisons. Each student participates in investigation of definite problems and in analysis of results. Six credits. III; MWF; 109Psy. MR. PATTERSON.
- 127s. **SOCIAL PSYCHOLOGY.** Study of the dependence of familiar forms of social organization and behavior upon the fundamental laws of mental activity. The adjustment of the innate mental equipment of the individual to the norms of social groups. Five credits. IV; MTWFS; 115Psy. MR. BIRD.
- 135w-136s. **DYNAMIC PSYCHOLOGY.** The constituents of character; their development, their interrelationship, and their rôle in the determination of human affairs. Six credits. III; TThS; 115Psy.
- 144f-145w.† **ABNORMAL PSYCHOLOGY.** A systematic review of psychopathology in relation to normal behavior. Six credits. IV; MWF; 109Psy. MR. LASHLEY.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 200f-201w-202s.† **SEMINAR IN THE HISTORY OF PSYCHOLOGY.** Selected topics from the history of psychology. Open to advanced students with permission of the instructor. Three or six credits in proportion to work done. (Not offered in 1921-22.) MR. FOSTER.
- 205w. **ADVANCED DIFFERENTIAL PSYCHOLOGY.** Three credits.
- 210f-211w-212s. **RESEARCH PROBLEMS.** Laboratory investigations. Open to graduate students only. MR. ELLIOTT, MR. FOSTER, MR. WOODROW, MR. LASHLEY, MISS LORING.
- 215f-216w-217s.† **SEMINAR IN PHYSIOLOGICAL PSYCHOLOGY.** Fortnightly meetings for report and discussion of some of the fundamental problems of behavior. Topics will be selected to meet, so far as possible, the current needs of the graduate students. Three to six credits in proportion to work done. MR. LASHLEY.
- 220f-221w-222s. **JOURNAL CLUB AND SEMINAR.** The members of the teaching staff and advanced students meet every other week for reports on the progress of their investigations and for discussion of contemporary trends in psychology and related sciences. Attendance of graduate students who are candidates for degrees is required. No credit.

† All quarters must be completed before credit will be given.

ROMANCE LANGUAGES.

Professors EVERETT W. OLMSTED, IRVILLE C. LeCOMPTE, COLBERT SEARLES; Associate Professor, RUTH S. PHELPS; Assistant Professors FRANCIS B. BARTON, JOSEPH E. GILLET, EUGENE F. PARKER, EDWARD H. SIRICH, GUSTAVE VAN ROOSBROECK.

Prerequisites.—For major work, survey of French literature; at least two courses in conversation and composition; and at least two century courses. Candidates for Master's degree must also have a reading knowledge of at least one other modern language. Candidates for the Doctor's degree must have had at least two years' work in Latin, and are required to take also the course in medieval Latin in the Latin Department. A reading knowledge of a second Romance language and of German is also required.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

French

- 100-101-102.† DICTION FRANÇAISE. Dissertations littéraires par le discours. Leçons sur des textes en prose et en vers. Exercices-oraux de diction, de syntaxe, et de vocabulaire. (Not offered in 1921-22.)
- 103-104-105.† FRENCH SYNTAX AND COMPOSITION. Special studies in characteristic problems of French syntax. V; F; 203F. MR. BARTON.
106. ADVANCED FRENCH PHONETICS. Practical study of the pronunciation in French: the sounds, the stress group, the connected phrase. Oral and phonograph practice in enunciation based upon reading of texts representing various literary types. (Not offered in 1921-22.)
- 115-116-117.† FRENCH LITERATURE: SEVENTEENTH CENTURY. Influence of the literary salons. Development of French prose. Perfection of French dramatic art by Corneille, Racine, and Molière. Reading, discussions, reports based upon collateral reading. III; TThS. MR. SEARLES.
- 118-119-120.† FRENCH LITERATURE: EIGHTEENTH CENTURY. Philosophic movement: Bayle, Fontenelle, Montesquieu, Voltaire, l'Encyclopédie, Rousseau. Literature: poetry, tragedy, comedy, novel. Reading, discussions, reports, based upon collateral reading. III; MWF. MR. PARKER.
- 121-122-123.† FRENCH LITERATURE: SIXTEENTH CENTURY. Forerunners of the Renaissance: Marot and l'Ecole Lyonnaise. The Renaissance movement and the Reformation, Rabelais, Calvin and the Pléiade and its successors; Montaigne; the situation at the close of the century. (Not offered in 1921-22.) MR. SIRICH.

† All quarters must be completed before credit will be given.

- 141-142-143.† REALISTIC NOVEL: NINETEENTH CENTURY. A study of realism with especial reference to the novel. Flaubert, Maupassant, Zola, etc. Alternates with 159-160-161. VI; TTh; 203F. MR. Lecompte.
- 150-151-152.† FRENCH DRAMATIC LITERATURE. A study of the development of dramatic literature in France from the classical period to the present time. Alternates with 153-154-155. (Not offered in 1921-22.) MR. OLMSTED.
- 153-154-155.† FRENCH LYRIC POETRY. Principles of French prosody. A study of the evolution of French lyric poetry. Alternates with 150-151-152. III; TTh; 203F. MR. OLMSTED.
- 156-157-158.† FRENCH CLASSICISM. The development of French classic ideals and doctrines. The humanistic element, the reform of Malherbe, the adoption of the Aristotelian doctrines. French classic writers. Alternates with 162-163-164. (Not offered in 1921-22.) MR. SEARLES.
- 159-160-161.† FRENCH CRITICISM. A study of the masters of French criticism. Alternates with 141-142-143. (Not offered in 1921-22.) MR. Lecompte.
- 162-163-164.† FRENCH LITERARY CRAFTSMANSHIP. A study of the methods followed by modern French authors. Alternates with 156-157-158. (Not offered in 1921-22.) MR. SEARLES.
- 171-172-173.† EXPLICATION DES TEXTES. An analytical and critical study of French texts, in which particular attention is given to style; thought, and diction. The course is conducted in French. (Not offered in 1921-22.)
- 174-175-176.† LECTURES IN FRENCH. La littérature française moderne, 1880-1920. MR. VAN ROOSBROECK.
- 177-178-179.† ADVANCED LECTURES IN FRENCH. (Not offered in 1921-22.)
- 191-192-193.† RESEARCH METHODS AND MATERIAL. MR. VAN ROOSBROECK.

Spanish

- 100-101-102.† SPANISH ORAL DICTION. Oral dissertations on assigned subjects. Exercises in diction, syntax, and vocabulary. (Not offered in 1921-22.) MR. HERAS.
- 103-104-105.† SPANISH SYNTAX. Special studies in characteristic problems of Spanish syntax. (Not offered in 1921-22.) _____
- 115-116-117.† SPANISH LITERATURE: GOLDEN AGE. A study of the principal literary movements from 1550 to 1681 with particular emphasis on the age of Lope de Vega. Assigned texts, collateral readings, lectures in Spanish. (Not offered in 1921-22.) _____

† All quarters must be completed before credit will be given.

- 141-142-143.† SPANISH NOVEL. The development of Spanish fiction from the picaresque novel to that of the present day. Alternates with 159-160-161. (Not offered in 1921-22.) _____
- 150-151-152.† SPANISH DRAMATIC LITERATURE. A general survey of Spanish dramatic literature with especial attention to the Golden Age. Alternates with 156-157-158. (Not offered in 1921-22.) _____
- 156-157-158.† SPANISH LITERATURE: SIXTEENTH CENTURY. Alternates with 150-151-152. IV; TS. _____
- 159-160-161.† CERVANTES. A study of his life and works. Attention will be centered upon *Don Quixote* and the *Novelas Exemplares*. Alternates with 141-142-143. (Not offered in 1921-22.) _____
- 174-175-176.† LECTURES IN SPANISH. Subject to be announced. VIII; TTh; 202F. _____
- 177-178-179.† ADVANCED LECTURES IN SPANISH. _____
- 194-195-196.† INTRODUCTION TO OLD SPANISH READINGS AND HISTORICAL GRAMMAR. Teachers' course for seniors and graduates. _____

Italian

- 153-154-155.† ITALIAN LYRICS. A study of the development of lyric poetry in Italy. Reading of representative authors. (Not offered in 1921-22.) MISS PHELPS.
- 159-160-161.† DANTE, PETRARCH, BOCCACCIO. An introduction to their works. The three cantiche of the *Divina Commedia* are read, one each year in rotation, together with a number of the canzoni, and sonnets of Petrarch, and portions of the *Decameron*. IV; MW. MISS PHELPS.
- 162-163-164.† DANTE IN ENGLISH. Lectures: reading and discussion of the *New Life*, and two cantiche of the *Divine Comedy* not read in 159-160-161. Private reading of one other work. IV; F. MISS PHELPS.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. OLD FRENCH PHONOLOGY AND MORPHOLOGY. Lectures on the origin and development of the French language, with practical exercises and reports on assigned topics. Six credits. MR. Lecompte.
- 204f-205w-206s. READINGS IN OLD FRENCH LITERATURE. An introductory course in the reading of Old French. Different types of literature will be read and their origin and development discussed. A certain amount of collateral reading required. Three credits. MR. Lecompte.

† All quarters must be completed before credit will be given.

- 207f-208w-209s. OLD PROVENÇAL. Reading in early Provençal literature with special attention to the poetry of the troubadours. Six credits. MR. Lecompte.
- 222f-223w-224s. SEMINAR IN MODERN FRENCH LITERATURE. Six credits. VII-VIII; Th; 203F. MR. SEARLES.
- 241f-242w-243s. OLD SPANISH PHILOLOGY. Three credits. (Not offered in 1921-22.)
- 244f-245w-246s. OLD SPANISH LITERATURE. Every year a different genre is studied, such as the epic. Subject to be decided by agreement of students. Three credits. (Not offered in 1921-22.)
- 250f-251w-252s. SPANISH SEMINAR. Six credits. VII-VIII; F; 203F. MR. OLMSTED.

SCANDINAVIAN

Professors GISLE BOTHNE, ANDREW A. STOMBERG.

Prerequisites.—For major work, 18 credits; for minor work, 6 credits in the department. All required foreign language credits for the Master's degree in this department may be in either Norwegian, Swedish, or Danish.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w-103s. MODERN NORWEGIAN LITERATURE. Norwegian literature from 1814 to the present day. Prerequisites: Scandinavian 1-2 and 3-4. Nine credits. II; TThS. MR. BOTHNE.
- 104f-105w-106s. MODERN SCANDINAVIAN HISTORY. Religious, political, and economic changes in the North, military enterprises, growth of liberalism, material progress. Knowledge of Scandinavian not required. Nine credits. IV; MWF. MR. STOMBERG.
- 107f-108w-109s. MODERN SWEDISH LITERATURE. The Swedish novel. Study of a selected list of Swedish classics. Nine credits. V; MWF. MR. STOMBERG.
- 117w-118s. EARLIER NORWEGIAN LITERATURE. History of literature. Sagas, Norwegian and Danish folk-songs, Holberg, Oplysningstiden. Prerequisite: Scandinavian 102. Five credits. III; TS. MR. BOTHNE.
- 110w. IBSEN. Lectures, reading, and interpretation. Prerequisite: Scandinavian 101-102-103. Three credits. MR. BOTHNE.
- 114f. STRINDBERG. Lectures, reading, and interpretation. Prerequisite: Scandinavian 107f-108w-109s. Three credits. MR. STOMBERG.
- 131f-132w-133s. DANISH LITERATURE OF THE NINETEENTH CENTURY. From Oehlenschläger to the present time. Nine credits. (Not offered in 1921-22.) MR. BOTHNE.

- 111f-112w-113s. OLD NORSE (ICELANDIC). Grammar and reading. Gunnlaug's Saga Ormstungu. Six credits. V; TTh. MR. BOTHNE.
- 134f-135w. THE LANDSMAAL MOVEMENT AND LITERATURE. From Aasen to Garborg. (Not offered in 1921-22.) MR. BOTHNE.
- 136s. BJÖRNSSON. A study of his activity as a central figure in modern Norway. MR. BOTHNE.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202-203. SEMINAR IN HISTORY OF SCANDINAVIAN LANGUAGES. MR. BOTHNE.
- 204-205-206. SEMINAR IN OLD NORSE. The Elder Edda. (Not offered in 1921-22.) MR. BOTHNE.
- 209-210. SEMINAR IN MODERN SWEDISH LANGUAGE AND LITERATURE. The course is based upon Schuck and Warburg's *Illustrated Svensk Litteraturhistoria* and includes a study of special authors. Nine credits. MR. STOMBERG.
- 215-216-217. SEMINAR IN NORWEGIAN LITERATURE. The various phases of the cultural development of modern Norway are discussed. The complete works of Björnsson or Ibsen are especially studied. MR. BOTHNE.

SOCIOLOGY AND SOCIAL WORK

Professor LUTHER L. BERNARD; Associate Professor MANUEL C. ELMER; Assistant Professors ROSS L. FINNEY, GUSTAV A. LUNDQUIST; Special Lecturers FRANK J. BRUNO, OTTO W. DAVIS, WILLIAM W. HODSON.

Prerequisites.—For major work, 18 quarter credits, for minor work, 12 credits.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 100f. SOCIAL PSYCHOLOGY. Primarily for sociology students. The social attitudes; their development and modification under social pressures; the interactions of individuals and groups. MR. BERNARD.
- 101w. SOCIAL ORGANIZATION. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; purposive social organization. MR. BERNARD.
- 102s. SOCIAL CONTROL. Nature, purpose, and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of the social controls under the influence of modern science. MR. BERNARD.
103. SOCIOLOGY OF CONFLICT. (Not offered in 1921-22.)

- 1104. STATE CARE OF DEPENDENTS, DEFECTIVES, AND DELINQUENTS IN MINNESOTA.** Organization, machinery, and function of such institutions as the state hospitals, asylums, training schools, prison, schools for the feeble-minded, the blind, and the deaf. Lectures and readings. (Not offered in 1921-22.) Specialists from the Board of Control and institutions studied.
- 110W. METHODS OF COMMUNITY ORGANIZATION AND SOCIAL WORK IN SMALL TOWNS AND COUNTRY.** Concrete problems and methods are emphasized. MR. BERNARD.
- 114s. RURAL SOCIAL INSTITUTIONS.** A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. For advanced students. Lectures, discussion, reports. MR. LUNDQUIST.
- 119f. THE FAMILY.** The evolution of the family; its various forms and their relation to other social institutions; the service of the family in social evolution; contemporary problems of the family (standards of living, birth rate, feminism, etc.). MR. ELMER.
- 120f. SOCIAL PROGRESS.** A study of the basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. MR. BERNARD.
- 122w. METHODS OF SOCIAL INVESTIGATION.** Methods of gathering and presenting community facts; social statistics; social surveys. Lectures, problems, and field work. MR. ELMER.
- 123s. SOCIAL STATISTICS.** A study and analysis of social statistics and their bearing upon group life. Especially designed to give social workers and public health officials the training necessary to carry on their work successfully. MR. ELMER.
- 125-126-127. SETTLEMENT AND COMMUNITY CENTER WORK.** (Not offered in 1921-22.)
- 128s. CHARITABLE ADMINISTRATION, FINANCE, AND PUBLICITY.** 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. MR. DAVIS.
- 130s. TECHNIC OF FAMILY TREATMENT.** An intensive study of social case work as the basis of practical dealing with problems of dependency and defectiveness. Lectures and conferences. MR. BRUNO.
- 132s. JUVENILE COURTS AND PROBATION.** Primarily a course in probation practice work, but prefaced by lecture on the social and legal aspects of the juvenile court and probation. (Not offered in 1921-22.)

- 133f. MEDICAL SOCIAL SERVICE. A course open only to students who are properly grounded in case work and who wish to specialize in this field.
- 134s. 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. MR. HODSON.
- 135s. FIELD PRACTICE IN LEGAL PROTECTION OF THE CHILD. Designed to meet the individual needs of students taking 134.
- 138w-139s. MENTAL CASE WORK. A study of mental abnormality and its treatment through case work. Lectures and clinical instruction. MISS SEEBERG.
- 140w. 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. MR. BERNARD.
- 141s. CONTEMPORARY SOCIAL THEORY. An intensive study of developments in the social theory of the late nineteenth and the twentieth centuries. MR. BERNARD.
- 150f. SOCIAL MOVEMENTS. Subject for fall quarter: the literature of social protest. Open to qualified students in either English or Sociology. (Not offered in 1921-22.)
- 151w. LABOR PROBLEMS. Subject for winter quarter: social aspects of the labor problem. (Not offered in 1921-22.)
- 152s. INSTITUTIONAL ADMINISTRATION. Subject for spring quarter: problems of institutional administration and reconstruction. (Not offered in 1921-22.)
- 180f-181w-182s. SEMINAR IN EDUCATIONAL SOCIOLOGY. MR. FINNEY.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 204f-205w-206s. SEMINAR IN SOCIAL THEORY. MR. BERNARD.
- 221f-222w-223s. GRADUATE FIELD TRAINING. Twelve hours per week each semester.
253. CRIMINOLOGY. An intensive analysis of recent literature on the nature of the criminal, causes of crime, and methods of treatment and prevention. (Not offered in 1921-22.)

SOILS

Professor FREDERICK J. ALWAY; Assistant Professor CLAYTON O. ROST.

Prerequisites.—For major work, at least two years of work in chemistry, including both quantitative analysis and organic chemistry, and one year of work in general physics. Those students who have not had courses

in the elements of geology and mineralogy will be expected to take Geology 1 and 21 during their first year of graduate work. A reading knowledge of French or German is required for the Master's degree. In certain cases where some other modern foreign language would be more valuable in connection with the thesis it may be substituted.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101w. MINNESOTA SOILS. Detailed study of the soils of Minnesota. Origin, formation, and classification; physical and chemical characteristics; moisture relations; response to manures, fertilizers, and soil amendments; naturally unproductive types and their reclamation. Lectures and laboratory. Prerequisites: Soils 1 and 3. Three credits. III; TThS; 251Ch. MR. ALWAY.
- 102w. PEAT SOILS. Formation, chemical composition, physical properties, classification, and reclamation. Lectures, laboratory, and greenhouse work. Prerequisites: Soils 1 and 3. Two credits. III; WF; 251Ch. MR. ALWAY.
- 103w. FERTILIZERS AND MANURES. Sources, composition, and uses of the various fertilizers, manures, and soil amendments. Lectures and laboratory work. Prerequisites: Soils 1 and 3. Two credits. II; TTh; 251Ch. MR. ROST.
- 104f. CHEMICAL ANALYSIS OF SOILS. A laboratory course on the chemical examination of soils, including both fusion and extraction methods for mineral nutrients. Prerequisites: Soils 1 and 3 and quantitative analysis. Five credits. 1:30-5:20; MWF; 156Ch. MR. ROST.
- 105w. PHYSICAL PROPERTIES OF SOILS. A laboratory course on the determination of physical constants of soils, including mechanical composition, moisture equivalent, and hygroscopic coefficient. Prerequisites: Soils 1 and 3. Three credits. 1:30-5:20. TTh; 156Ch. MR. McMILLER.
- 106s. SOIL-SURVEYING. Field practice in surveying soils and the preparation of soil maps. Prerequisites: Soils 1, 3, and 105. Three credits. MR. McMILLER.
- 107w,s. SPECIAL PROBLEMS IN SOILS. Individual laboratory or field work upon some special soil problem in soil physics, soil chemistry, or soil management. Arrangements must be made in advance. Prerequisites: Soils 1, 3, 104, and 105. Three to 5 credits according to work. 156Ch. MR. ALWAY.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201w. CLASSIFICATION OF SOILS. Study of the various systems of classification which have been proposed. Individual work, with assigned readings and conferences. Open only to those graduates who have a

reading acquaintance with French and German. Prerequisites: Soils 1, 3, 104, and 105. Three credits. MR. ALWAY.

202f,w,s. RESEARCH IN SOILS. The investigation in the field, in the laboratory, or in both, of soil problems. The particular problem which a student may select will depend upon his previous training in agronomy, botany, chemistry, geology, and physics. Credit according to work. MR. ALWAY.

203w. SEMINAR IN SOILS. Review of current literature; presentation and discussion of papers on research; study of methods of investigation of soils. Once a week. Required of graduate students. No credit. VII; T; 251Ch. MR. ALWAY.

SURGERY

(Including Divisions of General Surgery, Experimental Surgery, Orthopedic Surgery, Urology, and Dental Surgery.)

Professors WILLIAM F. BRAASCH,* ARTHUR J. GILLETE, MELVIN S. HENDERSON,* E. STARR JUDD,* FRANK C. MANN,* CHARLES H. MAYO,* ARTHUR C. STRACHAUER; Associate Professors DONALD C. BALFOUR,* J. FRANK CORBETT, BOYD S. GARDNER, EMIL S. GEIST, CONRAD JACOBSON, ARTHUR A. LAW, ARTHUR T. MANN, HARRY P. RITCHIE, WALTER E. SISTRUNK,* FRANKLIN R. WRIGHT; Assistant Professors H. CAREY BUMPUS,* CARLE C. CHATTERTON, JOHN L. CRENSHAW,* VERNE C. HUNT,* JAMES C. MASSON,* HENRY W. MEYERDING,* JOHN DEJ. PEMBERTON,* GILBERT J. THOMAS.

Dr. William J. Mayo, being a regent of the University, is not a member of the instructional staff. His services in instruction and conference, however, are available.

For courses of study offered, see special bulletin of graduate work in medicine.

VETERINARY MEDICINE

Professors CLIFFORD P. FITCH, MYRON H. REYNOLDS.

Prerequisites.—For major work, 12 credits; for minor work, 6 credits in the department.

101w-102s. 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. MR. KERNKAMP.

103f-104w. ADVANCED COMPARATIVE PHYSIOLOGY. An advanced course in physiology of the domestic animals, including laboratory work with special emphasis on animal nutrition. MR. HEWITT.

* Appointed on the Mayo Foundation.

- 201f-202w-203s-204su. PROBLEMS IN ANIMAL SANITATION. Losses to animal husbandry from disease. Causes and prevention of such losses. Organization of sanitary control work. MR. REYNOLDS.
- 205f-206w-207s-208su. VETERINARY PATHOLOGY AND BACTERIOLOGY. Advanced problems. Specially adapted to meet the needs of graduate students. Offered as major or minor work. Credits to be arranged MR. FITCH.

The Bulletin of the University of Minnesota

*Northwest School and Experiment
Station*

Crookston, Minnesota

*Announcement for the Year
1921-1922*



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SCHOOL CALENDAR

1921—1922

1921

October	10	Monday	First term begins; organization of classes.
November	24	Thursday	Thanksgiving Day.
December	23	Friday	First term closes; Christmas recess begins.

1922

January	2	Monday	Registration of new students.
January	3	Tuesday	Second term begins; organization of classes.
February	6-10	Week	Northwest School farmers' week.
March	30	Thursday	Senior class day.
March	31	Friday	Fourteenth annual commencement; alumni reunion.
April	1	Saturday	Second term closes.
April	3-7	Week	Junior short course.

THE NORTHWEST SCHOOL AND STATION

FACULTY

LOTUS D. COFFMAN, Ph. D., President.
WILLIAM WATTS FOLWELL, LL. D., President Emeritus
CYRUS NORTHRUP, LL. D., President Emeritus.
WALTER C. COFFEY, M. S., Dean of the Department of Agriculture

AT CROOKSTON

CONRAD G. SELVIG, M. A., Superintendent
ARTHUR H. LARSON, B. S., Preceptor, Registrar, Academic Subjects
MILDRED SCHENCK, B. S., Preceptress, Domestic Science
ALICE E. GLISE, Matron Dining Hall
OLGA E. NETTUM, Secretary
CORA PAULSBERG, Accountant
JULIA AUNE, Piano
A. K. PIERCE, Business Training, Assistant Preceptor
ELMER R. CLARK, Agronomy and Home Projects.
HENRY P. CONSTANS, Physical Training, Debate, Asst. Preceptor
RICHARD R. COWAN, Farm Motors.
CLARA M. EVENSON, English
ARNOLD M. FOKER, Carpentry and Farm Engineering
OLGA HANSON, School Nurse, Home Nursing.
HARVEY HOBERG, Poultry
_____, Live Stock
ARTHUR J. KITTELSON, Extension in Boys' and Girls' Club Work
KATHERINE KNEESHAW, English
THOMAS M. McCALL, Horticulture
BERNICE I. NOLAN, Domestic Art
HERBERT S. HINRICH, Farm Motors
LOUISE PEDERSON, Music
_____, Farm Crops and Soils
_____, Band and Orchestra

GENERAL INFORMATION

LOCATION

The Northwest School of Agriculture is located at the Experiment Farm, one and one-half miles north of Crookston, Minnesota. There is a paved roadway between the school and the city, and regular auto bus service is maintained.

PURPOSE

It was organized in 1906. It offers a practical course of study designed to fit young men and young women for successful farm life, and aims to give its students the necessary preparation to useful citizenship.

The work of the school aims to interpret for the young men and the young women from the farms, the life with which they are familiar. It gives reasons for the various farm operations, and makes a scientific basis for the proper management of the farm and the home.

TIME OF OPENING

The fall term of the Northwest School of Agriculture will open for registration on October 10, 1921, and classes will begin at 8:00 o'clock on Tuesday, October 11, 1921. The fall term closes on December 23, 1921.

The winter term will open for registration on January 2, and classes will begin at 8:00 o'clock on January 3, 1922. The winter term closes on March 31, 1922.

COURSES OF STUDY

The course of study offered covers a wide range of subjects, and is largely technical in character. It is briefly outlined on pages 12 to 15. The regular course for both young men and women requires three winters of six months each for completion.

The methods of instruction tend to educate students toward the farm instead of away from it, to develop in them a love for farm life by showing them its possibilities. In this respect the school has been very successful, as nearly all of its graduates continue agricultural pursuits.

The Advanced Course aims to prepare graduates of the three-year course for college entrance.

HOW TO GET TO THE SCHOOL.

Check all baggage to Crookston and bring checks to the school. A charge of twenty-five cents is made by the school for transporting trunks at the opening of school. The same charge is made for the re-

turn of the baggage at the close of school, provided it is ready to go on the days assigned. A charge of fifty cents is made for transporting trunks at any other time.

ADMISSION

Applicants who have completed a common-school course will be admitted without examination and boys must have had six months' practical experience on a farm.

Applicants who have completed a common-school course will be school course should write to the Registrar for information.

Students more than twenty-one years of age who can not pursue the full course, either from lack of time or proper preparation, may make special arrangements for taking such projects as will be most helpful to them.

Parents are advised not to send pupils under sixteen years of age.

Students from city or grade schools will not be admitted before finishing eighth-grade work or until their former school records have been passed upon by the superintendent. These records must be presented at least three weeks prior to the opening of school.

State High School Board certificates are accepted for work in English, physiology, algebra, geometry, and civics, or credits of 75 per cent or more received on state teachers' examinations.

ROOMS IN DORMITORIES.

Old or new students planning to attend the School of Agriculture should write early to the registrar, asking him to reserve a room in one of the dormitories. Students should reserve rooms in advance. This may be done by paying a deposit fee of \$2 which will apply on the first month's room rent. If the student is unable to enter school, the deposit may be reclaimed before September 15, after which time it is forfeited. Each dormitory room is furnished with two single beds, a dresser, table and chair. The rooms are all lighted by electric light and heated by steam. Preferences as to room mates should be stated early and will be considered as far as possible.

WHAT TO BRING

Each student should come provided with sheets, blankets, quilts, one bedspread, one pillow, three pillow cases, towels, napkins, comb, brushes, one glass tumbler, and one teaspoon, and at least two night-gowns.

Each girl should bring with her, in addition to her ordinary supply of clothing, kimono and bedroom slippers, laundry bag, gymnasium suit, and gymnasium shoes. The kimono and bedroom slippers may be of any style and material; the laundry bag should be of washable material, large enough to hold the soiled clothes of one person, and made to hang on two closet hooks; the gymnasium suit should con-

sist of a pair of black sateen bloomers and a white middy blouse. Standard pattern No. 9225 is recommended for the bloomers. Three and one-half yards of material 36 inches wide are required for the average size. Black gymnasium or tennis shoes complete this costume. For those who are unable to make the bloomers at home, assistance will be furnished at the school.

EXPENSES.

Necessary expenses for the year do not exceed \$150. This amount does not include traveling and personal expenses.

Each student is required to pay for breakage of apparatus used in practical work, and for all damage done to school property.

Text books are furnished at a rental of \$2 per year to students who do not desire to purchase. A gymnasium fee of 25 cents per term is charged all students.

Music fees for private lessons are \$7 for each term. Piano rental is \$2.50 per term.

It should be remembered that expenses for fees are for the entire term, and after the first month the only expenses are for board and room.

The cost to the student for board is the actual cost of maintaining the table (including management). Board is payable the first of each month in advance. A sur-charge of ten per cent is added to all bills delinquent more than ten days. No deduction is made for board for any absence of less than five days. No room refunds will be made for any period of less than one month. If students are compelled to be absent for that length of time, they are allowed half rates, provided they make arrangements with the accountant before leaving.

On entering the school, each student should bring sufficient money to pay for one month's board and room, and to pay for his books and fees. This will amount to from \$30 to \$35.

The following expenses are charged to all students. Fees are payable at the time of registration, and board and room at the first of each month.

TABLE OF CHARGES.

Registration fee for any part of school year	\$ 5.00
Non-residents of Minnesota	10.00
Deposits as guarantee of proper treatment of school property.....	5.00
Health fee per term, required for all students except those living at home	2.00
Board per week (price subject to change)	4.00
Room per week, including flat laundry (price subject to change)	1.50
Book rent, per term	1.00

HEALTH SERVICE.

The health fee collected from all students is used to maintain the Students' Health Service. A fully equipped hospital is maintained and a full-time nurse is engaged during the school year. The health fee provides for physical examinations for all students and care by the nurse in case of sickness. It does not provide for extra nurses in case of serious sickness, where such are necessary.

REQUIREMENTS FOR GRADUATION.

1. **Boys' and Girls' Regular Courses.** The completion of the prescribed course of study, including all of the required work and enough elective work to make a total of 150 credit hours for the boys and 144 for the girls.

2. Honorable standing in department.

3. An essay of not less than one thousand words upon a topic connected with agriculture or home economics, typewritten on paper of approved size for binding and filing in the library.

4. For young men, practical experience in farm work during each of the two summers that come between the freshman and senior years. Students will register for the study of some definite farm problem to be studied each summer and report at stated intervals during the summer the progress made. A satisfactory standing in this summer work, or its equivalent in practical work done at the school, is required for graduation. Six of the 150 credits are earned by home projects.

HOME LIFE ON THE CAMPUS.

The life of the student while attending the school is subject to supervision. Students residing in the school dormitories are not allowed to leave the campus without permission of the preceptor or preceptress. The home life of each student is carefully guarded and everything done to promote a healthful and moral atmosphere. The use of tobacco and spirituous liquors of all kinds is strictly forbidden. No person will be admitted as a student who is known to have the cigarette habit.

The preceptor of the School of Agriculture has charge of the boys in their dormitory and social life, and the preceptress has charge of the girls in their dormitory and social life, under such regulations as may be approved by the superintendent. Students are required to be correct in their habits, and to observe pleasantly all directions for their government.

From 8:15 a. m. to 4:30 p. m., students not at recitation or chapel are expected to be in their rooms or in the library, studying or reading; also after 7:30 in the evening. The rooms shall at all times be quiet, especially in the evening, so that no student may be disturbed.

Any one not in accord with these restrictions and not willing to lend a hand toward a strong moral growth, should not come to the School of Agriculture.

ASSEMBLY

On each school day at 11:40 a. m., the students assemble in the auditorium, a commodious room seating five hundred people. After the opening exercises, brief talks are given by the superintendent, members of the Faculty, or invited guests.

During the year the list of speakers includes prominent men, state and national officials, business men, particularly those connected with the agricultural industries, professional men, prominent clergymen of all denominations, educators from other institutions, and successful farmers. The addresses are of great interest and value to the students.

LECTURE COURSE.

During the school year a lecture and entertainment course, consisting of lectures and musical programs, will be given at a low cost. It is hoped to provide high-grade lectures and programs which will furnish a pleasant relaxation from school work and be instructive as well.

STUDENTS' LITERARY SOCIETIES

Societies for the purpose of improvement in elocution and debate, and for obtaining instruction in the form of lectures give excellent opportunities for entertainment and culture. Practice in parliamentary procedure is given which will greatly benefit the students. Each student is expected to associate himself with one of these societies as early in his course as possible.

MUSICAL ORGANIZATIONS

A school band is maintained each year. A competent leader has charge of this work. A school orchestra, glee clubs, and quartets contribute greatly toward creating an interest in music.

For those who are interested, credit courses in piano instruction are offered. Ten half-hour and ten group lessons per term are given, with special time for practice. Fees of \$7 per term for the lessons and \$2.50 per term for piano rental are charged. Special rooms are set aside for practice, making it possible to do good, thorough work. A class in musical theory meets once a week, and instruction is also given in the history of music, ear training, and the rudiments of harmony.

STUDENTS' CHRISTIAN ASSOCIATIONS

Young Men's and Young Women's Christian Associations have been formed, having for their objects social fellowship and moral and spiritual development. Bible classes will be held Sunday morning at

8:30. The associations are non-sectarian. Religious exercises are held at the school each Sunday evening at 7 o'clock. Various pastors and business men address the students at these meetings. The Christian Associations conduct the exercises and secure the speakers.

RED RIVER AGGIE.

The Red River Aggie is an annual published by the senior class of the school. The book gives an outline of all school and class activities; is fully illustrated, and contains, in addition to brief articles of student interest, a complete record of the development and growth of the institution.

THE NORTHWEST MONTHLY

The Northwest Monthly is a monthly published by the faculty of the school. It serves as a community publication, and is a medium by which former students and alumni are kept in touch with one another and with the school. It is also published to disseminate useful information and results of station work among its readers.

SCHOLARSHIP AND LOAN FUNDS.

The Northwest School of Agriculture considers itself very fortunate in being able to present the following scholarships and loan fund provisions. The donors have specified the purposes for which each may be used. The general purpose, however, is to enable the school to reach a larger number, to provide the means of encouraging many to acquire the training which the school offers, and to stimulate greater effort in school work.

AWARDS OF SCHOLARSHIPS.

The Crookston Milling Company, of Crookston, Scholarship

Awarded for greatest diligence and progress in school work during the year 1920-21, to

1. Iver Johnson, freshman class, Crookston, \$75.
2. Clayton Stageberg, freshman class, Floodwood, \$50.
3. Lloyd Ness, junior class, Ada, honorable mention.
4. William Johnson, junior class, Duluth, honorable mention.

The Crookston State Bank Scholarship

Awarded to the freshman students for general diligence and greatest progress in school work during 1919-1920.

1. Rosalind Friday, freshman class, Hawley, \$75.
2. Lloyd Ness, freshman class, Ada, \$50.
3. Johanna Nabben, freshman class, Thief River Falls, honorable mention.
4. Ava Gerstner, freshman class, Fertile, honorable mention.

SCHOLARSHIPS FOR 1921-22.**The Scandia-American Bank of Crookston Scholarship.**

The Scandia-American Bank of Crookston offers a scholarship of \$125 during 1921-22 to be awarded the student who is most diligent in his efforts to accomplish his work, and who shows the greatest progress during the year.

CLASS OF 1917 PRIZE

The class of 1917 has provided \$140, the interest of which shall be awarded annually to the student who makes the greatest progress in debating.

STUDENT LOAN FUNDS**The Gilfillan Trust Fund**

This fund may be used by students of the Northwest School of Agriculture in accordance with the action of the Board of Regents taken September 26, 1916. The regulations governing the administration of the income from the fund may be learned by addressing the superintendent of the Northwest School of Agriculture, Crookston, Minnesota.

Northwest School Loan Fund

Through the effort of a committee of Crookston citizens, a students' loan fund has been provided for the use of students at the Northwest School of Agriculture to supplement the above-mentioned fund. This committee will provide money for loans as needed. This money will be loaned to students at 6 per cent interest as a temporary loan. For information regarding this loan fund, address the Northwest School of Agriculture, Crookston, Minnesota.

Fairfax-Andover Social Club Loan Fund

The Fairfax-Andover Social Club (a farm club near Crookston) provided \$150 to be used as a students' loan fund. This money will be loaned to students at 6 per cent interest as a temporary loan.

SPECIAL COURSES

A few students are unable to enter in the fall or unable to attend school for the three years. In order to provide for such students, the course of study for the first year has been so arranged that new students may take the regular work and complete a course of study, beginning January 3, 1922.

Dressmakers

Two three months' courses, beginning in October, 1921, and January, 1922, are offered. Each student drafts, cuts, fits, and finishes dresses and garments of various kinds. Beginning students are taught to make their own garments and those who have had some experience, to become dressmakers.

Junior Short Course.

The tenth annual junior short course, from April 3 to April 7, 1922, is open to boys and girls from 12 to 18 years of age. With the exception of \$3.00 for board, there is no expense connected with the course. The course aims to deepen the interest of boys and girls in life on the farm. Special emphasis is placed on boys' and girls' club work. Instruction is given for the planning and carrying out of work in such projects and contests as gardening, corn and potato growing, pig, calf and chicken raising, cooking, sewing, and canning. Illustrated lectures, moving pictures of educational value, games, singing, and excursions add interest and pleasure to the course.

Northwest School Farmers' and Women's Week

A short course for farmers was organized at this school in 1911 to meet the needs of men and women who wish to study the problems of the farm and the home. The exhibit of farm crops in connection with the course was the origin of the annual farm crops show held at Crookston during the second week in February. A five days' meeting at this time with strong programs for both men and women, serves the purpose of the original short course.

EXPERIMENT STATION

The Northwest School and Station is now conducting extensive experiments in agronomy, soils, horticulture, animal husbandry, and agricultural engineering. Beginning with 1910, a special report has been issued each year describing the progress of the work.

SCHOOL FARM

The farm comprises approximately 600 acres, and furnishes an extensive laboratory for the work of the school. Information concerning the methods employed on the farm is always available to the students. The classroom work is supplemented with actual practice either in the field or with crops grown upon the farm.

STATION FLOCKS AND HERDS.

The school now maintains an abundance of livestock, all of which is used for student work in the Animal Husbandry Department. Pure-bred Holstein, Guernsey, Shorthorn, and Hereford cattle; grade and pure-bred Percheron horses, Shropshire sheep, Duroc Jersey hogs, White Leghorn and Barred Plymouth Rock chickens are maintained for station and school purposes. These furnish excellent opportunities for students to study intelligently the various courses in animal husbandry.

COURSES OF STUDY

BOYS' THREE-YEAR COURSE

FIRST YEAR

Required of All

Fall Term	Spring Term
Credit	Credit
Hours	Hours
5 English A	5 English A
5 Livestock*	5 Livestock*
Poultry G	Study Breeds A
Farm Dairying B	5 Farm Crops*
5 Farm Crops*	Cereal Crops A
Plant Life A	5 Arithmetic A*
5 Arithmetic A*	Personal Hygiene A
Personal Hygiene A	Gymnasium
Gymnasium	5 Elective from the following:
5 Elective from the following:	5 Elective from the following:
—	—
25	25
5 Blacksmithing D*	5 Carpentry C*
5 Farm Motors B*	5 Industrial History B
5 Industrial Geography A	1-3 Summer Practicums
5 Music	1 Music

Students having a mark of pass plus on State Board certificates in arithmetic will be given five hours' credit in arithmetic.

*Will be offered both terms.

SECOND YEAR

Required of All

Fall Term	Spring Term
Credit	Credit
Hours	Hours
5 English B	5 English B
5 Livestock	5 Livestock
Stock Feeding C	Stock Feeding C
Stock Judging D	Stock Judging D
5 Farm Crops	5 Farm Crops
Fruit and Vegetable Crops C	Elements of Soils C
5 Forage Crops B	5 Farm Accounts E
Gymnasium	Gymnasium
5 Elective from the following:	5 Elective from the following:
—	—
25	25
5 Advanced Motors	5 Mechanical Drawing E*
5 Advanced Carpentry	5 Modern History C
5 Business Forms	1 Parliamentary Law
5 Ancient History C	1-3 Summer Practicums
1 Music	1 Music

*Will be offered both terms.

THIRD YEAR

Required of All

Fall Term	Spring Term
Credit	Credit
Hours	Hours
5 English C	5 English C
5 Livestock	5 Livestock
Herd Management E	Livestock Business Management F
5 Farm Crops	5 Farm Crops
Forestry D	Plant Breeding E
Soil Management D	Farm Management F
5 Physics A	5 Civics and Farm Law
Gymnasium	Gymnasium
5 Elective from the following:	5 Elective from the following:
25	25
5 Elements of Business	5 Elements of Business
Typewriting	Typewriting
Stenography	Stenography
Letter Writing	
5 Rural Economics A	5 Rural Sociology B
1 Music	1 Music

CREDIT REGULATIONS REGARDING BOYS' THREE-YEAR COURSE

In addition to the required work of the term, students must elect enough work to make a total of not less than 23 or more than 26 credit hours. Exceptions may be allowed by the Committee on Students' Work.

Credit toward graduation will be allowed for work in debate, literary societies, school athletic teams, and other student activities on a basis to be determined by the Students' Work Committee.

One to four credits per term may be earned by approved work in instrumental or vocal music. A special fee will be charged for such courses. The same credit may be earned without the fee by membership in the orchestra by those who are competent for the work.

A class will not be maintained for less than six students.

CREDIT FOR HIGH SCHOOL WORK

A graduate of an approved high school course shall be allowed a total of 48 credits toward graduation.

A graduate of an approved high school course who presents four units of work in agriculture shall be allowed 96 credits toward graduation.

For each four units of credit of approved high school work presented on entrance, 12 credit hours shall be granted in the School of Agriculture, and 12 additional credit hours for each unit of agriculture offered.

Capital letters following the names of courses refer to descriptions given on pages 16 to 22.

HOME MAKERS' COURSE

Capital letters following the names of courses refer to descriptions given on pages 16 to 22.

FIRST YEAR

Required of All

Fall Term	Winter Term
Credit Hours	Credit Hours
5 English A	5 English A
3 Physiology and Public Health C	3 Arithmetic A*
3 Foods and Cookery A	2 Public Health C
4 Garment Making J	3 Foods and Cookery A
1 Drawing and Design N	4 Garment Making J
1 Music B	1 Music B
1 Social Training G	Physical Training
Physical Training	9 Elective from the following:
6 Elective from the following:	
—	—
24	24

General and Agricultural Electives

2 Poultry C	5 Plant Life A**
5 Industrial Geography A	3 Farm Dairying B**
4 Special Music	5 Industrial History B
	Summer Practicum
	4 Special Music

Office Training Electives

1 Spelling E	1 Spelling E
1 Penmanship E	1 Penmanship E
3 Business Forms	3 Typewriting

*Required for students who do not have a pass plus in arithmetic on State Board certificates.

**Offered both terms.

SECOND YEAR

Required of All

Fall Term	Winter Term
Credit Hours	Credit Hours
5 English B	5 English
3 Foods and Cookery B	3 House Planning and Furnishing I
4 Textiles and Elementary Dressmaking K	2 Home Nursing H
2 Home Nursing H	3 Dressmaking K
1 Music B	1 Drawing and Design O
Physical Training	1 Music B
9 Electives	Physical Training
—	9 Electives
24	24

General and Agricultural Electives

5 Fruit and Vegetable Crops C	5 Mechanical Drawing G
2 Laundering F	1 Parliamentary Law E
5 Ancient History C	5 Modern History C
4 Special Music	4 Special Music

Office Training Electives

3 Stenography	3 Stenography
3 Typewriting	3 Typewriting
2 Letter Writing	2 Dictation

THIRD YEAR

Fall Term		Winter Term	
Credit		Credit	
Hours		Hours	
5 English C		5 English C	
5 Physics A		4 Civics D	
3 Home Management D		3 Home Management D	
1 Millinery L		2 Dressmaking M	
1 Music B		1 Music B	
Physical Training		Physical Training	
9 Electives		9 Electives	
—		—	
24		24	

General and Agricultural Electives

3 Farm Forestry D	2 Plant Breeding E
2 Floriculture B	3 Farm Management F
5 Rural Economics A	5 Rural Sociology B
2 Household Accounts E	4 Special Music
4 Special Music	

Office Training Electives

3 Duplication and Mimeographing	3 Filing and Indexing
2 Dictation	3 Commercial Law
2 Comptometer Practice	1 Business Ethics

ADVANCED COURSE FOR GRADUATES OF THE SCHOOL OF AGRICULTURE

The work offered in this course is arranged to fit young men and women to enter the College of Agriculture, Forestry, and Home Economics. It will cover a period of six months, beginning and closing at the same time as the regular school classes. Students capable of carrying satisfactorily all the subjects required will be granted a certificate.

Upon the completion of two summers of supervised work in addition to this course, graduates will be admitted to the College of Agriculture, Forestry and Home Economics.

OUTLINE OF COURSE

First Term		Second Term	
Credit		Credit	
Hours		Hours	
6 Elementary Algebra B		6 Elementary Algebra B	
6 Plane Geometry C		6 Plane Geometry C	
6 English D		6 English D	
2 Farm Marketing C		2 Farm Marketing C	
6 English History F		6 Advanced United States History G	

DESCRIPTION OF COURSES

AGRICULTURE

- A. **Cereal Crops.** A study of the classes of field crops with special study of the most important cereals, as to history, habits, varieties, planting, harvesting, storing, uses and values, pests, including insects, diseases, and weeds.
- B. **Forage Crops.** This course is devoted especially to the kinds, methods of storing, description and identification, methods of handling, uses, value, and adaptability of grasses and forage crops. All field crops studied from actual specimens in laboratory.
- C. **Elements of Soils.** The principles of elementary chemistry and their applications most important to plant life. The chemical and physical properties of compounds common in water, air, soils, fertilizers, and foods.
- D. **Soils Management.** Consists of study of geology as related to soil formation; classification of soils; soil moisture and soil tillage; relation of these crops to each other in systematic rotation and in their relation to soil fertility.
- E. **Farm Accounts.** Bookkeeping, for the farmer rather than for the merchant. Principle of debits and credits is same. Course aims to help farmer in keeping records that he may know where his profits and losses come from.
- F. **Farm Management.** Systems of farming; selection of farms; the planning of rotations suitable to the students' home farms and to farms operated under different systems. Cost of producing crops; marketing products; business methods applied to the farm.

AGRICULTURAL ENGINEERING

- A. **Agricultural Physics.** Nature of matter and force in application to draft, levers, and pulleys in farm and household machinery, lightning protection, supports in house and bridge building, principles of heating and ventilation; soil formation, heat, and moisture.
- B. **Farm Motors.** Handling, construction and repair of stationary and traction gasoline engines. Practical work in repairing and running gasoline engines. Babbitting boxes and soldering taught to enable student to repair worn bearings, leaky gasoline tanks and pipes.
- C. **Carpentry.** Care and use of tools taught by means of practical farm problems; methods of sharpening tools; practical application of steel square; farm building construction, including foundation, framing, rafter cutting, estimating and selecting material. Foker.

- D. **Blacksmithing.** Instruction is given in the management of the forge, in bending, shaping, and welding iron and steel, and tempering steel tools, thus familiarizing the student with operations necessary for blacksmith repair work on the farm. Foker.
- E. **Drawing.** Use of tools and value of drawings in designing buildings and machinery. Drawings of carpentry exercises and work from drawings in shop afford direct application. Students design dwellings, etc., estimating quantity of material, cost, etc. Foker.

DAIRY AND ANIMAL HUSBANDRY

- A. **Study of Breeds.** Cattle, horses, sheep and swine are studied as to origin, quality, breed characteristics, and general adaptation. The work is made practical by scoring and judging stock kept at Experiment Station and near-by farms.
- B. **Farm Dairying.** A study of the principles and practices of producing dairy products, including a discussion on dairy barns, silos, herd management, milk production and testing, including record keeping.
- C. **Stock Feeding.** The principles of feeding as applied to the production of horses, beef cattle, hogs and sheep, are taught. Instruction is given in compounding rations for the different classes of stock.
- D. **Stock Judging.** Instruction is given in types and breeds of livestock, and attention is called to desirable and undesirable qualities in each. Practice is given in judging animals.
- E. **Herd Management.** Principles governing breeding and building up herds, with special reference to the value of pure-bred sires. Problems of sanitation and disease. Dressing and curing meats. Animals fitted and trimmed and cared for in competitive contests.
- F. **Livestock Business Management.** This course comprises a study of breed associations, registration, pedigrees, advertising, sales and markets.
- G. **Farm Poultry.** The study of breeds; planning and arrangement of poultry houses; feeds and feedings; killing and dressing fowls.

ENGLISH

- A. **Freshman English.** Oral and written compositions, with particular attention to sentence structure. Punctuation and spelling. Letter writing. Drills for the purpose of eliminating errors. The reading of simple classics to illustrate fable, allegory, parable, myth, and ballad. Kneeshaw.

DESCRIPTION OF COURSES

19

- Public Speaking.** One hour a week. Reading aloud, drilling upon articulation and enunciation, short talks on familiar subjects. Public programs to enable the students to learn to speak clearly and easily before an audience. Kneeshaw.
- Debating.** One hour a week. Principles of argumentation, briefs, debating in class, in public programs, and in debating societies.
- B. Junior English.** Practical business English. Magore's text. Paragraph and methods of paragraph development. Narration, description, and exposition in oral and written composition. Study of good literature as basis for composition work, and means of increasing student's vocabulary. Evenson.
- Public Speaking.** Extemporaneous talks, longer discussions, and a little dramatic work. Evenson.
- Debating.** A development and a continuation of the first year.
- C. Senior English.** Study of whole composition with reference to principles of unity, coherence, and emphasis. Exposition studied in oral and written composition work. Reading of best English writers with view of increasing students' appreciation of good literature. Evenson.
- Public Speaking.** The dramatization of scenes from literature studied, after-dinner speeches, and talks. Evenson.
- D. Advanced English.** Oral and written composition illustrative of forms of discourse and principles of composition previously learned. Study of the novel and the short story; the drama; the essay and the oration; narrative and lyrical poetry. Evenson.
- E. Spelling and Penmanship.** Practical drills closely related to work in other subjects aiming to give proficiency in every-day requirements.

INDUSTRIAL HISTORY AND CIVICS.

- A. Industrial Geography.** Study of climate, rainfall, location, and other geographical conditions affecting the primary industries. Larson.
- B. Industrial History.** A study of the growth of industry, commerce, labor, population, and agriculture in the United States. Larson.
- C. Ancient and Modern History.** A study of the world's history with particular emphasis placed on the development of institutions, states, industries, and organizations that have influenced the progress of civilization. Larson.

- D. **Civics and Farm Law.** Legislative, judicial, and executive departments and their functions. School district, township, county, and state government. National government is also considered. One hour per week is devoted to essentials of law relating to the farm. Clark.
- E. **Parliamentary Law.** The essentials of parliamentary practice as necessary in conducting public meetings effectively. Larson.
- F. **English History.** A study of the political and social development of England. A study of history of English literature is included.
- G. **Advanced United States History.** The political and industrial development of this nation. Special emphasis will be placed on territorial expansion, immigration, political parties, and conditions in industry.

RURAL ECONOMICS AND SOCIOLOGY

- A. **Rural Economics.** Attention is given to the consideration of factors affecting agricultural production and farm products. Selvig.
- B. **Rural Sociology.** The problems of rural communities, of rural health and sanitation, and of rural social institutions will receive attention. Selvig.
- C. **Farm Marketing.** Fundamentals in connection with the problems confronting the farmer to-day in disposing of his products. Selvig.

HOME ECONOMICS

Foods and Home Management.

- A. **Foods and Cookery.** Elementary cooking. Classification of foods and a study of the scientific principles underlying the cooking of the carbohydrate, fat, and protein foods; doughs and batters; beverages, desserts, and salads. Schenck.
- B. **Foods and Cookery.** Advanced cooking. Canning and preserving; planning and serving of meals.
- C. **Physiology and Public Health.** Review of structure of human body; digestion, absorption, and metabolism of foods; fundamental principles of human nutrition. The general principles of public hygiene and sanitation are included. Nolan.
- D. **Home Management.** Distribution of family income; household accounts; purchasing supplies; planning and serving meals, relation of cost to income; sanitation and application in care of house; labor-saving devices. Students take full charge of a house for six weeks. Schenck.

- E. **Nutrition.** Simple problems of nutrition; food for adult man and woman; children of different ages; planning of family dietary; cost of dietaries; food for the sick and convalescent. Schenck.
- F. **Laundering.** Care of laundry room and utensils, study of water, soap, starch, removal of stains, washing of woolen garments, ironing; also the principles of dry cleaning. Nolan.
- G. **Social Training.** A series of lectures on proper speech, table etiquette; care of children; first aid in emergencies. Practical work is given in assisting the regular school nurse.
- I. **House Planning and Furnishing.** Location, construction, and planning of farm houses; heating, lighting, ventilation, and equipping house; artistic and economical furnishing with work on cost and schemes of furnishing, floor and wall coverings, curtains and pictures for each room.

Clothing

- J. **Elementary Garment Making.** Hand stitches as applied to simple under garments and household articles; middy blouse and wash dress are additional problems of this course. Care of sewing machines. Use of commercial patterns. Nolan.
- K. **Textiles and Elementary Dressmaking.** Making of wool dress; infant's layette; afternoon or informal party dresses. Study of silk and woolen fabrics and fibres, and tests for adulteration and substitution. Nolan.
- L. **Millinery and Art Needlework.** Study of design and color harmony in hats; alteration of frames; making and trimming of simple hats; simple decorative stitches. Nolan.
- M. **Dressmaking.** This course includes the more advanced problems as modeling on the dress form. Underwear and dress for graduation are made in this course.
- N. **Drawing and Design.** This course treats of the fundamental principles in design and color harmony, with special emphasis upon design as expressed in clothing, house furnishing, and articles in common use. Nolan.
- O. **Institutional Management.** Study of planning, purchasing, care and preparation of food in quantity; organization and administration.

MATHEMATICS

- A. **Arithmetic.** Drill for speed and accuracy; application of principles to every-day farm problems, as measurements of material, extension, capacity; marketing of grain, stock, and products; purchase of machinery and supplies; cash accounts, business forms, and interest.

- B. **Algebra.** This work covers First Course in Algebra, by Hawkes-Lubby-Touton, or equivalent text, omitting ratio and proportion, graphical representation, and imaginaries.
- C. **Geometry.** The course in Geometry covers Wentworth and Smith's Geometry, from Book I to Book VIII, or equivalent text, except the work in symmetry, maxima and minima. Larson.

MUSIC

- A. **Piano and Vocal.** Piano.—Instruction adapted to needs of each student. Technical exercises for development and control of the fingers, hands, and arms. Studies and compositions by best composers. A special fee is charged for this work. Pederson.
- Voice.** Exercise in breathing and tone placing, for relaxing the throat, for formation of vowels and consonants, and for sight reading. Songs by American and foreign composers are studied. This work also requires a special fee. Pederson.
- Chorus Work.** A glee club, chorus, and quartets are organized during the year. Students with the best voices are admitted to these. No special fee is charged. Pederson.
- B. **Music.** In the regular course of study, there is offered one hour a week in music each year, consisting of work in ear training, vocal development; sight reading and chorus; and appreciation of music. Pederson.

PHYSICAL TRAINING

The aim of this department is to maintain the health of the students, to give outdoor exercise and deep breathing, to stimulate functional activity, to give coordination and control, and to form right habits of living.

Men

- A. **Personal Hygiene.** Importance of proper care of human body. Special attention is given to foods, water, air, narcotics, cleanliness, clothing, exercise, first aid to injured, care of sick, and care of special organs of the body.
- B. **Gymnasium.** Required of all men not excused because of physical disability. Aims to inspire pupils with desire to reach and maintain physical efficiency. Calisthenics with dumb-bells, Indian clubs, etc. Games or running follow light apparatus work.

Women

- C. **Physical Training.** The following lectures on hygiene will be given by head of Home Economics Department. All young women are required to attend. General view on health problems; diet; dress; first aid; care of sick; special lectures.
- Free-hand gymnastics, aiming to produce correct posture and to correct faults of posture; athletic movements aiming at grace; folk games.

PLANT LIFE AND HORTICULTURE

- A. Plant Life.** Taught with special reference to plants of interest to the Northern Minnesota farmer. Seeds and plants of the common weeds are studied, classified, and identified. Special emphasis is placed upon various methods of weed eradication. McCall.
- B. Floriculture.** Study of flowers, with special reference to planting, growing, and propagation. Considerable time spent on grouping and planting of ornamental flowers and shrubs, and making landscape planting plans. Station greenhouses supply material for laboratory work. McCall.
- C. Fruit and Vegetable Crops:**
- (1) **Fruit Growing.** Importance of farm orchard and small-fruit garden is emphasized. Field work consists of a study of orchard soils, planting and cultural methods, propagation, pruning, spraying, harvesting, marketing, selection of varieties of native and hardy fruits. McCall.
 - (2) **Vegetable Gardening.** The value of the home vegetable garden, preparation of the ground, and selection of plants and seeds are given attention. Includes tillage, rotation, transplanting, preparation and care of hotbeds, and insects dangerous to the garden. McCall.
 - (3) **Potato Culture.** The importance of the potato as a crop for Minnesota is recognized in this laboratory course. Includes the study of potato soils; seed selection, growing the crop, harvesting, storing, marketing, diseases and their control. McCall.
- D. Farm Forestry.** Why, how, when, and where to plant windbreaks and wood lots is taught; also characteristics and adaptability of the more common trees; methods of propagation, and the conservation of planted and natural forests. McCall.
- E. Plant Breeding.** The factors which cause plants to vary are studied, together with the fundamental principles underlying the breeding and development of plants. Practice work in crossing plants is given in the experiment station greenhouse. McCall.

NORTHWEST SCHOOL AND STATION

SUMMARY OF ATTENDANCE

1920-1921

Regular School Course	Men	Women	Total
Seniors	39	16	55
Juniors	36	14	50
Freshmen	92	28	120
	<hr/>	<hr/>	<hr/>
	166	59	225
Junior Short Course, 1921	42	35	77
	<hr/>	<hr/>	<hr/>
Total	208	94	302

STUDENTS

1920-1921

SENIORS—55

AnCerson, Martin C., St. Vincent	Lee, Gilmar, Hendrum
Austin, Marie A., Malung	Lincoln, Leland, Stephen
Bursheim, Maurice C., Winger	Lindahl, Eldred, Hallock
Bredlie, Elmer, Eldred	Lindgren, Alma, Clearbrook
Erickson, Gladys O., Twin Valley	Logan, Rufus, Ada
Erickson, Myrtle R., Goodridge	Marmorine, Milton, Clearbrook
Ferguson, Henry C., Clearwater	Melick, Harry, Strathcona
Flikke, Bena, Shelly	Melick, Roy, Strathcona
Forder, John R., Gatzke	Monson, Kennetl., Orleans
Gibbon, Veral, Crookston	Moses, Jay L., Pelican Rapids
Gilbertson, Clara M., Hendrum	Negaard, Ole, Gonvick
Green, Clyde, Plummer	Nelson, Egon, Hallock
Gullingsrud, Carl, Kratka	Norquist, George, Gonvick
Hallstrom, Harold L., Wylie	Norquist, Victor, Gonvick
Hansen, Luella B., Shelly	Nowak, Joseph, Zipple
Hanson, Percy, Newfolden	Olson, Nobel, Middle River
Jensen, Earl, Clearbrook	Perry, Hazel, Crookston
Johnson, Joseph, Kratka	Remick, Herbert, Mentor
Johnston, Wilbur, Angus	Reske, Laudy, Oslo
Jorgenson, George, Twin Valley	Sather, Edwin, Halstad
Kappes, John J., Badger	Shosten, Edith, Erie
Kasberg, Amos M., Eldred	Skime, Elmer, Gonvick
Kjallberg, Laura, Wannaska	Stennes, Charlotte, HenCrum
Knudson, Ray, Gully	Swedin, Martin, Grygla
Krbecek, Sophie H., Erie	Torgerson, Agnes, Stephen
LanCby, Esther, Swift	Vesledahl, Mable, Erskine
Landby, John, Swift	Wheeler, Loring, Crookston
Larson, Marie, Argyle	

JUNIORS—50

Aakre, Richard B., Goodridge	Jensen, Eddie, Drayton, N. Dak.
Anderson, Arthur, Jelle	Jensen, Osmund, Rhoda
Anderson, Walter, Gonvick	Johnson, Anton, Crookston
Bjorkman, Marie, Roseau	Johnson, Otto, Beltrami
Bolstad, Lloyd M., Floodwood	Johnson, William E., Duluth
Brenberg, Lars A., Drayton, N. Dak.	Lee, Clifford, Hendrum
Briden, Roger, Crookston	Marmorine, Myrtle L., Clearbrook
Briden, Una, Crookston	Martinson, Hannah, Kennedy
Clementson, Oscar, Erskine	Nabben, Johanna A., Thief River Falls
Emerson, Louis, Minneapolis	Nakken, John S., Rosewood
Erickson, Harold J., Duluth	Nansen, Naime, Erskine
Folvick, Inga O., Oslo	Nelson, Alma I., Winger
Friday, Norman A., Hawley	Ness, Lloyd, Aca
Friday, RosalinC K., Hawley	Nornes, Halvor, Winger
Gibbons, Neva L., Crookston	Olson, George E., Middle River
Gordon, Raymond G., Rhoda	Peterson, Jennie, Stephen
Gronner, John A., Underwood	Peterson, LaVerne, Brooks
Hegstad, Norval J., Haug	Peterson, Oscar A., Clearbrook

Rohrer, Erwin, Crookston
 Rud, Elof, Radium
 Sandem, Esther, Beltrami
 Severson, Laurine, Malung
 Slyter, Ila May, Red Lake Falls
 Smith, Charles A., Minneapolis
 Solberg, Edward, Fertile

Stephens, Gerald, St. Hilaire
 Tammy, Gust A., Iron
 Tarvas, Ole E., Iron
 Torpet, Minnie, Fertile
 Walter, Lawrence C., Beltrami
 Welte, Walter, Bagley
 Wold, Milo, Beltrami

FRESHMEN—120

Aasgaard, Clarence, Twin Valley
 Amundson, Oscar, Newfolden
 Anderson, R. Earl, Crookston
 Anderson, Jesse, Erie
 Anderson, Johannes, Cottonwood
 Anderson, Julia A., Mentor
 Anderson, Selmer, Erie
 Bakken, Helmer, Erskine
 Bjergo, Adolph, Fergus Falls
 Blazek, Mary, Haug
 Braaten, Conrad, Ross
 Braaten, Nels, Ross
 Braun, Marie, Gary
 Brenberg, Esther E., Drayton, N. Dak.
 Borgan, Bennet, Badger
 Burk, Walter, Brooks
 Carlson, Esther R., Beltrami
 Christophenson, Gladys S., Oklee
 Christianson, Lloyd, Fertile
 Christianson, William, Erskine
 Courtney, Harry, Bagley
 Dahl, Harvey, Golden Valley
 Dobbdal, Iva C., Guthrie
 Dougherty, Florence, Fertile
 Drotts, David, Viking
 Dunn, Mildred, Northcote
 Dunn, Roy, Northcote
 Engelbrakson, Alma, Drayton, N. Dak.
 Engelstad, Clarence, Fertile
 Erlanson, Esther, Fertile
 Eskildsen, Martin, Karlstad
 Espeland, Gustive, Westby, Montana
 Evans, Erwine M., Ulen
 Fjeld, Henry, Erie
 Forslund, Alice, Warren
 Fraser, Ronald A., Grand Rapids
 Friday, Clarissa, Hawley
 Gandrud, Ebenhard S., Detroit
 Groves, Frank F., Bemidji
 Grundysen, Benjamin, Fisher
 Hagen, Agnes J., Erskine
 Hagen, Eivin, Underwood
 Hagen, Gea A., Erskine
 Halvorson, Julian, Fergus Falls
 Hansen, Erwin, Shelly
 Hanson, Mina, Newfolden
 Harstad, Eva, Fertile

Haugen, Sam, Kratka
 Hauglid, Herman A., Noble
 Hedin, Oscar, Twin Valley
 Hemness, Melvin, Rollag
 Hemstock, Edwin B., Crookston
 Homme, James, Highlanding
 Hoper, William H., Stephen
 Hutchinson, William, Floodwood
 Ingvalson, Arthur, Beltrami
 Jennings, Harry D., Warren
 Jensen, Christian, Stephen
 Jensen, Nanford C., Badger
 Jensen, Peter, Stephen
 Jensen, Richard, Badger
 Johnson, Arthur, Rhoda
 Johnson, Iver, Crookston
 Jore, Tilda L., McIntosh
 Kilen, Lena O., Kratka
 Knutson, Ingvald, Kratka
 Kopecky, Alberg, Angus
 Larmoe, Stanley, Middle River
 Larson, Carl, Crookston
 Lee, Mary J., Fosston
 Lincoln, Eula, Stephen
 Lokstad, Clara M., Newfolden
 Lorbiecki, Lawrence, Greenbush
 Lorentson, G. L., Fosston
 Loyland, Olaf, Thief River Falls
 Lundin, Joseph, Bagley
 Lundin, Otto H., Stephen
 Lutnes, Olaf, Erskine
 McCradie, Arnott, Hendrum
 McCrum, Donald H., Thief River Falls
 Magnell, Beatrice, Rhoda
 Magnell, Clarence, Rhoda
 Mansfield, John E., Roosevelt
 Marshall, Clifford, Crookston
 Marshall, Harold, Crookston
 Martinson, Elizabeth A., Kennecey
 Meldahl, Edgar R., Badger
 Meyer, Clarence W., Red Lake Falls
 Mikkelson, John, Lake Park
 Morberg, Edwin, Alvarado
 Narum, Joseph E., Twin Valley
 Nelson, Emil, Clearbrook
 Nelson, Robert F., Warren
 Nelson, Russell, Crookston

STUDENTS

27

Nysveen, Henry J., Gonvick
Nysveen, Olaf, Gonvick
Olson, Mancur, Buxton, N. D.
Oswald, Grace, Fertile
Patenaude, Harvey L., Crookston
Pearson, John, Crookston
Ramberg, Einar, Mentor
Raymond, Adele M., Red Lake Falls
Rohrer, Ruth, Crookston
Rud, Arthur, Viking
Senske, Arthur, Fisher
Short, Frank, Angus
Sjoquist, Elmer, Strandquist
Sorenson, Leonard, Clearbrook
Stageberg, Clayton, Floodwood
Svendson, Morris, Nielsville
Swenson, Eva, Gary
Synnes, Arthur L., Clearbrook
Tanjén, Henry J., Fosston
Torgerson, Hilda, Strandquist
Thompson, David, Orleans
Thorpe, Clarence, Twin Valley
Tollefson, Theander, Bagley
Wardeberg, Elmer M., McIntosh
Warnes, Daniel, Karlstad
Westlin, Melvin, Newfolden

Bulletin of The University of Minnesota

GENERAL EXTENSION DIVISION

THE ARLINGTON SCHOOL SURVEY

COVERING A STUDY OF THE SCHOOLS
OF ARLINGTON AND OF DISTRICTS 14, 16,
AND 30 OF SIBLEY COUNTY, MINNESOTA



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THE ARLINGTON SCHOOL SURVEY

A REPORT OF A STUDY OF THE SCHOOL SYSTEMS OF
ARLINGTON AND THREE ADJACENT
RURAL DISTRICTS OF
SIBLEY COUNTY
MINNESOTA

By

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PREFACE

During the year 1920-21 the course in *School Surveys* in the College of Education at the University of Minnesota was divided into two parts. Part I consisted of a critical study of typical school survey reports with special emphasis upon the principles and methods essential in carrying out such investigations. Part II consisted of actual experience in making a survey.

For Part II of this work arrangements were made with the Board of Education at Arlington, and, by consent, with the Boards of Education in three of the adjacent rural districts, to undertake a complete survey of the schools of those districts. After formal agreement as to the character and scope of the survey, and the publication of the report the investigation was begun in February, 1921.

The plans for the survey were worked out in class, and carried out much as would be done by any survey staff, tho with some emphasis upon the idea that each student should participate to some extent in all parts of the work. After the study had been made, the task of compiling the data was divided up and parts were assigned to each member of the group. Numerous conferences were held for comparing findings, and finally each member wrote a full detailed report on those parts for which he was responsible. These detailed reports contain the original tabulations of facts and are written in a more technical style. Finally, when all these reports were assembled, they formed the basis upon which this report has been written. Whatever statements are made in this report, therefore, are made on the strength of carefully assembled and analyzed facts. One copy of these original detailed reports was presented to the Board of Education at Arlington and a second copy placed on file at the College of Education, of the University of Minnesota, where it may be consulted by properly interested persons.

The writer wishes to take this opportunity to thank the Boards of Education at Arlington and in the rural districts for the earnest consideration they have given to this survey, and, also, Superintendent S. C. Bolstad, not only for arranging with the several boards of education for the survey, but for his most helpful coöperation in carrying out the study. Special thanks, also, are due Director R. R. Price, of

the General Extension Division of the University, through whose department this report is being published. Further, it is a pleasure to speak in praise of the way in which the class in "School Surveys" used this valuable laboratory experience to the distinct benefit of a neighboring school system.

J. B. SEARS,
College of Education,
University of Minnesota

August, 1921

CONTENTS

PART I

ARLINGTON'S EDUCATIONAL PROBLEM DEFINED

	Pages
Sec. 1. What this report proposes to do.....	11
2. How can one determine the kind of education a community needs?..	12
3. What are the general characteristics of this community?.....	12
4. What are the educational needs of this community?.....	13
5. Is this community able to meet these needs?.....	14

PART II

PRESENT EFFICIENCY OF THE SCHOOLS

Sec. 1. The present plan of education.....	16
2. Are the studies offered in these schools what they should be?.....	17
3. Is the right amount of time spent on each of the studies taught?.....	19
4. Are the children attending school as they should?.....	21
5. Are the children advancing as rapidly as they should?.....	23
6. Are the children taught by good teachers?.....	26
7. Do the children have a fit place in which to attend school?.....	29
8. How can one measure the results of teaching?.....	35
9. How well do the children of these schools read?.....	37
10. How well do the children of these schools write?.....	39
11. Do the children spell as well as they should?.....	41
12. Are the children up to standard in arithmetic?.....	42
13. What do the children know about the history of their country?.....	13
14. Is Arlington financing its schools as it should?.....	14
15. Summary and conclusions about the efficiency of these schools.....	50

PART III

A PROPOSED PLAN OF REORGANIZATION

Sec. 1. A larger plan of organization is the greatest need.....	52
2. Is such a plan of reorganization feasible?.....	54
3. What would be needed to carry out such a plan?.....	55
4. What will be the cost of such reorganization?.....	56

LIST OF TABLES

	Pages
I. Showing the average number of minutes per week devoted to each of the elementary school studies in 32 consolidated schools of Minnesota and in Arlington.....	20
II. Showing the ratings assigned to buildings by use of the score card for rural schools	30
III. Ratings of teaching equipment by the Holton-Strickland Scale.....	35
IV. Distribution of school expenditures in Arlington, 1915-1920.....	46
V. Showing per cent of total school income which was derived from the State for all schools of the State and for Arlington.....	48

LIST OF FIGURES

Fig. 1. Showing the percentage of pupils who are retarded at age and accelerated in Arlington, the rural schools, and the United States	24
2. Showing the per cent of efficiency of each of the buildings in Arlington and the rural schools as measured by the Holton-Strickland Scale	31
3. Showing the achievement in reading of the Arlington and rural school children as compared with the standard for the country at large	38
4. Showing what the Arlington children know about American history as compared with the average child in each grade in the United States in general.....	45
5. Map of Arlington, Minnesota, and vicinity.....	54

INTRO D U C T I O N

The study of education has now ceased to be the mere examination of educational philosophy. In numerous ways students have attempted to apply the scientific methods of observation, experimentation, and coöperative treatment to the concrete problems of teaching and school administration. In the latter field it has become necessary for effective teaching, to go beyond the limits of the college classroom and secure first-hand data upon the processes of education as these occur in practical endeavors. This report is therefore not merely the presentation of valuable data upon the school problems of a local community in the Northwest; it is also the exemplification of the modern method of teaching school administration. The extension of this method is to be commended to all concerned with the problems of training teachers and administrators.

The report is to be commended for another feature—namely, it is presented in a form which can be read, not merely by the professional student of the subject, but by the average man who pays taxes to support the public schools. Too often survey reports have been written for college professors and scientific students of education. It is not less important to present scientifically collected material in an interesting and readable manner for the average school patron because to him in the final analysis must public-school organization be justified. It is a pleasure, therefore, to have this report printed by the General Extension Division of the University and to commend it to all citizens of the State interested in what the public schools are doing and should do for the education of the children of the State.

M. E. HAGGERTY,
Dean of the College of Education,
University of Minnesota

THE ARLINGTON SCHOOL SURVEY

PART I

ARLINGTON'S EDUCATIONAL PROBLEM

I. WHAT THIS REPORT PROPOSES TO DO

In this report it is our purpose to present in brief, readable form the results of a thoro and extensive survey of the schools of Arlington and rural districts numbers 14, 16, and 30, of Sibley County, Minnesota.¹ As explained above, detailed reports of all of the important findings in this survey have been presented to the Board of Education for their study. This report contains all the essential findings of those detailed reports, but is much abbreviated, contains few statistics, and is addressed particularly to the parents of the children in whose interest the study has been made.

This report is in three parts. Part I explains what kind of schools these communities ought to have; Part II shows what kind of schools they now have; Part III explains what needs to be done in order that the children of these communities may have at least as good an opportunity for education as is common to the children of the average American community.

It would be unfair to the people of Arlington to assume that they would be satisfied with anything less than average schools, and there is evidence that leads us to believe that the people are willing to support even better than average schools. In writing this report, therefore, we have assumed that the plain truth about their schools is what the parents want, and this we shall try to present in the following pages.

There are many points at which the schools of this community are as poor as the schools provided for the colored children of the poorest southern states, and some points at which they are up to the average, and what follows should not only convince every parent of the truth of this statement, but it should make him or her a staunch supporter of the constructive program of education presented in Part III of this report, and create an urgent demand that that program be entered upon without delay.

¹If District 15 and one or two other districts had been included in this survey the picture presented in this report would have been little different except in extent.

2. HOW CAN ONE DETERMINE THE KIND OF EDUCATION A COMMUNITY NEEDS?

We judge a man to be intelligent to-day accordingly as he shows intelligence in the way in which he lives and works. In the same way we judge a school system to be good when it offers effective training to these ends. It is the business of the schools to provide training that will add to the knowledge the children have already gotten from their homes and by their work and play. And each community should provide, as far as it is able, for just as much of this training as the children can take.

What the schools teach, then, and how extensively they teach it, must be decided in the light of the people themselves: their occupations, their racial and social traditions, their wealth, and their aspirations. The newsboy in a great city gets a vast amount of experience with people and business, but very little with the great world of nature. He knows all about money, but nothing about how to produce the food that he buys with his money. With the rural child the case is almost exactly the opposite of this. So it is that each community must have a school that is adapted to its own needs.

3. WHAT ARE THE GENERAL CHARACTERISTICS OF THE ARLINGTON COMMUNITY?

Arlington is a town of about 840 inhabitants, located in Sibley County, about 55 miles southwest of Minneapolis on the Minneapolis and St. Louis railroad, just outside of the lake region. The land here is level and rich, and mixed farming is well developed. The town of Arlington is a fairly thrifty rural town whose growth is dependent mainly upon the development of farming and stock-raising.

In 1890 the population of Arlington was 417, in 1900 it was 712, in 1910 it was 733, and in 1920 it was 776. This means a gain of approximately 60 per cent between 1890 and 1900, of 3 per cent between 1900 and 1910, and 6 per cent between 1910 and 1920. This is a slow growth to be sure, but the fact that the rate of growth has doubled during the past two decades, while some towns are losing in population, indicates that this section of the country is enjoying a normal, healthy growth.

The people of this region are quite largely of German birth or of German descent, and, judged by the appearance of the homes and by

the dress and manners of the school children, they are representative of the better classes that America has received from northern Europe. In large numbers of homes German is spoken almost exclusively, so that when the children start to school they are for a time handicapped somewhat for want of a knowledge of the English language.

As already suggested, the basic industry of the Arlington community is agriculture. A few people in Arlington are of course engaged in banking and merchandising but the income that supports these activities is produced on the farm.

4. WHAT ARE THE EDUCATIONAL NEEDS OF THIS COMMUNITY?

What is needed in the way of education, then, is very obvious. The parents from Europe, who have chosen to make America their home, want their children to know how to read, write, and speak the language of this country. They want them to understand the laws of the country, and to know its traditions, in order that they may become actual participants in directing American life. Then also, they want their children to help in the development of their own community.

To do all this the schools must offer the best possible training to these ends. It is not bookkeepers, clerks, and stenographers, for third-rate positions in Minneapolis, but farmers and home keepers, for first-rate positions in this community, that must be turned out by the schools.

The usual basic curriculum in the elementary schools is necessary, but with large emphasis on reading, writing, spelling, and composition in the early years, and with a similar emphasis upon civics, history, nature study, domestic science, agriculture, and manual training in the later years. In the high school, history, literature, agriculture, and domestic science ought to hold a prominent place.

In all this work attention should be given to the health and growth of the children, and every opportunity should be utilized to give them an understanding of American customs and manners. These are things which are not only appreciated by the parents but they are indispensable to the children as they grow to manhood and womanhood.

To accomplish these ends the most modern conveniences should be provided, and only the very best teachers employed. Emphasis should be placed upon getting teachers who are of American stock, and who understand American life, but who, at the same time, under-

stand and appreciate the problem which the child, and also the parent from a foreign country, has to meet here, and who are capable of understanding the schools of this community, since they are to train children for life in this community and not in some far away city to which, at most, only a few will go.

5. IS THIS COMMUNITY ABLE TO MEET THESE NEEDS?

If the above general educational aims and ideals are realized it appears that we are asking for fully as good or even better schools for this community than is common throughout the country. It is only after considering both what the children really need on the one hand, and what the people of this community are able to support, on the other, that we have outlined the needs as we have above. The community is actually able to pay for better than average schools, and we will now show why this is true.

It is reasonably fair to suppose that Arlington can afford as good schools as any similarly situated town of its size in the state provided it is equal to others in wealth. To find out just how Arlington stands a careful comparative study was made of 25 towns in central and southern Minnesota, with which the Minnesota State Department of Education considers Arlington fully comparable in respect to educational needs.² Of these 25 cities 13 are a little larger and 11 a little smaller than Arlington. In school enrolment, however, 17 are larger and only 7 smaller. That means that Arlington has relatively fewer children to educate than the other cities, and this means, of course, that it costs less per capita to have good schools in Arlington than it does in these other towns.³

Altho Arlington has a lighter educational load to carry than most of these 25 towns, yet, in wealth, or ability to carry a load, Arlington is fully up to average for the group. In assessed wealth last year Arlington was above average, being only ninth from the highest. In 1910 statistics show that only ten of these towns possessed more wealth per capita than Arlington, and in 1920 there were 20 of these 25 towns that possessed less wealth per each school child than Arlington.

There is reason to suppose that what is true of Arlington is equally true of the districts around Arlington, tho it was not possible to examine all the facts for these outside districts.

² See footnote 12, p. 47, for a list of these towns.

³ This is true in even greater degree than these figures indicate because of the wide use of parochial schools in this town.

If Arlington is relatively wealthier than other towns of the same class, and at the same time has fewer children to educate, then, from the standpoint of sacrificing something for the children, Arlington is not up to standard unless the town is actually spending more per child for schools than is spent by other towns of this class.

In the second part of this report it will be shown that Arlington is not doing her full duty in this respect.

To these facts, which show that Arlington is above average in capacity to support schools, we must note the fact that the rate of growth in population in Arlington, while small, is on the increase, and shows that its position is not at all likely to become less favorable, but that it is almost certain to improve.

Having in mind, now, that we are dealing with a rather well-to-do community, located in a well-developed agricultural region; that the population is to a large extent foreign born or of foreign descent, and that for that reason has certain educational needs that are more marked than would be true in a community where all are native Americans where the mother tongue is English, etc.; that by tradition the people of this community are thrifty and ambitious for the education of their children; that because of the occupations and character of the people special need exists for superior training in English, in history and civics, in agriculture, and home economics; and that the wealth of the community, as judged by the wealth of other similar communities in the State, is above average and, so, ample for the support of a school system that is better than the average school system in such communities; let us turn now to a consideration of what the present schools are like.

PART II

PRESENT EFFICIENCY OF THE SCHOOLS

I. THE PRESENT PLAN OF EDUCATION

The town of Arlington has 152 children in the elementary school and 50 children in the high school. These groups are housed separately in two buildings occupying, together, a city block. The rural schools offer instruction in the eight grades only, and the children of each of the three districts surveyed are housed in a single one-room building.

A child is expected to enter these schools at the age of six years and to complete the elementary grades in eight years. In Arlington a pupil completing the eight grades at the age of fourteen years may then enter upon a four-year high-school course. A child from any of the rural districts can only get a high-school education by going away from his home district. Arlington may, therefore, be looked upon, in a sense, as the high-school center for both the town and the rural districts adjoining.

Each of the rural schools is managed by a board of three trustees, who employ a teacher and look after the general interests of the school. In Arlington a board of six trustees employs a superintendent, with whose assistance they employ a staff of teachers. In the rural schools there is practically no supervision at all that really affects instruction, supervision of any sort being limited to one or two visits from the county superintendent of schools. In Arlington the superintendent devotes some time to actual helpful supervision of instruction.

The cost of high-school education for the children of Arlington is borne partly by the State and partly by a tax on Arlington property. If a child from one of these rural districts goes to Arlington for his high-school education the State pays Arlington \$3 a month, or \$27 a year (next year the State will pay about \$63) for training the child. The actual cost of training the child is not \$27 but from \$80 to \$90. The difference between what the State pays and what the schooling actually costs, is being paid by the people of the Arlington district. This is clearly an injustice to Arlington, which will be partly but not fully remedied next year by a recent legislative enactment. That the people of the rural districts ought to bear their part of the cost of

high-school education is clear enough, tho, as the schools are now organized, it is not possible for them to do so. This situation could be remedied by the plan of reorganization outlined in Part III of this report.

2. ARE THE STUDIES OFFERED IN THESE SCHOOLS

WHAT THEY SHOULD BE?

In Part I of this report it was shown why Arlington and the rural districts near by ought to have the very best possible provision for superior work in reading, writing, language, spelling, civics, history, agriculture, and home economics.

In the Arlington schools reading, writing, language, and grammar are taught in all eight grades. Spelling is taught in all grades but the first; history and civics are taught in the last four grades; and domestic science and manual training are taught in the last two grades. The rural schools offer no domestic science or manual training and neither Arlington nor the rural schools offer agriculture.

Failure to offer these studies which are to be so fundamental in the lives of the children a few years hence, is a serious criticism of the work in these schools. The work in geography, nature study, physiology, and hygiene seems to be fairly adequate, but it does not fill the need just mentioned.

The rural schools offer some work in music, and Arlington's work in music and art is as extensive as one would expect, yet, in the writer's judgment Arlington would do better to put in a strong course in agriculture, even if less emphasis had to be placed on music and art.

Comparison of Arlington's curriculum with those of 32 other school systems in Minnesota which are comparable to that of Arlington, shows that Arlington falls below the majority of these other schools in the following respects: more than half of the 32 systems begin the studies of history and civics in grade IV. Arlington does not begin until grade V; the same is true of geography; and in these 32 schools many offer two or three years of nature study while Arlington offers but one year. Strange as it may seem, less than one fourth of these 32 schools offer work in agriculture. This is evidence of a form of backwardness in Minnesota's small rural and town schools that Arlington should help to eliminate.

To the writer the children of the Arlington schools appeared below average in physical robustness, and large numbers of children stated

that they frequently suffered from headache. Systematic physical training, as it is offered in a number of the school systems above referred to, could be offered at Arlington with little, if any, added expense, and, if properly carried on would do much to improve the posture, walk, physical appearance, and health of the children.

As has been pointed out above, the only opportunity to attend high school for any of the children of these four districts is the Arlington high school, where four years of training may be had in the following branches:

- English—4 years
- Latin—2 years
- Mathematics—2 years (on alternate years $2\frac{1}{2}$)
- Zoology—1 year
- General Science—1 year
- Chemistry—1 year
- Physics—1 year
- History (anc. and mod.)—2 years
- Industrial History— $\frac{1}{2}$ year
- Physiology— $\frac{1}{2}$ year
- Sociology—1 year
- Home Economics— $2\frac{1}{2}$ years
- American History and Civics—1 year
- Singing—4 years

Here again we see no work in agriculture, tho the offering in science work otherwise is adequate in amount.

The training for girls looking toward home-making is good, and the work is being carried on under satisfactory conditions, but the boys have absolutely nothing corresponding to this that will help them to become efficient farmers. In fact, one looks in vain for any work looking toward any occupation or life career for boys. This is certainly not as it should be. When one reads the next section of this report he can but wonder why this high school teaches Latin and ancient history but no manual work and no agriculture.

Physical training ought also to receive more attention. Children at this age are growing rapidly and are developing habits of posture and attitudes towards matters of health and public sanitation that will remain with them through life. The opportunity for some systematic training in these matters ought not to be missed.

Summed up briefly, the schools are all offering plenty of training in the old, and, to a greater extent than many will admit, useless studies, and far too little in the studies that will do the things for these boys and girls that really ought to be done. A modern curriculum would cost these schools little if anything more and would give back to the people a far better return on their school taxes than they are now getting.

There is one other matter that must not be overlooked. The schools of Arlington ought to have a mimeographed, if not a printed, outline of the course of study to be followed. Such an outline would be of inestimable help to new teachers, and, indeed, to all teachers. It would tend to coördinate the work more thoroly and it would tend to establish real standards such as our survey clearly shows do not exist. Such an outline, based at the outset, upon the State course of study, could be worked out by the superintendent and his staff of teachers, and would furnish the very finest possible opportunity for the superintendent to exercise a useful supervisory influence over the entire work of the schools. Under the present system the rural schools can never take advantage of this sort of help. At best the one-room rural school must remain rather formal and traditional. By the plan of reorganization proposed in Part III of this report, however, these rural schools could participate in all the improvements here suggested.

3. IS THE RIGHT AMOUNT OF TIME SPENT ON EACH OF THE STUDIES TAUGHT?

It is not only important to know whether or not the schools are teaching the studies they should teach, but also, whether they are giving a reasonable amount of time to each study.

It is not possible here to examine in detail the time allotment in the rural schools. Roughly speaking, they all tend to put too much time on arithmetic, spelling, and grammar, and too little on geography, civics, history, nature study, physiology, and hygiene. The following study is concerned with time allotment in the Arlington schools only.

During the past year Miss Myrtle Welton, a student in the College of Education of the University of Minnesota, made a study of time allotment in 32 of Minnesota's Class A consolidated schools. Through the kindness of Miss Welton we have obtained a table showing the average amount of time devoted to each of the school subjects in each of

the grades for these 32 schools. This is a desirable set of figures with which to compare Arlington's time distribution. In Table I we show this comparison. The average allotment for the 32 schools is shown in one column, and the figures for Arlington in the adjacent column.

The table is to be read as follows: reading is taught on the average 441 minutes a week in grade I of the consolidated schools, and 450 minutes a week in Arlington. Writing is taught 83 minutes a week on the average in grade I of the consolidated schools and 75 minutes a week in Arlington.

TABLE I

SHOWING THE AVERAGE NUMBER OF MINUTES PER WEEK DEVOTED TO EACH OF THE ELEMENTARY SCHOOL STUDIES IN 32 CONSOLIDATED SCHOOLS IN MINNESOTA AND IN ARLINGTON

Subject	GRADE															
	I		II		III		IV		V		VI		VII		VIII	
	Av. 32 cities	Arlington	Av. 32 cities	Arlington	Av. 32 cities	Arlington	Av. 32 cities	Arlington	Av. 32 cities	Arlington	Av. 32 cities	Arlington	Av. 32 cities	Arlington	Av. 32 cities	Arlington
Reading ...	441	450	452	425	291	525	289	350	270	400	275	225	193	150	297	200
Writing ...	83	75	75	150	68	150	78	125	86	125	95	90	65	100	64	60
Arithmetic	139	50	166	150	219	150	215	200	246	200	240	225	246	160	240	250
Spelling ...	98	...	109	190	133	100	130	125	134	125	131	100	102	150	138	175
Language and Grammar	96	150	83	100	171	200	182	175	199	175	202	100	230	200	244	315
History and Civics	...	...	...	...	75	...	124	...	158	60	186	225	214	150	243	195
Geography	...	...	50	...	144	...	179	175	215	150	212	200	232	250	200	...
Physics and Hygiene	38	...	39	75	60	75	80	175	84	90	90	60	86	60	87	...
Nature Study	47	50	27	...	55	...	47	...	56	...	31	...	46	...	85	...
Music	81	25	77	125	63	125	67	60	62	60	52	60	60	60	55	60
Art	81	100	55	100	67	100	52	40	55	40	51	60	54	60	83	...
Home Econ.	...	...	...	...	...	...	...	...	77	...	87	...	163	150	163	80
Man. Tr.	...	...	...	...	...	...	...	...	77	...	77	...	135	150	136	80
Physical Education	72	50	52	...	57	...	46	...	47	...	49	...	47	...	42	...
Agriculture	...	...	...	...	...	...	...	...	...	...	...	...	128	...	118	...
Algebra	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gen. Sci.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

A careful study of this table shows that Arlington spends rather too much time on reading in grade III, and too little time in the upper three grades. It shows that writing receives much more attention in grades II, III, IV, and V, in Arlington than in these other schools.

In arithmetic Arlington has a very reasonable time allotment, tho it is lower as to some few points than is true of the other schools. The allotment for spelling is somewhat lower than the average for the other schools, but, according to the best standards, is still too high. In language and grammar there is no way of telling how much emphasis is placed on technical grammar and how much on language and literature. In Arlington the emphasis should by all means be placed upon the latter. Arlington's allotment for these two subjects differs somewhat from the group of schools, but perhaps the emphasis is not very far wrong for Arlington, except in grade VI. Most of Arlington's work in history and civics is confined to the last three years, and even there the amount of time used on these subjects is too low, considering Arlington's special needs for these subjects, as set forth above. By this comparison geography is obviously neglected in Arlington, as are physiology and hygiene, nature study, home economics, and manual training.

In the 32 school systems an average of one sixth of all school time was devoted to reading. Arlington devotes one fifth of the total time to this subject. The 32 schools on the average, gave one seventh of the total time to arithmetic, while Arlington gave but one tenth of the total time to this subject. The 32 schools averaged one fourteenth and Arlington one fifteenth of the total time to spelling. The 32 schools averaged one twenty-first and Arlington one fifteenth of the total time to writing. In other courses Arlington varied only slightly from the average of these 32 schools.

From this it is seen that not only is Arlington's curriculum short of what it should be but also that in the amount of time devoted to them many subjects receive a wrong emphasis.

4. ARE THE CHILDREN ATTENDING SCHOOL AS THEY SHOULD?

In order to find out whether all of the children of these districts are getting all the education they can get in their home schools we collected certain information about every child between the ages of 6 and 21 years who is not in the public schools. We obtained the name, the age, the sex, the age at which he or she left school, the grade each was in in school when he or she left school, where each is now, what he or she is doing, and the nationality of the parents. This information was collected for Arlington and for Districts 16 and 30.

In District 16 there are now 32 children attending the public school, and 18 others within the legal age limits who are not in the local public school, but 7 of whom are in parochial schools, and 3 in public schools elsewhere. This leaves 8 who are not in school at all. When these children left school 3 were 14 years old, and 4 were 16 years old. The age of the other one is not known. Two of the 14-year-olds were in grade III and the others in grade VI when they left school. Three of the 16-year-olds were in grade VI and the other in grade VII when they left school. All 7 of these are boys, and they are at home on the farm.

In District 30 there are 26 children now attending the public school and two others in parochial schools, while 17 others have left school entirely, and, with one or two exceptions, are at home on the farm. When these children left school 1 of them was 12 years old, 6 of them were 15 years old, 8 were 16 years old, and 2 were 17 years old. Two of them left school when they were in grade II, 4 left from grade IV, 1 left at grade V, 2 at grade VI, 7 at grade VII, and 1 was in grade VIII. Nine of the group were boys and 8 were girls.

In Arlington there were 216 children in the public schools, some of whom are rural and not town children, and 13 others are in parochial schools. There are 26 children in town who are of school age but are not in school. Of these 26 children, 4 are at work on the farm, 9 are laborers, 8 are clerks or stenographers, 2 are housekeepers, 1 is a barber, and 2 are doing nothing in particular. When these 26 children quit school 2 were 12 years old, 2 were 13 years old, 8 were 14 years old, 7 were 15 years old, 3 were 16 years old, 3 were 17 years old, and 1 was 18 years old. When they left, however, 1 was in grade III, 1 in grade IV, 1 in grade V, 3 in grade VI, 6 in grade VII, 11 in grade VIII, 1 in grade IX, and 2 in grade X.

These figures tell us some very impressive facts about 50 boys and girls in this community. They are entering upon their life's work with an average of less than seventh-grade education, and 21 of them had less than a sixth-grade education. It may be that that is enough to do the drudgery of the farm on, but it is not enough to make successful farmers in this age when so much technical knowledge is needed, and it is far from enough to make men and women into good citizens.

The fact that these children were on an average nearly 15 years old when they left school shows that they had made poor progress in

school,¹ and very likely many left, not only because they were needed to work at home, but partly because school was uninteresting and meant nothing but drudgery to them. It may be true that a very few of this group were incapable of profiting by a high-school education, but, since only 3 of the group had been in high school we can not know for sure. Certainly the opportunity ought to be open to every American child whether it is taken advantage of or not.

Perhaps it is not possible completely to stop this drift away from the schools, but, in the judgment of the writer, a large part of the drift could be stopped if the schools were made as good as the community is able to make them. Ways and means for bringing about the necessary improvements will be set forth in Part III of this report.

5. ARE THE CHILDREN ADVANCING AS RAPIDLY AS THEY SHOULD?

A study was made of the ages of the pupils in each grade in order to find out if they were of the right age for their grades. If a pupil is of the same age as most other pupils are for that grade throughout the country, he is of the right age for his grade, or, "at age"; if he is younger, he is accelerated, and if he is older he is retarded.

The findings of the study of retardation and acceleration in Arlington and the three rural schools are shown in Figure 1 below, together with the extent of retardation and acceleration throughout the United States. The black portion shows the percentage of pupils who are retarded, the light portion the percentage of pupils who are at age, and the hatched portion shows the percentage who are accelerated.

It will be seen that 74.8 per cent of the pupils in the Arlington elementary school and high school taken together are of the right age for their grade, 8.7 per cent are accelerated and 16.6 per cent are retarded. It was also found that in no grade are there pupils who are more than two years retarded. Compared with the per cent of retardation commonly found in schools throughout the United States, (see bar at the bottom of the figure) the per cent found in Arlington is low.² On

¹ Poor progress in school in Arlington is unquestionably accounted for in large amount by the fact that a large percentage of the children are taken out of the public school at about the age of twelve years in order that they may devote from one to two years to religious training in the parochial school. It is no exaggeration to say that the schools are substantially demoralized by this practice. The responsibility lies not with the school board but upon the churches of the town. The religious leaders of Minnesota towns should think twice before assuming such responsibility.

² Bonner. Statistics of City School Systems, 1917-18. Department of the Interior, Bureau of Education. *Bulletin* No. 24, p. 35.

the surface, this would appear to be a very favorable condition for the Arlington schools. However, the intelligence and achievement tests given to the pupils in Arlington seem to show something entirely different. In these tests the pupils almost invariably fell below the scores commonly made by pupils throughout the country. Since, therefore, we find that most of the children in Arlington are of the right age for their grades, but below the standards of intelligence and achievement of pupils elsewhere, it is quite evident that they have been promoted from grade to grade without having actually done the standard amount of work.

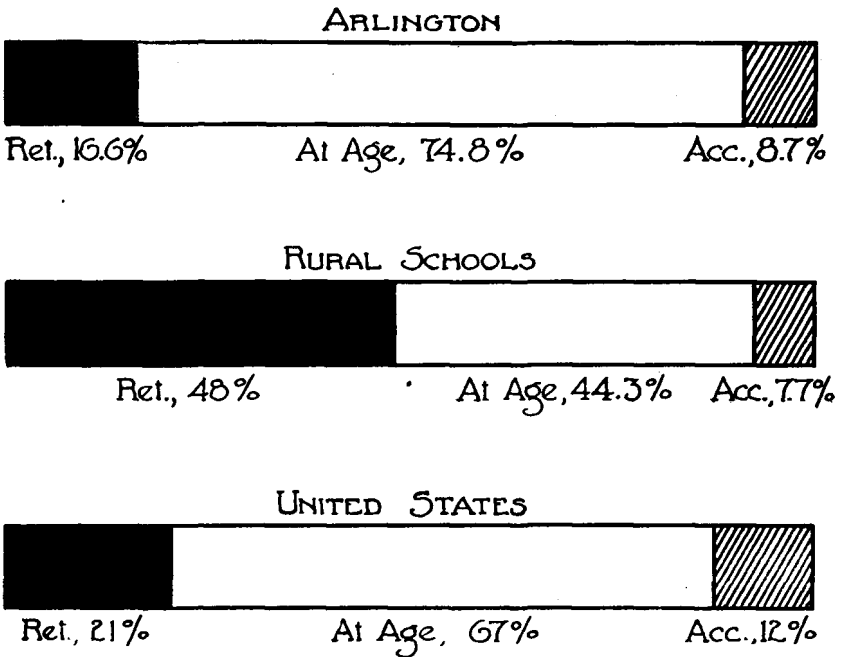


FIGURE 1. RETARDATION IN ARLINGTON, THE RURAL SCHOOLS, AND THE UNITED STATES

Grades VII and VIII showed a greater amount of retardation than did the other grades. It seems probable that these pupils, who are from 14 to 16 years old, have been out of school on working permits and thereby held back in their studies. It is also likely that a number of them are retarded on account of low intelligence. However, it would be well to investigate these cases one by one in order to determine the

real cause. Those who are found to be of high intelligence should be promoted one grade, as it is likely they are not getting as much out of their present work as they should, and experience has shown that promotion in such cases is wise. Those who are found to have special interests should be given special instruction suited to these interests if possible. In this manner they might be encouraged to continue their school work in preparation for some useful occupation rather than be dropped out of school entirely.

In every grade except the second, ninth, and tenth, there are accelerated pupils. If it is important to give special attention to the retarded pupils it is quite as important to do so in the case of those who are accelerated. The fact that they are ahead of the other pupils indicates that they are of high intelligence. The degree to which they are superior should be definitely determined by use of standardized tests of intelligence. Those of especially high intelligence should be promoted even further or given work equal to their abilities. It is unjust to neglect the bright pupil, for it is he who, when properly trained, becomes of greatest value to society.

The results of the study of retardation and acceleration in the rural schools are shown in the second bar of the figure. Here we find in the three rural schools taken together that 7.7 per cent of the pupils are accelerated, 44.3 per cent at age, and 48 per cent retarded. As will be seen from the third bar in the figure, the percentage of retarded pupils in the rural schools is greater than that commonly found throughout the United States.

In nearly every grade in the rural schools there are pupils who are from 5 to 6 years apart in their ages. In the fifth grade, for instance, there are pupils who are 10 years old, and others who are 16 years old. Pupils who are so far apart in ages can not profit equally by the same instruction. In a few years the 16-year-old pupil must set out for himself. If he had a chance at the kind of training for which he is most fitted, such as is offered by our best city schools, and by many good consolidated schools, he would go out into life far more thoroly equipped to become a useful and happy citizen.

The kind of training which is usually found in the one-room-rural-school, where, often, the teacher is poorly trained, where she must divide her time between from 20 to 40 classes a day, and where there is almost no suitable equipment with which to work, is an injustice not only to the child who must ultimately suffer from such inadequate training, but to the taxpayer who pays for it.

The best known solution for the rural-school problem is consolidation into a larger school unit where it will be possible to employ a well-trained and experienced superintendent, better teachers, better equipment, and the arrangement of special courses suited to the needs and interests of the pupils. Every rural child has a right to be taught in such a school where such consolidation is practicable.

To summarize, let us note that the retardation found in the elementary and high schools in Arlington is only about half that commonly found in schools throughout the country. Since the pupils in Arlington score below the standard scores of pupils elsewhere in achievement and intelligence, it is believed that the low retardation found is due to grading and promotion by ages rather than by achievement or ability. It is suggested that the pupils in Arlington be given a number of standardized tests of intelligence by a person fully capable of giving and interpreting them, and that, as far as it is practicably feasible, the entire school be re-grouped on the basis of intelligence. In making such a change, care should be taken not to place a pupil in a lower grade unless his intelligence is found to be so decidedly low as to make it impossible for him to profit by the work of the grade he is now in. Exceptionally bright pupils should be permitted to skip a grade or be given other work to keep them profitably occupied. In general, the aim should be to place in each grade a group of pupils who are of about the same intelligence as well as equal in amount of training.

The retardation in the three rural schools is somewhat greater than that found in general throughout the country. This may be due to a great many causes, among which are irregular school attendance, poor health, home work, and poor instruction. Probably the most common of all causes of retardation, and an irremediable one, is inferior mental ability. Consolidation is the first efficient remedy for retardation as well as for other rural-school difficulties. Much can be done, however, by a competent teacher who knows how to give and interpret tests of achievement and intelligence, and by parents who would be more immediately concerned with the health, home conditions, and school attendance of their children.

6. ARE THE CHILDREN TAUGHT BY GOOD TEACHERS?

In order to find out how well fitted the Arlington and rural school teachers are for their positions, each teacher was asked to fill out a questionnaire giving facts concerning her training, experience, salary,

etc., that would be of help in getting a general idea of the qualifications of the teachers as a whole. These facts were then carefully studied with a view to making a fair and impartial statement of the present situation.

There are thirteen teachers in Arlington and the three rural schools. They are as follows: one superintendent-principal; three high-school teachers, one eighth-grade teacher; one sixth- and seventh-grade teacher; one fourth- and fifth-grade teacher; one second- and third-grade teacher; one primary teacher; one music teacher; and one teacher in each of the three rural schools. The superintendent-principal, the music teacher, and one of the high-school teachers are men; all the other teachers in Arlington and the rural schools are women. All the teachers except one are American born. Eight of them are of American parentage, three are of Scandinavian parentage, one is an Austrian, and one is of German parentage. Nine out of the thirteen were born in the state of Minnesota. In general, the teachers have done very little traveling, it being limited chiefly to the state of Minnesota and neighboring states. Only two of the teachers were helping support others besides themselves.

The elementary and high-school teachers in Arlington are somewhat younger than teachers in general throughout the state of Minnesota and throughout the United States. The median age of the Arlington elementary teachers is 23 years, and the median age of the high-school teachers is 24 years.³ Both the elementary and high-school teachers in Arlington are 4 years younger than elementary and high-school teachers throughout the state of Minnesota. The elementary teachers are from 2 to 4 years younger, and the high-school teachers are from 4 to 7 years younger, than similar teachers in towns and cities throughout the United States.⁴ The median age for the three rural teachers is about $2\frac{1}{2}$ years less than that for rural teachers in Minnesota, and about $1\frac{1}{2}$ years more than that for rural-school teachers in the United States as a whole. In general it may be said that the teachers in Arlington and the rural schools are quite young as compared with teachers elsewhere.

One question of utmost importance must be answered when we are judging the quality of teachers, namely, "How much training have

³ Median age means that there are as many above that age as there are below it.

⁴ The comparative figures used here are taken from *The Social Composition of the Teaching Population* (1910) by L. D. Coffman. They are the only available facts on teachers' ages for the whole country.

they had as compared with teachers elsewhere?" All the high-school teachers in Arlington are college graduates, which means that they have had about eight years training beyond the eighth grade. This amount of training compares favorably with the training received by high-school teachers in general throughout Minnesota,⁵ but if we compare it with the amount received by teachers in cities of from 30,000 to 100,000 population in the United States, the Arlington high-school teachers are about $\frac{1}{4}$ year below. Nearly all the elementary teachers in Arlington, as well as the rural teachers, have had a four-year high-school course, plus some training in normal schools and colleges. The elementary teachers in Arlington have had almost as much training as have elementary teachers throughout Minnesota, but they have had $\frac{1}{2}$ year less training than elementary teachers in cities of from 30,000 to 100,000 population in the United States. The rural teachers have had a little more training than rural-school teachers throughout Minnesota, but $1\frac{1}{2}$ years less than the Arlington elementary teachers.

It must be remembered that rural-school teachers throughout the State are much under-trained. Rural children are entitled to as good instruction as are children in the cities, and the rural-school teachers should be as well qualified as are the city teachers. Furthermore, the people of Arlington should not feel satisfied with the mere fact that their teachers are as well trained as teachers throughout the State. The training received by teachers in general throughout the State of Minnesota is less than that received by teachers in cities of from 30,000 to 100,000 population in the United States as a whole. The children in Arlington have a right to be taught by just as well-trained and efficient teachers as are the children in such cities.

The teachers in Arlington and the rural schools are less well qualified as to experience than they are as to training. The median years of experience of the Arlington elementary teachers is 3 years. They have had $2\frac{1}{2}$ years less experience than have elementary school teachers in Minnesota towns and cities, including towns of the size of Arlington. Compared with the Iron Range towns, the Arlington elementary teachers have had $3\frac{1}{2}$ years less experience. On the average, the Arlington high-school teachers have had only $\frac{1}{2}$ year experience, which means that they have had 3 years less experience than high-school teachers in Minnesota towns and cities of the class which includes towns of the size of Arlington, and $5\frac{1}{2}$ years less experience than high-school teachers in towns and cities on the Iron Range. The teachers in the three

⁵ The comparative figures used here for the state of Minnesota have been recently compiled and are for the school year 1920-21. From an unpublished Master's thesis, by E. Selke, University of Minnesota.

rural schools near Arlington have had $\frac{1}{3}$ year more experience than have rural teachers throughout the state. It is evident from the above facts that Arlington should make a serious attempt to employ teachers of greater experience.

Compared with Minnesota teachers of the same amount of training and experience, the Arlington elementary and high-school teachers are slightly better paid. They are paid less, however, than the average salary for all elementary and high-school teachers in the State. The rural-school teachers are very poorly paid compared with rural-school teachers of the same amount of training and experience throughout the State. One of the rural-school teachers receives a salary of only \$600 a year. For such a price it is impossible to obtain the kind of efficient instruction to which the children in the rural schools are entitled.

All the teachers in Arlington and the rural schools are members of the Minnesota Educational Association or other educational organizations. It is also evident that they have not neglected to attend educational conferences and meetings whenever possible. This is a thing to be highly commended. A teacher can not keep fit professionally unless she comes into contact with the methods and practices of teachers elsewhere, and thereby seeks to improve herself in every possible way for the work she is doing. It is the duty of the school board and the people to encourage this professional spirit for the sake of better instruction and greater returns for money invested.

7. DO THE CHILDREN HAVE A FIT PLACE IN WHICH TO ATTEND SCHOOL?

The casual observer judges a school system by what he can see, its equipment, its buildings, and its grounds. Those who come to a community to seek a location for business or residence, all accept this testimony at its face value and commend or condemn the educational advantages of the community as they see it. As a rule, they will not judge amiss, for a good school system is usually well housed and equipped, and a community which is negligent in these respects is also negligent of other things relating to the educational welfare of the children.

The school buildings of these districts are hopelessly inadequate. They violate every principle of educational hygiene and form a menace to the physical and moral safety of the children, who, in keeping with the evidences of the wealth and the high standard of living of Arlington's people in general, have a right to expect better housing, better

educational equipment, and a more fitting and safe school environment.

The present school buildings and equipment will be evaluated here in the light of accepted principles of educational efficiency, educational hygiene, and moral and physical safety.

The school buildings were rated according to a definite and scientifically established score card.⁶

The items contained in this rating system are not extreme in their demands. The score cards make no attempt to demand building features or equipment which could be termed elaborate but limit themselves to the minimum essentials for an efficient, and a physically and mentally healthy school system.

Table II will show the credit assigned to each school building, item by item, and also the standard expectancy for that item.

TABLE II
SHOWING THE RATING ASSIGNED TO BUILDINGS BY USE OF THE SCORE CARD FOR
RURAL SCHOOLS

	Perfect Score	Arling- ton High	Arling- ton Gram- mar	Dist. 16	Dist. 14	Dist. 30
I Site:						
A. Location	65	65	65	25	15	20
B. Drainage	50	40	40	25	20	45
C. Size and form.....	70	50	50	0	20	10
D. Landscape effect....	25	20	20	0	0	10
Walks, fences, and hitching posts....	25	10	10	0	0	0
II Buildings:						
A. Location	50	30	40	5	25	28
B. Gross structure.....	140	30	10	40	55	85
C. Internal structure..	255	75	25	100	95	125
III Service and equipment:						
A. Heating	50	30	20	50	40	40
B. Ventilation	45	15	10	25	20	30
C. Artificial light.....	30	25	25	0	0	0
D. Seats and desks....	50	30	20	25	25	20
E. Water supply.....	50	25	20	20	10	25
F. Fire extinguishers..	10	5	0	0	0	0
G. Toilets	45	20	20	20	0	20
H. Playground ap- paratus	25	20	20	0	0	0
I. Flag staff.....	5	5	5	5	5	5
J. Horse shed.....	10	0	0	0	0	0
Total	1000	495	400	340	330	463

⁶ For discussion of this score card by Holton and Strickland see: Strayer & Englehardt, *The Classroom Teacher*. The card can be obtained by writing Holton & Strickland, College of Agriculture, Manhattan, Kan.

Figure 2 shows graphically, on a percentage basis, the number of points accorded each school building. It shows plainly how far these schools fall below the standard expectancy. Not one of them reaches 50 per cent adequacy, and one of the district schools rates as low as 33 per cent. The high-school building approaches 50 per cent, while the grammar school could be credited with only 40 per cent.

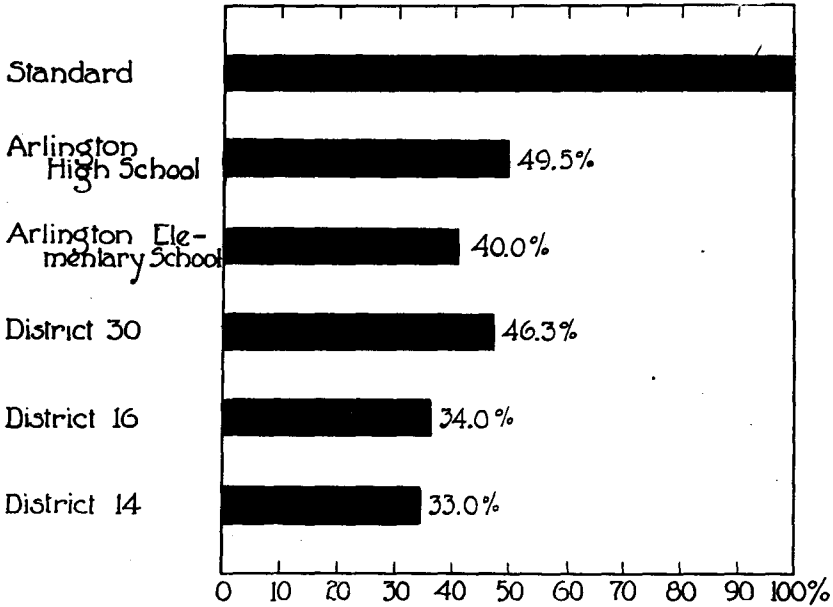


FIGURE 2. EFFICIENCY IN THE ARLINGTON BUILDINGS AND IN THE RURAL SCHOOLS

It will be seen by the table that Arlington is given a total of 495 points on its high-school building and a total of 400 on its grammar-school building. District No. 30 is accorded 463 points, District No. 16, 340 points, and District No. 14, only 330 points.

It might be well to state at this point that the rural schools were rated on a basis of the service demanded of them, and not in comparison with city school buildings. From the standpoint of an ideal educational opportunity for these rural districts, the buildings would rate next to nothing. Neither is it possible, with much improvement, to bring them up to the desired standard.

Modern one-room rural-school buildings can be built, but these old buildings could not be remodeled. The one best solution is not new

rural schools, but a single new building for all these districts combined, as will be explained in Part III, following.

In as far as the site is concerned Arlington compares favorably with the requirements, except that it is not as well drained as it might be. In matter of size it measures 1.67 acres. Three or six acres would be more suitable. This would allow a space for agricultural experiments in soils. A small expenditure would go a long way toward beautifying the grounds, and it would be money well invested.⁷

The buildings are unqualifiedly inadequate. The old frame structure housing the grammar school is dangerous to the safety of the children and to their health. It is old, out of date, poorly built, out of repair, and, on the whole, forms a fire trap. Almost without exception every child in this ramshackle school structure is accustomed to a clean, safe, and uplifting home environment and ought not to have this sort of school home. The influence of such squalid and unsanitary surroundings upon the pliable characters of boys and girls is sure to lead to evil results.

The high-school building is small and entirely insufficient to its needs. The facilities it affords can not admit of efficient instruction.

Internally attempts have been made to cover up the inadequacies with paint. But no amount of paint will make these rooms into fit places in which to compel pupils and teachers to stay five hours a day.

The windows in the grade rooms are entirely too small to admit sufficient light, and in the country, are lighted from both sides. The resulting cross light, in addition to the semi-twilight conditions, is bound to cause serious eye strain, evidences of which we found in a number of the rooms.

The window space should be no less than one fifth or one fourth of the floor area, and light should enter the room from the left side and never from both sides.

In many cases opaque shades are still in use. These, when drawn down from the top, make the rooms still darker.

The entire Arlington high school has but two classrooms worthy of the name, and one of these is the domestic-science room. To accommodate the rest of the teachers, the room now housing the library, the assembly room, and various small improvised places are pressed into service.

The manual-training room is such that attempts at instruction in it

⁷ See bulletin, *School Buildings, School Grounds and Their Improvement*, Kansas State Department of Education, 1911.

are but a waste of time. The library is full of books, and the floor crowded with long benches. A large space with tables and chairs should be provided, if the books in it are to be used to the best advantage. The entry in the high school serves also as a cloakroom for both boys and girls, and as a storeroom for books and supplies.

The heating plant, located in the basement of the high-school building, serves the grammar school also. This ought to be an efficient way of heating the two buildings, and appears to be functioning fairly well, tho it would be next to impossible to heat the old building satisfactorily with any system.

The ventilation system is entirely improvised, and is little better than none. It may be possible, however, that when the rooms are heated, and electric fans placed in the air shafts, that some ventilation can be obtained. Surely none can be obtained otherwise. As it is, the air in the rooms is very foul, and it is not only offensive, but dangerous, to require teachers and children to stay in such a germ-charged atmosphere.

The buildings are equipped with electric lights throughout, but the number of bulbs is insufficient, and there seems to be some hesitancy on the part of the teachers to use them during dark days. The slate blackboards, too, are as they should be; however, in a new building they should be placed with reference to the average height of the pupils in the various grades.

The seats are of the individual type and some account has been taken of the differences in the height of pupils by providing desks of various sizes. In a few cases the pupil's feet do not touch the floor, and in a few cases the seat and desk are too far apart, causing the child to sit in a stooped position. The adjustable type of seats would obviate this trouble.

From the standpoint of fire protection the grammar school is extremely dangerous. The few fire extinguishers scattered about show no signs of care, and it is doubtful whether anyone would know how to use them. It was found that the doors leading to the fire escapes on the second floor were closed with hooks so high that the children could not reach them. A fire in this flimsy structure during school time might easily result in a catastrophe.

The school is supplied with city water through sanitary fountains, but provisions for pupils to wash are inadequate and unsanitary, hence pupils go, without washing, from the playground or the toilet to their

classes. This is a sure way to disseminate disease, to say nothing about the development of habits of uncleanness.

The bathing facilities now in use were improvised and installed by the pupils. We appreciate their desire for a bathing place, and their ingenuity in getting one, but surely Arlington can give them a better one than this.

The toilets are outside of the building and are therefore of the type usually found in the absence of flush toilets and a septic tank. There was a violent, intolerable odor in these toilets. The wooden seats tend to encourage dirtiness. An entirely new system should replace the present one.

As to playground apparatus Arlington is to be congratulated upon both the variety and the quality of the apparatus it has provided. It is to be deplored, however, that winter weather prohibits the use of it so much of the year, and that during that time little provision can be made for indoor play.

The teaching equipment in Arlington was found to be fairly good. Out of a perfect score of 500 points, Arlington was rated 395. Forty-five points were lost because of the lack of agriculture, nature-study, and manual-training equipment. In an agricultural community such as Arlington this particular type of work should be emphasized. With adequate equipment, experiments could be undertaken in soil study, milk tests could be made, herds, poultry, and egg production could be studied, etc.

Table III shows how the schools are equipped when measured by a standard to which they ought to attain. Each school should score 500 points. The rural schools are so far short of this that the situation is really pathetic. No teacher can hope to accomplish results under such conditions as these.

There is also an outstanding need for book cases and display facilities. In most respects, however, Arlington is to be commended for the equipment it has. It is well supplied with all kinds of reference books, current magazines, primary supplies, and domestic-science material.

In the rural districts the equipment is deplorable. The imperfect work done there and the indifference are no doubt due in large part to the failure of the district to furnish the necessary buildings and equipment.

Summing up, we may say that there is not one school building in this community that is more than 70 per cent efficient, and one of the rural buildings is only 33 per cent efficient. The equipment in Arling-

TABLE III
RATINGS OF TEACHING EQUIPMENT BY THE HOLTON-STRICKLAND SCALE

	Standard Score	Arling- ton	Dist. 16	Dist. 14	Dist. 30
I. General equipment:					
A. Free textbooks.....	60	60	15	10	10
B. Maps, globe, chart.....	25	15	15	12	15
C. Book cases.....	20	15	10	10	15
D. Display facilities.....	20	0	0	0	0
E. Library	80	65	40	25	35
F. Music	40	40	20	23	20
G. Pictures	25	25	15	0	0
H. Industrial exhibits.....	15	10	0	0	0
I. Weights and measures.....	15	15	0	5	5
II. Special equipment:					
A. Primary	45	45	25	20	20
B. Household arts.....	65	65	0	0	0
C. Manual training.....	40	25	0	0	0
D. Nature-study material.....	25	10	5	5	5
E. Agriculture	25	10	0	5	5
Totals	500	395	145	120	130

ton's schools is fairly good in some respects, and wholly lacking in others, while in the rural schools the equipment is next to worthless.

This all means that the whole community must soon have new buildings and additional equipment. Shall they build one good one or several small ones that can never make good schools possible? Our answer to this question will be found in Part III, following.

8. HOW CAN ONE MEASURE THE RESULTS OF TEACHING?

The final and real test of the success of any school is, after all, the kind of work the children are doing in their studies. Knowledge and skill in arithmetic, reading, music, history, etc., are the final product for which the community is paying out its money. If the product is large and of good quality the taxpayer feels that he has made a good investment. If it is small and of poor quality he feels that his money has not been wisely spent.

How can we measure the output of the school? We can measure land, wheat, corn, cloth, coal, etc., by reference to acres, bushels, pounds, yards, and tons, and speak in very definite terms of how much of any of these items we possess. With education it has, until recently, been different. We have for years asked the teacher how the children are doing in arithmetic, and her reply has been: "fairly well," "very good,"

etc. During the last decade the large financial claims which our schools have been making upon the taxpayers have brought forth the question: how much education is my child getting for each dollar of tax I pay? At the same time scientific students have been at work trying to develop a system or scale of measure so that it would be possible to speak of accomplishment in school studies as we do of size, distance, weight, etc. The results have been more than gratifying, for to-day we have scales and tests by means of which we can measure, with fair accuracy, the accomplishment of a child, or of a class, or of a school in a number of our school studies.

Corresponding to the merchant's yard stick and scales we have in education what are called "tests" and "scales" for measuring a child's success in writing, spelling, reading, arithmetic, history, and several other studies. It is not possible to explain here how these "tests" and scales have been made, for the process is very long and very complicated. It is enough for our purpose here to say that we now have such instruments or devices for measuring the output of our schools, and that they are being widely used in schools all over the United States.

Just as an acre, a mile, or a pound in New York is the same as it is in London or San Francisco, so with our educational tests a unit of measure in one place is the same as it is in another. Thus, we are now able to compare the children of one community with those of another community however far apart they may be. This makes it possible to say whether the schools of Los Angeles are as good as the schools of Minneapolis, whether the rural schools of Sibley County are as good as the town schools, e.g., whether the taxpayer in Arlington is getting as much arithmetic for his children for each dollar of tax paid as he would get if he were living in some other community.

By applying these "scales" and "tests" in a large number of places we have been able to find out what is the average accomplishment in the country. This average we think of as the standard, or norm, by which every school in the country should measure itself. The people of Arlington or of any one of the three rural districts included in this survey naturally want to know whether their children come up to the American average in arithmetic, in writing, etc. These questions the next few sections of this report will answer.

In this survey we gave these tests in arithmetic, reading, spelling, writing, and history. The results of such extensive testing has furnished us with an abundance of evidence as to the kind of results the schools are turning out. These results are explained in the following

sections of the report. Whether they are good or poor, they are dependable, and fully indicative of just what the schools are doing as compared with average American schools.

9. HOW WELL DO THE CHILDREN OF THESE SCHOOLS READ?⁸

The children of Arlington apparently find learning to read a more difficult task than do most children in American schools. The reason for this is not hard to find. The Arlington children are, in the main, German, or of German descent. That there has been little association with the outside world is evidenced by the extremely slight increase in the town's population during the last twenty years. Large numbers of the Arlington children can scarcely speak English when they first come to school, German, in most cases being the only language spoken at home. Consequently they are handicapped for a time. This handicap is gradually overcome, however, until in the upper grades and in the high school, where the proper standard is attained.

Do we find the various grades in these schools up to standard or not? Reading results in Arlington are fairly satisfactory—indeed, quite encouraging as compared with test results in spelling, handwriting, and other subjects. The relation of reading achievement in Arlington and vicinity to the normal reading achievement for the country as a whole will be best understood by a study of Figure 3. This figure shows graphically just what the standard is and how Arlington and the rural schools measure up to it.

In the lower four grades both rural and town children do poor work in reading. They are on an average one grade behind.

Children in the rural schools keep falling farther and farther behind until we find that the eighth grade is doing no better work than an ordinary sixth grade should do.

In Arlington itself those children who are found in grades V through XII have approximately normal reading ability for their grade, except in grades VIII and XII. The eighth-grade pupils read no better than do the VI B pupils, and seniors in high school read only as well as high-school freshmen. Our study of time allotment may explain this in part, for we find that time devoted to reading in grades VII and VIII is somewhat below the standard.

⁸ In testing the Arlington pupils and pupils in rural Districts 14, 16, and 30, two different reading tests were used, the Haggerty Sigma 1, for grades one to four inclusive, and Haggerty Sigma 3 for grades five to twelve inclusive. A full description of the tests will be found in our detailed report, or may be gained by reading the *Haggerty Reading Examination—Manual of Directions*. World Book Co., N. Y.

Do the children read as well as they should, considering their age? Arlington children read very poorly for their age. The average child in Arlington reads only about as well as one would expect a child two years his junior to read. There are no available age norms for the reading ability of older pupils, so for these we can not say. We find that in Arlington pupils over eleven years of age do not increase in reading ability at any definite or constant rate. After the primary grades are past the only periods in which they seem to be making progress are between the ages of 12 and 14 and from 15 to 16.

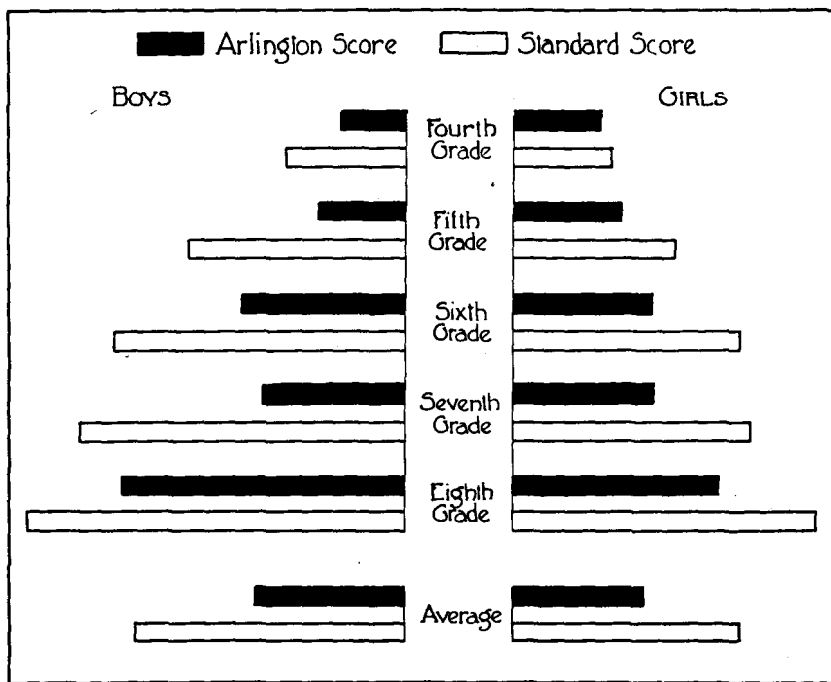


FIGURE 3. ACHIEVEMENT IN READING, ARLINGTON AND THE COUNTRY AT LARGE

How do the girls compare with the boys? Boys in the primary grades do poorer work than do the girls. Country boys do better than town boys. When they get a little older and a few grades farther on in school we find that the boys begin to outstrip the girls in reading ability. This is of special interest for two reasons: (1) In handwriting and spelling the girls are everywhere better than the boys. (2) Boys gen-

erally may be expected to vary through a wider range in all tests than do girls; yet in Arlington the reverse is true for reading. Here the boys read more nearly alike than do the girls.

What are the chief difficulties in reading? The chief difficulty Arlington children have in reading seems to be an inability quickly to get the meaning of paragraphs. Altho the thought conveyed by each individual sentence may be quite clear, the school children seem unable to grasp the idea when the sentences are combined into paragraphs.

What can be done to better conditions? A study of the methods of teaching reading, as related to the needs of the children of the community, is recommended as a preliminary step toward improvement of results. Careful study coupled with experiment may induce changes which will both make reading of English easier for the younger children who have the handicap of the German language, and lighten the load of the teacher who has them in charge.

10. HOW WELL DO THE CHILDREN OF THESE SCHOOLS WRITE?

In Arlington writing is taught in all grades from the first to the eighth inclusive, and as compared with other Minnesota schools the children of Arlington devote more than an average amount of time to this subject. In fact the average amount of time per grade given to writing each week in the 32 schools above referred to is 76 minutes, while in Arlington each grade spends on an average 109 minutes per week. Yet as our studies clearly show Arlington is still far below the standard in this subject, and we must say that Arlington's children are very poor penmen.

Up to and through the eighth grade much of their writing is almost illegible. Only six children in the entire eight grades write as well as quality 60 on the Ayres Scale.⁹ The median quality of handwriting to be expected of a second grade is, according to Ayres' norms, 38; yet Arlington's second grade scores only 28. Not until Arlington's children reach the sixth grade are they able to write as well as ordinary second-grade children. Eighth-grade children in Arlington write only as well as the fifth-grade children examined by Ayres, and only as well as fourth-grade children in St. Paul, Minnesota.

In speed the children do much better. Save for the children in grades II and III children in the Arlington schools write as rapidly

⁹ For a description of the test used and the methods of administering it see Ayres' *Measuring Scale for Handwriting*, Gettysburg edition. Division of Education, Russell Sage Foundation, New York City.

as do children in most other school systems. In grades VI and VII Arlington children are a full grade ahead of Ayres' norms for rate of handwriting, and there is a fairly constant gain in rate of handwriting from grade to grade.

The rural children fall below the town children in many ways but not in writing. In fact the children of Arlington and in the rural schools near by write very much alike, except in one of the rural schools, as noted below. Ayres' average quality for grammar schools is 50, Arlington's average is 35.7; and the rural schools' average is 38.0. In rate, the standard average for a school is 60 letters per minute; Arlington's average is 62.4 letters per minute, and the rural-schools' average is 62.3 letters per minute. It must be noted, however, that the rural-school averages are brought up by the work of pupils in District Number 16. Pupils attending the District 16 one-room rural school write with an average quality of 49.3, and an average rate of 78.7 letters per minute. Hence, we see that these children write just as well as the standard, and one third more rapidly than the standard. Judging from the samples of handwriting received we assume that the Palmer method of teaching penmanship is used in this district.

A study of the handwriting of pupils of different ages shows no connection between age and ability to write. Surely this is not as it should be. Children ought to improve with age.

Girls far surpass boys, both in quality and in rate of handwriting. Nowhere, save in grade II, do boys write better than do girls. In rate of handwriting boys and girls score approximately the same in grades II, V, and VIII. Boys in Arlington and in the rural schools write, on the whole, only as well as do girls two grades below them in school. This difference is not necessary and the schools should certainly try to bring the boys up to standard.

Why should the writing be so far below standard in Arlington and in Districts 14 and 30 when District 16 has kept its children fully up to the standard, or above it? It is not for lack of time, as we have pointed out above. It may be in part due to the fact that no standards for achievement are set and maintained. A real plan for teaching writing would help some, but it is clearly evident that better teaching is the principal need. With such poor results, and so much time spent, we must point to this as a great source of waste, and we must say that the responsibility is on the teachers themselves. Such results are wholly inexcusable, and could only result from poor teaching.

11. DO THE CHILDREN SPELL AS WELL AS THEY SHOULD?

Spelling is taught in grades II to VIII inclusive in Arlington and in all grades in each of the rural schools.

One of the standard tests above mentioned was given to 140 children in Arlington, to 9 children in District 14, to 14 in District 16, and to 17 in District 30. To come up to the average the children of Arlington should have made a score of 66. They actually made a score of 37.5. District 14 should have made a score of 66.7 but fell to 30.6. District 16 should have made 64.4 but fell to 30.6, and District 31 should have made 66 but fell to 26.8. In other words, the children of all these schools spell on an average only about half as well as do children on an average in the United States, and the rural children fall well below the children of Arlington. Such results as these must be regarded as undeniable evidence that the children of these schools have not had a chance equal to that of the average American child.

Not only are these several average scores exceedingly low, but the same kind of results appear when we study the results for the different school grades.

Not a single grade in any of the four schools measured up to standard. In the Arlington schools, each of the grades is from $\frac{2}{3}$ of a year to more than 3 full years behind where they should be in spelling. Grade VIII made the best showing of all, but even grade VIII spells only a little better than the average American seventh grade. Grade XII tested lower than any other in the whole system, being equal to the average American ninth grade.

With one exception, there is a gradual gain in spelling ability from the third to the twelfth grade, but the gain is far below what it should be. Grade VIII spells better than grade IX, and almost as well as grade X.

What is true of the different grades in Arlington is even more true of the various grades in each of the rural schools. Nowhere does any grade come up to the average American school. In other words, an eighth-grade child in the rural schools spells no better than a fifth-grade child in the average American school, and the same difference obtains for all the other grades.

The grade average is a very satisfactory measure of the group, but we should also like to know something of the standings of individuals within the group. The Arlington school showed a surprising range in this respect. In grade V, two pupils made a score of zero

and one a score of 100. In the other grades the range is not quite so great as it is in grade V, but everywhere it is extremely wide. In no grade did more than 25 per cent of the pupils reach or exceed the grade standard.

There is a very great overlapping of abilities. The best pupils in grade V spell better than the average pupils in grade XII. In every case, except two, the upper half of a grade spells better than the lower half of the grade above it. In every grade except the sixth and the twelfth, girls spell much better than boys, excelling by an average of 11.7 points per grade.

All of these facts together mean that the pupils of these schools are very poorly classified so far as spelling is concerned. Children who can make a score of 100 in this test ought not to be classed with children who can make no more than zero. Such classification means great waste of time, and tends to discourage the weak pupils while the bright ones simply do not have to study to keep up, and so learn to be lazy and indifferent to real work.

What is needed to bring these schools up to standard in spelling is not a greatly increased time allotment for the subject, but a better handling of individual pupils. It is not necessary to complicate the organization of the schools to get better results. Teach children of fifth-grade ability fifth-grade spelling lessons! If a child is in grade VIII, and can only spell up to fifth-grade standards, then let him recite spelling with grade V until he catches up with his grade. Or, if that is not possible, give him special individual help. If a child makes a score far above standard, either let him recite with a higher grade or omit spelling for a while and put his time on some lessons that are harder for him. Such a handling calls for not one cent extra cost, yet we are confident that by such changes spelling in these schools can be greatly improved.

12. ARE THE CHILDREN UP TO STANDARD IN ARITHMETIC?

To determine the efficiency of the pupils in the fundamental operations of arithmetic, a series of tests, arranged in order of difficulty, easiest to the most difficult, were given in grades IV to VIII.¹⁰ The time allowed for solving the problems was the same for all pupils.

The class or grade score was found by taking the median score for all pupils in the grade. These class scores were then compared with

¹⁰ The tests used were the *Woody Arithmetic Scales, Series B.*

the scores obtained from testing a large number of pupils in other schools of the United States.

When comparisons are made with the scores obtained from tests of pupils in other schools in the early part of the school year, the grades of Arlington stand in the following order of efficiency in arithmetic: fourth, fifth, eighth, sixth, and seventh. Only the fourth and fifth grades made a favorable showing. In as much as the Arlington pupils were tested in February, the score should have exceeded by a half year those scores obtained in other schools at the beginning of the school year. This fact must be kept in mind in noting the results.

Arlington pupils appeared to be efficient in the fundamental processes in this order: subtraction, addition, division, and multiplication.

The following per cents of pupils by grades had attained the desired skill in arithmetical computations:

	Fourth	Fifth	Sixth	Seventh	Eighth
Addition	50	53	21	18	13
Subtraction	71	65	43	41	6
Multiplication	71	41	7	6	27
Division	21	53	28	0	13

That is, 50 per cent of grade IV, 53 per cent of grade V, etc., were up to standard in addition.

Pupils appeared to be poorly graded, so far as abilities in arithmetic were concerned. Some pupils in lower grades were able to work as difficult problems as those solved by many of the pupils in the upper grades. Evidently, the brighter pupils should be allowed to do more advanced work, and the duller pupils should be given easier work and more individual instruction.

Girls seemed to be considerably more efficient in arithmetic than boys, except in the eighth grade.

The scores of the pupils indicate that certain processes in arithmetic are taught in each grade, but that these processes are not sufficiently reviewed and drilled upon to secure steady and definite advancement from grade to grade. Too much of a burden is thrown upon the eighth-grade teacher to conduct these reviews and prepare the pupils for final examinations in the subject.

Standard tests in arithmetic should be used frequently to show what progress pupils are making during the year, and from grade to grade.

The superintendent should study the scores of the pupils to determine the needs of individual pupils, the value of methods employed, the usefulness of textbooks and teaching materials, and finally the efficiency of the teachers. The survey of arithmetical abilities of Arlington pupils indicates the importance of a closer supervision of arithmetic work throughout the whole system of schools.

13. WHAT DO THE CHILDREN KNOW ABOUT THE HISTORY OF THEIR COUNTRY?

The answer to this question is of great importance because, in the first place, history is one of the most essential studies in school, and, in the second place, because the children's knowledge of history probably indicates roughly what they know in the other content subjects, civics, geography, and physiology.

In order to determine what the pupils know about history, the Van Wagenen History Information Test A was given to all the pupils from the fourth grade through the eighth. This test is well standardized, that is, it has been given to thousands of children in many different schools, and thus we know just what to expect from every grade. The test is adapted to every kind of pupil found in the five upper grades. Certain parts are easy enough for fourth-grade pupils who may never have studied formal history at all, while other parts are difficult enough for the brightest eighth-grade pupils.

The study of history is not begun until in the fifth grade at Arlington, altho most schools teach some history in the third grade. The result is that when the pupils finish the fifth grade at Arlington they have had only one fifth as much history as the average pupils in the 32 schools referred to elsewhere in this report. In the three upper grades, the time allotment for history is more nearly adequate, but the total amount of time given to history in all the grades is only 63 per cent of what is current practice elsewhere.

What is the result of this meager time allotment coupled with a low standard of promotion? Practically every grade at Arlington and in the rural schools falls miserably below the norm for the grade, that is below what is being accomplished in general in the public schools in this country. The fourth-grade girls in Arlington are the only group which approaches the norm for the grade. The one sixth-grade girl in District Number 14 excels the norm for that grade by a small margin. With these two exceptions, the class medians indicate that each grade,

both in Arlington and in the rural schools, is approximately two grades below the median standard of achievement for the grade. In most cases, not even the brightest pupils in the class made a score as high as that which should have been the class median. The poorest pupils in every grade made scores very near the zero mark. In fact one fifth-grade boy actually failed completely on the entire test.

In Figure 4, the shaded bars represent the Arlington record for each grade and the white bars indicate what each grade should have done. Taking the average of the school as a whole, we find that the boys know about 56 per cent and the girls 67 per cent as much about American history as we have a right to expect.

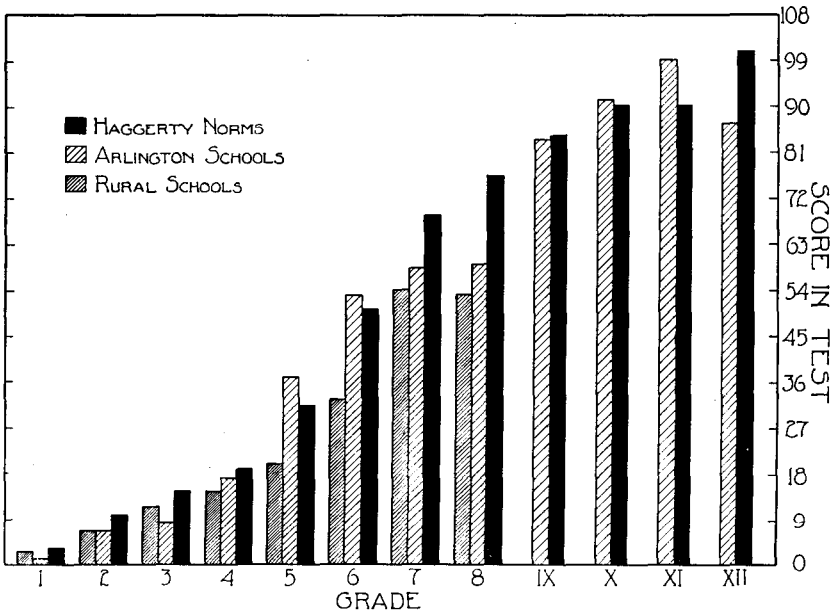


FIGURE 4. KNOWLEDGE OF HISTORY, ARLINGTON AND UNITED STATES IN GENERAL

The situation calls for vigorous and well-directed steps toward improvement. The study of history should be begun earlier in the grades. This does not necessarily mean that third- or fourth-grade pupils should be given a regular history textbook.

A great deal of very valuable historical information can be gleaned from well-selected supplementary readers, and from talks and suggestions by the teachers. Lower-grade children will learn some of the

simpler and more interesting facts in history quite as readily as they will learn Mother Goose stories. In the upper grades a more liberal time allotment should be given to history and the standard of promotion should be very much higher.

14. IS ARLINGTON FINANCING ITS SCHOOLS AS IT SHOULD?

We have already shown, in Part I, that Arlington is better able to support a good school system than is the average community of its size and character in Minnesota. This is true, first, because Arlington is relatively wealthier than the average, and second, because Arlington has relatively fewer children to educate. When these two facts are put together they mean that Arlington is not spending as liberally for education as other towns spend, until the amount per capita spent is well above the average, and the amount spent per pupil, very close to the highest amount spent by such communities.

Table IV shows a distribution of Arlington's educational expenditures by years, from 1915-16 to 1919-20 inclusive.

TABLE IV
DISTRIBUTION OF SCHOOL EXPENDITURES IN ARLINGTON, 1915-1920

Date	General control	Teachers' salaries	Text-books and supplies	Operation and maintenance	Transportation etc.	Land, new bldgs., equip.	Bonds and interest	Total expended
1915-16	\$159.31	\$6,859.95	\$ 787.88	\$1,750.57	\$22.51	\$691.87	\$22.25	\$10,204.28
1916-17	64.33	6,215.05	970.18	1,754.16	225.99	186.84	51.02	9,467.57
1917-18	79.40	6,507.45	960.72	2,046.81	16.28	203.11	43.95	9,857.72
1918-19	72.33	7,381.74	1,059.45	2,187.24	359.89	444.45	25.80	11,530.94
1919-20	145.18	9,333.45	936.39	2,188.04	137.15	532.72	92.98	13,365.91

An examination of the total column in this table shows that the town spent \$3,071.73 more in 1919-20 than in 1915-16, and reference to the salaries column shows that most of this increase went for increases in salaries. When we turn to the other columns of this table we find little change of importance through this period of five years, during which time there was so much inflation of prices everywhere. It was a period through which Arlington forced her schools to stand still in virtually every respect, except salaries, which, in the five years, show an increase of about 26 per cent, and most of that increase did not come until the last year.

When one considers that during this period Arlington's total budget increased less than 23 per cent, and that the salary budget increased only 26 per cent, and then reflects that a dollar in 1920 was worth only fifty cents in 1915, and, further, that during this period teachers' salaries over the United States rose 45 per cent,¹¹ he must be impressed with the fact that Arlington's schools have been sadly neglected during these years.

Of the 25 towns with which we have compared Arlington¹² only 7 have a smaller total income for their schools in 1919-20 than has Arlington, while 17 of the 25 have more income than has Arlington. This is far from being a creditable showing, when we recall that Arlington is well above average in per capita wealth.

Another set of financial facts which were gathered for this group of 25 towns is that showing the total tax rate for schools and the total amount of school funds raised for the calendar year 1921. In the size of tax rate Arlington was seventh from the lowest, and in total amount raised, Arlington was ninth from the lowest, in spite of the fact that it is far more able to bear its tax than is the average town of this group.

To show still further that Arlington is not spending enough on her schools, we have only to compare the per cent of her total school income which she receives from the State with that which other schools receive from the State. This was done, and it was found that while the average school in the State receives 13.36 per cent of its school money from the State, Arlington has received, during the past five years, an average of 25.62 per cent of hers from the State.

Table V shows the per cent of total school income received from the State for all schools of the State and for Arlington. From these figures it is clear that Arlington has consistently received more from the State than it is possible for the average school to receive.

The law intends to help poor districts, but here is a wealthy district enjoying more than double its proper share of income from the State. The pride of this community ought to call a halt on this. Surely Arlington is not yet an object of charity, to be cared for by the State, nor would any one of its citizens desire that it should ever become such.

¹¹ See Burgess, W. Randolph, *Trends of School Costs*, p. 57.

¹² In the full report on finance which has been presented to the Board of Education in typewritten form there are fifteen statistical tables upon which the statements of this section are based. The 24 towns with which Arlington has been compared are: Adrian, Annandale, Atwater, Belle Plaine, Browns Valley, Clarkfield, Cottonwood, Delano, Dodge Center, Gaylord, Hancock, Henderson, Howard Lake, Lake Benton, Maple Lake, Minneota, Monticello, Osakis, Red Lake Falls, Royalton, Rushford, Tyler, Walker, and Welcome.

TABLE V

SHOWING PER CENT OF TOTAL SCHOOL INCOME WHICH WAS DERIVED FROM THE STATE FOR ALL SCHOOLS OF THE STATE AND FOR ARLINGTON

School Year	Average of All Schools in State			Arlington		
	Per cent received from			Per cent received from		
	State appor- tionment	Special State aid	Total	State appor- tionment	Special State aid	Total
1915-16	8.01	5.65	13.66	23.07	7.14	30.21
1916-17	7.28	6.03	13.31	19.17	7.65	26.82
1917-18	7.23	7.73	14.96	8.45	17.36	25.81
1918-19	6.38	8.26	14.64	5.93	18.11	24.04
1919-20	5.37	4.89	10.26	17.33	3.96	21.29
Average for 5 years....	6.85	6.51	13.36	14.78	10.84	25.62

Another measure of whether the town is financing its schools as it should is the amount it spends per child in attendance at school. When the 25 towns were compared in this respect Arlington was found to be eighteenth in the list, that is, well below average, in spite of the fact that Arlington has fewer than an average number of children to provide for, and more than an average amount of wealth to provide from. The fact is, in wealth per child in average attendance, Arlington ranks fifth in the group, and yet, when it comes to spending money for schools, the town falls to the eighteenth place in rank.

One can sum up the meaning of the above facts by saying that Arlington is capable of supporting a better than average school system. As compared with other towns Arlington has a specially light burden to carry. In every respect Arlington is shown to hold a position decidedly below average in the amount she is spending for schools. The town leans too heavily upon the State, while other far less able towns are paying their own way. If Arlington would tax her wealth as heavily as does Lake Benton, a town of about the same rank in wealth per capita, the city would add 44 per cent to its school fund, and would raise Arlington from the sixteenth to the ninth position in rank among these 25 towns.

If one asks whether or not Arlington spends its revenue wisely, the answer is, yes, for the most part. When compared with 25 other towns as to the proportion of total revenues spent on schools and general government, respectively, it is found that Arlington occupies about a medium position. In fact Arlington spends a little larger per cent

of its total revenues on its schools than does the average city in this group.

Again, if we study the distribution of Arlington's school expenditures and compare it with other towns, as was done, we see that in most respects Arlington does not occupy an unfavorable position. Arlington spends 76.82 per cent of all school money on instruction, but 5 of the towns devoting a larger part of their money to this item. Of course this may not have been the best policy, when we consider how badly the schools are in need of a new building, yet it seems entirely fair to say, that, while Arlington has not been spending as much on schools as the town is able to afford, yet, what it has spent it has spent to fairly good advantage.

It should also be pointed out here, that one item in connection with the financing of the schools in Arlington, and one to be thoroly commended is the accounting system which the Board had installed in 1915 and which it has followed since. In this respect it is doubtful whether many towns of this size have been as progressive as Arlington. A board of education that attends to its duties in such a business-like way deserves to be heard when it asks the people for more money with which to run the schools.

One important fact is that the fiscal year for the town is the same as the calendar year, while for the schools it is from July 1 to June 30. Taxes are levied on the basis of the calendar year and collected in two installments, one in the spring and one in the autumn. It frequently happens that the Board of Education is temporarily without funds and must be tided over by the banks. This costs the schools something for interest, besides making work in bookkeeping, and causing general inconvenience. It is at least fair to raise the question as to whether the banks ought not to pay interest on the Board's unexpended balances, which, because of the awkwardness of the plan, are often large, since they charge interest on overdrawals or temporary small loans.

With the above facts before it the Board of Education in Arlington ought to feel fully justified in asking the people to spend more money on education, and, since the Board is making good use of what it has, and there is no evidence of serious waste anywhere, the people ought promptly to grant the request of their Board.

15. SUMMARY AND CONCLUSIONS ABOUT THE EFFICIENCY OF THESE SCHOOLS

In this part of our report we have described the plan of education that is in use for these communities, and by showing what kind of results it is producing we have shown in some detail how the plan is working. We have also shown the conditions under which the work is being carried on, and the way in which it is being financed. At each point we have not only pointed out very great weakness, but, as far as possible, we have tried to show why such weakness exists.

Speaking in general terms, the plain facts with which we have dealt in this survey fully warrant the statement that these schools are as poor as any that have yet been surveyed in the United States, unless it be schools for colored children in certain southern states. And when we say this we are saying that they are very, very poor. This is a disagreeable statement to make, but it is a true one, and must be made if we face the facts here reported.

To make this more specific we have only to review briefly this division of the report. First, we pointed out the unsatisfactory character of the plan of having four separate schools, each trying to run a complete system by itself. This is not only a more expensive way, but almost surely guarantees that certain weaknesses must exist, such as a poor curriculum, poor equipment, poor buildings, and poor teaching.

Secondly, we showed that these schools do not have the kind of curricula that they ought to have. They are not only inadequate but they are inadequate at the most vital points possible, viz., in history and civics, in hygiene, in physical training, and in agriculture. The school that does not train children to be good citizens and good workers is failing. Good citizens must know the history, the geography, the industries, and the people of their countries and good workers must not only be willing to work, but they must know the most improved methods and principles essential to their occupation. Since farming and home-keeping are the chief occupations in this community the schools must train toward these ends.

Third, we have shown that in allotting the pupil's time to different studies Arlington has been overemphasizing some studies and underemphasizing others. This can easily be remedied.

Fourth, we have shown that a relatively large number of children of legal school age in these districts are not in school. Most of these are at work on the farm. A few are clerks and stenographers, and a

few are day laborers. These children made miserably poor progress in school, and most of them have not even an elementary school training. Surely this well-to-do community of thrifty German and American stock will try to put an end to such waste. All these children should have had elementary, most of them should have had high-school, and at least a few should have had college training. That would make it merely an ordinary American community.

Fifth, we have shown that those in school have not made rapid progress, especially when we examine the results of tests which in nearly all cases show the children to be far below the standard. It is unwise for the people of these districts to let themselves be deceived by thinking a child is in grade VI, for instance, when in fact the quality of work he is able to do is scarcely that of a fourth-grade pupil.

Sixth, we have shown that the buildings in which the children are housed are all below standard, and most of them are not as good, not as beautiful, and not as clean as are the homes from which the children come. This can not but breed disrespect for school. All the buildings are more or less unhygienic, several of them exceedingly so, and in all cases the equipment is not the best by far.

Seventh, we have shown, by scientific tests, that the children are in nearly all cases from one-half to more than two full grades below standard in reading, in spelling, in writing, in arithmetic, and in history. There are exceptions to this, but when these exceptions are carefully scrutinized it is seen that they are scarcely exceptions after all. There is no denying the plain fact that these schools are not equal to average American schools by far. If it is true in these studies it is surely just as true in all the others. We believe part of this is due to present and past poor teaching, and even a larger part is due to poor equipment and buildings, and some of it is surely due to neglect on the part of parents who permit children to quit school, to attend irregularly, and to waste so much time in attendance at the parochial school when the same religious training could better be obtained by proper coöperation with the public schools of the community.

These words are written to the fathers and mothers of the children, and each parent should understand that "this means me." In the next part of the report we shall offer suggestions that we believe are fully practical to meet this situation. What to do about it should be the deep concern, not only of the school boards and teachers, but particularly of the parents.

PART III

A PROPOSED EDUCATIONAL PROGRAM

I. A LARGER PLAN OF ORGANIZATION IS THE GREATEST NEED.

Above we have tried to indicate the real educational needs of these communities, and to show the extent to which the schools are meeting those needs at the present time. Here we shall present what, in the light of facts, seems to us to be a thoroly practical and constructive program of reorganization, which will undoubtedly raise the efficiency of the schools very materially.

In preparing this program we shall assume that the people do not want their school tax to be above the average for Minnesota communities of the same general character, wealth, and school needs, as Arlington. We shall assume that the people are willing to pay a reasonable tax, that they really want good schools for their children, and that they will willingly support their school board in any such plan of reorganization that promises better schools.

We have shown that the schools of this community are very poor, and that very great change in many ways will be necessary before it will be possible for the children of Arlington and vicinity to have an average chance to become really equipped for life's work.

The first and most outstanding step that should be taken in a new program is that of a complete reorganization. As it now stands we have here four separate school systems. This calls for four separate sets of equipment, four buildings, and so on, for the training of a total of only 274 children. Every one of these four systems has been shown above to be very inefficient, and so long as they operate separately they are almost sure to remain inefficient. The rural teacher can not hope to get good results when she must teach all 8 grades, from 20 to 30 classes daily, under the very poorest of conditions.

To do away with these many weaknesses we suggest that these four systems combine, or consolidate, and operate as one school system.¹ It is possible that other neighboring districts would want to join, and if so it would be desirable to include any such.

The advantages of this plan are many. For the rural schools the plan has greater value, if possible, than it has for the city of Arlington.

¹In working out this plan District 15 and one or two other districts ought to be invited to join. The schools in these districts are no more efficient than are those surveyed, and if they were included the plan would be improved.

It would give the rural schools real supervision, of which they are sadly in need. It would give the rural children a beautiful, clean, and commodious school home which would go far toward keeping them in school. It would give the rural children a high school which would be their own. It would make it possible for rural teachers to teach one or two, rather than eight grades, and conduct about eight, instead of thirty, recitations daily. It would put the rural boys under a man principal, whose influence would be of great value. It would give the rural children a more intimate contact with life outside of their own dooryards. But greater, if possible, than all these, it would make it possible for the rural children to get training in home economics, agriculture, and other important subjects which they can never get as the schools are now operated.

For the town schools, many of these same advantages apply. The town children would meet new competitors. They would get the rural viewpoint, of which town children are often wholly ignorant. Classes could be larger in many cases, athletics, dramatics, debating clubs, social life, all would be greatly enriched.

Further than these educational advantages, we would find many others. As it is Arlington is the natural center of this whole territory, and if they would unite and erect one large school building which had a library, and a hall for entertainments, the building would soon become a natural meeting place where many people, adults as well as children, would find new friends and new social and business opportunities. In other words, the little neighborhood would be replaced by a large one, and life for all would be enriched accordingly.

That it would be decidedly to the business advantage of both farmers and merchants is obvious enough. Good school facilities have everywhere improved the value of real estate and improved business. The farmer three miles away may say, "It would not help me." He is mistaken. He now has a school, let us say, a mile from home, to which his children can walk in about thirty or forty minutes. The new school, three miles away, would be reached by the school bus in very much less time than that, so actually he is nearer school than before. There is plenty of evidence in other states to prove that when a first-class consolidated school replaces the old one-room schools land values increase instead of decrease. The main argument, however, is not business but educational advantages.

2. IS SUCH A PLAN OF REORGANIZATION FEASIBLE?

Legally such a plan would be easy to work out, in consultation with the State Department of Education. The accompanying map, Figure 5, shows the location of the districts we are here proposing to consolidate. By the map we can see the present district lines, the location of the schools and churches, the location of the homes, and the number of school children in each home. It also shows the places where there are good roads and poor roads, and indicates distances by the section lines. This map thus becomes the fact basis for figuring out distances to the new school and the best routes to be taken by the school busses.

This consolidation would produce a district containing 224 children for the elementary school, and 50 for the high school, using the figures for classes as they now stand. More than half of these children are close enough to the proposed school to walk most of the time. Transportation would need to be provided, however, for about 75 children. With this map and its figures before them, the superintendent and board should be able to determine the details of bus routes and a time schedule with little difficulty. It would require three busses. The school could own its own busses or employ drivers who would furnish busses. Probably at the outset the latter would be the better way. Care should be taken in drawing contracts for this work, and only thoroly trustworthy men should be employed. Attention is particularly called to the recent State law which provides that the State shall pay most or all the cost of transportation. The State Department of Education should be consulted on this subject.

As to whether a feasible plan of transportation can be worked out here, we can answer, yes. The roads, the distances, the number to be transported, present far fewer difficulties than have been overcome in any one of a dozen states, as may be ascertained from various state superintendents' reports.

The 224 pupils of the elementary school would fall into grade groups as follows: grade I, 44; grade II, 29; grade III, 27; grade IV, 27; grade V, 30; grade VI, 19; grade VII, 26; grade VIII, 22. These groups could be organized into classes as follows: room 1 would contain 22 first-grade pupils; room 2 the other 22 first-grade pupils; beyond this one room for each of the grades. The high school would be little different in numbers from what it is at present, tho there is little doubt but that it would very soon increase in size, if experience elsewhere indicates anything.

As it now stands the Arlington schools have five elementary and three high-school teachers, a supervisor of music, and a superintendent. With the three rural teachers this gives thirteen in all. For the new plan one extra teacher would be needed. But with this extra teacher let us count the advantages that would be gained. It would furnish each separate grade with a teacher, this would make possible semi-annual promotions. Under the plan of supervision which it would make possible it would mean opportunity for high-grade teaching. It would mean that other studies, such as agriculture, could be added. It would mean that some elective studies could be offered in the two upper grades. It would mean that rooms could be equipped for special work. It would mean that debating, dramatics, athletics, and the social life of the school would be enriched, and that classes would be large enough to produce real competition among students. Thus the housing and actual reorganization of classes would present no real difficulties at all.

3. WHAT WOULD BE NEEDED TO CARRY OUT THE NEW PLAN?

To carry out this plan the old rural buildings and the Arlington elementary school buildings should be disposed of, and a single new building erected. Such a central building should be located on the present Arlington school block, and the block just back of this purchased. The alley separating the two blocks should then be closed, and a larger playground and an agricultural plot developed. Even this would be a smaller area than is regarded as desirable. At the outset, however, it would be possible to use the ground now owned, the additions to be purchased as resources make it possible.

The building should contain at least ten regular classrooms, a library room, a superintendent's office, a teachers' restroom, an assembly room, a gymnasium that can be converted into an auditorium, and a room that can be used for laboratory work.

For the present the old high-school building could be used and the extra space in the new building could be used for certain high-school work. After the new building is mostly paid for a new high-school site should then be purchased and a new building erected. Perhaps this would be in about six years from now. Until then, it is believed that fairly good schools can be conducted with one new building. In six or seven years, at the present rate of growth, the school may become overcrowded. If so, an excellent solution would be to organize a junior high school, consisting of grades VII, VIII, and IX, and house

it with the senior high school in a new building constructed with such ends in view, leaving the other building to the pupils of the first six grades.

Transportation facilities would be needed but these would be hired, as suggested above, until funds were available for purchases.

At least one extra teacher would be needed, and in addition it is suggested that great improvement would be effected if an extra high-school teacher could be employed, and so free the superintendent almost entirely for real work in supervising and building up the work of the schools.

From this it is clear that nothing revolutionary is here proposed. All that is suggested could take place with very little change except that all the children would go to one school instead of four. There are no serious legal or practical difficulties to overcome.

4. WHAT WILL BE THE COST OF SUCH REORGANIZATION?

The question of cost is apt to be the deciding question. The plan may be legally feasible and educationally desirable, but the cost will very likely determine what decision will finally be made.

At the present time, as has been made clear in Part II, above, all four of these districts are in need of new school buildings. There is not one building in the group that is a fit school home for the children of these communities. Of course, these buildings can be used yet, probably for ten or twenty-five years more, before they actually fall down. But they are already unfit in every way, the high-school building partially excepted, and ought to be replaced by a modern school home.

If four new buildings are to be built then the cost not only would be greater than the cost under the proposed new plan, but it would prevent consolidation for many years to come, and so insure a perpetuation of the present inefficient plan.

Under either the old or the new plan, then, these schools must have new buildings. If they will pool their interests and bond the new consolidated district for a building they would receive a gift of \$6,000 from the State. If they remain as independent districts they would receive no such help from the State toward new buildings. This sum is not a very large part of what a new plant would cost, but it is certainly worth while to relieve the tax payer of that much burden when the State law is intended to serve just such purpose.

The fact is, a new plant large enough for Arlington alone would be nearly large enough for the consolidated district. The question might arise then, as to whether the outside districts ought to share the cost of a new building. The answer is, they should. There would be no just reason why they should not. The amount contributed by any district would be only in proportion to the property taxed, and there is no more reason why Arlington should furnish a building for the districts outside than that the outside districts should furnish a building for the Arlington children. The burden of cost should be borne by all the wealth in the new district and not by part of it. While it is true that District 14, for instance, has only a few children, it is also true that it has only a small amount of wealth to tax, and so, it would pay its just share of the cost and no more.

The best method for handling this large initial outlay would be for the new district to issue bonds for the amount necessary. The bonds should be serial bonds, so that part of the principal would be paid each year. The bonds should not run longer than fifteen years, and ten years would be preferable, in view of the fact that in six or eight years it will be necessary to bond again for a new high-school plant.

Let us assume that the new building would cost \$100,000. The assessed valuation of property in Arlington for 1920 is \$409,154. In District 14 the valuation is \$204,682. In District 16 it is \$181,080. In District 30 it is \$219,684. The consolidated district would then have an assessed valuation of \$1,014,600. In general over the country it is assumed that when a group of districts have an assessed valuation of \$400,000 it is safe to consolidate. Here would be a district with an assessed valuation of over a million dollars.

Let us assume that the new district would bond itself for the full amount of \$100,000, to be paid in 10 equal annual payments of \$10,000, and that the bonds will bear 5 per cent interest.

At the end of the first year the interest would be \$5,000. The amount to pay at the end of the first year then would be \$5,000 interest plus \$10,000 on the principal. The second year this total would be \$14,500, and each year it would decrease \$500 until at the end of ten years the debt would be fully liquidated.

With an assessed valuation of property of \$1,014,600 it would require a tax of a little less than 14.8 mills to meet the total payment of interest and principal the first year. The second year (even assuming that the assessed valuation did not increase) a tax of 14.3 mills

would meet the payment. On the tenth year a tax of only 10.4 mills would be required, even with no increase in taxable wealth.

The fact is taxable wealth will increase, and therefore the necessary additional tax would be much lighter than these figures indicate.

If we consider that some of the towns with which Arlington has been compared are, for ordinary school purposes only, levying a tax of 40, 50, and even as high (in Walker, Minnesota) as 83.53 mills, while Arlington levies for such purposes a tax of only 26.3 mills we can see that to add 14.8 mills would make Arlington's total school tax, including interest and payment on bonds, only 41.1 mills. This is still a lower tax than at least six of these 25 towns are levying right along for ordinary school purposes.

It would seem, therefore, that after, say, another mill or two were added to care for all cost of transportation² and an extra teacher, that there could be no reasonable argument against this plan because of cost.

When we think of a tax of only 15 mills standing between good and poor schools it seems impossible to believe that any patron of this community would refuse to vote for the consolidation of these districts.

² By State law it is provided that most of the cost of transportation—probably all in a community of this type—will be borne by the State and not by the local community.

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1921-1922



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CALENDAR

1921-1922

1921

September	19-24	Week	Registration week
September	26	Monday	Regular class work begins
November	24	Thursday	Thanksgiving Day; a holiday
December	24	Saturday	Christmas recess begins

1922

January	2	Monday	Class work resumed
January	23-27	Week	Examination week, first semester
January	27	Friday	First semester ends
January	30	Monday	Second semester begins
May	22-26	Week	Examination week, second semester
May	26	Friday	Second semester ends
May	29	Monday	Annual dinner and closing exercises

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It is not intended that any regulation should debar from the privileges of these courses any person who can pursue them profitably. Those persons desiring credit toward a university degree must of course comply with the regulations laid down by the college in which credit is desired. Those not desiring such credit may be admitted, provided they are sufficiently mature (more than eighteen years of age) and can satisfy the departments in which they wish to study that they are able to carry the work profitably to themselves and without hindrance to the classes.

CREDIT FOR EXTENSION COURSES

Credit toward a degree will be given students who satisfy the entrance requirements of the college in which credit is desired and who successfully complete any of the extension courses of university grade. This applies to all the courses listed under academic or collegiate courses, unless otherwise specified. It also applies to nearly all the business courses. No courses listed under engineering carry credits. Credit in any extension course will be awarded only to those students who pass the final examinations of that course. Such credits will be recorded upon matriculation in the University. Courses requiring one evening (two hours) a week for recitation normally carry 2 semester credits. Those requiring more time usually carry correspondingly more credits. In the Extension Division credits are still reckoned on the semester, not the quarter, basis. The school year is divided into two semesters of sixteen weeks each, with an extra week devoted to examinations. Normally each class meets one night a week for two hours.

The statement concerning credit for the Certificates in Accountancy, in Finance, and General Business will be found on pages 27, 28, and 29.

Students *must indicate at the time of registration whether or not they desire university credit in the courses pursued.*

Regulations Concerning Credit in the College of Science, Literature, and the Arts

1. All courses for which credit is given in the College of Science, Literature, and the Arts must be authorized with the credits by the Advisory Committee. But credit shall be given only to those extension courses which are conducted in essentially the same manner as the corresponding courses in the University and which are carried on under similar conditions as to attendance, term's work, quizzes, and examinations.

2. Each credit course shall be directly in charge of a member of the faculty.

3. Any regularly enrolled University student successfully completing an approved course shall receive an appropriate credit.

4. Any person shall receive a certificate upon satisfactorily completing an approved course. The certificates entitle the holder to the corresponding University credits whenever he has earned 30 credits in residence. The University examiner shall in all cases pass upon the qualifications of the student.

5. The maximum credit towards a degree for work done in extension courses shall not exceed one half the unit hours required for graduation.

6. Credit for an amount not exceeding one quarter of the unit hours required for graduation may be given at the University of Minnesota to students of such other extension schools or departments as may be approved by the advisory committee, provided that such credit shall be subject to the same provisions as govern credits in the General Extension Division of the University of Minnesota.

RESIDENT STUDENTS

1. No University student may enroll for extension courses for the purpose of removing a condition or failure.

2. No University student may enroll for an extension course if this would increase his credit hours beyond what the rules allow.

3. Any University student who wishes to enroll for an extension course must first obtain the approval of the dean of his college.

FEEES

Collegiate courses meeting one evening a week require a fee of from \$5 to \$7.50 a semester of sixteen weeks. For collegiate courses meeting two evenings a week, the fee is from \$10 to \$15 a semester.

The fee for the business and engineering courses for a single subject is \$7.50 a semester, with the exception of a few advanced or technical courses for which the fee is \$10 a semester. Each class is a separate unit. The grouping of subjects into courses does not affect the unit fee for each subject.

The fee does not include the cost of texts or materials. The cost of these items varies from \$1 to \$3 a course.

All fees are payable at the time of registration, and registration should not be deferred longer than the second meeting of class. Checks should be made payable to the University of Minnesota.

Special arrangements are made with organizations, clubs, and business concerns, whereby instruction may be given to groups of students within the organization at a sum which will somewhat reduce the individual rate per member. However, such classes can not be restricted to that group alone but must be open to the general public.

REFUNDS

No fee will be refunded on account of withdrawal from any course. Exceptions to this rule will be made only in case of (a) removal from

the city or (b) illness or physical disability as attested by the certificate of a reputable physician. Application for pro rata refund under the above conditions *will not be considered later than fifteen days after registration.*

LENGTH OF COURSE

A semester consists of sixteen weeks of instruction with an additional week for the final examination.

PLACES FOR CONDUCTING CLASSES

Most of the classes in engineering will be held in the Main Engineering Building, Electrical Engineering Building, the Mechanical Engineering, or the Experimental Engineering Building.

Other classes in Minneapolis are conducted at the University, at the Public Library, at the City Hall, and in some of the public schoolhouses. Definite locations for each class will be announced in a circular to be published about September 15.

In St. Paul the work will be carried on at the City Hall and the Public Library. Additional accommodations will be provided for in some cases.

In Duluth the work will be carried on in the St. Louis County Court-house.

NUMBER FOR WHOM CLASSES WILL BE ORGANIZED

Classes will not be organized for a smaller enrolment than fifteen and in some courses a larger registration will be required.

TIME OF MEETING

Classes ordinarily meet at 7:30 and dismiss at 9:30. Classes in business subjects frequently meet at 6:30.

ENROLMENT

Registration for the first semester takes place during the week preceding the organization of classes (September 19-24). Students are advised to register with the instructor at the first meeting of the class.

RULE REGARDING ABSENCES

The attention of students and faculty is called to the following rule regarding absences:

"No student whose absences exceed three (3) of the regular scheduled sessions of the course for a semester shall be admitted to the final examination of the course without special permission of the director of University Extension."

PROGRAM OF CLASSES

Folders will be issued about September 15, giving the program of classes and schedules of meeting places. It should be understood that *not all the courses listed in this bulletin are given in any one year.* Final announcement may be found in the special folder. Folders will be issued for the

- collegiate courses, the business courses, and the engineering courses. Separate bulletins are also issued for each of these groups of courses.

LOCATION OF EXTENSION OFFICES

The offices of the General Extension Division may be found on the ground floor of the Main Engineering Building, on Washington Avenue and Church Street Southeast. To telephone the office call N. W. Dinsmore 2760 and ask the University central for the General Extension Division.

COURSES OF INSTRUCTION

The courses of instruction naturally group themselves into three divisions, viz., (1) those corresponding to the regular college courses given in the College of Science, Literature, and the Arts, and conveying credit toward a degree from that college; (2) those furnishing a preparation for business (most of which also carry credit toward a degree from the School of Business); (3) engineering or industrial courses. A separate bulletin of each of these groups may be obtained on request. The description of courses will therefore be grouped in this order. The first group will be designated collegiate courses.

DEPARTMENT OF COLLEGIATE INSTRUCTION

The following courses are offered extension students with two purposes in view: First, an opportunity is afforded those who are candidates for degrees, but who are unable to pursue their entire college course in regular residence, to complete a part of their work while otherwise occupied during the day.

Second, the advantage of university training in cultural subjects is offered those who can devote one or more evenings a week to such work, regardless of any desire for university credit.

The General Extension Division is now prepared to offer the following evening courses. Others will be given provided a sufficient registration is assured, usually fifteen. Those interested in forming such classes are advised to correspond with the director.

A special folder announcing specific dates and places for holding classes will be issued early in September. This folder, containing the class program, will be sent to all requesting it.

FEEES

Each course listed as a collegiate course requires a fee of \$5 for the semester of sixteen weeks, the class meeting one evening a week for two hours. A few advanced courses require a fee of \$7.50. For collegiate courses meeting two evenings a week the fee is \$10 a semester, with the exception already noted.

TEXT MATERIAL

When text material is furnished in mimeographed or printed form the student is required to reimburse the University for its cost. This cost varies from \$1 to \$3 per course.

RULE REGARDING ABSENCES

The attention of students and faculty is called to the following rule regarding absences:

"No student whose absences exceed three (3) of the regular scheduled sessions of the course for a semester shall be admitted to

the final examination of the course without special permission of the director of University Extension."

CREDIT

Credit in any extension course will be awarded only to those students who pass the final examination of the course.

LENGTH OF COURSE

A semester consists of sixteen weeks of instruction with an additional week for a final examination.

AMERICANIZATION TRAINING AND ANTHROPOLOGY

THE AMERICAN PEOPLE

- 1 (113). OLDER IMMIGRANTS. Characteristics, contributions, and distribution of the older immigrant peoples in America, their modification and importance to us. Two credits (one evening a week); first semester. MR. JENKS.
- 2 (114). NEWER IMMIGRANTS. Characteristics, contributions, and distribution of the newer immigrant peoples in America, their modification and importance to us. Two credits (one evening a week); second semester. MR. JENKS.
- 3 (115). AMERICANISMS AND ASSIMILATION. Essential and unique historical Americanisms and their value and virility for the future in America. Conditions and facts of assimilation. Two credits (one evening a week); second semester. MR. JENKS.

ART

1. ART APPRECIATION—ANCIENT AND MEDIEVAL. This is a cultural rather than a technical course, leading to the appreciation of architecture, sculpture, and painting as an expression of the civic and intellectual activities of the time in which the artist lived. Sixteen two-hour lectures illustrated with lantern slides. One hour required reading to supplement each lecture. Two College of Education credits (one evening a week); first semester.
2. ART APPRECIATION—RENAISSANCE AND MODERN. This is a cultural rather than a technical course, leading to the appreciation of architecture, sculpture, and painting as an expression of the civic and intellectual activities of the modern period. Sixteen two-hour lectures, illustrated with lantern slides. One hour required reading to supplement each lecture. Two College of Education credits (one evening a week); second semester.
3. FREEHAND DRAWING. Drawing and painting from life and from casts. with lectures on the construction of the human figure and its

application to decoration. Students completing both semesters will be taught how to make etchings. (One evening a week); both semesters. MR. BURTON.

CHEMISTRY

1. GENERAL INORGANIC CHEMISTRY—THE NON-METALS. A study of the common non-metallic elements and their principal compounds, with discussions of the laws and theories of chemistry. One lecture, one recitation, and three hours laboratory work per week. TTh; 7:30-10:00. First semester. MR. GEIGER.
2. GENERAL INORGANIC CHEMISTRY AND QUALITATIVE ANALYSIS—THE METALS AND QUALITATIVE ANALYSIS. A study of the common metallic elements and their principal compounds, with a further discussion of the laws and theories of chemistry, and systematic qualitative analysis. One lecture, one recitation, and three hours laboratory work per week. Open to students who have completed Course 1 or its equivalent. Second semester. MR. GEIGER.

NOTE: The work of both semesters is equivalent to 6 semester or 9 quarter credits. Students desiring credit in the College of Science, Literature, and the Arts can earn 10 quarter credits by doing extra work by assignment.

ECONOMICS

1. ELEMENTS OF ECONOMICS. For description see Department of Business Instruction. (One evening a week); first semester.
2. ECONOMIC PROBLEMS. For description see Department of Business Instruction. (One evening a week); second semester.

EDUCATION

- 1 (3a). SOCIAL ASPECTS OF EDUCATION. This course deals with conditions within the school itself,—such as the socialized recitation and the social activities of students. It also discusses educational activities outside the school, including the various institutions which influence society. It treats of the necessity of coördinating the social activities within and without the school so that each may become more effective. Two credits (one evening a week); first semester.
- 2 (119). THE SCHOOL CURRICULA. An attempt is made to discover fundamental principles governing the material and methods of education in a democracy. To this end it discusses the nature of what we mean by a democratic society. The aims and methods of the enterprise of education are considered from this point of view. Two credits (one evening a week); second semester.

3. ADMINISTRATION OF VILLAGE AND CONSOLIDATED SCHOOLS. A course designed for the principals of small schools. The technic of school administration and supervision is specifically applied to the small system. An effort is made not only to acquaint the student with progressive movements in education, but also to help him adjust himself to conditions as he actually finds them. Two credits (one evening a week); second semester. MR. FINNEY.

VOCATIONAL AND INDUSTRIAL

1. METHODS OF ESTABLISHING TRAINING DEPARTMENTS IN FACTORIES AND STORES. This is a course for foremen, superintendents, and other executives in the organization and establishment of training departments and "vestibule schools" as a part of scientific management and the employment system. This course will be so arranged that each member of the class will at the end of the course be in possession of the complete data necessary for the establishment of such courses in his own organization. No credit (one evening a week); first semester. MR. PAYNE.
2. SHEET-METAL PATTERN-DRAFTING FOR TINSMITHS AND SHEET-METAL WORKERS. This is a practical course of real problems and development of patterns and of forms and types of sheet-metal work. For boiler-makers, coppersmiths, tinsmiths, and automobile-body men. The course is divided into the following progressive units: (1) development of patterns by orthographic projection; (2) by the use of parallel lines; (3) by means of radial lines; (4) by triangulation; (5) approximation; (6) templates. Students will be encouraged to bring in practical problems from their every-day work. No credit (one evening a week); first semester. MR. PAYNE.
3. SCIENTIFIC METHODS OF HANDLING AND TESTING LABOR. This is a practical course covering the development of scientific methods in handling and testing labor. A complete study will be made of the three groups of tests used. Practical illustrations from plants using these tests. The students of this class will be encouraged to apply the class work to their own particular situations. No credit (one evening a week); second semester. MR. PAYNE.
4. CAUSES OF AND CURES FOR INDUSTRIAL UNREST. An analytical study is made of the fundamental causes of various types of industrial unrest and the remedial measures that have been taken by various organizations. The work of this class will be from the standpoint of the administrator and executive. No political panaceas will be discussed. No credit (one evening a week); second semester. MR. PAYNE.
5. BUSINESS AND FACTORY MANAGEMENT I. The first part of this course deals with the origins of present practices in management, the underlying principles of efficiency in management, the several forms of organization. Part I is prerequisite to Part II. No credit (one evening a week); first semester. MR. PAYNE.

6. BUSINESS AND FACTORY MANAGEMENT II. The second part deals with the more specific details of management, such as scientific management, business cycles, methods of control, selection of personal incentives and rewards, labor problems, etc. No credit (one evening a week); second semester. MR. PAYNE.
7. FOREMAN'S COURSE IN METHODS OF HANDLING LABOR. The aim of this course is to develop in the foreman the scientific point of view in regard to the various problems of handling labor of various kinds as related to production. Some of the detailed lessons are: Evolution of the factory system, functional foremanship, testing of trade knowledge and skill, psychology of the worker, job analysis, personnel analysis and the foreman as an instructor. No credit (one evening a week); both semesters. MR. PAYNE.
8. EMPLOYMENT MANAGEMENT I. The first part of this course deals with the significance of employment management as a part of our evolving industrial civilization, its relation to scientific management, and the organization and functions of an employment department. Part I is prerequisite to Part II. No credit (one evening a week); first semester. MR. PAYNE.
9. EMPLOYMENT MANAGEMENT II. The second part deals in detail with the several functions of the employment department, such as: sources of labor supply, interviewing, scientific selection of men, wage systems, training the worker, labor audits, labor turnover, psychology of the worker, and modern industrial movements. No credit (one evening a week); second semester. MR. PAYNE.

ENGLISH

- 1 (1-2-3). GENERAL SURVEY OF ENGLISH LITERATURE. Lectures, recitations, and assigned readings. Designed to prepare for more minute study of special periods. Two credits (one evening a week); first semester.
- 2 (1-2-3). GENERAL SURVEY OF ENGLISH LITERATURE: A continuation of Course 1. Two credits (one evening a week); second semester.
- 3 (8). SHAKESPEARE. An introductory study of Shakespeare's development as a poet and dramatist up to *King Lear*, with readings of representative plays. Two credits (one evening a week); second semester. MR. RARIG.
- 4 (44). AMERICAN LITERATURE. Lectures on American literature with extensive readings from the principal poets and prose writers of the United States. Two credits (one evening a week); second semester. MR. NICHOLS.
- 5 (109-110). THE ROMANTIC POETS. A study of the Romantic School of poets from Wordsworth to Keats, and the influence of the French

- Revolution upon them. Two credits (one evening a week); first semester. MR. RUUD.
- 6 (151). RECENT POETRY. Poetry in England and America since the death of Queen Victoria. The main tradition and tendencies now prevailing. Two credits (one evening a week); second semester. MR. BEACH.
7. MODERN FRENCH AUTHORS. A study of the French authors of the nineteenth century in English. No credit (one evening a week); first semester. MR. SEARLES.

GERMAN

1. BEGINNING GERMAN. Pronunciation, grammar, conversation, and composition; selected reading in easy prose and verse. Eight credits (two evenings a week); both semesters. Open to all who have had no German. Both semesters must be completed before credit is given for the first semester. MR. KROESCH.
2. ELEMENTARY CONVERSATION. Conversation on topics of every-day life, aiming at fluency in the use of idiom. Not a course in composition. Organized on the laboratory basis—one hour credit with two hours recitation and at least one hour of outside preparation. Intended for those who have had at least one year of German. Two credits (one evening a week); both semesters. MR. DAVIES.
3. RAPID READING. Short stories and dramas by Storm, Heyse, Baumbach, Lessing, Goethe, Schiller, Hebbel, and Sudermann. Class work and discussions are conducted in German. Open to all who have had at least one year of German. Four credits (one evening a week); both semesters. MR. DOWNS.
4. COMMERCIAL GERMAN. Oral use of the language. Practical vocabulary. In the second semester attention will be given to business correspondence. Open to all with two years German. Both semesters must be completed before credit is given for the first semester. Eight credits (two evenings a week); both semesters. MR. BURKHARD.

GREEK IN ENGLISH

1. GREEK MYTHOLOGY. No knowledge of Greek is required for this course. A course of lectures and readings dealing with the legends and myths which appear in the literature and art of ancient Greece. The quaint and beautiful stories of Greek gods and heroes found in Homer and in the tragic and lyric poets will be presented and interpreted, and the whole course will be richly illustrated with the stereopticon. The origin and evolution of the myth, its relations to Greek literature, philosophy, and religion, and its influence upon later literature, will also be touched upon. Two credits (one evening a week); first semester. MR. SAVAGE.

2. GREEK LITERATURE AND LIFE. This is a course dealing with the literature, life, and art of the ancient Greeks, for which no knowledge of Greek is required. The course consists of lectures and illustrative readings by the instructor and assigned readings in translation and textbook work by the class; conferences and informal discussions will also be held. The character and influence of Greek culture, especially along the lines of literature, philosophy, and art, will be discussed; and the whole course will be richly illustrated with the stereopticon. Especially designed for those interested in language and literature. Two credits (one evening a week); second semester. MR. SAVAGE.

HISTORY

- 1 (1). EUROPEAN HISTORY I. The development of Europe from 800 to about 1500 A. D. with special emphasis upon the political, social, and economic institutions of the period. Open to all. Two credits (one evening a week); first semester. MR. KREY.
2. (2). EUROPEAN HISTORY II. The development of Europe from c. 1500 to 1789. In this period are treated the Reformation, religious wars, and the causes of the French Revolution. The political growth of the nations of Europe is especially emphasized. Two credits (one evening a week); second semester. MR. KREY.
3. EUROPEAN HISTORY III. The development of Europe from 1789 to the present time. Political history especially emphasized. Social and economic problems are treated in their international aspects. Two credits (one evening a week); second semester. MR. KREY.
4. RECENT AMERICAN HISTORY. A study of the political, social, and economic movements in the United States beginning with the later years of the nineteenth century. Considerable attention will be paid to international relations during this period. Two credits (one evening a week); first semester. MR. SHIPPEE.
5. THE FOUNDATIONS OF THE MODERN WORLD. A study of the history of the last half century, and especially of the historical development of the greater international problems of to-day. The course will be primarily historical in scope, studying such questions as the Near East, the conflict of imperialism in the Far East, the development of the present situation in Russia. Emphasis will however be laid on the factors that are especially important at the present moment. Two credits (one evening a week); first semester. MR. TYLER.
6. ROMAN HISTORY. A history of Rome to the death of Constantine in 337 A. D., with special emphasis on its political, social, and economic development. Lectures and assigned readings. Two credits (one evening a week); first semester. MR. CRAM.

HOME ECONOMICS

- 1 (H.E.3). TEXTILES. This course will include a discussion of those points in fabric study that are of value to both the purchaser and seller of fabrics,—fabric structure, fibers employed in their manufacture, methods of substitution and adulteration, tests for quality, art and economic considerations in their purchase for clothing and household purposes. Two credits (one evening a week); first semester. MISS WELLER.
- 2 (H.E.13). DRESSMAKING. A course in the technic of clothing construction that will give practice in the use of commercial patterns, modeling on the dress form, and application of construction processes. Problems: preparation of a dress form, and the making of a wool dress and tailored silk waist. Two credits (one evening a week); second semester. MISS PATCHIN.

JOURNALISM

1. NEWS-WRITING. Practice in writing types of stories covered by reporters for metropolitan newspapers. Study of style, structure, news value, and news-gathering methods, with practice in getting news. Analyses of American newspapers. Four credits (one evening a week); both semesters. MR. BARLOW.

LATIN IN ENGLISH

1. LATIN LITERATURE IN ENGLISH. No knowledge of Latin is necessary for this course. It is designed primarily for students of literature who desire an acquaintance with those great Roman figures who have exerted such a profound influence on the modern literatures, especially the English, but it is also hoped that it may prove of value to those students and teachers of the Latin language who desire a comprehensive view of its literature. The work will consist of lectures by the instructor on the history of Latin literature to the close of the Silver Age with some account of its influence on modern literature. Illustrative passages from the authors discussed will be read in class and there will be assigned reading in standard translations and histories of Latin literature. Two credits (one evening a week); first semester. MR. CRAM.

PHILOSOPHY

- 1 (20). PRESENT-DAY PHILOSOPHY. A popular discussion of the most important types of contemporary philosophy. Among the men and movements included are: Haeckel, Eucken, Bergson, Nietzsche, pragmatism, idealism, and neo-realism. Two credits (one evening a week); first semester. MR. CONGER.
- 2 (124). POLITICAL AND SOCIAL ETHICS. A study of the ethical basis of society and the state and a consideration of some of the unsettled problems of politics and economics from the ethical point of view. Two credits (one evening a week); first semester. MR. WILDE.

- 3 (129). MODERN POLITICAL THOUGHT. A study of the development of modern theories of the nature, basis, and authority of the state. Beginning with a preliminary sketch of the ideas of Plato and Aristotle, the course will include the most important political theories from the Renaissance to the present. Two credits (one evening a week); second semester. MR. WILDE.

POLITICAL SCIENCE

1. AMERICAN FEDERAL GOVERNMENT. An elementary course in American government and politics designed for those studying the problems of citizenship, and for teachers. The course treats of the origin and nature of the federal system of government; of the political party system; the federal constitution; structure and organization of the national government; powers and functions of Congress; the executive and the judiciary; the civil service; the regulatory commissions; national finance; the conduct of foreign affairs; war powers of the government. Texts, *American Government and Politics*, by C. A. Beard, and *The New American Government and Its Work* by J. T. Young. Two credits (one evening a week); first semester.
2. STATE GOVERNMENT. A complementary course to 1 preceding. The constitutional basis of state government; relation of the states to the national and local governments, and to the citizen; organization, functions, and actual workings of state governments, and of county, township, and city governments; public opinion and popular control in state governments; nominations and elections, initiative, referendum, and recall; taxation and finance; social and regulatory legislation. Texts, Beard's *American Government and Politics* and *The New American Government and Its Work* by J. T. Young. Two credits (one evening a week); second semester.
- 3 (158). GOVERNMENT AND BUSINESS. Governmental powers; laissez faire versus regulation; protection against fraud and oppression; restraint of trade and manipulation of prices; protection of debtors; business affected by public interest; qualified property; compulsory benefits; conservation of natural wealth; vested rights; confiscatory legislation; administration of business legislation; reaction of war emergency measures on permanent policy. Two credits (one evening a week); second semester. MR. YOUNG.

PSYCHOLOGY

- 1 (1-2). GENERAL PSYCHOLOGY. An introduction to the scientific study of the human mind. Two credits (one evening a week); first semester.
2. APPLIED PSYCHOLOGY. The practical application of psychology, especially in the field of business. Prerequisite: Psychology 1. Two credits (one evening a week); second semester. MR. FOSTER.

3. **ELEMENTARY EDUCATIONAL PSYCHOLOGY.** A survey of fundamental facts of human behavior involved in educational activities. Open to qualified students. Two credits (one evening a week); first semester. MR. MILLER.

RHETORIC AND PUBLIC SPEAKING

- 1 (1). **RHETORIC I.** Practical training in writing; exposition, narration, and description. Analysis of prose selections and of compositions written by the class. Two credits (one evening a week); first semester.
- 2 (2). **RHETORIC II.** A continuation of the preceding course, open to those who have had a one-half year course in freshman rhetoric, or its equivalent. Two credits (one evening a week); second semester.
- 3 (11-12). **DESCRIPTION AND NARRATION.** Principles and practice; analysis of specimens; short themes and fortnightly essays, with emphasis on planning and amplification. Open to those who have completed the equivalent of Course 1-2 in college composition and rhetoric. Two credits (one evening a week); first semester.
- 4 (13). **EXPOSITION.** Literary criticism. A continuation of Course 3. Open to those who have completed the equivalent of three half years of college rhetoric. Two credits (one evening a week); second semester.
- 5 (41-42). **A GENERAL COURSE IN PUBLIC SPEAKING.** The principles of analysis and organization. Extemporaneous speaking based on outlines. Study of model speeches. Attention is given to correctness and effectiveness in delivery. Open to ministers, lawyers, teachers, and others who are able to carry the work. Four credits (one evening a week); both semesters. MR. LINDSLEY.
- 6 (81-82). **INTERPRETATIVE READING.** Interpretation and oral expression of the various forms of literature, the essay, the short story, lyric, and narrative poetry, and the drama. Open to those who have credit for Course 1-2, college composition and rhetoric, and Public Speaking 5 (41-42). Four credits (one evening a week); both semesters. MR. RARIG, MR. GARNES.
- 7 (83). **ADVANCED PUBLIC SPEAKING.** The distinctive characteristics of oratorical style: analysis of the styles of representative orators. Written and extemporaneous speeches. Individual criticism and direction. Two credits (one evening a week); first semester. MR. RARIG.
- 8 (110). **SHORT-STORY WRITING.** An advanced course in writing for those who have had experience in writing for publication or have had preliminary training in the technic of writing. Open for credit only to those who have had at least two years of college courses in writing or the equivalent. Four credits (one evening a week); both semesters.

9. **STORY-TELLING TO CHILDREN.** (1) Story-telling; its place and value; (2) choice of the story; qualities, desirable and undesirable; (3) preparation of the story; application of the short-story ideals of "singleness of impression" and "dramatic struggle"; reconstruction of the story from the child's viewpoint; (4) the problem of delivery: the group, consciousness, holding attention, self-effacement, vocal and verbal adaptation. No university credit (one evening a week); first semester. MR. GARNES.
10. **PLAY-PRODUCING.** Practical work in stagecraft, study of new lighting systems, color schemes, stage sets, examination of new ideals in acting, putting on of one community play; problems in directing discussed. Analysis of play suitable for high-school and college production. Two credits (one evening a week); first semester. MISS MACNAUGHTON.

ROMANCE LANGUAGES

FRENCH

- 1 (1-2). **BEGINNING FRENCH.** Grammar, pronunciation, reading, and practice in speaking. Open to all. Both semesters must be completed before credit is given for the first semester. Four credits (one evening a week); both semesters. MR. Lecompte, MR. BARTON.
- 2 (3). **INTERMEDIATE FRENCH I.** Reading, grammar, and composition. French grammar review; readings from modern authors. Open to all who enter the University with two years of French. Both semesters must be completed before credit is given for the first semester. Four credits (one evening a week); both semesters. MR. SIRICH.
- 3 (4). **INTERMEDIATE FRENCH II.** Continuation of Course 2. Practical composition and conversation. Informational readings on contemporary France and selected modern texts. Four credits (one evening a week); both semesters. MR. BARTON.
- 4 (13-14, 16-17). **ELEMENTARY FRENCH CONVERSATION AND COMPOSITION.** Four credits (one evening a week); both semesters. Prerequisite: French I.
5. **MODERN FRENCH AUTHORS.** A study of the works of the French authors of the nineteenth century in English. No credit (one evening a week); first semester. MR. SEARLES.

SPANISH

- 1 (1-2). **BEGINNING SPANISH.** Grammar, pronunciation, reading, and practice in speaking. Open to all. Both semesters must be completed before credit is given for the first semester. Four credits (one evening a week); both semesters. MR. OLMSTED.
- 2 (3). **INTERMEDIATE SPANISH.** Readings from modern authors. Grammar review. Composition work devoted chiefly to correspondence and commercial practice. Spanish will be as largely as possible the language of

the classroom. Open to those who have had Spanish I (1-2) and are approved by the teacher. Four credits (one evening a week); both semesters.

- 3 (20). **ELEMENTARY SPANISH CONVERSATION AND COMPOSITION.** Prerequisite, Spanish I. This course is open to students who have completed the course in Intermediate Spanish. Four credits (one evening a week); both semesters.

SCANDINAVIAN

1. **MODERN NORWEGIAN LITERATURE.** Works in the original of Wergeland, Welhaven, Moe, Björnson, Ibsen, Lie, Kielland will be studied. Also the Landsmaal movement. Two credits (one evening a week); first semester. MR. BOTHNE.
2. **MODERN NORWAY FROM 1814, IN ENGLISH.** Lectures and translated works of modern authors. The aim of the course is to make students familiar with modern Norway. One evening a week; second semester. MR. BOTHNE.
- 3 (104-105). **MODERN SCANDINAVIAN HISTORY.** Religious, political, and economic changes in the North; military enterprises and growth of liberalism. Special attention will be given to later industrial development and social legislation. Knowledge of Scandinavian not required. Four credits (one evening a week); both semesters. MR. STOMBERG.
- 4 (107-108). **MODERN SWEDISH LITERATURE.** The Swedish novel. Works in the original of Frederika Bremer, Almquist, Rydberg, Strindberg, Heidenstam, and Selma Lagerlöf will be studied. Some attention will also be given to Swedish poetry of the last half century. Four credits (one evening a week); both semesters. MR. STOMBERG.

SOCIOLOGY

- 1 (1). **INTRODUCTION TO SOCIOLOGY.** An examination of the evolution of human society from its earliest beginnings to the present, including a discussion of the fundamental factors involved and the social institutions arising during this process, followed by an analysis of some of the leading social problems of the day and a discussion of the psychic and biologic factors involved in human associations. Lectures, reading, discussion. Prerequisite to all other courses in sociology when taken for university credit. Two credits (one evening a week); first semester. MR. BERNARD.
- 2 (101). **SOCIAL ORGANIZATION.** A study of the social mind and its communication, the problems of democracy, of class and caste, of social conflict and revolution, and of social organization on a rational and scientific basis for social efficiency and progress. Lectures, reading, discussion. Course 1, prerequisite if university credit is desired. Two credits (one evening a week); second semester. MR. BERNARD.

- 3 (6). MODERN SOCIAL REFORM MOVEMENTS. A survey of attempts to overcome certain social maladjustments: child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection of infancy and youth, public recreation, etc. Two credits (one evening a week). MR. ELMER.
- 4 (14). RURAL SOCIOLOGY. The background and evolution of country life; rural conveniences, communication, coöperation; rural social institutions, especially the family, school, church, and social center; rural leadership, surveys, organization, social agencies. Two credits (one evening a week); second semester.
- 5 (3). EDUCATIONAL SOCIOLOGY. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. Two credits (one evening a week); first semester. MR. FINNEY.
- 6 (100). SOCIAL PSYCHOLOGY. A study of the method by which character, attitudes, and capacities are built up in the individual. A critical examination of the nature and classifications of instincts and of the methods by which habits are constructed under the influence of the various environmental pressures. Designed as a background for students who are particularly interested in problems of social organization and control. Two credits (one evening a week); first semester. MR. BERNARD.
- 7 (102). SOCIAL CONTROL. A study of the social, psychological, and physical factors which control and direct people in their social relationships. Subjects considered are the origin, evolution, and direction of social control, the means and technic of social control, the growth toward rational and scientific social control under the influence of a developing social science, the limits and purposes of social control. Designed for the same class of students as Course 6. Two credits (one evening a week); first semester. MR. BERNARD.
- 8 (120). SOCIAL PROGRESS. An examination of the nature and conditions of social progress, involving a study of human nature in its relation to social progress, of the physical and social environments as limiting and stimulating factors in social progress, and of the contribution of modern science to social progress. Various theories of social progress are reviewed and criticized with the purpose of arriving at a tenable theory in the light of present knowledge. Two credits (one evening a week); second semester. MR. BERNARD.
- 9 (140). HISTORY OF SOCIAL THOUGHT. Lectures and readings on the main contributions, personalities, and social backgrounds of the leading contributors to social thinking from the times of the Greeks to the middle of the nineteenth century. The main tendencies as well as the individual theories are kept in view and both are related to the circumstances out of which they developed. Such men as Plato, Aristotle, St. Augus-

tine, Dante, More, Bacon, Hobbes, Vico, Montesquieu, Condorcet, Rousseau, Herder, Godwin, Bentham, Saint-Simon, and Comte are given most attention. Particularly recommended for those who wish to understand how our present social ideas came to be. Two credits (one evening a week); first semester. MR. BERNARD.

- 10 (141). CONTEMPORARY SOCIAL THOUGHT. Lectures and readings on the main lines of social thought developing within the last fifty years, with especial emphasis upon present tendencies. The chief schools considered are the biological, the environmentalist, the anthropological, the anthropogeographical, the statistical, the economic interpretationists, the anarchists, the social psychologists, the group struggle theorists, the classificationists, the theory of the elite, etc. Due consideration will be given to American sociologists. Two credits (one evening a week); second semester. MR. BERNARD.

SWIMMING

A course of instruction in swimming will be given in the Women's Gymnasium on the University campus. The classes are open to men and women alike. The course continues through the school year, one hour an evening, and those registering in the first semester will go on with the work the second semester without further registration. These courses carry no university credit.

Persons taking the courses are required to conform to the regular University rules in regard to the gymnasium and the pool.

1. SWIMMING. Family class with children. One evening a week; first and second semesters. MR. FOSTER.
2. SWIMMING. Beginning class for women only. One evening a week; first and second semesters. MR. FOSTER.
3. SWIMMING. Family class. No children. One evening a week; first and second semesters. MR. FOSTER.
4. SWIMMING. Advanced class for women only. One evening a week; first and second semesters. MR. FOSTER.

ADDITIONAL COURSES

Many advanced courses not listed in this bulletin will be given upon the request of any responsible individual or group willing to organize a sufficiently large class to insure the success of the undertaking.

DEPARTMENT OF BUSINESS INSTRUCTION

PURPOSE

The Department of Business Instruction recognizes the professional status of the business executive. It aims to give prospective executives thoro training for the work they are to undertake. Professional education rather than detailed drill in narrow technical processes is the object toward which instruction is directed. Scientific method in analyzing business data, trained intelligence in dealing with the human relationships with which business is made up, and well-developed sense of moral responsibility will be the foundations of business effectiveness in the future. Experience has proved that those persons whom the department is reaching can, by being actively employed during the day, comprehend and appreciate this course of instruction in a particularly advantageous manner. The courses are conducted in close coöperation with the School of Business of the University.

INSTRUCTION

The subjects of instruction are divided into three groups of courses of study; namely, those aiding in a preparation for accountancy, those aiding in preparation for banking, and those having for their object a general business training. In each of these courses certain fundamental subjects such as business law, economics, and business English are required.

Upon the completion of one of these courses, a University Certificate in Accountancy, Banking, or General Business, as the case may be, will be granted.

ADMISSION TO COURSES

All persons may be admitted to extension courses provided they are sufficiently mature and can satisfy the instructors in whose classes they wish to register that they are able to carry the work profitably to themselves and without hindrance to the classes. Students who are high-school graduates are invited to file, with the University registrar, their regular university entrance requirements so that credits earned in the department may apply toward a University degree as well as toward a departmental certificate. Attention is called to the fact that those persons who are not high-school graduates may work off university entrance requirements in several different ways. They may take the Minnesota State High School Board examination, they may pass the University entrance examinations, or they may successfully complete the required courses in the Correspondence Study Department of the University. (See University bulletin of general information.) The admission requirements for business students are as follows:

1. Four units of English; or three units of English and four units of a foreign language; or three units of English and two units each of two foreign languages.
2. One unit of algebra and one unit of plane geometry, and enough additional work to make in all fifteen units, of which not more than four may be in Group F.

The term unit means not less than five recitations of forty minutes each week for a school year of at least thirty-six weeks. In manual subjects and kindred courses, it means the equivalent of ten recitation periods a week for thirty-six weeks.

A detailed statement of the entrance subjects required, grouped into six groups may be found in the University bulletin of general information. The completion of preparatory courses as above outlined will also be accepted by the State Board of Accountancy as the preliminary high-school training qualification required of applicants for the degree of C.P.A.

CREDITS

The Department of Business Instruction gives credit upon the successful completion of any of its courses. A final examination is required in every instance. Such credit can be applied towards a University Certificate in Accountancy, Finance, or General Business as the case may be, and in addition, where the student has presented university entrance requirements may be applied towards a degree from the School of Business under certain restrictions. For further information on this subject see the University bulletin of general information and the bulletin of the School of Business.

FEEs

The fee for each business course is \$7.50 a semester, with the exception of a few advanced courses for which the fee is \$10 a semester. Each class is a separate unit. The grouping of subjects into courses does not affect the unit fee for each subject.

TEXT MATERIAL

When text material is furnished in printed or mimeographed form the student is required to reimburse the University for its cost. This amount will vary from \$1 to \$3 a course.

RULE REGARDING ABSENCES

The attention of students and faculty is called to the following rule regarding absences:

"No student whose absences exceed three (3) of the regular scheduled sessions of the course for a semester shall be admitted to the final examination of the course without special permission of the director of University Extension."

LENGTH OF COURSE

A semester consists of sixteen weeks of instruction with an additional week for the final examination.

THE HERBERT C. PALIN ADVERTISING PRIZE

Mr. Herbert C. Palin, of Los Angeles, California, has presented a silver loving cup to the advertising class. On this cup is to be inscribed each year the name of the student who, after taking a full year's course in advertising, submits the most constructive plan for an advertising campaign. The cup is to remain in the possession of the winner for one year.

COURSE IN ACCOUNTANCY

This course is designed to meet the needs of two classes of students, namely, those who wish to prepare to take the state C.P.A. examinations with a view to becoming public accountants, and those who aim to fit themselves for responsible positions with private business firms.

For the student who wishes to pursue either object we recommend that he plan to take the regular course herein outlined and thus secure a broad foundation for his work.

In addition to the courses enumerated below, attention is called to the subjects given in the four-year course of the School of Business, many of which may be taken by correspondence or in evening classes outside of this department. See the announcements of the collegiate and engineering courses, General Extension Division.

Upon the satisfactory completion of this course, the University Certificate in Accountancy will be granted.

Beginning with the year 1917-18 the course requires a total of 30 credits, each one-semester subject counting for 2 credits, with the exception of the accounting laboratory which counts for one credit. Each subject requires one two-hour class recitation per week for one semester of sixteen weeks with an additional meeting for a final examination.

In order to secure the University Certificate in Accountancy, 14 credits in accounting are necessary, including Principles of Accounting A, Principles of Accounting B, Accounting Laboratory A, Accounting Laboratory B, Accounting Practice and Procedure A, and Accounting Practice and Procedure B; 6 credits in business law including Business Law A and Business Law B; 2 credits in economics, and 2 credits in business English. The student may elect subjects to cover the remaining 6 credits.

Students of experience and some maturity may join the class by registering as auditors, in case they do not care to secure credit for the course toward a Certificate in Accountancy. These students will not be called upon to take part in the discussions nor to turn in work which is required of students registering for credit. In this way the University hopes to make available the benefits of the courses to those who feel they lack the opportunity or time to do the work regularly required in the course.

The following subjects are required for the course:

Principles of Accounting A (2)	Auditing A (2)	} Elective
Principles of Accounting B (2)	Auditing B (2)	
Accounting Laboratory A (1)	Cost Accounting A (2)	
Accounting Laboratory B (1)	Cost Accounting B (2)	
Accounting Practice and Procedure A (2)	Business Law A (2)	
Accounting Practice and Procedure B (2)	Business Law B (2)	
	Business Law C, D, or E (2)	
	Economics (2)	
	Business English (2)	
	Elective subjects (6)	

COURSE IN BANKING AND FINANCE

This course is designed to meet the needs of two kinds of students: (1) those who are preparing for, or who are now engaged in, such financial callings as banking, corporation management, stock and bond brokerage, credit work, or financial journalism; and (2) business men who wish to utilize in the upbuilding of their particular business all of the modern scientific knowledge of a practical financial nature.

University Certificate in Finance

Those students who wish to secure a thoro knowledge of finance, and an adequate knowledge of general business for a financial occupation, are urged to arrange their registration so as to obtain the Certificate in Finance as offered by the University.

Beginning with the year 1917-18 this certificate will be granted to those who complete a total of 30 credits distributed as follows:

Principles of Economics (2)	Accounting Laboratory A (1)
Banking Practice (2)	Accounting Laboratory B (1)
Investments and Speculation (2)	Business Law A (2)
Corporation Finance (2)	Business Law B (2)
Business English (2)	Business Law C or D (2)*
Principles of Accounting A (2)	Elective subjects (8)
Principles of Accounting B (2)	

The American Institute of Banking

The American Institute of Banking recognizes the evening courses of the General Extension Division of the University of Minnesota as fulfilling all the requirements of its educational department. Students who complete these courses in finance are accredited by the institute without further examinations or formality.

By this arrangement, the members of the Minneapolis, St. Paul, and Duluth chapters of the American Institute of Banking may obtain the A. I. B. Certificate upon completion of economics (2 credits), banking (2 credits), and Business Law A, B, C, and D (8 credits).

The advanced courses in finance coincide with the requirements of those who wish to receive the title of associate from the institute for post-graduate study.

COURSE IN GENERAL BUSINESS

For the benefit of those students who do not care to specialize in either accounting or in finance, yet wish to secure recognition as having completed a definite group of subjects, the following course is arranged. It is likely that certain of the subjects herein outlined will be more fully developed and later, together with the fundamental subjects, form courses in themselves.

It is planned that each of these courses will furnish a preparation for a definite calling, such as advertising, salesmanship, and sales management, railroad traffic, and office management.

University Certificate in General Business

Beginning with the year 1917-18 this certificate will be granted to those who successfully complete a total of 30 credits distributed as follows:

Business English (2)	Principles of Accounting B (2)
Business Law A (2)	Accounting Laboratory A (1)
Business Law B (2)	Accounting Laboratory B (1)
Business Law C (2)	Economics A (2)
Business Law D (2)	Economics B (2)
Principles of Accounting A (2)	Electives (10)

The electives should be selected with a view to specializing in some particular field, as in advertising and selling, in railroad traffic, and the like.

NOTE: It is possible for a student to obtain two of the certificates listed above. However, a second certificate will not be granted until the student has earned an additional 6 credits over the 30 credits required for the first certificate.

DESCRIPTION OF SUBJECTS

ACCOUNTING

The various courses in accounting are designed to subdivide the work in order that there may be proper sequence as well as to make possible sufficient emphasis on each phase of the subject. In the first year the subdivision is as follows: first, a series of lectures and discussions in the principles of accounting; and second, the putting of those principles to practical application by the working out of specific problems. Students not desiring to specialize in accounting may elect to omit this latter course, i.e., Accounting Laboratory A and B, but all taking the laboratory courses are required to take the corresponding courses in accounting principles.

1. INTRODUCTION TO ACCOUNTING. This is a course designed for those who are not prepared by experience or training to enroll immediately in Principles of Accounting, but who nevertheless desire to overcome their deficiencies and pursue the regular accounting courses. The course will take up the purposes of accounting, the use of books of original entry, posting to the ledger, the trial balance, closing the ledger, preparation of simple trading statements. No credit. MR. HOUSTON, MR. BLANDIN.
2. PRINCIPLES OF ACCOUNTING A. Fundamental classification of the balance sheet and operating accounts. The books and records primarily essential to disclose the data necessary for such balance sheets and operating accounts. Special discussions on the trading margins, operating expenses, etc. Various bookkeeping and accounting operations, such as accruals, deferred charges; special systems of handling accounting data, such as departmentization of accounts, imprest cash systems, the treatment of controlling accounts and auxiliary ledgers; preparation of simple working sheets and statements. Two credits (one evening a week); first semester. MR. HEILMAN, MR. BLANDIN, MR. HARPER, MR. HOUSTON, MR. RINGHAM, MR. SHANNON.

3. PRINCIPLES OF ACCOUNTING B. Continuation of Principles of Accounting A with more special reference to manufacturing and corporation accounts; treatment of good-will and depreciation, accountant's working sheet; adjusting of surplus, sinking funds, and reserve accounts; drafting condensed balance sheets and income statements. Two credits (one evening a week); second semester. MR. HEILMAN, MR. BLANDIN, MR. HARPER, MR. HOUSTON, MR. RINGHAM, MR. SHANNON.
4. ACCOUNTING LABORATORY A. The working out of practical problems covering the subject-matter discussed in Principles of Accounting A, under the guidance of an instructor. One credit (one evening a week); first semester. MR. BLANDIN, MR. HINES, MR. NIEMACKL, MR. SHANNON, MR. SMITH, MR. WHITE.
5. ACCOUNTING LABORATORY B. Work of a similar kind covering the subject-matter discussed in Principles of Accounting B. One credit (one evening a week); second semester. MR. BLANDIN, MR. HINES, MR. NIEMACKL, MR. SHANNON, MR. SMITH, MR. WHITE.
6. ACCOUNTING PRACTICE AND PROCEDURE A. An advanced course for the accounting student following the study of accounting principles. The object of the subject is two-fold: first, to familiarize the student with the peculiar accounting problems of business; and, second, to afford the student the means to secure that necessary insight and skill which practicing accountants must possess in order to meet the demands made upon them. The subject-matter is presented chiefly by means of a more or less exhaustive study of a representative business. The work consists of the following: (a) a study of the distinctive group of accounting problems which are likely to arise in a business organization through a series of years and the scientific solution of those problems; (b) a study of the accounting problems peculiar to representative business. The manner of presenting the subject is essentially practical, the students being required to work out for themselves problems similar to the ones studied. Two credits (one evening a week); first semester. MR. ROTZEL, MR. HARPER, MR. WAGNER.
7. ACCOUNTING PRACTICE AND PROCEDURE B. A continuation of Course 6. Two credits (one evening a week); second semester. MR. ROTZEL, MR. HARPER, MR. WAGNER.
8. COST-ACCOUNTING A. The elements of cost, i.e., prime cost and indirect expense of burden, kinds of cost-accounting, continuous process and production order costs. The materials ledger. Methods of accounting for labor. Methods of distributing indirect or "overhead" expense. The machine-rate method, and when applicable. Methods of compensating labor. Predetermined standard costs, and their relation to "scientific management." The cost ledger and its relation to the general ledger.

Modern industry demands that each plant be equipped with adequate accounting facilities for ascertaining the cost of operation. These costs are necessary to show, first, the profitableness of each branch of the industry so as to enable the management to push the profitable, and to drop the unprofitable lines, or to place them upon a paying basis; second, the cost of each article as a basis of price-making; third, so far as possible, the cost of each operation, so as to enable the management to plan economies in the operation of the plant. Two credits (one evening a week); first semester. MR. NOBLE, MR. TUTTLE.

9. COST-ACCOUNTING B. A continuation of Course 8. Two credits (one evening a week); second semester. MR. NOBLE, MR. TUTTLE.
10. AUDITING A. This course is essentially practical and is intended only for those whose previous training in the principles of accounting has been sufficient to enable them to be benefited by this advanced work. The chief aim will be to give students the training necessary to enable them to conduct audits and investigations either as private auditors or public accountants; to set up accounts for various purposes as a result of such audits or investigations and to prepare suitable reports thereon. Two credits (one evening a week); first semester. MR. ROTZEL.
11. AUDITING B. A continuation of Course 10. Two credits (one evening a week); second semester. MR. ROTZEL.
12. INCOME-TAX PROBLEMS. Course offered to those who have completed Principles of Accounting A and B for the purpose of familiarizing the accounting student with the accounting ramifications of the federal income tax law, and its application to various businesses and also to varying business conditions. The purpose of the course also will be to point out possible errors likely to be made in the preparation of the regular tax reports. Lectures, discussions, and working out of problems. Two credits (one evening a week); first semester. MR. PRESTON.

BANKING AND FINANCE

21. BANKING. The documents created by transactions in goods; the function of a bank in aiding industry; the steps in organization of national or state banks; corporate powers, rights, and liabilities of stockholders and directors; bank administration and the various offices and departments; deposits, depositors, and receiving tellers; bank reserves and circulating notes; the clearing-house, handling country checks, and transit departments; collections; domestic exchange; foreign exchange; discounts and collateral loans; credit department; how profits are made on government deposits, by note issue, in buying and selling exchange, by analysis of depositor's accounts; accounting methods and general balances; examination; supervision and reports; and bank policy from the analysis of local bank reports.

This course aims to explain the various functions of an up-to-date bank and to teach the methods by which its work is accomplished. A careful survey will be made of the economic basis, legal status, accounting methods, and financial problems of banking as carried on by large commercial institutions having a full complement of banking operations including city, country, and foreign business. The method of presentation comprises reading references, lectures, review questions, and use of the blackboard for all computations. Two credits (one evening a week); first semester. MR. EBERSOLE, MR. POWELL.

22. **MONEY AND CREDIT.** The origin, evolution, and functions of money; the gold standard, forms of money current in the United States; government paper, bank notes, and deposit currency described and analyzed; credit and its effects; the causes of general price changes; various types of standards and currency systems including bimetallism and the gold exchange standard; discount rates, the problem of securing an elastic currency, and the distribution of the world's gold among the nations; the problem of securing an ideal money. Textbook and money-market articles in current newspapers will furnish material for discussion.

A thoro understanding of the character and functions of money and of the principles of credit is the cornerstone of modern business intelligence. This course in money and credit constitutes an interesting and scientific treatment of the forces that determine value and prices, of the processes of exchange, and of the many forms of media of payment represented by monetary and credit instruments. Two credits (one evening a week); first semester.

- 23 (145). **CORPORATION FINANCE.** The evolution of the private corporation and its relation to other business units; the organization of a corporation; charters and articles of association; directors and officers, manner of their selection, their functions and responsibilities; forms of corporation stocks and bonds and their respective legal and financial characteristics; the marketing of securities; capital and revenues; intangible values; books and accounts; dissolutions, consolidations, and reorganization; trust and holding companies; the taxing of corporations; corporation statistics; the preparation and analysis of corporation reports; the corporation before the law.

Modern business in all of its major forms is directed through corporate organization. The course in corporation finance is designed to give the student such a knowledge of corporations and their administration as to make clear the general organization of industry and commerce. Texts will be extensively supplemented by informal lectures, class discussions, and topical essays. Two credits (one evening a week); first semester. MR. STEHMAN.

- 24 (142). **INVESTMENTS AND SPECULATION.** Stocks, bonds, endowments, annuities, and other forms of investment considered with regard to their security, income, and opportunity for rise or fall in value. The

social process of saving and investment; the investment fund; various classes of investments; the criteria of a good investment applied to government, corporation, and real-estate loans; railroad, industrial, timber, and mining securities compared; the laws of investment values. Stock exchange operations; money market and other influences affecting prices; analysis of present fundamental conditions. The actual operations upon the stock and produce exchanges are used to illustrate the study of speculation, and the course of the markets and the bank rates is closely followed as a basis of deduction in the analysis of cause and effect. Textbook and interpretation of financial quotations and reports. Two credits (one evening a week); second semester. MR. EBERSOLE.

BUSINESS LAW

NOTE: The subjoined courses in business law give credit toward a University degree only to those students who have earned 6 credits in political science or 6 in economics or three in each. Students who have not met these prerequisites may, however, take these courses for credit toward one of the University certificates in business. Specially qualified and mature extension students may petition for university credit.

31. BUSINESS LAW A—CONTRACTS AND AGENCY. Contracts: definition of a contract; offer and acceptance; special formality; consideration; capacity of parties; contractual powers of minors, or persons mentally deficient, and of married women; reality of consent, mistakes, misrepresentation, fraud, undue influence, legality of object; the operation of contracts; assignment of contracts; interpretation of contracts; methods of discharging contracts.

Agency: methods of forming agencies; methods of terminating agencies; the rights and obligations of principals, agents, and third parties. Text, lectures, and class discussion. Two credits (one evening a week; first semester. MR. CHAPIN, MR. CHILD, MR. GLICK, MR. PALMER, MR. RUMBLE.

This course is fundamental and must be completed before registration will be accepted for other courses in business law.

32. BUSINESS LAW B—SALES AND NEGOTIABLE INSTRUMENTS. Sales: sales of personal property; definition of a sale and its distinction from a bailment; when the title passes to the buyer; what title passes; rights of the seller (a) to set the contract aside on the ground of fraud, (b) to enforce lien for the purchase money, (c) to obtain stoppage in transit; rights of the purchaser (a) to demand goods of a certain quality, (b) to demand warranty of the purchaser's title.

Negotiable instruments: nature and characteristics: (a) definitions and characteristics, (b) uniform negotiable instruments law; form; (a) what a negotiable instrument must and must not contain (b) non-essential, (c) effect of blanks and delivery; negotiation: (a) negotiation, indorsement, and delivery, (b) holder in due course and his rights; maker's and acceptor's contract: (a) maker's contract on a promissory

note, (b) acceptor's contract on a bill of exchange, (c) presentment of a bill of exchange for acceptance; drawer's and indorser's contract: (a) drawer's contract on a bill of exchange, (b) indorser's contract on a bill or note, (c) presentment for payment, (d) notice of dishonor, (e) protest, (f) checks, (g) position of indorser after liability is fixed. Text, lectures, and class discussion. Two credits (one evening a week); second semester. For those who have completed Course 31. MR. CHAPIN, MR. CHILD, MR. DULEBOHN, MR. GLICK, MR. RUMBLE.

33. BUSINESS LAW C—PARTNERSHIPS AND CORPORATIONS. BANKRUPTCY. Partnerships: formation of partnerships; articles of co-partnerships; methods of terminating partnerships; rights and obligations of partner (a) toward his co-partners, (b) as an agent of the firm, (c) toward the firm's creditors, (d) for an accounting; special partners; limited partnerships.

Joint stock companies: how distinguished from ordinary partnerships; how like ordinary partnerships; statutory requirements.

Corporations: formation of corporations of various classes; termination of corporations; membership in corporations, methods of transferring interest, fraudulent issuance of stock by corporate officers; rights of stockholders (a) to dividends, (b) to inspect and control corporate affairs; liability of stockholders (a) on stock subscriptions, (b) to pay assessments, (c) for the corporate debts; the doctrine of ultra vires; rights and obligations of corporate directors; corporate mergers and consolidations; domestic and foreign corporations.

Insolvency and bankruptcy proceedings. Discharge in bankruptcy. Text, lectures, and class discussions.

For those who have completed Course 31. Two credits (one evening a week); first semester. MR. KENNY, MR. PALMER, MR. SMILEY.

34. BUSINESS LAW D—REAL PROPERTY AND MORTGAGES. Real property: estates in land, estates held jointly or in common, equitable estates, relative rights of adjoining owners, trespass, easements, sales of real property, the contract to sell, conveyances, wills, mortgages, and liens; landlord and tenant, the lease, assignment and subletting, rent, and remedies for non-payment; abstracts, title, insurance, Torrens titles. Two credits (one evening a week); second semester. MR. KENNY, MR. PALMER, MR. SMILEY.

ECONOMICS AND COMMERCE

- 41 (1a). ELEMENTS OF ECONOMICS. A fundamental course in economic principles as a basis for the study of current economic problems. Two credits (one evening a week); first semester. MR. CUMMINGS, MR. MYERS.
- 42 (B). ECONOMIC PROBLEMS. Current problems of importance will be studied, for example: business cycles and industrial depressions, taxation, labor organizations, combinations and monopoly, immigration,

international trade, and others. Two credits (one evening a week); second semester. MR. CUMMINGS, MR. MYERS.

NOTE: Economic Problems may be taken before Elements of Economics, but credit for it will not be granted until the elementary course has been successfully completed.

43. PRINCIPLES OF BUSINESS MANAGEMENT. Principles of organization showing comparative values and uses of line, staff, and combination types. Methods of saving time, money, and energy in the moving of work and materials. Making a scientific analysis of a particular operation, the operation of a department, and the operation of a plant. How to make use of the analysis in reducing waste, time, energy, money, and material. Principles underlying the establishment and maintenance of the improved methods and conditions obtained by the above study. These principles include a method of determining upon proper and clearly defined policies and a study of their use and value; the necessity for and proper means of profiting by the experience of others. How to develop business judgment in yourself and your subordinates. The principles governing executive control and the maintenance of discipline; discussion of methods of determining upon a wage scale and legitimate profits; the relation of physical condition to success, and its bearing upon production. Some principles underlying proper management of finances. The relation of home management to industrial and commercial efficiency; the organization and management of the sales department; training the salesman. The general problem of selection of help with a brief outline of a modern system of scientific selection and placement by a study of individual characteristics. No credit toward a degree, 2 credits for certificate in business (one evening a week); first semester. MR. PAYNE.
51. ELEMENTARY ADVERTISING. This course is intended for those who desire sufficient knowledge of the elements of advertising to prepare reasonably satisfactory copy for newspapers, magazines, street-car cards, circulars, and booklets. The fundamental elements of display, layout, headings, and copy are carefully outlined and the student is given practice in the preparation of advertisements.
- This course is intended to acquaint the student with what may be called "the tools of advertising" before he undertakes either of the two advanced courses in the planning and preparation of advertising campaigns. No credit toward a degree, 2 credits for certificate in business (one evening a week); first semester. MR. MARTIN.
52. NATIONAL ADVERTISING. A study of advertising from a new angle. The student puts himself in the place of one having a product for sale, and from the first lesson to the last each lecture is so planned as to give the methods pursued in conducting the many different steps in an advertising campaign.

The student first analyzes the product from the standpoint of its advertisibility. He considers the planning of a trademark, the organization of the sales force, the selling points, the prices, and the profits. He then thoroly analyzes the market, chooses the advertising medium most adaptable to his particular campaign, and decides on the appropriation.

Students will be furnished with pamphlets for these lectures which will give reference to practically everything which has so far been published on subjects taken in the course. In this way the experience of probably three hundred of the leading advertising men of this country will be available to the student. No credit toward a degree, 2 credits for certificate in business (one evening a week); second semester. MR. MARTIN.

61. **SALESMANSHIP.** A course for insurance men, specialty men, traveling salesmen. Lectures and demonstrations on the principles underlying successful salesmanship, as follows: the proper approach; securing attention; arousing interest; creating desire; closing the sale; the psychology of salesmanship; the use of suggestion in selling; the use of argument.

The chief feature of the work will be the demonstration sales. So far as possible each student will be given an opportunity to take part in a sufficient number of demonstrations that he may apply the principles laid out in the course. No credit for degree, 2 credits for certificate in business (one evening a week); each semester. (Not offered in 1921-22.)

71. **RAILWAY TRAFFIC AND RATES.** A practical study of the Act to Regulate Commerce and the other laws and regulations covering the transportation of property, locally and in foreign commerce, both by rail and by water. The student is acquainted with the correct compilation and interpretation of freight tariffs and economical and efficient methods in shipping. The lectures are comprehensive and embrace rate-making bases, the classifying and tracing of freight, the preparation of claims, etc. Rulings of the Interstate Commerce Commission and of the various state commissions are referred to and rates are quoted from current tariffs and classifications. Four credits (one evening a week); both semesters.

ENGLISH AND SPANISH

81. **BUSINESS ENGLISH.** Not a lecture course nor a dry, prosy study of technical English grammar and composition, but a new practical course designed for business men and women who recognize the value of a command of English for business and every-day writing and conversation. The main object of the course is to acquaint the student with the various types of business letters, reports, etc., and to teach him how to write and use them effectively. A secondary object of the course is to show students how training in expression—written or

oral—is primarily training in thinking and analysis and hence is a very real stimulus to general business efficiency. The types of letters to be studied include complaint and answer, reminder, acknowledgement, recommendation, application, collection, form, follow-up, sales, interdepartmental, and composite. Students will be expected to write letters and take part in the weekly discussions of actual problems in business correspondence. Ability to write simple, grammatically correct English is a prerequisite to this course. No credit toward a degree, two credits for a certificate in business (one evening a week); first semester. Repeated second semester.

82. PUBLIC SPEAKING. For description see Department of Collegiate Instruction. One evening a week; both semesters.
90. SPANISH. For description see Department of Collegiate Instruction. One evening a week; both semesters.

MATHEMATICS

100. MATHEMATICS OF BUSINESS A. A practical course dealing with certain fundamental mathematical operations peculiar to business transactions. The subject will cover percentage, simple interest, compound interest and discount, use of interest tables, problems in banking and taxation, graphical statistics, logarithms, elements of the theory of annuities—certain, use of annuity tables, application of annuities to problems in amortization, sinking funds and bond computations, and the elements of the mathematics of life insurance.

Prerequisites: 2 years of high-school mathematics. Two credits (one evening a week); first semester. MR. HART.

101. MATHEMATICS OF BUSINESS B. A continuation of Course 100.

Prerequisites: Course 100 or college algebra and trigonometry. Two credits (one evening a week); second semester. MR. HART.

DENTAL MECHANICS

A course in Dental Mechanics is offered by the General Extension Division in coöperation with the College of Dentistry. This course extends over a period of one college year beginning with the fall quarter. It requires for admission completion of eighth-grade work and a minimum age of eighteen years except in cases of students who have completed one or more years of high-school work.

The expenses for this course include a tuition fee of \$50 a quarter or \$150 for the year; and approximately \$150 additional for instruments.

The course of study includes the following: prosthetic technic: a course of lectures, recitations, and laboratory technic covering equipment

and arrangement of the dental laboratory, impression materials, study models, vulcanite and metallic dentures. Courses of lectures and laboratory work covering the following subjects: Oral Anatomy, Crown and Bridge Work, Operative Technic, and Orthodontia Technic with their practical application in the dental infirmary.

Upon the successful completion of the course the University certificate for Dental Mechanics will be granted.

DEPARTMENT OF ENGINEERING INSTRUCTION

The demand for men specially trained in engineering has been steadily increasing each year. Every branch of the profession has been calling for the services of trained men. By trained men is meant those who can plan work and use good engineering judgment in any given project.

Ex-President Woodrow Wilson emphasizes this when he says:

My attention has lately been called in particular to the falling off in the number of engineering students, and this has given me a good deal of concern, because it is not only immediately necessary that as many students as possible should prepare themselves for engineering duties in the army and navy, but it is also of the first consequence to the country that there should be an adequate supply of engineers for the period of reconstruction which must follow the war. Not only has technical training become of enormous importance in military operations, but the rôle of the engineer has become more and more important in every process of our industrial life.

To meet this demand the General Extension Division now offers groups of courses in architecture, civil engineering, electrical engineering, and mechanical engineering. These course groups are arranged to be completed in either three- or four-year periods and are planned primarily for workers in industrial establishments.

The subject of engineering is one that requires very thoro study, and no step should be neglected. These courses have been laid out with great care, and are especially adapted to the needs of men working in shops and other industrial and manufacturing establishments, to the end that such men may have added to their practical training a technical and theoretical knowledge which will enable them to advance more rapidly in their chosen line of work.

It has been found that many persons register who can not take the work with any great profit to themselves because of inadequate preparation. For this reason it is desirable that students should consult with the director of the General Extension Division before taking up any course, so that they may have proper guidance and direction.

Students who have had sufficient preparation need not start at the beginning, but may take up the work at the point where they can pursue it with advantage.

These courses also offer an opportunity to college graduates, who may wish to specialize in some subject not covered in their regular college work.

When a student completes any one of the consecutive courses, and has a total of 30 credits a certificate in engineering from the University of Minnesota will be granted.

FEEES

The fee for each engineering course is \$7.50 a semester, with the exception of a few advanced or technical courses for which the fee is \$10 a semester. Each class is a separate unit. The grouping of subjects into courses does not affect the unit fee of each subject.

TEXT MATERIAL

When text material is furnished in printed or mimeographed form the student is required to reimburse the University for its cost. This cost varies from \$1 to \$3.

RULE REGARDING ABSENCES

The attention of students and faculty is called to the following rule regarding absences:

"No student whose absences exceed three (3) of the regular scheduled sessions of the course for a semester shall be admitted to the final examination of the course without special permission of the director of University Extension."

CREDIT

Credit in any extension course will be awarded only to those students who pass the final examination of the course.

LENGTH OF COURSE

A semester consists of sixteen weeks of instruction with an additional week for the final examination.

THREE-YEAR COURSE

The following courses are arranged to be completed in three years of three evenings a week. Students, however, may adapt the number of evenings a week to their own specific circumstances, bearing in mind that the total number of semester credits required for a certificate is 30.

ARCHITECTURE

FIRST YEAR

<i>First Semester</i>	<i>Second Semester</i>
Elementary Architectural Design Shop Mathematics I	Elementary Architectural Design Shop Mathematics II

SECOND YEAR

<i>First Semester</i>	<i>Second Semester</i>
Intermediate Architectural Design Shop Mathematics III	Intermediate Architectural Design Mechanics, Strength of Materials

THIRD YEAR

<i>First Semester</i>	<i>Second Semester</i>
Advanced Architectural Design Structural Design	Advanced Architectural Design Reinforced Concrete

This makes a total of 24 credits. The student is permitted to elect other acceptable subjects to bring the total to 30.

CIVIL ENGINEERING

(For Office Men)

FIRST YEAR

First Semester
Shop Mathematics I
Mechanical Drawing

Second Semester
Shop Mathematics II
Structural Drafting

SECOND YEAR

First Semester
Shop Mathematics III
Applied Mechanics

Second Semester
Strength of Materials
Structural Design

THIRD YEAR

First Semester
Reinforced Concrete
Theory of Engineering
or
Roof-Trussed Bridges Design

Second Semester
Reinforced Concrete Design
Theory of Engineering
or
Bridge and Building Design

CIVIL ENGINEERING

(For Field Men)

FIRST YEAR

First Semester
Shop Mathematics I
Lettering and Sketching

Second Semester
Shop Mathematics II
Mapping

SECOND YEAR

First Semester
Shop Mathematics III
Plane-Surveying

Second Semester
Stadia and Topographical Surveys
or
Plotting and Calculation
Curves and Earthwork

THIRD YEAR

First Semester
Highways
or
Municipal Engineering
Theory of Engineering

Second Semester
Railways
or
Municipal Engineering
Theory of Engineering

This makes a total of 24 credits in each of the civil engineering courses. The student is permitted to elect other acceptable subjects to bring the total to 30.

Students in civil engineering are advised to take up the study of calculus. This course is not required; but it will prove of great advantage to anyone who desires to do more advanced work later.

ELECTRICAL ENGINEERING

FIRST YEAR

First Semester
Shop Mathematics I
Elementary Electricity I
Experimental Electricity

Second Semester
Shop Mathematics II
Elementary Electricity II
Experimental Electricity

GENERAL EXTENSION DIVISION

SECOND YEAR

<i>First Semester</i>	<i>Second Semester</i>
Alternating Currents I	Alternating Currents II
Shop Mathematics III	Shop Mathematics IV
Mechanical Drawing	Mechanical Drawing
or	or
Applied Mechanics	Strength of Materials
or	or
Experimental Electricity	Experimental Electricity

THIRD YEAR

<i>First Semester</i>	<i>Second Semester</i>
Direct-Current and Alternating-Current Machinery	Central Power Stations
or	or
Telephony	Telephony
Shop Mathematics V	Shop Mechanics VI
Electrical Machine Design	Electrical Machine Design

MECHANICAL ENGINEERING

FIRST YEAR

<i>First Semester</i>	<i>Second Semester</i>
Shop Mathematics I	Shop Mathematics II
Mechanical Drawing	Mechanical Drawing

SECOND YEAR

<i>First Semester</i>	<i>Second Semester</i>
Shop Mathematics III	Shop Mathematics IV
Applied Mechanics	Strength of Materials
Mechanical Drawing—Advanced	Mechanical Drawing—Advanced
or	or
Electricity—Elementary	Plumbing
or	or
Heat Engines	Heating and Ventilating

THIRD YEAR

<i>First Semester</i>	<i>Second Semester</i>
Shop Mathematics V	Shop Mathematics VI
Machine Design	Machine Design
or	or
Theory of Engineering	Theory of Engineering
Testing Materials	Steam-Engine Testing
	or
	Gas-Engine Testing

There are certain options allowed the student depending largely upon the work he intends to follow. This information must be furnished the General Extension Division at the time the student registers and his options will then be given him.

DESCRIPTION OF COURSES

1. ARCHITECTURAL HISTORY. Twelve lectures illustrated with lantern slides, covering the ancient and Renaissance periods. One evening a week; second semester. MR. FORSYTHE.

2. **ELEMENTARY ARCHITECTURAL DESIGN.** Shades and shadows and wash rendering. Architectural elements such as doors, windows, moldings, and the architectural orders; general drawing, exercises, and lectures in the application of these elements to simple problems in design and a survey course of lectures in architectural history illustrated by lantern slides. Open to high-school students who have had mechanical drawing, to those who have one year or more in an architect's office, and to those who, in the opinion of the instructors, have had equivalent experience. Two evenings a week; both semesters. Monday and Thursday evenings, 7:30-9:30. MR. FORSYTHE.
3. **INTERMEDIATE ARCHITECTURAL DESIGN.** Regular Class B "Analytique" or order problems of the Society of Beaux Arts Architects, or equivalent designs in architectural problems from the regular course of the University of Minnesota. Open only to those who have completed Course 2, or who have had two years or more in an architect's office, or have had equivalent preparation in an architectural school. Two evenings a week; both semesters. Monday and Thursday evenings, 7:30-10:00. Fee, \$5 a problem, or \$10 a semester. MR. FORSYTHE.
4. **ADVANCED ARCHITECTURAL DESIGN.** Class B, plan problems, and Class A, problems of the Society of Beaux Arts Architects, or equivalent design problems from the regular course in architecture at the University of Minnesota. Open only to those who have completed the required "Analytique" or order problems, or to those who have had one or more years of design in any architectural school. Two evenings a week; both semesters. Monday and Thursday evenings, 7:30-10:00. Fee, \$5 a problem, or \$10 a semester. MR. ARNAL.

NOTE: Regular instruction will be given on Monday and Thursday evenings, but students in these classes may work in the drafting rooms of the architectural department on other evenings, except Sunday.
5. **FREEHAND DRAWING.** Drawing and painting from life and from casts, with lectures on the construction of the human figure and its application to decoration. Students completing both semesters will be taught how to make etchings. One evening a week; both semesters. MR. BURTON.
6. **MAP-DRAWING.** (a) Farm and city plats. (b) Real-estate display maps. (c) Landscape architect's maps. (d) Topographic and hydrographic symbols. One evening a week; second semester. MR. ZELNER.
7. **LETTERING AND TITLES FOR ENGINEERS.** Principally freehand Reinhardt lettering. Title lay-outs and lettering. One evening a week; first semester. MR. ZELNER.
8. **PLANE-SURVEYING.** Elements of plane-surveying relating to methods of chain, compass, transit, and stadia surveys; leveling; methods of keeping field notes; determination of area of irregular plots; computation

- and plotting of field notes; care, use, and adjustment of instruments; methods of subdivision of the United States; public lands. One evening a week; first semester. MR. CUTLER.
9. **CURVES AND EARTHWORK.** Mathematics of simple, compound, and spiral curves; preliminary and location surveys; plotting of profiles; vertical curves; cross-sectioning and computation of earthwork volumes; methods of computation of overhaul; mass diagram, right-of-way and station ground maps. One evening a week; second semester. MR. CUTLER.
 10. **CONCRETE MATERIALS: SELECTION AND TESTS.** This course will cover the selection of materials entering into concrete, their properties and the tests to be applied. A study will be made of the proper combinations to obtain the best mixtures for given constituent materials at the lowest cost. Local materials will be used and those pursuing the course will make their own specimens and perform all the tests. One evening a week; first semester. MR. LAGAARD.
 11. **REINFORCED CONCRETE.** Covers the elements of the theory and practical design of reinforced concrete structures, including floors, roofs, walls, columns, foundations, and retaining walls. One evening a week; both semesters. MR. MANEY.
 12. **STRUCTURAL DESIGN.** This course will include a treatment of structural mechanics and stress computation, and the elements of the principles and practice governing the design of tension and compression members, beams, girders, and columns. Prerequisite: an elementary working knowledge of mathematics through trigonometry, and some knowledge of elementary physics. One evening a week; both semesters. MR. MANEY.
 13. **ELEMENTARY ELECTRICITY.** This course will start with the simple laws of magnetism and advance through the theory of direct-current machinery. Special attention will be given to direct-current motors and generators, armature windings, commutators, and wiring diagrams. The course will be of value to those who wish to take up the study of alternating-current machinery and power plants. Lesson sheets will be provided and demonstration experiments made. One evening a week; both semesters. MR. MARTIN.
 14. **ALTERNATING CURRENTS.** This course is planned to meet the need for an elementary course on alternating-current circuits and machines. General principles will be closely associated with the machines, the methods, and the facts of present-day practice. Theoretical demonstrations and discussions will be supplemented by a certain amount of laboratory work. The course will cover series and parallel circuits, single and polyphase systems, power and power factor. Transformers, induction motors, alternators, synchronous motors, rotaries, single-phase motors and transmission lines. One evening a week; both semesters. MR. RYAN.

15. **EXPERIMENTAL ELECTRICITY.** This course is provided for those students who have completed the course in elementary electricity. The course consists of experiments that each student should perform for himself, and the laws of electricity and magnetism will be fully developed. One evening a week; both semesters. MR. MARTIN.
16. **CENTRAL STATIONS.** Electric-power generating and distributing systems; demand, diversity, and load factors; load diagrams; voltage regulation; protective apparatus; selection of prime movers and units; methods of charging and metering; maintenance of plants; emergencies. One evening a week; first or second semester. MR. RYAN.
17. **ELEMENTS OF TELEPHONY.** Nature of voice sounds, construction and operation of receivers and transmitters, reading blueprints and circuits, magneto and central-energy circuits, the electro-magnet as used in telephony, batteries, and other generating apparatus, signalling apparatus. Some previous knowledge of alternating currents is desirable, but not absolutely necessary. The treatment will be elementary, using only simple mathematics. Experimental illustrations will be given so far as practical. One evening a week; second semester. MR. SHEPARDSON.
18. **SHOP MATHEMATICS I.** This course is designed to meet the needs of shop men, and affords an opportunity to take up engineering work of a higher grade. Practical shop problems will be thoroly discussed. This course together with one in drafting is essential for all other engineering branches. It will cover the subject of fractions, decimals, percentage, weights of materials, areas and volumes, thread-cutting, gearing, belts and pulleys, the milling machine, and a general drill in equations and the use of formulae. One evening a week; first semester. MR. EDWARDS.
19. **SHOP MATHEMATICS II.** This is a continuation of Course I, and will take up the subjects of algebra and geometry. One evening a week; second semester. MR. EDWARDS.
20. **SHOP MATHEMATICS III. TRIGONOMETRY.** This course is designed for those who have had the subjects of algebra and geometry and wish to pursue civil-engineering studies. The solution of right and oblique triangles will be thoroly discussed and practical plane-surveying problems will be given special attention. One evening a week; first semester. MR. EDWARDS.
21. **SHOP MATHEMATICS IV. ANALYTIC GEOMETRY.** This course is of great importance to the engineering student who wishes to take up the study of calculus. It consists of the study of the straight line, circle, ellipse, parabola, hyperbola, and a few of the higher plane curves met with in practice. One evening a week; second semester. MR. EDWARDS.

22. SHOP MATHEMATICS V. CALCULUS. This course is open to those who have completed mathematics through analytic geometry. Stress will be laid upon the various derivatives and their application to tangents, normals, evolutes, involutes, and maximum and minimum. Engineering examples will be given whenever possible. One evening a week; first semester. MR. EDWARDS.
23. SHOP MATHEMATICS VI. This is a continuation of Course V and will take up the subject of integration. Important mechanical and electrical problems will be introduced and discussed in class. One evening a week; second semester. MR. EDWARDS.
24. ELEMENTARY APPLIED MECHANICS. A short, practical course in elementary mechanics designed to meet the needs of students who have had a limited training in mathematics. Numerical calculations, simple graphical calculations, forces, simple machines, work, power, and energy. One evening a week; first semester. MR. BROOKE.
25. STRENGTH OF MATERIALS. An elementary course on the strength of materials, designed to follow the course in applied mechanics. The subjects to be treated are: the properties of materials, stress and strain, elastic and ultimate strength, deformations, principle of moments, moments of inertia, simple stresses, shear, riveted joints, the general elementary theory of beams, columns, and shafts. One evening a week; second semester. MR. BROOKE.
26. TESTING OF MATERIALS. Investigation of the physical properties of various metals and other engineering materials, including the more common grades of commercial steels, wood, cement, concrete, ropes, cables, belting, chains, etc. Supplemented by lessons on the various materials of construction and standard methods of testing. One evening a week; first semester. MR. HOLMAN.
27. STEAM-ENGINE AND POWER-PLANT TESTING. This course is intended for stationary engineers who wish to become more efficient in their line of work. The course will consist of lessons supplemented by experimental demonstrations illustrative of certain portions of the work. Actual problems arising in power-plant testing will be worked out in class with complete explanations and instructions for their solution. The laws of mechanics, heat, power, work, and energy will be applied to engine and power-plant testing. One evening a week; first semester. MR. SHOOP.
28. GAS ENGINES. This is a practical course in the theory of construction and operation of the gas engine. It will include various types of engines, cycles, ignition, carburetion, cooling, oiling, methods of determining horse-power, etc. One evening a week; first semester. MR. ROWLEY.

29. GAS-ENGINE TESTING. A practical laboratory course in gas-engine testing in which the student will perform tests on the various types of gas engines, as stationary, oil- and kerosene-burning engines, automobile, aeroplane, and tractor motors. The student must supply himself with a notebook in which records will be kept of the various tests. One evening a week; second semester. MR. ROWLEY.
30. HEAT ENGINES. This is an elementary course required for all engineering students. It relates especially to the steam engine and boiler, the steam turbine, and the gas engine. Attention is given to the different types of engines, boilers, and gas engines. The general problem of a modern power plant is considered for the benefit of those who do not devote further time to the subject. One evening a week; both semesters. MR. SHOOP.
31. BOILER-ROOM PRACTICE. This course has been written for the benefit of the persons who have charge of boiler plants. It is important for janitors in charge of schoolhouses and apartment houses as well as factory boiler shops. It will be beneficial to those who are expecting to obtain a license as a boiler inspector. One evening a week; first semester. MR. MARTENIS.
32. ADVANCED BOILER-ROOM PRACTICE. This is a continuation of the preceding course and will take up the subject of the steam engine and its accessories. This course is of interest to those seeking a chief engineer's license. One evening a week; second semester. MR. MARTENIS.
33. PLUMBING. This course is designed to meet the needs of the practical shop man and will cover the principles of plumbing and the best practice in use at the present time. It is hoped that a standard text will be available. One evening a week; second semester. MR. MARTENIS.
34. HEATING AND VENTILATING. The course will cover present heating and ventilating practice and is designed for heating contractors and others desirous of obtaining a fundamental knowledge of the subject. The plan of instruction includes a study of heat; methods employed for heating and ventilating buildings of various kinds; piping systems and temperature regulation. One evening a week; first semester. MR. MARTENIS.
35. STEAM FITTING. This course will cover steam-using machines and equipment. Particular emphasis is placed on heating appliances and refrigerating machines. One evening a week; first semester. MR. MARTENIS.
36. ELEMENTARY MECHANICAL DRAWING. This is a beginning course and includes instruction and practice in the use of drawing materials and instruments, lettering, tracing, view-drawing, dimensioning, blueprint reading, and the making of working drawings of machine parts. One evening a week; both semesters. MR. FRENCH.

37. **TEACHERS' COURSE IN MECHANICAL DRAWING.** This is a special course offered to those who teach drawing in the grade and high schools and who wish better to acquaint themselves with standard drafting-room practice. One evening a week; both semesters. MR. FRENCH.
38. **MECHANICAL DRAWING FOR WOMEN.** This course is similar to Course 36 above with the exception that more emphasis is laid on lettering and tracing at the option of the student. One evening a week; both semesters. MR. FRENCH.
39. **BLEUPRINT READING AND SKETCHING.** This course is intended for those who wish to get a working knowledge of drawings and blue-print reading without spending the time necessary to learn to make drawings. No instruments will be required. Various types of machine and other drawings will be thoroly discussed in class. Blueprints under discussion will be in the hands of each member of the class. Determination of quantities from drawings for cost estimates will be illustrated and discussed. The essential theory of drawing for machine-building and other construction purposes will be made clear. Practical sketching for shop and illustrative purposes will be explained. Practice home sketching work will be assigned to any who wish it; but such extra work is not required and will not be necessary to the understanding of subsequent lectures and class work. One evening a week; first semester. MR. FRENCH.
40. **COST-ESTIMATING.** Current costs of engineering construction work such as buildings, bridges, culverts, excavation, roads, and pavements. Labor and material costs. Analysis of construction for purposes of cost-estimating. Unit costs on different types of work. Actual estimates of recent and current construction. A working knowledge of blueprint reading is required for this course. Lectures and assigned problems. One evening a week; both semesters. MR. FRENCH.
41. **ADVANCED MECHANICAL DRAWING.** A practical course in drafting and drafting-room methods taking up the detail of machine parts as fastenings, screws, bolts, rivets, and rivet joints; keys, cotters, and pins; pipe and pipe fastenings; bearings and journals, pulleys and belting; spur gears, bevel gears, and spiral gears; cams, link motions, etc.; the application of empirical design and the principles of mechanics; assembly, diagrammatic and layout drawings. It is assumed that the student has a previous knowledge of drawing equivalent to Course 36. One evening a week; both semesters. MR. HERRICK.
42. **MACHINE DESIGN.** An elementary course in the calculation and design of machines and machine parts; such as machine frames, shafting, fly wheels, pulleys, riveted and screwed fastenings, bearings, spur gearing, bevel gearing, and helical gearing. Lectures and drawing-room practice of practical problems will be given.

Prerequisite: previous knowledge of drawing equivalent to Course 41 and mathematics through Course 20. A working knowledge of elementary physics, Course 43, and strength of materials, Course 25, is desirable. One evening a week, both semesters. MR. HERRICK.

43. PRACTICAL PHYSICS. This course will consist of lectures and laboratory work in general physics designed to meet the needs of technical students. Stress will be laid primarily on the sections of mechanics, heat, and electricity. Such a course will be of great advantage to the student who wishes to proceed with the subjects of technical mechanics, strength of materials, and general electric problems. Geometrical optics, sound, and the general principles of radio-activity and X-rays will also be taken up. One evening a week; both semesters. MR. FRAYNE.
44. ENGLISH FOR ENGINEERS. A course in practical English, designed to meet the professional needs of engineering students. The material of this course will include business letters—about twelve types; reports; estimates; instructions, etc. Some attention will be given to oral English. The underlying purpose of this course is to acquaint the student with the various kinds of business letters, reports, etc., and to teach him how to prepare and use them effectively. A secondary purpose is to show the prospective engineer that training in expression—written or oral—is training in clear, straight thinking and hence is a real stimulus to general efficiency. Students will be expected to do a certain amount of writing and take part in the weekly discussions of problems bearing upon the work of the course. Ability to write simple, grammatically correct English is a prerequisite to this course. One evening a week; both semesters.
45. THEORY OF ENGINEERING. A general course given to those students who have had two years' training in engineering work. This course includes the practical application of the fundamentals to engineering problems. Only students who have taken Courses 12, 13, 18, 19, 20, 21, 24, 25, 36, 27, 35, are eligible. Kent's *Mechanical Engineers' Pocket Book*, *Machinery Hand Book*, or Mark's *Mechanical Engineers' Hand Book* will be used as a text. The design of a simple machine will be taken up and discussed. One evening a week; both semesters. MR. EDWARDS.
46. HIGHWAYS AND PAVEMENTS. Elementary course relating to the economics, location, construction, and maintenance of highways and pavements, also a study of road-building materials, and methods of testing. One evening a week; both semesters. MR. LANG.
47. MUNICIPAL ENGINEERING. Development of municipal public works. City-planning, transportation, and housing. The principles of public health and sanitation. Public water supplies, sewerage and sewage disposal, refuse collection and disposal, and the sanitation of buildings. One evening a week; both semesters. MR. BASS.

48. WATER POWER AND ELEMENTS OF HYDROLOGY. Types of low, medium, and high-head developments. Details of developments; spillway dams; hollow reinforced concrete dams, arch dams, high masonry dams, movable dams. Turbine settings and characteristics. One evening a week; both semesters. MR. BASS.
49. ADVANCED REINFORCED-CONCRETE DESIGN. A course in the theory and design of structures planned to meet the needs of graduate students who wish to go into the subject more thoroly. Reinforced-concrete arches, framed structures, continuous beams, culverts, and circular pipes, which involve statically indeterminate methods for solutions to obtain correct moments and shears will constitute the problems to be considered. Enough of the theoretical work will be done to make possible accurate calculations of moment and shear forces. The design of resisting sections will be studied from a critical point of view, and applications made of the most recent developments in reinforced-concrete design methods and materials. One evening a week; both semesters. MR. PARCEL.
50. FOUNDRY PRACTICE. This is a semi-technical course dealing with everyday foundry problems from a technical standpoint. It is designed to link up the practical with the technical in the simplest manner possible. It will appeal especially to foremen, clerks, mechanics, and any person interested in foundry practice, who has had the equivalent of a common grade-school education. The course will cover the following subjects: drawing, materials, metallurgy, sands, refractories, fluxes, foundry economies, foundry machinery, and office practice. One evening a week; both semesters. MR. POTTER.

TRADE AND INDUSTRIAL TRAINING

1. METHODS OF ESTABLISHING TRAINING DEPARTMENTS IN FACTORIES AND STORES.
2. SHEET-METAL DRAFTING FOR TINSMITHS AND SHEET-METAL WORKERS.
3. SCIENTIFIC METHODS OF HANDLING AND TESTING LABOR.
4. CAUSES AND CURES OF INDUSTRIAL UNREST.
5. BUSINESS AND FACTORY MANAGEMENT.
6. FOREMAN'S COURSE IN HANDLING LABOR.
7. EMPLOYMENT MANAGEMENT.

For description of these courses see collegiate courses bulletin.

CERTIFICATE HOLDERS

CERTIFICATE HOLDERS OF 1917

On May 25, 1917, the following persons were granted University business certificates in the courses indicated:

Certificates in Accountancy

Bayley, Charles S., Minneapolis	McHenry, Robert D., Minneapolis
Cottor, Emil F., St. Paul	Schwartz, Solomon, Minneapolis
David, Charles A., Minneapolis	Smith, Arthur V., Minneapolis
Haselbeck, Henry, St. Paul	Wing, Llewellyn F., Minneapolis
Loberg, James M., Minneapolis	Wood, George, Minneapolis

Certificates in General Business

Gruber, J. Jeffrey, St. Paul	Kennedy, Thomas F., Minneapolis
	Rose, Carrol H., Minneapolis

Certificates in Finance

Berry, Harry E., Minneapolis	Johnson, Evan M., Minneapolis
Danielson, Andrew W., St. Paul	Jones, Earl R., Minneapolis

CERTIFICATE HOLDERS OF 1918

On May 28, 1918, the following persons were granted University business certificates in the courses indicated:

Certificates in Accountancy

Erbalang, Alphonse A., St. Paul	Linnerooth, Sidney, St. Paul
Gustafson, Victoria, Minneapolis	Nimerfroh, Gertrude, Minneapolis
	Welliver, Le Roy, Minneapolis

Certificates in General Business

Corcoran, John J., St. Paul	Melamed, Louis, St. Paul
	Schaffelke, Henry A., St. Paul

Certificates in Finance

Oberg, Ezra, Minneapolis

In Absentia

Hauge, Arthur, Certificate in General Business	Shannon, Thomas, certificate in Accountancy
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CERTIFICATE HOLDERS OF 1919

On May 26, 1919, the following persons were granted University business certificates in the courses indicated:

Certificates in Accountancy

Gothe, Oscar E., St. Paul	Melamed, M. L., St. Paul
Johnson, Lillian P., Minneapolis	Schmal, G. P., Minneapolis

Certificates in General Business

Barton, A. D., Minneapolis	Ekblad, E. G., Minneapolis
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GENERAL EXTENSION DIVISION

CERTIFICATE HOLDERS OF 1920

On May 25, 1920, the following persons were granted University business certificates in the courses indicated:

Certificates in Accountancy

Anderson, C. A. L., St. Paul	Chailquist, F. R., Minneapolis
Anderson, R. W., Minneapolis	Gadacz, Stanley J., St. Paul
Barton, A. D., Minneapolis	Kulp, Delmar C., Minneapolis
Benson, J. Raymond, Minneapolis	Schilling, P. A., Minneapolis

Certificates in Finance

Haselbeck, Henry, St. Paul

Certificates in General Business

Elmquist, Nan C., St. Paul

CERTIFICATE HOLDERS OF 1921

On May 31, 1921, the following persons were granted University business certificates in the courses indicated:

Certificates in Accountancy

Blandin, A. A., St. Paul	Kjelsberg, Clara, Minneapolis
Buetow, Herbert P., St. Paul	Le Borious, William, St. Paul
Doe, Richard H., St. Paul	Munson, Clifford A., St. Paul
Ekblad, E. G., Minneapolis	Oberg, Ezra N., Minneapolis
Hauge, Arthur W., Minneapolis	Wright, Ethel J., Minneapolis
Huffman, H. H., Minneapolis	Wright, William W., Minneapolis

Certificates in Finance

Jensen, Ernest W., Minneapolis	Kulp, Delmar E., Minneapolis
	Peterson, Clarence A., Minneapolis

Certificates in General Business

Bolstad, Alfred C., Minneapolis	Lee, Reynold, Minneapolis
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On May 31, 1921, the following persons were granted University engineering certificates:

Certificates in Engineering

Livermore, Harvey J., St. Paul	Stahle, Gilbert C., Minneapolis
Ryan, James L., St. Paul	Trierweiler, Dominic G., St. Paul

REGISTRATION 1920-1921
SIGNIFICANCE OF SYMBOLS

- *Also in St. Paul Business
- **Also in St. Paul Collegiate
- ***Also in Engineering
- †Also in Minneapolis Business
- ††Also in Minneapolis Collegiate
- †††Also in Minneapolis Collegiate and Minneapolis Business
- °Also in Minneapolis Business and St. Paul Business
- *††Also in Minneapolis Collegiate and St. Paul Business
- ‡Also in St. Paul Business and St. Paul Collegiate

MINNEAPOLIS—BUSINESS

- | | |
|--|--|
| Ahlen, Mauritz, 3036 10th Ave. S. | Auran, Nellie, 3715 Bloomington Ave. S. |
| Aitkens, F. A., 681 40th Ave. N.E. | Babb, W. M., 2218 E. 35th St. |
| Alexander, Helen D., 1103 S.E. 4th St. | Bailey, Howard D., 2423 Central Ave. N.E. |
| Allen, Samuel L., 1024 20th Ave. N.E. | ††Baillorgeon, Jos. Octave, 100 W. 14th St. |
| Allen, Willis G., 3324 Bryant Ave. S. | Bain, Donald, 3332 4th Ave. S. |
| Amundson, Alfred, 1320 Vine Place. | Baker, Ralph E., 1813 Dupont Ave. S. |
| Anderson, Arthur Edw., 3917 11th Ave. S. | Bakke, Arnold H., 2606 Chicago Ave. |
| ††Anderson, Arthur E. L., 4004 Oakland Ave. S. | Balkam, John T., 1900 1st Ave. S. |
| Anderson, A. W., 715 N.E. Fillmore St. | Ball, George W., Jr., 5052 Vincent Ave. S. |
| Anderson, Carl B., 2445 15th Ave. S. | Barber, Mrs. Paulina, 2907 W. 44th St. |
| Anderson, David, 4001 Girard Ave. N. | Barber, Ward J., 4108 Columbus Ave. |
| Anderson, E. F., 3118 Grand Ave. | *Barenbaum, Jacob M., 656 Broadway, St. Paul |
| Anderson, Earl, 1709 Chicago Ave. | Barlow, Arthur A., 1530 E. 26th St. |
| Anderson, Edwin W., 2731 E. 24th St. | Baroney, Z. Manuel, 1519 Stevens Ave. |
| Anderson, Fortner C., 3014 Holmes Ave. S. | ††Bart, Anna M., 620 Dupont Ave. N. |
| Anderson, Godfrey, 3622 Bryant Ave. S. | Bartig, Anna, 803 Huron St. |
| Anderson, G. E., 3836 Elliott Ave. | Batley, Ernest H., 312 S.E. Oak St. |
| Anderson, Harold V., 1706 N.E. Washington St. | Bauman, John Sprague, 711 Douglas Ave. |
| Anderson, Leora, 2531 15th Ave. S. | Beckstrom, John A., 3652 Lyndale Ave. S. |
| Anderson, Lloyd W., 2440 10th Ave. S. | Beggs, Roland R., 3808 1st Ave. S. |
| Anderson, Ray E., St. Louis Park, Minn. | Beggs, Truman J., 4307 Lyndale Ave. S. |
| Anderson, Rudolph H., 244 S.E. Bedford St. | ††Berg, Jessie O., 3243 Grand Ave. S. |
| Anderson, R. N., 1100 15th Ave. S.E. | Berg, Lorentz M., 3231 Elliott Ave. |
| Anderson, W. Roy, 1112 S. 8th St. | Bergh, Earl G., 1228 S.E. 4th St. |
| Andrews, W. R., 1908 Hennepin Ave. | Bergsland, Lonar F., 3205 Pillsbury Ave. |
| ††Applebee, Ruby Marie, 4331 Stevens Ave. | Berglund, Leonard L., 1912 3d Ave. S. |
| Armstrong, Philip S., 2618 Fremont Ave. N. | Berry, Alice L., 3112 Colfax Ave. S. |
| Arvidson, Carl W., 907 14th Ave. S. | Berry, Harry Edwin, 3601 Upton Ave. N. |
| Aura, Jno. W., 808 S.E. 4th St., Apt. 3 | |

- Berry, Leonard Lind, 2614 Stevens Av.
 Berner, F. E., 2715 N.E. Buchanan St.
 Berweiler, Katherine A., 2326 N.E. 6th St.
 Bigelow, C. H., Jr., 415 Laurel Ave., St. Paul
 ††Bjerke, Olaf E., 111 E. 31st St.
 Black, Ethel, 52 S. 10th St.
 Blackman, Clint W., 1915 Newton Ave. N.
 Bleakley, E. A., 2925 Emerson Ave. S.
 Bloom, Arthur W., 4123 Colfax Ave. N.
 Bogaz, Helen, 639 E. 17th St.
 Bohn, Edward C., 1113 Lyndale Ave. N.
 *Bolstad, Alfred C., 1100 12th Ave. S.E.
 Bonesteel, Ralph H., 2404 Lyndale Ave. S.
 Boody, F. J., 4277 Sheridan Ave. S.
 Borden, Clifford S., 5101 Emerson Ave. S.
 Borgen, Inga, 2640 Penn Ave. N.
 Bostwick, Ralph E., 4242 Washburn Ave. S.
 Botts, Mrs. Emma, 3320 Nicollet Ave.
 Bovino, Alfred S., 24 S. 13th St.
 Bowers, R. J., 2527 16th Ave. S.
 Bowers, Warren C., 520 13th Ave. S.E.
 Boyd, Roy M., 2121 Commonwealth, St. Paul
 Boyd, Barry F., 1009 Park Ave.
 Brackett, Scott, 3037 Bloomington Ave.
 Brainerd, D. L., 420 13th Ave. S.E.
 Brambach, Florence, 2516 15th Ave. S.
 Brancheau, Wilfred, 4654 W. Lake Harriet Blvd.
 Branley, J. F., 211 E. 34th St.
 Branner, B. A., 427 8th Ave. S.E.
 Brataas, Carl A., 3109 Cedar Ave.
 ††Brick, P. L., 4315 Harriet Ave.
 Briden, Kenneth F., 416 3d Ave. S.E.
 Brigán, Viola, 3644 26th Ave. S.
 Brinkman, A. L., 1829 5th Ave. S.
 ††Broderick, Martin J., 603 S.E. Delaware St.
 ††Bronstad, Obert Jerome, 1600 Linden Ave.
 Brooks, Albert, 1714 8th Ave. N.
 Broten, Alfred E., 3805 10th Ave. S.
 Brown, Thomas W., 417 8th Ave. N.E.
 Brown, V. K., 2718 Chicago Ave.
 Browne, Earnest H., 325 Wilder Ave., St. Paul
 ††Browne, Jack W. D., 1802 Marshall Ave., St. Paul
 Brubacher, Rexford Daniel, 3412 1st Ave. S.
 Brundidger, M. E., 2508 Emerson Ave. N.
 Brunsell, Harry, 2532 10th Ave. S.
 ††Bruschweiler, William, 1914 Aldrich Ave. S.
 Brysan, Enos, Vine Hall Apts.
 Buchanan, Rollin E., Excelsior, Minn.
 Buchen, Wm. Gains, 95 N. 17th St.
 Bungler, Harold Alan, 3009 Colfax Ave. S.
 Burley, Anna R., 111 W. Grant St.
 Burgess, Arthur L., 24 Grove St.
 Burgis, W. H., 5758 Thomas Ave. N.
 Burnett, James, 1117 Harmon Place
 Busch, Frank, 1508 3d Ave. S.
 Bush, Howard D., 123 W. 15th St.
 Butterfield, Clark, 3324 2d Ave. S.
 Byland, Clarence W., 215 Logan Ave. N.
 *Byrnes, William H., 228 Pleasant Ave., St. Paul
 Cady, Byron, 1714 Stevens Ave.
 Calvin, Arthur M., 1306 S. 7th St.
 Calvin, Carl A., 3412 1st Ave. S.
 Cameron, Joseph J., 2517 Emerson Ave. S.
 Camp, C. S., 1506 3d Ave. S.
 Campbell, Rena M., 1105 23d Ave. N.E.
 Canfield, Lowell M., 4409 45th Ave. S.
 Canfield, Ruth, 32 Spruce Place
 Carey, Anna E. V., 4745 Lyndale Ave. S.
 Carlson, Albin B., 3121 Emerson Ave. S.
 Carlson, Algot Theodore, 18 N. 13th St., Apt. P.
 ††Carlson, Axel W., 1508 Stevens Ave.
 Carlson, Earl A., 946 18½ Ave. N.E.
 Carlson, Estelle S., 3644 26th Ave. S.
 Carlson, Gideon C. E., 2401 N.E. Hayes St.
 Carlson, Maurice G., 305 30th Ave. N.
 Carlson, Roy W., 946 18½ Ave. N.E.
 Carlson, Theo, 1122 Y.M.C.A.
 Cary, Evan F., 2209 Aldrich Ave. S.
 Cary, Walter E., 2209 Aldrich Ave. S.
 Cederberg, Esther C., 4516 15th Ave. S.
 Chailquist, F. R., 3639 Sheridan Ave. N.
 Chapman, A. R., 1001 26th Ave. N.E.
 Charney, Maurice M., 106 Highland
 Chicken, Fred S., 3319 Washington Ave. N.
 Chier, Maurice C., 1000 Irving Ave. N.
 Chisolm, Ralph W., 1787 Colfax Ave. S.
 ***Christensen, Carl Fletcher, 294 Charles St., St. Paul

- Christensen, Edwin L., 1300 Linden Ave.
 Christensen, J. R., 1709 Central Ave. N.E.
 Christianson, A. C., 2017 Pleasant Ave.
 Christianson, Nora E., 3109 Lyndale Ave. S.
 Christianson, Phillip H., 320 Colfax Ave. N.
 Christoferson, George, 2223 N.E. Fillmore St.
 Christy, P. L., 2000 Park Ave.
 Clarity, Mark F., 4100 Garfield Ave. S.
 Clark, R. R., 4037 Queen Ave. S.
 Clarke, Helen, 92 Western Ave.
 Clements, Anthony P., 1413 University Ave. N. E.
 Colbert, Patrick W., 1527 James Ave. N.
 Colwell, Clyde C., 520 13th Ave. S.E.
 Comb, Grace Mary, 29 Ash St.
 Conn, R. D., 2312 Humboldt Ave. S.
 Cook, George, 234 20th Ave. N.
 Cook, Paul D., 1920 3d Ave. S.
 Cooley, Miss M. V., 2507 Nicollet Ave., No. 21
 Cooper, Robert O., 1824 Park Ave.
 Corcoran, Vincent M., 1028 Hawthorne Ave.
 Corson W. K., 959 24th Ave. S.E.
 Cougherour, Lloyd R., 72 N. 16th St.
 Craig, John H., Library Apts., 2 S. 11th St.
 Crane, L. S., 3045 11th Ave. S.
 Crist, C. E., 228 W. 27th St.
 Cross, M. Frances, 314 University Ave. S.E.
 Crouse, Agnes R., 3600 1st Ave. S.
 Crowley, Maurine, 84 Spruce Place
 Cumming, Harry F., 2502 Sheridan Ave. N.
 Cunningham, Sylvester E., 3722 Pleasant Ave.
 Curran, R. S., 1829 5th Ave. S.
 Currie, G. D., 3239 Bryant Ave. N.
 ††Cuzner, Dorothy, 1203 S.E. Talmadge St.
 Dahl, W. C., 300 E. 15th St.
 Dahlberg, A. A., 3949 Bloomington Ave.
 ††Daly, John J., 3209 S.E. 4th St.
 Danielson, L. N., 2324 Chicago Ave.
 Dart, Norma E., 1325 W. 27th St.
 Dash, Harry B., 432 University Ave. S.E.
 Davidson, Neil, 3809 3d Ave. S.
 Davis, Katherine G., 116 Oak Grove
 Davis, Raymond O., 1415 W. Broadway
 Dean, A. B., 2432 W. 24th St.
 Dean, Harvey M., 3757 Harriet Ave.
 Decker, Florence M., 2550 Central Ave. N.E.
 Deegan, Frank M., 3025 Stevens Ave.
 De Mille, H. N., 3251 Harriet Ave.
 Devereaux, Margaret, 1004 19th Ave. S.E.
 Dhole, Amelia, 2936 40th Ave. S.
 Dobratz, Leo F., 820 Y.M.C.A.
 Docken, Ruth M., 1206½ N. 6th St.
 *Doe, Richard H., 404 Dewey Ave., St. Paul
 Dokken, Anthony O., 3339 24th Ave. S.
 Douglas, John A., 3000 W. 43d St.
 Down, Lillian M., 2020 Garfield Ave.
 Downes, J. M., 3949 Lyndale Ave. S.
 Drake, Clarence Edw., 705 Y.M.C.A.
 Drugaeg Joseph T., 1809 N.E. Grand St.
 Dubbe, Albert, 3305 Irving Ave. S.
 Duckart, Carl J., 3506 2d Ave. S.
 Duffy, George L., 2010 3d Ave. S.
 Dumas, Ada, 3136 Holmes Ave. S.
 Duncan, A. E., 3236 Dupont Ave. S.
 Dunlop, Wilfrid L., 524 Ridgewood Ave.
 Dunn, Eva L., 1705 25th Ave. N.
 Dunnavan, Paul H., 1154 Portland Av.
 Duplantier, Mrs. S. F., 1819 Lyndale Ave. S.
 Durand, F. Lawrence, 455 N.E. Adams St.
 Dyer, E. Rowland, 2450 Stevens Ave.
 Dyer, Louis R., 4425 Zenith Ave. S.
 Dyregrov, Ludwig, 121 W. 15th St.
 Eastman, D. H., 1974 Marshall Ave., St. Paul
 Egbert, George R., 5012 Upton Ave. S.
 Eichhorn, Ernest W., 606 Washington Ave. S.E.
 Eitrheim. Eiliv, 2402 S. 4th Ave.
 Ekblad, E. G., 3112 43d Ave. S.
 Ekman, Lincoln G., 1550 Sherburn Ave., St. Paul
 Eller, Matt J., 1322 N.E. Adams St.
 Ellison, Eugene D., 1935 Fremont Ave. S.
 Elmquist, Irving C., Hopkins, Minn.
 Elsberry, Paul V., 1806 4th Ave. S.
 Enberg, Oscar E., 1530 Vine Place
 Engberg, Theodore, 617 Russell Ave. N.
 ††Engels, Mrs. Lucille, 97 N. 17th St.
 Engman, F. N., 730 E. 25th St.
 Ennis, Ralph Edward, 3107 Humboldt Ave. N.
 Enstad, Minnie C., 517 Ridgewood Ave
 Erickson, Earl, 921 13th Ave. S.

- Erickson, Ephriane O., 3652 3d Ave. S.
 Estrop, Eliza, St. Barnabas Hospital
 Evenson, J. S., 1445 Sherburn Ave., St. Paul
 Farley, William F., 898 Cromwell Ave., St. Paul
 Farnsworth, Ralph W., Room 818 Y.M.C.A.
 Feig, Theo H., 3320 Pleasant Ave.
 Feigal, Lillian E., 1518 Girard Ave. N.
 Ferguson, George A., 4151 Russell Ave. N.
 Ferrell, Walter A., 2514 N. 6th St.
 Fessler, E. J., 2014 Dupont Ave. S.
 Fiening, Elsie, 2935 Oliver Ave. N.
 Finman, Sadie P., 1210 Girard Ave. N.
 Finnegan, F. R., 300 Bryant Ave. N.
 Finnegan, Gilbert P., 1773 Hennepin Ave., Apt. 4
 ††Fischer, George J., 2819 E. 28th St.
 Fisher, Ruby K., 1501 11th Ave. S.
 Fiss, Frank A., 3205 Bloomington Ave.
 Fiterman, Harry, 915 Fremont Ave. N.
 Fitzsimmons, S. J., 3753 Dupont Ave. S.
 Fletcher, Asa, 3344 Dupont Ave. S.
 Fleury, Frank E., 600 20th Ave. N.E.
 Foltz, Frank E., 2729 Harriet Ave.
 Foran, J. H., 1912 15th Ave. N.
 Fornare, Harry, 1557 Roblyn Ave., St. Paul
 Forsberg, Carroll F., 3149 Pillsbury Ave. S.
 Foster, Kent, 3032 Grand Ave.
 Frary, Lewis S., 961 18th Ave. S.E.
 Fredkosky, Evelyn, 230 Mt. Airy St., St. Paul
 Fricke, H. E., 1807 4th St. S.E.
 Friedrich, John C., 902 Y.M.C.A.
 Fritz, Robert, 2918 Newton Ave. N.
 Fronk, L. B., 1724 Irving Ave. S.
 Fuller, Ray D., 2429 Colfax Ave. S.
 Furman, Sadie P., 1210 Girard Ave. N.
 Gadney, Clarence, 3128 Grand Ave.
 Gahring, Melba, 411 2d Ave. S.E.
 ††Gale, Samuel Chester, 713 8th Ave. S.E.
 Galvin, R. J., 3704 Nicollet Ave.
 Gantz, Raymond J., 722 E. 28th St.
 Garvey, Edward J., 500 Beacon St.
 *Gates, Edgar B., 665 Marshall Ave., St. Paul
 Gerber, Carl P., 149 12th Ave. N.E.
 Gerhard, Roy C., 2712 Bryant Ave. S.
 ††Gerken, Gretchen J., Berkeley Club
 *Gerner, Otto J., Jr., 587 Michigan St., St. Paul
 Gerth, Edwin P., 2312 Humboldt Ave. S.
 ††Gewalt, Carl H., 3140 Holmes Ave. S.
 Gibbon, Alex M., 4445 Beard Ave. S.
 Gibbons, E. J., 2417 Bryant Ave. S.
 Gibbons, M. J., 2417 Bryant Ave. S.
 Gilla, L. E., 1948 Princeton Ave., St. Paul
 Gilruth, James R., Commercial Hotel
 Ginsberg, Gladys G., 818 14th Ave. S.
 Gisvold, Jessie, 735 N.E. Jackson St.
 Gjerde, Sigverd E., 3005 E. Lake St.
 Glardon, Wm. G., 5122 40th Ave. S.
 Glasby, Ward M., 4740 Wentworth
 Gluck, Arthur L., 2004 N.E. Marshall St.
 Goblirsch, A. M., 4649 Pleasant Ave.
 ††Goldvarg, Anna A., 611 Fremont Ave. N.
 Gould, C. A., 24 W. 37th St.
 Grahn, Edgar R., 312 S.E. Walnut St.
 Granath, Gothfrid, 1816 S.E. 4th St.
 Granning, Alvin P., 2615 Lyndale Ave. N.
 Grant, H. W., 2409 Fremont Ave. S.
 Greeley, H. H., 4733 Bryant Ave. S.
 Greenwood, H. W., 729 E. 18th St.
 Greig, Paul B., 815 Portland Ave., St. Paul
 Grinager, Ada., 3450 11th Ave. S.
 Grinager, William F., 3447 Pleasant Ave.
 Gruenberg, Morris Z., 2111 13th Ave. S.
 Gudenberg, Abe H., 2206 Riverside Ave. S.
 Gulbrandsen, Chris A., 225 W. 15th St.
 Gunnarson, A. B., 1807 16th Ave. S.
 Gustafson, Clarence L., 1310 E. 22d St.
 Gustafson, Lawrence D., 20 N. 13th St.
 Gustafson, Walter F., 3201 34th Ave. S.
 Guth, Armin W., 713 S. 8th St.
 Haas, Ewald A., 15 E. 27th St.
 Haas, Theo J., 1003 S.E. Fulton St.
 Hackett, Howard L., 4323 Blaisdell Ave.
 Hagen, Sylvia, 761 E. 3d St., St. Paul
 Hagerman, I. L., 404 Dewey Ave., St. Paul
 Hainer, Eleanor S., 2207 Hennepin Ave.
 Haling, L. W., 2719 N.E. Johnson St.
 Hall, Neal C., 712 W. 28th St.
 Hambrook, Robert W., 1916 Marshall Ave., St. Paul
 ††Hanka, S. W., 254 Irving Ave. N.
 Hansen, E. M., 1422 Breda St., St. Paul
 Hanson, Oscar R., 1305 N.E. Monroe St.

- Hanson, Lillian, 2128 Dupont Ave. S.
 Hardaway, Logan M., 2546 Grand Ave.
 Harlan, R. B., 2297 Priscilla St., St. Paul
 Harmon, Glenn R., 3641 Portland Ave.
 Harrer, H. Rudolph, 2414 Bryant Ave. N.
 Harris, Nathan, 1224 12th Ave. N.
 Harty, Mae, 1701 University Ave. S.E.
 Hasselberg, Ragnar E., 2514 N.E. Garfield St.
 Hauge, Arthur W., 4052 10th Ave. S.
 Hawkes, Peter O., 3027 Bryant Ave. S.
 Hayes, E. J., 3633 Colfax Ave. S.
 ††Hayes, H. J., 2009 Ashland Ave., St. Paul
 Hays, Forrest J., 3543 Colfax Ave. N.
 Hazelberg, Axel, 2036 Upton Ave. S.
 Hedean, A. T., 1901 N.E. Fillmore St.
 Hedlund, M. E., 204 S.E. Cecil St.
 Heinz, H. E., 117 W. 15th St.
 Heller, George, 2737 Garfield Ave. S.
 Helmick, Alexander, 1014 13th Ave. S.E.
 Helsom, J. T., 500 W. 32d St.
 Helweg, Fred C., 1912 Lyndale Ave. S.
 Hendel, George P., 1513 Hennepin Ave.
 Hendel, William H., 1519 Thomas Ave. N.
 Hennessy, Robert V., 4211 Harriet Ave.
 Herman, Cyril Léonard, 177 Forbes Ave., St. Paul
 Hermanson, Ella S., 2911 W. 44th St.
 Hersey, Richard M., care Bemis Bros. Bag Co.
 Hestevold, Barney, 5159 Xerxes Ave. S.
 Hickey, Mame, 225 Oak Grove
 Higginson, Hardee, 1906 1st Ave. S., No. 17
 Hill, C. F., 212 W. 48th St.
 Hill, Harold Alexander, 2217 Fremont Ave. N.
 Hillgren, Harvey A., 3342 Oakland Ave.
 Hilliard, Robert C., 2312 Oliver Ave. S.
 Hinman, Kathleen E., Berkeley Club, 12th St. & Marquette
 Hirscher, B. J., 832 Y.M.C.A.
 Hjulín, Leonard A., 623 E. Franklin
 Hoel, Ludwig, 729 E. 14th St.
 Hoisve, Berger Norman, 3527 Lyndale Ave. N.
 Hokanson, John O., 418 E. 26th St.
 Holbrook, Dorothy E., 4845 Bryant Ave. S.
 Hollen, Robert S., 3320 Pleasant Ave.
 Holmberg, G. H., 1601 11th Ave. S.
 Holmquist, Clarence E., 917 22d Ave. N.E.
 Horn, Byron E., 1613 Clinton Ave. S.
 Hostetter, Miss Dene, 1775 Hennepin
 Houck, Margaret, 3420 Pleasant Ave. S.
 Howe, Walter A., 1900 N.E. Polk St.
 Howells, Robert S., 1914 14th Ave. S.
 Howson, Charles W., 1806 11th Ave. S.
 Huber, P. J., 3028 Bryant Ave. S.
 Hudak, Anna, 1711 5th Ave. S.
 *Huffman, H. H., 2325 Grand Ave.
 Hughes, William H., 1214 E. 28th St.
 Hultquist, Charles E., 1320 Vine Place
 Hultkrans, Edith, 2949 Fremont Ave. N.
 Hummel, Rufus, 12 E. Franklin Ave.
 Hunter, Mrs. Mabelle S., 3108 Holmes Ave. S.
 Hynes, Thomas F., 1721 N. 5th St.
 Immer, William C., 4640 Vincent Ave. S.
 Irwin, Charles A., 915 University Ave. S.E.
 Ingerson, H. Leonard, 1082 14th Ave. S.E.
 Isaacson, Paul, 1618 N.E. Jefferson St.
 Jaekel, Gus C., 1508 10th Ave. S.
 Jaffa, Goldie A., 704 Dupont Ave. N.
 Jarboe, John Felix, 4537 1st Ave. S.
 Jarchow, W. E., 1110 Hennepin
 Jedlicka, J. P., 103 Spruce Place
 Jehn, Herbert C., 100 E. 14th St.
 Jensen, Alice, 1119 S.E. 6th St.
 Jensen, Ernest W., 3400 Elliott Ave.
 Jerde, Claude, 2707 Aldrich Ave. N.
 ††Jermata, Loring P., 1349 Penn Ave. N.
 Johannsen, Arnold H., 1611 Emerson Ave. N.
 Johnson, Arthur B., 1607 N.E. Madison St.
 Johnson, Arthur E., 2733 Bloomington Ave. S.
 Johnson, Clarence Albert, 4050 Fremont Ave. N.
 Johnson, Clarence P., 1116 N.E. Washington St.
 Johnson, Frederick B., 3041 Oakland Ave.
 Johnson, Hazel G., 613 23d Ave. S.
 Johnson, H. R., 1459 W. Lake St.
 Johnson, Irwin O., 4049 Dupont Ave. N.
 Johnson, John F., 4351 Sheridan Ave. N.

- Johnson, Leander H., 1115 Harmon Court, Flat A 1
 Johnson, Leonard, 1921 Washington Ave. S.
 Johnson, Raymond, 2543 Chicago Ave.
 Johnson, Roy O., 4417 Zenith Ave. S.
 Johnson, Walter R., 2916 N. Emerson Ave.
 Johnson, Wilhelm, 1076 25th Ave. S.E.
 Johnston, F. E., 2111 Dupont Ave. N.
 Josewich, Pauline, 57 Arthur Ave. S.E.
 Joyner, Mary M., 3809 Portland Ave.
 Juettner, George J., 2215 N. 4th St.
 Juettner, Joseph, Jr., 2215 N. 4th St.
 Julicher, George F., 4049 Elliott Ave.
 Kabish, W. C., 3219 Lyndale Ave. S.
 Kaercher, Margaret B., 2934 N.E. Polk St.
 Karnofsky, H. E., 321 Syndicate Bldg.
 Kauppe, Ralph P., 3133 29th Ave. S.
 ††Keating, Maurice H., 3136 17th Ave. S.
 Kehoe, Florence, 1008 W. 28th St.
 Kellberg, E. H., 1500 Park Ave.
 Kelley, John W., 3602 Park Ave.
 Kellogg, Fred H., 1810 3d Ave. S.
 Kelly, F. J., 314 13th Ave. N.E.
 ††Kelly, F. M., 4100 Queen Ave. S.
 Kelly, Louis, 1525 Girard Ave. N.
 Kelly, Thomas F., 1311 2d Ave. S.
 Kent, E. C., 1800 3d Ave. S.
 ††Keough, Matthew J., 229 Fremont Ave. N.
 Keppel, Frank, Y.M.C.A.
 Kerr, Russell H., Central Y.M.C.A.
 Kermish, Margaret, 1605 2d Ave. S.
 Kierski, Paul S., 4744 Upton Ave. S.
 King, Fred E., 1819 Lyndale Ave. S.
 King, Harold R., 2631 Emerson Ave. S.
 Kingbay, I. B., 2119 Cedar Ave.
 Kinnane, James P., 500 N.E. 2d St.
 Kirkconnell, Evelyn, 1800 1st Ave. S.
 Kittelsen, Olga, 129 W. Grant St.
 Kjellander, Oscar, 2637 29th Ave. S.
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 Krussow, Walter, 2114 23d Ave. N.
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 ††Kulp, Delmar E., 332 Oak Grove St.
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 Larson, Clarence Edw., 3615 4th Ave. S.
 Larson, Ethel S., 3200 32d Ave. S.
 Larson, Floyd, 321 S.E. 6th St.
 Larson, Theodore W., 2641 N.E. Taylor St.
 Larson, Walter L., 22 N. 15th St.
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 Lee, Herbert W., 312 19th Ave. S.E.
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 Lee, Reynold A., 2024 30th Ave. S.
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 Lindborg, Elmer, 4008 N.E. 6th St.
 Lindquist, Harry C., 4000 Aldrich Ave. S.
 Lindrud, Stanley, 42 Willow St.
 Linner, Hulda G., 2018 Milwaukee Ave. S.
 Lindstroth, Clarence C., 3940 Garfield Ave.

- Lockman, Edgar D., 1900 1st Ave. S.,
Apt. 14
- Lokki, Oscar, 3305 Irving Ave. S.
- Lord, Josephine F., 225 W. 15th St.
- Loth, Karl E., 1711 Queen Ave. N.
- Lovik, Einer M., 1615 1st Ave. S.
- Lucas, Werner H., 2843 N.E. Taylor
St.
- Ludwig, Jos. P., 1225 University Ave.
N.E.
- Lund, A. S., 1312 S.E. 5th St.
- Lund, F. T., 2176 Dayton Ave., St.
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N.
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S.
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36
- McNiff, Ray F., 4008 Columbus Ave.
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 Amonson, Nettie, 1800 13th Ave. S.
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 **Anderson, Mr. and Mrs. A. E., 909 Iglehart Ave., St. Paul
 †Anderson, A. E. L., 4004 Oakland Ave.
 Anderson, Anna H., 1416 Portland Ave.
 Anderson, Bert Geo., 1210 Lowry Bldg. St. Paul
 Anderson, Bessie M., 78 Willow St.
 Anderson, Carl Oscar, 2421 11th Ave. S.
 Anderson, Christian, 3620 E. 42nd St.
 Anderson, Florence I., 2620 35th Ave. S.
 Anderson, Hulda F., 32 N. 11th St.
 Anderson, Lillian E., 2444 10th Ave. S.
 Anderson, Mabel, 3007 E. Lake St.
 Anderson, Margaret E., 78 Willow St.
 Anderson, Nora C., 2310 Emerson Ave. S.

- Andress, Lulu Page, 71 Melbourne Ave. S.E.
 Andrews, Mel C., 4453 Stevens Ave.
 Angus, Alice, 1313 S.E. 6th St.
 Anneberg, Robert D., 608 S.E. 7th St.
 Anneberg, Ruth A., 2221 Fremont Ave. S.
 Anthony, Maud R., 2620 Hennepin
 Apfeld, Josephine J., 3032 Irving Ave. S.
 †Applebee, Ruby M., 4331 Stevens Ave.
 Armstrong, C. E., 3512 17th Ave. S.
 Arnell, Mabel D., 2812 Grand Ave. S.
 Arosin, Marie A., 905 Hague Ave., St. Paul
 Arver, J. F., 1153 Abell St., St. Paul
 Ash, Ruby M., 93 N. 17th St.
 Ashton, Jennie, 1506 Laurel Ave.
 **Ashton, John B., 65 S. 11th St.
 Atkins, Marion P., Curtis Hotel, 208 C.
 Atkinson, Grace M., 1809 James Ave. S.
 Atwater, Pierce, 1536 Vine Place
 Aufderheide, Bertha, 806 42nd Ave. N.
 Auxer, Caroline C., 806 12th Ave. S.E.
 Avery, R. C., 2507 Nicollet Ave.
 Babcock, Lucile, 3032 Humboldt Ave. S.
 Babcock, Vinette, care Bryant School
 Bach, Ida M., 3100 Stevens Ave.
 Bach, Lydia H., 3100 Stevens Ave.
 Backstrom, Myrtle A., 1724 Capitol Ave.
 Bacon, Eleanor, 3416 2nd Ave. S.
 Bacon, Myrtle E., 2922 Lyndale Ave. N.
 Baer, Mrs. A. B., 2010 Marshall St. St. Paul
 Bailey, Irene M., 1733 Blair St., St. Paul
 Bailey, Lucille O., 1733 Blair St., St. Paul
 Bailey, Roscoe M., 6 11th St.
 †Baillargeon, Jos. Octave, 100 W. 14th St.
 Baldwin, Fanny E., 2417 Harriet Ave.
 Baldwin, Louise V., 2219 Dupont Ave. S.
 Ball, Sarah B., 314 University Ave. S.E.
 Ballentine, Emma K., 301 3rd Ave. S.E.
 Ballie, Jean E., 3136 Pillsbury Ave.
 Banker, May L., 3314 Elliott Ave.
 Barber, Bertha, 3132 Fremont Ave. S.
 Barber, Laura, 3409 3rd Ave. S.
 Bargewell, Myrta, 2903 Humboldt Ave. N.
 Barker, Mrs. Geo. H., 2403 Lake Pl.
 Barker, Helen B., 1810 3rd Ave. S.
 *Barker, Leland H., 1810 3rd Ave. S.
 Barker, Nellie-I., Curtis Hotel
 Barnes, Amy, 1500 Chicago Ave.
 Barnes, Bernice, 2008 Bryant Ave. S.
 Barney, Edith M., 2118 Cedar Ave.
 Barnhart, John R., 727 E. 18th St.
 Barnum, Anna L., 1917 Penn Ave. S.
 Barrett, Laura M., 3809 Pillsbury Ave.
 Barron, Nora M., The Buckingham
 Barry, A. B., Hopkins, Minn.
 †Bart, Anna N., 620 Dupont Ave. N.
 Bashefkin, Ida, 630 Iglehart Ave., St. Paul
 Bassett, Jas. E. H., 822 W. 35th St.
 Baston, Ethel, St. Louis Park
 Bather, Mrs. A. E., 1520 N.E. Washington St.
 Bauman, Helen L., 91 Ash St.
 Baxter, Bertha B., 427 8th Ave. S.E.
 Beach, Mr. & Mrs. J. W., 1801 University Ave. S.E.
 Beach, Rowena E., 2708 Colfax Ave. S.
 Beare, Florence, 2634 Oliver Ave. N.
 Beaverson, George, 2425 Lyndale Ave. N.
 Beck, Eva L., 1322 S.E. 6th St.
 Becker, Mrs. Gertrude, 1107 Harmon Place
 Becker, Nelle, 4041 Vincent Ave. S.
 Beckman, Elsie E., 455 N.E. Pierce St.
 Beckstrom, Emily, 812 S.E. 4th St.
 Beisner, Goldie, 1309 Plymouth Ave. N.
 Belden, Mary Foster, 2951 Penn Ave. N.
 Belitz, Lillie M., 2635 N.E. Jackson St.
 Bell, Mrs. E. T., 527 S.E. 7th St.
 Bell, Freda, 14th St. & 5th Ave. S.
 Bell, John, Warren, 1001 E. River Rd.
 Bell, Lois C., 602 E. 15th St.
 Bell, Mable V., 77 Ash St.
 Bell, Margaret Merrill, 1001 E. River Road
 Bellinger, Louise G., 1309 Plymouth Ave. N.
 Bells, Erma M., 1521 S.E. 6th St.
 Bells, L. W., 1521 S.E. 6th St.
 Bennett, Mrs. J. A., 2013 Selby Ave., St. Paul
 Bennett, Mable, 714 S.E. 4th St.
 Bennett, Rufus C., 1225 Hawthorne Ave.
 Benson, Clara, Hamel, Minn.
 Benson, Florence, 2216 Clinton Ave.
 Benson, Gudrun, 137 E. Grant
 Benton, Mrs. Jeannette, 3640 Portland Ave.
 Ber, Adelaide, 1801 1st Ave. So.
 †Berg, Jessie, 3243 Grand Ave. S.
 Berg Robt. D., 1557 Midway Pkwy., St. Paul

- Berg, Mrs. Zella E., 1557 Midway Pkwy, St. Paul
- Berglund, Ada G., 116 Groveland Ave.
- Berglund, Lillian O., 116 Groveland Ave.
- Berquist, W. I., 3536 Colfax Ave. S.
- Berkheimer, Effie, 2228 Dayton Ave., St. Paul
- Berman, Edna, 1115 Bryant Ave. N.
- Bertels, Ernest H., 885 21st Ave. S.E.
- Berven, Gay C., Mound, Minn.
- Beseman, Magdalen, 1800 1st Ave. S.
- Betts, Laura J., 5604 Blaisdell Ave.
- Bicknell, E. H., 3446 1st Ave. S.
- Biever, Ernest, 213 N. 3rd St.
- Birkenmeyer, Hazel V., 1506 Chicago Ave., Apt. 33
- Bissell, Blanche S., 2035 Kenwood Pkwy.
- Bissell, Stanford, 2035 Kenwood Pkwy.
- †Bjerke, Olaf E., 111 E. 31st St.
- Bjorklund, Oliva, 3148 10th Ave. S.
- Blakeley, Addie, 2616 Hennepin Ave.
- Blakey, Mr. & Mrs. Roy, 424 S.E. Harvard St.
- Blanchette, A. M. (Miss), Curtis Hotel
- Bliven, Paul, 2932 7th Ave. S.
- Blosmo, Mrs. O. J., 504 S.E. Beacon St.
- Boehme, Alma E., 1816 Stevens Ave., Apt. 15
- ***Boker, Vitus A., 88 Arthur Ave. S.E.
- Bolter, Leon Maynard, Leamington Hotel
- Bolton, Grace M., 908 5th Ave. S.
- Borden, Gertrude C., 2026 Laurel Ave., St. Paul
- Borden, Mabel C., 2026 Laurel Ave., St. Paul
- Borden, Margaret E., 4753 Xerxes Ave. S.
- Bosley, Harriet, 2870 Humboldt Ave. S.
- Boss, L. C., 802 Franklin Ave. W.
- Bosserman, Homer L., 3038 39th Ave. S.
- Botts, Alice L., 4004 Bryant Ave. S.
- Bowe, A. G., 2145 Carroll Ave., St. Paul
- Braa, Cecilia, 2712 13th Ave. S.
- Brackett, Constance E., 516 S.E. 4th St
- Braden, Elizabeth B., 2300 Hennepin Ave.
- Brady, Mrs. H. L., 819 S.E. Essex St.
- Brandsted, Miss, Minneapolis
- Brask, Herbert C., 2432 15th Ave. S.
- Breen, Genevieve R., 2223 Russell Ave. N.
- Brennan, Mrs. Jessie, 1780 Bryant Ave. S.
- †Brick, P. L., 4315 Harriet Ave.
- Bridgman, Mrs. G. H., The Leamington
- Brink, Carol, 55 Williams Ave. S.E.
- Brink, Frances V., 1708 Brook Av. S.E.
- Brinker, Howard C., 3715 Nicollet Av.
- Brockman, Mrs. Gretta K., 4429 York Ave. S.
- Brockway, Helen, 1786 Hennepin Ave.
- †Broderick, Martin J., 603 S.E. Delaware St.
- †Bronstad, Obert J., 1600 Linden Ave. N.
- Brooke, Mrs. W. E., 416 S.E. Walnut St.
- Brooks, Anna Pamela, 1779 James Ave. S.
- Brooks, Mrs. Edmund D., 1779 James Ave. S.
- Brooks, Susan A., 2028 Seabury Ave.
- Brown, Mrs. Blanche, 5714 Pillsbury Ave.
- Brown, D. Grace, 2720 Pillsbury Ave.
- Brown, Effie M., 411C Curtis Hotel
- Brown, Harry L., 175 Iglehart Ave., St. Paul
- Brown, Helen M., 1609 Hawthorne
- Brown, Mrs. J. M., 4649 Park Ave.
- Brown, Lillian H., 3132 Drew Ave. S.
- †Browne, Jack W. D., 1802 Marshall Ave., St. Paul
- †Bruschweiler, William, 1914 Aldrich Ave. S.
- Bruss, Edwin F., 1120 S.E. 4th St.
- Bryant, Lora S., 728 E. 33rd St.
- Bryne, May E., 3648 Garfield Ave.
- Buchanan, Elsie, 1916 2nd Ave. S.
- Buchanan, Anabel, 4029 Garfield Ave.
- Buck, Mrs. E. H., 611 S.E. Delaware St.
- Buckett, Eleanor, 4205 Linden Hills Blvd.
- Buckle, Mrs. Laurel L., 401 5th St. S.E.
- Bullard, Irma L., 4630 Blaisdell
- Burdette, Clark, 2177 Carroll Ave., St. Paul
- Burger, Maybell A., 1506 Laurel Ave.
- Burkhard, Mrs. O. C., 719 E. River Rd.
- Burns, Anna R., 2601 16th Ave. S.
- Busse, Ida D., 2951 Penn Ave. N.
- Bussey, Marian, 429 S.E. Walnut St.
- Buxton, Anna K., St. Louis Park
- Byrne, Anna M., 24 S. 13th St.
- Byrnes, Mary S., 325 Franklin Ave.

- Cady, Katherine Rowell, 317 S.E. Harvard St.
- Calkin, Ruth M., 3825 Aldrich Ave. S.
- Callahan, Mary Ida, 1208 W. 28th St.
- Cameron, Iva, 129 S.E. 4th St.
- Cameron, Malva M., Grant-Portland Hotel
- Campbell, Ina, 1335 Vine Place
- Campbell, Sarah, Hampshire Arms
- Campbell, Susan D., 3218 Humboldt Ave. N.
- Cannon, Harry S., University of Minnesota
- Cantiency, Josephine J., 5124 Nicollet Ave.
- Cantwell, L. M. (Miss), 1418 Vine Place
- Cap, Frances M., 2628 Aldrich Ave. N.
- Caplin, Jessie F., 3136 Girard Ave. S.
- Carey, E. P., 2502 16th Ave. S.
- Carey, John Henry, 4515 45th Ave. S.
- Carey, Mary L., 4745 Lyndale Ave. S.
- †Carlson, Axel W., 1508 Stevens Ave.
- Carlson, Clarence E., 1508 Stevens Ave.
- Carlson, Esther C., 1597 Roblyn Ave., St. Paul
- Carlson, Ida C., 81 Summit Ave. W., St. Paul
- Carlson, Paul, 3301 22nd Ave. So.
- Carlsten, Esther C., 602 E. 15th St.
- Carpenter, Ellen T., 1103 15th Ave. S.E.
- Carr, Edna M., 1630 W. Minnehaha, St. Paul
- Carroll, Teresa R., 4055 Pleasant Ave.
- Carson, C. Arthur, 1126 S.E. 5th St.
- Carson, Mrs. Virginia R., 1524 Vine Place
- Carufel, Abigail, 1221 S.E. 5th St.
- Cary, Mary L., 4745 Lyndale Ave. S.
- Casady, Gladys, 2019 Lincoln, St. Paul
- Cashin, Charles V., 223 Oak Grove St.
- Casselman, Caroline, Hotel Maryland
- Cavanaugh, Constance, 2727 N.E. Buchanan St.
- Cedarstrand, Cora, 5712 Clinton Ave.
- Cederstrom, Iris, 805 S.E. 7th St.
- Cederstrom, Susan Mary, 805 S.E. 7th St.
- Cenfield, De Ette, Curtis Hotel, Apt 51
- Challman, Esther, The Leamington
- Charney, Sarah, 618 Fremont Ave. N.
- Chase, Marjorie G., 250 20th Ave. N.
- Chase, Polly, Leamington Hotel
- Cheney, George W., 3111 42nd Ave. S.
- Chilstrom, Ethel K., 230 W. 40th St.
- Chinnock, Katherine, 707 Summit Ave.
- Christensen, Emma D., 2344 Aldrich Ave. S.
- Christensen, May J., 901 Minnehaha Ave.
- Christian, Lella B., 5115 Nicollet Ave.
- Christianson, John O., 1412 Portland Ave.
- Christianson, Lavine, 26 Oak Grove St.
- Christie, Blanche, 3145 James Ave. S.
- Christman, Elvin T., 3804 5th Ave. S.
- Claggett, Alice W., The Leamington
- Clancy, Ellen, 2655 15th Ave. S.
- Clancy, Mary, 2655 15th Ave. S.
- Clark, Harry S., 1170 14th Ave. S.E.
- Clark, Ida, The Maryland Hotel
- Clark, Wilber B. (Mr. & Mrs.), 317 18th Ave. S.E.
- Clarke, Permelia A., 914 Elliott Ave.
- Cleary, Susie A., 3325 3rd Ave. S.
- Clements, Jean C., 2020 Garfield Ave.
- Cleveland, Alrise, 3228 Elliott Ave.
- Cleveland, Esther M., 3228 Elliott Ave.
- Cleveland, Guy H., 3712 Upton Ave. S.
- Cleveland, Mrs. M. M., 3228 Elliott Av.
- Coffin, Isa L. E., 4411 Morgan Ave. N.
- Cohen, Jacob G., 1203 Aldrich Ave. N.
- Cohen, Mamie R., 1203 Aldrich Ave. N.
- Cohen, Marion S., 800 Irving Ave. N.
- Colburn, Lillie E., 3022 Longfellow Ave.
- Collins, Anna B., 3220 Holmes Ave. S.
- Collins, M. E., 4410 W. Lake Harriet Blvd.
- Colliton, Helen, 104 E. 25th St.
- Colose, Earl, 2523 Irving Ave. N.
- Condon, William J., 2429 Emerson Ave. S.
- Connell, Florence H., 4629 Zenith Ave. S.
- Connell, Mary E., 4629 Zenith Ave. S.
- Cook, Charlotte E., 2738 Pillsbury Ave.
- Cook, Elizabeth, 1311 Yale Place
- Corcoran, Katherine M., 2541 N.E. Monroe St.
- Corkrey, Grace, 44 N. 6th St., No. 2
- Corkrey, Mary, 44 N. 6th St.
- Corliss, Ione E., 417 S.E. Delaware St. S.E.
- Corser, Mary G., 910 University Ave. S.E.
- Cory, Mae M., 2611 17th Ave. S.
- Cosgrove, Loretta J., 5240 Washburn Ave. S.
- Cosgrove, Marz A., 5240 Washburn Ave. S.
- Costigan, Honora, 517 11th Ave. S.E.
- Coughlan, Cecilia, 237 Pleasant Ave., St. Paul
- Coulter, M. Etta, 1310 Lowry Ave. N.
- Cowen, Mae I., 2310 Girard Ave. S.
- Cowin, Edith B., 3538 Blaisdell Ave.

- Cowrie, Ruby C., 2602 Como Ave. S.E.
 Coyle, Mrs. Katherine, 4436 35th Ave. S.
 Coyle, Maud H., 204 S.E. Bedford St.
 Crane, Grace C., 1624 Hague Ave., St. Paul
 Crane, Jennie C., 3040 Humboldt Ave. S.
 Crane, Robert V., 710 13th Ave. S.E.
 Crawford, C. A., 3437 3rd Ave. S.
 Crawford, Mary E., 2903 'Humboldt Ave. N.
 Crawford, Myrtle E., 602 E. 15th St.
 Creswell, Emma L., 3948 Garfield Ave.
 Cribbs, F. Margaret, 1663 Edgerton St., St. Paul
 Crickmer, Louise S., 610 E. 15th St., Apt. 21
 Crickmer, Nolie, 610 E. 15th St.
 Crittenden, Ethel F., 2525 12th Ave. S.
 Crockett, Clara S., 2512 Hennepin
 Crouse, Tillie F., 1700 Stevens Ave.
 Curran, Mrs. Clarice E., 4845 Lyndale Ave. S.
 Curran, Robert S. (Mr. & Mrs.), 1829 5th Ave. S.
 Curry, Margaret G., 1511 Breda St., St. Paul
 *Curtis, Dorothea, 589 Portland Ave., St. Paul
 Cushman, Mrs. Robt. E., 1225 S.E. 5th St.
 Cutler, Bessie, University Hospital
 Cutler, Mary E., 629 E. 19th St.
 †Cuzner, Dorothy, 1203 Talmadge
 Dahl, Marion, 111 Spruce Place
 Dahlen, Dorothy, 2419 Taylor St.
 Dalton, Mary, 524 Ridgewood Ave.
 †Daly, John J., 3209 S.E. 4th St.
 Daly, Mary L., Eden Prairie, Minn.
 Daniels, Mrs. Alice R., 1221 26th Ave. N.E.
 Danielson, O. W., 1910 Feronia Ave., St. Paul
 D'arche, Genevieve C., 5600 Nicollet Ave.
 Dart, Izella M., 715 University Ave. S.E.
 Dauffenback, Minnie, 3116 Emerson Ave. So.
 Daur, Augusta A., 1421 Park Ave.
 Davenport, Marcia, 3446 1st Ave. S.
 Davidson, Lois C., 1786 Hennepin Ave.
 Davies, C. Lucile, Hotel Ogden
 Davis, Anna J., 2922 Dorman Ave.
 Davis, Mr. & Mrs. Edward W., 1023 University Ave. S.E.
 Davis, John L., 4339 Pleasant Ave.
 Davis, M. E., 1786 Hennepin Ave.
 Davis, Mrs. Thos. E., 5050 Bryant Ave. S.
 Davlin, L. P., 501 15th Ave. S.E.
 Davlin, Mrs. N. D., 501 15th Ave. S.
 Dean, Elizabeth D., 580 Holly Ave., St. Paul
 Deltz, Eva, 2106 5th Ave. S.
 DeLeuw, Lucy B., 4612 Columbus Ave.
 DeLeyer, Howard, 3911 Girard Ave. N.
 DeLoach, Mrs. Gertrude B., 4115 Garfield Ave.
 Densmore, Lydia M., 2433 Colfax Ave. S.
 DeVaney, Ethel Anne, 2301 Minneapolis Ave.
 DeVaney, Grace M., 2301 Minneapolis Ave.
 Devany, Anne, 3801 Stevens Ave.
 Dickinson, Mrs. Z. C., 939 14th Ave. S.E.
 Diederich, R. C., 1933 Ashland Ave., St. Paul
 Dills, Mrs. May H., 5531 1st Ave. S.
 Disch, Cecilia, 3657 3rd Ave. S.
 Disch, Irene, 3700 Dupont Ave. N.
 Disney, Florence H., Grant-Portland Hotel
 Disney, Madeline W., 3443 Elliott Ave. S.
 Doman, Dayne, 2405 Portland Ave.
 Donahue, Mary E., 3112 40th Ave. S.
 Donaldson, Cary E., 2520 Aldrich Ave. S.
 Donnell, Charlotte C., 827 S.E. 6th St.
 Donnelly, Mrs. Clare B., 20 N. 13th St., Apt. 6
 Doran, Alice N., 1495 Sherburne Ave., St. Paul
 Dorrance, Grace J., 423 Harrison Ave., St. Paul
 Dougherty, Edith L., University Hospital
 Dow, Rollin N., 1935 Dupont Ave. S.
 Dowd, Katherine I., 2316 Lake Place
 Dowd, Marion A., 2316 Lake Place
 Dowe, Helen G., Hotel Ogden
 Down, Lillian, 2020 Garfield Ave.
 Dowrie, Mrs. George W., 501 S.E. Walnut St.
 Doyle, Mary C., 327 Carroll, St. Paul
 Drake, Leah R., 1429 W. Como, St. Paul
 Drake, Zieda, 1059 17th Ave. S.E.
 Driscoll, Helen, 4404 Xerxes Ave. S.
 Drohan, Margaret, 2716 Portland Ave.

- Dunbar, Emma L., 2173 Marshall Ave.
St. Paul
- Dunbar, Louise E., 3136 Humboldt
Ave. S.
- Duncan, Lela B., Curtis Hotel
- Dungan, Minnie W., 2812 W. 47th St.
- Dunn, Anna M., 3110 S.E. 4th St.
- Dunn, Emily, 2507 Emerson Ave. S.
- Dunn, W. P., 1316 S.E. 7th St.
- Dusschee, H. E., 1932 Aldrich Ave. S.
- Dyckman, Howard, 915 University Ave.
S.E.
- Dyer, Martha, 1608 Hawthorne Ave.
- Earenfight, Linnette G., 3634 Dupont
Ave. N.
- Early, Jas. N., Jr., 65 S. 11th St.
- Eaton, Nellie, 717 S.E. Delaware St.
- Eayes, Alena K., 707 S.E. 8th St.
- Ebers, Helen, 4336 Lyndale Ave. S.
- Edelman, Sophie, 152 E. Isabel, St.
Paul
- Edgerton, Bessie E., 2919 Girard Ave.
N.
- Egan, Elizabeth M., 1601 Park Ave.
- Egan, Helen M., 2540 18th Ave. S.
- Egan, Margaret, 2870 Humboldt Ave.
S.
- Elkhorn, Edel, 2729 15th Ave. S.
- Elklund, Nora A., 1903 Stevens Ave.,
Apt. 303
- Ekstrom, Chas. E., 186 Malcolm Ave.
S.E.
- Ellingsen, Willeik E., 310 12th Ave.
S.E.
- Elliott, Celia Mildred, 1407 Yale Place
- Elliott, Mrs. Emma, 3924 Stevens Ave.
- Ellis, Ethel F., 175 Curtis Hotel
- Ellis, Evelyn G., Curtis Hotel
- Emunson, Della C., 2831 Bloomington
Ave.
- Emery, Rhoda J., 701 Manomin Ave.,
St. Paul
- Emmett, Edna E., 1119 W. Franklin
- Emmons, Mrs. Virginia, 1225 S.E. 7th
St.
- †Engels, Mrs. Lucille R., 97 N. 17th
St.
- Engh, Alvilda M., 1721 Vine Place
- Engstrom, Edythe J., 714 N.E. Pierce
St.
- Enos, J. G., 3407 Minnehaha Ave.
- Erb, Nellie M., 1415 Dupont Ave. N.
- Erickson, Beda E., 3010 Girard Ave. N.
- Erickson, Mrs. Henry A., 424 S.E. Har-
vard St.
- Erickson, Julia, Waverly Hotel
- Erlougher, R. J., Y.M.C.A., St. Paul
- Esse, Nora, 3441 Portland Ave.
- Estes, Adah, 1415 Willow St.
- Evans, Mrs. A. G., 3250 47th Ave. S.
- Evans, Carrie M., 2214 Girard Ave. N.
- Evers, Mrs. H. C., 2421 Girard Ave. S.
- Fearseth, Evelyn E., 2206 Doswell Ave.,
St. Paul
- Featherstone, Harriet, 3136 1st Ave. S.
- Felkey, Marie, 1818 13th Ave. S.
- Fellows, Edward O., 3012 Elliott Ave.
- Femberg, Jennie F., 137 Highland Ave.
- Fernald, Mabel R., 509 15th Ave. S.E.
- Fickal, Anna E., 2714 Bloomington Ave.
- Figur, Irene B., 923 14th Ave. S.
- Finger, Clarence L., 1206 S.E. 5th St.
- Finn, Delia A., 1908 Hennepin Ave.
- Finseth, Amelia, 2429 Colfax Ave. S.
- †Fischer, George J., 2819 E. 28th St.
- Fischer, Minna, 2113 Harriet Ave.
- Fiten, Luther J., 412 S.E. Walnut St.
- Fitzgerald, Mary G., Hastings Hotel
- Fitzgerald, Mrs. S. A., 215 Fairview
Ave. S., St. Paul
- Fitzpatrick, Lucy, The Leamington
- Fitzpatrick, Mary A., The Leamington
- Fladager, Natalie, 1513 Bryant Ave. N.
- Flahavan, Frances, 2531 16th Ave. S.
- Fleming, Agnes, University Hospital
- Fleming, Frank W., 1315 N.E. Jeffer-
son St.
- Fleming, Sybil I., 621 S.E. Beacon St.
- Fletcher, Frances, 1101 17th Ave. S.E.
- Fletcher, Miriam, 413 5th Ave. S.E.
- Fletcher, Pauline, 413 5th Ave. S.E.
- Fligelman, Henry I., 2304 Lyndale
Ave. S.
- Flitton, Letta T., 1819 4th Ave. S.
- Flor, Albert, New Ulm, Minn.
- Flynn, Mary E., 813 11th Ave. S.E.
- Foley, Sarah, 4146 Vincent Ave. S.
- Folsom, Elizabeth G., 601 E. 14th St.
- Folsom, Louise M., 3228 Portland Ave.
- Fontaine, Mrs. Idaline, 1206 W. 32nd
St.
- Ford, Mrs. G. S., 517 S.E. Essex St.
- Ford, Mary F., 1939 Bryant Ave. S.
- Forseth, E. Pauline, 1500 3rd Ave. S.
- Fossum, Dora, 4327 Morningside Road
- Fox, Amy A., 946, The Leamington
- Fox, Helen M., 513 8th Ave. S.E.
- Francis, Helena L., 1669 Hague Ave.,
St. Paul
- Frandsen, Mabel, 2714 E. 29th St.
- Franseen, Clifford C., 74 Spruce Place,
Apt. 318
- Fraser, Mrs. Everett, 813 S.E. 7th St.
- Fredlund, Paul, 909 21st Ave. S.
- Fredrickson, Margaret, 2126 Carter
Ave., St. Paul

- Freeman, Edna, 4704 Colfax Ave. S.
 Freeman, Nellie M., 4704 Colfax Ave. S.
 French, Shirley M., 26 Sidney Place S.E.
 Fridley, Mr. & Mrs. John P., 707 E. 14th St.
 Friedlander, Esther, 2803 2nd Ave. S.
 Frink, James L. (Mr. & Mrs.), 1718 Park Ave.
 Frisch, L. H., 1019 Knox Ave. N.
 Frost, Edith L., 4623 Washburn Ave. S.
 Funk, Harriet, Curtis Hotel
 Furbush, Sara A., 3815 Cedar Ave.
 Gable, Margaret, 623 14th Ave. S.E.
 †Gale, Samuel C., 713 8th Ave. S.E.
 Galland, Belle B., 4042 Linden Hills Blvd.
 Gardner, Marie, 4323 Garfield Ave.
 Garvey, Anna T., 4305 Aldrich Ave. S.
 Garvey, Mary L., 4305 Aldrich Ave. S.
 Gates, Cullen C., 916 Y.M.C.A.
 Gates, Edwin H., 916 Y.M.C.A.
 Gaus, Ottelie J., 2915 W. 44th St.
 Gaylord, Ruth, 626 8th Ave. S.
 George, Harold M., Buckingham Apts.
 †Gerken, Gretchen J., Berkeley Club
 †Gewart, Carl H., 3140 Holmes Ave. S.
 Gibbs, Louise D., 2426 Garfield Ave.
 Gibbs, Nina M., 2426 Garfield Ave.
 Gilbert, Clarence A., 525 11th Ave. S.E.
 Gillette, Elizabeth, 808 S.E. 4th St.
 Gilligan, Frona A., 2530 Oakland Ave.
 Gilman, Howard, 3417 Park Ave.
 Gilson, Gretchen E., St. Louis Park
 Glover, K. R., Mineral Springs, West Shore, Lake Calhoun
 †Goldvarg, Anna A., 611 Fremont Ave. N.
 Goodale, Ina L., 1413 Willow St.
 Goodrich, Ellen, 3205 Colfax Ave. S.
 Goodrich, Helen L., 1415 N.E. 5th St.
 Goodson, Leota W., 87 Ash St.
 Gordon, H. Truman, 4709 28th Ave. S.
 Gorgen, Mary, 1908 Hennepin Ave.
 Gorham, Bernice, 3033 N. 2nd St.
 Grabow, May Helen, 806 S.E. 4th St.
 Graf, Blanche, 4044 4th Ave. S.
 Graham, Gladys, 3016 Garfield Ave.
 Gram, Mary, 5400 1st Ave. S.
 Gram, Robert W., 5400 1st Ave. S.
 Granger, Charlotte S., 601 W. Minnehaha Pkwy.
 Grant, Alex L., 3000 Humboldt Ave. N.
 Grant, Norman, 2123 S. 5th St.
 Gras, Ethel C., 712 10th Ave. S.E.
 Gray, Grace D., 3105 Hennepin Ave.
 Green, Catherine, 3824 Nicollet Ave.
 Greene, Elsie, 1224 Mary Place
 Greer, Anne A., 2920 44th Ave. S.
 Greer, Eva E., 3220 Pillsbury
 Gregor, Rosa Claire, 1370 Stanford Ave., St. Paul
 Gremer, Anne, 738 E. 16th St.
 Gremer, Bertha R., 738 E. 16th St.
 Grendall, Alice D., 730 E. 4th St., St. Paul
 Griffith, Lulu, 4026 Vincent Ave. S.
 Grimes, Della, 524 15th Ave. S.E.
 Grimes, Lucy A., 524 15th Ave. S.E.
 Grimes, Margaret, 943 Cromwell Ave., St. Paul
 Grobel, Olive A., 3421 3rd Ave. S.
 Groesbeck, Mrs. Agnes M., 2020 N. Fremont Ave.
 Grout, Mrs. Frank F., 504 University Ave. S.E.
 Guptill, Grace, 3940 16th Ave. S.
 Gurtzweiler, Rose M., 604 11th Ave. S.E.
 Gustafson, Florence, 2314 N.E. Johnson St.
 Gustafson, Sadie, 811½ S. 5th St.
 Haberbush, Ruth Gladys, 834 S.E. Thornton St.
 Hadley, Joseph A., 716 N.E. 4th St.
 Haefner, Alice, 3723 1st Ave. S.
 Haertel, Carolyn, 4135 Aldrich Ave. N.
 Hagarty, Inez E., 2004 Portland Ave., St. Paul
 Hagerman, Aldura H., 2168 Knapp St., St. Paul
 Haggerty, Mrs. Laura C., 315 S.E. Walnut St.
 Hainer, Gertrude B., 2446 1st Ave. S.
 Haines, Nellie C., 1823 13th Ave. S.
 Hale, Hattie M., 3229 5th Ave. S.
 Hall, Ella F., 2709 Humboldt Ave. S.
 Hall, Grace Elizabeth, 3015 1st Ave. S.
 Halse, Mrs. Laura, 1115 Logan Ave. N.
 Halsey, Sarah E., 2100 Bryant Ave. S.
 Hamilton, Laura M., 1495 Raymond Ave., St. Paul
 Hamilton, Zelma L., 1828 Park Ave.
 Hammer, Mina J., care General Hospital
 Hammes, Eleanor, Robbinsdale, Minn.
 Haney, Elizabeth, 4837 Lyndale Ave. S.
 †Hanka, S. W., 254 Irving Ave. N.
 Hanna, Delia, 113 N.E. 2nd St.
 Hannon, Marie, 1420 Aldrich Ave. N.
 Hansen, Alta I., 1419 Harmon Place
 Hansen, Carl W., 410 17th Ave. S.E.
 Hansen, Meta, 2616 Hennepin Ave.
 Hansen, Nora, 1422 Breda St., St. Paul

- Harding, Mrs. F. A., 1700 Dupont Ave. N.
 Harding, Fred A., 1700 Dupont Ave. N.
 Harding, Nellie, 5141 Camden Ave. N.
 Hardison, Cora E., 2808 Cedar Ave.
 Harger, Lena, 4321 Grimes Ave. S.
 Harmon, Ida, 1916 2nd Ave. S.
 *Harpole, Leon Ray, Y.M.C.A., St. Paul
 Harries, B., 2882 Humboldt Ave. S.
 Harrington, Julia G., 506 N.E. 2nd St.
 Harris, Mary, 225 15th St.
 Hart, Mabel R., 2643 Lyndale Ave. S.
 Hartfeil, Hermina Elsa, 3735 Blaisdell Ave.
 Hartig, Paul C., 914 18th Ave. N.
 Hartley, Agnes, 416 11th Ave. S.E.
 Hartley, Isabel, 416 11th Ave. S.E.
 Harty, Dorothy, 1820 Stevens Ave.
 Harven, Ellen E., 2501 Hennepin Ave.
 Harvey, Edna, 741 E. 24th St.
 Harwood, Evelyn I., 2644 Aldrich Ave. S.
 Haseltine, Ina M., Excelsior, Minn.
 Haseltine, Julia M., 3534 Russell Ave. N.
 Hastings, Ruby, 421 S.E. Walnut St.
 Hatcher, Harriet, 533 Logan Ave. N.
 Hatz, Anna B., 1710 Stevens Ave.
 Hauer, Marie E., 1706 Stevens Ave.
 Hauge, Esther F., 3616 Chicago Ave.
 Haven, Kittie, 3416 2nd Ave. S.
 Havens, Virginia, 111 Spruce Place
 Haveson, Sophia, 929 Penn Ave. N.
 Havre, Sylvia, 2929 Elliott Ave.
 Hawkes, Gertrude A., 3815 Waveland Terrace
 Hawkins, Catherine, 1523 Fremont Ave. N.
 Hawkins, Claire, 427 15th Ave. S.E.
 Hawkins, Martha, 1609 Hawthorne Ave.
 Hayes, Bridget T., 1701 University Ave. S.E.
 Hayes, Gertrude C., 1900 Park Ave.
 †Hayes, H. J., 2009 Ashland Ave., St. Paul
 Hayes, Mary, 3130 1st Ave. S.
 Hayne, Maebil, 3304 Elliott Ave.
 Hays, Ada S., 3304 2nd Ave. S.
 Hazel, Barbara, 1508 Chicago Ave.
 Hazelton, Lydia L., 4629 Zenith Ave. S.
 Heath, Julia C., 1302 Linden Ave.
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 Hefferman, Susan, 2633 Humboldt Ave. S.
 Hegel, Edith, 1310 S. 7th St.
 Heitzman, Elsie, 201 W. 15th St.
 Heitzman, Louise, 201 W. 15th St.
 Hellesen, Anne E., 4700 Bryant Ave. S.
 Helling, Arvilla, 2621 2nd Ave. S.
 Helm, Mr. & Mrs. C. B., 2513 Dupont Ave. S.
 Henderson, I. N., 4505 Xerxes Ave. S.
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 Henriksen, Miss Heide, 2507 Nicollet Ave.
 Henry, Mrs. C. G., 1709 2nd Ave. S.
 Henry, Lola, 1925 Western Ave.
 Henry, Mattie, 4329 Colfax Ave. S.
 Henry, Raymond R., 1900 3rd Ave. S.
 Herman, Mary, 959 14th Ave. S.E.
 Herskovitz, Bess, 502 Humboldt Ave. N.
 Hessberg, Elizabeth, 2732 29th Ave. S.
 Hibbard, Carrie, 5600 Blaisdell Ave.
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 Higgins, Lucy V., 100 W. 27th St.
 Higus, Mrs. Florence, 3104 10th Ave. S.
 Hilder, Fannie E., 1057 13th Ave. S.E.
 Hill, Dr. Eleanor J., 315 University Ave. S.E.
 Hill, Esther, 904 E. 18th St.
 Hill, Golda, Hampshire Arms
 Hill, Mabel, 1219 Knox Ave. N.
 Hill, Ruth H., 3348 Emerson Ave. S.
 Hillhake, Blanch P., City & County Hospital, St. Paul
 Hillhouse, James T., 112 S.E. Church St.
 Hills, John J., 904 Raymond Ave.
 Hitchcock, Jessie, 3116 Fremont Ave. S.
 Hoffman, Edna, 3104 30th Ave. S.
 Holbrook, Eleanor B., 5250 Penn Ave. S.
 Holland, Carolyn, Berkeley Club
 Holland, Edw. B., 715 E. 17th St.
 Holland, Helen, 336 S.E. 9th St.
 Holm Signa W., 2517 29th Ave. S.
 Holmer, T. B., Minneapolis
 Holmen, Gertrude O., Anoka, Minn.
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 Holter, S. B., 2008 Como Ave. S.E.
 Holtman, F. W., 2521 W. 40th St.
 Holtz, Grace M., 2007 Fremont Ave. S.
 Holzschuk, Rita E., 3814 Upton Ave. S.
 Hood, Leone B., 3415 Nicollet Ave.
 Hookey, Edith H., 2877 Holmes Ave. S.
 Horan, Lillian G., 4051 Pillsbury Ave.
 Horan, William R., 1918 Hayes St. N.E.
 Horn, Clara, 214 Oak Grove St.
 Horn, Mary B., 2546 N.E. Fillmore St.
 Hoskins, Eleanor, Minneapolis

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- Howard, Harold G., 3705 24th Ave. S.
- Howard, Isabelle, 1514 3rd Ave. S.
- Hoy, Rosehelen, 3622 E. 50th St.
- Hoy, V. Grace, 1402 Spruce Place
- Hubbard, E. L., 824 9th Ave. S.E.
- Hubbard, Gladys, 2204 Grand Ave.
- Hueffner, Beulah, 1780 Bryant Ave. S.
- Huefner, Stanley R., 1786 Hennepin Ave.
- Hughes, C. L., 2418 Ferrant Place
- Hughes, Ethel M., 2922 Dorman Ave.
- Hughes, Harriet J., 2433 Colfax Ave. S.
- Hughes, Margaret, Curtis Hotel
- Hughson, Florence M., 2300 Nicollet Ave.
- Hulett, Ethel R., 2012 Hennepin Ave.
- Hulett, Jessie L., 2012 Hennepin Ave.
- Hull Maebelle C., 3148 10th Ave. S.
- Hullis, Mrs. Mabel G., 3914 2nd Ave. S.
- Hulls, Mrs. F. B., 3914 2nd Ave. S.
- Hultman, Ida, 1501 Linden Ave.
- Hunter, Eva M., 2300 Nicollet Ave.
- Hunter, Mrs. W. H., 629 University Ave. S.E.
- Hurlburt, Frances, 3541 17th Ave. S.
- Hussey, Alice, 3124 Portland Ave.
- Hussey, Martha L., 2012 Park Ave.
- Hustvedt, S. B., 112 Church St.
- Hutchinson, Frances, 2612 37th Ave. S.
- Hynes, Julia, 1731 Park Ave.
- Ingle, Jeannette, 2708 Colfax Ave. S.
- Ingraham, Florence, 26 Oak Grove St.
- Irving, Alice M., 833 Summer St.
- Irwin, G. W., 3913 Chicago Ave.
- Isham, Eugene S., 715 Laurel Ave., St. Paul
- Jackson, Elizabeth, 820 University Ave. S.E.
- Jacobs, F. E., 2413 Emerson Ave. S.
- Jacobson, Jay Arthur, 1059 16th Ave. S.E.
- James, Mary L., Hampshire Arms
- Jameson, May, The Leamington
- Janzig, Alexander C., 904 20th Ave. S.E.
- Japs, Amelia R., 1786 Hennepin Ave.
- Jaynes, Mrs. E. L., 147 Orin Ave. S.E.
- Jensen, Christina M., 785 Linwood Place, St. Paul
- Jensen, Louise, 3115 Dupont Ave. S.
- Jensen, Mildred H., 1419 5th St. S.E.
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- John, Olga, 3304 Dupont Ave. S.
- Johns, Muriel O., 3304 Dupont Ave. S.
- Johnson, Adelia, 2832 Riverside Ave.
- Johnson, Agnes, 1903 E. 39th St.
- Johnson, Anna F., 70 S. 12th St.
- Johnson, Anna M., 3255 14th Ave. S.
- Johnson, Clara, 2624 30th Ave. S.
- Johnson, Delia J., 2704 11th Ave. S.
- Johnson, Dena L., St. Louis Park
- Johnson, Elsie C., 3932 37th Ave. S.
- Johnson, Eva C., 2412 4th Ave. S.
- Johnson, Jennie A., 1308 Harmon Place
- Johnson, Lillian M., 1425 Vine Place
- Johnson, Mabel A., 401 S.E. 5th St.
- Johnson, Mildred, 627 N.E. Pierce St.
- Johnson, Myrtle H., 3116 10th Ave. S.
- Johnson, Olga, 926 N.E. Fulton St.
- Johnson, Thora E., 1015 S.E. 8th St.
- Johnstone, Mrs. Nelle B., 611 Central Park Place, St. Paul
- Jones, Vera R., 323 14th Ave. S.
- Jones, Zola Lucile, 1209 S.E. 7th St.
- Jordan, Helen, 2321 Dupont Ave. S.
- Jordet, Orval, 2236 N.E. Pierce St
- Joyce, Carolyn, Plaza Hotel
- Juhl, Anna, 3620 E. 42nd St.
- Kaldahl, H., 1486 Hythe St., St. Paul
- Kammarran, Abbie M., 1208 W. Franklin Ave.
- Kane, Mrs. D., 3612 4th Ave. S.
- *Kantor, George J., 1618 Charles St., St. Paul
- Keating, Anna B., 2020 Fremont Ave. N.
- Keating, Lillian M., 1315 S.E. 7th St.
- †Keating, Maurice H., 3136 17th Ave. S.
- Keeler, Irene M., 1515 Selby Ave., St. Paul
- Keen, Adeline M., 1918 Chicago Ave.
- Keenan, Sarah, 3435 Longfellow Ave.
- Keiser, Laura Jean, 319 W. 25th St.
- Kellam, Martha T., 1415 Willow St.
- Keller, Lucia C., 194 Rondo St., St. Paul
- Kelley, Evie F., 2615 Columbus Ave.
- Kelley, Gladys R., 2417 Emerson Ave. S.
- Kelly, Nellie E., 16 S. 12th St.
- **Kelly, Alice M., 1985 Selby Ave., St. Paul
- †Kelly, Frederic M., 4100 Queen Ave. S.
- Kelly, Helen M. V., 2541 N.E. Monroe St.
- Kelly, Mrs. Hubert, 5104 Colfax Ave. S.
- Kelsey, Dr. C. W., 3525 Elliott Ave.
- Kendall, Calla, 1911 Park Ave., Apt. 306
- Kendall, Eunice A., 701 S.E. 8th St.
- Kennedy, Agnes M., 2533 Bryant Ave. S.
- Kennedy, Charlotte, Anoka Minn.
- Kennedy, Marion, 2533 Bryant Ave. S.

- †Keogh, M. J., 229 Fremont Ave. N.
 Kepperlex, Marian L., 2308 Common-
 wealth Ave., St. Paul
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 Kerr, Adah L., 1520 N.E. Washington
 St.
 Kerr, Maude M., 1416 Portland Ave.
 Kesler, Emma, 59th & Nicollet Ave.
 Kirkpatrick, Jessie, 3815 2nd Ave. S.
 Killeen, Florence M., 1325 Vine Place
 Killeen, Usula M., 1325 Vine Place
 Kimball, Florence, 1119 W. Franklin
 St., Apt. 302
 King, Cecelia, Glen Lake, Minn.
 *King, Don L., St. Paul Academy, St.
 Paul
 King, Julia E., 1034 19th Ave. S.E.
 King, L. Louise, 2818 1st Ave. S.
 Kinney, Elvira, 2319 Irving Ave. N.
 Kirk, Renie J., 1926 3rd Ave. S.
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 Kirochstein, Helen I., 220 Oak Grove
 St.
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 Knauss, Mr. & Mrs. W. C., 1406 Mid-
 way Pkwy., St. Paul
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 Knutson, Mrs., 721 N.E. Madison St.
 Kocourek, John F., 736 S.E. Superior
 St.
 Koefod, Ella, 3439 10th Ave. S.
 Koehler, Elsa I., 508 University Ave.
 S.E.
 Koehsel, Minnie C., 2417 Dupont Ave.
 S.
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 St. Paul
 Kohler, Katherine M., 320 N.E. Jackson
 St.
 †Koll, Gertrude, 1800 1st Ave. S.
 Kortnem, Catherine, 2401 Portland
 Kostick, Gertrude, 2415 Colfax Ave. S.
 Kostick, Mrs. J., 331 13th Ave. N.E.
 Konrad, Edith L., 716 16th Ave. S.E.
 Kowalewska, Josepha, 723 2nd St. N.E.
 Kraemer, Elizabeth, 2029 James Ave. N.
 Kraemer, Lena, 1529 Hawthorne Ave.
 Krawczyk, Monica, 2111 University Ave
 N.E.
 Krey, A. C., 324 S.E. Walnut St.
 Krueger, Etta A., 2409 1st Ave. S.
 Kruger, Isabelle R., 111 Spruce Place
 Kuehl, Bertha I., 2533 Chicago Ave.
 Kuehn, Louise M., 1831 Irving Ave. N.
 Kuenhert, Mrs. Alma J., 6 Oakley Ave.,
 St. Paul
 Kuhlman, Grace G., 4412 Beard Ave. S.
 †Kulp, Delmar E., 332 Oak Grove St.
 Kurth, Henretta L., 317 12th Ave. N.E.
 Kurtzman, Mrs. Dorothy, 1033 E. River
 Road.
 LaBarge, Mrs. Myrtle, 1819 Lyndale
 Ave. S.
 Labriche, Olive, 3231 Girard Ave. N.
 LaDell, Minnie, 1601 1½ Hawthorne
 Ave.
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 Ave. N.
 Lamb, Edna A., 1919 N.E. 6th St.
 Lambertson, H., 29 Clarence Ave. S.E.
 Lamont, Harry K., Hotel Hastings
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 S.
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 Langvick, Emma M., 2406 Girard Ave.
 N.
 Langvick, Huldah, 2406 Girard Ave. N.
 Lantz, Edwin W., 3809 Elliott Ave.
 Lantz, Ludwig A., 3809 Elliott Ave.
 Lapierre, Catherine, 319 University Ave.
 N.E.
 Lapierre, Esther, 319 University Ave.
 N.E.
 Larawa, Douglas, 485 Carter Ave., St.
 Paul
 Larpenteur, M. A., 3615 Park Ave.
 Larson, Mrs. L. P., 5716 Clinton Ave.
 Larson, Mrs. Winford, 516 9th Ave.
 S.E.
 Latourelle, Constance, 1201 E. River
 Road
 Laughead, Caecilia V., 736 S.E. Superior
 St.
 Lawrence, E. Margaret, 2449 Blaisdell
 Ave.
 Lawrence, Hortense, 1817 Vine Place
 Layden, Genevieve, 640 E. 19th St.
 Leager, Marc C., 4506 Colfax Ave. S.
 LeBoribus, Mabel, 342 Bates Ave., St.
 Paul
 LeCompte, Mrs. I. C., 803 University
 Ave. S.E.
 †Lee, Clara, 2101 Minnehaha Ave.
 Lee, Julia M., 238 Nelson Ave., St. Paul
 †Lee, Wm. S., Wells Dickey Co., Mc-
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 N.
 LeMaitre, Rose, 1705 Stevens Ave.

- Leman, Margaret F., 127 E. 14th St.
 Lemke, Louise, 2117 22nd Ave. N.E.
 Lemm, Morley B., 2207 Blake St., St. Paul
 Lenthold, Dorothy G., 707 Summit Ave.
 Lenhart, E. M., 4020 Harriet Ave.
 Lennon, Mary M., 221 N.E. 2nd St.
 Leonard, Alice E., 2919 Girard Ave. N.
 Leonard, Lucy A., 310 E. 31st St.
 Leonard, Marion S., 1213 S.E. 7th St.
 Lestico, Elizabeth, 4642 Wentworth Ave. S.
 Lestico, Florence, 4642 Wentworth Ave. S.
 Leu, Elisabeth, Curtis Hotel
 Leuthold, Dorothy G., 707 Summit Ave.
 Leverett, Lilah, 1209 S. 7th St.
 Lewis, Mrs. Carl H., 3304 48th Ave. S.
 Lewis, H. Adelaide, 1800 3rd Ave. S.
 Lewis, Harry M., 3342 Holmes Ave. S.
 Lewis, Lulu V. (Mrs.), Long Lake, Minn.
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 Liden, Miss Elin, 1906 N.E. Buchanan St.
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 Liedl, Rose M., 718 S.E. 6th St.
 †Lienan, Clair T., 19 N. 15th St.
 Lillienfeld, Harry, 1315 S. 7th St.
 Liljemstrom, William J., 914 W. 36th St.
 Lindahl, Elizabeth H., 695 Holly Ave. St. Paul
 Lindberg, Viola G., 2936 43rd Ave. S.
 Lindberg, Walter F., 2106 Dupont Ave. N.
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 Lindquist, Mabelle, 717 N.E. Fillmore St.
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 Lobdell, Frances R., 1937 Fremont Ave. S.
 Lobdell, Marie, 1937 Fremont Ave. S.
 Locke, Olive A., 625 E. 37th St.
 Loftus, Katherine M., 2401 Grand Ave.
 Loker, Grace E., 3420 18th Ave. S.
 Lommen, Julia A., 1941 Aldrich Ave. S.
 Lommen, Olga L., 1941 Aldrich Ave. S.
 Loring, Mildred W., 623 14th Ave. S.
 Lowen, Maud B., 3240 Oakland Ave.
 Lucas, Florence C., 3156 Columbus Ave.
 Luce, Martha J., 2103 Franklin Ave. S.E.
 Luger, Alvina, 2612 Humboldt Ave. S.
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 Lund, Lillian C., 4017 Elliott Ave.
 Lundall, Leon N., 3109 Humboldt Ave. S.
 Lundberg, George Wm., 204 S.E. Harvard St.
 †Lundberg, Roy Wm., 2808 28th Ave. S.
 Lundberg, Ruth, 1922 N.E. Pierce St.
 Lundgren, Magda E., 4143 Girard Ave. N.
 Lundgren, Paul J., 5129 28th Ave. S.
 Lynch, Catherine C., 1103 15th Ave. S.E.
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 MacDonald, Nellie C., 1643 Queen Ave. N.
 MacEwen, Nora H., 246 N. St. Albans St., St. Paul
 MacGregor, Effie, The Buckingham
 MacLaughlin, Cecil, 3239 1st Ave. S.
 MacMillan, Katherine V., 3016 Portland Ave.
 McCall, Margaret, 905 W. Franklin Ave.
 McCarren, Jane, 424 S.E. 5th St.
 McCarthy, Emma, 1923 Aldrich Ave. S.
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 McCauley, Isabel, 2732 3rd Ave. S.
 McConnell, Daisie C., 5340 Nicollet Ave.
 McCormack, Katherine B., 2001 Aldrich Ave. S.
 McCrosan, Esther E., 4227 Pillsbury Ave.
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 McDowell, Harriett J., 2608 3rd Ave. S.
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 McElroy, Pauline G., 1619 Logan Ave. S.
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 McFetridge, Margaret E., care Central High School, St. Paul
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 McGrory, Mabel, 1929 3rd Ave. S.
 McGuane, Anna, 3016 Portland Ave.
 McGuane, Marcella, 2608 15th Ave. S.
 McGuane, Marion C., 2608 15th Ave. S.
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 McKusick, Marion, Hotel Maryland

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 McMillan, Edith, 20 W. 36th St.
 McMillan, Margaret, 505 10th Ave. S.E.
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 McNie, Mary Bella, The Leamington
 McQuen, Wm. W., 204 S.E. Harvard St.
 McShane, Catherine, Hampshire Arms
 McGibbon, Dr. E. E., 2105 Newton Ave. S.
 Mackay, Margaret, 510 15th Ave. S.E.
 Mackey, Laura P., 1706 Stevens Ave.
 MacLaughlin, Cecil, 3239 1st Ave. S.
 Madden, Adeline E., 2612 Chicago Ave.
 Madsen, Mary A., 611 14th Ave. S.E.
 Madsen, Semina C., 611 14th Ave. S.E.
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 Malone, Mrs. Edw. W., 217 Fairview Ave., S. St. Paul
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 Mann, Helen G., 766 Iglehart Ave., St. Paul
 Manning, Evelyn, 271 Selby Ave., St. Paul
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 Martin, Mildred W., 1780 Bryant Ave. S.
 Martin, Portia Hazel, 3113 Bloomington Ave.
 Martineau, Stella L., 3706 Grand Ave.
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 Mattoon, Hope I., 624 E. 17th St.
 Mattson, Mabel J., 1320 S.E. 6th St.
 May, Julia F., 2012 Park Ave.
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 Maynes, Mrs. Genevieve, Osseo, Minn.
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 Merrill, Blanche L., 214 Oak Grove St.
 Merrill, Helen B., 2172 Conno Ave. W., St. Paul
 Merten, Mildred W., 1780 Bryant Ave. S.
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 Miller, Miss, care Powers Mercantile Co.
 Miller, Howard, 2325 Laurel Ave.
 Miller, Jane S., 1904 Park Ave.
 Miller, Jessie A., 1712 E. Lake St.
 Miller, Mrs. L. F., 417 12th Ave. S.E.
 Miller, Mary T., 1712 E. Lake St.
 Miller, Mathilda, 612 E. 15th St.
 Minten, Esther, 89 Hague Ave., St. Paul
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 Monsos, Rachel, 2000 Portland Ave.
 Montelius, George A., 2518 Emerson Ave. S.
 Montgomery, Esther D., 3015 Fremont Ave. N.
 Moore, George R., 815 S.E. 6th St.
 Moore, May, 3439 10th Ave. S.
 Moorhead, Amy O., 1421 Vine Place
 Moorman, Lucile, 610 E. 15th St.
 Morris, Annie B., 1927 Elliott Ave.
 Morris, Agatha B., 1530 Vine Place
 Morris, Calvin W., 1927 Elliott Ave.
 Morrison, Katherine McLacklan, 1622 Clinton Ave.
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 Morrissey, Ethel L., 2622 Chicago Ave.
 Morse, Anna J., 1420 Portland Ave.
 Morton, Catherine L., 5122 Washburn Ave. S.

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 Mulle, Olga, 3022 Irving Ave. S.
 Mullen, Cleo E., 2617 3rd Ave. S.
 Mullen, Mrs. P., 407 University Ave. S.E.
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 Mullin, Jessica L., 1804 1st Ave. S.
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 Munson, Harriet, Waverly Hotel
 Murphy, Anna, Curtis Hotel
 Murphy, Helen M., 2624 Humboldt Ave. S.
 Murphy, Mary L., 2885½ Knox Ave. S.
 Murphy, Mary V., 4109 Sheridan Ave. S.
 †Murphy, Theresa, 3505 Sheridan Ave. N.
 Murray, Agnes R., 2445 Aldrich Ave. S.
 †Myklebust, I. L., 1558 Hillside Ave. N.
 Myers, Genevieve, 2501 Bryant Ave. S.
 Myers, Mrs. Walter, 608 S.E. Oak St.
 Myhre, Emma A., 1819 Lyndale Ave. S.
 Naion, Effie L., 1407 Clinton Ave.
 Nalezny, Catherine D., 423 N.E. Jefferson St.
 Naper, Martha E., 3149 Holmes Ave. S.
 Nash, Anna, 2018 Hennepin Ave.
 Nauer, Berta, 3936 12th Ave. S.
 Niedham, Marie, 3253 Bloomington Ave.
 Neill, Caroline M., 2705 1st Ave. S.
 Neilson, Elizabeth, 2908 45th Ave. S.
 Nelson, Anna J., 3001 Fremont Ave. N.
 Nelson, Beth, 2108 Western Ave.
 Nelson, F. Olaf, 3220 16th Ave. S.
 Nelson, Pauline A., 5716 Clinton Ave.
 Nessel, Martha E., 1704 Park Ave.
 Nessel, Nellie, 1704 Park Ave.
 Nestor, Edna Macy, 1210 N.E. 2nd St.
 Nettleton, Flora, 1109 Hawthorne Ave.
 Newell, Bertha M., 3333 Humboldt Ave. S.
 Newell, Margaret M., 1103 S.E. 4th St.
 Newgard, Olaf, 3648 34th Ave. S.
 Newholm, J. Bernire, 179 N. Kent St., St. Paul
 Newkirk, Mrs. Bert, 509 S.E. Essex St.
 Newkirk, Muriel, 509 S.E. Essex St.
 Newkirk, Virginia, 509 S.E. Essex St.
 Newlander, Ruth D., 419 Groveland Ave.
 Newton, Mrs. Emma, 1502 Raymond Ave., St. Paul
 Newton, Sadie H., 2623 Harriet Ave.
 Nickell, Marion F., 500 S.E. 7th St.
 Niedorf, Katherine E., 237 N. St. Albans St., St. Paul
 Niles, Harriet S., Hotel Maryland
 Nimis, B. Louise, 290 Cathedral Pl., St. Paul
 Nolan, Muriel A., 557 Rondo St., St. Paul
 Nolander, Austin P., 2876 Humboldt Ave. S.
 Nooris, Rev. Lester S., 5835 Lyndale Ave. S.
 Norden, Thos. P. (Mr. & Mrs.), 817 Portland Ave., St. Paul
 Normann, Astrid, 500 S.E. Delaware
 Northfield, Mrs. Susan M., 1415 19th Ave. N.
 Nortner, Dr. M. G., 401 Penn Ave N.
 Norton, Anna C., 4952 Newton Ave. S.
 Noyes, Wilbur J., Mineral Springs, Minneapolis
 Nye, Ellen S., 1705 Stevens Ave.
 Nygaard, Mrs. Mabel G., 4121 W. 45th St.
 Nystrom, Clara, 513 13th Ave. S.E.
 Nystrom, Ruth, 37 W. 54th St.
 **O'Brien, Genevieve, 511 Harrison Ave., St. Paul
 O'Dell, Thomas E., 21 W. Grant St.
 O'Farrell, Margaret, 1929 3rd Ave. S.
 O'Gordon, Melvilene, 808 9th Ave. S.E.
 O'Hagen, Archie M., 2905 28th Ave. S.
 O'Hare, Joseph P., 205 W. 6th St., St. Paul
 O'Reilly, Gertrude, 1608 Hawthorne Ave.
 Oakford, Frances P., 1788 Hennepin Ave.
 Oberg, Anna M., 2519 Grand Ave.
 Odean, G. R., Jr., 3431 Nicoller Ave.
 Okerblad, Stina A., 1409 Chicago Ave.
 Okland, Herman J., 29 N.E. 2nd St.
 †Olmen, Stella L., 1016 W. 28th St.
 Olson, Chester J., 412 S.E. Walnut St.
 Olson, Clarence T., 1419 S. 7th St.
 Olson, Helena, 2115 3rd Ave. S.
 Olson, Olga E., 2936 43rd Ave. S.
 Olson, Oscar B., 92 Snelling Ave. N., St. Paul
 Opfer, Albert B., 3244 Colfax Ave. S.
 Opsahl, Josephine M., 1606 22nd Ave. N.
 Orcott, F. R., 136 W. 56th St.
 Orcott, Mrs. Frank, 136 W. 56th St.
 Oren, Ellen, 1111 Russell Ave. N.
 Oren, Mary L., 1111 Russell Ave. N.
 Orr, Loretta M., 2509 Emerson Ave. N.
 Osmundson, Walter E., 204 S.E. Harvard St.

- Osterberg, Mathilda, Hotel Curtis
 Osterberg, May, 1234 Edmund St., St. Paul
 Overholser, Margaret, 2803 Fremont Ave. N.
 Owre, Alice, 514 S.E. Essex St.
 Owre, Frances C., 514 S.E. Essex St.
 Oyen, Agnes G., 3722 Oakland Ave.
 Padgett, Florence O., 1710 Stevens Ave.
 Page, Grace M., 2162 Carroll Ave., St. Paul
 Palm, Cora R., 4003 Wentworth Ave.
 Palmer, Mary J., 528 14th Ave. S.E.
 Parsons, Mrs. Clara D., 4242 Alden Drive
 Patchen, Georgia A., 1811 1st Ave. S.
 Patchin, Mrs. Eva, 619 University Ave. S.E.
 †Patterson, Howard G., 86 Willow St.
 Paul, Helen, 3315 Holmes Ave. S.
 Paulson, H. Arthur, 1428 S.E. 6th St.
 Peacock, Agnes, Hampshire Arms
 Pearce, James B., 1915 Fremont Ave. S.
 Pearry, Lynne A., West Hotel
 Pearson, Carl E., 723 Sims St., St. Paul
 Pearson, Delia E., 2110 30th Ave. S.
 Pearson, Elizabeth, 2832 31st Ave. S.
 Pearson, Julian H., 1415½ Dupont Ave. N.
 Pease, Cecil, 3307 Emerson Ave. N.
 Peterson, Mildred, 31 Arthur Ave. S.E.
 Pederson, Nora L., 619 N.E. Pierce St.
 Peet, Mrs. Wm., 2018 2nd Ave. S.
 Penhall, Lillith F., 113 W. Grant St.
 Perkins, Alice, 1622 W. 31st St.
 Perkins, Ellen G., 3021 Park Ave.
 Perry, Georgia, 2717 Pleasant Ave.
 Perusse, Blanche, 1312 S. 8th St.
 Perusse, Esther A., 413 S.E. Oak St.
 Peters, Leone E., 1915 2nd Ave. S.
 Peterson, Beatrice E., 617 University Ave. S.E.
 Peterson, Clara V., 2016 28th Ave. S.
 Peterson, Claudine, 3400 Bryant Ave. S.
 Peterson, David N., 3247 Columbus Ave.
 Peterson, Edna L. T., 2904 41st Ave. S.
 Peterson, Edwin T., 3301 5th Ave. S.
 Peterson, Effie A., Portland Ave. & 59th St.
 Peterson, Emma V. E., 2904 41st Ave. S.
 Peterson, Eva C., Hotel Harmon
 Peterson, Hannah M., 2320 S. 7th St.
 Peterson, H. G., 2816 27th Ave. S.
 Peterson, J. E., 1708 Como Ave., St. Paul
 Peterson, Marian L., 3301 5th Ave. S.
 Peterson, Marie Hanna, 2300 S. 7th St.
 Peterson, Merle C., 2411 11th Ave. S.
 Peterson, Minnie, Portland Ave. & 59th St.
 **Peterson, Richard M., 959 14th Ave. S.E.
 Phede, Celina, 3817 38th Ave. S.
 Phillips, Anna T., 1808 Stevens Ave.
 Phillips, Bertha I., 3208 Humboldt Ave. S.
 †Phillips, Grace, 1686 Capitol Ave., St. Paul
 Piemeisel, Robert L., 1615 1st Ave. S.
 Pierce, Elizabeth, University Hospital
 Pierce, Mrs. M. Frances, 706 University Ave. S.E.
 Piltz, Edna M., 2641 15th Ave. S.
 Pitney, E. H., 2315 Dupont Ave. S.
 Pittard, Katherine V., 1118 S.E. 7th St.
 Pitorf, Albert J., 274 E. Annapolis St., St. Paul
 Pixley, Mary Maude, 3247 Stevens Ave.
 Platzter, Helen, 3410 Garfield Ave.
 Plunkett, Mrs. Thos., 2724 Chicago Ave.
 Plantikow, Lyla G., 2215 Dupont Ave. N.
 Plantkrow, Miranda M., 2215 Dupont Ave. N.
 Pletke, Dora, 1786 Hennepin Ave.
 Plummer, Bel, 1111 Hawthorne Ave.
 Plummer, Mrs. S. H., 414 W. 54th St. S.
 Polk, Grace E., 516 Hampshire Arms
 Pomeroy, Lillian C., 2404 Nicollet Ave.
 Poppe, Eleanor, 2627 Humboldt Ave. S.
 Poore, Louise, 2871 Humboldt Ave. S.
 Porter, H. W., 121 11th St. S.
 Powell, Mrs. Irene, 5600 Nicollet Ave.
 Powell, Mrs. Mary A., Grant-Portland Hotel
 Powell, Louise M., University Hospital
 Preston, Catherine, 99 S.E. Bedford St.
 Price, Cora Belle, 332 1-3 Humboldt Ave. S.
 Purdy, Beatrice, 413 5th Ave. S.E.
 Purdy, Daisy I., 123 W. 5th St.
 Putman, Alice E., 1823 9th Ave. S.
 Pybus, Emma M., 610 E. 15th St.
 Pyke, Emily, 1922 Humboldt Ave. S.
 Quilling, Alice M., 1530 Vine Place
 Quinby, Thos. F., 2424 Humboldt Ave. S.
 Quinn, Mary E., 2432 Lyndale Ave. S.
 Radke, Helen M., 504 2nd Ave. S.E.
 Radsch, Mina, 75 Melbourne Ave. S.E.
 Raines, Mary Edith, 3136 Humboldt Ave. S.

- Randall, Ada M., Hopkins, Minn.
 Randall, Grace A., 1425 Vine Place
 Randall, Louise E., 3248 2nd Ave. S.
 Rankin, Mrs. A. B., 605 E. 17th St.
 Ranney, Lila Weber, 69 S.E. Bedford St.
 Ranum, Edna E., care Alfred J. Krank, 140 E. 6th St., St. Paul
 Rarig, Margaret, 111 Orlin Ave. S.E.
 Ray, Charlotte D., Hampshire Arms
 Ray, Rosalie E., 1939 Bryant Ave. S.
 Reber, Maude, 2416 28th Ave. S.
 Rechcygl, Mildred, 2402 Hennepin Ave.
 Reed, Carolyn A., The Leamington
 Reed, Margaret, 2204 Grand Ave. S.
 Rees, Mrs. Lester, 1000 Franklin Ave. W.
 Regan, Mrs. Grace H., 609 The Leamington.
 Rehart, Nell, 3717 Cedar Ave.
 Rehfeld, Alice D., St. Louis Park
 Reichard, Veda, 4541 York Ave. S.
 Reichert, Ida A., 415 Dupont Ave. N.
 Reid, Mary D., 604 11th Ave. S.E.
 Rehrke, Rosetta M., 4544 Zenith Ave. S.
 Reque, Marie E., 307 W. 15th St.
 Renfield, Alice D, St. Louis Park
 Reusch, J. J., 391 Beacon Ave., St. Paul
 †Rex, Florence, 307 W. 15th St.
 Rhame, Edith Pope, 209 S.E. State St.
 Rhoads, Paul H., 538 12th Ave. N., St. Paul
 Richards, Estelle W., Hotel Maryland
 Richards, Mary L., 114 W. Grant St.
 Richards, Nellie, The Leamington
 Richter, Grace A., 4324 Lyndale Ave. S.
 Ricketson, Mrs. Francis J., 2931 Oliver Ave. N.
 Riedle, Anna M., 738 E. 16th St.
 Rieff, Florence, The Minnehaha, Apt. 28, St. Paul
 Rien, Earl A., 501 S.E. Beacon St.
 Righter, V. Mari, 623 14th Ave. S. E.
 Ristrom, Ruth, 3708 Blaisdell Ave.
 Ritchie, Lillian, 2687 Lake of Isles Blvd.
 Ritze, Bertha L., 2549 Bryant Ave. S.
 Robertson, Katherine H., Hastings Hotel
 Robinson, Harriet M., The Leamington
 Robinson, Mabel, 500 S.E. 7th St.
 Robinson, Willis S., 3736 11th Ave. S.
 Roesler, Pearl, 1119 S.E. 6th St.
 Rogers, Edna M., 1420 Portland Ave.
 Rogers, Fay, 1206 18th Ave. N.
 Rogers, Helen, 4029 Garfield Ave.
 Rogers, Richard S. (Mr. & Mrs.), 212 S.E. Harvard St.
 Rohann, Alice Eva, 223 W. Diamond Lake Road
 Rohann, Emma, 223 W. Diamond Lake Road
 Rohweder, Gertrude, 1821 1st Ave. S.
 Rollins, Mark P., 1912 Hennepin Ave.
 Roney, Katherine L., 219 Groveland Ave.
 Rood, L. C., 2633 Pillsbury Ave.
 Rood, Mary B., Maryland Hotel
 Rose, Florence, 2425 Dupont Ave. S.
 Rose, Mrs. L. V., 325 W. 54th St.
 Rose, Mollie Mae, Asbury Hospital
 Rosenquist, Selma E., 3119 Stevens Ave. S.
 Ross, Mrs. Effie L., 1820 Stevens Ave.
 Rotering, Anna, 1915 1st Ave. S.
 Rowan, Margaret, 1700 Portland Ave.
 Rowe, Dr. A. T., 3345 Grand Ave. S.
 Rowell, Ora M., 1408 Spruce Place
 **Rowles, May V., 1958 Selby Ave., St. Paul
 Rudy, Max M., 917 14th Ave. S.
 Rue, Christ M., 681 Lowry Ave. N.E.
 Rumbaugh, Mary L., 2406 Nicollet Ave.
 Rusch, Ella, 1753 Iglehart Ave., St. Paul
 **Rusch, Gertrude C., 1753 Iglehart Ave., St. Paul
 **Rusch, Mabel A., 1753 Iglehart Ave., St. Paul
 Russell, Clementina R., 2451 Aldrich Ave. S.
 Russell, Lydia L., 2118 Como Ave. W., St. Paul
 Russell, Marian E., Anoka, Minn.
 Rutherford, S. J., 1016 27th Ave. N.E.
 Rutledge, Jeanette W., 18 W. Rustic Lodge
 Ruud, M. B., 813 10th Ave. S.E.
 Ruud, Peter H., 604 20th Ave. S.
 Ryan, Miss, care Powers Merc. Co.
 Ryan, Anna M., 416 7th Ave. N.E.
 Ryan, James L., 820 Nor. Pac. Bldg., St. Paul
 Ryan, Joseph M., 416 7th Ave. N.E.
 †Rye, Carlton D., 1407 Girard Ave. N.
 Rylander, Carl E., 705 Sims St., St. Paul
 Rylander, Lawrence, 705 Sims St., St. Paul
 Rystrom, Roy, 716 E. Magnolia St., St. Paul
 Saam, Selma L., 610 E. 15th St.
 Sachs, Lena, 568 7th Ave. N.
 Sachs, Louis, 1903 1st Ave. S.
 Salpeter, Mrs. J., 579 Carroll Ave., St. Paul

- Sampson, Frances P., 2428 Portland Ave.
 Sand, Anna, 800 13th Ave. S.E.
 Sand, Borghild L., 612 E. 15th St.
 Sandbo, William E., 1724 S.E. 4th St.
 Sanden, Bert C., 1292 Dayton Ave., St. Paul
 Sanderson, James C., 813 S.E. 5th St.
 Sanderson, Katherine, 679 Lincoln Ave., St. Paul
 Sanver, Mary T., 603 River Road S.E.
 Sarvela, Leonard A., 808 12th Ave. S.E.
 Sauer, Marion, 3435 Longfellow Ave.
 Sbenikle, Mrs. M., 3145 Stevens Ave.
 Scals, Kate M., 2300 Nicollet Ave.
 Scammon, Mrs. R. E., 33 Arthur Ave. S.E.
 Schadde, Alva J., 528 S.E. 8th St.
 Schaefer, Emmel, 2545 Bryant Ave. S.
 Schain, George A., 2917 31st Ave. S.
 Schey, Jennie O., 417 S.E. Delaware
 Schey, Martin J., 1516 11th Ave. S.
 Schill, Gertrude B., 721 12th Ave. S.E.
 Schmidt, Martha L., 2200 Sheridan Ave. S.
 Schmit, Florence M., 539 Brainard Ave., St. Paul
 Schmitt, Harold N., 733 Aurora Ave., St. Paul
 Schoening, Ida Beth, 2109 Fremont Ave. S.
 Schoenleben, Leland A., 1825 Emerson Ave. N.
 Schoettler, Arthur E., 1905 Elliott Ave.
 Schoof, Bessie J., 1070 17th Ave. S.E.
 Schow, Mayme J., 224 E. Page St., St. Paul
 Schroeder, Mrs. J. F., 1324 N.E. Grand St.
 Schroeder, Neva, 3323 Columbus Ave.
 Schubert, Martha, General Hospital
 Schuhardt, Lena, 6 N. Dale St., St. Paul
 Schumacher, Gladys M., 2622 4th Ave. S.
 Schussler, Emma U., 2722 Blooming-ton Ave.
 Schwartz, Celia M., 1031 St. Clair St., St. Paul
 Scofield, Harriet E., 2609 Columbus Ave.
 Scott, Walter I., 2608 Pillsbury Ave.
 Scripture, Elizabeth, Minneapolis
 Scully, Zita, 2413 Emerson Ave. N.
 Seamans, Florence R., 910 21st Ave. S.
 Seavey, Howard L., 2300 Nicollet Ave.
 Sehey, Emma M., 1301 4th Ave. S.
 Seiden, A. W., 3228 22nd Ave. S.
 Seidlitz, Ella, 2541 Harriet Ave.
 Seigert, Mary, 3912 Aldrich Ave. S.
 Seitz, Mrs. Adelle K., 1416 W. 34th St.
 Seitz, Conrad, 1416 W. 34th St.
 Seitzer, Johanna, 600 Ridgewood
 Sellhorn, Minnie D., 69 Lyndale Ave. N.
 Sevaton, Martha, 3900 Minnehaha Ave.
 Seyller, Blanche L., 1325 Vine Place
 Shane, William Geo., 3549 Humboldt Ave. S.
 Shaney, Florence, 1612 Stevens Ave.
 Shannon, Rose M., 203 W. 5th St., St. Paul
 Shannon, S. Q., 913 Eustis St., St. Paul
 Shapiro, Amo, 908 Fremont Ave. N.
 Shaw, Gertrude J., 2344 Aldrich Ave. S.
 Shea, Agnes, 20 N. 13th St.
 Shebat, Esther, 2825 Hennepin Ave.
 Shebat, Katherin, 2825 Hennepin Ave.
 Shedorsky, Lena, 204 Western Ave., St. Paul
 Sheehan, Katherine, 1815 1st Ave. S.
 Sheldon, Bessie, 1315 S.E. 7th St.
 Shellhorn, Emma J., 911 Queen Ave. N.
 Shillock, Anna, 702 S.E. 4th St.
 Sheppard, Ross I., 1800 S.E. 4th St.
 Shere, Lewis, 3435 Grand Ave. S.
 Sheridan, Helen M., 3443 Elliott Ave.
 Sherin, Mabel, 1819 Lyndale Ave. S.
 **Shields, Alice, 89 Mackubin St., St. Paul
 Shippee, Elizabeth, Prospect Park, St. Paul
 Shirey, Fay D., 729 10th Ave. S.E.
 Shivley, Viola E., 1551 Hillside Ave. N.
 Sholley, Gertrude B., 3836 Thomas Ave., S.
 Shuman, Anne, 914 E. 18th St.
 Shumway, George G., 3410 Pillsbury Ave.
 ***Sidebottom, Radclyffe S., 1907 Orange St., St. Paul
 Siebert, Marie H., 3006 Oliver Ave. N.
 Siegert, Frances, 3552 3rd Ave. S.
 Siehl, C. D., 3315 W. 45th St.
 Sifton, Hattie E., 2015 W. Broadway
 Siggelkow, Grace R., 2954 Penn Ave. N.
 Silber, Gertrude G., 127 Highland Ave.
 Silber, Mary, 127 Highland Ave.
 Silk, Harry L., 41 27th Ave. S.E.
 Simon, Selma S., 184 Fillmore Ave. E., St. Paul
 Simonson, Adolph C., 2502 N.E. Johnson St.
 Simpson, Myrtle, 1847 E. 31st St.
 Sims, Mrs. Ralph W., 2644 Aldrich Ave. S.
 Slattery, Thelma L., 3328 5th Ave. S.
 Slider, Ethel M., 1226 5th St. S.E.
 Small, Mary F., 1219 S.E. 4th St.
 Smart, Mrs. Catherine C., 1418 Port-

- land Ave., Apt. 19
 Smith, Agnes C., 4100 Upton Ave. S.
 Smith, Alice D., Curtis Hotel, Apt. 476
 Smith, Claribel, 1224 Mary Place
 Smith, Cleora F., 309 Como & River
 Blvd., St. Paul
 Smith, Evelyn F., 1266 Curtis Hotel
 Smith, Gertrude, 2608 Pillsbury Ave.
 Smith, Gertrude K., 476 Curtis Hotel
 Smith, Grace I., 60 Royalston Ave.
 Smith, Helen E., 1705 Stevens Ave.
 Smith, Irene A., 3125 16th Ave. S.
 †Smith, Margaret L., 1958 Carroll Ave.,
 St. Paul
 Smith, Samuel E., 1417 W. Lake St.
 Smith, Winnifred B., 1107 S.E. 6th St.
 Snyder, Mary, 1325 Vine Place
 Soare, Edna R., 3125 Penn Ave. N
 Solmans, Emma, 515 S.E. Harvard St.
 Somers, Catherine W., 2111 14th Ave. S.
 Souba, Amy, Hopkins, Minn.
 Spaulding, Edith E., 5538 Nicollet Ave.
 Spear, Florence H., 2317 Humboldt Ave.
 S.
 Spencer, Gertrude L., 3112 Fremont
 Ave. S.
 Sperry, Ralph M., 705 S.E. 7th St.
 Springsted, James H., 1807 4th St. S.E.
 Squire, Anne, 1025 6th Ave. S.
 Squier, Carrie, 303 S.E. Walnut St.
 Staehle, Jean (Mrs.), 2738 Portland Ave.
 Stanley, Elizabeth A., 747 N.E. Madis-
 son St.
 Stayman, Bessie, 156 Gobertson St., St.
 Paul
 Steele, Katherine D., 1316 S.E. 7th St.
 Steele, Robert E., 1930 Girard Ave. S.
 Steinert, Bessie B., Excelsior, Minn.
 Steinmetz, Jennie, 914 Logan Ave. N.
 Steffanus, Clara, 695 Holly Ave., St.
 Paul
 Stenning, Cliff, 1829 5th Ave. S.
 Stephens, Florence G., 116 W. 27th St.
 Stephens, Jean P., 3102 W. 44th St.
 Stevens, Janet M., The Leamington
 Stevenson, Irene, 3201 Colfax Ave. S.
 Stewart, Theodosia, 3112 3rd Ave. S.
 Stockwell, Mrs. Lynn E., 625 Univer-
 sity Ave. S.E.
 Stone, Charles W., 911 W. 43rd St.
 Strain, Inga, 1402 Emerson Ave. N.
 Straub, Lloyd J., 1126 S.E. 5th St.
 Strauss, Clara, 911 Newton Ave. N.
 Streit, Frank M., 204 S.E. Harvard St.
 Stringham, Josephine A., The Leaming-
 ton
 Stromme, W. A., St. Louis Park
 Strong, Mrs. Carolyn H., 2445 Aldrich
 Ave. S.
 Suidley, Charles P., 1904 1st Ave. S.
 Sullivan, Elizabeth M., 846 Holly Ave.,
 St. Paul
 Sumner, Elizabeth L., 84 Spruce Place
 Sundberg, Frederick G., 45 N. Dale
 St., St. Paul
 Svenddal, Dagny, 2522 Garfield Ave.
 Swanson, Anna E., 3215 Pillsbury Ave.
 Swanson, Clarence V., 730 Capitol
 Heights, St. Paul
 Swanson, Edith M., 911 Penn Ave. N.
 Swanson, Ellen J., 2323 N.E. Pierce St.
 Swanson, Helen A., 5814 Portland Ave.
 Swanson, Lucile I., 1918 3rd Ave. S.
 Swanson, Mabel M., 911 Penn Ave. N.
 Sweet, Earl, 5604 Blaisdell Ave.
 Sweet, Mrs. Earl, 5604 Blaisdell Ave.
 Swennes, Agnes E., 3818 Chicago Ave.
 ***Swenson, G. A., 2842 31st Ave. S.
 Swensrud, Hannah, 2608 S. 8th St.
 Swift, Vivian, 1936 Ashland Ave.. St.
 Paul
 †Syhl, Phillip, 1688 Lafond St., St. Paul
 Syse, Sara, 5015 41st Ave. S.
 Talbot, Esther B., 901 Summit Ave.
 Tallmadge, Mrs. May E., 3221 18th Ave.
 S.
 Tansy, Bessie, 1412 E. 15th St.
 †Taube, Theodore, 2826 Humboldt Ave.
 N.
 Taylor, Beulah, 1915 Portland Ave.
 Taylor, Louis A., 3743 22nd Ave. S.
 Taylor, Mary E., 1015 3rd Ave. S.
 Taylor, Sarah E., 4208 Chicago Ave.
 Taylor, Susan E., 4208 Chicago Ave.
 Teichroew, Henry W., 2339 Pierce Ave.,
 St. Paul
 Telfair, Nellie M., 1422 Portland Ave.
 Teuill, Gertrude, 1415 Willow St.
 Thom, L. W., 3432 32nd Ave. S.
 Thomas, Anna B., 3312 Nicollet Ave.
 Thomas, Gertrude T., University Hos-
 pital
 Thomas, Joseph M., 818 University
 Ave. S.E.
 Thomas, Lucy A., 2420 Harriet Ave.
 Thomas, Jessie M., 818 University Ave.
 S.E.
 ***Thomas, Mabel H., 3032 Irving Ave.
 S.
 Thomas, Mary E., 1786 Hennepin Ave.
 Thomas, Mrs. Selma, 2403 Bloomington
 Ave.
 Thompson, Blanche M., 2311 Bryant
 Ave. N.

- Thompson, Dena, 417 S.E. Oak St.
 Thompson, Edith, 1521 Spruce Place
 Thompson, Faith, 2608 Humboldt Ave. S.
 Thompson, Helen, 106 E. 16th St.
 Thompson, Vera A., 316 12th Ave. S.E.
 Thomson, Vida A., 316 12th Ave. S.E.
 Thomson, Margaret M., 2655 Irving Ave. S.
 Thomson, Thomas C., 3620 E. 42nd St.
 Thor, Christine L., 1216 Sheridan Ave. N.
 Thornton, B. Elizabeth, Curtis Hotel
 Thornton, Katherine J., Curtis Hotel
 Thorpe, Ilene, 3715 Aldrich Ave. S.
 Thorson, Thea, 406 17th Ave. S.E.
 Thyken, Hugh J., 1707 Stevens Ave.
 Tierney, M. J., 3015 W. 52nd St.
 Tinstrom, Ernest A., 716 Cromwell Ave., St. Paul
 Todd, Erma E., 1217 Washburn Ave. N.
 Tolbot, Esther B., 901 Summit Ave.
 Tollefson, Esther, 3648 17th Ave. S.
 Tollifson, Eunice J., 201 S.E. State St.
 Tollifson, Hazel, 315 S.E. Harvard St.
 Tomblor, Marie, 4617 Aldrich Ave. S.
 Tomblor, Alice, 4617 Aldrich Ave. S.
 Tomlinson, Bessie A., 3115 13th Ave. S.
 Tote, Mrs. John, 1011 14th Ave. S.E.
 Tousignant, Florence, 2326 Bryant Ave. N.
 Towey, Agnes M., 2746 Fremont Ave. S.
 Towey, Robert E., 2746 Fremont Ave. S.
 Towler, May B., Minn. Soldiers Home
 Tripp, Eva M., Curtis Hotel
 Trueman, Veronica, 1323 E. 25th St.
 Tuma, Alfred B., 407 Carroll Ave., St. Paul
 Tupper, Emily H., 1902 Park Ave.
 Turngren, Ellen M., 4049 5th Ave. S.
 Turnquist, Anna L., 2542 Chicago Ave.
 †Turnquist, Clarence H., 2418 Chicago Ave.
 Turnquist, Myrtle, 2631 3rd Ave. S.
 Turrittin, Mary, 3302 Harriet Ave.
 Tusler, Wilbur H., 4044 Pleasant Ave.
 Tuttle, Marguerite W., 621 S.E. Beacon St.
 Twitchell, Mrs. S. D., 1429 Como Ave. W., St. Paul
 Tyler, Alice F., 619 S.E. Beacon St.
 Tyra, M. Dorothea, 2009 Lyndale Ave. N.
 Tyra, Ruth, 2009 Lyndale Ave. N.
 Ulbricht, Clara, 523 S.E. 7th St.
 Ulbricht, Emma A., 523 S.E. 7th St.
 Underdahl, Olive, 328 15th Ave. S.E.
 Underwood, Elizabeth, care Girl's Vocational High
 Unngaard, Robert L., 3309 19th Ave. S.
 Vail, Mrs. R. W. G., 519 S.E. Essex St.
 Vanderhoof, Clare, 500 S.E. Delaware St.
 Van Dusen, Sara H. (Mrs.), 601 S.E. 6th St.
 Van Kleek, Maud, 2010 Park Ave.
 Vannier, Marion L., University Hospital
 Van Patten, Mrs. W. E., 120 S.E. 7th St.
 †Vanstrum, Margaretta, 4508 Lyndale Ave. S.
 Van Valkenburg, Mabel, 2408 1st Ave. S.
 Veblen, Gertrude, 2644 Aldrich Ave. S.
 Velson, Pauline, 5716 Clinton Ave.
 Verry, Ethel, 827 S.E. 6th St.
 Vert, Mrs. Nellie R., Curtis Hotel
 Vertz, Mrs. Leila W., 4938 Russell Ave. S.
 Vievering, William, 2360 Hampden Ave., St. Paul
 Voight, Walter Edw., 1892 Feronia Ave., St. Paul
 Von Drak, Lela, 113 S.E. Cecil St.
 Von Rohe, Lucy E., The Leamington
 Wadden, Loretta, 4104 Park Ave.
 Wagner, Ernest, 4419 Pleasant Ave.
 Wahl, Gertrude, 1800 1st Ave. S.
 Wajahn, Martha, 324 16th Ave. N.
 Waldum, Oluf, 3013 James Ave. S.
 Walker, Eva, 411 16th St. N.
 Wallar, Beulah H., 1835 Dayton Ave., St. Paul
 Walsh, William C., 1819 Lyndale Ave. S.
 Walter, Raymond B., 5216 Upton Ave. S.
 Wanless, Luceille, 420 S.E. Walnut St.
 Ward, Susanna R., 4424 Upton Ave. S.
 Warden, Marion, 2112 Humboldt Ave. S.
 Warnock, Florence M., 1786 Hennepin Ave.
 Warren, Elizabeth S., 910 21st Ave. S.E.
 Warren, Gladys E., 3503 Lyndale Ave. S.
 Weaver, Mrs. H. A., 3944 Zenith Ave. S.
 Weeks, Mrs. Barbara E., 601 5th Ave. S.E.
 Weeks, Ida M., 3036 Bryant Ave. S.
 Weidner, Rose, 1311 17th Ave. N.
 †Wells, F. J., Jr., 3641 Pillsbury Ave. S.

- Welo, Alma H., 3036 Harriet Ave.
 Wendell, Ida Marie, 623 E. 14th St.
 Wentland, Ida V., 1325 Vine Place
 Wentz, Edith N., 1469 Hythe St., St. Anthony Park, St. Paul
 Wesbrook, Helen F., 702 S.E. 4th St.
 West, Carleton, care Dayton Co.
 Westlund, Mary E., 4311 Wentworth Ave.
 Westlund, Olof N., 2107 Portland Ave.
 Weston, Carlyle D., 2201 Aldrich Ave. S.
 Westen, Effie M., 2527 N. 4th St.
 Wetmone, Mrs. Theodore, The Leamington
 Wheeler, Eva G., 3336 Irving Ave. S.
 Wheeler, G. A., 926 Chicago Ave.
 Wheeler, Mrs. Iris J., 3734 28th Ave. S.
 Wheeler, Marion L., 315 S.E. Harvard St.
 Whitaker, John A., 3752 Grand Ave. S.
 Whitcomb, Anne W., 2205 Lyndale Ave. S.
 White, Anna M., 1083 15th Ave. S.E.
 White, Caroline A., 1208 W. 28th St.
 White, Carrie A., 1208 W. 28th St.
 Whiteford, Mr. and Mrs. A. W., 2917 Aldrich Ave. S.
 Whitenack, Miss, care Powers Merc. Co.
 Whiting, Jennie N., 2208 Western Ave.
 Whitmer, Marie, 619 Washington Ave. S.E.
 Whitney, Earl L., 527 S.E. Oak St.
 Wichman, Edward W., 2421 Girard Ave. S.
 Wicklund, Hazel E., 4504 Pleasant Ave.
 Wilcox, Gilbert D., 3119 Girard Ave. S.
 Wilde, Oliver T., 803 E. 15th St.
 Wilkinson, Helen F., 4028 Grand Ave. S.
 Wilkinson, Sarah H., 20 W. 36th St.
 Willets, Blaine, St. Louis Park
 Williams, Belle, 20 15th St. N.
 Williams, Josephine F., 5625 Stevens Ave.
 Williams, Maud M., 2010 Park Ave.
 Williams, Ruth, Curtis Court
 Williams, Violet, 122 S.E. 4th St.
- Willis, James P., 2114 Dayton Ave., St. Paul
 Wilson, Neva M., Hillcrest, D. 2
 Wincott, Marguerite, 1013 W. Lake St.
 Wingblade, Henry, 1392 Almond St., St. Paul
 Winn, Blanche, 5101 44th Ave. S.
 Winter, Winifred, 629 12th Ave. S.E.
 Winton, Adelaide A., 2705 Bloomington Ave.
 Winton, Mary F., 2705 Bloomington Ave.
 Witchie, Hazel M., 1700 Dupont Ave. N.
 Wolfe, Mrs. Chas. R., 4032 Harriet Ave.
 Wolfe, G. Beatrice, 714 S. 10th St.
 †Wolfson, Wilfred, 1810 13th Ave. S.
 Wood, Adelia, 3341 2nd Ave. S.
 Wood, Genevieve M., 1523 Van Buren St.
 Woodbury, Jessie E., 3121 Dupont Ave. S.
 Woodruff, Pearl, 1208 Franklin Ave. W.
 Woods, Laura, 60 Ash St.
 Woodworth, H. C., 1662 Capitol Ave., St. Paul
 Woolever, Raymond G., 312 S.E. Ontario St.
 Woolsey, Adelaide, 3024 Aldrich Ave. S.
 Woolsey, Edith, 3024 Aldrich Ave. S.
 Wright, Anna W., Pillsbury Settlement House
 †Wright, Ethel J., 3220 Grand Ave.
 Wright, Quincey, 311 5th Ave. S.E.
 Wright, Robert S., Excelsior, Minn.
 Wunderlich, Margaret E., 3800 Pillsbury Ave.
 Wyland, Elizabeth, 3108 Clinton Ave.
 Wyman, Claude, 1411 2nd Ave. S.
 Yeaton, Katherine, 1828 Clinton Ave.
 Yetter, Margaret C., 2550 Monroe St.
 Yikl, Ida, 1714 Western Ave.
 Youatt, L. W., 915 S.E. 6th St.
 Young, Katherine, 1120 S.E. 6th St.
 Youngquist, Wilma, 821 25th Ave. S.
 Zickrick, Theo., 117 W. Grant St.
 Zobel, Cora Ennes, 1009 W. 26th St.

ST. PAUL—BUSINESS

- Adam, Theresa M., 566 Edmund St.
 Ahlman, Ernest, 530 Collins St.
 Altman, Louis, 2126 Thomas Ave. N.
 Amundson, Alfred, 76 Summit Ave. W.
 Amundson, Fritjof A., White Bear Lake
 Anderson, A. D., St. Anthony Park State Bank
- Anderson, Allen R., 593 Summit Ave.
 Anderson, Arthur C., 714 Case St.
 Anderson, Arthur Wm., 1109 26th Ave. N.
 Anderson, C. A. L., 954 Westminster St.
 Anderson, C. Robert, 663 E. Maryland St.

- Anderson, Garret E., care St. P. F. & M. Ins. Co.
- Anderson, Leonard J., 596 Laurel Ave.
- Anderson, O. Nicholas, 114 W. Cook St.
- Anderson, Wallace S., 375 Iglehart Ave.
- Anderson, Walter A., 574 Dayton Ave.
- Angell, C. E., 605 Ottawa Ave.
- Angell, J. Fred, 605 Ottawa Ave.
- Armstrong, Alice A., 917 Hague Ave.
- Arndt, Arthur L., 1107 Hawthorne St.
- Atlas, Sam, 583 Carroll Ave.
- Axness, C. Edwin, 1387 Breda St.
- Baillie, Monroe, 988 Lincoln Ave.
- Baillon, Paul V., 413 Holly Ave.
- Baird, John Broden, 210 S. Victoria St.
- †Barenbaum, Jack M., 656 Broadway
- ††Barker, Leland H., 1810 3rd Ave. S., Mpls.
- **Barwise, Thos C., 2064 James St.
- Baumgardner, Frank H., 1064 Dayton Ave.
- Beavens, U. B., 1313 James St.
- Becker, Wm. A., 796 Manomin Ave.
- Bergquist, F. W., 729 Case St.
- Bergquist, W. J., 729 Case St.
- Bibus, Anthony A., care Stockyards Nat'l Bank
- **Billingsley, Merle, Piedmont 33 E
- Birnberg, J. V., 628 Lowry Bldg.
- Blandin, A. A., 1015 Grand Ave.
- Bocarde, Isabel A., 665 Fairmount Ave.
- Boese, Alvin H., 571 Como Ave.
- Bohman, Oscar W., 50 Como Ave.
- Bohmert, J. H., 640 Bedford St.
- †Bolstad, Alfred C., 1100 12th Ave. S.E. Mpls.
- Borovansky, Francis J., 399 Superior St.
- Breher, Aloysius F., 1506 Lincoln Ave.
- **Broadstone, Erminie, 1662 Capitol Ave.
- Brodgers, M. C., 214 E. Page St.
- Broten, Anton, 484 Blair St.
- Brown Cyrus P., Jr., care N. W. Trust Co.
- Brusell, Cecil J., 327 Fuller Ave.
- Buetow, Carl H., 428 N. Victoria St.
- Buetow, Herbert P., 733 Charles St.
- Bunde, Carl M., 734 Lafond St.
- Burke, P. S., 807 Jessamine St.
- Butke, Henry B., 625 Wabasha St.
- †Byrnes, Wm. H., 228 Pleasant Ave.
- Calender, George E. 580 Laurel Ave.
- Carlson, Albin Wm., 1836 E. 3rd St.
- Carlson, Melvin B., 753 Laurel Ave.
- Cedarblade, Richard C., 3039 31st Ave. S., Mpls.
- Chenery, John H., 175 N. Avon St.
- Chrest, Rubert W., 894 E. 3rd St.
- ***Christensen, L. C., 473 N. Fairview
- Clapp, Warrer H., 1882 Ashland Ave.
- Clinton, Miss P. M., 395 Marshall Ave.
- Coffey, John J., 1731 Laurel Ave.
- Conklin, O. J., 2334 Alden Place
- Connolly, J. L., Knights of Columbus Hall
- Conroy, Henry M., 1093 Jenks St.
- Coutois, Irene C., 1005 Portland Ave.
- Copland, A. E., 86 Western Ave. N.
- ††Curtis, Dorothea, 589 Portland Ave.
- Darwitz, Wm. A., 1063 E. 3rd St.
- Delander, N. Paul, 710 Laurel Ave.
- DeMeules, E. A., 180 W. George St.
- Desmond, R. A., 986 Sherburne Ave.
- †Doe, Richard H., 404 Dewey Ave.
- Doeren, Frank H. C., 695 E. 7th St.
- Dolan, George F., 1155 Beech St.
- ***Donaldson, Cary E., 1815 Emerson Ave. N.
- Dorfner, Josephine K., 409 Lafond St.
- Dougher, Otto, 772 Fairmount Ave.
- Dramdahl, George H., 908 Sims St.
- Dreher, R. F., 1425 Lincoln Ave.
- Driscoll, Gregory L., 1942 Selby Ave.
- Dushek, Henry, 783 Marshall Ave.
- Egan, Peter T., 797 Cedar St.
- Egan, Raymond W., St. Thomas College
- Ekland, Chester A., 959 Burr St.
- Ells, C. J., 1084 Goodrich Ave.
- Epstein, Israel, 312 Fuller Ave.
- Etter, Frank, 833 York St.
- Fandel, Frayne, 222 Iglehart Ave.
- Fanning, Joseph H., 1354 Lincoln Ave.
- Farrell, Arthur J., 866 Charles St.
- Faulkner, Louis R., 1378 Charles St.
- Felton, Nat. L., Simon & Bircher Ave., S. St. Paul
- Fleischhacker, R. B., 232 W. Rose St.
- Flesher, Blanche, 357 Maria Ave.
- Flesher, Herbert J., 357 Maria Ave.
- Foreman, John P., 419 S. Hamline
- ***Fornare, Harry F., 1557 Roblyn Ave.
- Fortune, John W., 837 Marshall Ave.
- **Fox, Edward J., 535 Ashland Ave.
- Franke, E. P., 1248 Marshall Ave.
- Freeman, Neil, 1625 Middleton
- †Gates, Edgar B., 665 Marshall Ave.
- Gehoke, Edward A., 782 Fuller Ave.
- †Gerner, Otto J., Jr., 587 Michigan St.
- Gillespie, Mary, 326 Harrison Ave.
- Gourhan, George, 969 Randolph St.
- Greenman, Marion, 1056 Goodrich Ave.
- Greer, Herbert L., 1134 Edgerton St.
- Gregerson, Earl N., 899 Grand Ave.
- Gregerson, George, 670 Charles St.
- Greaves, G. H., 2191 Carter Ave.

- **Greeley, Margaret, 278 Dayton Ave.
 Greig, Paul B., 815 Portland Ave.
 Grohs, Louis A., 426 Cherokee Ave.
 Hackner, Herbert M., 720 Armstrong Ave.
 Hakensen, Walter P., 1171 Seminary Ave.
 Hanrahan, Leo H., 241 E. Robie St.
 Hansen, Erling M., 1422 Breda St.
 Hansen, Theo. L., 1422 Breda St.
 ††Harpole, Leon Ray, Y.M.C.A.
 Hauenstein, Irene M., 948 Osceola Ave.
 Haun, Albert A., 645 Central Park Pl.
 Heaton, William R., 819 Stellar St., Mpls.
 Heck, Helen M., 418 Rice St.
 Heimbach, E. M., 1299 Lincoln Ave.
 Henley, Harold J., 271 Prescott St.
 Hille, Henry M., 102 4th Ave. S.
 Hirsch, Alfred G., care Capitol Trust & Savings Bank
 Hoag, R. L., 10 W. Belvidere St.
 Horeish, F. Robert, 17 Wilkin St.
 Horrigan, Wm. J., 900 Dayton Ave.
 Horton, W. S., 551 Laurel Ave.
 Hoslett, Ernel J., 722 Marshall Ave.
 Howe, Frank W., 1708 Blair St.
 †Huffman, Harry H., 2325 Grand Ave.
 ***Hull, Henry O., 1508 Sherburne Ave.
 Hultkrans, Beda T., 1608 Van Buren St.
 Hultman, T. W., 886 Burr St.
 Hultquist, Charles E., 76 West Summit Ave.
 Imsdahl, A. J. A., 704 E. Lawson St.
 Jackson, Carroll, 656 Cherry St.
 Jackson, Claire A., 1616 Edmund St.
 Jacobson, John A., 1319 Blair St.
 Jennings, Thomas J., 467 Selby Ave.
 Johanson, Raymond John, 627 E. Jessamine St.
 Johnson, Arthur K., 694 Oakland Ave.
 Johnson, Edwin L., 828 Sirius St.
 Johnson, George A., 420 Osceola Ave. S.
 Johnson, H. C., 687 Manomin Ave.
 Johnson, Harry L., 667 Magnolia St.
 Johnson, Walter, 667 Magnolia St.
 Jones, Edmund J., 848 Lafond St.
 Jordon, Loretto, 80 Western Ave.
 Jorgensen, Harold M., 843 Selby Ave.
 Jorgensen, Joseph M., 655 Charles St.
 Jorgenson, P. H., 910 St. Anthony Ave.
 Kadela, A. L., 389 View St.
 Kahlert, Wm. A., 2084 Buford Ave.
 ††Kantor, George J., 1618 Charles St.
 Keefe, Herbert H., 1385 Palace St.
 Kennedy, Daniel, 1296 Hague Ave.
 Kerfoot, K. S., 1523 Hewitt Ave.
 King, Clarence M., 716 Hudson Ave.
 Kirchhoff, E. Norman, 839 Lafond St.
 Klock, Frank L., 625 Wabasha St.
 Knudson, Walter O., 35 Como Ave.
 Knudsen, Wm. A., 35 Como Ave.
 Koenen, William B., 318 S. Franklin St.
 Kohler, Clara M., 579 Holly Ave.
 Kohner, Henry J., 544 Smith Ave. S.
 Kortmann, Roland A., 169 E. Belvidere St.
 Krieger, Carolyn, 1081 Goodrich Ave.
 Kuklay, Ray L., 610 Holly Ave.
 Kvaase, Gustav J., 722 Marshall Ave.
 ***Landey, Jens, 2540 W. 7th St.
 Lane, Elvie A., 217 Pleasant Ave.
 Langlois, Wm. J., 886 Fuller St.
 Lanphear, Harry M., 1443 Blair St.
 Laqua, John Jacob, 827 Van Buren St.
 Larson, Esther M., 942 Osceola Ave.
 Lavigne, John E., 397 Smith Ave. N.
 Lawrenz, Olga A., 642 Ashland Ave.
 Leahy, Maurice G., 472 Hall Ave.
 LeBoribus, Wm., 342 Bates Ave.
 Leonard, Wm. N., 833 Carroll Ave.
 Leseemann, E. C., 833 Margaret St.
 Lewis, Harry, 1737 Lincoln Ave.
 Lewis, James D., 923 DeSota St.
 Looby, Mary J., 843 Edmund St.
 Loomis, Muriel Louise, 744 Robert St. S.
 Lowe, Victor G., 34 Cambridge Ave.
 Luecke, Henry G., 910 E. 5th St.
 Luedtke, Rose, 1549 Grand Ave.
 Lundgren, Albert L., 891 Iglehart Ave.
 MacKnight, Mary V., 355 St. Anthony Ave.
 Mackintosh, William J., 515 S. 3rd St., Stillwater
 McCarl, Scott, 593 Summit Ave.
 McClung, Harrison, 665 Portland Ave.
 McConell, Harold G., 77 Langford Park Place
 McConnon, B. J., Bircher & Concorde
 McCreight, Harry A., 1037 Iglehart Ave.
 McMahon, John D., 1779 Carroll Ave.
 McNulty, N. W., 299 Dayton Ave.
 Makiesky, Jack, 799 Cedar St.
 Malone, E. W., 217 Fairview Ave. S.
 Margulis, Sidney, 786 Aurora Ave.
 Marke, Frederick W., 803 W. Van Buren St.
 Markve, Stuart F., 1805 Portland Ave.
 Marsh, Fred C., 1393 Hewitt Ave.
 Mattson, C. Henning, 1350 Edmund St.
 Medley, Mable, 1065 Hague Ave.
 Mellgren, Carl A., 857 Fremont Ave.
 Meyer, Albert J., 905 Armstrong Ave.
 Miller, C. F., 1223 Laurel Ave.

- Miller, Geo., 503 Fred St.
 Moberg, Clarence W., 292 E. 13th St.
 Moffett, J. J., 220 Mackubin St.
 Monick, Eugene A., 837 Margaret St.
 Moore, Betty, 1051 Sherburne Ave.
 Moreland, Grace E., State Hospital,
 Phalen Park
 Morkin, Mary, 2149 Roblyn Ave.
 Mullery, John F., 1696 Iglehart Ave.
 Mulliken, C. E., 521 Cleveland Ave. S.
 Munson, Clifford R., 118 N. Dale St.
 Murphy, Marie, 925 Edmund St.
 Nelson, Clifford M., 150 Fairview Ave.
 N.
 Nelson, Elmer, 1357 Wynne St.
 Nelson, Henry, 164 Thomas Ave.
 Nelson, Hugo E., 2024 Selby Ave.
 Nelson, James B., 2024 Selby Ave.
 Neubauer, Henry R., 778 Tuscarora
 Ave.
 Neutson, Douglas C., 1667 W. Minne-
 haha St.
 O'Brien, Charles, 571 Ashland Ave.
 ††Okland, Herman J., 29 N.E. 2nd St.,
 Mpls.
 Olson, Alexander A., 1268 Dayton Ave.
 Olson, George, 604 Jenks St.
 Olson, Martin N., 627 Cable Ave.
 Olson, Walter E., 963 E. Minnehaha St.
 Oltman, C. E., 1361 Van Buren St.
 Pampush, Joseph R., 420 Lafond St.
 Pearson, Godfrey, 1955 Lincoln Ave.
 Perrier, O. J., 947 Wakefield Ave.
 Peterson, A. M., 411 Forest St.
 Peterson, Melvin A., 253 Fuller Ave.
 Peterson, Rohland O., 716 E. Rose St.
 Peterson, Winfield, 1126 Jessie St.
 Pioske, A. H., care Produce Exchange
 Bank
 Power, Robert E., 494 Ashland Ave.
 Randt, Walter A., 772 Cortland St.
 Rasmussen, Gustav C., 669 Grand Ave.,
 Flat 6
 Read, Cecil, 457 Ashland Ave.
 Reber, Joseph W., 512 Edmund St.
 Rice, J. M., Lakewood, White Bear
 Lake, Minn.
 Risinger, Dean J., 217 Pleasant Ave.
 Risser, C. D., 298 Nelson Ave., Apt. 17
 Ristan, L. A., 382 Avon St.
 Robbins, Jacob J., 130 E. Colorado St.
 Rochetto, Russell E., 821 Manomin Ave.
 Rooney, John G., 1239 Hewitt Ave.
 Rosenbloom, Maurice Wm., 868 Hague
 Ave.
 Rowe, Chas. M., 178 Summit Ave. W.
 **Rowles, Florence L., 1958 Selby Ave.
 Russell, Edgar D., 657 Goodrich Ave.
 Ryan, Wm. P., 9 W. George St.
 Samuelson, H. E., 1611 Ashland Ave.
 Sandberg, Florence, 222 Arundel St.
 Scharff, E. W., 1260 Laurel Ave.
 Schmid, John A., 272 Baker St.
 Schmitt, Michael A., 866 Central Ave.
 W.
 Schrankler, Anna, 1200 Buchanan St.
 Schroeder, Chester E., 1175 Goodrich
 Ave.
 Schroeder, N. J., 211 Goodrich Ave.
 Schwartz, Henry F., 217 Pleasant Ave.
 **Schwartz, Mary, 1031 St. Clair St.
 Scribner, Michael A., 666 E. Lake Como
 & Phalen Ave.
 **Shaker, Elias, 1626 Ashland Ave.
 Shapiro, Herbert David, 131 E. 13th St.
 Shepard, Albert, 299 Harrison
 Shugard, Mrs. Ella M., 1725 Iglehart
 Ave.
 Shugard, Verna, 1725 Iglehart Ave.
 Skeoch, Walter K., 1010 E. 5th St.,
 White Bear
 Soderman, Harold, 756 Burr St.
 Sorensen, Roy T., 1964 Goodrich Ave.
 Stevenson, James R., 118 Western Ave.
 N.
 Stiles, Hazel, 1272 Raymond Ave.
 Stoeckmann, Reuben C., 590 Mendota
 St.
 Strom, Alfer B., 716 E. Rose St.
 Strut, George W., 246 E. Lake Como
 & Phalen Ave.
 Stubbs, E. H., 771 Dayton Ave.
 Stutzman, W. J., care Merchants Nat'l
 Bank
 Svoboda, Gerald J., 784 Pleasant Ave.
 Swanson, Albert F., 516 Laurel St.,
 Stillwater
 Tegner, J. G., 1517 Portland Ave.
 Thomas, Leo, 673 Iglehart Ave.
 ***Timmons, Martin J., 71 Tilton St.
 Toensing, Arthur F., 695 Blair St.
 Torgersen, Raymond W., 785 Lawson
 St.
 Trapp, Paul Fred, 659 Lafond St.
 Trueblood, Clarence, Forest Lake, Minn.
 **Tufvesson, Harold Nels, care Van
 Sant Trust Co.
 Turnburke, V. P., 1832 Portland Ave.
 Turnquist, Arthur E., 1342 Raymond
 Ave.
 Vogel, J. Harold, 722 Central Ave. W.
 **Wattles, Fern, Piedmont Apt.
 Webb, H. H., 610 Holly Ave.
 Wells, Katherine, 1453 Hythe St.
 Wiblishauser, Jos. A., 193 Midway Ave.
 Wicktor, Elmer C., 1717 Van Buren St.

Wilhelmi, R. J., 1039 Arkwright St.
 Williams, Anna K., 1061 Fairmount
 Ave.
 Winkler, Roy A., 1110 Edmund St.
 Winter, Emil Otto, 4053 York St.

Wise, Marion C., 642 Portland Ave.
 Wood, Richard A., 975 Laurel Ave.
 **Woodruff, Earl A., 820 Ohio St.
 Yungbauer, William, 777 Marshall Ave.

ST. PAUL—COLLEGIATE

Aberle, Mrs. David W., 1008 Fairmount
 Ave.
 Allen, Margaret M., 1000 Wakefield
 Ave.
 ††Anderson, August Edward, 909 Igle-
 hart Ave.
 ††Anderson, Mrs. Florence, 399 Holly
 Ave., Minneapolis
 ††Ashton, John Barton, care Dayton Co.
 Atlas, Maurice, 583 Carroll Ave.
 Baber, Florence E., 1415 Van Buren St.
 Bach, Lovena, 627 Cable Ave.
 Baker, Mrs. E. Dorothy, 642 Ashland
 Ave.
 Baldwin, Julia M., 215 S.E. Harvard
 St., Mpls.
 *Barwise, Thos. C., 2064 James St.
 Bassford, M. Hannah, 441 Iglehart Ave.
 Battelle, Madeleine F., 1028 Hague Ave.
 Behrens, Marie, 118 Western Ave. N.
 Bengtson, J. F., 1388 Albany St.
 Bergmeier, Clara H., 614 Fountain St.
 Berry, Mona, 826 Selby Ave.
 Bigne, Blanche S., 54 N. Delos St.
 *Billingsley, Merle, Piedmont, No. 33 E.
 Birch, Ethel L., 1133 Selby Ave.
 Birch, Nellie E., 1133 Selby Ave.
 Birnberg, Mrs. Tobias L., 911 Fair-
 mount Ave.
 Blair, Chas. W., 500 S. 10th St., Mpls.
 Blumberg, Carrie, 2064 Summit Ave.
 Boeke, Henriette, 218 N. Dunlap
 Bohan, Victoria S., 1859 Roblyn Ave.
 Boulger, Francis Jas., 1996 Dayton Ave.
 Boxell, Ethel H., 814 Hague Ave.
 Bowe, John, Brookside, Mpls.
 Branch, Peter A., 205 6th St.
 Brandon, Charles A., 909 Y.M.C.A.,
 Mpls.
 Brennan, Mary Frances, 760 Carroll
 Ave.
 Bresnahan, Katherine, 605 Selby Ave.
 Brey, Florence, 614 Dayton Ave.
 Bright, M. Louise, 805 Portland Ave.
 Brink, Oscar, 717 Lawson
 *Broadstone, Erminie, 1662 Capitol
 Blvd.
 Brooks, Robert L., 1630 W. 26th St.,
 Mpls.
 Brown, Mrs. Elsie C., 927 Hastings Ave.

Brubacher, Ruford D., 3412 1st Ave.
 S., Mpls.
 Bryant, Richard, 162 W. Annapolis St.
 Buckley, Margaret, 226 Nelson Ave.
 Bucklin, C. A., 201 Macalester Ave.
 Bucklin, Inez C., 201 Macalester Ave.
 Burch, Miriam A., Angers Hotel
 Burke, Margaret W., State Hospital,
 Phalen Park
 Burns, Elizabeth, 999 Portland Ave.
 Burns, Maria, 999 Portland Ave.
 Burns, Dr. Robert M., 1049 Portland
 Ave.
 Burns, Mrs. Wendell T., 1857 Laurel
 Ave.
 Butler, Augusta H., 1153 Laurel Ave.
 Calmenson, Mrs. Bertha, 1985 Portland
 Ave.
 Canning, Katherine M., 1662 Capitol
 Ave.
 Canon, Winnifred, 1966 Ashland Ave.
 Carlson, Vinnette, 1145 Jessie St.
 Carroll, Charles, 393 Stryker Ave.
 Casady, Gladys, 2019 Lincoln Ave.
 Caulfield, Mary G., 937 Laurel Ave.
 Chandler, Mary, 512 Portland Ave.
 Christofferson, C. H., 885 Hague Ave.
 Clark, Laurretta, 605 Iglehart Ave.
 Clark, R. W., 1012 Portland Ave.
 Cohen, Gertrude, 855 St. Clair St.
 Colter, Mabel A., 841 Laurel Ave.
 Conley, Lydia M., 1141 Laurel Ave.
 Connolly, Mary M., 135 Western Ave.
 Corcoran, Anna, 245 N. Oxford St.
 Corrigan, Edna, 41 W. Cook St.
 Coughlan, Cecilia, 237 Pleasant Ave.
 Countryman, Alden, 213 S. Avon St.
 Cuzner, Mary F., 213 S.E. Harvard St.,
 Mpls.
 Dakin, E. T., 89 N. Oxford St.
 Daly, Harriet K., 630 Marshall Ave.
 Daly, M. A., 630 Marshall Ave.
 Davenport, Florence, The Angers
 Dearborn, Mollie K., White Bear, Minn.
 DeVinney, Mrs. Mabel I., 1869 Selby
 Ave.
 Dixon, Woodson F., 3016 Portland Ave.
 Donlin, Mrs. J. E., 1271 Ashland Ave.
 Dorrman, Paula, 1907 Marshall Ave.
 Dossdall, Bertha, 1332 Dayton Ave.

- Dougherty, Aurelia M., 620 Park Ave.
 Dougherty, Hannah T., 620 Park Ave.
 Doyle, Anastasia, 2057 Grand Ave.
 Drackert, Grace, 1208 Selby Ave.
 Drake, Miss L. R., 1429 W. Como Ave.
 Duffy, Margaret F., 439 N. Cleveland Ave.
 Egan, Anastasia, 1183 Ashland Ave.
 Elliott, Mary C., 811 E. 5th St. White Bear Lake
 Emery, Marion G., No. 3, 293 Dayton Ave.
 Engstrom, H. E., 1700 Princeton Ave.
 Engstrom, Theo. A., 694 Sims St.
 Erickson, Agnes E., 946 Arkwright St.
 Erickson, Cyrus H., 497 Dayton Ave.
 Erickson, Jno. A., Jr., 1368 Payne Ave.
 Ern, H. R., 3617 39th Ave. S., Mpls.
 Fanning, Mary G., 757 E. 6th St.
 Farrell, Bernice, 828 Holly Ave.
 Fayerweather, Mary, 535 Ashland Ave.
 Feeley, Mae A., 1144 Dayton Ave.
 Filysek, Walter E., 2726 N.E. Fillmore St., Mpls.
 Finstrom, Ernest A., 716 Cromwell Ave.
 Fitzpatrick, Mary F., 1183 University Ave.
 Fligelman, Mrs. Sol, 2116 Fairmount Ave.
 Foster, J. Maude, 271 Selby Ave.
 *Fox, Edward John, 535 Ashland Ave.
 Fox, Mrs. Joseph L., 1764 Portland Ave.
 Fraser, Harriet R., 109 W. Summit Ave.
 Friedl, Mrs. Joseph, 1163 Laurel Ave.
 ***Fullerton, Donald C., 416 S.E. 8th Ave., Mpls.
 Funkel, Irene Pay, Mahtomedi, Minn.
 Garrels, Gebnardine, 595 Ottawa Ave.
 Garrett, Thos. H., 1514 Portland Ave.
 Gaughan, Miss S., The Marlborough
 Gaynor, Lucy M., 902 Cromwell Ave.
 Gille, Anna W., 309 Iglehart Ave.
 Glasgow, Esther, 1511 W. Minnehaha St.
 Glasgow, Mabel, 1511 W. Minnehaha St.
 Goodkind, Mrs. Harold, 567 Lincoln Ave.
 Gordinier, Lillian A., 109 Bates Ave.
 Gorman, Alice A., 727 E. 3rd St.
 *Greeley, Margaret, 218 Dayton Ave.
 Green, Anna B., 303 Nelson Ave.
 Gundlach, Caroline M., 1726 Lincoln Ave.
 Hacuser, C. L., 920 Hennepin Ave., Mpls.
 Hagerty, Inez Elizabeth, 2004 Portland Ave.
 Hagen, G. W., 1114 McLean Ave.
 Hagen, Sylvia, 761 E. 3rd St.
 Hall, Edith P., 997 Dayton Ave.
 Hamilton, Winifred C., 642 Ashland Ave.
 Hand, Richardine, 591 Ashland Ave.
 Hansen, Nancy E., 475 Laurel Ave.
 Harmon, Mrs. H. W., 1924 Iglehart Ave.
 Harris, Dena S., 1854 Portland Ave.
 Harris, Mrs. Wm., 1458 Lincoln Ave.
 Hayes, Laura, 881 St. Clair St.
 Hayward, Della G., 1295 Goodrich Ave.
 Heal, Pearl A., 1462 Capitol Ave.
 Heck, Jennie, 418 Rice St.
 Heck, Mathilda A., 418 Rice St.
 ††Hedrick, W. L., 519 Asbury Ave.
 Heicie, O. C., 321 Lowry Bldg.
 Heim, Mrs. Maritz, Park Farm, White Bear, Minn.
 Heller, Elsa M., 936 Fairmount Ave.
 Helperin, Mrs. Edward, 44 Lexington Ave. N.
 Henly, Clara L., 271 Prescott St.
 Herrman, Clare E., 1600 Western Ave.
 Hess, Mrs. George H., Jr., Apt 34, 389 Dayton Ave.
 Heydon, Jessie M., White Bear, St. Paul
 Higgins, Mary M., 55 Masey
 Holcomb, Dr. Joel T., 599 E. Maryland St.
 Hollister, Gladys M., 1721 Hague Ave.
 Holmes, Margaret J., 1156 Summit Ave.
 Hope, Alice M., 391 Beacon Ave.
 Horrigan, Mary J., 683 Iglehart Ave.
 Hosmer, Alice M., 528 Ashland Ave.
 How, Mary W., 436 Portland Ave.
 Hubbell, Nellie M., 248 Dayton Ave.
 Iddings, Clara L., 998 Ashland Ave.
 Ingersoll, Archibald G., 404 Ashland Ave.
 Jacobs, Ann, 2117 Commonwealth Ave.
 Janes, Mrs. A. L., 588 Grand Ave.
 John, Elsa, 373 Maple St.
 Johnson, Anna, 333 E. Lawson St.
 Johnson, Florence A., 788 Fairmount Ave.
 Johnson, Gertrude, 1005 Lincoln Ave.
 Johnson, Jennie U., 1685 Capitol Ave.
 Johnson, Mathilda, 1388 Capitol Ave.
 Johnson, Nettie, 1780 Wordsworth St.
 Johnston, Ruth, 33 S. Avon St.
 Kallusky, Frederick A., 915 S.E. 6th St., Mpls.
 Keller, Lucia C., 194 Rondo St.

- Kelley, Agnes P., 278 Dayton Ave.
 Kellogg, Gertrude, 369 Laurel Ave.
 ††Kelly, Alice M., 1985 Selby Ave.
 Kelly, Blanche F., 1985 Selby Ave.
 Kennedy, Ella F., 741 Hague Ave.
 Kernkamp, Ella, White Bear, Minn.
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 King, Margaret M., 842 Laurel Ave.
 King, Mrs. W. E., 1544 Goodrich Ave.
 Klein, Elsie, 634 Iglehart Ave.
 Klein, Elizabeth, 1685 Capitol Ave.
 Koeneman, Clara, 1233 Hague Ave.
 Koeneman, Emma, 1233 Hague Ave.
 Kohl, John, 1005 St. Clair St.
 Krakauer, Rose, 612 Lincoln Ave.
 Kuehne, Minnie, 402 Dayton Ave.
 Kurtz, Myrtle H., 886 Fairmount Ave.
 Laramy, Ruth G., St. Paul Park
 Larkin, Jane V., 1204 Portland Ave.
 Larkin, Mrs. M. B., 701 Laurel Ave.
 Larpenteur, Ethel, 737 Hudson Ave.
 Lauritzen, Helga D., 1236 Churchill Ave.
 LaValle, Mrs. Rose, 178 Summit Ave.
 Lawrence, L. H., 2091 Buford Ave.
 Layton, Edith M., 702 Cedar St.
 Lealtad, Grace, 465 Mackubin St.
 Ledegar, Archie A., 1362 W. 7th St.
 Lee, Mrs. Earle Goodrich, 1787 Dayton Ave.
 Lee, Julia M., 238 Nelson Ave.
 Lengby, Hilda C., 768 E. Lawson St.
 Lengby, John Alex, 1618 Berkeley Ave.
 LeVasseur, Mme. Deluice M., 345 Pleasant Ave.
 Lindvall, August J., 714 E. Cook St.
 Little, Mrs. Arthur P., 1656 Wellesley Ave.
 Loenger, Millie S., 1699 Portland Ave.
 Lofgren, Margaret, 599 Case St.
 Lotter, Josephine Anne, 1128 E. Geranium St.
 Long, Justine, 589 Summit Ave.
 Loveland, Carrie E., 2126 Carter Ave.
 Lovgren, Bernard N., Church St. John the Evangelist
 Lowenthal, Bertha, 277 Prescott
 McConville, Marguerite, 11 Summit Court
 McCormack, Elizabeth M., 632 St. Peter St.
 McFeeley, Alice, 2228 Carter Ave.
 McLearn, Rose G., 703 Willard St., Stillwater, Minn.
 McNally, Genevieve E., 293 Nelson Ave.
 MacAlister, Una F., 658 Holly Ave.
 MacEwen, Wm. S., 246 N. St. Albans St.
 MacKnight, Mary, 353 St. Anthony Ave.
 ††Malone, Anne, 1197 Grand Ave.
 Martenson, Theodore M., 9 Como Ave.
 Martin, Ruth E., Mounds Park Sanatorium
 Mellem, Lulu E., 2201 Scudder Ave.
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 Mitchell, Katherine C., 528 Capitol Blvd.
 Mogilner, Mrs. S. N., 208 S. Victoria St.
 Moorman, Mrs. A., Jr., 1615 Stanford Ave.
 Moreland, Marie F., 636 Grand Ave.
 Murray, Albert Sherman, 1242 W. Minnehaha St.
 Neiger, Mrs. James, 1135 Summit Ave.
 Neill, Adelaide, 135 Western Ave. N.
 Nelson, Elizabeth, 389 Dayton Ave.
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 Nelson, Esther T., 1358 Lafond St.
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 Neumann, Minnie M., 947 Cromwell Ave.
 Newell, Frank J., 923 Edmund St.
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 O'Dell, Thomas E., 600 University Ave., Mpls.
 O'Hare, Joseph P., 205 W. 6th St.
 Ohl, Mrs. Lawrence, 374 Daly St.
 Ohr, Frances D., 118 Western Ave.
 Ohr, Winnifred, 556 Ashland Ave.
 Olsen, Carolyne, 271 Selby Ave.
 Olson, Florence E., 750 E. Geranium St.
 Olson, Mina, 1253 Lafond St.
 Olson, Ruth I., 1358 Lafond St.
 Olson, Walfred A., 724 Case St.
 Orenstein, Mrs. L. F., 806 Linnwood Place
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 Poreau, Germaine, 589 Portland Ave.
 Price, Elmer P., 637 Burr St.

- Pukrop, Caleria, 916 Jessamine St.
 Rawlinson, Anna I., 203 S. Chatsworth St.
 Reier, Martin A., 520 S.E. Delaware St., Mpls.
 Rice, Catherine, 766 Carroll Ave.
 Riordan, Gertrude B., 269 Selby Ave.
 Rodgers, Ethel, 967 Fremont
 Rood, Belle, 651 Portland Ave.
 Rosenholtz, Mrs. Alfred, 725 Laurel Ave.
 Rosenthal, Mrs. H., 844 Grant Ave.
 Ross, Eleanor M., 515 Manomin Ave.
 *Rowles, Florence F., 1958 Selby Ave.
 ††Rowles, Mary V., 1958 Selby Ave.
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 ††Rusch, Mabel A., 1753 Iglehart Ave.
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 Schow, Mayme J., 224 E. Page St.
 Schulz, Erna M., 927 Hastings Ave.
 Schumman, Carl T., 535 Grand Ave.
 Schwartz, Anna K., 608 Lincoln Ave.
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 Schwartz, Rachel B., 699 Ashland Ave.
 Selig, Ruth H., 1799 Summit Ave.
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 Slaptes, Mrs. C. D., 1656 Wellesley Ave.
 Slemmons, Antoinette, 235 Arundel St.
 Slette, Inga, 538 Dayton Ave.
 Sliney, Elizabeth J., 736 Holly Ave.
 Soukup, Joseph F., 1180 Portland Ave.
 Stathan, Oliver C., 657 Grand Ave.
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 Stoffer, Doris, 1324 Langtry Ave.
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 Strand, Mary, 296 Duke St.
 Stroble, Elizabeth, 591 Ashland Ave.
 Sumerfield, Irene L., 1493 Summit Ave.
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 Sweeney, Randall, care Field, Schlick & Co.
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 Thuet, Emma, 591 Ashland Ave.
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 Titus, Lucile J., 2187 Dayton Ave.
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 Tomczak, Antoinette M., 1217 Lafond St.
 Towlinson, Geo. H. (Mr. & Mrs.), 1034 Dayton Ave.
 Tozier, Beatrice K., 216 Ann St.
 Tschida, Katherine A., 1188 Laurel Ave.
 Tuff, Jane R., 924 Iglehart Ave.
 *Tufnesson, Harold N., Y.M.C.A., Rm. 527
 Wakefield, Nelle, 1958 Carroll Ave.
 Walsh, William, 205 W. 6th St.
 Watson, Florence, Central High School
 *Wattles, Fern, Piedmont, Apt 33 E
 Wedge, Agnes, 805 Portland Ave.
 Weisz, Hans, 386 Exchange
 Wentworth, C. D., Y.M.C.A.
 Williams, Isabel, 554 Holly Ave.
 Willmer, Mrs. James G., 954 Fairmount Ave.
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 ††Wilson, Neva M., Hillcrest, D. 5
 Wimber, Mrs. L. L., 2170 Lincoln Ave.
 *Woodruff, Earl A., 820 Ohio St.
 Yost, Lena, 260 Iglehart Ave.
 Zirkin, Daniel E., 1600 Plymouth Ave. N., Mpls.

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 Alderson, W. H., 1810 Ashland Ave., St. Paul
 Almqvist, Herbert, 3833 Bryant Ave. S.
 Altman, Otto A., 879 Charles St., St. Paul
 Anderson, Albert E., 131 E. 14th St., Apt. 9
 Anderson, Evold W. C., 1210 E. 25th St.
 Anderson, G. A., 1152 Laurel Ave., St. Paul

- Anderson, Herman W., 816 Hardenburg Place, St. Paul
Aordal, Carl J., 1629 7th St. S.E.
Balding, F. J., 1389 Albany St., St. Paul
Balkins, Ellis H., 1850 Jackson St. N.E.
Bartishofski, Frank, 850 University Ave., St. Paul
Bastis, Emil, 248 22nd Ave. S.
Batdorf, Robert A., 4201 Bryant Ave. N.
Batzli, O., 4231 Humboldt Ave. N.
Beach, G. P., 1403 Albany St., St. Paul
Benson, Clifford E., 4219 Bryant Ave. N.
Benson, R. E., 2864 Irving Ave. S.
Bernard, Walter L., 914 Arkwright St., St. Paul
Bilodeau, Arthur, 1602 University Ave. N.E.
Blanchard, Cecil D., 87 Prior Ave. N., St. Paul
Bloom, Ralph L., 1537 E. 28th St.
Boker, John P., 88 Arthur Ave. S.E.
††Boker, Vitus A., 88 Arthur Ave. S.E.
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Boody, P. L., 4311 E. Lake St.
Boon, Leonard F., 312 16th Ave. S.E.
Bovaird, Ellis L., 709 Cherokee Ave., St. Paul
Boyd, Harold C., 1708 1st Ave. S.
Bremseth, Oliver A., 3513 Colfax Ave. S.
Broms, Thurston, 2025 29th Ave. S.
Brown, Wayne S., 815 Aurora Ave., St. Paul
Brusch, Elmo F., 483 Sherburne Ave., St. Paul
Bryce, Arthur J., 246 E. Page St., St. Paul
Buell, Edwin A., 2551 N.E. Ulysses St.
Buetow, Max, 506 Central Ave. W., St. Paul
Burlingame, Robt. E., 106 W. Rustic Lodge
Caldwell, W. H., 1711 Selby Ave., St. Paul
Campbell, D., 710 7th Ave. S.E.
Campbell, Robert E., 1449 Laurel Ave., St. Paul
Capwell, Claud, 923 Franklin Ave., E.
Carlson, Homer, 1856 Prospect Ave., St. Paul
Carlson, Lawrence, 2632 17th Ave. S.
Carlson, V., 3144 Elliott Ave.
Case, M. Maud, 603 E. 14th St.
Chapman, Stella L., 3708 Colfax Ave. S.
Chilman, Adolph, 618 Magnolia St., St. Paul
Christensen, Sigfred G., 112 Winnipeg Ave., St. Paul
†Christenson, Carl F., 294 Charles St., St. Paul
*Christenson, LeRoy C., 417 Fairview Ave. N., St. Paul
Christy, Mrs. F. P., 4633 Aldrich Ave. S.
Clarke, H. W., 1396 Lincoln Ave., St. Paul
Clausen, Laurits, 1015 15th Ave. S.E.
Clow, Richard A., Y.M.C.A., St. Paul
Colbert, Edward S., 614 Western Ave., St. Paul
Collins, Frank Jas., 37 Hunt St., St. Paul
Conger, Stephen B., 985 Laurel Ave., St. Paul
Copeland, James M., 3216 Hennepin Ave.
Cornish, Truman Wm., 1411 2nd Ave. S.
Cottrell, S. G., 278 Dayton Ave., St. Paul
Cowan, Boyd H., Y.M.C.A.
Cowling, Chas. N., 184 W. Robie St., St. Paul
Crosman, George A., 5811 Nicollet Ave.
Cunningham, James B., 394 Dayton Ave., St. Paul
Dahle, Frederick B., 1830 Selby Ave., St. Paul
Dahlstrom, Arthur, 107 Orin Ave. S.E.
Dale, Dallas W., 429 2nd Ave. S.E.
Dale, D. P., 1513 E. Hennepin Ave.
Dane, Royden S., Kennedy St. & Arthur St. N.E.
††Davlin, L. P., care Mpls. Journal
Dege, Paul, 3222 N. 3rd St.
††*Donaldson, Cary E., 2520 Aldrich Ave. S.
Dorrance, Harold W., 423 Harrison Ave., St. Paul
Duemke, B. B., 2309 N.E. Buchanan St.
Edwards, John B., 193 Aurora Ave., St. Paul
Elliott, Ernest E., 2413 Cole Ave. S.E.
Elliott, Herbert C., 1414 E. Lake St.
Elmond, George, 1251 Edmund St., St. Paul
Erickson, Carl I., 2932 3rd Ave. S.
Estes, Edwin C., 1847 Laurel Ave., St. Paul
Fark, Elmer L., 710 Lafond St., St. Paul

- Farnham, Carleton W., 22 Oak Grove St.
- Felten, Leo D., 940 Thomas St., St. Paul
- Ferlen, Claude Stowe, 517 James Ave. N.
- Foley, Mike, 321 S.E. Ontario St.
- *Fornare, Harry, 1557 Roblyn Ave., St. Paul
- Fox, Allen H., 616 S.E. Ontario St.
- Frenaz, C. K., 372 Aurora Ave., St. Paul
- Fuller, Frank W., 524 Ashland Ave., St. Paul
- Fuller, Mrs. Jewell, 2407 Pleasant Ave.
- **Fullerton, Donald C., 4520 Dupont Ave. S.
- Gahagan, Harry, 207 Pleasant Ave., St. Paul
- Gebert, R. C., 2731 Lyndale Ave. S.
- Gilbertson, Ralph, 339 E. 15th St.
- Gillard, Herbert W., 4400 46th Ave. S.
- Gille, R. G., 616 Central Ave. W., St. Paul
- Godske, Wm. J., 2039 Dayton Ave., St. Paul
- Graham, Mrs. Caroline P., 3612 Lyndale Ave. S.
- Graham, Frank A., 575 Fuller Ave., St. Paul
- Graham, J. W., 874 Raymond Ave., St. Paul
- Grant, Allen A., 909 Franklin Ave. W.
- Grant, Mabel Kroll, 204 W Grant St.
- Grant, Otto Adolph, 319 Prescott St., St. Paul
- Greshl, John, 1009 Western Ave., St. Paul
- Greshl, S. A., 1009 Western Ave., St. Paul
- Haberle, Edw. L., 1310 Emerson Ave. N.
- Hamilton, J., 3849 Stevens Ave.
- Hample, Gideon A., 2823 14th Ave. S.
- Hansen, C. P., 1027 14th Ave. S. E.
- Hansen, Charles R., 2124 Ann Arbor St., St. Paul
- Harris, Jane M., 225 W. 15th St.
- Hazelwood, Richard N., 95 N. Victoria St., St. Paul
- Heen, John, 2820 27th Ave. S.
- Hgilig, Louis S., 1819 Lyndale Ave. S.
- Helm, Oscar A., 269 21st Ave. S.
- Henneman, R. E., 3038 21st Ave. S.
- Heymer, James K., 1412 18th Ave. N.
- Hodnett, Ralph M., 1516 W. Minnehaha St., St. Paul
- Hoff, Henry, 25 W. Summit Ave., St. Paul
- Hulig, Louis Shepherd, 1819 Lyndale Ave. S.
- *Hull, Henry O., 1508 Sherburne Ave., St. Paul
- Hult, Dewey E., Long Lake, Minn.
- Hurnburg, Chas. J., 272 Erie St., St. Paul
- Hutton, Robt. J., 209 Maria Ave., St. Paul
- Hyman, Jacob, 1817 Washington Ave. S.
- Hundman, W. L., Y.M.C.A., St. Paul
- Johnson, Axel W., 740 N.E. Monroe St.
- Johnson, A. D., 3819 Thomas Ave. S.
- Johnson, Clarence, 1623 16th Ave. N.
- Johnson, Elmer, 1306 N.E. Lincoln St.
- Johnson, Elof, 1259 Cleveland Ave. N., St. Paul
- Johnson, Emil L., 426 Blair St., St. Paul
- Johnson, Gerhard M., 814 24th Ave. N.E.
- Johnson, Leonard F., 671 Sherburne Ave., St. Paul
- Jones, Wallace S., 789 Sheldon Ave., St. Paul
- Karlstrom, Walfred E., 4753 Bryant Ave. S.
- Kasmarynski, John E., 1818 N.E. 5th St.
- Kelly, Roy David, St. Louis Park
- Keyes, George C., 1453 Grantham St., St. Paul
- King, Cecilia, care General Hospital
- King, Donald A., 1157 Hague Ave., St. Paul
- Knapke, Larry A., 6 Spruce Place
- Knutson, Morris R., 1064 13th Ave. S.E.
- Kock, J. E., 771 Smith Ave. S., St. Paul
- Kolar, J. L., 179 Malcolm Ave. S.E.
- Konsbruck, Joseph Wm., 2542 N.E. Garfield St.
- Kroening, Emil, 780 Park Ave., St. Paul
- Kroft, George H., 2417 Aldrich Ave. N.
- Kronstedt, Anton S., 120 Seymour Ave. S.E.
- Kularsky, Henry M., 1504 N.E. 4th St.
- *Landey, Jens, 2540 W. 7th St., St. Paul
- Larson, Amandus C., 721 S.E. Superior St.
- Larson, Emil, 1467 Hewitt Ave., St. Paul
- Larson, Herbert S., 626 S. 7th St.
- Larson, L. C., 2648 N.E. Ulysses St.

- Larson, Maynard H., 623 Franklin Ave.
E.
- Larson, Nils J., 3825 15th Ave. S.
- Lavine, Edgar W., 833 18½ Ave. N.E.
- Lee, Lawrence E., 889 Clarke St., St. Paul
- Legg, W. B., 808 Cromwell Ave., St. Paul
- Lemm, Morley B., 2207 Blake St., St. Paul
- Lennark, Oal J., 3516 14th Ave. S.
- Leppla, Lester B., 1618 Carroll Ave., St. Paul
- Levengood, Archie Grey, 2730 5th Ave. S.
- Lewis, Herbert N., 1509 26th Ave. N.E.
- Lewis, John T., care St. Hilaire Rtl. Libr. Co., 913 1st Nat'l Bldg.
- Liden, Clarence, 1906 Buchanan St.
- Lilja, Reinor O., 1818 S. 3rd St.
- Lindblom, Hilda, 245 Oak Grove St.
- Livermore, Harvey J., 1611 Carroll Ave., St. Paul
- Loomis, L. H., 716 Aurora Ave., St. Paul
- Lord, Bernard H., 2601 Humboldt Ave. N.
- Lindeke, Harold A., 922 Margaret St., St. Paul
- Lund, H. O., 21 Melbourne Ave. S.E.
- Lundberg, Verna M., 4129 Bryant Ave. S.
- Lyden, Theodore W., 2153 Scudder St., St. Paul
- McCollum, Kenneth B., 249 5th Ave. N., So. St. Paul
- McCutchan, Julian F., 724 Cromwell Ave., St. Paul
- McGilvra, Walter Vern, 1915 Portland Ave.
- McMillan, Jas. A., 505 Selby Ave., St. Paul
- Mabry, Palmer V., 1324 Marshall Ave., St. Paul
- Macnie, Mrs. John S., 2424 Lake Place
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- Martin, F. B., 3644 Clinton Ave.
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- Masters, Clark G., 610 10th Ave. S.
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- Mayhew, Oscar K., 4026 Lyndale Ave. N.
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- Miller, Roy Wallace, 1104 24th Ave. N.E.
- Mitchell, C. H., 414 S.E. Harvard St.
- Mogen, O. B., 12 W. 29th St.
- Monahan, George L., 1311 E. 39th St.
- Moore, George B., 2442 10th Ave. S.
- Murphy, Allan, 1079 Burgess St., St. Paul
- Myhie, Arthur H., 1831 Clinton Ave.
- Nachtsheim, C. A., 917 Margaret St., St. Paul
- Napavance, Wm., 2102 N.E. 6th St.
- Neville, Earle L., 827 17th Ave. N.
- Newquist, Harry, 487 Aurora Ave., St. Paul
- Nimis, Carl A., 185 Rondo St., St. Paul
- Nitardy, Otto J., 1915 Hennepin Ave.
- Nitardy, Walter C., 1915 Hennepin Ave.
- Norburg, Otto E., 558 St. Peter St., St. Paul
- Noren, John U., 1946 N.E. Lincoln St.
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- Orr, Urban E., 2940 Dupont Ave. S.
- Osgard, Norbet E., 285 Lafond St., St. Paul
- Ostvig, Richter N., 215 S. 11th St.
- Overholt, Harley G., 2856 Irving Ave. S.
- Pager, Henry L., 956 Earl St., St. Paul
- Pauly, Roger B., 4632 Emerson Ave. S.
- Peasley, William M., 137 Cleveland Ave. S., St. Paul
- Peterson, Alvin F., 3036 12th Ave. S.
- Peterson, Arthur M., 2933 33rd Ave. S.
- Peterson, Earl C., 3657 Stevens Ave.
- Peterson, Edward J., 322 S. Exchange St., St. Paul
- Peterson, F. T., 601 17th Ave. N.E.
- †Peterson, Harold R., 3443 5th Ave. S.
- Peterson, H. R., 430 Thomas St., St. Paul
- Peterson, Manuel W., 3036 12th Ave. S.
- Peterson, O. E., 1135 Edgerton, St. Paul
- †Peterson, Ray C., 3025 5th Ave. S.
- Peterson, Wallace, 2724 12th Ave. S.
- Pieh, Lillie M., 818 E. 18th St.

- Post, George Rosewell, 413 3rd Ave. N.E.
- Prigge, George W., 595 Ohio St., St. Paul
- Prydz, John, 5 Barton Ave. S.E.
- Raymond, Edward H., 4028 22nd Ave. S.
- Ready, A. L., 1473 Blair St., St. Paul
- Reid, Victor H., 1500 1st Ave. S.
- Reimer, John L., 847 Thomas St., St. Paul
- Richardson, Harry, St. Louis Park
- Ringholm, Swan, 3828 Bloomington Ave.
- Robinson, Donovan J., 1018 19th Ave. N.E.
- Robohm, J. F., Jr., 2835 Girard Ave. S.
- Roddy, Fred T., 1411 2nd Ave. S.
- Roden, George A., 949 Rondo St., St. Paul
- Root, George Harold, Y.M.C.A., St. Paul
- Rosenland, Oscar, 706 Robert St., St. Paul
- Rosholt, Ruth, 1925 Penn Ave. S.
- Ross, Don, 500 S.E. Beacon St.
- Rund, Peter H., 604 20th Ave. S.
- Russell, Jno F., 1009 29th Ave. N.E.
- Ryan, James Lee, Y.M.C.A., St. Paul
- Rydell, Maurice, 832 Pusey Ave., St. Paul
- St. John, Dynan A., 681 Burr St., St. Paul
- Sagarsky, Anne, 569 Fuller Ave., St. Paul
- Salisbury, Clarence W., 1806 3rd Ave. S.
- Sampson, Harry R., 2122 S. 5th St.
- Sandgren, Carl H., 2122 Girard Ave. N.
- Sargent, Norman D., 1431 Thomas St., St. Paul
- Schermerhorn, James R., 418 S.E. Oak St.
- Schimmelpfennig, F. F., 418 10th Ave. N.
- Schlingerman, Frank J., 1800 Stevens Ave.
- Schmidt, Clara E., 2529 Hennepin Ave.
- Schnaith, Roy W., care Crane & Ordway Co.
- Schultz, Arthur H., 1036 Edmund St., St. Paul
- Schulz, Emil H., 951 Wakefield Ave., St. Paul
- Semenuck, D. N., 3716 Humboldt Ave. N.
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- Soderstrom, Wendell, 926 S.E. Fulton St.
- Sola, Arthur S., 1552 Roblyn Ave., St. Paul
- Sovereign, Hammond B., 868 Thomas St., St. Paul
- Stachle, Gilbert C., 2738 Portland Ave.
- Stevens, W. N., 2326 N.E. Filmore St.
- Stock, Ernest G., 65 S. 11th St.
- Strand, Eno, 1004½ Nicollet Ave.
- Strand, Trygre, 1106 Kenwood Pkwy.
- Strandberg, Henry J., 4212 10th Ave. S.
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- Swanson, Harold E., 238 Bates Ave., St. Paul
- Swenson, Albert L., 1126 N.E. Jefferson St.
- Swenson, Ernell H., 1723 Western Ave. N.
- ††Swenson, Gustav A., 2842 31st Ave. S.
- Taylor, Harold W., 4104 38th Ave. S.
- Taylor, Herbert H., 425 8th Ave. S.E.
- Taylor, Josephine, 1938 Fremont Ave. S.
- ††Thomas, Mabel H., 3032 Irving Ave. S.
- Thompson, Arthur J., 3142 19th Ave. S.
- Thomsen, Theodor, 1802 E. 22nd St.
- Thomson, Harold P., 2731 Lyndale Ave. S.
- Thon, Edward O., 86 Park Place, St. Paul
- Thurston, Walter M., Signal Corps, U. S. Gov't., Fort Snelling, Minn.
- *Timmons, Martin J., 71 Tilton St., St. Paul
- Tobric, Wilbert, 1524 E. 22nd St.
- Trierweiler, Dominio G., 406 Maple St., St. Paul
- Trierweiler, Leo J., 406 Maple St., St. Paul
- Valebos, Christian O., 887 20th Ave. S.E.
- Vanderhoff, Cassius O., Fairview Hospital

- Van der Menten, John, 1007 Aurora Ave., St. Paul
 Vievering, Wm. A., 2360 Hampden Ave., St. Paul
 Vun Zinderen, Jacob, 201 King St., St. Paul
 Wallof, Arthur L., 311 7th Ave. S.E.
 Walton, Nellie C., 3125 Columbus Ave.
 Ward, Thomas M., 1142 Jessie St., St. Paul
 Wardner, Francis D., 1625 Carroll Ave., St. Paul
 Warnick, A. B., 2535 1st Ave. S.
 Weetman, George P., 715 Douglas Ave.
 Westberg, Oscar, 269 21st Ave. S.
 Westmark, Mauritz V., 418 N.E. Jefferson St.
 Wilcox, Hazel, 3801 Garfield Ave.
 Willard, Mary L., 2400 Humboldt Ave. S.
 Williams, Levens, Minneapolis
 Willoughby, H. D., 1004½ Nicollet Ave.
 Witkop, Clarence, 452 E. Minnehaha St., St. Paul
 Yankoski, Frances E., 2503 Hennepin Ave. S.
 Yates, Robert La Paul, 3940 Upton Ave. N.
 Yungbauer, Wm. F., 777 Marshall Ave., St. Paul
 Zehn, A. R., 114 5th Ave. N., So. St. Paul

DULUTH—BUSINESS

- Anderson, Agnes E., 2508 W. 2d St.
 †Anderson, Fred, 612 N. 6th St. W.
 †Anderson, Lawrence O., 2526 E. 1st St.
 Antenucci, Bennie, 432 E. 7th St.
 Arenson, Anna C., 2510 W. 2d St.
 Aske, Lilla, 5707 Otsego St.
 Bagley, Mathew, 5118 Roosevelt St.
 Barines, David L., 2123 Dunedin Ave.
 Bartholdi, Walter, 822 E. 4th St.
 Bauman, Alfred E., 322 W. 2d St.
 Beaupre, Charles G., 216 E. 2d St.
 Bergquist, Harold A., 2032 London Road
 Berly, O. L., 507 22nd Ave. W.
 Bernard, H. W., 2624 W. Huron St.
 Bishop, I. L., 2517 W. 2nd St.
 Bjorge, Oscar B., 1535 Woodland Ave.
 Boggio, Joseph C., 4717 Gladstone St.
 Burke, Mary A., 832 E. 2nd St.
 Burke, Mary J., 216 W. 3d St.
 Campbell, G. F., Western Hotel
 Coad, J. H., 108a 2d St.
 Cowen, R. L., 2109 E. 2d St.
 Craig, Horace B., 1119 E. 1st St.
 Crawford, James A., 831 E. 1st S.
 Deighton, J. D., 1720 E. 5th St.
 Deline, Kenneth P., Lincoln Park Gardens
 Draper, Warren A., 1723 E. 2d St.
 Dunham, C. E., 4932 Tioga St.
 Dunning, Ralph A., 529 Woodland Ave.
 Durbrow, G. DeWitt, 1831 London Rd.
 Evans, C. G., 21 E. 6th St.
 Evans, John L., 1715 E. 7th St.
 Feranar, Leonard C., 1021 E. 6th St.
 Finn, Leo S., 201 E. 2nd S.
 Forbes, Robert J., 9B 4th St., Morgan Park
 Franseen, Carl G., 712 1st Ave. E.
 Germeroth, R. M., 912 7th Ave. E.
 Guthrie, Catherine, 2311 E. 4th St.
 Hanford, Dana R., 1418 Jefferson St.
 Hann, Fred J., 2825 W. 2nd St.
 Harley, Sydney A., 619 10th Ave. E.
 Hegardt, Wm. Gordon, 1708 E. 1st St.
 Henriksen, John, 716 E. 1st St.
 Henriksen, Sigurd F., 716 E. 1st St.
 Highmark, T. L., 411 N. 59th Ave. W.
 Hoff, John Edw., 2235 Roslyn Ave.
 Holmberg, Harry, 2813 W. Huron St.
 Horrigan, Marie, 301 W. 4th St.
 Hubbard, Burt C., 432 E. 2nd St.
 Hunt, W. S., 815 12th Ave. E.
 Idzorek, G. I., 1424 E. 5th St.
 Johannsen, Emil B. L., 3113 Vernon St.
 Johnson, Axel A., 624 Lake Ave. N.
 Johnson, C. M., 306 W. 5th S.
 Johnson, George W., 2913 W. 3rd St.
 Johnson, Lillian A., 915 E. 4th St.
 Kelly, James C., 2003 W. 4th St.
 Kennedy, Lauren A., 2022½ E. 2nd St.
 Kenny, Lillian, 1818 E. 4th St.
 Knutson, H., 702 E. 2nd St.
 Laskowski, Frank S., 215 N. 34th Ave. W.
 Larson, E. R., 1012 Garfield Ave.
 Lavelle, W. F., 1518 London Road
 Linne, Thore J., 2217 W. 10th St.
 Loubert, Albertine M., 2410 W. 2nd St.
 Lowry, Raymond R., 120 12th Ave. E.
 Luster, C. A., Jr., 1717 E. 1st St.
 Lyons, A. M., 630 36th Ave. N.
 MacGregor, Donald, 4031 W. 4th St.

- McCarthy, J. R., 2204 E. 1st St.
 McGiffert, John R., 2324 E. 15th St.
 McGiffert, S. Y., Ashtabola Apts.
 Malone, E. W., 217 S. Fairview, St. Paul.
 Marjamaa, Jafet, 506½ E. 4th St.
 Mason, H. A., 4130 W. 3rd St.
 Meehan, Kathryn, 329 5th Ave. W.
 Moir, Hazel M., 320 N. 27th Ave. W.
 Mullin, H. J., 1501 E. 2nd St.
 Neimeyer, John C., 13 5th Ave. E.
 Nelson, Eric W., 2229 W. 12th St.
 Nelson, Sigfred, Box 16, Riverside
 Norman, Chas., 3017 Vernon St.
 O'Brien, Ruth, 227 W. Victoria St.
 O'Gorman, Samuel A., 423½ E. 2nd St.
 Palin, Erhard R., 2125 W. 7th St.
 Pederson, Dan, 2827 W. 1st St.
 Pederson, P. A., 2710 W. 6th St.
 Pedrizette, Virgil J., 515½ W. 4th St.
 Peterson, Alvin, 2001 E. 4th St.
 Peterson, J. A., 1225 E. 7th St.
 Philstrom, H. A., 309 E. 6th St.
 Plotnicky, Andrew F., 616 7th Ave. E.
 Plotnicky, Stella A., 616 7th Ave. E.
 Potter, R. K., 506½ E. 4th St.
 Reid, V. V., 1330 E. 6th St.
 Rice, Franklin S., 1418 E. Superior St.
 Rief, Emil A., 1331 E. 7th St.
 Rodger, Ben, 705 E. 3rd St.
 Rosborough, Chester S., 4805 W. 6th St.
 Rosborough, G. D., 4004 W. 5th St.
 Samuelson, Miss S. E., 2728 W. Michigan St.
 Schroer, C. W., 1919 Jefferson St.
 Sell, Myrtle, 116 E. 3rd St.
 Sellhorn, Bertha M., 408 8th Ave. E.
 Signorelli, Louis, 418 W. 6th St.
 Siring, Letta, 1601 E. 8th St.
 Small, J. J., Morgan Park
 Spearin, E. M., 525 3rd Ave. E.
 Strickland, Ruth G., 219 Fairmont St.
 Thorson, Valentine I., 711 W. Boulevard
 Toft, A. B., 15 N. 54th Ave. W.
 Troyer, Marc D., 1724 Greysolon Road
 Turnquist, Mr., 1809 E. 8th St.
 Wagen, Allen E., 5417 Onieda St.
 Walker, C. D., 1421 E. Superior St.
 Westrom, Henry C., 5615 W. 6th St.
 Whelan, James H., 1815 E. 5th St.
 Wickstrom, I. Albert, 217 E. 5th St.
 Wiking, Ernest F., 321 E. 1st St.
 Wilhelmson, J. A., 421 1st Ave. E.
 Williams, Albert O., 209 Pittsburg Ave.
 Wiltse, Opal B., 512 2nd Ave. E.

DULUTH—COLLEGIATE

- *Anderson, Lawrence O., 2526 E. 1st St.
 Bradden, Alexander J., 1814 E. 1st St.
 Brun, Wm., 22 E. 1st St.
 Daly, Margaret B., 3902 W. 3rd St.
 Erickson, Anna E., 403 E. 2nd St.
 Hansen, Ruth M., 1414 E. 5th St.
 Maki, Enoch, 1007 E. 2nd St.
 Maki, John F., 1007 E. 2nd St.
 Neipp, John C., 17 W. 5th St.
 Pascoe, P. R., 308 E. 5th St.
 Stram, S. T., 413 4th Ave. E.
 Webb, John, Alexander Hotel
 Westlund, Albert, 624 25th Ave. W.
 Whelan, E. H., 715 17th Ave. E.
 Williams, Thor, 1305 E. 6th St.

VIRGINIA—BUSINESS

- Anderson, John I., Buhl, Minn.
 Biron, J. F., 516 N. 11th St.
 Brude, A. C., 526 First National Bank Bldg.
 Dennis, C. L., 511 N. 11th St.
 Ekstrom, Robert E., Box 443, Hibbing, Minn.
 Emmons, A. C., 314 S. 4th St.
 Girard, Michael, 205 S. 6th St.
 Hawkinson, C. M., 301 S. 4th St.
 Jarvey, William A., 618 S. 5th Ave. W.
 Lucas, C. E., Buhl, Minn.
 Rolfe, F. A., 228 S. 2d St.
 Rowe, L. A., 322 S. 3d St.
 Rutherford, W. J., 506 S. 7th St.
 Sullivan, Steve, 619 S. 3d St.
 Tancig, E. A., 201 W. Oak St., Chisholm, Minn.
 Tornquist, Edwin T., 228 S. 5th St.
 Tumble, George V., 416 N. 1st St.
 Wasgatt, A. J., 502 First National Bank Bldg.
 Wickman, John, Hibbing, Minn.
 Williams, C. H., 321 S. 8th St.

*The Bulletin
of the University of
Minnesota*

*The School of Nursing
Announcement for the Year
1921-1922*



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1921							1922													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	..	..	..	..	..	..	1
3	4	5	6	7	8	9	8	9	10	11	12	13	14	2	3	4	5	6	7	8
10	11	12	13	14	15	16	15	16	17	18	19	20	21	9	10	11	12	13	14	15
17	18	19	20	21	22	23	22	23	24	25	26	27	28	16	17	18	19	20	21	22
24	25	26	27	28	29	30	29	30	31	..	..	..	..	23	24	25	26	27	28	29
31	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	1	2	3	4	1	2	3	4	5
7	8	9	10	11	12	13	5	6	7	8	9	10	11	6	7	8	9	10	11	12
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21	22	23	24	25	26	27	19	20	21	22	23	24	25	20	21	22	23	24	25	26
28	29	30	31	26	27	28	27	28	29	30	31
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	1	2	3	..	..	..	1	2	3	4	..	..	..	..	1	2	3
4	5	6	7	8	9	10	5	6	7	8	9	10	11	3	4	5	6	7	8	9
11	12	13	14	15	16	17	12	13	14	15	16	17	18	10	11	12	13	14	15	16
18	19	20	21	22	23	24	19	20	21	22	23	24	25	17	18	19	20	21	22	23
25	26	27	28	29	30	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30
..
OCTOBER							APRIL							OCTOBER						
..	..	..	..	..	..	1	..	..	..	..	..	..	1	1	2	3	4	5	6	7
2	3	4	5	6	7	8	2	3	4	5	6	7	8	8	9	10	11	12	13	14
9	10	11	12	13	14	15	9	10	11	12	13	14	15	15	16	17	18	19	20	21
16	17	18	19	20	21	22	16	17	18	19	20	21	22	22	23	24	25	26	27	28
23	24	25	26	27	28	29	23	24	25	26	27	28	29	29	30	31	..	..	..	..
30	31	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	1	2	3	4	5	6	..	..	..	1	2	3	4
6	7	8	9	10	11	12	7	8	9	10	11	12	13	5	6	7	8	9	10	11
13	14	15	16	17	18	19	14	15	16	17	18	19	20	12	13	14	15	16	17	18
20	21	22	23	24	25	26	21	22	23	24	25	26	27	19	20	21	22	23	24	25
27	28	29	30	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	3	..	..	..	..	..	1	2
4	5	6	7	8	9	10	4	5	6	7	8	9	10	3	4	5	6	7	8	9
11	12	13	14	15	16	17	11	12	13	14	15	16	17	10	11	12	13	14	15	16
18	19	20	21	22	23	24	18	19	20	21	22	23	24	17	18	19	20	21	22	23
25	26	27	28	29	30	31	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..

UNIVERSITY CALENDAR

1921-1922

1921			
September	17	Saturday	Payment of fees closes, except for new students
September	20-27	Week	Examinations for removal of conditions and entrance examinations Physical examinations for all new students
September	19-24	Week	Registration period, Colleges of Science, Literature, and the Arts, and Agriculture, Forestry, and Home Economics
September	26	Monday	First semester evening extension classes begin
September	26-27		Registration days for all colleges not indicated above
September	27	Tuesday	Payment of fees for new students closes
September	28	Wednesday	Fall quarter begins, 8:30 a.m.
October	15	Saturday	Class Scrap Day; all classes dismissed the fourth hour
October	20	Thursday	Senate meeting, 4:30 p.m.
November	5	Saturday	Home Coming Day; classes dismissed the third and fourth hours
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	15	Thursday	Senate meeting, 4:30 p.m.
December	21	Wednesday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
1922			
January	4	Wednesday	Christmas vacation ends, winter quarter begins, 8:30 a.m.
January	20	Friday	First semester evening extension classes close
January	30	Monday	Second semester evening extension classes begin
February	16	Thursday	Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	23	Thursday	Winter quarter ends, spring vacation begins, 5:20 p.m.
March	29	Wednesday	Spring vacation ends, spring quarter begins, 8:30 a.m.
May	18	Thursday	Senate meeting, 4:30 p.m.
May	19	Friday	Second semester evening extension classes close

THE SCHOOL OF NURSING

LOUISE M. POWELL, R.N., Superintendent

In the year 1909 the Board of Regents of the University of Minnesota approved the organization of the School of Nursing under the direction of the Medical School and associated with the University Hospital. This is the first school of nursing established anywhere as a university department of instruction and under the university's direct ownership and control. It is the pioneer of the movement toward the university education of the nurse, a movement which is serving to standardize training in nursing.

The thoro scientific training of the nurse is best assured by the association, of the school with the teaching hospital, also owned and controlled by the University.

The school is subject to the general supervision of the superintendent of the University Hospital, Dr. L. B. Baldwin, and is under the immediate direction of the superintendent of the school, Miss Louise M. Powell, a directress of large institutional experience.

The capacity of the School of Nursing has been greatly increased by its recent association with the Minneapolis General Hospital and the Charles T. Miller Hospital, of St. Paul, and the proposed alliance with the Northern Pacific Beneficial Association Hospital, entrusting to the University the teaching of their student nurses and placing their nursing services at the University's use for the more complete and varied training of its pupils.

A class is entered in each quarter of the University year.

While the stated requirements for admission establish a minimum standard of fitness, the school invites to matriculation women of superior education and of large and earnest purpose. For the encouragement of students of this type, the University offers a combined course of study in the College of Science, Literature, and the Arts and the School of Nursing. This course occupies five years and leads to the degrees of Bachelor of Science and of Graduate in Nursing.

The entire period of study, in the School of Nursing alone, covers three years. The first two quarters are devoted to preliminary courses of instruction under a special matriculation fee. These courses are conducted in several of the departments of the Medical School by the superintendent of the school and a corps of faculty instructors. Examinations are held at the close of this period and must be satisfactorily passed to permit of further advancement.

In the last three months of this period admission is given to the hospital for practical training in hospital service. Upon the successful completion of the preliminary course and with due consideration of their general fitness, students are admitted to the full hospital service. In the succeeding two and one-half years a graded system of hospital education

is conducted, during which the student serves in the wards, diet kitchens, dressing-rooms, and operating-rooms, and in the Out-Patient Department and visiting service of the University Hospital. Courses of lectures, recitations, and demonstrations are given by the superintendent of the school and her assistants, and by members of the faculty. At the close of each year examinations are conducted in both practical and didactic work.

Within the past two years the school has entered upon graduate work in the establishment of courses in public health nursing.

THE MEDICAL SCHOOL THE ADMINISTRATIVE BOARD

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WINFORD P. LARSON, M.D., Director of the Department of Bacteriology and Immunology
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S. MARX WHITE, B.S., M.D., Chief of the Department of Medicine
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WILLIAM R. MURRAY, Ph.B., M.D., F.A.C.S., Chief of the Department of Ophthalmology and Oto-Laryngology
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FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Member-elect Representing the Faculty
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ELIZABETH PIERCE, R.N., Assistant Superintendent of the School of Nursing, University of Minnesota
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MATHILDA SCHLUTZ, R.N., Instructor in Nursing
ROBERT G. ALLISON, M.D., Assistant Professor of Roentgenology
LEE W. BARRY, Ph.D., M.D., Assistant Professor of Obstetrics and Gynecology

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JOHN BUTLER, M.D., Associate Professor of Dermatology
HOWARD S. CLARK, B.S., M.D., Assistant Professor of Ophthalmology and Oto-Laryngology
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WILLIAM A. GRAY, D.D.S., Assistant Professor of Oral Surgery, Research Assistant in Mouth Infections
ARTHUR S. HAMILTON, B.S., M.D., Professor of Nervous and Mental Diseases and Chief of Division of Nervous and Mental Diseases
ARTHUR D. HIRSCHFELDER, B.S., M.D., Professor of Pharmacology and Director of the Department of Pharmacology
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ANGUS W. MORRISON, B.A., M.D., Assistant Professor of Nervous and Mental Diseases
WILLIAM R. MURRAY, Ph.B., M.D., F.A.C.S., Professor of Ophthalmology and Oto-Laryngology and Chief of the Department of Ophthalmology and Oto-Laryngology
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ERNEST T. F. RICHARDS, M.D., C.M., Assistant Professor of Medicine
HARRY P. RITCHE, Ph.B., M.D., F.A.C.S., Associate Professor of Surgery
FREDERICK C. ROEDA, M.D., Associate Professor of Pediatrics

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MAX SEHAM, M.D., Assistant Professor of Pediatrics

ARTHUR C. STRACHAUER, M.D., F.A.C.S., Professor of Surgery and Chief of the Department of Surgery

JOHN SUNDWALL, Ph.D., M.D., Professor of Hygiene, University Health Officer

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S. MARK WHITE, B.S., M.D., Professor of Medicine and Chief of the Department of Medicine

FREDERICK W. WITTICH, M.A., M.D., Assistant Professor of Medicine

ANNE BENTON, M.A., Instructor in Bacteriology

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CHARLES E. NIXON, M.Sc., M.D., Instructor in Nervous and Mental Diseases

JOHN A. PRATT, M.D., F.A.C.S., Instructor in Ophthalmology and Otolaryngology

MARION A. TEBBETS, B.A., Director of Department of Social Service

JOHN P. QUIGLEY, B.S., Teaching Fellow in Pharmacology

GENERAL INFORMATION

THE UNIVERSITY HOSPITALS

The ownership of a teaching hospital enables the University to offer the best opportunities for the training alike of students in medicine and in nursing.

While the University Hospitals and the School of Nursing are interdependent, each serving the interests of the other, the faculty regards the hospitals as the teaching laboratory of the nurse, in which her interests, together with those of the medical student body, are first considerations.

The University Hospitals are open to free and per diem patients who are entered under certificate from local, city, or county physicians, who vouch for their inability to pay ordinary medical fees or hospital charges and who cite the clinical character of each case. Applications come from all parts of the state for the admission of patients, many of whom it is impossible to care for. The hospitals now provide 192 beds, which are almost continually full.

A service building with modern equipment of kitchens, laundries, dining-rooms, etc., adds greatly to the convenience of the hospital system.

The recent association of the School of Nursing with an allied group of hospitals enlarges its opportunity of efficient teaching and invites a practically unlimited registration. By this arrangement the student gains experience in the nursing of free patients, per diem patients, and private patients, and in the study of a broader range of diseases, accidents, and emergency cases.

UNIVERSITY RELATIONS

The School of Nursing has its headquarters at the University Hospitals. The nurses' homes are temporarily situated on the adjoining campus and in or near the associated hospitals. In the preliminary courses of instruction the students work mainly in the lecture-rooms and laboratories of the Medical School.

In the second quarter, they are assigned initially to some one of the associated hospitals, but are subject to rotation in the services of these several hospitals from time to time.

The medical division of the new University campus includes within it both the hospitals and the laboratory buildings of the Medical School. It occupies the high bluffs overlooking the east bend of the Mississippi River.

The Elliot Memorial Building stands upon the bank of the river and commands a beautiful prospect. This building, provided principally by a gift from the estate of Dr. and Mrs. A. F. Elliot, is the first of the permanent hospital group. The service building connects with the west wing of the Elliot Memorial. The hospital has at present some 200 beds.

The Charles T. Miller Hospital, situated in St. Paul, has a beautiful and thoroly modern building, housing fifty free and one hundred and fifty private patients.

The Minneapolis General Hospital is supported by taxation and has over 700 beds, principally for the use of the indigent sick. It enters large numbers of accident and emergency cases and acute diseases.

The Northern Pacific Beneficial Association opens in August its new model hospital building, in St. Paul, and will care for the employes and the families of employes of the railway system the name of which it bears.

THE OUT-PATIENT DEPARTMENT SERVICE

The dispensary is the Out-Patient Department of the University Hospital and is directed by the Superintendent, Dr. L. B. Baldwin. It is conveniently located in Millard Hall in the block adjoining the hospital. It is manned by members of the faculty and clinical assistants, under a chief of staff. Its patients are assigned to medical, surgical, gynecological, obstetrical, children's, eye and ear, nose and throat, skin, genito-urinary, nervous and mental, and orthopedic clinics. In the past year 15,647 new patients have been entered and 69,133 visits have been recorded.

Students of the School of Nursing enjoy opportunities of clinical observation in the Out-Patient Department and are assigned, during their junior and senior years, to its nursing service.

The Dispensary of the Minneapolis General Hospital is also available for study and training to the students of the school.

THE LIBRARIES

The medical libraries of the University contain 14,988 bound volumes, 33,500 unbound volumes, monographs, reprints, etc., and 201 current periodicals.

The general University Library also is open to students of all schools. The library catalogs a number of works selected with reference to the needs of students of the School of Nursing.

THE COURSE OF TRAINING

REQUIREMENTS FOR ADMISSION

Applications for admission to the School of Nursing should be made in writing to the superintendent. Blanks will be furnished on request. Educational credentials should accompany the application. When a registration card is received, it should be re-forwarded to the superintendent. All applicants must meet personally the enrolment committee of the school. Notices of enrolment meetings will be sent to each applicant. A class is entered at the opening of each of the four quarters of the year.

Applicants must state age, residence, and credentials of graduation from a four-year high school of the first grade. While a high-school diploma is a prerequisite of admission, preference will be given to women

of superior preliminary training. Applicants must not be less than twenty, nor more than thirty-five years of age. They must submit satisfactory evidence to the committee of physical and mental fitness and good character, and will undergo a general physical examination by the school physician.

All matriculants are required to take the preliminary course of instruction and to pass examinations at its close. The period is one, not only of preliminary training, but of probation. The faculty reserves the right to pass upon the general fitness of the student to enter the hospital services at the close of the preliminary period.

Information and application blanks may be had, upon request, of Miss Louise M. Powell, superintendent of the School of Nursing, University Hospital, Minneapolis.

REGISTRATION AND FEES

Upon acceptance of the candidate by the enrolment committee registration is made at the office of the registrar of the University. Fees approximating \$40 cover the preliminary course of instruction and are payable at the office of the University cashier. Students supply their own textbooks and stationery. Housing and board are provided on the campus.

No fees are charged during the remaining two and one-half years of the course. With admission to the hospitals, at the opening of the second quarter, students reside at the nurses' homes of the University or of the associated hospitals. Clothing, other than the hospital uniform dress, students provide for themselves, and in character and sufficiency of supply it must conform to the school regulations.

A vacation of two weeks is allotted, in succession, to each nurse in each year at her own living expense.

Graduates of other schools for nurses, in good standing, or matriculants of these schools, having the required entrance qualifications, will be admitted to the preliminary course of instruction upon the conditions of entrance cited above and upon payment of the prescribed fee. Upon successfully passing the examinations in this course, they are granted a certificate of proficiency, which if they are matriculants of any other school is submitted to the superintendent in charge.

PLAN OF INSTRUCTION

The entire course of instruction in the School of Nursing covers a period of three years and, successfully pursued, conformably with the rules and regulations of the hospital service, leads to the degree of Graduate in Nursing conferred, upon recommendation of the faculty, by the Board of Regents of the University of Minnesota.

The first half of the first year is devoted to preliminary and probational courses of instruction.

In the last half of the first year and the first half of the second year, the student is assigned to duty and receives instruction in the men's and women's medical and surgical wards of the University and allied hospitals.

In the second half of the second year and throughout the third year, she is assigned to special duty in the obstetrical, gynecological, and children's wards, in the operating rooms, and in special departments of practice.

The practical work of each year is accompanied by courses of lectures and demonstrations conducted by the superintendent of the school and by members of the faculty. Examinations conclude each of these courses.

COMBINED COURSE IN ARTS AND IN NURSING

A combined course in the College of Science, Literature, and the Arts and the School of Nursing is offered. This course covers a period of five years; the first two years, of three quarters each, being taken in the College of Science, Literature, and the Arts. A seventh quarter follows, in which the specific preparation of the student for admission to the School of Nursing is completed. In the ensuing nine quarters the student will be in residence at the University Hospital and will follow the graded courses of training. The last two quarters will be devoted to elective work, either in preparation for educational service or for public health nursing.

An outline of the course of study follows.

COMBINED COURSE IN THE LIBERAL ARTS AND IN NURSING

Freshman Year

	Credits
Rhetoric-English	15
Foreign language (selected)	15
General Chemistry	15
Total	45

Sophomore Year

General Psychology.....	9
Rhetoric, Exposition, Argument.....	6
Principles of Economics.....	10
Modern History	10
Human Anatomy	3
Human Physiology.....	5
Bacteriology	5
Total	48

Third Year—Fall Quarter

Elementary Pharmacology.....	3
Bacteriology	4
General Sociology.....	5
Home Economics.....	5
Total	17

Third Year—Winter Quarter

Theoretical and practical work during this quarter includes Lettering; History and Ethics of Nursing; Hospital Economics; Personal Hygiene; Nursing Practice; and Practical Dietetics.

During this period the student spends a portion of each day, under supervision, in the ward.

At the completion of this quarter the student enters the junior class of the School of Nursing and continues her work in theory and practice with the students taking the three-year course.

Nine quarters are spent in the hospital, during which time the student is assigned to the graded services in the hospital and Out-Patient Department.

The last two quarters of the fifth year are devoted to courses which carry 25 credits in the College of Science, Literature, and the Arts. The course in Public Health Nursing may be chosen, or the student may elect such approved studies as will best fit her for the special branch of nursing service she desires to enter.

AFFILIATED SCHOOLS

Students from affiliated training schools or from schools of recognized standing and of general requirements equivalent to those of the University of Minnesota, who have completed two years of study and are graduates of such schools, will be admitted to the third year of the School of Nursing as affiliated students, so far as housing capacity will permit. Upon successful completion of the work of the third year they will receive a certificate of graduation.

This affiliated third-year course is planned especially for those students whose training has been in schools allied to hospitals of exclusively surgical or other special character.

COURSES IN PUBLIC HEALTH NURSING

The University has established graduate courses in Public Health Nursing.

These courses cover a period of eight months, divided into sessions of four months each, which may be taken severally or in succession. In the first four months' session, the fundamental principles of public health nursing are taught by a corps of expert teachers, while the director conducts field work in visiting nursing, infant welfare, school inspection, and rural nursing. The second session includes a systematic study of public health problems and gives the student the opportunity to elect, within prescribed limits, intensive work in any phase of public health service she may wish to follow. The relief agencies and the public-school systems of the Twin Cities, the infant welfare organizations, the social service departments of the University Dispensary and of certain industrial and commercial plants, and the Hennepin County model practice field afford ample occasion for practical application of the principles theoretically taught.

Graduate nurses, bearing the diploma of an approved training school, or senior students in these schools, recommended by their supervisors for admission, will be eligible to registration. Applicants of either class must present evidence of a four-year high-school course.

A tuition fee of \$25 will be charged in each four months session.

PRELIMINARY COURSES OF INSTRUCTION

SCIENTIFIC COURSES

ANATOMY

1f,w,s,su. **ELEMENTARY ANATOMY.** The general properties and development of tissue cells; the development of the human embryo. The description and demonstration of the osseous, muscular, nervous, circulatory, respiratory, excretory, and reproductive systems. Thirty-six hours. DR. JACKSON.

PHYSIOLOGY

3f,w,s,su. **ELEMENTARY PHYSIOLOGY.** Functional properties of tissue-cells; the material bases of the body; the nutritive media; the physiology of nerve and muscle; of the nervous system; the vascular mechanism; respiration, digestion, excretion, and metabolism. One hundred eight hours. DR. BEARD, DR. LYON.

CHEMISTRY

51f,w,s,su. **ELEMENTARY CHEMISTRY.** A brief study of matter and energy; of chemical and physical changes; the fundamental laws of chemistry; chemical elements and compounds; the qualitative and quantitative composition of foods, air, and water. Thirty-six hours.

PHARMACOLOGY

1f,w,s,su. **ELEMENTARY PHARMACOLOGY.** A study of the history, uses, classification and preparation of drugs; definition of descriptive terms; systems of weights and measures; methods of administration, principles of dosage, etc. Forty-four hours. DR. QUIGLEY.

BACTERIOLOGY

6f,w,s,su. **ELEMENTARY BACTERIOLOGY.** The principles and technic of general bacteriology. Studies in the morphologic and biologic characters of the common bacteria. Preparation of culture media. Disinfectants and disinfection. Bacteriology of water and food products. Seventy-two hours. DR. LARSON, MISS BENTON.

PRACTICAL COURSES

PHYSICAL CULTURE

7f,w,s,su. A course of physical exercises for the personal development of the student, especially directed to the training of the nurse in the adaptation of her movements to the best results in her practical work. Thirty-six hours. DR. NORRIS, MISS KISSOCK.

LETTERING

69f,w,s,su. **EXERCISES IN LETTERING.** For training the nurse in the making of records and the charting of clinical observations; the accurate forming of letters in plain, single stroke types and special clinical characters. Twelve hours. MR. KIRCHNER.

PRINCIPLES OF NURSING

- 10f,w,s,su. HISTORY OF NURSING. A study of nursing history to cultivate an understanding and appreciation of nursing traditions and ideals, and of the people and influences that have brought the profession to its present status. Twelve hours. MISS POWELL.
- 11f,w,s,su. NURSING ETHICS. This course deals with the present scope of nursing; the attitude of the nurse towards various problems, the patient, the physician, and other nurses. Hospital etiquette; the principles of self-government. Twelve hours. MISS POWELL.
- 12f,w,s,su. PERSONAL HYGIENE. A study of the conditions governing the health of the individual. Ideals and conceptions of health. Ethical and economic aspects of hygiene. Responsibility of the nurse in health preservation and disease prevention. Twelve hours. MISS PIERCE.

HOSPITAL ECONOMY

- 13f,w,s,su. A STUDY OF HOSPITALS. The general principles of hospital and household economy applied to the practice of nursing. A study of types of hospital buildings; their construction, heating, lighting, and plumbing. Twelve hours.
- 14f,w,s,su. HOSPITAL DEPARTMENTS. The equipment and operation of laundry, linen- and serving-rooms; general and special kitchens; wards and special departments; cost and care of hospital supplies; household chemicals. Twelve hours.

PRACTICAL DIETETICS

- 15f,w,s,su. FOOD STUFFS. A course of practical exercises and lectures upon foods; their definition, classes, form; food values; food composition; energy values; caloric index; selection of dietaries; balanced rations; market conditions. Twelve hours. MISS THOMAS.
- 17f,w,s,su. THE PREPARATION OF FOOD. Methods of cooking; effect on food values; percentages of loss; treatment of various classes of foods; of typical foods; enhancement of food values; mechanical methods of preparation; raw foods. Forty-eight hours. MISS THOMAS.

PRACTICAL NURSING

- 21-37f,w,s,su. Courses of lectures, demonstrations, and practical exercises. Eighty hours. MISS PIERCE.
21. THE ENVIRONMENT OF THE PATIENT. The care of the room or ward; of service-room, bath, and lavatory; of the serving-room; the linen-room; the bed and bedding; the detail of bed-making.
23. THE ADMISSION AND GENERAL CARE OF THE PATIENT. The bed, bath, and toilet; the preparation of the patient for the night; the prevention of bed-sores, stiffness, and cramping of muscles; care of mouth, teeth, and hair; special devices for comfort.

25. **OBSERVATION OF THE PATIENT.** How and what to observe; temperature, pulse, respiration; observation of feces, urine, sputum, and vomites.
27. **THE EXAMINATION OF THE PATIENT.** The preparation for routine examinations; methods of assisting examiner; the doctor's order book; the value of the bedside record; the detail and technic of record.
29. **METHODS AND MECHANISMS OF TREATMENT.** The preparation of solutions; the application of heat and cold; counter irritants; the use of enemata; the vaginal douche; catheterization; lavage; gavage; expression of stomach contents.
31. **BATHS FOR THERAPEUTIC PURPOSES.** The reduction of temperature; sedative baths; baths and packs to produce sweating; local baths; medicated baths.
33. **THE PREPARATION OF PATIENTS FOR OPERATION.** Details of preparation; the ether bed; post-operative care of patient.
35. **MEDICINES.** The medicine case; medicine trays; system of giving medicines; method of preparing and giving hypodermic injections; method of giving inhalations; method of giving drugs by inunction.
37. **INFECTIOUS DISEASES.** Precautions of care; details of disinfection; the care of typhoid fever cases; venereal diseases; preparation of rooms for fumigation.

UNDERGRADUATE COURSES

Students who have successfully completed the preliminary courses of the first six months are regularly entered in the hospital service. In addition to their hospital duties, which employ fifty-six hours each week, they will attend courses of lectures, demonstrations, and recitations upon subjects in general medicine and surgery and in special branches of practice related to their professional work.

ELEMENTS OF PATHOLOGY

39. **THE PRINCIPLES OF PATHOLOGY.** The deviations from the normal in the more common diseases. A brief consideration of the normal and pathologic blood and excretions of the body. Eighteen hours.

SURGICAL NURSING

41. **THE CARE OF SURGICAL CASES.** Anesthesia and anesthetics. Surgical emergencies; inflammation; wounds; hemorrhage; shock; fractures; dislocations. Surgical infections; toxemia; wound infections; erysipelas, gangrene, etc. Surgical tuberculosis. Plastic surgery; orthopedics. Sixteen hours.
43. **SPECIAL SURGICAL CONDITIONS.** The stomach; carcinoma, gastric ulcer; the liver and gall tract; abscess, gall-stones, etc.; the intestines; appendicitis, obstruction, etc.; the kidneys and bladder; the uterus and appendages; the brain. Sixteen hours.

45. **BANDAGING.** Demonstrations and practical exercises in the uses and methods of application of bandages of all forms. Ten hours.

MEDICAL NURSING

47. **DISEASES OF CIRCULATORY SYSTEM AND BLOOD.** Diseases of the heart; pericarditis, endocarditis, myocarditis; hypertrophy and dilatation. Diseases of the blood-vessels; arterio-sclerosis, angina pectoris; aneurism; apoplexy; phlebitis. Diseases of the blood; anemia; leukemia.
49. **GENERAL NURSING MEASURES.** Diet, drugs, rest; appliances for comfort. Observations of symptoms. Taking and recording pulse. Recording intake and output of fluids. Treatment of emergencies. Demonstration of enteroclysis. Weight and temperature. Fresh air treatment. Preparation for transfusion.
51. **GENERAL NURSING MEASURES.** Discussion of diet; observation of symptoms; technic of collecting specimens. Demonstration exercises; treatment with packs; function tests; blood pressure tests; preparation for phlebotomy and venipuncture; bladder irrigation.
53. **DISEASES OF THE URINARY TRACT.** Nephritis and complications. Cystitis.
55. **DISEASES OF RESPIRATORY SYSTEM.** Laryngitis; bronchitis; bronchial asthma; broncho-pneumonia. Lobar pneumonia and complications. Pleurisy; empyema; emphysema.
57. **NURSING CARE.** Isolation and disinfection; prevention of infection. Methods of observing and saving sputum. Fresh air treatment. Methods of reducing temperature; packs. Methods of pain relief. Inhalation. Counter irritants. Preparation for aspiration. Dietary.
59. **DISORDERS OF DIGESTIVE SYSTEM.** Pyorrhoea; stomatitis; ptyalism. Gastritis; gastric and duodenal ulcer. Carcinoma of stomach. Diarrhoea; constipation; colitis.
61. **GENERAL NURSING METHODS.** Study of oral hygiene; significance of oral disease; methods of care of mouth. Test meals; lavage; expression of stomach contents. Duodenal catheterization. Abdominal massage. Colon irrigation. Description of stools. Charting. Discussion of diet.
63. **DISEASES OF LIVER.** Cholecystitis. Cirrhosis of liver.
65. **GENERAL NURSING CARE.** Observation of symptoms. Preparation for abdominal paracentesis.
67. **DISORDERS OF METABOLISM.** Diabetes; obesity. Acute articular rheumatism; arthritis deformans; G. C. arthritis.

69. NURSING CARE. Accurate collection of specimens. Study of dietary. Measures of comfort for rheumatics. Bier's hyperemia; massage; dental treatment. Vaccines.
71. MEDICAL EMERGENCIES. Heat prostration; sunstroke. Cases of poisoning. Fainting.
73. NURSING MEASURES IN TREATMENT OF EMERGENCIES.
- Courses 47 to 73 cover a period of 32 hours.

TUBERCULOSIS

75. STUDY OF TUBERCULOSIS. Cause, prevalence, curability. Classification; tissues and organs involved. Emergencies. Treatment in home and sanatorium. Prevention of tuberculosis. Practical demonstration in sanatorial visits. Five hours.
77. CARE OF TUBERCULOSIS. Prevention of infection. Treatment of emergencies; hemoptysis. Fresh air treatment; out-of-door sleeping. Dietary; rest; exercise. Five hours.

COMMUNICABLE DISEASES

79. INFECTIOUS AND CONTAGIOUS DISEASES. Typhoid fever. Typhus. Dysentery. Hookworm. Malaria. Yellow fever. Tetanus. Rabies. Social, economic, and educational factors in the prevention and treatment of communicable diseases. Four hours.
81. GENERAL MEASURES. Precautions for protection of nurse and public. Prevention of spread. Special care of room and patient. Measures for destruction of insects. Board of health regulations concerning communicable diseases. Two hours.
83. NURSING CARE. Case charting. Dietary. Bathing; sponge baths; pack baths. Colon irrigation. Technic of vaccination. Pasteur treatment of rabies. Care of patients in convulsions. Emergency treatment of infected wounds. Two hours.

GYNECOLOGY

85. GYNECOLOGICAL NURSING. A study of terms and definitions bearing upon the nursing of pelvic diseases; preparation of gynecological patients for examination and for operation; general care of gynecological cases; special modes of treatment. Twelve hours.

NURSING OF INFANTS AND CHILDREN

87. THE NORMAL CHILD. Conditions of growth and development; breast feeding; artificial feeding; mixed feeding; preparation of foods in laboratory; general care and nursing. Psychology of childhood. Social aspects of children's diseases.
89. DISEASES OF DIGESTIVE TRACT. Disorders of respiratory system. Diseases of circulatory system; of genito-urinary tract. Nervous disorders. Constitutional diseases. Syphilis; gonorrhoea.

91. **CONTAGIOUS DISEASES.** Diphtheria; scarlet fever; smallpox; chicken-pox; whooping-cough; measles; mumps; meningitis; poliomyelitis.
Courses 87, 89, and 91 occupy thirty-two hours.

MASSAGE

93. **DEMONSTRATIONS AND CLASS PRACTICE** in the general manipulation of the body tissues and in those general movements which have the value of passive exercise for the sick or convalescent. Twenty-four hours.

OBSTETRICS

95. **OBSTETRICAL NURSING.** Lectures and demonstrations of the anatomy and physiology of the female pelvis; the physiology of pregnancy; its accidents; the physiology of parturition; the nursing of labor; complications; post-partum hemorrhage, puerperal fever; puerperal convulsions, puerperal insanity. Fourteen hours.

THE DIETETIC TREATMENT OF DISEASE

97. **THE DIETARY OF DISEASE.** The conditions of digestion, absorption, assimilation, and metabolism in disease; the influence of age, sex, and previous nutrition; the relation of food and water supply to functional inactivity, tissue loss, and elimination.
99. **THE DIETETIC TREATMENT OF SPECIAL DISEASES.** The dietary of continued fevers; gastro-intestinal disorders; respiratory disorders; disorders of nutrition; renal diseases, cardiac disorders, and diabetes. Ten hours.

HYGIENE AND PUBLIC HEALTH

101. **HOUSEHOLD HYGIENE.** The dwelling, its location, site; lighting, plumbing, heating, ventilation; disposal of waste.
103. **SCHOOL HYGIENE.** The sanitation of school buildings; the health inspection of school children; the duties of school nurses.
105. **THE HYGIENE OF FOODS.** The conditions of food supply; the principles of food preparation; the preservation and adulteration of foods; food inspection laws.
107. **INDUSTRIAL HYGIENE.** The sanitary conditions of employment; the study of industrial diseases and of occupational dangers; the principles of industrial betterment.
109. **THE HYGIENE OF THE COMMUNITY.** The regulation of food, drug, and clothing supplies; the disposal of waste materials; the suppression of public nuisances; the control of offensive trades; the prevention and control of communicable diseases. Twenty hours.

DISEASES OF THE SKIN

- III. **THE NURSING CARE OF THE SKIN.** A course upon methods of treatment of disorders of the skin of general occurrence. Ten hours.

SCHOOL OF NURSING

NERVOUS AND MENTAL DISEASES

113. THE NURSING OF NERVOUS AND MENTAL CONDITIONS. Insanity; its common forms and symptoms; principles of care of insane patients. Epilepsy; its manifestations and care. Neurasthenia, hysteria; their recognition and distinctive features; their nursing; their rest cure. Fourteen hours.

DISEASES OF THE EYE, EAR, NOSE, AND THROAT

115. THE EYE, EAR, NOSE, AND THROAT. Anatomy and physiology. General and local care; use of applications, douches, etc.; application of leeches. Recognition and care of foreign bodies. Prevention and treatment of ophthalmia neonatorum. Pre-operative and post-operative care. Twelve hours.

SPECIAL THERAPEUTICS

117. SPECIAL METHODS OF TREATMENT. Special forms of therapy, requiring the services of the nurse. The X-ray in the diagnosis and treatment of disease. The use of vaccines and sera. Six hours.

SOCIAL RELATIONS

119. PROFESSIONAL PROBLEMS. Social and civic status of nurses. Professional ethics and etiquette. Nursing education; legislation; organizations. Six hours.

SPECIAL TOPICS

Arrangements will be made, from time to time, for formal lectures upon special topics, to be delivered by available lecturers of large institutional and educational experience, to which the students of the training schools of the Twin Cities will be invited.

The Bulletin
of the University of
Minnesota

The Law School
Announcement for the Year
1921-1922



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1921							1922														
JULY							JANUARY							JULY							
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..	31

UNIVERSITY CALENDAR

1921-1922

1921

September	17	Saturday	Payment of fees closes, except for new students
September	20-27	Week	Examinations for removal of conditions and entrance examinations Physical examinations for all new students
September	19-24	Week	Registration period, Colleges of Science, Literature, and the Arts, and Agriculture, Forestry, and Home Economics
September	26-27		Registration days for all colleges not indicated above
September	27	Tuesday	Payment of fees for new students closes
September	28	Wednesday	Fall quarter begins, 8:30 a.m.
October	15	Saturday	Class Scrap Day; all classes dismissed the fourth hour
October	20	Thursday	Senate meeting, 4:30 p.m.
November	5	Saturday	Home Coming Day; classes dismissed the third and fourth hours
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	15	Thursday	Senate meeting, 4:30 p.m.
December	21	Wednesday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.

1922

January	4	Wednesday	Christmas vacation ends, winter quarter begins, 8:30 a.m.
February	16	Thursday	Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	23	Thursday	Winter quarter ends, spring vacation begins, 5:20 p.m.
March	29	Wednesday	Spring vacation ends, spring quarter begins, 8:30 a.m.
May	18	Thursday	Senate meeting, 4:30 p.m.
May	30	Tuesday	Memorial Day; a holiday
June	11	Sunday	Baccalaureate service
June	13	Tuesday	Spring quarter closes, 5:20 p.m.
June	14	Wednesday	Fiftieth annual commencement
June	17-19		Registration days for summer session
June	20	Tuesday	Summer session begins
July	28	Friday	Summer session closes

THE LAW SCHOOL

FACULTY

LOTUS DELTA COFFMAN, Ph.D., President
WILLIAM WATTS FOLWELL, LL.D., President Emeritus
CYRUS NORTROP, LL.D., President Emeritus
EVERETT FRASER, B.A., LL.B., Dean and Professor of Law
HENRY W. BALLANTINE, B.A., LL.B., Professor of Law
ANDREW A. BRUCE, B.A., LL.B., Professor of Law
WILBUR H. CHERRY, B.A., LL.B., Professor of Law
NOEL T. DOWLING, M.A., LL.B., Professor of Law
HENRY J. FLETCHER, LL.M., Professor of Law
JAMES PAIGE, M.A., LL.M., Professor of Law
GEORGE E. OSBORNE, B.A., LL.B., S.J.D., Assistant Professor of Law
MELKEOR U. S. KJORLAUG, B.A., LL.B., Instructor in Practice

PROFESSORIAL LECTURERS

HOWARD S. ABBOTT, B.L., Minneapolis
HON. HOMER B. DIBELL, B.A., LL.B., Associate Justice of the Supreme
Court of Minnesota
PAUL J. THOMPSON, M.A., LL.B., Minneapolis

SPECIAL LECTURERS

HON. CALVIN L. BROWN, Chief Justice of the Supreme Court of Minnesota
ROME G. BROWN, B.A., Minneapolis
CHARLES W. BUNN, B.S., St. Paul
HON. BERT FESLER, Duluth, Judge of the District Court
HON. CHARLES S. JELLEY, Minneapolis, Judge of the District Court
HON. FRANK B. KELLOGG, LL.D., St. Paul, United States Senator
HUGH V. MERCER, LL.M., D.C.L., Minneapolis
HON. THOMAS D. O'BRIEN, St. Paul, formerly Justice of the Supreme
Court of Minnesota

GENERAL INFORMATION

OBJECT AND METHOD OF INSTRUCTION

The Law School of the University of Minnesota was established in 1888.

The object of the Law School is to provide a thoro training in the law and to prepare students for practice in any jurisdiction where the Anglo-American legal system prevails. Particular emphasis is laid upon the statutes, the special doctrines of law, and the rules of practice that obtain in the state of Minnesota.

Instruction is given by the use of the "case system." This method of teaching law, which has been approved by experience and which is now employed in the leading law schools of the country, has the two-fold merit of enabling the student to acquire a thoro and practical knowledge of legal principles, and to become familiar with those processes of legal reasoning which have determined the form and character of our jurisprudence, and will govern its future development.

The faculty is composed chiefly of resident professional law teachers who devote their entire time and energy to teaching. The courses in practice are taught by men experienced in practice at the Minnesota bar. In addition, courses of lectures on special topics are given by distinguished lawyers and judges, selected primarily from the bar of Minnesota.

ADMISSION

Regular Students

Candidates for admission to the Law School must have completed at least two years of work with an average one grade above the passing mark in the College of Science, Literature, and the Arts of the University of Minnesota, or some other accredited college or university. This requirement is met by showing a minimum of 90 credits and 90 honor points.¹ Such candidates may be admitted upon presenting their diplomas or other credentials showing the completion of such college work to the registrar of the University. Altho two years of college education satisfy the Law School's entrance requirements, prospective law students are urgently advised to take a full college course or at least three years if possible.

Special Students

Applicants who are twenty-one years of age and have preliminary education sufficient at least to entitle them to admission to the College of Science, Literature, and the Arts² may, on petition to the faculty, be admitted to the Law School as special students. The petitioner should state age, education, grades, occupation since leaving school, reason for not qualifying as a regular student, and should present all evidence to enable the faculty to determine his fitness for the study of law.

¹ The requirement for 1921-22 is 87 credits.

² These requirements are stated in full in the current bulletin of the College of Science, Literature, and the Arts.

Special students entering with 75 credits and 75 honor points may become regular students by complying with the requirements for admission before the beginning of their third year in the Law School. But the additional credits can not be earned while carrying full law work. They may be secured by reducing the regular law work carried, or in Summer School.

ADVANCED STANDING

No credit is given for time spent in private reading. The candidate for graduation must spend three years in residence, either at this Law School or at some other accredited law school. A student coming from such other law school must possess the preliminary education required for admission to this school and must spend at least one year in attendance at this school before he can qualify for a degree. Attorneys-at-law, however, who have been admitted to practice in the state of Minnesota and who have had two years of academic work in college, may enter the third-year law class without examination upon presentation to the registrar of their certificates of admission to the bar, and shall be entitled to the degree of Bachelor of Laws upon satisfactorily completing such courses, aggregating 36 credits (one year's work), as the law faculty may designate.

REGISTRATION

New students should register on or before the opening of the first term.¹ Such students will not be permitted to enter the Law School at the beginning of the second or third term unless entitled to advanced standing. Lectures in all subjects begin promptly on the opening day of the term, and those who join their classes later will necessarily be seriously handicapped in their work. No student will be admitted to classes unless he registers within ten days after the opening of the term, except by special action of the faculty and for good cause shown. (See Tuition and Other Fees, post page 9.)

COMBINED SIX-YEAR COURSE LEADING TO DEGREES OF BACHELOR OF ARTS AND BACHELOR OF LAWS

A student in the College of Science, Literature, and the Arts of this University who has by the end of his junior year secured not less than 135 credits selected in accordance with the regulations of that college, may take during his senior year the first-year law course, and upon its completion receive the Bachelor of Arts degree, provided he has attained a total of 180 honor points during the four years. Upon completion of the work of the remaining two years in law, such student will receive the degree of Bachelor of Laws, thus obtaining both degrees in six years. Several Minnesota colleges also permit students who have completed three years work to transfer to this Law School and accept the first year of law in completion of the requirements for their B.A. degree.

¹ See page 9 for the provisions as to penalty for late registration.

RECOMMENDED PRE-LEGAL COURSES

Students preparing to enter the Law School after two or more years in the College of Science, Literature, and the Arts of this University are required to comply with the rules of the Junior College. The following course, available under the rules, is recommended by the faculty of the Law School.

1. Latin, 0 to 20 credits
2. Rhetoric, English A-B-C
3. Natural science, 10 credits
4. Political Science 1
5. Philosophy 2, and 50-51
6. History 3-4 and 33-34
7. Economics 3-4

Other subjects recommended for pre-legal students are Psychology 1-2, Public Speaking 45-46, Economics 1-2, 54, 143-144, and 167-168, History 146-147, and 116-117-118, Philosophy 1, 3, 124, and 129, Political Science 7, 11, 15, 65, 121-122, 123, and 161.

REGULATIONS GOVERNING CLASS WORK, EXAMINATIONS, GRADES, AND PROMOTIONS

Every student registered in the Law School is required to attend with regularity all lectures, whether special or in course, that may be prescribed for his class, to prepare all papers and other class exercises that may be assigned, and to perform all services in connection with the practice court that may be required of him. These requirements apply to all special students as well as to candidates for graduation. Serious delinquency in discharging these requirements may be regarded by the faculty as sufficient reason for requiring the delinquent student to withdraw from the school.

Final examinations are held only as the several courses are completed, whether they extend through one, two, or three terms, and credit is given only for an entire course and not for any part thereof. The ratings given, A, B, C, and D, signify passing grades of varying degrees of merit, A being the honor mark. E signifies a condition and F a failure. I signifies that the course has not been completed because of illness or a similar reason.

A student who, for any reason, is absent from as many as 20 per cent of the lectures in any course will receive no credit in such course.

A student who fails in a subject must repeat the subject in course.

A student who receives a condition in a subject is entitled to one examination only to remove such condition. Examinations for the removal of conditions are held only during the week prior to the beginning of the fall term. All conditions must be removed before entering upon the work of the next year. If not removed at that time they become failures and the student must repeat the subjects in course.

Candidates for graduation the following June in Arts or Law may take examinations on the day following the spring recess to remove not more than two conditions in first-term subjects, or during the examination period at the end of the third term to remove not more than two conditions in second-term subjects. Any student desiring to take examinations under this provision is required to give notice in writing of his intention, specify-

ing the subjects in which the examinations are desired, such notice to be filed in the office of the dean not less than three weeks before the date of the examination requested.

A student who is deficient in subjects aggregating 12 or more credits (term hours) will not be promoted to the next higher class. If, in the opinion of the faculty, such student is not qualified either (1) to continue as a student of law, or (2) to take any more advanced work, he may, by vote of the faculty, either (1) be denied the privilege of continuing in the Law School, or (2) be required to repeat the entire work of the preceding year.

A student, who at the end of any term, receives conditions or failures in two or more subjects may by vote of the faculty be denied the privilege of continuing in the Law School.

ELECTIVES IN OTHER DEPARTMENTS OF THE UNIVERSITY

Students in the Law School may be permitted, after completion of the work of the first year, and under proper regulations to elect, without extra charge, courses offered in other departments of the University, provided that such election does not interfere with their law studies; but such election of courses in other departments may be made only with permission of the law faculty. Among the subjects which may be profitably selected are English composition, English and American constitutional history, public speaking and debating, political science, economics, and sociology.

LIBRARIES

The library of the Law School contains more than thirty-four thousand volumes, including all the American reports, state and federal (excepting a few reports of inferior state courts), Interstate Commerce and other commission reports, nearly all the English, Australian, New Zealand, and Canadian reports, the English, federal, and state statutes (with a few exceptions), the standard digests, encyclopedias, legal periodicals and textbooks. To this collection substantial additions, particularly in foreign law, are constantly being made. Further library facilities are afforded by the generous action of the Bar Association of Minneapolis in granting to the students the free use of its library located in the Court House. Besides the University and Bar Association libraries, the State Law Library, located at the Capitol in St. Paul, is accessible to students.

STATE AND UNITED STATES COURTS

The University is located within easy reach of both the federal and state courts. The United States courts are in session in St. Paul and Minneapolis during the greater part of the school year. The Supreme Court of Minnesota, sitting at St. Paul, the district courts of Ramsey and Hennepin counties, and the municipal courts of St. Paul and Minneapolis are open and in session almost constantly, and afford the student abundant opportunity for witnessing the trial of actual cases and hearing the argument of appeals.

GENERAL INFORMATION

9

FEEES

Tuition fees (per quarter)	
Residents of Minnesota.....	\$30.00
Non-residents	40.00
Tuition fees (per credit hour)	
Residents of Minnesota.....	2.75
Non-residents	3.75
Deposit (first quarter only).....	5.00
Health fee (per quarter).....	2.00
Minnesota Union or Shevlin Hall (per quarter).....	1.00
Post-office box (per quarter).....	.20
Special fees:	
Examination for removal of conditions.....	1.00
Special examinations.....	5.00

PENALTY FEES:

Registration penalties.—A penalty fee for late registration, late change of registration, or late payment of fees shall be two dollars (\$2.00) and one dollar (\$1.00) additional for each day of delay after classes begin, provided that no student shall pay more than twelve dollars (\$12.00) of penalty in any given quarter.

EXPENSES

Careful estimates of the expenses of a student attending the Law School, together with other general information useful to students, are to be found in the bulletin of general information, to be had upon application to the registrar of the University.

INQUIRIES

Further particulars as to any phase of the work of the Law School not given herein, or in the bulletin of general information, will be cheerfully given upon request. Communications addressed at any time to the dean of the Law School, of the University of Minnesota, Minneapolis, Minnesota, will receive prompt attention.

COURSE OF STUDY

The curriculum leading to the degree of Bachelor of Laws covers a period of three academic years. To qualify for graduation, a student must complete the entire work of the first and second years and the required work of the third year, together with a sufficient number of electives to aggregate 12 hours of work during each term of the third year.

Students, unless they be of exceptional ability and industry, who find it necessary to devote a considerable portion of their time and energy to work not connected with their law studies are strongly advised to limit their work in the Law School to not more than 10 hours in the classroom per week, and thus extend the period of their study of law over four years. The credit hour tuition fee enables students to extend the period of study at slight additional expense.

No student, unless permitted by special action of the faculty, will be allowed to carry more than the regularly prescribed work for the year, or proportional work for any term.

Attendance upon all special lectures scheduled is required; and all students in the Law School may be required to serve as jurors or witnesses in any proceedings before the practice court.

All the courses offered by the Law School are given between the hours of 8 a.m. and 5:30 p.m.

FIRST-YEAR COURSES

CONTRACTS. Offer and acceptance; consideration; contracts under seal; the Statute of Frauds; rights of beneficiaries and assignees; joint and several contracts; conditions; illegality; impossibility; and discharge of contracts. Corbin, *Cases on Contracts*. Three hours through the year. MR. BALLANTINE.

PROPERTY I. Real and personal property distinguished; possessory rights, liens, pledges; title to personal property by accession, confusion, gift, and finding. Theory of feudal land tenure; rights incident to ownership; profits; easements; licenses; covenants running with land. Warren, *Cases on Property*. Three hours through the year. MR. FRASER.

TORTS. General principles underlying law of civil liability for wrongful conduct; specific wrongs of deceit, defamation, malicious prosecution, interference with contracts and trade, etc. Ames and Smith, *Cases on Torts* (edition of 1909-10), Vols. I and II. Three hours through the year. MR. DOWLING.

COMMON LAW ACTIONS AND EQUITY I. The several forms of action at common law. Relation of forms of action to substantive law. Introduction to equity. Morgan, *Lectures*. Cook & Hinton, *Cases on Common Law Pleading*. Ames, *Cases on Equity Jurisdiction*, Vol. I. Two hours through the year. MR. OSBORNE.

CRIMINAL LAW AND PROCEDURE. The common and statutory law of crimes; criminal procedure. Mikell, *Cases on Criminal Law and Criminal Procedure*. Three hours first term and first half of second term. MR. PAIGE.

AGENCY. Principal and agent, master and servant—their rights and obligations, mutually and as to third persons. Goddard, *Cases on Agency*. Three hours, second half of second term and third term. MR. BRUCE.

SECOND-YEAR COURSES

PLEADING. (1) COMMON LAW PLEADING: demurrers, pleas, replications, departure, new assignment, amendment, set-off and counterclaim. Ames, *Cases on Pleading*. Second edition. (2) CODE PLEADING: Relation of code to common-law pleading, parties, splitting and joinder of causes, the complaint, answer, demurrer, reply, motions, bills of particulars, amendment and aider. Sunderland, *Cases on Code Pleading*. Two hours, first and second terms, three hours third term. MR. FLETCHER.

EQUITY II. Nature of equity jurisdiction; injunctions; bills of peace; interpleader; specific performance; bills for account. Ames, *Cases on Equity*, Vols. I and II. Three hours first and second terms, two hours third term. MR. BRUCE.

EVIDENCE. Burden of proof; judicial notice; admission and exclusion of evidence; competency, privilege, and examination of witnesses; hearsay rule and recognized exceptions; opinions and conclusions; circumstantial evidence; best evidence rule; parole evidence rule. Hinton, *Cases on Evidence*. Two hours through the year. MR. CHERRY.

DECEDENTS' ESTATES AND PROPERTY II. (1) Testamentary capacity; execution, revocation, and republication of wills; descent; probate of wills and administration of estates. Text to be announced. (2) Titles and conveyancing; the execution of deeds and estates created thereby; executive sales and priorities; actions concerning real property. Dibell, *Cases on Real Property*. Two hours through the year. MR. DIBELL.

NEGOTIABLE INSTRUMENTS. Formal and essential requirements of negotiable instruments, and the nature of the liability of the respective parties thereto; acceptance; endorsement; transfer; presentment; notice of dishonor; the Negotiable Instruments Law. Colson's, Huffcutt, *Cases on Negotiable Instruments*. Two hours through the year. MR. PAIGE.

SALES. Contracts resulting in the transfer of title to personal property, and the special rights and remedies of the buyer and seller. Williston, *Cases on Sales* (second edition). Three hours, first term and first half of second term. MR. OSBORNE.

TRUSTS. Nature and incidents of the trust relationship; methods of creating trusts; rights and obligations of trustees and beneficiary; constructive trusts, charitable trusts. Scott, *Cases on Trusts*. Three hours, second half second term and third term. MR. OSBORNE.

THIRD-YEAR COURSES

PRACTICE AND PRACTICE COURT (required). This course deals with the various proceedings in an action from the commencement thereof, through trial and appellate courts, to final satisfaction of judgment, including work in the practice course. Sunderland, *Cases on Trial Practice*. Three hours through the year. MR. CHERRY, MR. THOMPSON, MR. KJORLAUG.

PROPERTY III. Conditional and future interests in land: reversion and remainders; executory limitations by way of use and devise; powers; rule against perpetuities; conditions in restraint of alienation. Minnesota restrictions on future interests and trusts. Kales, *Future Interests*, American Casebook series, and selected cases. Two hours through the year. MR. FRASER.

CONFLICT OF LAWS. The rules applied by courts in enforcing rights acquired under the law of a sister state or a foreign country. Lorenzen, *Conflict of Laws*. Two hours through the year. MR. PAIGE.

MORTGAGES. Legal and equitable mortgages of realty and chattels; rights of mortgagor and mortgagee at law and in equity; foreclosure, redemption, extension, assignment, and discharge of mortgages. Dibell, *Cases on Mortgages*. One hour, first and second terms. MR. DIBELL.

INTERNATIONAL LAW. (1) INTERNATIONAL RELATIONS IN TIME OF PEACE; territorial jurisdiction; jurisdiction on the high seas; nationality. (2). INTERNATIONAL RELATIONS AS MODIFIED BY WAR; measures short of actual war; effect of war as between enemies; relation between belligerents and neutrals. Scott, *Cases on International Law*. Three hours, first and second terms. MR. ALLIN.

DAMAGES. Exemplary damages; nominal damages; direct and consequential damages; elements of injury; functions of court and jury; liquidated damages; entire and prospective damages: limitations of interest; aggravation and mitigation. Special applications. Beale, *Cases on Damages*. Three hours, first term. MR. BRUCE.

INSURANCE. Nature and requisites of the contract; premiums and assessments; insurable interest; concealment; representations and warranties; waiver and estoppel; rights under the policy; beneficiaries, assignees, and creditors; construction of the policy. Vance, *Cases on Insurance*. Three hours, first term. MR. BALLANTINE.

- MUNICIPAL CORPORATIONS.** Legislative control; officers and agents; power to incur indebtedness, to pass ordinances, to grant franchises, to levy taxes, to issue securities, to own and operate public utilities; municipal liability for torts. Abbott, *Cases on Municipal Corporations*. Three hours, first term. MR. ABBOTT.
- PUBLIC UTILITIES.** Origin of common callings, peculiar duties and liabilities incident thereto, the modern law applicable to those engaged in public service, particularly common carriers, with special reference to the Interstate Commerce Act and similar state statutes. Textbook to be announced. Three hours first term. MR. DOWLING.
- TAXATION.** This course deals only with the legal questions arising in connection with the assessment of property and the levying and collection of taxes. Selected cases. Three hours, first term. MR. FLETCHER.
- PRIVATE CORPORATIONS (required).** The nature, creation, and citizenship of corporations; *ultra vires* contracts and acts; stock issues; rights and liabilities of stockholders, officers and agents of corporations; rights of creditors. Richards, *Cases on Private Corporations*. Three hours, second and third terms. MR. BALLANTINE.
- CONSTITUTIONAL LAW.** Nature of American constitutional system; legislative, executive, and judicial departments; fundamental rights; due process of law; police power; taxation; eminent domain; the federal government and its general powers; interstate commerce. Hall, *Cases on Constitutional Law*. Three hours, second and third terms. MR. DOWLING.
- PARTNERSHIP.** The nature and formation of the partnership relation; the rights and liabilities of the partners, both *inter se* and as to third parties. Gilmore, *Cases on Partnership*. Two hours, second and third terms. MR. PAIGE.
- SURETYSHIP.** The surety distinguished from the guarantor, the guaranty insurer, and the endorser; surety's defenses against creditor; surety's rights to subrogation, indemnity, contribution, and exoneration; creditor's rights to surety's securities. Ames, *Cases on Suretyship*. Two hours, second and third terms. MR. BRUCE.
- QUASI CONTRACTS.** Nature and scope of quasi contracts, benefits voluntarily conferred by mistake, in partial performance of a contract, in the absence of a contract; benefits conferred under duress; waiver of tort. Thurston, *Cases in Quasi Contracts*. Three hours, second term. MR. FLETCHER.
- BANKRUPTCY.** Origin, history, and nature of the bankruptcy law; jurisdiction of the courts; acts of bankruptcy; practice; receivers; claims, preferences; assets, trustees; liens; adverse claimants; summary jurisdiction; crimes, composition, discharge. Selected cases. Three hours, third term. MR. FLETCHER.

THE LAW SCHOOL

WORK IN PRACTICE

Members of the third-year class, in addition to classroom instruction in Practice engage in the exercises of the Practice Court. Each student is assigned a number of cases in which he is required to draw the necessary pleadings, to see to the service of process and pleadings, and to prepare for and conduct the trial. In at least one of the cases so assigned, the student must take steps to secure or oppose a provisional or extraordinary remedy. Each student also serves as witness in several cases. The trial is followed by a discussion of the conduct of the case, led by the instructor who has acted as judge.

Students prepare three sets of papers, which include all papers ordinarily used in the prosecution and defence of a civil action in the District Court and on appeal to the Supreme Court. The papers are explained and discussed in class.

Members of the third-year class are required to serve as assistants in the office of the Legal Aid Society and to attend at the office of the society during the periods assigned for such service.

ATTENDANCE FOR 1920-21

Third-year class	60
Second-year class	90
First-year class	119
	<hr/>
Total	269

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

The College of Agriculture, Forestry,
and Home Economics
Announcement of
Courses in Forestry for the Year
1921-1922

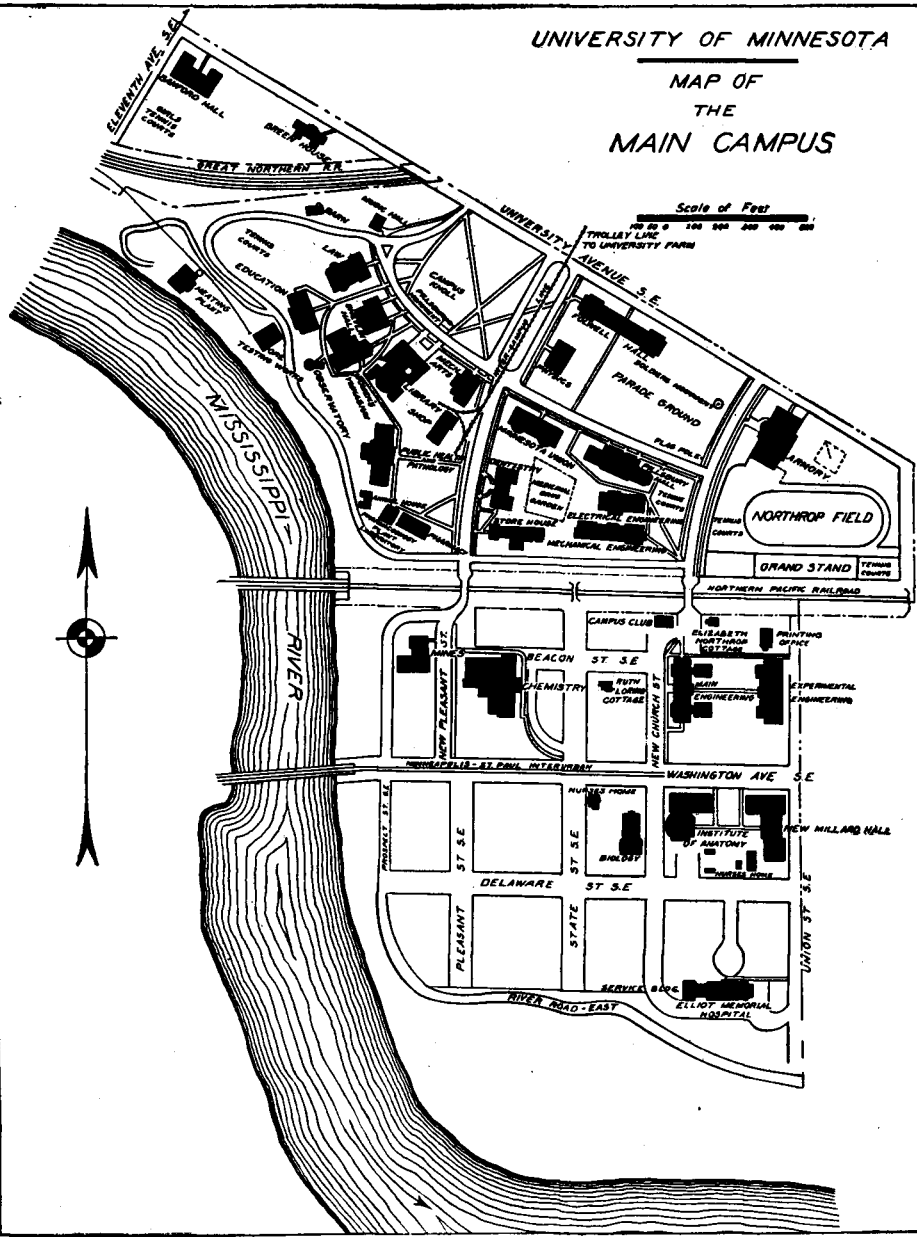


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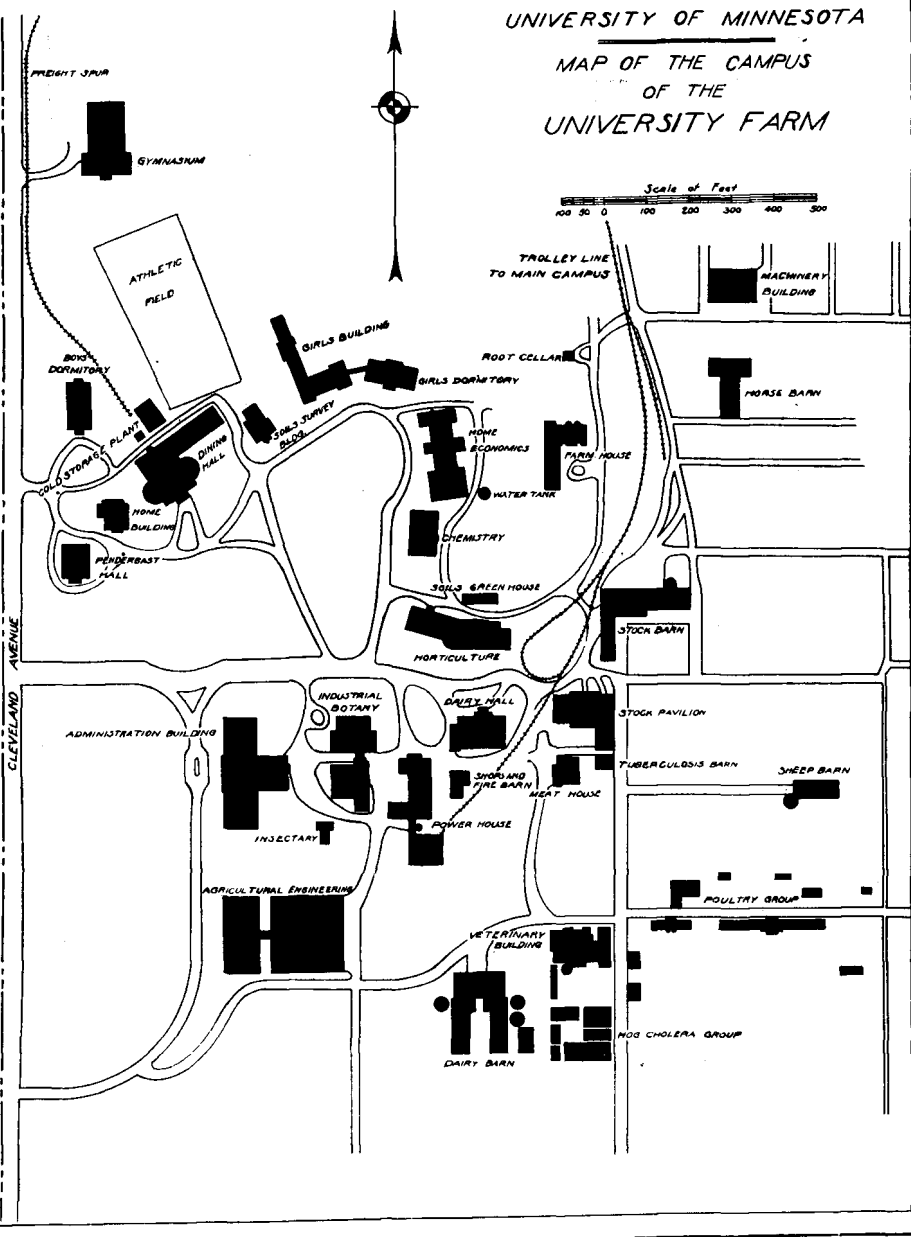
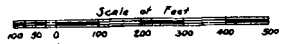
Accepted for mailing at special rate of postage provided for in section 1103,
Act of October 3, 1917, authorized July 12, 1918

UNIVERSITY OF MINNESOTA
 MAP OF
 THE
 MAIN CAMPUS



Area of Main Campus, 108.5 acres

UNIVERSITY OF MINNESOTA
 MAP OF THE CAMPUS
 OF THE
 UNIVERSITY FARM



Area of University Farm, 422.56 acres

1921							1922													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	..	..	..	..	..	..	1
3	4	5	6	7	8	9	8	9	10	11	12	13	14	2	3	4	5	6	7	8
10	11	12	13	14	15	16	15	16	17	18	19	20	21	9	10	11	12	13	14	15
17	18	19	20	21	22	23	22	23	24	25	26	27	28	16	17	18	19	20	21	22
24	25	26	27	28	29	30	29	30	31	..	..	..	..	23	24	25	26	27	28	29
31	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	1	2	3	4	5
7	8	9	10	11	12	13	5	6	7	8	9	10	11	6	7	8	9	10	11	12
14	15	16	17	18	19	20	12	13	14	15	16	17	18	13	14	15	16	17	18	19
21	22	23	24	25	26	27	19	20	21	22	23	24	25	20	21	22	23	24	25	26
28	29	30	31	..	..	..	26	27	28	..	..	..	..	27	28	29	30	31	..	..
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	1	2	3	..	..	..	1	2	3	4	..	..	..	..	..	1	2
4	5	6	7	8	9	10	5	6	7	8	9	10	11	3	4	5	6	7	8	9
11	12	13	14	15	16	17	12	13	14	15	16	17	18	10	11	12	13	14	15	16
18	19	20	21	22	23	24	19	20	21	22	23	24	25	17	18	19	20	21	22	23
25	26	27	28	29	30	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30
..
OCTOBER							APRIL							OCTOBER						
..	..	..	..	..	..	1	..	..	..	..	..	..	1	1	2	3	4	5	6	7
2	3	4	5	6	7	8	2	3	4	5	6	7	8	8	9	10	11	12	13	14
9	10	11	12	13	14	15	9	10	11	12	13	14	15	15	16	17	18	19	20	21
16	17	18	19	20	21	22	16	17	18	19	20	21	22	22	23	24	25	26	27	28
23	24	25	26	27	28	29	23	24	25	26	27	28	29	29	30	31	..	..	..	..
30	31	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..
..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	1	2	3	4	5	6	..	..	..	1	2	3	4
6	7	8	9	10	11	12	7	8	9	10	11	12	13	5	6	7	8	9	10	11
13	14	15	16	17	18	19	14	15	16	17	18	19	20	12	13	14	15	16	17	18
20	21	22	23	24	25	26	21	22	23	24	25	26	27	19	20	21	22	23	24	25
27	28	29	30	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..
DECEMBER							JUNE							DECEMBER						
..	4	5	6	7	8	9	..	..	..	..	1	2	3	..	..	..	..	..	1	2
11	12	13	14	15	16	17	4	5	6	7	8	9	10	3	4	5	6	7	8	9
18	19	20	21	22	23	24	11	12	13	14	15	16	17	10	11	12	13	14	15	16
25	26	27	28	29	30	31	18	19	20	21	22	23	24	17	18	19	20	21	22	23
..	..	..	..	..	..	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..

CALENDAR

1921-1922

1921			
September	14	Wednesday	Registration closes except for new students
September	20-27	Week	Examinations for removal of spring quarter conditions. Entrance examinations Registration of new students. Payment of fees Physical examinations for new students
September	28	Wednesday	Fall quarter begins, 7:45 a.m.
October	3	Monday	School of Agriculture, first term begins
October	15	Saturday	Class Scrap Day; all classes dismissed the fourth hour
October	20	Thursday	Senate meeting, 4:30 p.m.
October	28	Friday	Last day for removal of spring quarter incompletes
November	5	Saturday	Home Coming Day; classes dismissed the third and fourth hours
November	11	Friday	Armistice Day; a holiday
November	14-26		Advanced Creamery Operators' Short Course
November	24	Thursday	Thanksgiving Day; a holiday
November	28	Week	Ice-Cream Makers' Short Course
December	3		
December	5-10	Week	Milk-Plant Operators' Short Course
December	15	Thursday	Senate meeting, 4:30 p.m.
December	21	Wednesday	Last day for winter quarter registration except for new students Fall quarter closes, 4:50 p.m. School of Agriculture, first term closes Christmas vacation begins, 4:50 p.m.
December	27	Week	Registration of new students. Payment of winter quarter fees
January	3		
1922			
January	2-7	Week	Farmers' and Home-Makers' Week Short Course
January	2	}	Beginning Creamery Operators' Short Course
February	11		
January	4	Wednesday	Winter quarter begins, 8:15 a.m.
January	9	Monday	School of Agriculture, second term begins
February	3	Friday	Last day for removal of fall quarter incompletes

COURSES IN FORESTRY

February	13-26	Week	Advanced Cheese-Makers' Short Course
February	16	Thursday	Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	18	Saturday	Last day for spring quarter registration except for new students
March	23	Thursday	Winter quarter closes. Spring vacation begins, 5:20 p.m.
March	23-28	Week	Registration of new students. Payment of spring quarter fees
March	29	Wednesday	Spring quarter begins, 7:45 a.m. School of Agriculture, second term closes
April	3-8	Week	Boys' and Girls' Week Short Course
April	28	Saturday	Last day for removal of winter quarter incompletes
May	18	Thursday	Senate meeting, 4:30 p.m.
May	30	Tuesday	Memorial Day; a holiday
June	11	Sunday	Baccalaureate service
June	13	Tuesday	Spring quarter closes
June	14	Wednesday	Fiftieth annual commencement
June	17-19		Summer session registration. Payment of fees
June	20	Tuesday	Summer session begins
July	28	Friday	Summer session closes

THE COLLEGE OF AGRICULTURE, FORESTRY AND HOME ECONOMICS

FACULTY

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WILLIAM WATTS FOLWELL, LL.D., President Emeritus
CYRUS NORTROP, LL.D., President Emeritus
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Agriculture
EDWARD M. FREEMAN, Ph.D., Dean of the College of Agriculture, Forestry,
and Home Economics
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JESSIE S. LADD, Dean of Women
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JOHN H. ALLISON, Ph.B., M.F., Professor of Forestry
FREDERICK J. ALWAY, Ph.D., Professor of Soil Chemistry
PHILIP A. ANDERSON, B.S. in Agr., Assistant Professor of Animal Hus-
bandry
ALBERT C. ARNY, M.S. in Agr., Associate Professor of Agronomy
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ALICE BIESTER, M.A., Associate Professor of Nutrition
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WILLIAM BOSS, Professor of Farm Engineering
WILLARD L. BOYD, D.V.S., Professor of Veterinary Science
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HARRY J. BURTIS, B.A., Assistant Professor of Rhetoric
LEROY CADY, B.S. in Agr., Associate Professor of Horticulture
NORRIS K. CARNES, B.S., Assistant Professor of Animal Husbandry
EDWARD G. CHEYNEY, B.A., Professor of Forestry
ALICE M. CHILD, M.A., Assistant Professor of Foods and Cookery
LOUIS J. COOKE, M.D., Director of Physical Education for Men
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for Women
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R. ADAMS DUTCHER, M.S., M.A., Associate Professor of Agricultural Bio-
chemistry
WILLIAM P. DYER, M.A., Assistant Professor of Agricultural Education
CLARENCE H. ECKLES, M.S., D.Sc., Professor of Dairy Husbandry
GUY R. B. ELLIOT, Assistant Professor of Farm Engineering
BEN W. FEILD, Major, U.S.A., Assistant Professor of Military Science
and Tactics

¹Resigned, June 30, 1921.

- EVAN F. FERRIN, M.Agr., Professor of Animal Husbandry
 ALBERT FIELD, M.S., Assistant Professor of Agricultural Education
 CLIFFORD P. FITCH, M.S., D.V.M., Professor of Animal Pathology and
 Bacteriology
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 EDWARD M. FREEMAN, Ph.D., Professor of Botany and Plant Pathology
 LOUIS F. GAREY, M.A., Assistant Professor of Agronomy and Farm
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 and Tactics
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 DEXTER D. MAYNE, Professor of Agricultural Pedagogics
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 WILLIAM MOORE, Ph.D., Associate Professor of Research in Economic
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- WILLIAM L. HOGAN, Sergeant, U.S.A., Instructor in Military Science and Tactics
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- ALLEN D. JOHNSTON, Instructor in Blacksmithing
- FRED A. KRANTZ, B.S., Instructor in Horticulture
- CLARENCE G. LANGE, Sergeant, U.S.A., Instructor in Military Science and Tactics
- ALVIN H. LARSON, B.S. in Agr., Instructor in Agricultural Botany
- JULIAN G. LEACH, M.S., Instructor in Plant Pathology

- JOSEPH LEES, First Sergeant, U.S.A., Instructor in Military Science and Tactics
- FRED LILLIE, Sergeant, U.S.A., Instructor in Military Science and Tactics
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- MARK A. McCARTY, B.S., Instructor in Animal Husbandry
- OLIVE B. MACCOMBER, Instructor in Textiles and Clothing
- MABEL C. McDOWELL, B.S., Instructor in Textiles and Clothing
- PAUL R. McMILLER, M.S., Instructor in Soils
- JOHN McWILLIAMS, Sergeant, U.S.A., Instructor in Military Science and Tactics
- PAUL L. MILLER, M.A., Instructor in Agricultural Economics
- ¹RUTH MOHL, M.A., Instructor in Rhetoric
- MARGARET K. MUMFORD, M.S., Instructor in Foods and Cookery
- ABE PEPINSKY, Instructor in Violin and Director of Orchestra
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- LENORE RICHARDS, B.A., Instructor in Institutional Management
- HELEN RIDER, B.S., Instructor in Home Economics
- GRACE M. ROCKWOOD, B.A., Instructor in Physical Education for Women
- CARL B. ROEMER, Instructor in Physical Education for Men
- JAMES L. SEAL, M.S., Instructor in Plant Pathology
- PAUL F. SHARP, B.A., Instructor in Agricultural Biochemistry
- CLARENCE C. SHELTON, Sergeant, U.S.A., Instructor in Military Science and Tactics
- HERMAN SMITH, Sergeant, U.S.A., Instructor in Military Science and Tactics
- FREDERICK H. STEINMETZ, B.S. in Agr., Instructor in Agronomy
- HARRY E. STRIDER, Sergeant, U.S.A., Instructor in Military Science and Tactics
- VIRGIL R. WERTZ, M.S., Instructor in Agricultural Economics
- GILBERT H. WIGGIN, B.S., Instructor in Forestry
- ELMER O. ANDERSON, B.S., Assistant in Dairy Husbandry
- JOHN W. BUSHNELL, B.S. in Agr., Assistant in Horticulture
- FRANK GILMAN, Assistant in Physical Education for Men
- HARRY GOLDIE, Assistant in Physical Education for Men
- JOHN W. WILBUR, B.S. in Agr., Assistant in Dairy Husbandry

EXTENSION STAFF

- ¹ARCHIE D. WILSON, B.S. in Agr., Director
- CLARENCE H. WELCH, Assistant to the Director
- MARGARET B. BAKER, Assistant State Leader Boys' and Girls' Club Work

¹Leave of absence, 1921-22.

FRANK E. BALMER, B.S. in Agr., State Leader County Agricultural Agents
 MARY L. BULL, Household Management Specialist

GENEVIEVE BURGAN, B.S., Assistant State Leader Boys' and Girls' Club
 Work

ANNABEL CAMPBELL, B.S., Poultry Specialist

WILLIAM L. CAVERT, M.S., Farm Management Specialist

NORTON E. CHAPMAN, M.A., Poultry Husbandry Specialist

SPENCER B. CLELAND, B.S., Assistant State Leader County Agents

ESTHER B. COOLEY, B.S., Clothing Specialist

LUCY CORDINER, M.A., Nutrition Specialist

WILLIS J. CORWIN, B.S., Assistant State Leader County Agents

JAMES M. DREW, Assistant

THEODORE A. ERICKSON, B.A., State Leader Boys' and Girls' Club Work

ROY H. GIBERSON, Assistant State Leader Boys' and Girls' Club Work

GEORGE F. HOWARD, Assistant State Leader Boys' and Girls' Club Work

J. SENECA JONES, B.S., Assistant State Leader County Agents

ARTHUR J. KITTELSON, B.S., Assistant State Leader Boys' and Girls' Club
 Work

ARTHUR J. MCGUIRE, B.Agr., Reclamation and Livestock Specialist

ADELE KOCH, M.A., Assistant State Leader in Home Economics

WILLIAM A. MCKERROW, Livestock Specialist

ROGER S. MACKINTOSH, B.Agr., M.S. in Agr., Horticultural Specialist

JOSEPH S. MONTGOMERY, B.S. in Agr., Livestock Specialist

WILLIAM E. MORRIS, Assistant State Leader County Agents

GEORGE H. NESOM, B.A., B.S., Soil Specialist

JULIA NEWTON, B.A., State Leader in Home Economics

RETT E. OLMSTEAD, B.D., Farmers' Club Specialist

RAYMOND C. ROSE, B.S., Plant Pathology Specialist

JUANIATA L. SHEPPARD, M.A., Home Economics Specialist

EDWARD C. TORREY, Specialist in Public Work

LESLIE V. WILSON, B.S., Dairy Specialist

MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN
 THE COLLEGE OF AGRICULTURE, FORESTRY,
 AND HOME ECONOMICS

CEPHAS D. ALLIN, LL.B., M.A., Professor of Political Science

FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor
 of Romance Languages

ROY G. BLAKEY, Ph.D., Professor of Economics

FREDERIC K. BUTTERS, Ph.D., Associate Professor of Botany

WILLIAM S. COOPER, Ph.D., Assistant Professor of Botany

ROBERT E. CUSHMAN, Ph.D., Associate Professor of Political Science

JAMES DAVIES, Ph.D., Assistant Professor of German

GEORGE W. DOWRIE, Ph.D., Professor of Economics

ELIAS J. DURAND, D.Sc., Professor of Botany

- WILLIAM H. EMMONS, Ph.D., Professor of Geology
 HENRY A. ERIKSON, Ph.D., Professor of Physics
 JULES T. FRELIN, B.A., Assistant Professor of Romance Languages
 FREDERICK B. GARVER, Ph.D., Associate Professor of Economics
 ISAAC W. GEIGER, Ph.D., Assistant Professor of Chemistry
 RODNEY B. HARVEY, Ph.D., Assistant Professor of Botany
 ERNEST A. HEILMAN, Ph.D., Assistant Professor of Economics
 RALPH E. HOUSE, Ph.D., Associate Professor of Romance Languages
 NED L. HUFF, M.A., Assistant Professor of Botany
 WILLIAM H. HUNTER, Ph.D., Professor of Chemistry
 LEE I. KNIGHT, Ph.D., Professor of Botany
 ELMER J. LUND, Ph.D., Associate Professor of Zoology
 FRANK H. MACDOUGALL, Ph.D., Associate Professor of Chemistry
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 HENRY F. NACHTRIEB, B.S., Professor of Animal Biology
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 THOMAS S. ROBERTS, M.D., Professor of Ornithology
 C. OTTO ROSENDAHL, Ph.D., Professor of Botany
 CARL SCHLENKER, B.A., Professor of German
 COLBERT SEARLES, Ph.D., Professor of Romance Languages
 CHARLES F. SIDENER, B.S., Professor of Chemistry
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 ANTHONY ZELENY, Ph.D., Professor of Physics
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 ANTONIO HERAS, Bachiller, Licenciado en Derecho, Professorial Lecturer in
 Romance Languages
 LOUALLEN F. MILLER, M.A., Professorial Lecturer in Physics
 IRA S. ALLISON, B.A., Instructor in Geology
 HERMAN H. CHAPMAN, B.A., Instructor in Economics
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 M.A., Instructor in Romance Languages
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GEORGE A. THIEL, M.A., Instructor in Geology
 JOSEPH VALASEK, B.S., Instructor in Physics
 W. COURTNEY WERNER, B.A., Instructor in Geology

FACULTY COMMITTEES

1921-1922

Executive.—The Executive Committee of the Department of Agriculture
Curriculum.—Mr. Freeman, Miss Biester, Mr. A. Boss, Mr. Cheyney, Mr. Eckles, Mr. Riley, Mr. Storm, Miss Weigley, Miss Weller, Mr. West
Enrolment.—Mr. Field, Miss Clara Brown, Mr. Wentling, Mr. Morrow, Mr. West
Students' Work.—Mr. Freeman, Miss Weigley, Mr. Alderman, Mr. Cheyney, Mr. Nicholson, Mrs. Ladd
Student Organizations.—Mr. Lansing, Mr. Dutcher, Miss Morse, Miss Weller, Mr. Freeman
Faculty Business.—Mr. Gortner, Mr. Stakman, Miss Phelps, Mr. Ruggles
Farm Experience.—Mr. A. Boss, Mr. Alderman, Mr. Eckles
Program.—Mr. Fitch, Mr. Allison, Mr. Ruggles, Mr. Hayes, Miss Child
Scholarships.—Mr. Eckles, Miss Weigley, Mr. Gortner, Mr. Hayes, Mr. Black, Mr. Freeman

GENERAL INFORMATION

ADMISSION

New students are admitted at the opening of the fall, winter, and spring quarters.

All students upon entering for the first time must submit their credentials to the Enrolment Committee.

Admission is either by certificate or by examination. Candidates must have completed the equivalent of a four-year high-school course and must present:

1. Four units of English; or 3 units of English and 4 units of a foreign language, or 3 units of English and 2 units in each of two foreign languages.
2. One unit of elementary algebra and 1 unit of plane geometry.
3. Enough additional work to make in all 15 units, of which not more than 4 may be in subjects not listed in the admission groups in the general information bulletin.

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.

For details of admission requirements and definition of "unit" see the bulletin of general information.

All students desiring to enter the forestry courses are urged to present physics and chemistry for entrance credits.

FEEES

Free tuition.—The state will pay the tuition of any student who served in the army, navy, or marine corps of the United States during any war in which the United States has been involved, including members of the National Guard, or who, upon the call of the president, performed military service outside the borders of Minnesota in any trouble with Mexico and of any student who performed overseas service as a regularly enlisted full-time worker of the Red Cross, engaged in nursing the sick or assisting in the care of soldiers in any government hospital, field, or camp which service has been officially recognized by the national government. The amount of this free tuition is not to exceed \$200 for any person and the benefits of this act will not extend beyond July 1, 1924. The amount to be paid in any year will be limited by the legislative appropriation for that year.

Any amount applied for as bonus under the state bonus law is deducted from the \$200 available for tuition.

Application for this fee tuition should be made to the registrar's office at the time of registration.

This applies only to students, who at the time of enlistment were citi-

zens and residents of the state of Minnesota.

Tuition includes all of the regular quarter charges listed below except the deposit and penalty fees for change of registration, late registration, condition examinations, etc.

Tuition fee (per quarter)	
Residents of Minnesota.....	\$20.00
Non-residents	30.00
Deposit (for the year).....	5.00
Military deposit (for all students registered for Military Drill)	10.00
Health fee (per quarter).....	2.00
Minnesota Union (per quarter).....	1.00
Post-office box (per quarter).....	.20
Itasca Park, same as regular quarter fees	
Special fees	
Examination for removal of conditions.....	1.00
Examination for credit (after the first quarter in residence)	5.00
Special examination.....	5.00
Change of registration.....	2.00

Late registration.—Old students must indicate their registration not later than two weeks before the day set for classes to begin. All 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 for each day of delay after the last day set for payment of fees.

Important.—The regulations require that no student shall 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 DEGREE

After the completion of the prescribed course of study, including all of the required work and the requisite amount of elective work equivalent to 204 (207 in 1922) credit hours, candidates will be recommended for graduation with the degree of Bachelor of Science.

The course of study is made up of 204* credit hours of work including:

1. Required courses, 100 to 107 credit hours, which every student must complete. These constitute approximately one half of the curriculum and are considered as fundamental to any course in forestry. In most cases these will be completed in the freshman and sophomore years.

* Students graduating in June, 1922, will be required to complete 207 credit hours.

2. Elective courses, 97 to 104 credit hours, distributed as follows:
 - a. A major of from 24 to 36 credit hours.
 - b. ¹A minor of 18 credit hours.
 - c. Limited electives amounting to 50 per cent of the remaining number of 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.

¹ The major and minor must be selected from different groups.

COURSES OF STUDY

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 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 in pages 22 to 40. The program of classes is printed on pages 41 to 109. The divisional statements are arranged alphabetically according to the name 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.

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.

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.

REQUIRED COURSES

100 to 107 Credit Hours

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 17 credit hours per quarter. In such cases those subjects listed below which can not be taken in the freshman and sophomore years must take precedence the following year. Registration for from 15 to 18 credit hours of work each quarter (summer quarter at Itasca Park, 11 credit hours), will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

COURSES OF STUDY

19

1. *Non-credit courses* required for graduation in addition to the 204 credit hours. Freshman lectures. A course of nine lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter. Must be taken in the freshman year.
- Military drill. Three hours per week throughout the freshman and sophomore years. Students found to be physically unfit may be required to substitute corrective exercises in gymnasium.
- Phys. Educ. 1f,w,s, Personal Hygiene
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
- An. Biol. 14f-15w-16s, General Zoology, 9 (sophomore year)
- Bot. 4f-5w-6s, General Botany, 9
- Bot. 7s, Taxonomy of Flowering Plants, 5 (Bot. 4-5-6)
- Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high-school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits
- Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. Those required to take Chem. 1-2-3 are exempt
- Econ. 5f,w, General Economics, 5
- Ent. 5f, Elementary Forest Entomology, 3
- Farm Eng. 3f,s, Mechanical Drawing, 2
- Farm. Eng. 11f,w,s, Applied Mathematics, 5
- Farm Eng. 23f, 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 course of study
- For. 1f,s, General Forestry, 4
- For. 41f, Silvics, 3 (For. 1, 3, 4, Bot. 4-5-6)
- For. 2su, Elementary Dendrology, 3 (Itasca Park)
- For 3f,w-4w,s, Dendrology, 8 (Bot. 4)
- For. 5su, Elementary Sylviculture, 3 (Itasca Park)
- For. 9su, Elementary Mensuration, 5 (Itasca Park)
- For 33f-34w, Wood Structure and Identification, 6 (For. 3-4, Bot. 4-5-6)
- Geol. 29f, General Physiography, 3
- Pl. Path. 10s, Forest Pathology, 5 (Bot. 4-5-6)
- Rhet. 1f,w,s, ¹Rhetoric I, 3
- Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)
- Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)
- Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1
- Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)

ELECTIVE GROUPS

A. GROUPS FROM WHICH THE MAJOR, MINOR, OR ELECTIVES MAY BE CHOSEN

1. *Sylviculture*

- Bot. 20f, Forest Ecology, 3
- Bot. 52f, Plant Physiology, 5
- Bot. 113f-114w-115s, Advanced Taxonomy, 9
- Bot. 131f, Field Ecology, 3
- Bot. 133s, Forest Geography, 5
- Bot. 141f-142w-143s, Advanced Plant Physiology, 15
- For. 26f,w, Tree Crops, 1
- For. 27w, Groves and Windbreaks, 3
- For. 35w, Seeding and Planting, 3
- For. 43s, Sylviculture Laboratory, 6 (Itasca Park)
- For. 101w, Advanced Dendrology, 3

¹ Special attention is called to rules on delayed credit and to regulations for

For. 106w, Research Methods in Sylviculture, 3
 student with insufficient preparation in English on page 38.

2. *Forest Organization and Management*

Econ. 28s, Principles of Accounting, 5
 Econ. 54s, Corporation Finance, 3
 Econ. 85f,s, Principles of Marketing, 3
 Econ. 91w, Principles of Organization and Management, 3
 Econ. 167w-168s, Industrial Relations, 6
 Farm Eng. 18s, Surveying, 5
 For. 10w, Mensuration, 5
 For. 11f, Forest Valuation, 5
 For. 20w, Grazing, 3
 For. 28w, Logging, 3
 For. 31s, Logging Plants, 3
 For. 32w, Lumber Distribution, 5
 For. 36w, Forest Policy and Administration, 5
 For. 45s, Forest Regulation, 3
 For. 46s, Forest Regulation Laboratory, 3 (Itasca Park)
 For. 112w, Advanced Forest Mensuration, 3.

3. *Forest Products.*

Chem. 11s, Qualitative Chemistry, 4
 Chem. 27f, Quantitative Chemistry, 4
 Chem. 35f-36w, Organic Chemistry, 10
 Ent. 6w, Insects of Forest Products, 3
 For. 23su, Factory Experience, 3-5
 For. 29f, Sawmills and Wood-Working Machinery, 3
 For. 30s, Wood-Seasoning, 3
 For. 39f, Wood Preservation, 3
 For. 40s, Forest By-Products, 3
 For. 44s, Wood Pulp and Paper, 3
 For. 107f-108w-109s, Uses of Wood, 9
 For. 110w, Mechanical and Physical Properties of Wood, 2
 For. 111f, Advanced Wood Structure, 3
 For. 113, Advanced Forest By-Products, 3

4. *Forest Sciences*

Includes any courses offered in the fields of

Chemistry
 Ecology
 Entomology and Zoology
 Plant Pathology

B. GROUPS FROM WHICH ELECTIVES ONLY MAY BE CHOSEN

1. Courses in other divisions of the College of Agriculture, Forestry, and Home Economics, not listed in major groups
2. Military Science and Tactics
3. Physical Education
4. Courses in departments of other schools and colleges of the University not included in major groups

ELECTIVES

Students should consult with their advisers with reference to their choice of limited and free electives.

In selecting electives, note particularly (a) prerequisites, (b) classes of students (fr., 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, open to freshmen and sophomores, and Senior College courses open to juniors and seniors. In addition to satisfying other prerequisites an average grade of C must be maintained for the first two years in order to register for a Senior College elective.

DESCRIPTION OF COURSES

For explanation of course numbers and credits see page 18.

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY F. NACHTRIEB, WILLIAM A. RILEY, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate Professor ELMER J. LUND; Instructor ADOLPH RINGOEN.

COURSES

- 1-2. GENERAL ZOOLOGY. A survey of the animal kingdom emphasizing the principles of development and structure in relation to function and habit, heredity and evolution, and animals of economic importance. Lectures, quizzes, and laboratory. MR. NACHTRIEB, MR. SIGERFOOS, MR. LUND, MR. RINGOEN.
- 14-15-16. GENERAL ZOOLOGY. Same as Course 1-2 extended throughout three quarters. MR. RILEY, MR. SIGERFOOS.
- 45-46. ORNITHOLOGY. Structure, classification, and habits of birds with special reference to the birds of Minnesota. Considerable time devoted to field study. Bird or field glasses and handbook required. Laboratory, lectures, quizzes. Class limited to ten. MR. ROBERTS.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors C. OTTO ROSENDAHL, ELIAS J. DURAND, LEE I. KNIGHT, JOSEPHINE E. TILDEN; Associate Professor FREDERIC K. BUTTERS; Assistant Professors WILLIAM S. COOPER, RODNEY B. HARVEY, NED L. HUFF; Instructor ARTHUR M. JOHNSON.

COURSES

- 1-2. GENERAL BOTANY. Fundamental principles of botany. Survey of organs of the flowering plant; its internal structure and physiology. Representatives of the algae, fungi, liverworts, etc., examined with special reference to tracing evolution of the vegetable kingdom. MR. DURAND, MR. BUTTERS, MR. HUFF, MR. JOHNSON.
- 4-5-6. GENERAL BOTANY. Same as Course 1-2 extended throughout three quarters. For students in agriculture and forestry only. MR. DURAND.
7. TAXONOMY OF FLOWERING PLANTS. A general study of the classification and relationships of flowering plants. Laboratory and field practice in the determination of species, together with lectures and quizzes. MR. ROSENDAHL, MR. JOHNSON.

11. GENERAL MORPHOLOGY OF ALGAE AND FUNGI. A general survey of the structure, evolution, and classification of the algae and fungi. Lectures, laboratory, and field work. MISS TILDEN.
15. ANATOMY OF VASCULAR PLANTS. A study of the microscopic structure of vascular plants, the cell, tissues, and tissue systems with particular attention to the development and evolution of the vascular system in the root, stem, and leaf. MR. BUTTERS.
20. FOREST ECOLOGY. A study of relations between forest trees and their environment; soil and atmospheric factors, their influence upon function, structure, and distribution; an introduction to the study of forest communities and successions. Lectures, discussion, and laboratory. MR. COOPER.
51. HISTOLOGICAL METHODS. Training in methods used in the preparation and preservation of class material. Special attention is given to methods of killing, imbedding, sectioning, staining, and mounting. MR. DURAND.
52. PLANT PHYSIOLOGY. An introductory course giving a general survey of plant functions. MR. KNIGHT.
53. BOTANY OF ECONOMIC PLANTS. A survey course treating the most important botanical features of the common economic plants. MR. KNIGHT.
54. ELEMENTARY ECOLOGY. An introduction to the study of plants and their environment; investigation of the habitat; its effects upon plants as individuals and in mass; plant communities; plant succession. Laboratory and field work, lectures, and discussion. MR. COOPER.
55. ALGAE. A study of freshwater forms, based on collections made by the class. Lectures, laboratory, and field work. MISS TILDEN.
62. GENERAL MORPHOLOGY OF BRYOPHYTES AND PTERIDOPHYTES. A general survey of the structure, evolution, and classification of the liverworts, mosses, and ferns. MR. HUFF.
63. GENERAL MORPHOLOGY OF ANGIOSPERMS AND GYMNASPERMS. A general survey of the structure, evolution, and classification of seed plants. MR. BUTTERS.
107. MORPHOLOGY AND TAXONOMY OF THE BRYOPHYTES. A special study of the structure and classification of the liverworts and mosses. MR. DURAND.
108. MORPHOLOGY AND TAXONOMY OF THE PTERIDOPHYTES. An intensive study of lycopods, ferns and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. MR. BUTTERS.
110. MORPHOLOGY AND TAXONOMY OF THE GYMNASPERMS. An intensive study of cycads, conifers, and their allies, their structure and history,

with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. MR. BUTTERS.

- 113-114-115. **ADVANCED TAXONOMY.** An advanced course in which special attention is given to the taxonomy of difficult natural groups, involving systematic principles and practice rules of nomenclature, systems of classification, etc. MR. ROSENDAHL.
- 118-119. **CYTOLOGY.** A survey of cell structure and the various phenomena of division, fusion, and metamorphosis, together with a review of history of cytological investigation. Methods of cytological investigation. Methods of cytological research indicated in the laboratory. MR. ROSENDAHL.
131. **FIELD ECOLOGY.** A careful study 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. MR. COOPER.
133. **FOREST GEOGRAPHY OF NORTH AMERICA.** Preliminary discussion of principles of plant distribution, followed by detailed study of forest regions of North America; reading, discussion, lantern slides, distribution maps, microscopic work, written reports. MR. COOPER.
141. **PHYSICAL PHASES OF PLANT PHYSIOLOGY.** A course dealing with the intake of materials and their translocation, also the energy relations of the plant. MR. KNIGHT, MR. HARVEY.
142. **PLANT METABOLISM.** A course dealing with the synthesis of plant food, its transformation and utilization by the plant. MR. KNIGHT, MR. HARVEY.
143. **PLANT METABOLISM AND GROWTH.** Continuation of Course 142, also introducing certain fundamental phases of growth. MR. KNIGHT, MR. HARVEY.
144. **PLANT MICROCHEMISTRY.** A study of the localization of materials of physiological importance in the plant and their relation to physiological processes. MR. HARVEY.

CHEMISTRY

THE SCHOOL OF CHEMISTRY

Professors WILLIAM H. HUNTER, CHARLES F. SIDENER; Associate Professors FRANK H. MACDOUGALL, M. CANNON SNEED; Assistant Professor ISAAC W. GEIGER; Instructor WALTER M. LAUER.

COURSES

- 1-2-3. **GENERAL INORGANIC CHEMISTRY.** Designed for those who have had no high-school chemistry. 1-2. A study of the general laws of chemistry; the non-metals and their compounds. 3. A study of the metals and their compounds. MR. SNEED.

- 9-10. **ADVANCED GENERAL INORGANIC CHEMISTRY.** For those who have had one year of high-school chemistry. 9. General laws of chemistry; non-metals and their compounds. 10. The metals and their compounds and ionic equilibrium, considered quantitatively. MR. SNEED.
11. **QUALITATIVE CHEMICAL ANALYSIS.** Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry. MR. SNEED.
- 12-13. **QUALITATIVE CHEMICAL ANALYSIS.** Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry. MR. SNEED.
- 20-21. **QUALITATIVE ANALYSIS.** An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. MR. SIDENER, MR. GEIGER.
- 35-36. **ORGANIC CHEMISTRY.** An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. MR. HUNTER, MR. LAUER.
126. **SANITARY WATER ANALYSIS.** Lectures and laboratory practice in the chemical examination of potable waters. MR. SIDENER, MR. GEIGER.
- 140-141-142. **PHYSICAL CHEMISTRY.** A general survey of the subject. Laboratory work three to six hours per week. Nine, twelve, or fifteen credits, depending on amount of laboratory work. MR. MACDOUGALL.

ECONOMICS

SCHOOL OF BUSINESS

Professors GEORGE W. DOWRIE, JOHN D. BLACK, ROY G. BLAKEY; Associate Professors FREDERICK B. GARVER, BRUCE D. MUDGETT; Assistant Professors ERNEST A. HEILMAN, CLARENCE L. HOLMES, HOWARD S. NOBLE, J. WARREN STEHMAN, HOLBROOK WORKING; Professorial Lecturer J. FRANKLIN EBERSOLE; Instructors HILDING E. ANDERSON, HERMAN H. CHAPMAN, JOSEPH E. CUMMINGS, PAUL L. MILLER, VICTOR H. PELZ, VIRGIL R. WERTZ.

COURSES

5. **GENERAL ECONOMICS.** The usual basic principles of economic science interpreted in terms of agriculture and forestry as well as of other industries. MR. HOLMES, MR. WORKING, MR. ANDERSON, MR. WERTZ.
6. **AGRICULTURAL ECONOMICS.** The special body of economic principles that have been developed for agricultural production, exchange, and

- distribution, together with the application of these principles to agricultural problems. MR. HOLMES, MR. WORKING, MR. WERTZ.
13. AGRICULTURAL STATISTICS. Statistical method applied to agricultural data. MR. BLACK.
 20. ECONOMIC GEOGRAPHY OF AGRICULTURE. The localization of agricultural products, markets and systems of farming; economic and other forces determining this localization; considered in relation to industries in general. MR. HOLMES.
 21. ECONOMIC HISTORY OF AGRICULTURE. The evolution of modern methods of agricultural production and marketing, types of farming and tenure systems.
 - 25-26. PRINCIPLES OF ACCOUNTING. The purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts, and other statements; introduction to partnership and corporation accounts. Laboratory course with supplementary lectures. MR. NOBLE.
 28. PRINCIPLES OF ACCOUNTING. (For Agriculture, Forestry, and Home Economics students.) Principles of general and cost accounting presented in somewhat abridged form. MR. HEILMAN, MR. CHAPMAN.
 50. FARM FINANCE. The financial needs of typical farmers. Present facilities for supplying them; institutions, their organization and operation, interest rates, defects, and proposed remedies. The financing of the various farm organizations. The farmer as an investor. MR. DOWRIE.
 72. ECONOMICS OF TRANSPORTATION. The theory and practice of rate-making. Government regulation, the conflict between state and federal authorities, and suggested improvements in control of transportation agencies. MR. CUMMINGS.
 73. RAILWAY TRAFFIC AND RATES. Railway transportation from standpoint of business man and shipper. Freight shipping documents. Classification and tariffs, time and preference freight, private car lines, industrial trackage and terminal service, express rates and service, special passenger rates. MR. CUMMINGS.
 85. PRINCIPLES OF MARKETING. Analysis of market functions, marketing channels, and marketing agencies. MR. ANDERSON.
 88. ADVERTISING AND SELLING. Marketing of manufactured products; selling methods and problems. MR. PELZ.
 90. ECONOMICS OF CONSUMPTION. Nature of human wants; standards of living; cost of living; income, administration of income; nature of demand; demand and price; relation of consumption to the population problem. MR. GARVER.

91. PRINCIPLES OF ORGANIZATION AND MANAGEMENT. Types of operating organization; specialization; coöperation of men and departments; delegation of authority; establishment and maintenance of standards for materials, operations, machinery; determination of business policies; personnel problems. MR. PELZ.
- 103-104. VALUE AND DISTRIBUTION. An advanced course in economic theory devoted chiefly to the study of recent theories of wages, interest, rents, and profits. Assigned readings and reports on current problems in distribution. MR. GARVER.
106. LAND ECONOMICS. Land as a factor of production; urban land utilization; rents and land values; land classification, land exchange. MR. BLACK.
107. LAND TENURE. Property in land; tenancy; farm labor, evolution of the tenure classes. MR. BLACK.
108. MARKETING OF FARM PRODUCTS. Studies of the problems and methods of marketing selected farm products with special reference to the Twin City markets. MR. BLACK.
- 110-111. PRACTICE COURSE IN MARKETING. Eight to twelve weeks of experience as an employee in central or local markets. Careful study and observation of methods. Written plans and reports. MR. BLACK, MR. ANDERSON.
112. BUSINESS STATISTICS. The use of statistics in the analysis of the internal operations of a business and of external business conditions. MR. MUDGETT.
116. ECONOMICS OF AGRICULTURAL PRODUCTION. Detailed analysis of the economic principles underlying agricultural production; economic characteristics and functions of the factors of production; proper combinations of factors; selection of enterprises. MR. HOLMES.
117. PRICES OF FARM PRODUCTS. Price determination in the various markets of various classes of farm products; analysis of forces determining prices. MR. WORKING.
126. PRINCIPLES OF COÖPERATION. The coöperative mode of economic functioning as compared with the competitive and governmental, as to motivation, organization, and public control; applied to agricultural marketing, finance, production, and consumption. MR. BLACK, MR. MILLER.
- 127-128. MARKETING ORGANIZATION AND MANAGEMENT. Principles of accounting and business organization applied to the organization and management of proprietary and coöperative marketing business units.
131. COST ACCOUNTING. General principles of cost accounting; elements of cost; methods of arriving at costs and of distribution of overhead; application of cost-accounting principles to selling, banking, mining, farming, etc. MR. NOBLE.

- 143-144. **MONEY AND BANKING.** Relation to industrial system. Monetary principles with special reference to United States. American banking and bank organization, principles of commercial banking, non-commercial banking, relation of government to banking, comparative study of leading foreign systems. MR. DOWRIE, MR. STEHMAN, MR. EBERSOLE.
145. **INTERNATIONAL EXCHANGE.** Theory of international exchange, pars of exchange with gold, silver, and paper standard countries; the rates of exchange; financing imports and exports; bankers' bills; futures, arbitrage; specie movements; the present foreign exchange situation. MR. DOWRIE.
149. **BUSINESS CYCLES.** American business conditions since 1890 with regard to the great cycle of alternate prosperity and depression, and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. MR. EBERSOLE.
176. **COMMERCIAL POLICIES.** Theory of international commerce; free trade, reciprocity, protection, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign policies, and other governmental and organized efforts to affect trade. American problems emphasized. MR. BLAKEY.
177. **FOREIGN TRADE.** Nature and methods of foreign trade. Character of the foreign trade of the United States and leading countries of the world; organization for foreign trade. MR. BLAKEY.
- 180-181-182. **SENIOR SEMINAR IN ECONOMICS.** Advanced course work in marketing, production, consumption, prices, land economics, finance, statistics, accounting, transportation, etc., to suit the needs of advanced groups of students in these fields. MR. DOWRIE, MR. BLACK, MR. BLAKEY, MR. GARVER, MR. MUDGETT, MR. HEILMAN, MR. HOLMES, MR. WORKING.
- 191-192. **PUBLIC FINANCE.** National government revenues, expenditures, and debts. This includes a study of the principles and various forms of taxation, budgetary legislation and control, war and emergency financing, the shifting and incidence of taxes and fiscal reforms. MR. BLAKEY.
193. **STATE AND LOCAL TAXATION.** Principles and problems, e.g., state and local taxation of lands, mineral resources, forests, corporation, incomes, inheritances; also studies of classification, separation, local option, exemption, double taxation, evasion, assessment, centralized administration. MR. BLAKEY.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors WILLIAM A. RILEY, FREDERIC L. WASHBURN; Instructor SAMUEL A. GRAHAM.

COURSES

5. ELEMENTARY FOREST ENTOMOLOGY. A study of the life histories and methods of controlling insects affecting shade and forest trees. Not open to credit for students majoring in field of entomology. MR. GRAHAM.
6. INSECTS OF FOREST PRODUCTS. Treating life history, habits, and control of insects attacking dead or freshly felled wood and forest products. MR. GRAHAM.
12. FOREST ZOOLOGY. Forest animals. Relation of birds and of various four-footed animals to forest protection. Habits, range, usefulness; the manner of protecting the important large and small game, fish, and birds; fish culture. Lectures and laboratory work. MR. WASHBURN.

FARM ENGINEERING

Professor WILLIAM BOSS; Associate Professors HARRY B. ROE, EARL A. STEWART; Assistant Professors ARTHUR G. TYLER, HALL B. WHITE; Instructors MAURICE G. JACOBSON, ALLEN D. JOHNSTON.

COURSES

3. MECHANICAL DRAWING. Materials, instruments and their uses. The conventions, lettering, scale-reading, kinds of drawings, practice in cabinet projection and drawing building plans. MR. JACOBSON.
4. BLACKSMITHING. The management of forge and fire in bending, shaping, and welding iron. MR. JOHNSTON.
5. CARPENTRY. The use and care of carpentry tools. The construction of farm equipment such as hayracks, self-feeders, etc. Building construction. Painting and wood-finishing. MR. WHITE.
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, percentages, proportions, variations, investments, cost problems, etc. _____
18. SURVEYING. Plain surveying as applied to forestry. Mensuration, leveling, elements of topography and mapping. MR. ROE.
23. GENERAL PHYSICS. An introductory course in the elements of physics for those who have not had physics in high school. The study of mechanics, heat, light, and electricity with laboratory work. MR. STEWART, MR. TYLER.

FORESTRY

Professors EDWARD G. CHEYNEY, JOHN H. ALLISON; Associate Professor JOHN P. WENTLING; Instructors LELAND L. DEFLOON, THORWALD S. HANSEN, GILBERT H. WIGGIN.

COURSES

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. MR. CHEYNEY.
2. ELEMENTARY DENDROLOGY. A full study of the trees and shrubs found in Itasca Park, with special reference to identification by means of gross characters. MR. WENTLING.
- 3-4. DENDROLOGY. Comprehensive study of the forest trees of the United States; their classification, characteristics, and range, with special attention to prominent and constant characteristics. Lectures, assigned reading, laboratory. MR. WENTLING, MR. DEFLOON.
5. ELEMENTARY SYLVICULTURE. Largely field work designed to give the student a working knowledge of the forest. Includes sylvicultural study of the species found in the north woods and the general principles underlying sylvicultural reconnaissance. MR. WENTLING.
9. ELEMENTARY 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. MR. ALLISON.
10. FOREST MENSURATION. The basic principles underlying the measurement of forest products. Measurement of standing and felled timber. Special attention is given to log rules, preparation and use of volume tables, growth of trees, and yield table. MR. HANSEN.
11. FOREST VALUATION. The business of forest management. A study of the different factors entering into the valuation of forest property. MR. ALLISON.
20. GRAZING. History of grazing in the West. Kinds of stock used. Forage plants. Regulations and methods of handling stock, Range management and protection. Lectures, recitations, and reading. MR. ALLISON.
23. FACTORY EXPERIENCE. Two or more months in a factory utilizing wood by-products such as pulp or paper mill, wood distillation or wood preservation plant.
26. TREE CROPS. The part trees play in the successful development of the farm. The relation of the forest to agriculture and animal husbandry. The farm and the timber supply. MR. CHEYNEY.
27. GROVES AND WINDBREAKS. Trees and their relation to the farm. Planning and planting farm windbreaks and shelterbelts. Utilization and marketing of farm, grove, or woodlot products. MR. WIGGIN.
28. LOGGING. The practice, cost, and development of the different logging methods in use in the different forest regions of the United States,

- and the modifications required by forest management. Report based on personal investigations required. MR. CHEYNEY.
29. SAWMILL AND WOOD-WORKING MACHINERY. A study of sawmills, wood-working machinery, and other processes in the primary manufacture of lumber products. MR. CHEYNEY.
 30. SEASONING OF WOOD. The theory and practice of air seasoning and kiln drying the different species of wood and the different forms of wood products; the results obtained and the defects to be avoided. MR. CHEYNEY.
 31. LOGGING PLANS. A study of the data essential to the preparation of a logging plan for each region. Estimating costs. The organization of crews and companies. MR. CHEYNEY.
 32. LUMBER DISTRIBUTION. The standing timber of the United States in its relation to the lumber market. The organization of the industry and the distributing agencies. MR. CHEYNEY.
 - 33-34. WOOD STRUCTURE AND IDENTIFICATION. A study of the structure, classification, and identification of the most important commercial domestic and foreign woods. Lectures, papers, laboratory. Record's *Economic Woods* used as a text. MR. WENTLING.
 35. SEEDING AND PLANTING. The cultural principles, operations, methods, and equipment in nursery work and artificial regeneration. Includes seed-collecting, storing, sowing, raising seedlings, packing, transplanting, field-planting, packing for shipment, etc. —————
 36. 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. MR. ALLISON.
 39. WOOD PRESERVATION. Lectures and collateral reading upon the history, development, and methods of wood preservation. Different systems now in use and preservatives used. MR. ALLISON.
 40. FOREST BY-PRODUCTS. A general survey of forest products other than wood, as wood pulp and paper, naval stores, tannins, sugar, wood-distillation products. MR. ALLISON.
 41. SYLVICS. The fundamentals forming the basis of silviculture with special attention to the sylvics of the important tree species. Lectures, readings, and required papers. MR. WENTLING.
 43. SYLVICULTURAL LABORATORY. Nursery practice and field-planting. Field investigations and planting plans. Seed-collecting, extracting, and storing. Daily nursery and field work. MR. WENTLING.
 44. WOOD PULP AND PAPER. A general study of the manufacture of wood pulp and wood-pulp papers. MR. ALLISON.

45. FOREST REGULATION. The principles of forest regulation. The purpose and preparation of forest working plans. Includes working with the data collected in Course 46 as well as lectures. MR. ALLISON.
46. 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. MR. ALLISON.
101. ADVANCED DENDROLOGY. A continuation of Course 3-4 with special studies in classification and distribution of the timber species of the world. MR. WENTLING.
106. RESEARCH METHODS IN SYLVICULTURE. The fundamental principles upon which silviculture is based. Methods used at experiment stations in solving problems in forestation, protection, and management.
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107. USES OF WOOD I. A study of the economic hard and soft woods, both foreign and domestic from standpoint of regions of production, distribution centers, qualities, amounts, and prices in relation to the wood-using industries. Lectures, reading, reports. MR. WENTLING.
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, reuse, distribution of product. Regions of production and relation to other industries. Lectures, reading, reports. MR. WENTLING.
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. MR. WENTLING.
110. MECHANICAL AND PHYSICAL PROPERTIES OF WOOD. Study of strength as related to density, quality, etc. Wood stresses, failures, and methods of testing timber. MR. WENTLING.
111. ADVANCED WOOD STRUCTURE. Study of wood elements and structures as related to seasoning, mechanical failures, penetration of preservatives, etc. MR. WENTLING.
112. ADVANCED FOREST MENSURATION. Continuation of Course 10 with special emphasis on tree forms. The development of the formula used in study of volume and growth of trees. MR. HANSEN.
113. ADVANCED FOREST BY-PRODUCTS. A detailed study of methods of production of wood-pulp and paper products, naval stores, tannins, oils, wood-distillation products, etc. Lectures, reading, reports. MR. ALLISON.

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor WILLIAM H. EMMONS; Instructors IRA S. ALLISON, JOHN W. GRUNER, GEORGE M. SCHWARTZ, GEORGE A. THIEL, W. COURTNEY WERNER.

COURSES

- 1-2. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. MR. EMMONS, MR. ALLISON, MR. THIEL.
- 7-8. LABORATORY WORK. Open only to students taking Course 1-2. Supplements Course 1-2 with study of rocks and ores, topographic and geologic maps, and reference reading. MR. ALLISON.
- 11-12. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. MR. WERNER.
- 21-22. ESSENTIALS OF MINERALOGY. The crystal systems; morphological, physical, and chemical character of minerals; occurrence, genesis, and uses of minerals; classification and description of common minerals. Determinative work in laboratory blowpipe analysis, sight identification. MR. GRUNER.
29. GENERAL PHYSIOGRAPHY. Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology; field excursions.
34. METEOROLOGY. The properties and phenomena of the atmosphere, including composition, temperature, pressure, and circulation; the work of the weather bureau; the major climatic divisions of the earth and their climates. _____
37. ECONOMIC AND COMMERCIAL GEOGRAPHY. A study of the geographic factors influencing production and trade. Natural resources in their relation to commerce and industry and the major trade routes will be emphasized. _____
- 51-52. ECONOMIC GEOLOGY. The mineral resources of the United States. The origin, occurrence, distribution, and uses of the more important minerals and mineral fuels of economic value. Lectures, map work, conferences, and field excursions. MR. SCHWARTZ.

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARL SCHLENKER; Assistant Professor JAMES DAVIES; Instructors LYNWOOD DOWNS, COWDEN LAUGHLIN.

COURSES

1. BEGINNING A. Pronunciation, conversation, grammar, and composition; selected readings in easy prose and verse. _____
2. BEGINNING B. Continuation of Course I.
3. BEGINNING C. Selected texts from modern writers. _____
10. RAPID READING. Modern narrative prose. _____
11. ADVANCED RAPID READING. Continuation of Course 10. Representative works of the eighteenth and nineteenth centuries. _____
14. NINETEENTH-CENTURY PROSE. Narrative readings from modern novelists. _____
- 28-29. ADVANCED CHEMICAL GERMAN. Selections from more difficult works on chemistry. _____
- 31-32. MEDICAL GERMAN. Readings from general works on physiology, anatomy, and bacteriology. _____
40. COMMERCIAL GERMAN. Vocabulary of commerce, business forms; reading of texts on economics. _____
- 50-51-52. COMPOSITION. Aims to develop grammatical correctness. Translations from English selections. Essay-writing on assigned subjects. MR. LAUGHLIN.
- 53-54-55. CONVERSATION. Aims to develop ease and correctness of oral expression. Organized on the laboratory plan—one-hour credit with two hours of recitation and one hour of outside reading. MR. LAUGHLIN.
63. MODERN DRAMA. Plays of modern dramatists: Hauptmann, Sudermann, Fulda, and others. MR. DAVIES, MR. DOWNS.
64. CLASSIC DRAMA. Plays of Lessing, Goethe, and Schiller. MR. DAVIES, MR. DOWNS.
74. GERMAN POETS. Survey of German poetic literature. MR. DAVIES, MR. DOWNS.

HOME ECONOMICS

Professor MILDRED WEIGLEY; Instructor ALICE M. CHILD.

COURSES

24. **CAMP COOKERY.** Designed to give prospective foresters, engineers, and others a knowledge of the simpler cookery processes; and of such adaptations as are practicable in the several types of out-of-doors camps. (Given in alternate years. Offered in 1921-22.) MISS CHILD.

HORTICULTURE

Professor WILLIAM H. ALDERMAN; Associate Professor LEROY CADY.

COURSES

56. **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. MR. CADY.
71. **LANDSCAPE GARDENING.** The practice and principles of landscape gardening as applied to the home and community. Lectures and field trips to parks and private grounds. MR. CADY.

MILITARY SCIENCE AND TACTICS

Professor GIRARD STURTEVANT, Colonel, Infantry, Chairman; Assistant Professors BEN W. FEILD, Major, Infantry; LAURENCE T. WALKER, Major, Coast Artillery Corps; LEE R. WATROUS, JR., Major, Coast Artillery Corps; HARRY C. INGLES, Major, Signal Corps; EDWARD G. SHERBURNE, Major, Infantry; EDGAR B. MOOMAU, 1st Lieutenant, Infantry; HAL M. ROSE, 1st Lieutenant, Cavalry; Instructors: ALFRED BRANDT, Master Sergeant, Infantry; HARRY E. STRIDER, Master Sergeant, Signal Corps; JOSEPH HAVLICEK, Regimental Commissary Sergeant, Retired; JOSEPH LEES, 1st Sergeant, Retired; JOHN McWILLIAMS, 1st Sergeant, Retired; WILLIAM R. FINKE, 1st Sergeant, Coast Artillery Corps; WILLIAM L. HOGAN, 1st Sergeant, Coast Artillery Corps; AUBREY R. DUNKUM, 1st Sergeant, Coast Artillery Corps; KENNA B. CALDWELL, Sergeant, Coast Artillery Corps; HENRY W. BROWN, Sergeant, Coast Artillery Corps; CLARENCE G. LANGE, Sergeant, Field Artillery; EDMUND T. McCANN, Sergeant, Infantry; FRED LILLIE, Sergeant, Infantry; PRESTICE B. RHODES, Sergeant, Infantry; CLARENCE C. SHELTON, Sergeant, Infantry; HERMAN SMITH, Sergeant, Infantry; CASPER M. HECKEMEYER, Sergeant, Infantry.

COURSES

- 1-2-3. **FIRST-YEAR BASIC COURSE R.O.T.C.** Practical instruction in schools of the soldier, company, and battalion; signals, ceremonies, first aid.
- 4-5-6. **SECOND-YEAR BASIC COURSE R.O.T.C.** Practical and theoretical instruction in schools of the company and battalion; advance and rear guard drill; practical and theoretical instruction in guard duty. Gallery practice. Ceremonies. Infantry, coast artillery, and signal corps.

51-52-53. FIRST-YEAR ADVANCED COURSE R.O.T.C.

54-55-56. SECOND-YEAR COURSE R.O.T.C.

PHYSICAL EDUCATION

FOR MEN

Associate Professor LOUIS J. COOKE, Director; Assistant Professor WILLIAM K. FOSTER; Instructors EDWIN S. BROWN, PERCY C. GLIDDEN, CARL B. ROEMER; Assistants FRANK GILMAN, HARRY GOLDIE.

General statement.—The purpose of the department is to provide all men of the University opportunity for exercise in order to maintain and build up their general health. It also provides special training for the correction of physical defects and functional derangements.

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. Students taking the required work in physical education are examined also at the close of the year. A study of these records shows a marked improvement in the standard of health of the average student during the college course.

The gymnasium, swimming-pool, and baths are open to all students of the University, who are free to use the apparatus and to pursue a course in physical training under the supervision of the director and his assistants.

Those students, taking the required course in physical education, who can not 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.

COURSES

- I. PERSONAL HYGIENE. Two hours per week; first six weeks of fall quarter. Examination at close of course. Four hours per week collateral work with themes. DR. COOKE, MR. FOSTER, DR. BROWN.
- 2-3-4. GYMNASIUM AND SWIMMING. Two hours a week for the winter quarter. Required, qualifications in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. MR. FOSTER, MR. GLIDDEN, MR. ROEMER.
- 5-6-7. ADVANCED LEADERS. Three hours a week. MR. FOSTER.
- 8-9-10. CORRECTIVE GYMNASISTICS. Three to six hours a week instead of regular gymnasium or military drill in case of physical disability. DR. BROWN.
- 11-12. WRESTLING. Three times per week. Students admitted by special assignment. _____

- 13-14-15. INTERMEDIATE SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. MR. GLIDDEN.
- 16-17-18. ADVANCED SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned, and other useful swimming accomplishments. MR. GLIDDEN.
- 19-20. BOXING. By special arrangement a few students may be accommodated in this class which meets twice per week. MR. GOLDIE.
- 21-22-23. INTRAMURAL ATHLETICS. Competitive games in the various athletic leagues in football, basket-ball, hockey, track, and field events, baseball, tennis, swimming, handball, bowling, etc. MR. FOSTER.

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY A. ERIKSON, ANTHONY ZELENY; Professorial Lecturer LOUALLEN F. MILLER; Instructor JOSEPH VALASEK.

COURSES

1. ELEMENTS OF MECHANICS AND SOUND. Mechanics of solids, fluids, wave motion, and sound. A study of the simpler fundamental principles. First part of a general course 1, 21, 31, 41. Course 2 should be taken in conjunction with this course. MR. ERIKSON.
2. ELEMENTS OF MECHANICS LABORATORY. Measurements in the mechanics of solids, fluids, and wave motion; the laboratory part supplementing Course 1. MR. ERIKSON.
9. ACOUSTICS. A study of the fundamental principles of sound. A course designed primarily for the students in the Department of Music. Open also to other students. MR. ERIKSON.
21. HEAT. A study of the principles underlying heat phenomena. Course 22 should be taken in conjunction with this course. MR. MILLER.
22. HEAT LABORATORY. The laboratory part supplementing Course 21. MR. MILLER.
31. OPTICS. A study of the principles underlying light phenomena. Course 32 should be taken in conjunction with this course. MR. VALASEK.
32. OPTICS LABORATORY. The laboratory part supplementing Course 31. MR. VALASEK.
41. MAGNETISM AND ELECTRICITY. A study of the principles underlying magnetic and electric phenomena. Course 42 should be taken in conjunction with this course. MR. ZELENY.

42. ELECTRICAL LABORATORY. The laboratory part supplementing Course 41. MR. ZELENY.

PLANT PATHOLOGY AND BOTANY

Professors EDWARD M. FREEMAN, ELVIN C. STAKMAN; Instructors JULIAN G. LEACH, JAMES L. SEAL.

General statement.—For opportunities to major in this division, see bulletin of courses in agriculture.

COURSES

INTRODUCTORY COURSE

10. FOREST PATHOLOGY. Elementary study of plant diseases due to fungi, bacteria, and slime-molds; life histories and preventive methods. Lectures, laboratory, and reference. MR. STAKMAN, MR. LEACH, MR. SEAL.

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CEPHAS D. ALLIN; Associate Professor ROBERT E. CUSHMAN.

COURSES

1. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system.
7. STATE AND LOCAL GOVERNMENT. Comparison of American state governments, especially Minnesota; relation of states to the United States and to local units of government; recent experiments such as initiative and referendum, the recall and primaries; social and economic legislation. MR. CUSHMAN.

RHETORIC

Assistant Professor ROBERT C. LANSING, HARRY J. BURTIS; Instructors MINNIE M. CLAUSEN, JESSIE W. JENKINS, RUTH MOHL.¹

General statement.—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 drop the course and enter a class in elementary rhetoric. These students will be required to complete 3 additional credit hours in rhetoric.

¹ Leave of absence, 1921-22.

COURSES

1. RHETORIC I. Note-taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading. MR. LANSING, MISS CLAUSEN, MISS JENKINS.
2. RHETORIC II. Sentence structure, diction, exposition, supplementary reading. MR. LANSING, MISS CLAUSEN, MISS JENKINS.
3. RHETORIC III. Description, narration, supplementary reading. MR. LANSING, MISS CLAUSEN, MISS JENKINS.
4. ELEMENTARY RHETORIC. Elementary grammatical and rhetorical principles. MISS JENKINS.
11. ARGUMENTATION. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating. MR. BURTIS, MR. LANSING.
22. PUBLIC SPEAKING. A practical course in fundamentals of speech-making. Rules of order and practice in conducting assemblies included. MR. BURTIS.
24. ADVANCED PUBLIC SPEAKING. A course in preparing and delivering occasional addresses and informal lectures. MR. BURTIS.
31. SURVEY OF ENGLISH LITERATURE I. Survey of English literature of the sixteenth, seventeenth, and eighteenth centuries. MR. LANSING.
32. SURVEY OF ENGLISH LITERATURE II. Survey of English literature of the nineteenth century. MR. LANSING.

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor EVERETT W. OLMSTED, COLBERT SEARLES; Associate Professors RALPH E. HOUSE, RUTH S. PHELPS; Assistant Professors FRANCIS B. BARTON, JULES T. FRELIN; Professorial Lecturer ANTONIO HERAS; Instructors CHARLES B. DRAKE, MARGUERITE GUINOTTE.

COURSES

French

- 1-2. BEGINNING FRENCH. Pronunciation, grammar, oral exercises, translation. _____
- 3-4. INTERMEDIATE FRENCH. Review of grammar, connected prose composition, conversation, and reading of representative authors. _____
20. ORAL AND WRITTEN FRENCH. Practical French conversation and composition. _____
- 21-22-23. SURVEY OF FRENCH LITERATURE. This course will outline the history of French literature from 1600 to present day, and is prerequisite

for the courses devoted to special periods. Representative texts will be read. MR. BARTON, MISS PHELPS, MR. SEARLES.

50-51-52. FRENCH CONVERSATION. A small amount of outside preparation will be required. MR. FRELIN, MISS GUINOTTE.

53-54-55. FRENCH COMPOSITION. MR. FRELIN, MISS GUINOTTE.

Spanish

1-2. BEGINNING SPANISH. Pronunciation, grammar, oral exercises, and translation. _____

3-4. INTERMEDIATE SPANISH. Review of grammar, conversation, connected prose composition, and reading of representative authors. _____

20. ORAL AND WRITTEN SPANISH. Practical Spanish conversation and composition. MR. DRAKE.

50-51-52. SPANISH CONVERSATION. A small amount of outside preparation will be required. MR. HERAS.

53-54-55. SPANISH COMPOSITION. MR. HERAS.

65-66-67. SURVEY OF SPANISH LITERATURE. An outline of the history of Spanish literature from 1500 to the present day, based upon texts and collateral reading. Prerequisite for courses devoted to special periods. MR. HOUSE.

**COLLEGE OF AGRICULTURE, FORESTRY, AND
HOME ECONOMICS
TABULAR STATEMENT AND
PROGRAM OF COURSES
1921-1922**

TABULAR STATEMENT AND PROGRAM OF COURSES
CLASS HOUR SCHEDULE

	University Farm	Minneapolis Campus
I Hr	7:45- 8:35	8:00- 8:50
II Hr	8:45- 9:35	9:00- 9:50
III Hr	9:45-10:35	10:00-10:50
IV Hr	10:45-11:35	11:00-11:50
V Hr	1:00- 1:50	1:00- 1:50
VI Hr	2:00- 2:50	2:00- 2:50
VII Hr	3:00- 3:50	3:00- 3:50
VIII Hr	4:00- 4:50	4:00- 4:50

Convocation—Thursdays, IV Hour, University Armory

Final examinations.—Final examinations will be given during the last four days of the quarter. A detailed schedule will be published in the *Official Daily Bulletin*.

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 University Farm.

A, *Armory	Hr, Horticulture
AB, *Animal Biology	IA, *Institute of Anatomy
Ad, Administration	MA, *Mechanic Arts
BB, Beef Barn	ME, *Main Engineering
C, *Chemistry	MH, *Millard Hall
CB, *Christian Bible School	MS, Meat Shop
Ch, Agricultural Chemistry	Mu, *Music
DB, Dairy Barn	P, *Pillsbury Hall
DH, Dairy Hall	Ph, *Physics
DiH, Dining Hall	PHP, *Public Health and Pathology
Ed, *Education	PP, Plant Pathology
En, Agricultural Engineering	Psy, *Psychology
FH, Farm House	SS, Soil Survey
F, *Folwell Hall	St, Stock Pavilion
G, *Greenhouse	Ve, Veterinary
Gy, Gymnasium	WGM, *Woman's Gymnasium
HE, Home Economics	

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 su (summer), indicate the quarters in which the course is offered. For example: 5f,w,s indicates that Course 5 is a one-quarter course given in the fall and repeated in the winter and again in the spring; 10f-11w-12s indicates that Course 10-11-12 is a three-quarter course running through three quarters; 25f,w-26w,s indicates a two-quarter course given in the fall and winter quarters and repeated in the winter and spring quarters.

PROGRAM, 1921-22

AGRICULTURAL BIOCHEMISTRY

No.	Title	Credits	Offered to	Prerequisite courses
2	Quantitative Methods.....	5	Jr., sr.	Chem. 10 cred.
3	Types of Carbon Compounds	6	Soph., jr., sr.	Chem. 10 cred.
7-8	General Agricultural Bio-chemistry	10	Soph., jr., sr.	Chem. 10 cred.
15	Principles of Animal Nutri- tion	3	Jr., sr.	7-8
101-102	Agricultural Quantitative Analysis	6	Jr., sr.	7-8
103	Dairy Chemistry.....	5	Jr., sr.	7-8
106	Chemical Technology of Agricultural Products.....	5	Sr.	101-102
108	Chemistry of Wheat and Wheat Products.....	3	Jr., sr.	7-8
110	Flour Laboratory Methods..	5	Jr., sr.	101-102, or Chem. 131-132, parallel 108
111-112	Phytochemistry	6	Sr.	Biol. 9 cred., org. chem.
113-114	Biochemical Laboratory Methods	4	Sr.	Quant. anal., paral- lel 111-112
116	Chemistry of "Vitamines" and Deficiency Diseases...	3 or 5	Sr.	111-112, 113-114, or Physiol. 101- 102, or 7-8 and 15
118	Laboratory Problems in Bio- chemistry	3 or 5	Sr.	111-112, 113-114; or 103 or 110

AGRICULTURAL ECONOMICS

See Economics, page 61.

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

No.	Title	Credits	Offered to	Prerequisite courses
11	Principles of Vocational Edu- cation	3	Jr., sr.‡	None
21	Vocational Education.....	3	Jr., sr.‡	None
41	Apprentice Teaching.....	2	Jr., sr.‡ ††	11, 131

‡ Offered only to those preparing to teach.

†† Students are admitted to this course only when approved by the Division of Agricultural Education.

AGRICULTURAL BIOCHEMISTRY

No.	Title	Hour	Day	Room	Instructor
2w	Quantitative Methods.....	V, VI, VII, VIII	MWF	7Ch	Mr. Willaman
3f,w† 7f-8w	Types of Carbon Compounds General Agricultural Bio- chemistry	I	MTWThFS	201Ch	Mr. Anderson
	Lect.	II	TThS	201Ch	Mr. Anderson
	Lab.	V, VI, VII	MW	203Ch	Mr. Anderson
7w-8s	General Agricultural Bio- chemistry				
	Lect.	III	TThS	201Ch	Mr. Anderson
	Lab.	V, VI, VII	MF	203Ch	Mr. Anderson
15f	Principles of Animal Nutri- tion	III	MWF	3St	Mr. Palmer
101ff-102w‡	Agricultural Quantitative Analysis	V, VI, VII	MWF	105Ch	Mr. Morrow
103s	Dairy Chemistry.....	V	MWF	251Ch	Mr. Palmer
	Lect.	V	MWF	251Ch	Mr. Palmer
	Lab.	VI, VII, VIII	MWF	7Ch	Mr. Palmer
106f	Chemical Technology of Agri- cultural Products.....	Ar	Ar	Ar	Mr. Bailey
108s‡	Chemistry of Wheat and Wheat Products.....	I	MWF	201Ch	Mr. Bailey
110s‡	Flour Laboratory Methods..	V, VI, VII, VIII	MWF	7Ch	Mr. Bailey
111ff-112w‡	Phytochemistry	III	MWF	201Ch	Mr. Morrow
113ff-114w‡	Biochemical Laboratory Methods	V, VI, VII	TTh	7Ch	Mr. Morrow, Mr. Sharp,
116f,w,s‡	Chemistry of "Vitamines" and Deficiency Diseases...	Ar	Ar	Ar	Mr. Palmer, Miss Kennedy
118f,w,s‡	Laboratory Problems in Bio- chemistry	Ar	Ar	Ar	Ar

AGRICULTURAL ECONOMICS

See Economics, page 62.

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
11f,w	Principles of Vocational Education	II	TThS	1PP	Mr. Dyer
11s	Principles of Vocational Education	III	MWF	307Ad	Mr. Dyer
21f,w	Vocational Education.....	I	TThS	317Ad	Mr. Mayne
41f	Apprentice Teaching.....				
	Sec. 1	IV	MWF	317Ad	Mr. Field, Mr. Dyer
	2	Ar	Ar	Ar	Mr. Field, Mr. Dyer

† Offered also in the summer session.

‡ Offered also in the summer quarter (eleven weeks).

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
42	Teaching	3	Sr.	41, Agron. 121, 122, 123
53	Consolidated Rural Schools..	3	All†	None
54	Rural Education and Com- munity Life.....	3	All	None
63-64-65	General Agriculture.....	9	All	None
75	Visual Presentation.....	3	Jr., sr.	11
81	Extension Work.....	3	Jr., sr.	6 cred. in farm mgt., 6 cred. in farm crops, 15 cred. in an. ind., 6 cred. in agr. educ.
82	Agricultural Extension Field Course	3-10	Jr., sr.	81¶
121	Teachers' Course Home and School Garden Supervision	2	Approval of division	
131	Methods in Teaching High- School Agriculture.....	5	Jr.,† sr.‡	11
151	Organization and Manage- ment	5	Sr.‡	11, 21
161-162-163	Fundamentals of Agriculture	9	Jr., sr.‡	None
164	Fundamentals of Agriculture	3	§	None
176	Advanced Visual Presentation	3	Jr., sr.	75
181	Agricultural Statistics and Graphic Representation....	3	Soph., jr., sr.	Farm Eng. 3, 11
191-192-193	Seminar in Agricultural Edu- cation	6	Sr.‡	11 cred. in agr. educ.

† Open to juniors on approval of the chief of the division.

‡ Offered only to those preparing to teach.

§ Special reduced courses for consolidated-school principals.

¶ Broad curriculum approved by the Agricultural Education Division and a position approved by the Agricultural Extension Division are also prerequisites to this course.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
41w	Apprentice Teaching..... Sec 1	II	MWF	317Ad	Mr. Field, Mr. Dyer
	2	Ar	Ar	Ar	Mr. Field, Mr. Dyer
41s	Apprentice Teaching.....	Ar	Ar	Ar	Mr. Field
42f,w†	Teaching				
	Sec. 1	I	MWF	317Ad	Mr. Field
	2	Ar	Ar	Ar	Mr. Field
53s‡	Consolidated Rural Schools..	Ar	Ar	Ar	Mr. Dyer
54w‡	Rural Education and Com- munity Life.....	Ar	Ar	Ar	Mr. Dyer
63f-64w-65s	General Agriculture.....	Ar	Ar	Ar	Mr. Storm, Mr. Mayne, Mr. Field
75f,w	Visual Presentation.....	Ar	Ar	Ar	Ar
81s	Extension Work.....	II	TThS	Ar	Mr. Storm
82f,w,s‡	Agricultural Extension Field Course	Ar	Ar	Ar	Mr. Storm
121w	Teachers' Course, Home and School Gardening.....	Ar	Ar	Ar	Mr. Field
131f‡	Methods in Teaching High- School Agriculture.....	II	MTWFS	317Ad	Mr. Field
131s‡	Methods in Teaching High- School Agriculture.....	III	MTWFS	317Ad	Mr. Field
151f	Organization and Manage- ment	III	MTWThF	317Ad	Mr. Storm, Mr. Dyer
151s	Organization and Manage- ment	IV	MTWFS	317Ad	Mr. Storm, Mr. Dyer
161f-162w- 163s	Fundamentals of Agriculture	Ar	Ar	Ar	Mr. Storm
164w ‡	Fundamentals of Agriculture	Ar	Ar	Ar	Mr. Field
176s‡	Advanced Visual Presentation	Ar	Ar	Ar	Ar
181w	Agricultural Statistics and Graphic Representation....	Ar	Ar	Ar	Ar
191f-192w- 193s¶	Seminar in Agricultural Education	Ar	Ar	Ar	Mr. Storm

† It may be possible for a limited number to take this course in the spring quarter. Approval of the instructor and chief of division is required before registering.

‡ Offered also during the summer session.

¶ A continuation of this course, (194 su), carrying 2 credits is offered only during the summer session.

COURSES IN FORESTRY

AGRONOMY AND FARM MANAGEMENT

No.	Title	Credits	Offered to	Prerequisite courses
1	Farm Crops.....	3	All	None
11	Farm Machinery.....	3	Jr., sr.	None
101	Farm Management I.....	3	Jr., sr.	1, Econ. 6
102	Farm Management II: Or- ganization	3	Sr.	1, Econ. 6, An. Husb. 6 or 8. Soils 5
103	Farm Management II: Op- eration	3	Sr.	102
104	Farm Management III.....	3	Sr.	101, 102
121	Cereal Crops.....	3	Jr., sr.	1, bot. 9 cred.
122	Corn and Potato Crops.....	3	Jr., sr.	1, bot. 9 cred.
123	Forage and Fiber Crops....	3	Jr., sr.	1, bot. 9 cred.
131	Principles of Genetics.....	3	Jr., sr.	Bot. 9 cred., an. biol. 9 cred.
132	Farm Crops Plant-Breeding..	3	Jr., sr.	131

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Credits	Offered to	Prerequisite courses
1-2	General Zoology.....	10†	All	None
9-10	Cytology and Technic.....	10†	Soph., jr., sr.	14-15-16
11	Cytology and Technic.....	5	All	14-15-16
14-15-16	General Zoology (Agr., For., and H. E.).....	9‡	All	None

† The full course must be completed before credit will be allowed.

‡ The full course must be completed before credit will be allowed except that students in home economics may receive credit for the first two quarters work when Botany 8 has also been satisfactorily completed.

AGRONOMY AND FARM MANAGEMENT

No.	Title	Hour	Day	Room	Instructor
1f,w,s†	Farm Crops.....	III, IV	MWF	2Ad	Mr. McGinnis, Mr. Steinmetz
11s	Farm Machinery.....	V, VI, VII	WF	BAd	Mr. Bassett
101s	Farm Management I.....	II	TThS	24Ad	Mr. Pond
102f	Farm Management II: Or- ganization	II	MWF	24Ad	Mr. Boss, Mr. Garey
102w†	Farm Management II: Or- ganization	I	MWF	24Ad	Mr. Boss, Mr. Garey
103w	Farm Management II: Opera- tion	II	MWF	24Ad	Mr. Boss, Mr. Garey
103s†	Farm Management II: Opera- tion	I	MWF	24Ad	Mr. Boss, Mr. Garey
104s	Farm Management III.....	II	MWF	24Ad	Mr. Boss
121f	Cereal Crops.....	V, VI, VII	TTh	2Ad	Mr. Arny, Mr. McGinnis
122w	Corn and Potato Crops.....	V, VI, VII	TTh	2Ad	Mr. Arny, Mr. McGinnis
123s	Forage and Fiber Crops.....	V, VI, VII	TTh	2Ad	Mr. Arny, Mr. McGinnis
131f	Principles of Genetics.....	I	TThS	24Ad	Mr. Hayes Mr. Dorsey
132s†	Farm Crops Plant-Breeding..	I	TThS	24Ad	Mr. Hayes, Mr. Griffec

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Room	Instructor
1f-2w*	General Zoology.....				
	Sec. 1 Lab.	III, IV	MWF	101AB	Ar
	Lect.	III	TThS		
		IV	T	313AB	Ar
	2 Lab.	V, VI, VII	TTh	101AB	Ar
	Lect.	V	MWF		
		VI	F	313AB	Ar
	3 Lab.	V, VI	MWF	101AB	Ar
	Lect.	V, VI	TTh	313AB	Ar
1w-2s*	General Zoology.....				
	Lab.	I, II	MWF	101AB	Ar
	Lect.	I	T		
		II	TThS	313AB	Ar
1s-2w*	General Zoology.....				
	Lab.	V, VI, VII	TTh	101AB	Ar
	Lect.	V	MWF		
		VI	F	313AB	Ar
9f-10w*	Cytology and Technic.....	III, IV	MTWFS	201,211AB	Mr. Downey
11s*	Cytology and Technic.....	III, IV	MTWFS	201,211AB	Mr. Nachtrieb
14f-15w-16s	General Zoology, (Agr., For., and H.E.).....	V, VI, VII	TTh	101,313AB	Ar

† Offered also in the summer session.

* Offered on the Minneapolis campus.

COURSES IN FORESTRY

17-18	General Physiology.....	10†	Soph., jr., sr.	14 cred. or 9 cred. and chem. or phys. 10 cred.
23	Principles of Animal Behavior	3	All	14-15-16
37-38-39	General Entomology.....	9†	Soph., jr., sr.	14-15-16
43	Introductory Entomology...	5	All	14-15-16
44	Animal Parasites.....	3	All	14-15-16
46-47	Ornithology	6†	Soph., jr., sr.	14-15-16
48	General Ecology.....	5	All	14-15-16
107	Protozoology	3	Jr., sr.	14 cred. incl. 14-15-16
109-110	General Physiology.....	10†	Jr., sr.	20 cred.
117-118-119	Ecology of Insects.....	9†	Jr., sr.	43
124	Advanced Ecology.....	5	Jr., sr.	117-118-119
125-126-127	Advanced Entomology.....	9†	Jr., sr.	37-38-39 or 43
130	Biology and Taxonomy of the Aphididae	3	Jr., sr.	19 cred. incl. 14-15-16
139-140	Histology and Development of Insects.....	6†	Jr., sr.	37-38-39 or 43
144-145-146	Animal Parasites and Parasitism	9	Jr., sr.	37-38-39 or 43
181-182	Embryology	6	Jr., sr.	11 or equiv.
183	Genetics and Eugenics.....	3	Jr., sr.	14-15-16, 5 cred. in an. biol. or bot.

For additional courses, see the bulletin of the College of Science, Literature, and the Arts.

ANTHROPOLOGY AND AMERICANIZATION TRAINING

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Credits	Offered to	Prerequisite courses
1	Introduction to Anthropology	5	3d qu. fr., Soph., jr., sr.	None
4	Cultural Anthropology.....	3	Soph., jr., sr.	1
5	General Immigration.....	3	Soph., jr., sr.	1
12	Ethnology	3	Soph., jr., sr.	1
110	Physical Anthropology and Amalgamation	3	Jr., sr.	1, an. biol. 9 cred.
113	The American People, Older Immigrants	3	Jr., sr.	3 courses
114	The American People, Newer Immigrants	3	Jr., sr.	3 courses
115	The American People, Americanisms and Assimilation..	3	Jr., sr.	3 courses

For additional courses, see the bulletin of the College of Science, Literature, and the Arts.

† The full course must be completed before credit will be allowed.

PROGRAM

17f-18w*	General Physiology.....	V, VI, VII V, VI, VII, VIII	MW F	10AB 10AB	Mr. Lund Mr. Lund
23s*	Principles of Animal Behavior	V, VI, VII	TTh	208,10AB	Mr. Oestlund
37f-38w-39s*	General Entomology.....	I, II	MWF	208,10AB	Mr. Oestlund
43s*	Introductory Entomology....	I, II	MWThFS	208,10AB	Mr. Riley
44f*	Animal Parasites.....	V, VI	MWF	208,10AB	Mr. Riley
44s*	Animal Parasites.....	V, VI, VII	WF	208,10AB	Mr. Riley
46w-47s*	Ornithology	V, VI, VII	TTh	211,314AB	Mr. Roberts
48s*	General Ecology.....	V, VI, VII, VIII	MW F	208,10AB	Mr. Chapman
107s*	Protozoology	I, II	MWF	211,213AB	Mr. Sigerfoos
109f-110w*	General Physiology.....	V, VI, VII V, VI, VII, VIII	MW F	10AB	Mr. Lund
117f-118w- 119s*	Ecology of Insects.....	V, VI, VII	TTh	208,10AB	Mr. Chapman
124†*	Advanced Ecology.....	Ar	Ar	Ar	Ar
125f-126w- 127s*	Advanced Entomology.....	III, IV	TThS	208,10AB	Mr. Oestlund
130w*	Biology and Taxonomy of the Aphididae	III, IV	MWF	208,10AB	Mr. Oestlund
139f-140w	Histology and Development of Insects.....	II, III, IV	TTh	324Ad	Mr. Riley
144f-145w- 146s*	Animal Parasites and Para- sitism	V, VI, VII	WF	208,10AB	Mr. Riley
181f-182w*	Embryology	V, VI	MWF	201,211AB	Mr. Nachtrieb
183s*	Genetics and Eugenics.....	III	MWF	211AB	Mr. Nachtrieb

ANTHROPOLOGY AND AMERICANIZATION TRAINING

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Room	Instructor
1f*	Introduction to Anthropology				
	Sec. 1	II	MWThFS	15F	Mr. Jenks
	2	V	MTWThF	15F	Mr. Grace
1w*	Introduction to Anthropology	V	MTWThF	15F	Mr. Grace
1s*	Introduction to Anthropology				
	Sec. 1	II	MWThFS	15F	Mr. Grace
	2	V	MTWThF	25F	Mr. Grace
4w*	Cultural Anthropology.....	II	MWF	25F	Mr. Jenks
5f,w,s*	General Immigration.....	III	TThS	15F	Mr. Grace
12f*	Ethnology	II	TThS	12F	Miss Speaker
12w*	Ethnology	III	MWF	25F	Mr. Grace
12s*	Ethnology	II	TThS	25F	Miss Speaker
110s*	Physical Anthropology and Amalgamation	II	MWF	25F	Mr. Jenks
113f*	The Older Immigrants.....	III	MWF	15F	Mr. Jenks
114w*	The Newer Immigrants.....	III	MWF	15F	Mr. Jenks
115s*	Americanisms and Assimila- tion	III	MWF	15F	Mr. Jenks

* Offered on the Minneapolis campus.

† Offered in the summer session.

COURSES IN FORESTRY

ANIMAL HUSBANDRY
ANIMAL INDUSTRY GROUP

No.	Title	Credits	Offered to	Prerequisite courses
1	Types and Breeds of Live- stock	5	All	None
2	Livestock-Judging	3	Soph., jr., sr.	1
3	Market Classes of Livestock	6	Jr., sr.	2†
5	Livestock-Breeding	3	Jr., sr.	Agron. 131
6	Livestock-Feeding	5	Jr., sr.	Agr. Biochem. 15
7	Meats	3	Sr.	2, Agr. Biochem. 15
8	Fundamentals of Feeding....	3	Jr., sr.	Agr. Biochem. 15
9	Pedigrees and Herd Books..	3	Jr., sr.	5
101	Advanced Stock-Judging....	3	Sr.	2, 3-4
102	Horse Husbandry.....	3	Jr., sr.	2, 3-4, 5, 6
103	Beef-Cattle Husbandry.....	3	Jr., sr.	2, 3-4, 5, 6
104	Sheep Husbandry.....	3	Jr., sr.	2, 3-4, 5, 6
105	Swine Husbandry.....	3	Jr., sr.	2, 3-4, 5, 6
106	Advanced Meats.....	3	Jr., sr.	7
107	Meat Problems.....	3	Sr.	106
108	Seminar	3	Sr.	5, 6

ART EDUCATION

COLLEGE OF EDUCATION

No.	Title	Credits	Offered to	Prerequisite courses
29-30-31††	Fundamental Principles of Design	9	All	None
32-33-34	Freehand Drawing and Com- position	9‡	All	None
	A Still Life, B Composition, and C Sketch			
40-41-42	Principles of Harmony in Form and Color.....	9	Soph., jr., sr.	29-30-31 or in- structor's per- mission

For additional courses see the bulletin of the College of Education.

‡ Three one-unit courses each term which may be registered for separately.

† No prerequisite except for students who take courses in this division in addition to 1 and 3.

†† Home economics students who have completed H. E. 51 and 53 will be admitted to the last quarter's work.

PROGRAM

ANIMAL HUSBANDRY
ANIMAL INDUSTRY GROUP

No.	Title	Hour	Day	Room	Instructor
if,w	Types and Breeds and Live-stock	I, II	MTWFS	CSt	Mr. Carnes
2f	Livestock-Judging	III, IV	MWF	CSt	Mr. Anderson
3f-4w	Market Classes of Livestock				
	Lect.	I	M	WSt	Mr. Ferrin
	Lab.	I, II	WF	WSt	Mr. Ferrin
5w	Livestock-Breeding	IV	MWF	3St	Mr. Peters
6w	Livestock-Feeding	III	MTWFS	3St	Mr. Ferrin
7f	Meats	V, VI, VII	TTh	MS	Mr. Anderson
8s	Fundamentals of Feeding....	I	TThS	3St	Mr. Harvey, Mr. Rayburn
9s	Pedigrees and Herd Books..	II	TThS	3St	Mr. Ferrin
101f	Advanced Stock-Judging....	VI, VII	MWF	CSt	Mr. Ferrin
102s	Horse Husbandry.....				
	Lect.	II	TTh	WSt	Mr. Peters
	Lab.	V, VI, VII	F	CSt	Mr. Peters
103s	Beef-Cattle Husbandry.....				
	Lect.	III	MW	3St	Mr. Carnes
	Lab.	V, VI, VII	T	BB	Mr. Carnes
104s	Sheep Husbandry.....				
	Lect.	IV	WF	3St	Mr. Anderson
	Lab.	V, VI, VII	M	CSt	Mr. Anderson
105s	Swine Husbandry.....				
	Lect.	III	TS	3St	Mr. Ferrin
	Lab.	V, VI, VII	Th	CSt	Mr. Ferrin
106w	Advanced Meats.....	V, VI, VII	WF	MS	Mr. Anderson
107s	Meat Problems.....				
	Lect.	IV	TS	MS	Mr. Anderson
	Lab.	V, VI, VII	W	MS	Mr. Anderson
108s	Seminar	II	MWF	3St	Mr. Peters

ART EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
29f-30w-31s*	Fundamental Principles of Design				
	Lect.	III	TThS	401,404F	Miss Raymond
	Sec. 1 Lab.	II	TThS	401,404F	Miss Raymond
	2	IV	TThS	401,404F	Miss Raymond
32f-33w-34s*	Freehand Drawing and Composition				
	Comp.	II	W	401,404F	Miss Raymond
	Sketch	III	F	401,404F	Miss Raymond
	Sec. 1 Lab.	I	MWF	401,404F	Miss Raymond
	2	IV	MWF	401,404F	Miss Raymond
40f-41w-42s*	Principles of Harmony in Form and Color.....				
	Lect.	II	TThS	406F	Miss Raymond
	Sec. 1 Lab.	I	TThS	406F	Miss Raymond
	2	III	TThS	406F	Miss Raymond

* Offered on the Minneapolis campus.

COURSES IN FORESTRY

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

No.	Title	Credits	Offered to	Prerequisite courses
1	General Bacteriology.....	5	Soph., jr., sr.	Chem. 10 cred.
103	Special Bacteriology for Students of Agriculture...	4	Jr., sr.	1
105	Household Bacteriology.....	3	Jr., sr.	1

For additional courses see the bulletin of the Medical School.

BEE CULTURE

No.	Title	Credits	Offered to	Prerequisite courses
1	Elements of Beekeeping I...	3	All	None
2	Elements of Beekeeping II..	3	All	None
3	Advanced Beekeeping I....	3	Soph., jr., sr.	1, 2
4	Advanced Beekeeping II....	3	Soph., jr., sr.	1, 2
5	Queen-Raising	3	Jr., sr.	3, 4

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Credits	Offered to	Prerequisite courses
1-2	General Botany.....	10†	All	None

† The full course must be completed before credit will be allowed.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

No.	Title	Hour	Day	Room	Instructor
1f-w-s*†	General Bacteriology.....	V, VI, VII	MWF	MH	Ar
103w*	Special Bacteriology for Students of Agriculture...	III, IV IV	TS Th	MH	Ar
105f*	Household Bacteriology.....	VI, VII	TTh	MH	Ar

BEE CULTURE

No.	Title	Hour	Day	Room	Instructor
1f,w,s†	Elements of Beekeeping I..				
	Sec. 1 Lect.	III	TThS	FH	Mr. Jager
	Lab.	Ar	Ar	FH	Mr. Jager
	2 Lect.	III	MWF	FH	Mr. Jager
	Lab.	Ar	Ar	FH	Mr. Jager
2f,w,s†	Elements of Beekeeping II..				
	Sec. 1 Lect.	IV	MW	FH	Mr. Jager
	Lab.	Ar	Ar	FH	Mr. Jager
	2 Lect.	IV	TS	FH	Mr. Jager
	Lab.	Ar	Ar	FH	Mr. Jager
3f,w	Advanced Beekeeping I.....				
	Lect.	V	TTh	FH	Mr. Jager
	Lab.	Ar	Ar	FH	Mr. Jager
4w,s	Advanced Beekeeping II....				
	Lect.	VI	TTh	FH	Mr. Jager
	Lab.	Ar	Ar	FH	Mr. Jager
5‡	Queen-Raising				Mr. Jager

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Room	Instructor
1f-2w*	General Botany.....				Mr. Durand in charge
	Sec. 1 Lab.	I, II	MWF	212-214-220P	
	Quiz	I	T	212-214-220P	
	Lect.	II	TThS	210P	
	2 Lab.	III, IV	MWF	212-214-220P	
	Quiz	IV	T	212-214-220P	
	Lect.	III	TThS	210P	
		III, IV	S	210P	
	3 Lab.	V, VI	MWF	212-214-220P	
	Quiz	V	Th	210P	
	Lect.	V, VI	T	210P	
		VI	Th	210P	

*Offered on the Minneapolis campus.

† Offered also in the summer session.

‡ Offered only in the summer session.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
4-5-6	General Botany for Agriculture and Forestry Students	9†	All	None
7	Taxonomy of Flowering Plants	5	All	2, 6, or 8
8	General Botany for Home Economics Students.....	5	All	None
11	Algae and Fungi.....	5	Soph., jr., sr.	2, 6, or 8
15	Anatomy of Vascular Plants	5	Soph., jr., sr.	2, 6, or 8
20	Forest Ecology.....	3	Soph., jr., sr.	14 cred., for. 4 cred.
51	Histological Methods.....	3	Jr., sr.	14 cred.
52	Plant Physiology.....	5	Jr., sr.	14 cred.
53	Botany of Economic Plants..	5	Jr., sr.	14 cred.
54	Elementary Ecology.....	5	Jr., sr.	14 cred.
55	Algae	5	Jr., sr.	14 cred.
62	Bryophytes and Pteridophytes	5	Jr., sr.	14 cred.
63	Angiosperms and Gymnosperms	5	Jr., sr.	7 or 62
107.	Bryophytes	5	Sr.	7, 62
108	Pteridophytes	5	Sr.	7, 62
110	Gymnosperms	5	Sr.	7, 63
113-114-115	Advanced Taxonomy.....	9	Jr., sr.	7
118-119	Cytology	6†	Jr., sr.	51
131	Field Ecology.....	5	Sr.	54
133	Forest Geography of North America	5	Sr.	54
141	Physical Phases of Plant Physiology	5	Sr.	52, org. chem.
142	Plant Metabolism.....	5	Sr.	52, org. chem.
143	Plant Metabolism and Growth	5	Sr.	52, org. chem.
144	Plant Microchemistry.....	5	Sr.	52, org. chem.

For additional courses, see the bulletin of the College of Science, Literature, and the Arts.

† The full course must be completed before credit will be allowed.

PROGRAM

57

No.	Title	Hour	Day	Room	Instructor
1s-2f*	General Botany.....				Mr. Durand in charge
	Lab.	I, II	TThS	212-214-220P	
	Quiz	I	W	210P	
	Lect.	II	MWF	210P	
4f-5w-6s*	General Botany (Agr. and For.).....				Mr. Durand
	Lect.	VII	TTh	210P	
	Lab.	V, VI	TTh	212-214-220P	
7s*	Taxonomy of Flowering Plants.....				Mr. Rosendahl in charge
	Lab.	V, VI	MWF	212-214P	
	Quiz	VI	Th	210P	
	Lect.	V	TTh	210P	
8s*	General Botany (Home Econ.).....				Mr. Durand
	Lect.	II	TThS	210P	
	Lab.	I, II	MWF	212-214-220P	
11f*	Algae and Fungi.....	I, II	TWThFS	10AB	Mr. Johnson
15w*	Anatomy of Vascular Plants	III, IV	MTWFS	202AB	Mr. Butters
20f*	Forest Ecology.....	Ar	Ar	Ar	Ar
51f*	Histological Methods.....	I, II	MWF	202AB	Mr. Rosendahl
52f*	Plant Physiology.....	III, IV	MTWFS	G	Mr. Knight
53w*	Botany of Economic Plants..	III, IV	MTWFS	G	Mr. Knight
54s*	Elementary Ecology.....	III, IV	MTWFS	G	Mr. Cooper
55s*	Algae.....	III, IV	MTWFS	10AB	Miss Tilden
62w*	Bryophytes and Pteridophytes.....	I, II	TWThFS	202AB	Mr. Huff
63s*	Gymnosperms and Angiosperms.....	I, II	TWThFS	202AB	Mr. Butters
107w*	Bryophytes.....	Ar	Ar	Ar	Mr. Durand
108w*	Pteridophytes.....	Ar	Ar	Ar	Mr. Butters
110w*	Gymnosperms.....	Ar	Ar	Ar	Mr. Butters
113f-114w-115s*	Advanced Taxonomy.....	V, VI	MWF	202AB	Mr. Rosendahl
118w-119s*	Cytology.....	I, II	MWF	202AB	Mr. Rosendahl
131f*	Field Ecology.....	Ar	Ar	Ar	Mr. Cooper
133s*	Forest Geography of North America.....	V, VI	MWF	G	Mr. Cooper
141f*	Physical Phases of Plant Physiology.....	I, II	TWThFS	G	Mr. Knight, Mr. Harvey
142w*	Plant Metabolism.....	I, II	TWThFS	G	Mr. Knight, Mr. Harvey
143s*	Plant Metabolism and Growth.....	I, II	TWThFS	G	Mr. Knight, Mr. Harvey
144s*	Plant Microchemistry.....	Ar	Ar	G	Mr. Harvey

* Offered on the Minneapolis campus.

COURSES IN FORESTRY

CHEMISTRY

SCHOOL OF CHEMISTRY

No.	Title	Credits	Offered to	Prerequisite courses
1-2-3	General Inorganic Chemistry	12†	All	None
9-10	General Inorganic Chemistry	10†	All	H.-s. chem.
11	Qualitative Chemical Analysis	4	Soph., jr., sr.	1-2-3
12-13	Qualitative Chemical Analysis	10†	Soph., jr., sr.	9-10
20-21	Quantitative Analysis.....	10	Soph., jr., sr.	12-13
35-36	Organic Chemistry.....	10†	Jr., sr.	15 cred. in chem.
126	Sanitary Water Analysis....	1 or 2	Jr., sr.	21
140-141†-142	Physical Chemistry.....	9, 12, or 15	Jr., sr.	2 yrs. chem., 1 yr. phys.

For additional courses see the bulletin of the School of Chemistry.

† The full course must be completed before credit will be allowed.

‡ The first two quarters must be completed before credit is allowed.

CHEMISTRY

SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Room	Instructor
1f-2w*	General Inorganic Chemistry				
	Lect.	VI	MWF	100C	Mr. Sneed
3s*	Lab.	VII, VIII	MW	210C	Mr. Sneed
	General Inorganic Chemistry				
	Lect.	VI	MF	100C	Mr. Sneed
9f-10w*	Lab.	IV	S	100C	Mr. Sneed
	General Inorganic Chemistry				
	Lect.	VII, VIII	MF	210C	Mr. Sneed
11f*	General Inorganic Chemistry				
	Lect.	VI	MWF	100C	Mr. Sneed
11s*	Lab.	VII, VIII	MWF	210C	Mr. Sneed
	Qualitative Chemical Analysis				
11s*	Lect.	IV	MWF	225C	Miss Cohen
	Lab.	V, VI	MW	210C	Miss Cohen
12s*	Qualitative Chemical Analysis				
	Lect.	V	MWF	100C	Mr. Henderson, Mr. Fosse
	Lab.	V, VI or VII, VIII	TTh TTh	210C 210C	
12f-13w*	Qualitative Chemical Analysis				
	Lect.	II	MWF	100C	Mr. Sneed
13f*	Lab.	I, II, III	ThS	210C	Mr. Sneed
	Qualitative Chemical Analysis				
13f*	Lect.	II	TThS	Ar	Ar
	Lab.	V, VI, VII	MW	Ar	Ar
140f-141w- 142s*	Qualitative Chemical Analysis				
	Lect.	II	TThS	325C	Mr. Sneed
	Lab.	V, VI, VII	MW	210C	Mr. Sneed
	Quantitative Analysis.....				
35f-36w*	Lect.	V	M	325C	Mr. Geiger
	Rec.	V	F	315C	Mr. Geiger
	Lab.	VI-VIII	MF	310C	Mr. Sidener, Mr. Geiger
		V-VIII	W	310C	Mr. Sidener, Mr. Geiger
126s*	Organic Chemistry.....				
	Lect.	III	MWF	325C	Mr. Hunter
140f-141w- 142s*	Lab.	V-VII	TTh	10C	Mr. Hunter, Mr. Lauer
	Sanitary Water Analysis....				
	Lect.	V	T	315C	Mr. Sidener
140f-141w- 142s*	Lab.	VI-VII	T	310C	Mr. Sidener, Mr. Geiger
	Lab.	V-VII	Th	310C	Mr. Sidener, Mr. Geiger
	Physical Chemistry.....				
140f-141w- 142s*	Lect.	IV	MWF	325C	Mr. MacDougall
	Lab.	V-VII	F	117C	Mr. MacDougall
	Rec.	IV	S	115C	Ar

* Offered on the Minneapolis campus.

COURSES IN FORESTRY

DAIRY HUSBANDRY

ANIMAL INDUSTRY GROUP

No.	Title	Credits	Offered to	Prerequisite courses
1	Elements of Dairying.....	5	All	None
2	Dairy Bacteriology.....	5	Soph., jr., sr.	Bact. 1
3	Dairy Products.....	5	Jr., sr.	1, 2
4	Cheese-Factory Practice.....	3	Jr., sr.	1, 3
5	Creamery Practice.....	3	Jr., sr.	1, 3
101	Milk Production.....	5	Jr., sr.	1
102	Market Milk.....	3	Jr., sr.	1, 2
103	Dairy-Stock Feeding.....	3	Sr.	101, Agr. Biochem. 15
104	Advanced Study of Dairy Breeds	3	Jr., sr.	101
105	Seminar I.....	1	Sr.	3 courses in dy. husb.
106	Seminar II.....	1	Sr.	3 courses in dy. husb.
107	Seminar III.....	1	Sr.	3 courses in dy. husb.

ECONOMICS

SCHOOL OF BUSINESS

No.	Title	Credits	Offered to	Prerequisite courses
5	General Economics.....	5	Soph., jr., sr.	None
6	Agricultural Economics.....	3	Soph., jr., sr.	3-4, or 5
13	Agricultural Statistics.....	5	Soph., jr., sr.	3-4, or 5
20	Economic Geography of Agriculture	5	All	None
21	Economic History of Agriculture	5	All	None

DAIRY HUSBANDRY
ANIMAL INDUSTRY GROUP

No.	Title	Hour	Day	Room	Instructor
1f,w,s	Elements of Dairying..... (Limited to 50)				
	Lect.	III	TWS	39DH	Mr. Keithley
	Lab.	III, IV	MF	Lab.DH	Mr. Dahle, Mr. Anderson
2w	Dairy Bacteriology..... (Limited to 12)				
	Lect.	IV	TS	40DH	Mr. Macy
	Lab.	V, VI	MWF	30DH	Mr. Macy
3f	Dairy Products.....				
	Lect.	IV	MWF	39DH	Mr. Keithley
	Lab.	V, VI	WF	Lab.DH	Mr. Dahle
4†	Cheese-Factory Practice.....	....	....	....	Mr. Keithley
5†	Creamery Practice.....	....	....	....	Mr. Keithley
101f	Milk Production.....				
	Lect.	IV	MTWF	40DH	Mr. Eckles
	Lab.	V, VI, VII	Th	Ar	Mr. Rayburn
102s	Market Milk.....	VI, VII	MWF	39DH	Mr. Keithley, Mr. Macy
103w	Dairy-Stock Feeding.....	III	MWF	30DH	Mr. Eckles
104s	Advanced Study of Dairy Breeds				
	Lect.	III	S	40DH	Mr. Rayburn
	Lab.	V, VI	TTh	40DH	Mr. Rayburn
105f	Seminar I.....	II	S	30DH	Mr. Eckles
106w	Seminar II.....	II	S	30DH	Mr. Eckles
107s	Seminar III.....	II	S	30DH	Mr. Eckles

ECONOMICS

SCHOOL OF BUSINESS

No.	Title	Hour	Day	Room	Instructor
5f,w,‡	General Economics (Agriculture and Forestry).....				
	Sec. 1	I	MWThFS	106En	Ar
	2	III	MTWFS	4PP	Ar
5w,s	General Economics (Home Economics)	II	MTWThF	203HE	Ar
6f,w,s,‡	Agricultural Economics.....				
	Sec. 1	I	TThS	1PP	Ar
	2	II	TThS	307Ad	Ar
13f	Agricultural Statistics.....				
	Lect.	III	TThS	307Ad	Mr. Working
	Lab.	V, VI	TTh	307Ad	Mr. Working
20f	Economic Geography of Agriculture	IV	MTWFS	307Ad	Mr. Holmes
21w	Economic History of Agriculture	IV	MTWFS	307Ad	Ar

† Offered only in the summer session.

‡ Offered also in the summer session.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
25-26	Principles of Accounting....	8‡	Soph., jr., sr.	3-4, 5, or parallel
28	Principles of Accounting (for Agr., For., and H.E.).....	5	Soph., jr., sr.	3-4, or 5
50	Farm Finance.....	3	Jr., sr.	3-4, or 5 and 6
73	Railway Traffic and Rates..	3	Jr., sr.	3-4, or 5 and 6
85	Principles of Marketing.....	3	Jr., sr.	3-4, or 5 and 6
88	Advertising and Selling.....	3	Jr., sr.	85, Psychol. 156
90	Economics of Consumption..	3	Jr., sr.	3-4, or 5 and 6
91	Principles of Organization and Management.....	3	Soph., jr., sr.	3-4, or 5

‡ The full course must be completed before credit will be allowed.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
25f-26w*	Principles of Accounting....				Mr. Heilman in charge
	Sec. 1	I	MWF	301MA	
	2	II	MWF	301MA	
	3	II	MWF	303MA	
	4	III	MWF	301MA	
	5	IV	MWF	301MA	
	6	V	MWF	301MA	
	7	I	TThS	301MA	
	8	II	TThS	301MA	
	9	III	TThS	301MA	
	10	VI	MWF	209MA	
25f-26w*	Accounting Laboratory (to be given with Principles of Accounting).....				Mr. Heilman in charge
	Sec. 1	V, VI	M	303MA	
	2	VI, VII	M	301MA	
	3	III, IV	T	303MA	
	4	I, II	T	303MA	
	5	VI, VII	T	301MA	
	6	VII, VIII	T	303MA	
	7	V, VI	W	303MA	
	8	VI, VII	W	301MA	
	9	II, III	Th	303MA	
	10	VI, VII	Th	301MA	
	11	V, VI	Th	303MA	
	12	VII, VIII	Th	303MA	
	13	V, VI	F	303MA	
	14	VI, VII	F	301MA	
	15	III, IV	F	303MA	
	16	III, IV	S	303MA	
	17	I, II	S	303MA	
	18	VII, VIII	W	303MA	
25w-26s*	Principles of Accounting....				Mr. Heilman
	Sec. 1	III	MWF	102MA	
	2	I	TThS	107F	Mr. Heilman
25w-26s*	Accounting Laboratory.....				Mr. Heilman in charge
	Sec. 1	V, VI	T	303MA	
	2	III, IV	W	303MA	
	3	VII, VIII	M	303MA	
28s	Principles of Accounting.... (Agr., For., and H.E.)				
	Lect.	III MWF and VI Th		24Ad	Mr. Heilman, Mr. Chapman
	Lab.	VII, VIII	Th	24Ad	Mr. Heilman, Mr. Chapman
50s	Farm Finance.....	II	MWF	307Ad	Mr. Dowrie
73w*	Railway Traffic and Rates...	V	MWF	202MA	Mr. Cummings
85f,s	Principles of Marketing....	II	TThS	4PP	Mr. Anderson
88s*	Advertising and Selling....	I	TThS	202MA	Mr. Pelz
90s	Economics of Consumption..	IV	MWF	307Ad	Mr. Garver
91w	Principles of Organization and Management.....	I	TThS	202MA	Mr. Pelz

* Offered on the Minneapolis campus.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
94	Office Management.....	3	Jr., sr.	3-4, or 5 and 6
103-104	Value and Distribution.....	6‡	Jr., sr.	3-4, or 5 and 6
106	Land Economics.....	3	Jr., sr.	See footnote†
107	Land Tenure.....	3	Jr., sr.	106
108	Marketing of Farm Products	3	Jr., sr.	85
110-111	Practice Course in Marketing	3	Jr., sr.	85
112	Business Statistics.....	3	Jr., sr.	13 or 14
116	Economics of Agricultural Production	3	Jr., sr.	See footnote†
117	Prices of Farm Products....	3	Jr., sr.	See footnote†
126	Principles of Coöperation...	3	Jr., sr.	85 or see footnote†
127-128	Marketing Organization and Management	6	Jr., sr.	85, 25-26 or 28
131-132-133	Cost Accounting.....	3	Jr., sr.	25-26
143-144	Money and Banking.....	8‡	Jr., sr.	3-4, or 5 and 6
145	International Exchange.....	3	Jr., sr.	143-144
149	Business Cycles.....	3	Sr.	143-144
176	Commercial Policies.....	3	Jr., sr.	3-4, or 5 and 6
177	Foreign Trade.....	3	Jr., sr.	176
180-181-182	Senior Seminar in Economics	9	Sr.	See footnote†
191-192	Public Finance.....	6‡	Jr., sr.	3-4, or 5 and 6
193	State and Local Taxation...	3	Jr., sr.	191-192

For additional courses, see bulletin of the School of Business

EDUCATIONAL ADMINISTRATION AND SUPERVISION

COLLEGE OF EDUCATION

No.	Title	Credits	Offered to	Prerequisite courses
3	Educational Sociology.....	3	Jr., sr.	Psychol. 6 cred.
5	Public Education in the United States.....	3	Jr., sr.	Psychol. 6 cred.
119	The Elementary-School Cur- riculum	3	Sr.	1 or 101-102-103, 3

For additional courses see the bulletin of the College of Education.

† Senior rank, or 13 credits in economics and farm management, and 5 credits in other social sciences (political science, sociology, or history).

‡ The full course must be completed before credit will be allowed.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
94f*	Office Management.....				Miss Sykes
	Rec.	V	Th	102MA	
	Lab. Sec. 1	V, VI	M	104,106MA	
	2	V, VI	W	104,106MA	
103f-104w*	Value and Distribution.....	VI	MWF	102MA	Mr. Garver
106w	Land Economics.....	VI	MWF	307Ad	Mr. Black
106s*	Land Economics.....				
	See School of Business program				
107s	Land Tenure.....	VI	MWF	307Ad	Mr. Black
108w	Marketing of Farm Products	VI, VII	T	323Ad	Mr. Black
108-111f	Practice Course in Marketing	Ar	Ar	Ar	Mr. Black, Mr. Anderson
112f*	Business Statistics.....	II	TThS	202MA	Mr. Mudgett
116f,w	Economics of Agricultural Production	II	TThS	24Ad	Mr. Holmes
117w	Prices of Farm Products....	II	TThS	4PP	Mr. Working
126f*	Principles of Coöperation...	A1	Ar	Ar	Mr. Black, Mr. Miller
127w-128s	Marketing Organization and Management	Ar	Ar	Ar	Ar
131f-132w- 133s*	Cost Accounting.....	II	TThS	109MA	Mr. Noble
143f-144w*	Money and Banking.....				
	Lect.	IV	T		Mr. Dowrie, Mr. Working, Mr. Stehmax
	Sec. 1	II	TThS	302D	
	2	III	MWF	209MA	
	3	II	MWF	102MA	
	4	VII	MTW	209MA	
	5	V	MWF	102MA	
	6	III	TThS	209MA	
145s*	International Exchange.....	II	TThS	102MA	Mr. Dowrie
149s*	Business Cycles.....	VIII	MTW	209MA	Mr. Ebersole
176f*	Commercial Policies.....	I	MWF	202MA	Mr. Blakey
177w*	Foreign Trade.....	I	MWF	202MA	Mr. Blakey
180f-181w- 182s	Senior Seminar in Economics	Ar	Ar	Ar	Ar
191f-192w*	Public Finance.....	III	MWF	209MA	Mr. Blakey
193s*	State and Local Taxation...	III	MWF	209MA	Mr. Blakey

EDUCATIONAL ADMINISTRATION AND SUPERVISION

(COLLEGE OF EDUCATION)

No.	Title	Hour	Day	Room	Instructor
3f*	Educational Sociology.....				
	Sec. 1	II	MWF	205Ed	Mr. Finney
	2	III	MWF	205Ed	Mr. Finney
3w,s*	Educational Sociology.....	III	MWF	205Ed	Mr. Finney
5w*	Public Education in the United States.....	VI	MWF	102Ed	Mr. Swift
5s	Public Education in the United States.....	VI	MWF	317Ad	Miss Alexander
119w*	The Elementary School Cur- riculum	VII	MWF	102Ed	

* Offered on the Minneapolis campus.

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

No.	Title	Credits	Offered to	Prerequisite courses
45	Elementary Educational Psychology	3	Soph., jr., sr.	Psychol. 6 cred.
106-107-108	Advanced Educational Psychology	9	Jr., sr.	45 or equiv.
111	Educational Diagnosis.....	3	Jr., sr.	45 or equiv.

For additional courses see the bulletin of the College of Education.

ENGLISH

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Credits	Offered to	Prerequisite courses
1-2-3	General Survey of English Literature	9	Soph., jr., sr.	Rhet. 1-2-3
4	Old English.....	4	Soph., jr., sr.	1-2-3 or parallel
6	Chaucer	4	Soph., jr., sr.	1-2-3 or parallel
8	Shakespeare	4	Soph., jr., sr.	1-2-3 or parallel
27	History of the English Language	2	Soph., jr., sr.	4
40	Bible as Literature.....	4	Soph., jr., sr.	1-2-3 or parallel
44-45	American Literature.....	6†	Jr., sr.	1-2-3
51	Spenser	3	Jr., sr.	1-2-3
53	Seventeenth-Century Lyrist.	4	Jr., sr.	1-2-3
58-59	Nineteenth-Century Prose...	6†	Soph., jr., sr.	1-2-3
62	Milton	4	Jr., sr.	1-2-3
64	Bacon	3	Jr., sr.	1-2-3
66	English Novel.....	4	Jr., sr.	1-2-3

For additional courses, see the bulletin of the College of Science, Literature, and the Arts.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title	Credits	Offered to	Prerequisite courses
1	Introductory Entomology....	5	Soph., jr., sr.	An. biol. 9 cred.
2	Economic Entomology.....	5	Soph., jr., sr.	1
3	Elementary Economic Entomology	3	Soph., jr., sr.	An. biol. 9 cred.
4	Economic Vertebrate Zoology	3	Jr., sr.	An. biol. 9 cred.

† The full course must be completed before credit will be allowed.

PROGRAM

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
45f,s*	Elementary Educational Psychology	I	MWF	Psy	Miss Dealey
45w*	Elementary Educational Psychology	IV	MWF	Psy	Miss Dealey
106f-107w-108s	Advanced Educational Psychology	III	MWF	Psy	Mr. Van Wagenen
111s*	Educational Diagnosis.....	II	MWF	Psy	Mr. Van Wagenen

ENGLISH

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Room	Instructor
1f-2w-3s*	General Survey of English Literature				
	Sec. 1 Lect.	II	M	Ar	Ar
	Rec.		WF	114F	Ar
	2 Lect.	VI	T	Ar	Ar
	Rec.	VI	WF	205F	Ar
4w,s*	Old English.....	V	MTThF	204F(w)205F(s)	Ar
6f*	Chaucer	VII	MWThF	204F	Ar
6w*	Chaucer	IV	MTWF	205F	Ar
6s*	Chaucer	II	TWFS	204F	Ar
8f,w*	Shakespeare				
	Sec. 1	I	TWFS	204F	Ar
	2	V	MTThF	204F	Ar
8s*	Shakespeare				
	Sec. 1	I	TWFS	204F	Ar
	2	IV	MTWF	204F	Ar
27w*	History of English Language	VIII	TTh	204F	Mr. Klaeber
40f*	Bible as Literature.....	III	MWF	301F	Mr. Burton
44f-45w*	American Literature.....	IV	MWF	204F	Mr. Moore
51f*	Spenser	VI	MWF	204F	Ar
53f*	Seventeenth-Century Lyrists. II		MTWF	205F	Mr. Moore
58w-59s*	Nineteenth-Century Prose... II		TThS	205F	Mr. Beach
62w*	Milton	VI	MTThF	204F	Ar
64s*	Bacon	VI	MWF	204F	Ar
66f*	English Novel.....	IV	MTWF	9F	Mr. Burton

ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title	Hour	Day	Room	Instructor
1f,s*†	Introductory Entomology....	V, VI	MTWThF	208-210AB	Mr. Oestlund, Mr. Riley
2w†	Economic Entomology.....	V, VI	MTWThF	306Ad	Mr. Ruggles
3f,w	Elementary Econ. Entomology	V, VI, VII	WF	306Ad	Mr. Ruggles
4f	Economic Vertebrate Entomology	Ar	Ar	Ar	Mr. Washburn

* Offered on the Minneapolis campus.

† Offered also during the summer session.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
5	Elementary Forest Entomology	3	Soph., jr., sr.	An. biol. 9 cred.
6	Insects of Forest Products..	3	Soph., jr., sr.	5
8	Varieties and Habits of Fur-Bearing Animals.....	3	Soph., jr., sr.	An. biol. 9 cred.
12	Forest Zoology.....	3	Jr., sr.	An. biol. 9 cred.
20	Home Economics Entomology	3	Soph., jr., sr.	An. biol. 6 cred.
37-38-39	General Entomology.....	9	Soph., jr., sr.	An. biol. 9 cred.
44	Introductory Course in Animal Parasites and Parasitism	3	Soph., jr., sr.	An. biol. 9 cred.
117-118-119	General Ecology of Insects..	9	Jr., sr.	1-2 or 37-38-39
125-126-127	Advanced General Entomology	9	Jr., sr.	1-2 or 37-38-39
130	Biology and Taxonomy of the Aphididae	5	Sr.	1-2 or 37-38-39
139-140	Histology and Development of Insects.....	6	Jr., sr.	1-2 or 37-38-39
144-145-146	Animal Parasites and Parasitism	3-9	Jr., sr.	1-2 or 37-38-39
150	Insecticides and Their Action	3 or 6	Jr., sr.	1-2 or 37-38-39, Agr. Biochem., 7-8 or equiv.
197	Introduction to Research....	5 or more	Sr.	1-2 or 37-38-39 and other work as prescribed by the division

FARM ENGINEERING

No.	Title	Credits	Offered to	Prerequisite courses
3	Mechanical Drawing.....	2	All	None
4	Blacksmithing	2	All	None
5	Carpentry	3	All	None
7	Farm Structures.....	3	Jr., sr.	3
8	Farm Engineering.....	5	All	None
11	Applied Mathematics.....	5	All	None
13	Farm Motors I.....	3	All	None
14	Farm Motors II.....	3	All	13
15	Mechanical Laboratory.....	2	All	None
17	Advanced Blacksmithing.....	2	All	4
18	Surveying	5	Jr., sr.†	3, 11 or equiv.
23	General Physics.....	5	All	None

† Open also to sophomores in forestry.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
5f	Elementary Forest Entomology	V, VI, VII	WF	306Ad	Mr. Graham
6w	Insects of Forest Products..	Ar	Ar	Ar	Mr. Graham
8f	Varieties and Habits of Fur-Bearing Animals.....	Ar	Ar	Ar	Ar
12w	Forest Zoology.....	Ar	Ar	Ar	Mr. Washburn
20w	Home Economics Entomology	V, VI, VII	TTh	307Ad	Mr. Riley, Mr. Ruggles
37f-38w-39s*	General Entomology.....	I, II	MWF	208-210AB	Mr. Oestlund
44f,s	Introductory Course in Animal Parasites and Parasitism	V, VI, VII, VIII	MW or TTh	321Ad	Mr. Riley
117f-118w-119s*	General Ecology of Insects..	V, VI, VII	TTh	208-210AB	Mr. Chapman
125f-126w-127s*	Advanced General Entomology	III, IV	TThS	208-210AB	Mr. Oestlund
130w*	Biology and Taxonomy of Aphididae	Ar	Ar	Ar	Mr. Oestlund
139f-140w*	Histology and Development of Insects.....	III, IV	MWF	208-210AB	Mr. Riley
144f-145w-146s	Animal Parasites and Parasitism	V, VI, VII	WF	Ar	Mr Riley
150f†	Insecticides and Their Action	Ar	Ar	Ar	Mr. Moore
197f,w,s†	Introduction to Research....	Ar	Ar	Ar	Mr. Oestlund, Mr. Ruggles, Mr. Chapman, Mr. Moore, Mr. Riley, Mr. Washburn

FARM ENGINEERING

No.	Title	Hour	Day	Room	Instructor
3f,s	Mechanical Drawing.....	III, IV	MWF	305En	Mr. Jacobson
4s	Blacksmithing	V, VI, VII	TTh	20En	Mr. Johnston
5f	Carpentry	I, II	TThS	48En	Mr. White
7w	Farm Structures.....				
	Lect.	IV	TS	305En	Mr. White
	Lab.	VI, VII, VIII	M	305En	Mr. White
8f,w	Farm Engineering.....	I	MTWFS	107En	Mr. Boss
11f,w,s	Applied Mathematics.....	III	MTWFS	215En	
13f	Farm Motors I.....	I, II	TThS	37En	Mr.Torrance
13s	Farm Motors I.....	V, VI, VII	MF	37En	Mr.Torrance
14s	Farm Motors II.....	V, VI, VII	TTh	37En	Mr.Torrance
15f,s	Mechanical Laboratory.....	I, II	WF	56,101En	Mr. Dent
17s	Advanced Blacksmithing....	V, VI, VII	WF	20En	Mr. Johnston
18s	Surveying	1:15-5:20	MWF	215En	Mr. Roe
23f,s	General Physics.....				
	Lect.	III	TThS	102En	Mr. Stewart
	Sec. 1 Lab.	I, II	TS	103En	Mr. Tyler
	2	V, VI	TTh	103En	Mr. Tyler

* Offered on the Minneapolis campus.

† Offered also during the summer session.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
24	Agricultural Physics I.....	4	All	8, 11, 23 or equiv.
25	Agricultural Physics II.....	4	All	24
28	Land-Clearing	3	Jr., sr.	None
31	Farm Surveying and Drain- age	5	Jr., sr.	3, 11 or equiv.
34	Household Mechanics and Heat	4	All	23 or equiv.
35	Household Electricity and Light	4	All	34
101	Advanced Drainage.....	3	Sr.	31

FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
1	General Forestry.....	4	All	None
2	Elementary Dendrology.....	3	All	None
3-4	Dendrology	8†	Soph., jr., sr.	Bot. 4
5	Elementary Sylviculture.....	3	All	None
9	Elementary Mensuration....	5	All	None
10	Forest Mensuration.....	5	Jr., sr.	3-4
11	Forest Valuation.....	5	Jr., sr.	10, 41
20	Grazing	3	Jr., sr.	None
23	Factory Experience.....	3 to 5	Jr., sr.	33-34
26	Tree Crops.....	1	All	None
27	Groves and Windbreaks.....	3	All	None
28	Logging	3	Sr.	3-4
29	Sawmills and Wood Working Machinery	3	Jr., sr.	33-34
30	Wood-Seasoning	3	Jr., sr.	33-34
31	Logging Plans.....	3	Sr.	28
32	Lumber Distribution.....	5	Jr., sr.	33-34
33-34	Wood Structure and Identi- fication	6	Jr., sr.	3-4, Bot. 4-5-6
35	Seeding and Planting.....	3	Jr., sr.	41
36	Forest Policy and Administra- tion	5	Sr.	43, 11, 28 parallel
39	Wood Preservation.....	3	Jr., sr.	33-34
40	Forest By-Products.....	3	All	None

† The full course must be completed before credit will be allowed.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
24w	Agricultural Physics I.....				
	Lect.	III	MWF	102En	Mr. Stewart
	Lab.	V, VI, VII	M	103En	Mr. Tyler
25s	Agricultural Physics II.....				
	Lect.	III	MWF	102En	Mr. Stewart
	Lab.	V, VI, VII	M	103En	Mr. Tyler
28w	Land-Clearing	Ar	Ar	Ar	Mr. Thompson
31f	Farm Surveying and Drain- age	1:15-5:20	MWF	215En	Mr. Roe
34w	Household Mechanics and Heat				
	Lect.	II	MWF	102En	Mr. Stewart
	Sec. 1 Lab.	V, VI	F	103En	Mr. Stewart
	2	I, II	Th	103En	Mr. Stewart
35s	Household Electricity and Light				
	Lect.	II	MWF	102En	Mr. Stewart
	Sec. 1 Lab.	V, VI	F	103En	Mr. Stewart
	2	I, II	Th	103En	Mr. Stewart
101s	Advanced Drainage.....	Ar	Ar	Ar	Mr. Roe

FORESTRY

No.	Title	Hour	Day	Room	Instructor
1f,s	General Forestry.....	II	MTWF	302Hr	Mr. Cheyney
2f	Elementary Dendrology.....				Mr. Wentling
3f-4w	Dendrology				
	Lect.	II	TThS	302Hr	Mr. Wentling
	Lab.	VI, VII, VIII	M	302Hr	Mr. De Flon
3w-4s	Dendrology				
	Lect.	I	TThS	302Hr	Mr. Wentling
	Lab.	VI, VII, VIII	F	302Hr	Mr. De Flon
5f	Elementary Sylviculture.....				Mr. Wentling
9f	Elementary Mensuration....				Mr. Allison
10w	Forest Mensuration.....	IV	MTWFS	302Hr	Mr. Hansen
11f	Forest Valuation.....	I	MTWThF	302Hr	Mr. Allison
20w	Grazing	III	TThS	302Hr	Mr. Allison
23ff	Factory Experience.....				
26f,w	Tree Crops.....	IV†	TS	217En	Mr. Cheyney
27w	Groves and Wind Breaks...	I	MWF	302Hr	Mr. Wiggins
28w	Logging	III	MWF	302Hr	Mr. Cheyney
29f	Sawmill and Wood-Working Machinery	IV	MWF	301Hr	Mr. Cheyney
30s	Wood Seasoning.....	III	MWF	302Hr	Mr. Cheyney
31s	Logging Plans.....	Ar	Ar	Ar	Mr. Cheyney
32w	Lumber Distribution.....	II	MTWThF	302Hr	Mr. Cheyney
33f-34w	Wood Structure and Identifi- cation	V, VI, VII	WF	303Hr	Mr. Wentling
35w	Seeding and Planting.....	III	MWF	301Hr	.....
36w	Forest Policy and Adminis- tration	I	MTWThF	202Hr	Mr. Allison
39f	Wood Preservation.....	II	TThS	202Hr	Mr. Allison
40s	Forest By-Products.....	I	MWF	302Hr	Mr. Allison

† Offered only during summer session at Itasca Park.

‡ Arrangements for this course must be made in advance.

§ In the fall quarter this course follows hygiene lectures the last six weeks of the quarter. In the winter quarter it will be given the first six weeks of the quarter.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
41	Sylvics	3	Jr., sr.	3-4, Bot. 4-5-6
43	Sylviculture Laboratory.....	6	Jr., sr.	35
44	Wood Pulp and Paper.....	3	Jr., sr.	33-34 Chem. 3 or 10
45	Forest Regulation.....	3	Sr.	43, 11
46	Forest Regulation Laboratory	3	Jr.	43, 11
101	Advanced Dendrology.....	3	Jr., sr.	3-4, Bot. 4-5-6
106	Research Methods in Sylvi- culture	3	Sr.	43
107	Uses of Wood I.....	3	Sr.	33-34
108	Uses of Wood II.....	3	Sr.	33-34
109	Uses of Wood III.....	3	Sr.	107, 108
110	Mechanical and Physical Properties of Wood.....	2	Sr.	33-34
111	Advanced Wood Structure..	3	Sr.	33-34
112	Advanced Forest Mensura- tion	3	Sr.	10
113	Advanced Forest By-Products	3	Sr.	33-34, Chem. 35-36

FRESHMAN LECTURES

No.	Title	Credits	Offered to	Prerequisite courses
1	Agriculture and Forestry....	None	Fr.	None
2	Home Economics.....	None	Fr.	None

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Credits	Offered to	Prerequisite courses
1-2	General Geology.....	10†	Soph., jr., sr.	Chemistry
7-8	Laboratory Work.....	2†	Soph., jr., sr.	Supports 1-2
11-12	Introduction to Geology.....	8†	Soph., jr., sr.	None
21-22	Essentials of Mineralogy...	6†	Soph., jr., sr.	Chemistry
29	General Physiography.....	5	Soph., jr., sr.	None
34	Meteorology	5	Soph., jr., sr.	None
37	Economic and Commercial Geography	5	Soph., jr., sr.	None
51-52	Economic Geology.....	6†	Jr., sr.	1-2

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

† Both quarters must be completed before credit will be given.

PROGRAM

No	Title	Hour	Day	Room	Instructor
41f	Sylvics	II	MWF	301Hr	Mr. Wentling
43S	Sylviculture Laboratory....	Ar	Ar	Ar	Mr. Wentling
44S	Wood Pulp and Paper.....	II	MWF	301Hr	Mr. Allison
45S	Forest Regulation.....	IV	MWF	302Hr	Mr. Allison
46S	Forest Regulation Laboratory	Ar	Ar	Ar	Mr. Allison
101W	Advanced Dendrology.....	Ar	Ar	Ar	Mr. Wentling
106W	Research Methods in Sylvi- culture	II	MWF	301Hr	.....
107f	Uses of Wood I.....	IV	MWF	303Hr	Mr. Wentling
108W	Uses of Wood II.....	IV	MWF	303Hr	Mr. Wentling
109S	Uses of Wood III.....	IV	MWF	303Hr	Mr. Wentling
110W	Mechanical and Physical Properties of Wood.....	V, VI	TTh	303Hr	Mr. Wentling
111f	Advanced Wood Structures..	V, VI, VII	TTh	303Hr	Mr. Wentling
112W	Advanced Forest Mensura- tion	Ar	Ar	Ar	Mr. Hansen
113W	Advanced Forest By-Products	Ar	Ar	Ar	Mr. Allison

FRESHMAN LECTURES

No.	Title	Hour	Day	Room	Instructor
1f	Agriculture and Forestry....	III	Th	107En	Mr. Freeman
2f	Home Economics.....	V	F	203HE	Mr. Freeman

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Room	Instructor
1f-2w*	General Geology.....				
	Sec. 1	I	TWThFS	210P	Mr. Thiel
	2	III	MTThFS	110P	Mr. Emmons
	3	VI	MTWThF	110P	Mr. Allison
1w-2S*	General Geology.....	II	MWThFS	210P	Mr. Werner
1S-2W*	General Geology.....	III	MTThFS	110P	Mr. Emmons
7f-8w*	General Geology Lab.....	Ar	Ar	112P	Mr. Allison
7w-8S*	General Geology Lab.....	Ar	Ar	112P	Mr. Allison
7S*	General Geology Lab.....	Ar	Ar	112P	Mr. Allison
11f-12w*	Introduction to Geology....	VII	MTWThF	200aP	Mr. Werner
21w-22S*	Essentials of Mineralogy....				
	Lect.	IV	MWF	210P	Mr. Gruner
	Lab.	V-VIII	F	100P	Mr. Gruner
	Lab.	III	MWF	100P	Mr. Gruner
29f*	General Physiography.....	III	MTThFS	210P	.....
34w*	Meteorology	III	MTThFS	210P	.....
37S*	Economic and Commercial Geography	III	MTThFS	210P	.....
51f-52w*	Economic Geology.....	II	MWF	210P	Mr. Schwartz

* Offered on the Minneapolis campus.

COURSES IN FORESTRY

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Credits	Offered to	Prerequisite courses
1	Beginning, A.....	5	All	None
2	Beginning, B.....	5	All	1 or 1 yr. prep. German
3	Beginning, C.....	5	All	2
10	Rapid Reading.....	5	All	3 or 2 yrs. prep. German
11	Advanced Rapid Reading....	5	All	10 or 3 yrs. prep. German
14	Nineteenth-Century Prose...	5	All	11 or 4 yrs. prep. German
28-29	Advanced Chemical German	6†	All	15

PROGRAM

75

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Room	Instructor
1f*	Beginning A.....				
	Sec. 1	I	TWThFS	207F	Ar
	2	II	MWThFS	207F	Ar
	3	IV	MTWFS	207F	Ar
	4	VI	MTWThF	207F	Ar
1w*	Beginning A.....				
	Sec. 1	I	TWThFS	209½F	Ar
	2	V	MTWThF	209½F	Ar
1s*	Beginning A.....				
	Sec. 1	II	MWThFS	209½F	Ar
	2	V	MTWThF	207F	Ar
2f*	Beginning B.....				
	Sec. 1	II	MWThFS	209F	Ar
	2	VI	MTWThF	209½F	Ar
2w*	Beginning B.....				
	Sec. 1	I	TWThFS	207F	Ar
	2	II	MWThFS	207F	Ar
	3	IV	MTWFS	207F	Ar
	4	VI	MTWThF	207F	Ar
2s*	Beginning B.....				
	Sec. 1	I	TWThFS	209½F	Ar
	2	V	MTWThF	209½F	Ar
3f*	Beginning C.....				
	Sec. 1	IV	MTWFS	209F	Ar
	2	V	MTWThF	207F	Ar
3w*	Beginning C.....				
	Sec. 1	II	MWThFS	209F	Ar
	2	VI	MTWThF	209½F	Ar
3s*	Beginning C.....				
	Sec. 1	I	TWThFS	207F	Ar
	2	II	MWThFS	207F	Ar
	3	IV	MTWFS	207F	Ar
	4	VI	MTWThF	207F	Ar
10f*	Rapid Reading.....				
	Sec. 1	II	MWThFS	212F	Ar
	2	IV	MTWFS	209½F	Ar
	3	VI	MTWThF	212F	Ar
10w*	Rapid Reading.....				
	Sec. 1	IV	MTWFS	209F	Ar
	2	V	MTWThF	207F	Ar
10s*	Rapid Reading.....				
	Sec. 1	II	MWThFS	209F	Ar
	2	VI	MTWThF	209½F	Ar
11f*	Advanced Rapid Reading....	II	MWThFS	209½F	Ar
11w*	Advanced Rapid Reading....				
	Sec. 1	II	MWThFS	212F	Ar
	2	VI	MTWThF	212F	Ar
11s*	Advanced Rapid Reading....	IV	MTWFS	209F	Ar
14s*	Nineteenth-Century Prose...	II	MTThFS	212F	Ar
28w-29s*	Advanced Chemical German..	III	MWF	209½F	Ar

* Offered on the Minneapolis campus.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
31-32	Medical German.....	6†	All	10 or 15
40	Commercial German.....	5	All	10
50-51-52	Composition	3†	Jr., sr.	11, 14 or 4 yrs. prep. German
53-54-55	Conversation	3†	Jr., sr.	11, 14 or 4 yrs. prep. German
63	Modern Drama.....	3	Jr., sr.	11 or 14
64	Classic Drama.....	3	Jr., sr.	14 or 63
74	German Poets.....	3	Jr., sr.	63 or 64

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	Credits	Offered to	Prerequisite courses
1	Brief Course in the History of Education.....	5	Jr., sr.	Psychol. 6 cred.
101-102-103	Foundations of Modern Education	9	Jr., sr.	Psychol. 6 cred., hist. 6 cred.

For additional courses see the bulletin of the College of Education.

HOME ECONOMICS

No.	Title	Credits	Offered to	Prerequisite courses
3	Textiles	5	All	None
4	Textiles	3	All†	None
5-6	Textiles	3	See note ††	None
11	Garment-Making	3	All	None

† All quarters must be completed before credit is granted.

‡ Not open to students in home economics.

†† For teachers only.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
31f-32w*	Medical German.....	I	MWF	212F	Ar
31w-32s*	Medical German.....				
	Sec. 1	I	MWF	209F	Ar
	2	I	TThS	209F	Ar
31s*	Medical German.....	I	MWF	212F	Ar
32f*	Medical German.....	I	MWF	209½F	Ar
40w*	Commercial German.....	V	MTWThF	302D	Mr. Laughlin
50f-51w-52s*	Composition	III	W	227F	Mr. Laughlin
53f-54w-55s*	Conversation	IV	TS	101F	Mr. Laughlin
63f*	Modern Drama.....	IV	MWF	212F	Mr. Davies
63s*	Modern Drama.....	II	MWF	125F	Mr. Downs
64w*	Classic Drama.....	IV	MWF	209½F	Mr. Meyers
74s*	German Poets.....	IV	MWF	212F	Mr. Davies

HISTORY AND PHILOSOPHY OF EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
1f*	Brief Course in the History of Education.....				
	Sec. 1	II	MWThFS	102Ed	Miss Alexander
	2	IV	MTWFS	205Ed	Miss Alexander
	3	VI	MTWThF	205Ed	Miss Alexander
1w,s*	Brief Course in the History of Education.....	II	MTWThF	205Ed	Miss Alexander
101f-102w-103s*	Historical Foundations of Modern Education.....	VII	MWF	205Ed	Mr. Swift

HOME ECONOMICS

No.	Title	Hour	Day	Room	Instructor
3f,w	Textiles (Limited to 20)	I, II	MTWThF	211,305HE	Miss Weller, Miss Phelps
3s	Textiles (Limited to 20)				
	Sec. 1	I, II	MTWThF	211,307HE	Miss Weller, Miss Phelps
	2	III, IV	MTWFS	211,307HE	Miss Weller, Miss Phelps
4f,w,s	Textiles (S. L. & A.)..... (Limited to 20)	V, VI	MWF	211,307HE	Miss Phelps
5f-6w	Textiles (Teachers)..... (Limited to 20)	II, III, IV	S	211,307HE	Miss Weller
11f,w,s	Garment-Making (Limited to 20)				
	Sec. 1	I, II	MWF	304HE	Miss McDowell, Miss Ebersole
	2	I, II	TThS	304HE	Miss McDowell, Miss Ebersole
	3	V, VI, VII	TTh	304HE	Miss McDowell, Miss Ebersole

* Offered on the Minneapolis campus.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
13	Dressmaking	5	Soph., jr., sr.	3, 11, 51, Home Pract. in Garment-Making
17	Advanced Clothing Construction	3	Jr., sr.	13, 52, 53.
18	Commercial Clothing Manufacture	4	Sr.	17 or parallel
21	Foods and Cookery.....	5	Soph., jr., sr.	Chem. 5 cred., Physiol. 4 parallel
22	Food Economics.....	5	Soph., jr., sr.	21
23	Nutrition I.....	5	Jr., sr.	22, Agr. Biochem. 3, Bact. 1
24	Camp Cookery.....	4	All†	None
34	Home Management: Operation and Maintenance, Lectures	3	Jr.,† sr.	22, 35, parallel, Ecqn. 5 or parallel
35	Home Management: Operation and Maintenance, Laboratory	6	Jr.,† sr.	22, 37 and H. E. Educ. 40 or parallel, 34 parallel Home Pract. in Foods and Cookery advised
37	Home Care of the Sick.....	3	Jr., sr.	Chem. 5 cred., Bact. 1
45	Home Economics Survey....	2	Sr.	None
51	Drawing and Design.....	3	All	None

† Open to juniors only in their third quarter.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
13f,w	Dressmaking (Limited to 20)	III, IV	MTWFS	304HE	Miss McDowell, Miss Patchin
13s	Dressmaking (Limited to 20) Sec. 1	III, IV	MTWFS	304HE	Miss McDowell, Miss Patchin
	2	I, II	TWThFS	112HE	Miss McDowell, Miss Patchin
17f,w,s†	Advanced Clothing Construc- tion (Limited to 20)	III, IV	MWF	305HE	Miss McDowell, Miss Patchin, Miss Carlotta Brown
18w,s	Commercial Clothing Manu- facture	V, VI, VII, VIII	MWF	305HE	Miss Patchin
21f,w	Foods and Cookery..... (Limited to 20) Sec. 1	V, VI	MTWThF	209HE	Miss Child
	2	III, IV	MTWFS	209HE	Miss Child
21s	Foods and Cookery..... (Limited to 20) Sec. 1	I, II	TWThFS	209HE	Miss Child
	2	III, IV	MTWFS	209HE	Miss Child
22f,w	Food Economics..... (Limited to 20)	III, IV	MTWFS	205,207HE	Miss Child
22s	Food Economics..... (Limited to 20) Sec. 1	III, IV	MTWFS	205,207HE	Miss Child
	2	V, VI	MTWThF	104,105,106HE	Ar
23f,w	Nutrition I..... (Limited to 25)	V, VI, VII, VIII	MWF	211,213HE	Miss Anderson
24s	Camp Cookery.....	VII, VIII	MWF	105,106HE	Miss Child
34f,w,s†	Home Management: Opera- tion and Maintenance, Lectures	III	TThS	203HE	Miss Studley
35f,w,s†	Home Management; Opera- tion and Maintenance, Laboratory	Ar	Ar	Ar	Miss Lindquist, Miss Studley
37f,s†	Home Care of the Sick..... Lect.	I	S	213HE	Miss Moorhead
	Lab.	V, VI	TTh	WH	Miss Fisher
45w	Home Economics Survey....	IV	TS	203HE	Miss Weigley
51f,w,s	Drawing and Design..... (Limited to 20) Sec. 1	I, II	MWF	401HE	Miss Bacon, Miss V. Goldstein
	2	I, II	TThS	401HE	Miss Bacon, Miss V. Goldstein

† Offered also in the summer session.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
52	Art History and Appreciation	3	Jr., sr.	51
53	Advanced Design.....	4	Jr., sr.	51
54	Interior Design.....	3	Sr.	52, 53, 131
55	Decorative Needlework and Other Crafts.....	3	Jr., sr.	51, 53 or parallel
57	Weaving and Other Crafts..	3	Jr., sr.	3, 51, 53
58	Costume Design.....	3	Jr., sr.	55
61	Large Quantity Cookery and Marketing	4	Jr., sr.	22
63	Institutional Experience....	3	Jr., sr.	22
69	Institution-Management Prac- tice	3	Sr.	151
70	Food Preparation in Rela- tion to Social Work.....	3	Soph., † jr., sr.	An. Biol. 1-2, chem. to cred. advised
71	Elementary Dietetics for the Social Workers.....	3	Soph., † jr., sr.	70, Physiol. 4 or parallel
72	Home-Management Problems	3	Soph., † jr., sr.	71, Econ. 5 or parallel
103	Dietetics	5	Sr.	108
105	Experimental Cookery.....	3	Jr., sr.	108
108	Nutrition II.....	5	Jr., sr.	23

† Open to sophomores only in their third quarter. Not open to students in home economics except by special permission of the head of the division.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
	Sec. 3	V, VI, VII	TTh	402HE	Miss Bacon, Miss V. Goldstein
52f,s	Art History and Appreciation (Limited to 2c)				
	Sec. 1	II	MWF	309HE	Miss V. Goldstein
	2	VII	MWF	309HE	Miss V. Goldstein
52w	Art History and Appreciation (Limited to 20)	VII	MWF	309HE	Miss H. Goldstein
53f	Advanced Design..... (Limited to 20)				
	Sec. 1	V, VI, VII	MWF	402HE	Miss H. Goldstein, Miss V. Goldstein
	2	I, II	MWThF	402HE	Miss H. Goldstein, Miss V. Goldstein
53w,s	Advanced Design..... (Limited to 20)	I, II	MWThF	402HE	Miss H. Goldstein, Miss Patchin, Miss V. Goldstein
54s	Interior Design.....	V, VI	MWF	401HE	Miss Morse
55f,s	Decorative Needlework and other Crafts..... (Limited to 12)	V, VI, VII	TTh	401HE	Miss Morse
57w	Weaving and Other Crafts.. (Limited to 12)	V, VI, VII	TTh	401HE	Miss Morse
58w	Costume Design.....	V, VI	MWF	402HE	Miss H. Goldstein
61f,s	Large Quantity Cookery and Marketing				
	(Limited to 10)				
	Lect.	I	S	309HE	Miss Richards, Miss Farmer
	Lab.	I, II, III	TTh	DiH	Miss Richards
63f,w	Institutional Experience.....				
	Lect.	I	T	309HE	Miss Treat, Miss Richards
	Lab.	Three fourth hour periods to be arranged			
69s	Institution-Management Prac- tice	Two 8 hour days	Ar	Ar	Miss Treat, Miss Richards
70w	Food Preparation in Relation to Social Work.....	V, VI	MWF	107HE	Miss Lindquist
71s	Elementary Dietetics for So- cial Workers.....	V, VI	MWF	107HE	Miss Mumford
72f	Home-Management Problems:	V	MWF	106HE	Miss Lindquist
103f,w,s	Dietetics	V, VI	MTWThF	207-203HE	Miss Biester, Miss Mumford
	(Limited to 20)				
105w,s†	Experimental Cookery..... (Limited to 12)	I, II	MWF	207HE	Miss Weigley, Miss Child
108f,w,s†	Nutrition II..... (Limited to 25)	III, IV	MTWFS	211-213HE	Miss Anderson, Miss Mumford

† Offered also in the summer session.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
109	Advanced Nutrition.....	5	Jr., sr.	108, Agr. Biochem. 2
110	Special Problems in Dietetics	3	Sr.	103
111	Special Food Problems.....	3	Sr.	105, Agr. Biochem. 2
122	Advanced Textiles.....	3	Jr., sr.	3, Agr. Biochem. 2
123	Clothing Economics.....	2	Jr., sr.	13, Econ. 5
131	Home Management: House- Planning and Equipment..	5	Jr., sr.	52, 53
151	Institution Management.....	4	Sr.	61, 63

HOME ECONOMICS EDUCATION

COLLEGE OF EDUCATION

No.	Title	Credits	Offered to	Prerequisite courses
40	Child-Training	3	Jr., sr.	H. E. 37, Psychol. 1-2
42	Special Methods of Teaching Home Economics.....	5	Jr., sr.	H.E. 13, 22, Psychol. 1-2
43	Organization and Methods for Related Art Teaching.	3	Sr.	42, H. E. 52, 53, 131
44	Methods in Home Economics Extension Work.....	3	Sr.	42
46	Observation and Teaching: Related Art.....	8	Sr.	42, H. E. 13, 52, 53, Educ. 45 or Agr. Educ. 11, see course de- scription
47	Observation and Teaching: Foods and Home Manage- ment	8	Sr.	42, Educ. 45 or Agr. Educ. 11, see course de- scription
48	Observation and Teaching: Textiles and Clothing.....	8	Sr.	42, Educ. 45 or Agr. Educ. 11, see course de- scription
49	Observation and Teaching: General Home Economics.	8	Sr.	42, Educ. 45 or Agr. Educ. 11, see course de- scription
141	Problems in Home Economics Education	3	Sr.	42, Educ. Psychol.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
109S	Advanced Nutrition..... (Limited to 15)				
	Lect.	III	TS	106HE	Miss Biester,
	Lab.	V, VI, VII, VII	TTh	311HE	Miss Anderson
110S	Special Problems in Dietetics (Limited to 20)				
	Lect.	VII	MW	213HE	Miss Biester
	Lab.	One full afternoon	Ar		Miss Mumford
111S†	Special Food Problems.....	V, VI, VII	TTh	107HE	Miss Child
122f,w	Advanced Textiles..... (Limited to 16)	V, VI, VII	TTh	307-311HE	Miss Phelps, Miss Weller
123w,s	Clothing Economics.....	III	TTh	313HE	Miss Weller
131f,w,s	Home Management: House- Planning and Equipment..	III, IV	MTWFS	401HE	Miss Morse
151w	Institution Management.....	III	TS	106HE	Miss Treat
		III, IV	M	106HE	Miss Treat

HOME ECONOMICS EDUCATION
COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
40f	Child-Training	IV	MWF	203HE	Miss Binzel
42f,s†	Special Methods of Teaching Home Economics.....	VII	MTWThF	313HE	Miss Miller, Miss Clara Brown
43w	Organization and Methods for Related Art Teaching.....	IV	MWF	309HE	Miss H. Goldstein
44S	Methods in Home-Economics Extension Work.....	IV	MWF	309HE	Miss Lombard, Miss Newton
46f,w	Observation and Teaching: Related Art.....				
	Lect.	VIII	TTh	213HE	Miss Brown,
	Teaching	Ar	Ar	Ar	Miss Bacon
47f,w	Observation and Teaching: Foods and Home Manage- ment				
	Lect.	VIII	TTh	213HE	Miss Miller, Mrs. Dorsey, Miss Lombard, Miss Rider
48f,w	Teaching Observation and Teaching: Textiles and Clothing.....	Ar	Ar	Ar	
	Lect.	VIII	TTh	213HE	Miss Clara Brown
49f,w	Teaching Observation and Teaching: General Home Economics.	Ar	Ar	Ar	Miss Ebersole, Mrs. MacComber
	Lect.	VIII	TTh	213HE	Miss Miller, Miss Brown
141S†	Teaching Problems in Home Economics Education	Ar	Ar	Ar	.....

† Offered also in the summer session.

HORTICULTURE

No.	Title	Credits	Offered to	Prerequisite courses
6	Fruit-Growing	3	All	None
21	Small-Fruit Culture.....	3	Soph., jr., sr.	6 or 32, bot. 9 cred.
32	Vegetable-Growing	3	All	None
33	Vegetable-Forcing	3	Soph., jr., sr.	32, bot. 9 cred.
50	Floriculture	3	All	None
56	Propagation and Nursery Practice	3	Soph., jr., sr.	None
71	Landscape-Gardening	3	All	None
91	Advanced General Horticulture	3	Jr., sr., in agr. educ.	Bot. 9 cred.
93	Judging Horticultural Crops	2	Soph., jr., sr.	6 or 32
107	Orchard Management.....	3	Jr., sr.	6
109	Principles of Genetics.....	3	Jr., sr.	Bot. 9 cred., an. biol. 9 cred.
110	Horticultural Crop-Breeding.	3	Jr., sr.	109
111	Systematic Pomology.....	3	Jr., sr.	6
131	Advanced Vegetable Production	3	Sr.	32
132	Systematic Olericulture.....	3	Jr., sr.	32
133	Commercial Truck-Growing..	3	Jr., sr.	32
135	Potato Production.....	3	Jr., sr.	6 or 32, bot. 9 cred.
151	Advanced Floriculture.....	3	Jr., sr.	50, bot. 9 cred.
191-192	Special Problems.....	6	Jr., sr.	Special permission
193-194-195	Horticultural Seminar.....	3	Jr., sr.	9 cred.

HORTICULTURE

No.	Title	Hour	Day	Room	Instructor
6f	Fruit-Growing				
	Sec. 1 Lect.	II	MW	102Hr	Mr. Alderman
	Lab.	I, II	T or F	8Hr	Mr. Alderman
	2 Lect.	IV	TS	102Hr	Mr. Alderman
	Lab.	VI, VII	M	8Hr	Mr. Alderman
21W	Small-Fruit Culture.....	VI	MWF	210Hr	Mr. Brierley
32S	Vegetable-Growing				
	Sec. 1 Lect.	II	MW	102Hr	Mr. Tapley
	Lab.	I, II	T or F	8Hr	Mr. Bushnell
	2 Lect.	IV	TS	102Hr	Mr. Tapley
	Lab.	VI, VII	M	8Hr	Mr. Bushnell
33W	Vegetable-Forcing				
	Lect.	I	TTh	210Hr	Mr. Tapley
	Lab.	V, VI	F	8Hr	Mr. Tapley
50S	Floriculture	III	MWF	102Hr	Mr. Cady
56S	Propagation and Nursery Practice				
	Lect.	III	TS	102Hr	Mr. Cady
	Lab.	V, VI	T	8Hr	Mr. Cady
71S	Landscape-Gardening	II	TThS	102Hr	Mr. Cady
91S	Advanced General Horticul- ture	Ar	Ar	Ar	Mr. Alderman
93f	Judging Horticultural Crops	V, VI, VII	T	8Hr	Mr. Alderman
107f	Orchard Management.....				
	Lect.	III	TTh	106Hr	Mr. Brierley
	Lab.	I, II	Th	8Hr	Mr. Brierley
109f	Principles of Genetics (See Agronomy 131)				
110W	Horticultural Crops-Breeding	I	TThS	212Hr	Mr. Dorsey
111f	Systematic Pomology.....	IV, V, VI, VII	W	8Hr	Mr. Alderman, Mr. Brierley
131f	Advanced Vegetable Produc- tion				
	Lect.	III	MW	210Hr	Mr. Tapley
	Lab.	I, II	S	8Hr	Mr. Tapley
132f	Systematic Olericulture.....				
	Lect.	II	TTh	210Hr	Mr. Tapley
	Lab.	V, VI	F	8Hr	Mr. Tapley
133W	Commercial Truck-Growing..	Ar	Ar	Ar	Mr. Tapley
135W	Potato Production.....				
	Lect.	III	MW	210Hr	Mr. Krantz
	Lab.	V, VI	Th	8Hr	Mr. Krantz
151f	Advanced Floriculture.....	Ar	Ar	Ar	Mr. Cady
191W-192S	Special Problems.....	Ar	Ar	Ar	Mr. Alderman
193f-194- 195S	Horticultural Seminar.....	Ar	Ar	Ar	Horticultural Staff

MILITARY SCIENCE AND TACTICS

No.	Title	Credits	Offered to	Prerequisite courses
1-2-3	First-Year Basic Course R. O. T. C.....	None	Fr.	See note††
4-5-6	Second-Year Basic Course R. O. T. C.....	None	Soph.	1-2-3
51-52-53	First-Year Advanced Course R. O. T. C.....	9	Jr.	4-5-6
54-55-56	Second-Year Advanced Course R. O. T. C.....	9	Sr.	51-52-53

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Credits	Offered to	Prerequisite courses
1-2-3	Harmony	9†	Jr., sr.	None
16-17-18	Pianoforte	6 or 12†	Jr., sr.	None
22-23-24	Violin	6-12†	Jr., sr.	None
40-41-42	Orchestra	3†	Jr., sr.	See statement
43-44-45	Choir	3	Jr., sr.	None
46-47-48	Appreciation of Music.....	3†	Jr., sr.	None

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

PHYSICAL EDUCATION

FOR MEN

No.	Title	Credits	Offered to	Prerequisite courses
1	Personal Hygiene.....	None	Fr.	None
2-3-4	Gymnasium and Swimming..	None	Fr.	None
5-6-7	Advanced Leaders.....	3†	Soph., jr., sr.	Instr. permission
8-9-10	Corrective Gymnastics.....	None	All	None
11-12†	Wrestling	None	All	Instr. permission
13-14-15†	Intermediate Swimming.....	None	All	Instr. permission
16-17-18†	Advanced Swimming.....	None	All	Instr. permission
19-20†	Boxing	None	All	Instr. permission
21-22-23†	Intramural Athletics.....	None	All	Instr. permission

† The full course must be completed before credit will be allowed.

‡ Students who meet all the requirements of Course 2-3-4 and show special ability may elect these courses instead of Course 2-3-4.

†† Must be legally eligible for enrolment in Reserve Officers' Training Corps. Consult commandant.

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Room	Instructor
1f-2w*	First-Year Basic Course.....	V	MWF	A	Ar
3s*	First-Year Basic Course.....	VI, VII, VIII	W	A	Ar
4f-5w*	Second-Year Basic Course...	I	MWF	A	Ar
		III	MWF	A	Ar
		VII	MWF	A	Ar
6s*	Second-Year Basic Course...	VI, VII, VIII	W	A	Ar
51-52-53*	First-Year Advanced Course	Ar	Ar	Ar	Ar
54-55-56*	Second-Year Advanced Course	Ar	Ar	Ar	Ar

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Room	Instructor
1f-2w-3s*	Harmony	II	MWF	Mu	Ar
		V	MWF	Mu	Ar
16f-17w-18s*	First-Year Piano.....	Ar	Ar	Mu	Ar
22f-23w-24s*	Violin	Ar	Ar	Mu	Ar
40f-41w-42s*	Orchestra	VIII	TF	A	Mr. Pepinsky
43f-44w-45s*	Choir	VIII	M	Mu	Mr. Scott
46f-47w-48s*	Appreciation of Music.....	V	M	Mu	Miss Reeves

PHYSICAL EDUCATION

FOR MEN

No.	Title	Hour	Day	Room	Instructor
1f,w,s*	Personal Hygiene.....				
	Sec. 1	II	TTh	A	Dr. Cooke, Mr. Roemer, Mr. Glidden
	2	III	TTh	A	Dr. Cooke, Mr. Roemer, Mr. Glidden
	3	IV	TS	A	Dr. Brown, Mr. Roemer, Mr. Glidden
	4	VI	TTh	A	Dr. Brown, Mr. Roemer, Mr. Glidden
	5	VII	TTh	A	Mr. Foster, Mr. Roemer, Mr. Glidden
2f-3w-4s*	Gymnasium				
	(Same schedule as Course 1, Hygiene)				
5f-6w-7s	Advanced Leaders.....	Ar	TThS	A	Mr. Foster, Mr. Roemer
8f-9w-10s*	Corrective Gymnastics.....	Ar	Ar	A	Dr. Brown
11w-12s*	Wrestling	Ar	Ar	A	Mr. Gilman
13f-14w-15s*	Intermediate Swimming.....	Ar	Ar	A	Mr. Glidden
16f-17w-18s*	Advanced Swimming.....	Ar	Ar	A	Mr. Foster, Mr. Glidden
19w-20s*	Boxing	Ar	Ar	A	Mr. Goldie
21f-22w-23s*	Intramural Athletics.....	Ar	Ar	A	Mr. Foster, Mr. Roemer

*Offered on the Minneapolis campus.

COURSES IN FORESTRY

PHYSICAL EDUCATION
FOR WOMEN

No.	Title	Credits	Offered to	Prerequisite courses
1-2-3†	Elem. Phys. Training.....	0	Required of all new students	None
4	Preliminary Hygiene.....	0	Required of all new students	None
7-8-9‡	Sophomore Physical Training	0	Soph.	1-2-3
10-11-12	Soph. Orthopedic Gymnastics	0	Soph.	1-2-3
13-14-15	Soph. Interpretive Dancing	0	Soph.	1-2-3
16-17-18§	Soph. Organized Games and Folk-Dancing	0	Soph.	1-2-3
19-20-21§	Sophomore Major Sports...	0	Soph.	1-2-3
22-23	Sophomore Elementary Swimming	0	Soph.	1-2-3
28-29	Sophomore Advanced Swimming	0	Soph.	1-2-3, swimming test
32	Personal Hygiene.....	3	Soph., jr., sr.	An. Biol. 1-2
33	Hygiene of the Family.....	3	Jr., sr.	An. Biol. 1-2
34-35-36‡	Intermed. Physical Training	3†	Jr., sr.	6 qtrs. of phys. tr. Permission of director
40-41-42	Interpretive Dancing.....	3†	Jr., sr.	6 qtrs. of phys. tr.
43-44-45§	Folk-Dancing and Organized Games	3	Jr., sr.	6 qtrs. of phys. tr.
46-47-48‡	Hockey, Basket-Ball and Baseball. No registration necessary	0	Fr., jr., sr.	Permission of director
49	General Swimming. No registration necessary.....	0	All	None

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

‡ The third quarter of this course is open to students who have not had the first two quarters.

§ Students may enter any quarter.

PHYSICAL EDUCATION
FOR WOMEN

No.	Title	Hour	Day	Room	Instructor
1f-2w-3s*‡	Elem. Physical Train.....	IV	MWF	3,151,153WGm	Ar
		V	MWF	3,151,153WGm	Ar
		VI	MWF	3,151,153WGm	Ar
		VII	MWF	3,151,153WGm	Ar
		III	TThS	3,151,153WGm	Ar
4f*	Preliminary Hygiene.....	I	M	201WGm	Dr. Norris
		II	T	201WGm	Dr. Norris
		IV	T	201WGm	Dr. Norris
		VII	T	201WGm	Dr. Norris
		III	W	201WGm	Dr. Norris
7f-8w-9s*‡	Sophomore Physical Train..	IV	TS	3,153WGm	
		V	TTh	3,153WGm	
10f-11w-12s*	Soph Orth. Gymnastics....	IV	TS	3,153WGm	
		V	TTh	3,153WGm	
13f-14w-15s*	Soph. Interpretive Dancing..	VII	TTh	151WGm	Miss Baker
		VIII	TTh	151WGm	Miss Baker
16f-17w-18s*§	Soph. Org. Games and Folk-Dancing	III	MF	151WGm	Ar
19f-20w-21s*§	Soph. Major Sports.....	VIII	MW	151WGm	Ar
22f-23w-24s*¶	Soph. Elem. Swimming.....	IV	MW	51WGm	Ar
		VI	MW	51WGm	Ar
		II	TTh	51WGm	Ar
		III	MTh	51WGm	Ar
		III	TF	51WGm	Ar
		IV	TS	51WGm	Ar
		VI	TTh	51WGm	Ar
28f-29w-28s*¶	Sophomore Adv. Swim.....	VII	TTh	51WGm	Ar
		VII	MW	51WGm	Ar
		III	WS	51WGm	Ar
32w*	Personal Hygiene.....	III	TThS	201WGm	Ar
33s*	Hygiene of the Family.....	II	MWF	201WGm	Dr. Norris
34f-35w-36s*‡	Intermed. Phys. Train.....	VI	TTh	153WGm	Ar
40f-41w-42s*	Interpretive Dancing.....	IV	TS	151WGm	Miss Baker
43f-44w-45s*§	Folk-Dancing and Organized Games	V	TThF	151WGm	Miss Kissock
46f-47w-48s*‡	Hockey, Basket-Ball, Base-ball	VIII	TTh	151WGm	Ar
49f,w,s*	General Swimming.....	VIII	MTWTh	51WGm	No instr.

*Offered on the Minneapolis campus.

‡ The third quarter is open to students who have not taken the preceding quarters.

§ The second or third quarter of this course is open to students who have not had the first two quarters.

¶ No student may register for more than two quarters of swimming without permission.

COURSES IN FORESTRY

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Credits	Offered to	Prerequisite courses
1	Elements of Mechanics and Sound	3	All	Trigonometry
2	Elements of Mechanics Lab- oratory	1	All	1 or parallel
9	Acoustics	3	All	None
21	Heat	3	All	1
22	Heat Laboratory.....	1	All	2, 21 or parallel
31	Optics	3	All	1
32	Optics Laboratory.....	1	All	2, 31 or parallel
41	Magnetism and Electricity...	3	All	1
42	Magnetism and Electricity Laboratory	1	All	2, 41 or parallel

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

PROGRAM

91

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Room	Instructor
1f,w*	Elements of Mechanics and Sound				
	Lect.	VII	MWF	30Ph	Mr. Erikson
	Quiz	VIII	W	100C	Mr. Erikson
1s*	Elements of Mechanics and Sound				
	Lect.	III	TThS	30Ph	Mr. Erikson
	Quiz	VIII	W	100C	Mr. Erikson
2f,w,s*	Elements of Mechanics Laboratory				
	Sec. 1	V, VI	T	16Ph	Mr. Erikson
	2	VII, VIII	T	16Ph	Mr. Erikson
	3	V, VI	Th	16Ph	Mr. Erikson
	4	VII, VIII	Th	16Ph	Mr. Erikson
9s*	Acoustics	Ar	Ar	30Ph	Mr. Erikson
21f,w*	Heat				
	Lect.	III	TThS	30Ph	Mr. Miller
	Quiz	VIII	W	100C	Mr. Miller
22f,w*	Heat Laboratory.....				
	Sec. 1	V, VI	M	23Ph	Mr. Miller
	2	VII, VIII	M	23Ph	Mr. Miller
	3	V, VI	T	23Ph	Mr. Miller
	4	VII, VIII	T	23Ph	Mr. Miller
31f,s*	Optics				
	Lect.	I	TThS	30Ph	Mr. Valasek
	Quiz	VIII	W	100C	Mr. Valasek
32f,s*	Optics Laboratory.....				
	Sec. 1	V, VI	Th	23Ph	Mr. Valasek
	2	VII, VIII	Th	23Ph	Mr. Valasek
	3	V, VI	F	23Ph	Mr. Valasek
	4	VII, VIII	F	23Ph	Mr. Valasek
41w,s*	Magnetism and Electricity...				
	Lect.	III	TThS	30Ph	Mr. Zeleny
	Quiz	VIII	W	100C	Mr. Zeleny
42w,s*	Electrical Laboratory.....				
	Sec. 1	V, VI	T	31Ph	Mr. Zeleny
	2	VII, VIII	T	31Ph	Mr. Zeleny
	3	V, VI	Th	31Ph	Mr. Zeleny
	4	VII, VIII	Th	31Ph	Mr. Zeleny
	5	V, VI	W	31Ph	Mr. Zeleny
	6	VII, VIII	W	31Ph	Mr. Zeleny

*Offered on the Minneapolis campus.

COURSES IN FORESTRY

 PHYSIOLOGY
 MEDICAL SCHOOL

No.	Title	Credits	Offered to	Prerequisite courses
4	Human Physiology.....	5	All	Chem. 10 cred., biol. 8 cred.
100-101	Physiologic Chemistry.....	12	Jr., sr.	Org. chem., physics, an. biol.
103	Physiology of Muscle, Nerve, Blood, Circulation, and Di- gestion	8	Jr., sr.	Org. chem., an. biol., physics
104	Physiology of the Nervous System and Special Senses	8	Jr., sr.	Org. chem., an. biol., physics
150	Some Newer Aspects of Nu- trition	3	Sr.	101
153	Advanced Physiologic Chem- istry	3	Sr.	101
163	Metabolism	2 or 3	Sr.	101

For additional courses see the bulletin of the Medical School.

PLANT PATHOLOGY AND BOTANY

No.	Title	Credits	Offered to	Prerequisite courses
1	Plant Pathology.....	5	Jr., sr.	Bot. 9 cred.
7	Weeds and Grasses.....	3	Soph., jr., sr.	Bot. 9 cred.
9	Weeds and Seed-Testing....	3	Soph., jr., sr.	Bot. 9 cred.
10	Forest Pathology.....	5	Soph., jr., sr.	Bot. 9 cred.
12	Seed Problems.....	3	Jr., sr.	9
14	Plant-Disease Control.....	5	Jr., sr.	1, Ent. 1 or 3
105-106-107	Mycology	9	Jr., sr.	Bot. 7, 11 or equiv.
108-109	Methods	6	Jr., sr.	1, Bact. 1
110	Principles of Pathology....	3	Jr., sr.	1, Bact. 1
111	Diseases of Field Crops....	3	Jr., sr.	1
112	Diseases of Fruit and Vege- table Crops.....	3	Jr., sr.	1

PROGRAM

PHYSIOLOGY
MEDICAL SCHOOL

No.	Title	Hour	Day	Room	Instructor
4f,w,s*	Human Physiology.....				
	Lab.	I, II, III	Th	315MH	Miss Greisheimer
	Lect.	I	MTWFS	301MH	Miss Greisheimer
100f-101w*	Physiologic Chemistry.....	I, II, III	TTbS	310MH	Mr. Pettibone, Mr. Kingsbury
103f*	Physiology of Muscles, etc..	IV, V, VI, VII	MWF	301MH	Mr. Scott
104w*	Physiology of Nervous System, etc.....	IV, V, VI, VII	MWF	301MH	Mr. Scott
150f*	Some Newer Aspects of Nutrition	Ar	Ar	Ar	Mr. Pettibone
153f,w,s*	Advanced Physiologic Chemistry	Ar	Ar	310MH	Mr. Pettibone or Mr. Kingsbury
163s*	Metabolism	VI, VII, VIII	TTh	310MH	Mr. Pettibone

PLANT PATHOLOGY AND BOTANY

No.	Title	Hour	Day	Room	Instructor
1f†	Plant Pathology.....	V, VI, VII, VIII	MWF	1,2PP	Mr. Stakman, Mr. Leach, Mr. Seal
7w	Weeds and Grasses I.....	V, VI, VII	WF	3PP	Mr. Larson
9f†	Weeds and Seed-Testing....	V, VI, VII	WF	3,4PP	Mr. Larson
10f	Forest Pathology.....	V, VI, VII, VIII	MWF	1,2PP	Mr. Stakman, Mr. Leach, Mr. Seal
12w	Seed Problems.....	Ar	Ar	Ar	Mr. Larson
14‡	Plant-Disease Control.....	..	..	..	.....
105‡-106w- 107s	Mycology	III, IV	MWF	1,32PP	Mr. Freeman, Mr. Stakman, Miss Dodsall
108f-109w	Methods	I, II	MWF	1,30PP	Mr. Stakman, Mr. Leach
110s	Principles of Pathology.....	I, II	MWF	1,30PP	Mr. Stakman, Mr. Barker
111w†	Diseases of Field Crops....	V, VI	MWF	1,2PP	Mr. Stakman, Mr. Barker
112s†	Diseases of Fruit and Vegetable Crops.....	V, VI	MWF	1,2PP	.....

*Offered on the Minneapolis campus.
† Offered also in the summer session.
‡ Not offered in 1921-22.

COURSES IN FORESTRY

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Credits	Offered to	Prerequisite courses
1	American Government.....	5	Soph., jr., sr.	None
7	State and Local Government	5	Soph., jr., sr.	1

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

POULTRY HUSBANDRY

ANIMAL INDUSTRY GROUP

No.	Title	Credits	Offered to	Prerequisite courses
1	Poultry	3	All	None
2	Poultry-Judging	3	All	None
4	Incubating and Brooding...	3	All	None
5	Advanced Poultry-Judging...	3	All	2

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Credits	Offered to	Prerequisite courses
1-2-3	General Psychology.....	9†	Soph., jr., sr.	None
4-5	Introductory Laboratory			
	Psychology	4†	Soph., jr., sr.	1-2 or parallel
7	Introductory Laboratory			
	Psychology	4	Soph., jr., sr.	1-2 or parallel
101-102	Experimental Psychology....	6†	Jr., sr.	1-2, 4-5, or 7

† The full course must be completed before credit will be allowed.

‡ Six credits will be allowed for the first two quarters.

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Room	Instructor
1f*	American Government.....				
	Sec. 1	IV	MTWFS	LitTh	Ar
	2	VI	MTWThF	306D	Ar
1w*	American Government.....				
	Sec. 1	IV	MTWFS	LitTh	Ar
	2	VI	MTWThF	306D	Ar
1s*	American Government.....				
	Sec. 1	IV	MTWFS	LitTh	Ar
	2	VI	MTWThF	LitTh	Ar
7f*	State and Local Government	VI	MTWThF	308D	Mr. Cushman
7w*	State and Local Government	VI	MTWThF	109MA	Mr. Cushman
7s*	State and Local Government	VI	MTWThF	209MA	Mr. Cushman

POULTRY HUSBANDRY

No.	Title	Hour	Day	Room	Instructor
1f,w	Poultry	V	MWF	104Ve	Mr. Smith
2w	Poultry-Judging	Ar	Ar	Ar	Mr. Smith
4s	Incubating and Brooding....	V	MWF	104Ve	Mr. Smith
5s	Advanced Poultry-Judging...	Ar	Ar	Ar	Mr. Smith

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Room	Instructor
1f-2w*	General Psychology.....				
	Lect. Sec. 1	I	MW	LitTh	Mr. Elliott, Mr. Foster
	2	VII	MW	LitTh	Mr. Elliott, Mr. Foster
	Rec. Sec. 1	III	S	Psy	
	2, 3	VII	Th or F	Psy	
3s*	General Psychology (cont.)..				
	Lect.	I	MW	LitTh	Mr. Elliott
	Rec. Sec. 1	I	Th or F or S	Psy	
	2	III	Th or F or S	Psy	
	3	V	Th or F	Psy	
	4	VII	Th or F	Psy	
4f-5w*	Introductory Laboratory Psychology				
	Sec. 1	I, II	TTh	211Psy	Mr. Foster
	2	III, IV	TS	211Psy	
	3	V, VI	TTh	211Psy	
	4	VII, VIII	TTh	211Psy	
7s*	Introductory Laboratory Psychology				
	Sec. 1	V, VI	MTWF	211Psy	
	2	III, IV	MTWF	211Psy	
101f-102w*	Experimental Psychology....	VI	MWF		
		VII	WF	116Psy	Miss Fernald

*Offered on the Minneapolis campus.

COURSES IN FORESTRY

108-109	Advanced General Psychology	6†	Sr.	101-102 or by permission
114-115	Human Behavior.....	6†	Jr., sr.	1-2, 4-5 or 7, 9 cr. an. biol., or by permission
119-120	Animal Behavior.....	6†	Jr., sr.	1-2, 4-5 or 7, 9 cr. an. biol., or by permission
121	Neuro-Psychology	3	Jr., sr.	1-2, 4-5 or 7, 9 cr. an. biol., or by permission
125-126	Differential Psychology.....	6†	Jr., sr.	1-2, 4-5 or 7
127	Social Psychology.....	5	Jr., sr.	1-2, 4-5 or 7
135-136	Dynamic Psychology.....	6†	Jr., sr.	1-2, 4-5 or 7
144-145	Abnormal Psychology.....	6†	Jr., sr.	1-2, 4-5 or 7

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

PUBLICATIONS AND RURAL JOURNALISM

No.	Title	Credits	Offered to	Prerequisite courses
10-11-12	Agricultural Journalism.....	9	Jr., sr.	13-14-15, 16-17
19	Agricultural Publicity.....	3	Jr., sr.	Rhet. 19 cred. or rhet. 9 cred.. Eng. 9 cred.

RHETORIC

No.	Title	Credits	Required of	Prerequisite courses
1	Rhetoric I.....	3	All	None
2	Rhetoric II.....	3	All	1
3	Rhetoric III.....	3	All	2
4	Elementary Rhetoric.....	3	All	None

† The full course must be completed before credit will be allowed.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
108w-109s*	Advanced General Psychology	II	MWF	109Psy	.....
114w-115s*	Human Behavior.....	II	TThS	109Psy	Mr. Elliott
119f-120w*	Animal Behavior.....	VI	MWF		Mr. Lashley
121s*	Neuropsychology	VII	WF	109Psy	Mr. Lashley
		VI	MWF		Mr. Lashley
125f-126w*	Differential Psychology.....	VII	WF	109Psy	Mr. Lashley
		III	MWF	109Psy	Miss Fernald
127s*	Social Psychology.....	IV	MTWFS	115Psy	Mr. Bird
135w-136s*	Dynamic Psychology.....	III	TThS	115Psy	Mr. Woodrow
144f-145w*	Abnormal Psychology.....	IV	MWF	109Psy	Mr. Lashley

PUBLICATIONS AND RURAL JOURNALISM

No.	Title	Hour	Day	Room	Instructor
10f-11w-12s	Agricultural Journalism.....	V	MWF	317Ad	Mr. Kirkwood
19f	Agricultural Publicity.....	I	TThS	4PP	Mr. Kirkwood

RHETORIC

No.	Title	Hour	Day	Room	Instructor
1f	Rhetoric I.....				
	Sec. 1	I	MWF	310En	Miss Jenkins
	2	II	MWF	310En	Miss Jenkins
	3	III	MWF	310En	Miss Clausen
	4	IV	MWF	310En	Miss Clausen
1w,s	Rhetoric I.....	VI	MWF	310En	Miss Jenkins
	Rhetoric II.....	II	MWF	308En	Miss Clausen
2f,s	Rhetoric II.....				
	Sec. 1	II	MWF	310En	Miss Jenkins
	2	IV	MWF	310En	Miss Jenkins
	3	IV	MWF	217En	Miss Clausen
	4	I	TThS	310En	Miss Clausen
3f	Rhetoric III.....	III	TThS	310En	Miss Jenkins
	Rhetoric III.....	III	MWF	310En	Miss Jenkins
3s	Rhetoric III.....				
	Sec. 1	II	MWF	310En	Miss Jenkins
	2	IV	MWF	310En	Miss Clausen
	3	IV	MWF	307En	Miss Jenkins
	4	I	TThS	310En	Miss Jenkins
4f,w,s	Elementary Rhetoric.....	Ar	Ar	Ar	Miss Clausen
					Miss Jenkins

*Offered on the Minneapolis campus.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
11	Argumentation	3	Soph., jr., sr.	3
22	Public Speaking.....	3	Soph., jr., sr.	3
24	Advanced Public Speaking..	3	Soph., jr., sr.	22
31	Survey of English Literature			
	I	5	Soph., jr., sr.	3
32	Survey of English Literature			
	II	3	Soph., jr., sr.	31

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

French

No.	Title	Credits	Offered to	Prerequisite courses
1-2	Beginning French.....	10†	All	None
3-4	Intermediate French.....	10	All	1-2 or 2 yrs. h. s

† The full course must be completed before credit will be allowed.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
11f	Argumentation				
	Sec. 1	I	MWThFS	311En	Mr. Lansing
	2	IV	MTWFS	311En	Mr. Burtis
11W	Argumentation	III	MTWFS	311En	Mr. Burtis
11S	Argumentation	III	MTWFS	307En	Mr. Lansing
22f	Public Speaking.....	III	MTWFS	311En	Mr. Burtis
22W	Public Speaking.....				
	Sec. 1	I	MTWFS	311En	Mr. Burtis
	2	IV	MTWFS	311En	Mr. Burtis
22S	Public Speaking.....				
	Sec. 1	III	MTWFS	311En	Mr. Burtis
	2	IV	MTWFS	311En	Mr. Burtis
24f,W,S	Advanced Public Speaking..	II	TThS	311En	Mr. Burtis
31f,W,S	Survey of English Literature				
	I	II	MWThFS	306En	Mr. Lansing
32W,S	Survey of English Literature				
	II	I	MWF	310En	Mr. Lansing

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

French

No.	Title	Hour	Day	Room	Instructor
1f-2W*	Beginning French.....				
	Sec. 1	I	TWThFS	213F	Ar
	2	II	MWThFS	227F	Ar
	3	III	MTThFS	226F	Ar
	4	IV	MTWFS	201F	Ar
	5	V	MTWThF	226F	Ar
	6	VI	MTWThF	202F	Ar
1W-2S*	Beginning French.....				
	Sec. 1	I	TWThFS	227F	Ar
	2	V	MTWThF	202F	Ar
1S*	Beginning French.....				
	Sec. 1	Ar	Ar	Ar	Ar
	2	Ar	Ar	Ar	Ar
2f*	Beginning French.....				
	Sec. 1	I	TWThFS	202F	Ar
	2	V	MTWThF	213F	Ar
3f-4W*	Intermediate French.....				
	Sec. 1	I	TWThFS	205F	Ar
	2	II	MWThFS	204F	Ar
	3	III	MTThFS	213F	Ar
	4	VI	MTWThF	213F	Ar
3W-4S*	Intermediate French.....				
	Sec. 1	I	TWThFS	202F	Ar
	2	V	MTWThF	213F	Ar
3S*	Intermediate French.....				
	Sec. 1	I	TWThFS	213F	Ar
	2	II	MWThFS	227F	Ar
	3	III	MTThFS	226F	Ar
	4	IV	MTWFS	201F	Ar
	5	V	MTWThF	226F	Ar
	6	VI	MTWThF	202F	Ar

*Offered on the Minneapolis campus

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
20	Oral and Written French...	5	All	3-4 or 3 yrs. h. s.
21-22-23	Survey of French Literature	9†	All	3-4 or 3 yrs. h. s.
50-51-52	French Conversation.....	3†	Jr.,‡ sr.	3-4 or 3 yrs. h. s., 53-54-55 or parallel
53-54-55	French Composition.....	3†	Jr.,‡ sr.	3-4 or 3 yrs. h. s.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

Spanish

No.	Title	Credits	Offered to	Prerequisite courses
1-2	Beginning Spanish.....	10†	All	None

† The full course must be completed before credit will be allowed.

‡ Open without petition to sophomores who can satisfy the requirements.

PROGRAM

101

No.	Title	Hour	Day	Room	Instructor
4f*	Intermediate French.....				
	Sec. 1	I	TWThFS	227F	Ar
	2	II	MWThFS	213F	Ar
	3	III	MTThFS	124F	Ar
	4	IV	MTWFS	125F	Ar
	5	V	MTWThF	202F	Ar
20f*	Oral and Written French....				
	Sec. 1	III	MTThFS	205F	Mr. Frelin
	2	VI	MTWThF	206F	Ar
20s*	Oral and Written French....				
	Sec. 1	I	TWThFS	15F	Ar
	2	II	MWThFS	213F	Ar
	3	VI	MTWThF	213F	Ar
21f-22w-23s*	Survey of French Literature				
	Sec. 1	II	TThS	107F	Mr. Barton
	2	III	TThS	301F	Mr. Strich
	3	VI	MWF	107F	Mr. Searles
50f-51w-52s*	French Conversation.....				
	Sec. 1	III	MW	201F	Miss Guinotte
	2	V	MW	107F	Mr. Frelin
53f-54w-55s*	French Composition.....				
	Sec. 1	III	F	201F	Miss Guinotte
	2	V	F	107F	Mr. Frelin

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Spanish

No.	Title	Hour	Day	Room	Instructor
1f-2w*	Beginning Spanish.....				
	Sec. 1	I	TWThFS	15F	Ar
	2	II	MWThFS	226F	Ar
	3	III	MTThFS	227F	Ar
	4	IV	MTWFS	226F	Ar
	5	V	MTWThF	201F	Ar
	6	VI	MTWThF	226F	Ar
1w-2s*	Beginning Spanish.....				
	Sec. 1	II	TWThFS	202F	Ar
	2	VI	MTWThF	125F	Ar
1s*	Beginning Spanish.....				
	Sec. 1	II	TWThFS	201F	Ar
	2	VI	MTWThF	226F	Ar
2f*	Beginning Spanish.....				
	Sec. 1	I	TWThFS	201F	Ar
	2	VI	MTWThF	201F	Ar
3f-4w*	Intermediate Spanish.....				
	Sec. 1	II	MWThFS	201F	Ar
	2	III	MTThFS	202F	Ar
	3	V	MTWThF	109F	Ar
3w-4s*	Intermediate Spanish.....				
	Sec. 1	I	TWThFS	201F	Ar
	2	VI	MTWThF	201F	Ar

*Offered on the Minneapolis campus.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
3-4	Intermediate Spanish.....	10	All	1-2 or 2 yrs. h. s.
20	Oral and Written Spanish..	5	All	3-4 or 3 yrs. h. s.
50-51-52	Spanish Conversation.....	3†	Jr., ‡ sr.	3-4 or 3 yrs. h. s., 53-54-55 or parallel
53-54-55	Spanish Composition.....	3†	Jr., ‡ sr.	3-4 or 3 yrs. h. s.
65-66-67	Survey of Spanish Literature	9†	Jr., ‡ sr.	3-4

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Credits	Offered to	Prerequisite courses
1	Introduction to Sociology....	3†† or 5	3d qu. fr., soph., jr., sr.	None
6	Modern Social Reform Move- ments	3	Soph., jr., sr.	1

† The full course must be completed before credit will be allowed.

‡ Open without petition to sophomores who can satisfy the requirements.

†† A 3-credit course, open only to students in Agriculture, Forestry, and Home Economics will be offered at University Farm in the fall and spring quarters.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
35*	Intermediate Spanish.....				
	Sec. 1	I	TWThFS	226F	Ar
	2	II	MWThFS	226F	Ar
	3	III	MTThFS	227F	Ar
	4	IV	MTWFS	226F	Ar
	5	V	MTWThF	201F	Ar
	6	VI	MTWThF	227F	Ar
(3s)-4f*	Intermediate Spanish.....				
	Sec. 1	I	TWThFS	301F	Ar
	2	II	MWThFS	202F	Ar
	3	III	MTThFS	308D	Ar
	4	IV	MTWFS	202F	Ar
	5	V	MTWThF	227F	Ar
			MTThFS	202F	Ar
20s*	Oral and Written Spanish...	III			
50f-51w-52s*	Spanish Conversation.....	II	MW	302D	Mr. House
53f-54w-55s*	Spanish Composition.....	II	F	302D	Mr. House
65f-66w-67s*	Survey of Spanish Literature	II	TThS	306F	Mr. House

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Room	Instructor
if	Introduction to Sociology....				
	Sec. 1*	I	TWThFS	9F	
	2*	III	MTThFS	5F	
	3*	IV	MTWFS	301F	
	4, 5*	V	MTWThF	5F,9F	
	6*	VI	MTWThF	9F	
	7 (3 cred.)	IV	MWF	105En	Mr. Lundquist
iw	Introduction to Sociology....				
	Sec. 1*	I	TWThFS	9F	
	2*	III	MTThFS	5F	
	3*	IV	MTWFS	301F	
	4, 5*	V	MTWThF	5F,9F	
	6*	VI	MTWThF	9F	
	7*	VII	MTWThF	110F	
	8 (3 cred.)	IV	MWF	105En	Mr. Lundquist
is	Introduction to Sociology....				
	Sec. 1*	I	TWThFS	9F	
	2*	II	MWThFS	5F	
	3*	III	MTThFS	5F	
	4*	IV	MTWFS	301F	
	5, 6*	V	MTWThF	5F,9F	
	7*	VI	MTWThF	9F	
	8*	VII	MTWThF	110F	
	9 (3 cred.)	IV	MWF	105En	Mr. Lundquist
6f*	Modern Social Reform Move- ments				
	Sec. 1	II	TThS	102F	Ar
	2	IV	MWF	5F	Ar
	3	V	MWF	110F	Ar
	4	VI	MWF	5F	

*Offered on the Minneapolis campus.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
14	Rural Sociology.....	3	Soph., jr., sr.	1‡
51	Background of Dependency and Defectiveness.....	3	Jr., sr.	10 cred. in sociol.; or 10 cred. in sociol. and pol. sci.; econ. or psychol.
52	Treatment of Dependents and Defectives	3	Jr., sr.	51
53	Treatment of Delinquents...	3	Jr., sr.	Same as for 51
55	Housing Problems.....	3	Jr., sr.	Same as for 51
56	Field Practice in Case Work	2	Jr., sr.	51 parallel

‡ No prerequisite for seniors in the College of Agriculture, Forestry, and Home Economics.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
6w*	Modern Social Reform Movements				
	Sec. 1	II	TThS	301F	Ar
	2	IV	MWF	5F	Ar
	3	V	MWF	110F	Ar
	4	VI	MWF	5F	
6s*	Modern Social Reform Movements				
	Sec. 1	II	TThS	301F	Ar
	3	IV	MWF	5F	Ar
	4	V	MWF	110F	Ar
	5	VI	MWF	5F	
14f	Rural Sociology.....				
	Sec. 1*	III	MWF	25F	Ar
	2*	V	MWF	25F	Ar
	3	I	MWF	105En	Mr. Lundquist
14w	Rural Sociology.....				
	Sec. 1*	III	MWF	9F	Ar
	2*	V	MWF	25F	Ar
	3	I	MWF	105En	Mr. Lundquist
14s	Rural Sociology.....				
	Sec. 1*	III	MWF	25F	Ar
	2*	V	MWF	15F	Ar
51f*	Background of Dependents and Defectives.....	I	TThS	5F	Mr. Bruno
51w*	Background of Dependents and Defectives.....	I	MWF	5F	Mr. Bruno
51s*	Background of Dependents and Defectives.....	I	TThS	5F	Mr. Bruno
52w*	Treatment of Dependents and Defectives.....	I	TThS	5F	Mr. Bruno
52s*	Treatment of Dependents and Defectives.....	I	MWF	5F	Mr. Bruno
53f*	Treatment of Delinquents...	III	MWF	9F	
53w*	Treatment of Delinquents...	III	MWF	101F	
53s*	Treatment of Delinquents...	III	MWF	101F	
55w*	Housing Problems.....	I	MWF	101F	Mr. Davis
56f*	Field Practice in Case Work				
	Sec. 1	I, II, III	MW		Mrs. Mudgett
	2	I, II, III	WF		
	3	V, VI, VII	MW		
	4	V, VI, VII	TTh		
	5	V, VI, VII	WF		
56w*	Field Practice in Case Work				
	Sec. 1	II, III, IV	MW		Mrs. Mudgett
	2	II, III, IV	WF		
	3	V, VI, VII	MW		
	4	V, VI, VII	WF		
	5	V, VI, VII	TTh		
56s*	Field Practice in Case Work				
	Sec. 1	V, VI, VII	MW		Mrs. Mudgett
	2	V, VI, VII	WF		
	3	II, III, IV	TTh		
	4	V, VI, VII	TTh		

*Offered on the Minneapolis campus.

COURSES IN FORESTRY

No.	Title	Credits	Offered to	Prerequisite courses
57	Field Practice in Case Work	2	Jr., sr.	52 parallel
60	Child Welfare.....	3	Jr., sr.	52
97-98-99	Supervised Field Practice Work	3, 6 or 9	Jr., sr.	Director's consent
100	Social Psychology.....	3	Jr., sr.	1 and 15 cred. in sociol.; anthro.; econ.; educ.; hist.; philos.; pol. sci.; or psychol. includ- ing Psychol. 1-2
101	Social Organization.....	3	Jr., sr.	4 courses in sociol. or 1 and 15 cred. in sociol.; anth.; econ.; educ.; hist.; philos.; pol. sci.; or psychol.
102	Social Control.....	3	Jr., sr.	Same as for 101
110	Community Organization and Social Work in Small Towns and Country.....	2	Jr., sr.	Same as for 101
114	Rural Social Institutions....	3	Jr., sr.	Same as for 101
119	The Family.....	3	Jr., sr.	Same as for 101
120	Social Progress.....	3	Jr., sr.	Same as for 101
122	Methods of Social Investiga- tion	3	Jr., sr.	Same as for 101
123	Social Statistics.....	3	Jr., sr.	122
128	Charitable Administration, Finance, and Publicity....	2	Jr., sr.	Same as for 101
130	Technic of Family Treatment	2	Jr., sr.	Same as for 101 including 52
134	Legal Protection of the Child	3	Jr., sr.	Same as for 101 including 60
138-139	Mental Case Work.....	6	Jr., sr.	Same as for 130
140	History of Social Theory....	3	Jr., sr.	Same as for 101
141	Contemporary Social Theory	3	Jr., sr.	Same as for 101
150	Seminar: The Literature of Social Protest.....		Sr.	Consent of director
180-181-182	Seminar in Educational Soci- ology	6	Jr., sr.	1, 6, 120

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
57w*	Field Practice in Case Work				
	Sec. 1	II, III, IV	MW		Mrs. Mudgett
	2	II, III, IV	WF		
	3	V, VI, VII	MW		
	4	V, VI, VII	WF		
	5	V, VI, VII	TTh		
57s*	Field Practice in Case Work				
	Sec. 1	V, VI, VII	MW		Mrs. Mudgett
	2	V, VI, VII	WF		
	3	II, III, IV	TTh		
	4	V, VI, VII	TTh		
60w*	Child Welfare.....	VIII	MWF	9F	Mr. Hodson
97f-98w-99s*	Supervised Field Practice				
	Work	Ar	Ar	Ar	Mrs. Mudgett
100f*	Social Psychology.....	II	TThS	9F	Mr. Bernard
101w*	Social Organization.....	II	TThS	9F	Mr. Bernard
102s*	Social Control.....	II	TThS	9F	Mr. Bernard
110w*	Community Organ. and So-				
	cial Work in Small Towns				
	and Country.....	VII-VIII	Th	9F	Mr. Bernard
114s	Rural Social Institutions....	I	MWF	105En	Mr. Lundquist
119f*	The Family.....	III	TThS	9F	
120f*	Social Progress.....	II	MWF	9F	
122w*	Methods of Social Investiga-				
	tion	VII	MWF	9F	Mr. Elmer
123s*	Social Statistics.....	VII	MWF	9F	Mr. Elmer
128s*	Charitable Administration,				
	Finance, and Publicity....	VII-VIII	Th	9F	Mr. Davis
130s*	Technic of Family Treat-				
	ment	VII-VIII	T	9F	Mr. Bruno
134s*	Legal Protection of the Child	VIII	MWF	9F	Mr. Hodson
135w*	Mental Case Work.....	VII, VIII	T and Ar	5F	Miss Seeberg
139s*	Mental Case Work.....	VIII	Th and Ar	5F	Miss Seeberg
140w*	History of Social Theory...	II	MWF	9F	Mr. Bernard
141s*	Contemp. Social Theory.....	II	MWF	9F	Mr. Bernard
180f-181w-		VIII-IX	M	Ed	Mr. Finney
182s*	Seminar in Educ. Sociol....				

*Offered on the Minneapolis campus.

COURSES IN FORESTRY

SOILS

No.	Title	Credits	Offered to	Prerequisite courses
4	Soils	3	Soph., jr., sr.	Chem. 10 cred.
5	Soil Fertility.....	3	Soph., jr., sr.	4
101	Chemical Analysis of Soils..	3-5	Jr., sr.	5, quant. anal.
102	Special Problems in Soils....	*	Jr., sr.	101 or 108
104	Soil-Surveying	3	Jr., sr.	108
105	Minnesota Soils.....	3	Jr., sr.	5
106	Peat Soils.....	2	Jr., sr.	5
107	Fertilizers and Manures....	2	Jr., sr.	5
108	Physical Properties of Soils..	3	Jr., sr.	5

VETERINARY MEDICINE

ANIMAL INDUSTRY GROUP

No.	Title	Credits	Offered to	Prerequisite courses
2	Anatomy of Domestic Animals	5	Soph., jr., sr.	None
3-4	Comparative Physiology.....	6	Soph., jr., sr.	2
6	Physiology and Hygiene of Breeding	3	Jr., sr.	3-4
8	Veterinary Studies.....	5	Soph., jr., sr.	None
12	Infectious Diseases.....	3	Jr., sr.	3-4, Bact. 1
13	Non-Infectious Diseases....	3	Jr., sr.	3-4
101-102	Advanced Anatomy of Domestic Animals.....	6	Jr., sr.	2 or equiv.
103-104	Advanced Comparative Physi- ology	6	Jr., sr.	3-4 or equiv.

* Credit according to the amount of work.

PROGRAM

SOILS

No.	Title	Hour	Day	Room	Instructor
4f	Soils				
	Lect.	III	TTh	251Ch	Mr. Rost
	Lab.	III, IV	S	253Ch	
5s	Soil Fertility.....				
	Lect.	III	TTh	251Ch	Mr. Alway,
	Lab.	III, IV	S	253Ch	
101f	Chemical Analysis of Soils..	Ar	Ar	Ar	Mr. Rost
102w,s	Special Problems in Soils...	Ar	Ar	Ar	Mr. Alway
104s	Soil-Surveying	Ar	Ar	Ar	Mr. McMiller
105w	Minnesota Soils.....	Ar	Ar	Ar	Mr. Alway
106w	Peat Soils.....	Ar	Ar	Ar	Mr. Alway
107w	Fertilizers and Manures....	Ar	Ar	Ar	Mr. Rost
108w	Physical Properties of Soils	Ar	Ar	Ar	Mr. McMiller

VETERINARY MEDICINE

No.	Title	Hour	Day	Room	Instructor
2t	Anatomy of Domestic				
	Animals	V	MTWF	2Ve	Mr. Kernkamp
		II	MWThFS	2Ve	
3w-4s	Comparative Physiology.....	I	TThS	2Ve	Mr. Hewitt
6f	Physiology and Hygiene of				
	Breeding	IV	MWF	9Ve	Mr. Boyd
8s	Veterinary Studies.....	III	MTWFS	9Ve	Mr. Reynolds
12w	Infectious Diseases.....	I	MWF	2Ve	Mr. Fitch,
					Mr. Billings
13s	Non-Infectious Diseases.....	I	MWF	2Ve	Mr. Boyd
101w-102s	Advanced Anatomy of				
	Domestic Animals.....	Ar	Ar	Ar	Mr. Kernkamp
	(Limited to 9)				
103f-104w	Advanced Comparative Physi-				
	ology				
	Lect.	II	TTh	9Ve	Mr. Hewitt
	Lab.	V, VI	Th	9Ve	Mr. Hewitt

The Bulletin of the University of Minnesota

*Graduates of the School of Mines
1921-1922*



33
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SCHOOL OF MINES SOCIETY OFFICERS

1920-1921

President.....Kenneth A. Johnston
Vice-President.....Frank J. Hamernik
Secretary-Treasurer.....Donald U. Gray

1921-1922

President.....Garfield C. Siverson
Vice-President.....Maurice Adams
Secretary-Treasurer.....W. R. Griswold

SCHOOL OF MINES SOCIETY MEMBERS

Seniors

Butler, Roy G.	Johnston, Kenneth A.
Carlson, Edwin N.	Nicholls, William J.
Chadbourn, Charles H.	Sebenius, Carl H.
Davies, Herman F.	Sponberg, Edwin C.
Dawson, Loren W.	Walz, C. M.
Frank, Elden	Wenger, Frank B.
Gandrud, Bennie W.	West, Herbert S.
Hamernik, Frank J.	Zanger, Eugene

Juniors

Adams, E. Maurice	Johnson, Ralph C.
Anderson, Oscar B.	Kip, Raymond G.
Barker, Clifton T.	Lin, Sze Chen
Chang, Chen Ping	Lovering, Thomas S.
Clay, Withers	McKenzie, Frederick R.
Echebarria, Luis de Uribe	Moga, Gregory M.
Gray, Donald U.	Plut, Frank J.
Gustafson, Arnold A.	Ridgway, Robert H.
Hoffman, Louis	Siverson, Garfield C.
Hope, Lawrence D.	Thoeni, Victor T.

Wilson J. Byron

Sophomores

Allen, Arthur W.	Gallagher, Luke J.
Allen, Lauren L.	Gerber, William A.
Anderson, Alfred T.	Gordon, Maurice E.
Ballord, John A.	Gow, Alexander M.
Brawley, John N.	Graeber, Clyde P.
Brenner, Walter W.	Greenberg, Arnold N.
Brooke, Clinton L.	Griswold, W. R.
Calhoun, Robert A.	Gross, Forrest C.
Case, Carlos C.	Gudmundson, Stanley L.
Case, Leslie M.	Hall, Howard C.
Chang, Chi	Hansen, Mayer G.
Conhaim, Howard J.	Hawlik, Hartley H.
DeVaney, Fred D.	Heathcote, William O.
Dinmore, Harry C.	Henkel, Howard L.
Erdmann, Charles E.	Hezzlewood, George W.
Erickson, Arthur C.	Jeffers, G. B.
Foss, Adolph L.	Jensen, Willard C.
Friedl, Arthur	Kegler, Vern L.

Knutson, Clarence J.
Kwong, Shou Kun
Larsen, Raymond M.
Latendresse, Henry E.
Levy, Julian H.
Lilly, Richard J.
Lundquist, O. William
Lust, Harold W.
Middleton, John L.
Mooney, Frank E.
Murphy, Fred M.
Opdahl, Carl
Pabst, Henry A.
Patten, Richard C.
Person, Virgil H.
Queneau, Roland B.
Russell, Charles B.
Rydlyn, Edwyn G.
Scheid, Adolph J.

Searles, John N.
Sjolinder, Anthony O.
Smith, Donald K.
Smith, Lyle W.
Smith, Wayland H.
Stewart, James L.
Sundeen, Ludvig J.
Swart, John A.
Swensen, Clifford H.
Thellin, Herbert E.
Tollefson, Everett H.
Trulander, William
Vivian, Edgar W.
Wachtel, Dean E.
Wilcox, Fred H.
Winter, W. Morse
Wolfer, Donald H.
Wrbitzky, Harry M.
Wright, Donald R.

Freshmen

Apuli, Waino E.
Barker, Merlin M.
Beggs, Perry R.
Betts, David
Blair, John V.
Boreen, Mildred S.
Boxell, John W.
Breitkreutz, Lloyd A.
Brock, Henry K.
Brunner, Donald G.
Curran, Francis J.
Davis, Park
Forsyth, Arthur C.
Grabau, E. L.
Griffith, E. H.
Groch, John R.
Hakes, Lloyd A.
Hufford, Allan S.
Huang, Ta Hing
Hutchinson, Barnard
Idzal, Walter G.
Johnson, Robert C.
Johnstone, George J.
Jones, Elmer A.
Kean, N. Dudley
Kimm, Gervaise A.
Kirby, Donald R.

Larpenteur, Bernard J.
Lee, Clarence O.
Linstrom, John H.
McAdams, Clayton E.
Mann, Victor I.
Miller, Ackley K.
Miller, Harold C.
Moe, Cecil J.
Murphy, John D.
Nelmark, John H.
Nordquist, Conrad
Olson, Stanley G.
Oscarson, Philip E.
Packard, Silas M.
Porter, Roy R.
Powers, Kenneth
Rea, Vernon A.
Rivkin, Bennie
Rorem, Bernard E.
Scheid, Carl F.
Silkey, Rodly T.
Soderstrom, Leonard G.
Sturgeon, John R.
Sung, Kuo Hsiang
Thorndyke, Royal J.
Treat, Herbert R.
Tregrove, Stanley A.

Winter, Harry

THE ALUMNI DIRECTORY

List I—A list of all graduates by classes.

List II—An alphabetical list of graduates with individual records.

List III—An alphabetical list of former members who are following mining and metallurgical work.

List IV—Graduates and former members listed according to geographical location.

List V—Letters sent to the graduates at the addresses given in this list have been returned to us. The Secretary of the School of Mines Society would greatly appreciate any information regarding the present location of these men.

LIST I

GRADUATES BY CLASSES

1894

Peter Christianson

*Harry C. Cutler

1895

Charles D. Wilkinson

1896

Thomas M. Hughes

Albert E. May
Wallace N. Tanner

1897

George Becker

Eugene C. Mills
Roland T. Wales

1898

Cyril Brackenbury
Peter Christianson
Joseph B. McIntosh

Albert E. May
George A. Pratt
Clinton L. Walker

1899

William C. Bass

Andrew Peterson
Frank M. Warren

* Deceased.

1900

William L. Campbell
Eugene D. Chandler
Oliver J. Egleston
Walter E. Hunt

Edward P. McCarty
Rutherford B. Sumner
Harold W. Teague
Rensselaer H. Toll

1901

Thomas O. Burgess
W. Howard Clapp
Arthur L. Gholz

Henry S. Sanderson
Elmo V. Smith
Hoval A. Smith
John Taresh

1902

Henry H. Holden

*Charles C. Hoyt
Charles S. Morris

1903

Samuel W. Cohen
Edward M. Field
John G. Flynn
Harold J. Hoard
*Ralph I. Johnson

Donald M. Rait
Franklin W. Smith
Lawrence K. Sowle
William H. Truesdell
Eugene E. Whiteley
Arno Winther

1904

*Samuel T. Bass
Frank A. Bowman
Harold I. Brosius
Francis C. Devereux
William H. Hale
Lewis K. Houlton

Merton S. Kingston
Amor F. Keene
Andrew L. McCarty
Lucien Merritt
Sydney L. Shonts
*Dewey C. Squyer

1905

Harry H. Angst
Robert R. Boyd
W. Chauncey Cadwell
Allan B. Calhoun
Duncan E. Curry
Thorold F. Field
Hervey Gulick

Orrin E. M. Keller
Henry E. Loye
Walter W. Lytzen
Henry S. McKay
Robert S. Merriam
Emil G. Minder
Erick J. Schrader
Ralph A. Ziesemer

* Deceased.

1906

John Brandt
 Lester L. Clement
 Guy P. Harrington
 Frank T. Howes
 Paul S. Kurtzman
 William F. Moenke

Charles Morgan
 Berthold R. Neustadt
 Edward S. O'Connor
 Horace C. Rawson
 William A. Rose
 George W. Wallace

Walter H. Wheeler

1907

Robert H. Bassett
 James Cowin
 Silas L. Gillan
 Charles F. Jackson
 *Arthur S. McCreery
 Randolph J. McRea
 *George E. Malcolmson
 *Bartley F. Noehl
 Anton C. Oberg

Henning E. Olund
 Walter H. Parker
 Elmer A. Probst
 Olaf Roed
 Edgar W. Smith
 Charles W. Steele
 Karl P. Swensen
 Michael A. Wiest
 Harry M. Ziesemer

1908

Patrick J. Boyle
 James A. Cullyford
 *Christen F. Dahl
 William A. Deichen
 Frank R. Edwards
 William R. Goodwin
 *John A. Grimes

Ole G. Hoass
 John J. Kennedy
 Arthur K. Knickerbocker
 Alfred M. Locke
 John S. Olmstead
 Joseph S. Peterson
 John L. Strong

1909

Willard A. Cole
 Jay Crowley
 Lawrence T. Gavin
 Roy C. Grant
 George B. Hoganson

Samuel L. Hoyt
 Lynn Rood
 Julius H. Santo
 Harold G. Taylor
 Homer A. Williams

1910

*Eugene L. Bills
 Harry R. Bischoff
 Charles R. Conkey
 Lawrence Devereux
 Kenneth J. Duncan
 Henry E. Farnam

Ernest A. Fritzberg
 George M. Giltinan
 Norman P. Goodrich
 Benjamin G. Harmon
 Clarence L. Heath
 Charles S. Heidel

* Deceased.

William E. Herring
Fred W. Holler
*Harry Jacobsen
Algot F. Johnson
Philo E. Jones
Clarence L. Larson
Forest M. Leonard

James R. McKenzie
Reville G. Moody
John R. Newell
Peter M. Ostrand
G. Gordon Stewart
Archie J. Strane
Axel H. Swanson

1911

Theodore S. Abbott
Joseph Anderson
Walter C. Anderson
Paul T. Bailey
Emory P. Baker
Charles S. Beck
Anshelm C. Borgeson
Robert J. Burgess
Charles S. Crouse
George M. Drake
Victor E. Ekloff
Jay R. Elliott
Victor L. Fixen

Arthur W. Fosness
*Arthur Stanley Hill
*John J. Hurley
William F. Jahn
Neil S. Kingsley
Milton S. Lindholm
Ervin W. McCullough
Harold Rahilly
*Sam G. Swartz
John R. Tetlie
E. Harold Walker
Charles W. Walters
Arthur J. Wehr

Lloyd R. Whitson

1912

Guy N. Bjorge
Edward D. Coventry
Robert Dickson
Leonard J. Hagstrom
George L. Harrington
Ezra A. Hewitt
La Fayette Knox
Edward G. Kremer
John Lea
John W. Lewis
Howard R. McAdams

Lynn Martin
J. Charles O'Brien
Walter S. Olson
Joe B. Perry
Roswell W. Prouty
Max F. Quinn
Howard Stevens
William L. Taylor
Albin F. Victor
Arthur Wallinder
Rollie B. Walter

Clark N. Woodis

1913

Leo J. Coady
Robert H. Ely
Arthur H. Hammond
J. Bernard Hanson
Olaf Hondrum

Greeley Ladd
Roy G. Michie
Arvid Nissen
Norman Ofsthun
Charles A. Walker

* Deceased.

1914

Arthur P. Anderson
Alfred C. Bierman
Howard N. Eidemiller
Ernest L. Larson

Orrin W. Potter
Howard Quinlan
Louis Ravicz
John H. Robertson
Harold J. Wasson

1915

William V. Builer
Alfred Christenson
*Malcolm W. Clark
Walter A. Coller
Leon T. Collins
Albert C. Haugan
Louis S. Heilig

Charles D. Kerr
Herman Neerland
Fred C. Ramsing
Richard M. Sanchez
George K. Urquhart
Henry H. Wade
Paul S. Williams

1916

Sam Aronson
John J. Craig
Fred A. Davies
Adolph Dovre

Alvin T. Krogh
Oscar Lee
Archie J. McDermid
Roy H. McHardy
Harry H. Nord

1917

Edwin H. Anderson
Charles E. Buresch
*Thomas E. Cassilly
Lewis S. Coryell
Richard C. Dennis
J. Lawrence Dopp
William H. Elson
Omer F. Ernster

Edward J. Fearing
W. Earle Hubbard
Yih Kun Kwong
A. Irving Levorsen
Paul A. Peterson
Edwin A. Sweetman
Carleton S. Wallace
John J. Woodruff

1918

Raymond W. Allard
Harold K. Armstrong
Percy G. Cowin
Ralph L. Dowdell
Lyndon L. Foley
Roger W. Gannett
Sydney Harmon

Chung Hsieh
Guy E. Ingersoll
Walther L. Jerrard
*Laing Lee
John A. Moga
Howard E. Quinn
Harry W. Strand

* Deceased.

1919

Sidney A. Frellsen
 Bert Goldberg
 Samuel B. Goldberg

Joseph O. Hosted
 Walter R. Mellen.
 Wen Ping Pan

1920

Robert E. Ainsworth
 Lewis E. Arnold
 A. K. Bailey, Jr.
 Fred E. Clark
 William A. Copeland
 Abner J. Donaghue
 John Edwin

Harry O. Frank
 Axel L. Johnson
 Erwin H. Kersten
 Israel Mark
 Clifford R. Nichols
 Clarence D. Peterror.
 Clifford R. Raiter

James D. Wheeler

LIST II

ALPHABETICAL LIST OF GRADUATES WITH INDIVIDUAL RECORDS

ABBOTT THEODORE S., E.M.....1911
 (Home Address) 425 Dayton Avenue, St. Paul, Minn.

With the Calumet and Arizona Mining Co., June, 1911, to January, 1912. With Miami Copper Co., Miami, Ariz., February to September, 1912. Assistant engineer, Liberty Bell Gold Mining Co., Telluride, Colo., September, 1912, to November, 1913. Chief engineer for same company, November, 1913, to October, 1917. U. S. service, October, 1917 to August, 1919. At Bingham Canyon, Utah, September to April, 1920. Vipont Silver Mining Co., Oakley, Idaho, April, 1920 to date.

AINSWORTH, ROBERT E., E.M.....1920
 Care of State Highway Commission, St. Paul, Minn.

With Minnesota State Highway Commission to date.

ALLARD, RAYMOND W., Met.E.....1918
 1754 W. Minnehaha, St. Paul, Minn.

U. S. military service to December 6, 1918. Metallurgical engineer for the Northern Malleable Iron Company, St. Paul, Minn., to date.

ANDERSON, ARTHUR P., E.M.....1914
 Miami, Ariz.

Powder man for E. G. Evensta Co., Minneapolis, June to October, 1914. Rodman, Inspiration Consolidated Copper Co., Miami, Ariz., March to July, 1915. Stope engineer, July, 1915 to April, 1916. Shift boss, April, 1916 to date.

- ANDERSON, EDWIN H., E.M.....1917
 Crystal Falls, Mich.
 Engineer, Oliver Iron Mining Co., Hibbing, Minn., September, 1917.
 U. S. service from September, 1917 to October, 1919. Valuation engineer
 for the M. & St. L. R. R., Minneapolis, November, 1919 to June, 1920.
 Engineer, the McKinney Steel Company from June, 1920 to date.
- ANDERSON, JOSEPH H., E.M.....1911
 See List No. V.
- ANDERSON, WALTER C., E.M.....1911
 Hibbing, Minn.
 Mining Engineer, Webb Mine, Shenango Furnace Co., January, 1916
 to date.
- ANGST, HARRY H., E.M.....1905
 Chisholm, Minn.
 Engineer, Hull-Rust Mines, Oliver Mining Co. Foreman, Hull-Rust
 Pit, 1905 to 1908. Foreman, Monroe Mine, Chisholm, Minn. Mine in-
 spector, Chisholm District. Mine foreman, Hartley Burt Mine, Chisholm,
 1917 to date.
- ARMSTRONG, HAROLD K., E.M.....1918
 (Home address) 3034 Lyndale Avenue So., Minneapolis, Minn.
 U. S. service to November, 1918. With Minnesota Geological Survey
 from November, 1918 to May, 1919. With Liberty Bell Gold Mining Co.,
 May, 1919 to May, 1920. With American Silver Corporation, June, 1920.
 With Burro Mountain Copper Company, June, 1920 to March, 1921. En-
 gineer, New Silver Queen Mining Co., March, 1921, Galena, S. D. Miner,
 Homestake Mining Co., Lead, S. D., April and May, 1921. Geologist
 Cerro de Pasco Copper Corp., Cerro de Pasco, Peru, to date.
- ARNOLD, LEWIS E., E.M.....1920
 2603 Stevens Ave., Minneapolis, Minn.
 Junior mining engineer with the Braden Copper Company, Rancagua,
 Chile. State Highway Commission to date.
- ARNOSON, SAM M., E.M.....1916
 Care of Butte and Superior Mining Co., Butte, Mont.
 Engineer, Perseverance Mine, Alaska Gastineau Mining Co., Juneau,
 Alaska to January, 1917. Mill operator, same company at Thane, Alaska
 to March, 1917. Assayer, Tacoma Smelting Co., Tacoma, Wash., to
 September, 1918. Smelter representative, Butte and Superior Mining Co.,
 to February, 1920. Research work with same company to date.

BAILEY, A. K., Jr., E.M.....1920
(Home address) 3304 Grand Ave., Minneapolis, Minn.

Junior mining engineer, Braden Copper Company, Rancagua, Chile to date.

BAILEY, PAUL T., E.M.....1911
Yanke Jims, Calif., via Colfax, Calif.

Engineer for Lake Superior Iron and Steel Corporation, June to December, 1911. Shift boss, Nipissing High Grade Mill, Cobalt, Ont.

BAKER, EMORY P., E.M.....1911
6027 Woodlawn Ave., Chicago, Ill.

Steel foreman, Leonard Construction Co., of Chicago, May to August, 1911. Masonry inspector, Illinois Central R. R. Co., August, 1911 to July, 1913. Draftsman, Bridge department, Illinois Central R. R. Co., July, 1913 to 1916. Assistant engineer, Bridge department, same company. Assistant chief draftsman, Bridge department to date.

*BASS, SAMUEL T., E.M.....1904

BASS, WILLIAM C., E.M.....1899
Los Angeles, Cal. Care of Smith, Emery & Co.

Assayer, American Developing & Mining Co., at Gibbonsville, Idaho, 1899 to 1901. Mining engineer, Chandler Iron Mine, Ely, Minn., 1901 to 1902. Superintendent, Maxwell Mine, Chloride, Ore., 1902 to 1904. Manager, Black Eagle Mine, 1904 to 1907. Manager, Mining department, for Smith, Emery & Co., San Francisco and Los Angeles, 1908 to 1919. President, Smith Emery Co., Los Angeles 1919 to date.

BASSETT, ROBERT H., E.M.....1907
Care of Hanna Ore Mining Co., Hibbing, Minn.

Draftsman and estimator, Andrews Heating Co., Minneapolis, Minn., 1908 to 1909. Assistant engineer, Great Northern Iron Ore Properties, Hibbing, Minn., 1909 to 1912. Assistant engineer, Arthur Iron Mining Co., Duluth, Minn., 1912 to 1915. Chief engineer, Eastern District, Arthur Iron Mining Co., Chisholm, Minn., 1915 to July, 1917. Chief engineer, Hanna Ore Mining Co., July, 1917 to date.

* Deceased.

BECK, CHARLES S., E.M.....1911
Box 504, Morenci, Ariz.

Mill operator, Miami Copper Co., January to July, 1912. Engineer, Morenci Water Co., July, 1912 to November, 1913. Engineer, Detroit Copper Co., November, 1913 to August, 1916. Superintendent, Morenci Water Co., August, 1916 to date.

BECKER, GEORGE, E. M.....1897
See List No. V.

*BILLS, EUGENE L., E.M.....1910

BIERMAN, ALFRED C., E.M.....1914
Care of Harrison & Eaton, W. T. Waggoner Bldg., Ft. Worth, Texas.

Assistant geologist in the employ of Mr. Ralph Arnold, Los Angeles, Calif., June to August, 1914. With the Oliver Iron Mining Co., September, 1914 to January, 1915. Instructor in the Hibbing Public Schools, January to April, 1915. Engineer, Oliver Mining Co., April to December, 1915. Assistant geologist, Producers Oil Co., Tampico, Tamps, Mexico, December, 1915 to July, 1916. Geologist same company, Costa Rica, C. A., July to November, 1916. Division geologist, same company, Colombia, South America, November, 1916 to November, 1917. U. S. service, November, 1917 to February, 1919. Geologist, the Texas Company, Houston, Tex., April, 1919. Geologist, Harrison & Eaton, W. T. Waggoner Bldg., Ft. Worth, Texas.

BISHOP, HARRY R., E.M.....1910
Crown Reserve Mining Co., Cobalt, Ontario, Canada.

Miner, mine sampler, for Crown Reserve Mining Co., Ltd., Cobalt, Ont., from July, 1910 to January, 1911. Mine surveyor, for same company, January, 1911 to February, 1915. On mine examinations, Central America, for the Crown Reserve Mining Co., Ltd. On mine examinations, Idaho and British Columbia, for the same company to May, 1916. Manager, Molybdenite Claims Co., Harricana, Que., May to September, 1916. Superintendent, Dominion Mine, Cobalt, Ont., September, 1916 to August, 1918. Superintendent Bluestone Mining & Smelting Co., Mason, Nev., from August, 1918 to March, 1920. Field engineer, Crown Reserve Mining Co., Ltd., from March, 1920 to October, 1921, Superintendent, Crown Reserve Mining Co., Cobalt, Ont.

BJORGE GUY N., E.M.....1912
788 Mills Bldg., San Francisco, Cal.

Engineer, Pickands, Mather & Co., McKinley, Minn., May to November, 1912. Geologist in reconnaissance work near Maracaibo, Venezuela,

* Deceased.

- S. A., for the Barber Asphalt Paving Co., of New York, November, 1912 to April, 1913. Assistant chief engineer, Pickands, Mather & Co., May to November, 1913. Chief geologist, Old Dominion Copper Mining & Smelting Co., Globe, Ariz., December, 1913 to May, 1917. Mining geologist, May, 1917 to 1918. Examination work in Arizona, California, Nevada and Utah. U. S. service, 1918. Mining geologist to date.
- BORGESON, ANSHELM C., E.M.....1911
 Care of Shenango Mine, Chisholm, Minn.
- Resident engineer, Webb Mine, Hibbing, Minn., June, 1911 to January, 1914. Mining engineer, Shenango Mine, January, 1914 to January, 1916. Mine inspector, Shenango Furnace Co., Mesabi Range Mines, January, 1916 to date. Also in charge of drying plant test, Whiteside Drying Plant, July and August, 1917. Washing Plant Tests, Webb Washing Plant, August, 1918 to October, 1919.
- BOWMAN, FRANK A., E.M.....1904
 See List No. V.
- BOYD, ROBERT R., E.M.....1905
 Box 2569, Bisbee, Ariz.
- Transitman, Franklin W. Smith Co., Bisbee, Ariz., 1905, Mining engineer and U. S. Mineral surveyor, Globe, Ariz., 1905 to 1908. Mining engineer, Old Dominion Copper Mining & Smelting Co., 1908 to 1912. Superintendent, Arizona Commercial Mining Co., 1912 to 1918. U. S. service to December, 1918. Superintendent, Arizona Commercial Mining Co., 1919 to October, 1919. Assistant superintendent, mine department, Phelps Dodge Corporation, Copper Queen Branch, November, 1919 to date.
- BOYLE, PATRICK J., E.M.....1908
 Eveleth, Minn.
- Engineer, Oliver Iron Mining Co., 1908 to 1909. Engineer and captain, Republic Iron & Steel Co., 1910 to 1913. Engineer and inspector, Mesabi Mountain Township, 1913. Assistant city engineer, Eveleth, Minn., January, 1914, to September, 1917. Garage proprietor, September, 1917 to 1918. U. S. service to December, 1918. Garage proprietor to date.
- BRACKENBURY, CYRIL, B.Sc., E.M.....1898
 St. Maur, Newton Abbot, Devonshire, England.
- Mining engineer, Genoa and Elba Mines of the Minnesota Iron Co., 1898 to 1899. Chief mining engineer, Quincy Copper Mine, Michigan, 1899 to 1902. Mining engineer, Tharsis Sulphur & Copper Co., examining mines in Russia, Bulgaria, Servia, and Italy, 1902 to 1903. General manager in Rhodesia for the Consolidated African Copper Trust, Ltd., 1903 to 1905.

Mining engineer for the Siberian Syndicate, 1906. Manager, Tresavean Mines, Ltd., Lanner, Cornwall, England, 1907 to 1911. Consulting engineer, Tresavean Mines Co., Ltd., Cornwall, England, 1911 to 1912. Examining mines in Greece for the Mond Nickel Co., Ltd., 1912. In charge of exploration work in Canada for Mond Nickel Co.; also private practice reporting on gold mines in Ontario, 1913. Works manager, Devon & Courtenay Clay Co., Newton Abbot, to December, 1914. Joined sportsman's battalion, December, 1914. First Lieutenant, 7th battalion, York & Lancaster, February, 1915. Served at the front with Tunneling company, Royal Engineers. (Temporary commission for the war.) With a pioneer battalion, 1916. Wounded at the Somme, July 28, 1916. Instructor, Pioneer School of Instruction, January, 1917 to April, 1919. Manager and consulting engineer, Devon & Courtenay Co., Newton Abbot, Devonshire, to date.

BRANDT, JOHN, E.M.....1906
 Hibbing, Minn.

Superintendent of refinery of Consolidated Mercur Gold Mining Co., Mercur, Utah, May, 1906 to May, 1907. Solutionman, Goldfield Reduction Co., May to July, 1907. Mill assayer for same company, July to November, 1907. Foreman of Nevada Goldfield Reduction Works, November, 1907 to October, 1908. On construction of Goldfield Consolidated mill, October to December, 1908. Underground work, Goldfield Consolidated Mining Co., 1909 to 1912. Assistant sampler for same company, 1912 to 1913. Consulting engineer, 1913 to August, 1915. Leasing on Midway mines, Tonopah, Nev., August, 1915 to August, 1917. With State of Minnesota, Department of Mines and Mineral Lands, August, 1917 to date.

BROSIUS, HAROLD I., Met.E.....1904
 Minas de Oro, Honduras, C. A.

Superintendent, cyanide plant at Birdseye, Mont. Superintendent, stamp mill at Helena, Mont. Engineer for the New Penn Mining Co., at Argentine, Colo. Assayer and chemist for Summit County Mining Exchange. Assayer, East Pacific Mine, Winston, Mont. Engineer and assayer for the Park New Era Mine, Mason, Mont. Assistant cyanide superintendent, Imperial Mining Co. Chemist and engineer for the Victoria Chief M. & S. Co., Engle, N. M. Manager, Pacific Assay Co., Seattle, Wash. Superintendent, Dunton Mine and Mill, Hollis, Alaska. Examining mining properties in Honduras, C. A. to date.

BURESCH, CHARLES E., E.M.....1917
 Hibbing, Minn.

Raise engineer and sampler, Inspiration Copper Co., Miami, Ariz., June 1, 1916 to June 1, 1917. Entered army, September, 1917. Discharged September, 1919. At present engineer with the Arthur Iron Mining Co. at Hibbing, Minn.

BURGESS, ROBERT J., E.M.....1911
Virginia City, Nevada.

Timekeeper, Roberts-Kingston Co., Virginia, Minn., June to August, 1911. Assayer, Guadalupe Consolidated Mining Co., Inde, Durango, Mex., August, 1911 to March, 1912. Shift boss, cyanide mill, El Rayo Mine, Los Azules, Chihuahua, March to May, 1912. Shift boss, Huntington Mill-Floor, Tecolotes Mill, A. S. & R., Santa Barbara, Chihuahua, May to July, 1912. Assayer and engineer, Montezuma Lead Co., Santa Barbara, Chihuahua, July to October, 1912. Assistant engineer, Cia Metalurgica Mexicana, San Luis Potosi, S. L. P., Mex. Metallurgical chemist, same company at La Plantacarmen, San Luis Potosi, to December, 1912. Member of firm, Kinney, Trujillo & Burgess, Proprietarios & Explotadores de Fundos Mineros, Charuas, S. L. P., Mex., December, 1912 to May, 1914. With the Esperanza Mining Co., El Oro, Mex., May, 1913 to July, 1915. Associated with the Canyon Mines Corporation of Boston and San Francisco, with mines in Placer County, Cal., December, 1915 to November, 1916. Examining properties, State of California. Superintendent Surcease Mine, Goldfield Consolidated Mining Exploration Co., Yankee Hill, Calif. Superintendent, Surcease Mine to August, 1918. Engineer, Goldfield Consolidated Mines Co., to February, 1919. Assayer and chemist, Tonopah Divide Mine, Tonopah, Nevada to July, 1920. With Consolidated Ore Hauling and Trucking Co., Price, Utah.

BURGESS, THOMAS O., E.M.....1901
Porteau, B. C.

Assistant foreman, Thistle Gold Co., Ltd., June to December, 1902. Asst. engineer, Oliver Iron Mining Co., Ely, Minn., December, 1902 to February, 1903. Vice-president, and business manager of the Thistle Gold Co., Ltd., Barkersville, B. C. Superintendent, the Deeks Gravel & Rock Co., Porteau, B. C., to date.

BUTLER, WILLIAM V., E.M.....1915
Yambuya, Congo, Belge, Africa.

Assistant state mining engineer, June, 1915 to May, 1916. Engineer and chemist, Patterson Construction Co., Wilcox Mine, Brainerd, Minn., May to August, 1916. Prospecting, Yambuya, Congo, Belge, Africa, August, 1916 to date.

CADWELL, W. CHAUNCEY, E.M.....1905
Box 143, Anaconda, Mont.

Department of Civil Engineering, Anaconda Copper Mining Co. Superintendent, surface department, Washoe Smelter, A. C. M. Co., Anaconda, Montana to date.

CALHOUN, ALLAN B., E.M.....1905
 Burma, India.

Miner and timberman at the Gray Mine, Butte, Mont. Assayer, surveyor and shift boss, Cornucopia Mine, Ore., 1907. Acting superintendent, White Bear Mining Co., Ltd., Rossland, B. C. Engineer, Center Star Mine, Rossland, 1908. Engineer, Consolidated Mining & Smelting Co., Snowshoe Mine and Phoenix Amalgamated Group, to June, 1911. Superintendent, Motherlode Sheep Creek Mining Co., Sheep Creek, B. C., June, 1911 to January, 1913. Consulting engineer in Spanish Honduras, C. A., January to June, 1913. Engineer, British Columbia Copper Co., Princeton, B. C., June, 1913 to February, 1914. Superintendent, Arabian Consolidated Mines, Frisco, Mohave Co., Ariz., February, 1914 to January, 1915. Superintendent, El Rayo Mining & Development Co., Santa Barbara, Chihuahua, Mex., April, 1915 to February, 1916. Efficiency engineer, Old Dominion Mining & Smelting Co., Globe, Ariz., February, 1916 to May, 1917. Mine superintendent, Burma Corporation, Ltd., Burma, India, May 1917 to date.

CAMPBELL, WILLIAM L., E.M.....1900
 Davenport, Wash.

Mining engineer at Cripple Creek, 1900 to 1901. Railway engineer, C. & W., 1901 to 1902. Lumber business at Elmira, Idaho, 1902. Secretary-treasurer of Campbell Mer. Co., Connel, Wash. With Spokane Merchants' Association. Owner and operator, Farmers' Store, Davenport, Wash.

*CASSILLY, THOMAS E., E.M.....1917

CHANDLER, EUGENE D., E.M.....1900
 Casa Grande, Ariz.

Chemist, Mongolian Exploration Co., at Nome, Alaska, 1900. Draftsman, American Bridge Co., Minneapolis, 1901, U. S. G. S., Reno, Nev. Assistant at cyanide plant, White Hills, Ariz. Superintendent, cyanide plant, Basin, Ariz., 1903 to 1904. Assayer and chemist, Exposed Treasure Mining Co., Mojave, Cal. Assayer Queen Esther Mining Co., Mojave, Cal. Operator of cyanide plant at Casa Grande, Ariz. Assayer and surveyor, Standby Mining Co., Rockford, S. D. Surveyor, Golden Reward Consolidated Mining and Milling Co., at Terry, S. D. Foreman, Argenta Mine, Silver City, Utah, 1908. Chief mine sampler, Ray Consolidated Copper Co., Ray, Ariz., 1910 to 1911. Engineer at Camps 11 and 12, Los Angeles Aqueduct, 1912. Chief mine sampler, Inspiration Consolidated Copper Co., Miami, Ariz., 1912 to 1919. Ranching and running general store on the ranch at present.

* Deceased.

CHRISTENSON, ALFRED, E.M.....1915
Crystal Falls, Mich.

Mining engineer, Leonard Mine, Great Northern Iron Ore Properties, May, 1915 to June, 1916. Mining engineer, McKinney Steel Co., Stevenson, Minn., June, 1916 to time of enlistment. U. S. service to November, 1918. Mining engineer, McKinney Steel Co., Bessemer, Mich., to May, 1920. District chief engineer, McKinney Steel Co., May, 1920 to date.

CHRISTENSON, PETER, B.S., 1894 E.M.....1898
217 Union St. S.E., Minneapolis, Minn.

Professor of Metallurgy, Minnesota School of Mines.

CLAPP, W. HOWARD, E.M.....1901
Pasadena, Cal.

Mill foreman, Checkmate M. & M. Co., Pearl, Idaho, 1901 to 1903. Mining engineer with F. W. Sherman, Park City, Utah. Consulting engineer—specialty: the wet concentration of ores and the design and equipment of milling plants. Superintendent, Sherman Engineering Co. Associate Professor of Machine Design, Throop College of Technology, Pasadena, Cal., 1912 to 1918. Professor of Mechanism and Machine Design, 1918 to date.

CLARK, FRED E., E.M.....1920
Los Angeles, Calif.

Assistant engineer, City Engineering Department, Los Angeles, Calif.

*CLARK, MALCOLM W.....1915

CLEMENT, LESTER L., E.M.....1906
928 Clarke Ave., Ames, Iowa.

Miner, Highland Boy Mine, July, 1906. Surveyor for same company, August to November, 1906. Draftsman and surveyor for U. S. Smelting, Refining & Mining Co., November, 1906 to November, 1907. Foreman of lead bullion plant, U. S. Smelter, November, 1907 to February, 1908. General engineer, Goldfield, Nev., February to June, 1908. Instrumentman, Indian Surveys, Mont., July to November, 1908. U. S. surveyor, General Land Office, Washington, D. C., 1908 to 1917. Cadastral engineer, U. S. General Land Office, 1917. Road engineer, Iowa State Highway Commission, September, 1919 to date.

*Deceased.

COADY, LEO J., E.M.....1913
Care of North Butte Mining Co., Butte, Mont.

Assistant engineer, Shenango Furnace Co., Chisholm, Minn., May to December, 1913. Assayer, Granite Bi-Metallic Mining Co., Phillipsburg, Mont., December, 1913 to February, 1914. Sampler, North Butte Mining Co., Butte, Mont., February to March, 1914. Head sampler, North Butte Mining Co., Butte, Mont., November, 1915 to August, 1916. Chief engineer, North Butte Mining Co., August, 1916 to September, 1919. Efficiency engineer, North Butte Mining Co., September, 1919 to date.

COHEN, SAMUEL W., M.E.....1903
Dominion Express Bldg., Montreal, Can.

Assayer and chemist, Consolidated Gold Mines & Development Co., Mancos, Colo., June to September, 1903. Draftsman for C. G. W. Ry. to March, 1904. Assayer, Adler Mining Co., Virginia City, Mont., March to July, 1904. Miner, B. & M. C., Butte, from July, 1904 to July, 1905. Superintendent, Gilt Edge Mining Co., Florence, Idaho, April to November, 1905. Mining engineer at Spokane, Wash., November, 1905 to May, 1906. Superintendent, Kerr Lake Mining Company, Cobalt, Ont., May, 1906 to August, 1907. General manager, Crown-Reserve Mining Co., Ltd., Porcupine Crown Mines, Ltd., and Reward Gold Mines Company, until May, 1918. Vice-president and general manager of Bluestone Mining & Smelting Company, Mason, Nev. Vice-president and chief engineer of the Jacobs Asbestos Company of Thetford, Ltd., and Federal Asbestos Company of Robertsonville, P. Q. General manager, Croesus Gold Mines, Ltd. Consulting engineer, Dominion Reduction Co., Ltd., Cobalt, Ont., to January, 1920. Consulting mining engineer, president and general manager, General Asbestos Co., Ltd., to date.

COLE, WILLARD A., E.M.....1909
710 Security Bldg., Minneapolis, Minn.

Chief engineer, E. J. Longyear Co., Exploring Engineers, to date.

COLLER, WALTER A., E.M.....1915
(Home address) 1149 Ashland Ave., St. Paul, Minn.

Engineer, Toltz Engineering Co., St. Paul, Minn., June, 1915 to March, 1916. Engineer, P. E. Stevens, St. Paul, Minn., March to May, 1916. Engineer, L. P. Wolff, St. Paul, Minn., May, 1916 to April, 1917. Bridge department, Northern Pacific Ry., April to September, 1917. Civil engineer, St. Paul Union Depot Co., September to December, 1917. Mining engineer, Great Northern Iron Ore Properties, Hibbing, Minn., December, 1917, to March, 1918. Ordnance department, U. S. A., Cleveland, Ohio, March, 1918 to January, 1920. Chicago manager of Frank Lane Co., Steel Brokers, Room 318 Temple Bldg., 108 South La Salle St., Chicago, Ill., January, 1920 to date.

COLLINS, LEON T., E.M.....1915
1932 W. Santa Barbara Ave., Los Angeles, Calif.

Experimental work, June 1915 to July, 1916. With Beck Electrical Construction Co., Minneapolis, July, 1916 to February, 1917. Experimental work, Los Angeles, February, 1917 to October, 1919. October, 1919 to August, 1920, Engineering department, Union Oil Company of California, August, 1920 to date, Technical department, Metro Pictures Corporation.

CONKEY, CHARLES R., E.M.....1910
Ft. William, Ont., Can.

Engineer, Gilbert Mine. Assistant engineer, Genoa Mine. Engineer, Fayal Mine, Eveleth, Minn., March, 1911 to June, 1912. Engineer, Kewatin District, Meriden Iron Co., Hibbing, Minn., June, 1912 to March, 1913. Draftsman, Barnett & McQueen Co., Ft. William, Ont., March, 1913 to March, 1915. Designing engineer, same company, March, 1915 to March, 1916. Chief draftsman, also stockholder in the firm, Fegels-Bellows Engineering Co., Ltd., March, 1916 to May, 1919. Chief engineer and stockholder, Fegels Construction Company, Ltd., Ft. William, Ont., May, 1919. Chief engineer and director, Fegels Construction Company, Ltd., to date.

COPELAND, WILLIAM A., E.M. (Geol.).....1920
2591 West 7th St., St. Paul, Minn.

Instructor in Geology, Carnegie Institute of Technology, Pittsburgh, Pennsylvania, to date.

CORYELL, LOUIS S., E.M. (Geol.).....1917
Bartlesville, Okla.

With the Texas Company, geological division, May, 1917 to April, 1918. U. S. service to March, 1919. Geologist, April 1, 1919 to May 11, 1919. Geologist, New England Petroleum Co., New England, N. D., May 11, 1919 to July 15, 1919. Geologist, Twin State Oil Company to October 1, 1919. Geologist, Okmalgee District, Phillips Petroleum Co., October 1, 1919 to date.

COVENTRY, EDWARD D., E.M.....1912
Crosby, Minn.

Timberman, Oliver Iron Mining Co., June to August, 1912. Time-keeper, Oliver Iron Mining Co., August to November, 1912. Efficiency engineer, Victoria Copper Mining Co., Victoria, Mich., November, 1912 to July, 1915. Mine captain, same company, August, 1915 to December, 1916. Superintendent, Algoma Manganese Co., December, 1916 to March, 1917. Superintendent, Canadian Cuyuna Ore Co., March to July, 1917. Superintendent, Omaha Iron Co. Mill superintendent, John A. Savage & Company, to date.

COWIN, JAMES, E.M.....1907
526 McKnight Bldg., Minneapolis, Minn.

Outcrop engineer for the Utah Fuel Co. Construction engineer, Noble Electric Steel Co. Cyanide foreman, Loretto Mill, Pachuca Hidalgo. With Spurr & Cox, consulting engineers, Mexico City. Assistant engineer, C. A. P. Turner. President, Cowin & Fee, Ltd., Winnipeg, Man., and Cowin & Co., Inc., Minneapolis, reinforced concrete.

COWIN, PERCY G., E.M.....1918
Care of E. J. Longyear Co., Box 37, Bessemer, Ala.

U. S. service to December, 1918. Engineer, E. J. Longyear Company, contract shaft sinking department. At present, district engineer, E. J. Longyear Company.

CRAIG, JOHN J., E.M.....1916
(Home address) 3817 1st Ave. S., Minneapolis, Minn.

Mining engineer, Northwestern Improvement Co., Brainerd, Minn. Churn drill clerk, Detroit Copper Mining Co., Morenci, Ariz. Assistant mining engineer, United Verde Copper Co., to September, 1917. U. S. military service to July, 1919. Instructor in College of Engineering, University of Minnesota, October, 1919 to date.

CROUSE, CHARLES S., E.M.....1911
University of Kentucky, Dept. Mines and Metallurgy, Lexington, Ky.

Assistant State Mining Engineer, Hibbing, Minn., May, 1911 to February, 1914. Engineer, Cananea Consolidated Copper Co., Cananea, Sonora, Mex., February to June, 1914. With C. A. P. Turner, consulting engineer, Minneapolis, Minn., June, 1914 to August, 1915. Mining engineer, Ray Consolidated Copper Co., Ray, Ariz., August, 1915 to May, 1916. Engineer in charge of No. 1 Mine, Ray Consolidated Copper Co., Ray, Ariz., May, 1916 to June, 1917. Engineer No. 2 Mine, Ray Consolidated Copper Co., June, 1917 to February, 1918. Six weeks, Carnegie Institute of Technology, Pittsburgh, Pa., February and March, 1918. Metallurgist in charge of heat treatment of 75-mm. cannon, inspection division, ordnance department, U. S. A. at plant of Symington-Anderson Co., Rochester, N. Y., March, 1918 to February, 1919. Professor of Metallurgy, Department of Mines and Metallurgy, University of Kentucky, Lexington, Ky., February, 1919 to date.

CROWLEY, JAY, E.M.....1909
Grafton, Cal.

Reclamation work, Sacramento River.

CULLYFORD, JAMES A., E.M.....1908
P. O. Box 216, Magna, Utah.

Miner, Uncle Sam Mine, Lida, Nev., June, 1908 to September, 1910. Office engineer with B. & G. R. R. Co., from November, 1910 to November, 1911. Surface engineer, Boston Mine, Bingham Canyon, Utah, November, 1911 to September, 1917. With the B. & G. R. R. Co., Magna, Utah, September, 1917 to September, 1918. With Utah Copper Co., Magna Plant, Magna, Utah, September, 1918 to date.

CURRY, DUNCAN E., E.M.....1905
122 Hart Ave., Ocean Park, Cal.

Mining engineer with Franklin W. Smith & Co., Bisbee, Ariz., from June, 1905 to March, 1908. With the Calumet & Arizona Mining Co., from March, 1908 to March, 1910. Engineer, Cananea Consolidated Copper Co., March, 1910 to March, 1914. With the Democrata Mining Co., Cananea, Sonora, Mex., March, 1914 to 1915. Night foreman, Democrata Mine, Cananea, Mex., 1915 to June, 1918. Mine superintendent, Duquesne Mining and Reduction Co., Duquesne, Ariz., June, 1918 to May, 1919. Leasing, Duquesne, Ariz., May, 1919 to December, 1919. Unemployed, December, 1919 to August, 1920. Foreman, Abe Lincoln Copper Company, Wickenburg, Ariz., August, 1920 to date.

*CUTLER, HARRY C., E.M.....L.....1894

*DAHL, CHRISTEN F., E.M.....1908

DAVIES, FRED A., E.M.....1916
Box 1503, Lewistown, Mont.

Testing department, A. C. M. Co., Anaconda, Mont. Research department, Electrolytic Zinc Plant, A. C. M. Co., Great Falls, Mont. U. S. service to February, 1919. Geologist, Greenwood Company, Kansas City, Mo., to May, 1920. Geologist, Stewart & Wright, consulting geologists. May, 1920 to date.

DEICHEN, WILLIAM A., E.M.....1908
Box 27, Hibbing, Minn.

Assistant engineer, Gilbert Mine., 1909 to 1910. Chief engineer, Gilbert Mine. Chief state mining engineer, Department of State Auditor, April, 1910 to date.

*Deceased.

DENNIS, RICHARD C., E. M.....1917
709 Pierce St., Eveleth, Minn.

U. S. military service to April 17, 1919. Estimating timber, John Schroeder Lumber Co., of Ashland, Wis., to July, 1919. Engineer, Humble Oil & Refining Co., at Cisco, Texas, to February, 1920. Engineer, Oliver Iron Mining Co., Eveleth from February, 1920 to date.

DEVEREUX, FRANCIS C., E.M.....1904
Care of N. Y. & Honduras Rosario Mining Co., San Juancito, Honduras, C. A.

Assistant engineer, cyanide plant, Gold Leaf Reduction Co., Birdseye, Mont., from June to October, 1904. Millman at Canyon Creek, Mont., also at Iron Siding, Mont. Mill superintendent, U. S. Copper Mining & Smelting Co., Alpha, Nev. Assayer and chemist for Franklin W. Smith & Co., Bisbee, Ariz., from April 1905 to October, 1906. Mine superintendent, San Fernando Consolidated Copper Mining Co., Lower California, Mex. Metallurgist for same company. General superintendent for same company. Assayer, Guadalupe Consolidated Mining Co., Inde, Durango, Mex., from October, 1907 to January, 1910. Mill and cyanide superintendent for same company, January, 1910 to December, 1912. Mill shift boss, New York & Honduras Rosario Mining Co., San Juancito, Honduras, C. A., February, 1913 to March, 1915. Mill foreman, same company, March, 1915 to March, 1916. Mill and cyanide superintendent, same company, March, 1916 to date.

DEVEREUX, LAWRENCE, E.M.....1910
See List No. V.

DICKSON, ROBERT H., E.M.....1912
Box 1435, Bisbee, Ariz.

Miner, Irish Mag. Mine, Bisbee, Ariz. Mining engineer, Calumet & Arizona Mining Co., Bisbee, Ariz. Mining engineer, Pioneer District Exploration, Calumet and Arizona Mining Co., Superior, Ariz., September, 1913 to October, 1914. Mining engineer, Calumet & Arizona Mining Co., Bisbee, Ariz., October, 1914 to July, 1917. U. S. service August, 1917 to April, 1919. Mining engineer, Calumet and Arizona Mining Co. to January, 1920. Chief engineer, Calumet and Arizona Mining Co., January, 1920 to date.

DONAGHUE, ABNER J., E.M. (Geol.).....1920
(Home address) 2651 Ulysses St. N.E., Minneapolis, Minn.

With State Highway Commission to date.

DOPP, J. LAWRENCE, E.M.....1917
709 Pierce St., Eveleth, Minn.

U. S. military service to 1920. Engineer, Oliver Iron Mining Company to date.

DOVRE, ADOLPH, E.M.....1916
Apartado de Correos, 34, Maracaibo, Venezuela.

Geologist, Producers Oil Co., May, 1916 to August, 1917. Battery B, 65th Artillery, C. A. C., foreign service to January 27, 1919. Geologist, Twin State Oil Co., Tulsa, Okla., March 1, 1919 to January 1, 1920. Chief geologist, Sun Company's subsidiaries in Venezuela, January 1, 1920 to date.

DOWDELL, RALPH L., Met.E.....1918
(Home address) 1462 Como Ave. W., St. Paul, Minn.

Assistant metallurgical engineer on manganese war problems, U. S. Bureau of Mines, Lake Superior Station. Instructor in Metallography, University of Minnesota, to date.

DRAKE, GEORGE M., E.M.....1911
912 Plymouth Bldg., Minneapolis, Minn.

Engineer, Libby & Nelson, on University of Minnesota engineering buildings. Engineer, Pacific Coast Coal Co., Seattle, Wash., to May, 1914. In partnership with A. F. Johnson under the firm name of Johnson & Drake, engineers and builders, Plymouth Bldg., Minneapolis, Minn., May, 1914 to January 1, 1920. With firm of Johnson-Drake & Piper, 912 Plymouth Bldg., Minneapolis, January 1, 1920 to date.

DUNCAN, KENNETH J., E.M.....1910
Ely, Minn.

Mining engineer, Pioneer Mine, Oliver Iron Mining Co., Ely, Minn., May, 1910 to March, 1912. Superintendent, Consolidated Vermilion & Extension Co., Tower, Minn, March to October, 1912. Representative of R. B. Whiteside of Duluth on Mesabi Range, October, 1912 to January, 1918. Representative of R. B. Whiteside on Mesabi and Vermilion ranges, January, 1918 to September, 1919. Superintendent, Zenith Mine for Zenith Iron Mining Co., September, 1919 to August, 1920. Superintendent, Zenith Mine for Vermilion Mining Company (Pickands, Mather & Co.) August, 1920 to date.

EDWARDS, FRANK R., E.M.....1908
Bowdle, S. Dak.

Foreman, Bowdle Artificial Stone Co. Rodman, levelman, and instrumentman, Soo Line, Ladysmith and Superior, Wis., 1909. Mining engineer

and underground superintendent, Rosiclare Lead and Fluorspar Mine, Rosiclare, Ill., September, 1910 to April, 1911. Engineer, Oliver Iron Mining Co., Eveleth, Minn., April to October, 1911. Engineer and assistant superintendent Memphis Fluorspar Mines, Marion, Ky., October, 1911 to February, 1913. Mining engineer, Pickands, Mather & Co., Elba and Corsica Mines, Gilbert, Minn., February, 1913 to July, 1917. Mining engineer, Pickands, Mather & Co., Elba and Belgrade Mines, July, 1917 to November, 1919. Farming, November, 1919 to date.

EDWIN, JOHN, E.M.....1920
(Home address) 2315 27th Ave. So., Minneapolis, Minn.

Engineer, Surinaamsche Bauxite Maatschappij, Moengo, Dutch Guinea, S. A.

EGLESTON, OLIVER J., E.M.....1900
Kennett, Cal.

Draftsman, George K. Fischer, Salt Lake City, Utah, 1900 to 1902. Constructing engineer, U. S. Smelting, Refining & Mining Co., 1902 to 1913. Assistant consulting engineer, for same company, February, 1913 to February, 1916. Engineer, same company, February, 1916 to May, 1917. Chief engineer, same company, May, 1917 to September, 1919. Manager, Mammoth Plants, U. S. Smelting, Refining & Mining Co., September, 1919 to date.

EIDEMILLER, HOWARD N., E.M.....1914
Crystal Falls, Mich.

Geologist, Wisconsin Geological Survey, June, 1914 to May, 1919. Engineer and geologist, Benj. C. Neely, Crystal Falls, Mich., May, 1919 to date.

EKLUFF, VICTOR E., E.M.....1911
Gilmore, Idaho

With the Oliver Iron Mining Co., Hibbing, Minn. With the Centennial Eureka Mining Co., Eureka, Utah. Assayer and surveyor, Victoria Consolidated Mining Co., Eureka, Utah, April, 1912 to December, 1914. County surveyor and assessor of mining properties, Juab County, Utah; also shift boss, Chief Consolidated Mining Co., Eureka, Utah, December, 1914 to 1918. Engineering and fire filling departments, A. C. M. Co., Butte, Montana to August, 1919. Superintendent, construction and design of 50-ton concentrating plant, Idaho Minerals Company, Gilmore, Idaho to January 1, 1920. Manager, Idaho Minerals Company to date.

ELLIOTT, JAY R., E.M.....1911
3312 3rd Ave. S., Minneapolis, Minn.

Mine inspector, Beaver Consolidated Mines, Ltd., May, 1911 to September, 1912. Engineer for the same company from September, 1912, also Temiskaming Mines Co., Ltd., October, 1914 to October, 1916. Superin-

tendent, Kirkland Lake Branch, Beaver Consolidated Mines, Ltd., October, 1916 to February, 1918. Engineer Beaver Consolidated Mines, Ltd., February, 1918 to October, 1918. Assistant engineer, Ford Motor Company's blast furnace, November, 1918 to June, 1919. Assistant engineer with C. A. P. Turner Co., reinforced concrete engineers, October, 1919 to date.

ELSON, WILLIAM H., E.M.....1917
305 Cosden Bldg., Tulsa, Okla.

With the Gypsy Oil Co., Tulsa, Okla., May to December, 1917. U. S. service to August, 1919. Production department, Riverland Oil Co., Tulsa, Okla., August, 1919 to date.

ELY, ROBERT H., E.M.....1913
Eveleth, Minn.

With the Oliver Iron Mining Co., Hibbing, Minn., June to October, 1913. Engineer, Higgins Estate, Virginia, Minn., October, 1913 to March, 1917. Assistant secretary-treasurer, Rutland Mining Co., Virginia, Minn., also engineer, Robinson-Flinn-Murphy-Dorr interests at Eveleth, Minn., March to September, 1917. U. S. service to August, 1919. Mining engineer, for Robinson-Flinn-Murphy-Dorr interests and Fowler estate at Eveleth, Minn., to date.

ERNSTER, OMER F., E.M., M.S.....1917
Care of Sinclair Exploration Co., Liberty Tower Bldg., New York City.

Geologist, with Producers Oil Co., May to October, 1917. U. S. service October, 1917 to August, 1919. Taking M.S. degree at University of Minnesota, Department of Geology, October, 1919 to July, 1920. Geologist for American Engineering & Operating Co., N. Y., under direction of Rogers, Mayer & Ball, 42 Broadway, New York City, July, 1920 to November 1, 1920. Chief engineer, Alvarado Mining & Milling Company, Parral, Chih, Mexico, November, 1920 to May, 1921. Sinclair Exploration Company, Liberty Tower Bldg., New York City, to date.

FARNAM, HENRY E., E.M.....1910
5137 London Road, Duluth, Minn.

Engineering department, Oliver Iron Mining Co., Hibbing, District, June, 1910 to November, 1912. Building construction, Edmonton, Alta., November, 1912 to February, 1915. Building construction, February, 1915 to October, 1916. General contracting, Farnam Brothers Co., Duluth, Minn., October, 1916 to June, 1918. General contractor, July, 1918 to date.

FEARING, EDWARD J., E.M.....1917
Crosby, Minn.

U. S. service until June, 1919. Engineer, John A. Savage & Company,
June, 1919 to date.

FIELD EDWARD M., E.M.....1903
804 Metropolitan Life Bldg., Minneapolis, Minn.

With Mechanical Service Company, 804 Metropolitan Life Bldg., Min-
neapolis, Minn., to date.

FIELD, THOROLD F., E.M.....1905
Care of Mr. Chester A. Congdon Estate, 807 Lonsdale Bldg., Duluth,
Minn.

With Franklin W. Smith & Co., Bisbee, June to November, 1905. In
the geological department of the Calumet & Arizona Mining Co., and
Superior and Pittsburgh Copper Company, 1905 to 1909. In the employ
of Mr. Chester A. Congdon September, 1909 to November, 1916. In the
employ of the Congdon estate and general consulting engineering practice,
to date.

FIXEN, VICTOR L., E.M.....1911
5 S. Wabash Ave., Chicago, Ill.

Engineering department, Stone & Webster, June to September, 1911.
Assistant field engineer, W. H. Fohrney, Chicago, Ill., September to
December, 1911. Electrical inspector, Twin City Rapid Transit Co., De-
cember, 1911 to October, 1912. Testing engineer and estimator, C. A. P.
Turner, consulting engineers, October, 1912 to September, 1918. Instructor
engineering, S.A.T.C. to December, 1918. Chicago representative C. A. P.
Turner Co. District manager, C. A. P. Turner Co., to date.

FLYNN, JOHN G., E.M.....1900
El Oro, Estado De Mexico, Mexico.

Geologist with Amalgamated Copper Co., Butte, Mont. Engineer
Belle Mining Co., Butte, and B. & B. Mining Co., Butte. Superintendent,
Mohawk Mine. General superintendent of mines for the Goldfield Con-
solidated Mines Co. Manager, Jerome Copper Mining Co. Superintendent,
El Oro Mining & Ry. Co., to date.

FOLEY, LYNDON L., E. M. (Geol.).....1918
Port of Spain, Trinidad.

Mining engineer, Oliver Iron Mining Co., Chisholm, Minn., July
and August 1918. U. S. military service September to November, 1918.
Assistant geologist, Trinidad Petroleum Development Co., Ltd., to 1919.
Geologist, Trinidad Petroleum Development Co., to date.

FOSNESS, ARTHUR W., E. M.....1911
515 Union Bank Bldg., Winnipeg, Canada.

Draftsman and assistant engineer, C. A. P. Turner, Minneapolis, May, 1911 to March 1913. Manager, Winnipeg branch office for C. A. P. Turner, March, 1913 to January, 1920. Engineer for the Carter-Halls-Aldinger Co., January, 1920 to date.

FRANK, HARRY O., E.M.....1920
(Home address) 2002 Lake of the Isles Blvd., Minneapolis, Minn.

FRELLSEN, SIDNEY A., E.M.....1919
3233 16th Av So., Minneapolis, Minn.

Engineer, Truscon Steel Company, July, 1919 to December, 1919.
Engineer, Jacobson Engineering Company, December, 1919 to date.

FRITZBERG, ERNEST A., E.M.....1910
See List No. V.

GANNETT, ROGER W., E.M. (Geol.).....1918
Ta Tong, Chwang, Tengyueh, Yunnan Province, China.

Mineralogist, War Minerals Committee, Bureau of Mines, Washington, D. C. U. S. service to November, 1918. Mining engineer, New York Orient Mines Co., Bangkok, Siam. Geologist, Yunnan Ming Hsing Mining Co. Ta Tong Chwang, Tengyueh, Yunnan Province, China.

GAVIN, LAWRENCE T., E.M.....1909
Diorite, Mich.

Rodman, U. S. Reclamation Service, June to November, 1909. Engineering department, Oliver Iron Mining Co., Fayal District, Eveleth, Minn., November, 1909 to May, 1913. Assistant mine captain, Fayal Mine, May, 1913, to July, 1914. Engineer, Leonard Mine, Arthur Iron Mining Co., Chisholm, Minn., June, 1914 to September, 1915. Superintendent, Cuyuna-Mille Lacs Iron Co., and Cuyuna-Duluth Iron Co., Iron-ton, Minn., September, 1915 to December, 1917. U. S. service to July 14, 1919. In business Minneapolis, Minn., to September, 1920. Superintendent, American-Boston Mine, to date.

GHOLZ, ARTHUR L., E.M.....1901
710 Security Bldg., Minneapolis, Minn.

Millman at concentrating mill of Forest Hill Consolidated M. M. Co., Colo. Rocky Mt. Smelting Co., Florence, Colo., 1901 to 1902. Surveyor for E. J. Longyear, Hibbing, Minn., 1902 to 1903. Field superintendent of exploration for E. J. Longyear to September, 1911. Representing E. J.

Longyear Co., Birmingham, Ala., September, 1911 to October, 1912. With E. J. Longyear Co., Minneapolis, Minn., October, 1912 to January, 1914. Superintendent for E. J. Longyear Co., in Wisconsin-Michigan District. January, 1914 to July, 1917. Manager, contract-drilling department, E. J. Longyear Co., July, 1917 to July, 1920.

GILLAN, SILAS L., E.M.....1907
203 W. Maple St., Glendale, Cal.

With Irrigated Lands Co., engineer in charge of Moapa project. Moapa, Nev., August to December, 1907. Mineral land examiner for U. S. government, February, 1908 to May, 1920. Valuation engineer, Bureau Internal Revenue, May, 1920 to May, 1921. Mining engineer, Los Angeles, Cal., July, 1921 to date.

GILTINAN, GEORGE M., E.M.....1910
See List No. V.

GOLDBERG, BERT, E.M.....1919
Care of Carter Oil Co., Parkersburg, W. Va.

Miner, Chief Consolidated Mining Co., Eureka, Utah, May, 1919 to 1920. Assistant Mining Engineer, Anaconda Copper Mining Company, Butte, Montana, to December, 1920. With Carter Oil Company, to date.

GOLDBERG, SAMUEL B., E.M.....1919
Care of Colorado Mng. Co., Arroy, Masbate, Philippine Islands.

Miner, Portland Gold Mining Co., Victor, Colo., June, 1918 to 1919. With Colorado Mining Co., Arroy, Masbate, Philippine Islands, to date.

GOODRICH, NORMAN P., E.M.....1910
Trojan, S. D.

Millman, smelter, and amalgamator, Liberty Bell Gold Mining Co., June, 1910 to December, 1911. Sampler and assistant surveyor, same company, December, 1911 to August, 1912. With Colorado Iron Works, Denver, Colo., February, 1913 to September, 1914. Assistant superintendent, cyanide plant, Tomboy Gold Mines Co., Ltd., December, 1914 to January, 1917. Superintendent, cyanide plant, same company, January, 1917, to February, 1919. Mill superintendent, Trojan Mining Co., to date.

GOODWIN WILLIAM R., E.M.....1908
203 City Hall, Minneapolis, Minn.

Railroad work, 1908 to 1910. Engineer, Elba Mine, McKinley, Minn., September, 1910, to February, 1911. Engineer, A. C. Railway, February to December, 1911. Engineer Brazeau Collieries, December, 1911 to November, 1912. Engineer, Seymour & Dawe, December, 1912 to June, 1913.

Inspector, City Engineer's Dept., Minneapolis, July, 1913 to November, 1915. Assistant engineer, November, 1915 to time of entering army. U. S. service to November, 1918. Assistant engineer, City Engineer's Dept., Minneapolis, Minn., to date.

GRANT, ROY C., E.M.....1909
Tshikaysa, Kasai, Congo, Belge, Africa. Care of Forminiere:

Chemist and assayer with the Pacific Assay Co., Seattle, Wash. Millman, Dunton Mine & Mill, Hollis, Alaska. Examining mining prospects in Honduras, C. A. Mill foreman, Mineral Hill Consolidated Mines Co., Mineral Hill, Nev. With New York Mining Co., on placer examinations in Colombia, S. A., and Honduras, C. A. Mining engineer with Société Internationale Minière du Congo, 1915 to 1916.

GRIMES, JOHN A., E.M.....1908
510 Treasury Annex, No. 1, Washington, D. C.

Graduate work in Geology, Columbia University, 1908 to 1910. Geologist, A. C. M. Co., Butte, Mont., 1910 to 1918. U. S. Service to April, 1919. Assistant geologist, Anaconda Copper Mining Co., Butte, Mont., to January, 1920. Valuation engineer, Metals Valuation Section, Natural Resources Subdivision, Income Tax Unit, Treasury Dept., U. S. A., January, 1920 to date.

GULICK, HERVEY, E.M.....1905
See List No. V.

HAGSTROM, LEONARD J., E.M.....1912
(Home address) 4520 Xerxes Ave. So., Minneapolis, Minn.

With Chas. E. Hagstrom & Co., general contractors, Minneapolis, Minn., June, 1912 to September, 1917. With Builders' Lime & Cement Co., Minneapolis, September, 1917 to March, 1918. U. S. service to March, 1919. Sales engineer, Truscon Steel Co., Minneapolis, district office, April, 1919 to February, 1920. Engineer and estimator, Farnam Construction Co., Minneapolis, March to June, 1920. Field engineer, Northern Appraisal Co., July, 1920 to date.

HALE, WILLIAM H., E.M.....1904
(Home address) 529 2nd Ave. So., Minneapolis, Minn.

With the Atlin & Willow Creek Gold Mining Co., Atlin, B. C., 1904 to 1905. Surveyor and engineer, the Alaska Copper Co., Coppermount, Alaska, 1905 to 1906. Assayer and representative of the Federal M. & S. Co., Wallace, Idaho, 1907 to 1908. Engineer, Kettle River Quarries Co., Minneapolis, 1908 to 1911. Proprietor of Wm. H. Hale & Co. (contractors'

equipment and building specialties), Minneapolis, Minn., 1911 to May, 1917. U. S. service to February, 1919. Proprietor of Wm. H. Hale & Co., Minneapolis, to 1920. District manager Lakewood Engineering Company, also interested in Wm. H. Hale & Co., to date.

HAMMOND, ARTHUR H., E.M.....1913
(Home address) 2015 Aldrich Ave. S., Minneapolis, Minn.

Draftsman, Great Northern Iron Ore Properties, Duluth. Engineer, Cananea Copper Co., November, 1913 to June, 1914. Miner, Copper Queen Consolidated Copper Co., Bisbee, Ariz., November, 1913 to March, 1915. Member, engineering staff, Shattuck-Arizona Copper Co., geological department, March, 1915 to January, 1917. Superintendent, Northwest Inspiration Copper Co., January, 1917 to January, 1918. U. S. service from April, 1918 to date.

HANSON, J. BERNARD, E.M.....1913
300-303 Endicott Bldg., St. Paul, Minn.

Assistant chief engineer, Morton Mine, Hibbing, Minn. Chief engineer and member of the firm, Hanson-Collins Construction Co. Designing engineer, C. A. P. Turner, Minneapolis. Superintendent of construction for W. S. Kingsley, Faribault, Minn. At present superintendent of construction for the Gauger-Korsmo Construction Company, St. Paul.

HARMON, BENJAMIN G., E.M.....1910
Watervliet Arsenal, Watervliet, N. Y.

Foreman and engineer to Paragon Consolidated Mining Company from June, 1910 to August, 1911. Superintendent, Bear Top and Orofino Consolidated Mining Co., Murray, Idaho, from November, 1911 to June, 1912. Assayer and chemist in charge of all analytical work in Wardner district of Federal Mining & Smelting Co., from September, 1912 to July, 1914. Mine examinations in Colorado and Idaho, July to November, 1914. Installation of flotation plant, Ontario Mill, Kellogg, Idaho, from November to December, 1914. Experimental and adjustment work on this flotation plant from December, 1914 to February, 1915. Operating plant, February, 1915 to April, 1915. General manager, Northern Light Mining & Milling Co., from April 1915; also vice-president and general manager, Henrietta Exploration Co., from March, 1918 to June, 1918. Post-graduate metallurgical studies, Carnegie Institute of Technology, June 1918 to August, 1918. Engineer of tests, Symington-Anderson Ordnance Co., from August, 1918 to September, 1918. Chief engineer of tests, inspection division, Watervliet Arsenal, Watervliet, N. Y., September, 1918 to December, 1918. Metallurgist and superintendent, metallurgical department, Watervliet, N. Y., December, 1918 to date.

HARMON SYDNEY, E.M.....1917
Care of Arthur Iron Mining Co., Hibbing, Minn.

Compressor and hoistman, Northern Light M. & M. Co., Kellogg, Idaho, June, 1915 to January, 1916. Surface foreman for the same company, January to November, 1916. Superintendent for the same company, November, 1916 to September, 1917. U. S. military service, September, 1917 to April, 1919. Assistant engineer, Crow Wing Co., Brainerd, Minn., July, 1919 to December, 1919. Assistant engineer, Aitkin Co., Minn., December, 1919 to March, 1920. Assistant engineer, St. Louis Co., Virginia, Minn., March, 1920 to August, 1920. Engineer, Arthur Iron Mining Co., Hibbing, Minn., August, 1920 to date.

HARRINGTON, GEORGE L., E.M.....1912
U. S. Geological Survey, Washington, D. C.

With U. S. Geological Survey, May to September, 1912. Graduate work, University of Minnesota. Aid, U. S. Geological Survey, June to September, 1913. Scientist, U. S. Bureau of Soils, September, 1913 to June, 1914. Assistant geologist, U. S. Geological Survey, June, 1914, to August, 1917. Associate geologist, U. S. Geological Survey, August, 1917 to July, 1918. U. S. military service to April, 1919. Associate geologist, U. S. Geological Survey, Washington, D. C. to date.

HARRINGTON, GUY P., E.M.....1906
Box 154, Santa Fe, N. M.

Assistant engineer, Oliver Iron Mining Co. Engineer in the U. S. Indian Service, U. S. surveyor, Department of the Interior, June, 1907 to April, 1913. General Land Office Bureau, April, 1913 to July, 1918. Cadastral engineer, same department. Field manager, Mid-Continent Consolidated Oil, Gas and Refining Co., New Mexico division, to date.

HAUGEN, ALBERT C., E.M.....1915
(Home address) Hanska, Minn.

Draftsman, structural and bridge department, Minneapolis Steel Machinery Co., June, 1915 to June, 1916. With the Anaconda Copper Mining Co., June to December, 1916. In the engineering department, Lackawanna Steel Co., Buffalo, N. Y., December, 1916 to August, 1919. Draftsman, structural and bridge department, Minneapolis Steel & Machinery Co. (detailed reinforcing steel for new Franklin Ave. bridge, Minneapolis, Minn.) August, 1919 to February, 1920. On construction work, heating and light plant, Watertown, S. D., July, 1920 to date.

HEATH, CLARENCE L., E.M.....1910
South Porcupine, Ont., Can.

Assistant chemist and assayer, Canadian Exploration Co., Ltd., Naughton, Ont. Municipal and township engineer for township of Tisdale.

Manager, Porcupine Consolidated Gold Mines & Milling Co., South Porcupine, Ont. Manager, Gold Bullion Mines, Ltd., South Porcupine, Ont. Manager, Rypan Porcupine Mines, Ltd. Engineer, Hollinger Consolidated Gold Mines, Ltd., to date.

HEIDEL, C. SUMNER, E.M.....1910
 Helena, Mont.

Hydrographer for Montana, State Engineer's Office, from July, 1910 to March, 1920. Also assistant engineer, Water Resources Branch, U. S. Geological Survey, May, 1917 to date. State engineer of Montana, April, 1920 to date.

HEILIG, LOUIS S., E.M.....1915
 Apt. 102, 1819 Lyndale Ave. S., Minneapolis, Minn.

Engineer's helper, Scranton and Crete Mining Companies, June, 1915 to April, 1916. Mining engineer, Societe Internationale Forestiere et Miniere du Congo, April, 1916 to 1918. October, 1918 to February, 1919, U. S. army engineer. June, 1919 to July, 1920 Mpls. Im. Co. July to October, 1920 with American Bridge Co., Minneapolis, Minn. Instructor, Minnesota School of Mines, to date.

HERRING, WILLIAM E., E.M.....1910
 See List No. V.

HEWITT, EZRA A., E.M.....1912
 Kimberly, Nevada.

Assistant engineer, Fayal Mine, Eveleth, Minn., May to August, 1912. Assistant engineer, Great Northern Iron Ore Properties, Hibbing, Minn., August, 1912 to February, 1913. Assistant engineer, North Butte Mining Co., February, 1913 to January, 1914. Geologist, North Butte Mining Co., and Rainbow Lode Development Co., January, 1914 to December, 1915. Chief engineer, North Butte Mining Co., December, 1915 to November, 1917. Assistant superintendent, same company, November, 1917 to November, 1919. Superintendent, Consolidated Copper Mines Co., Kimberly, Nev., November, 1919 to date.

*HILL, A. STANLEY, E.M.....1911

HOARD, HAROLD J., E.M.....1903
 See List No. V.

*Deceased.

- HOASS, OLE G., E.M.....1908
 1644 Taylor St., San Francisco, Cal.
 Miner at Bunker Hill & Sullivan Mine, Kellogg, May to June, 1908.
 Miner at Tiger Mine, Burke, to September, 1908. Engineer for Federal
 M. & S. Co. Mining engineer to date.
- HOGANSON, GEORGE B., E.M.....1909
 See List No. V.
- HOLDEN HENRY H., Met.E.....1902
 4027 Goldfinch St., San Diego, Cal.
 With U. S. Steel Co., Hibbing, Minn. Foreman in cyanide mill for
 B. L. & B. M. Co., Alma, Colo. Engineer for C. & A., Bisbee, Ariz., to
 1906. Construction engineer, C. & A. and S. & P. Copper Co., Bisbee,
 Ariz., 1906 to June, 1910. Engineer, C. & S., Cananea, Sonora, Mex.,
 June, 1910 to January, 1911. Engineering and mining at Bisbee, January
 to June, 1911. Engineer, Old Dominion Copper Mining & Smelting Co.,
 Globe, Ariz., August, 1911 to June, 1913. Chief engineer, Superior &
 Boston Copper Co., June, 1913 to October, 1916. Superintendent, New
 Dominion Copper Co., Globe, Ariz., October, 1916 to April, 1918. Engineer,
 Arizona Con. Mng. Company, Globe, Ariz., June, 1918 to March, 1919.
 Superintendent, Telluride Mining, Milling & Development Company, Oat-
 man, Ariz., March, 1919 to January 1, 1920. At present consulting engineer.
- HOLLER, FREDERICK W., E.M.....1910
 Surf Inlet, B. C.
 Engineer, Copper Queen Consolidated Mining Co., Bisbee, Ariz.
 Foreman, Crown Point Co., Cactus Springs, Nev. Engineer on mill con-
 struction, Tonopah, Belmont Development Co., Tonopah, Nev., July, 1911
 to August, 1912. Field engineer, same company, August, 1912 to April, 1914.
 Superintendent, Surf Inlet Power Co., Ltd., and Belmont Canadian Mines,
 Ltd., Surf Inlet, B. C., April, 1914 to date. Also superintendent, Belmont
 Surf Inlet Mines, Ltd., September, 1917 to date.
- HONDRUM, OLAF, E.M.....1913
 Cananea, Sonora, Mex.
 Draftsman, Oliver Iron Mining Co., Eveleth, Minn., June to Novem-
 ber, 1913. Engineer, Cananea Copper Co., November, 1913 to April, 1914.
 Head transitman, Cananea Consolidated Copper Co., April to September,
 1914. Cyanide engineer and assayer, Cerro de Plata Mining Co., Cerro
 de Plata, Sonora, Mex., December, 1914 to May, 1915. Engineer, Cananea
 Consolidated, September, 1915 to March, 1916. Chief engineer, Cananea
 Consolidated Copper Co., March, 1916 to date.

HOSTED, JOSEPH ORRIN, E.M. (Geol.)1919
Lead, S. D.

Miner, Homestake Mining Company, Lead, S. D., May, 1919 to October, 1919. Sampler, same company, October, 1919 to June, 1920. Geologist, same company, June, 1920 to date.

HOULTON, LEWIS K., E.M.1904
Elk River, Minn.

Mining engineer with Calumet & Arizona Mining Co., Bisbee, Ariz. With Houle & Houlton, Mining engineers, Douglas, Ariz. Mining engineer, Santiago, Chile. Real estate, Elk River, Minn. President, First National Bank, Elk River, Minn., to date.

HOWES, FRANK T., E.M.1906
Engineering department, Northern Pacific Ry., St. Paul, Minn.

Resident engineer, Spokane-Portland & Seattle Ry., Kahlotus, Wash., May, 1906 to February, 1908. Resident engineer, Northern Pacific Ry., Missoula, Mont., and Mandan, N. D., April, 1908 to July, 1909. Locating engineer, Great Northern Ry., Lewistown, Mont., May to September, 1910. Resident engineer and locating engineer, Alberta Central Ry., Red Deer, Alberta, March, 1911 to April, 1912. Division engineer and locating engineer, Canadian Northern Ry., in Saskatchewan, April, 1912 to October, 1913. Member engineering staff, Oliver Iron Mining Co., Hibbing, Minn., January to April, 1914. Locating engineer, Mesabi Ry. (electric), February, 1914. Assistant engineer, valuation department, D. S. & A. Ry., Michigan, May to September, 1914. Assistant engineer, Minnesota Highway Commission, Canby, Minn., September to December, 1914. Junior civil engineer, Interstate Commerce Commission, valuation division, Chicago, December, 1914 to March, 1916. Engineer on construction, Tennessee Copper Co., March to May, 1916. Pilot engineer, D. S. S. & A. Ry., May to November, 1916. Resident engineer, Northern Pacific Ry., November, 1916 to date.

*HOYT, CHARLES C., E.M.1902

HOYT, SAMUEL L., E.M., Ph.D.1909
Nela Park, Cleveland, Ohio.

Graduate work for Ph.D., Columbia University, 1909 to 1911. Graduate work, Technische Hochschule, Charlottenburg, 1911 to 1913. Ph.D., Columbia University, 1914. Assistant Professor of Metallography, Minnesota School of Mines, August, 1913 to August, 1918. Associate Professor of Metallography, August, 1918 to July, 1919. Metallurgical engineer, Experimental Engineering Laboratory, National Lamp Works of the General Electric Co., Nela Park, Cleveland, Ohio. Government service:

*Deceased.

consulting metallurgist of the U. S. Bureau of Mines in coöperation with National Research Council for the War Minerals Investigation. Metallurgical engineer, Experimental Engineering Laboratory, Nela Park, Cleveland, Ohio, to date.

HSIEH, CHUNG, E.M.....1918
Kirin City, China.

Mining engineer, Oliver Iron Ore Company. Mining engineer, the Great Northern Iron Ore Company. At present, Head of the Bureau of Mines of the Kirin Industrial & Commercial department.

HUBBARD, WILLIAM E., E.M. (Geol.).....1917
Drawer 58, Ardmore, Okla.

Oil geologist, The Texas Co., Wichita Falls, Tex., May, 1917 to time of entrance into army. U. S. service to November, 1918. Oil geologist, Humble Oil and Refining Co., Cisco, Tex. Division geologist, same company to date.

HUGHES, THOMAS M., E.M.....1896
See List No. V.

HUNT, WALTER E., E.M.....1900
Care of E. J. Longyear Co., 710-722 Security Bldg., Minneapolis, Minn.

Mining engineer, Cripple Creek, Colorado, 1900. Mining engineer, Hibbing, Minn., 1901 to 1917. Mining engineer, E. J. Longyear Co. to date.

*HURLEY, JOHN J., E.M.....1911

INGERSOLL, GUY E., E.M. (Geol.).....1918
Dept. of Geology, Michigan College of Mines, Houghton, Mich.

U. S. service to December, 1918. Assistant metal mining engineer, U. S. Bureau of Mines, Minneapolis Station to October, 1920. Assistant Professor, Department of Geology, Michigan College of Mines, Houghton, Mich., to date.

JACKSON, CHARLES F., E.M.....1907
1300 Leader-News Bldg., Cleveland, Ohio.

Millman, miner and surveyor in Coeur d'Alene Mining District, Idaho. Assayer and surveyor, Santa Rosa Mine, Sonora, Mex. Sampler, Ray Consolidated Copper Co., Ray, Ariz. Engineer for fee interests at Hibbing, Minn. Mining engineer, Scranton mine, Hibbing, Minn., April to November, 1910. Engineer, Alpena and Fay Mines, Virginia, Minn., November, 1910 to May, 1912. General engineering, Minneapolis, Minn.,

May, 1912 to February, 1914. Engineer, Arthur Iron Mining Co., Hibbing, Minn., February, 1914 to April, 1915. Chief engineer, Central District, Arthur Iron Mining Co., Hibbing, Minn., April, 1915 to April, 1917. Miner and shift boss, Old Dominion Copper Mining & Smelting Co., Globe, Ariz., April to November, 1917. Mining engineer, M. A. Hanna Co., November, 1917 to date.

*JACOBSON, HARRY, E.M.....1910

JAHN, WILLIAM F., E.M.....1911
 (Permanent address) 3036 Bryant Ave. So., Minneapolis, Minn.

Millman, engineer, metallurgist, Mogul Mining Co., Pluma, S. D., May, 1911 to April, 1912. Solutionman, Nevada Hill Mining Co., Fairview, Nev., October, 1912 to January, 1913. Foreman, mill and cyanide plant of New York and Honduras Rosario Mining Co., San Juancita, Honduras, C. A., January to July, 1913. Mill superintendent, same company, July, 1913 to March, 1916. Mill superintendent, Tough-Oakes Gold Mines, Ltd., Kirkland Lake, Ont., Ca., August, 1916 to May, 1917. Staff engineer, the Dorr Co., engineers, New York, May to August, 1917. U. S. service to January, 1919. Engineer, the Dorr Co., New York, to November, 1919. General metallurgist, El Salvador Silver Mines Co., Inc., Divisadero, Salvador, C. A., November, 1919 to August, 1920. General superintendent for Compania Minera el Sacramento, S. A., Mina Mexico, Sonora, Mexico, via Douglas, Ariz., and Nacozeni, Sonora, Mexico, to date.

JERRARD, W. L., E.M.....1918
 P. O. Box 332, Elcor, Minn.

January, 1919 to June, 1919, tool designer with the Pan Motor Company, St. Cloud, Minn. June, 1919 to July, 1920, E. M. State of Minnesota. July to date E. M. for Hobart Iron Company of Pickands-Mather Company at Elcor, Minn.

JOHNSON, ALGOT F., E.M.....1910
 912 Plymouth Bldg., Minneapolis, Minn.

Draftsman with C. A. P. Turner Co. Engineer and foreman, Libby & Nelson Co. General foreman, Butler Bros. Junior member of the firm, James A. Burner & Co., architects and engineers, Minneapolis, Minn. Contracting under the name A. F. Johnson, engineer and builder, Minneapolis, Minn., June, 1913 to May, 1914. Senior member of the firm, Johnson & Drake, contractors and builders, Minneapolis, Minn., May, 1914 to date.

* Deceased.

JOHNSON, AXEL L., E.M.....1920
Care of State Highway Commission, St. Paul, Minn.

Engineer, Arthur Iron Mining Co., Hibbing, Minn., from June 1, 1920 to 1921. State Highway Commission to date.

*JOHNSON, RALPH I., E.M.....1903

JONES, PHILO E., E.M.....1910
32nd and K St., Vancouver, Wash.

Inspector of construction for H. M. Byllesby & Co., Faribault, Minn., September, 1910 to January, 1911. With Cummings & Kiehl, engineers and contractors on the Great Northern Dock, Vancouver, B. C. Member of the firm Bendon, Jones & Reed, general contractors, Sidney, Mont., to January, 1916. Contracting engineer, Sidney, Mont., January, 1916 to February, 1918. With G. M. Standifer, contracting corporation on steel ship-building, Vancouver, Wash., February, 1918 to January 1, 1920. Appraisal engineer with U. S. Shipping Board to April 1, 1920. Member of Consolidated Construction Co., Vancouver, Wash. April 1, 1920 to date.

KEENE, AMOR F., E.M.....1904
233 Broadway, New York City.

Examining engineer, Turnagain Gold Mining Co. of Minneapolis. Mine superintendent for same company at Cableville, Ore. Assistant engineer, Killen, Warner, Stewart Co., of Sumpter, Ore. Construction engineer for Cerro de Pasco Mining Co., Peru. Superintendent of construction and acting superintendent of the Peruvian Smelting & Refining Co., Ría Blanco, Peru, to 1907. Examining engineer for F. Kleptko, Peru, S. A. With Allen H. Rogers & A. Chester Beatty, 71 Broadway, New York City. With A. C. Beatty & H. C. Hoover, New York and London. Consulting engineer, No. 1 London Wall Bldg., London, E. C. Consulting engineer, Consolidated Mines Selection, Ltd. On technical committee of board of directors, Messina (Transvaal) Development Corporation, Ltd., Burma Corporation, Ltd., Lake View and Orova, Ltd., Mawchi Mines, Ltd., Lake View and Star, Ltd., Yuanmi Gold Mines, Ltd., Babalonio Mines, Ltd., Central American Mines, Ltd. Consulting engineer, Anglo-Colonial Estates, Ltd., to H. C. Hoover; also private consulting engineer. Examining mining properties, Burma, India. On foreign ore reserve for Colonial House Commission at office of U. S. Geological Survey, Department of Interior, Washington, D. C. At present consulting engineer and member of New York advisory committee, 233 Broadway, N. Y., Goldfields American Development Co., Ltd. Also Goldfields of South Africa.

* Deceased.

KELLER, ORRIN E. M., E.M. 1905
 Roundout, Ill.

Miner at Gray Rock Mine, Butte, Mont., 1905. Assistant manager of the McVey Mine, Harrison, Mont., 1906. Engineer and draftsman, Western Portland Cement Co., Yankton, S. D. Member of Engineering Corps, Calumet & Arizona Mining Co., Bisbee, Ariz., 1907-1908. Cashier, International Sugar Feed Companies, Minneapolis, 1909. Comptroller, M. W. Savage interests, 1911 to 1912. Secretary, International Sugar Feed Co., 1913 to July, 1914. President, Arcady Farms Milling Co., Chicago, July, 1914 to date.

KENNEDY, JOHN J., E.M. 1908
 Care of American Trading Co., Tokyo, Japan.

Mining engineer for the San Miguel Gold Mining Co., Sonora, Mex. Chief engineer of mines, Tennessee Copper Co., to January, 1913. Superintendent of mines, Tucson Mines Development Co., Tucson, Ariz., January, 1913 to January, 1914. Sales engineer, Ingersoll-Rand Co., Boston, Mass. Manager, Northwestern Branch, Ingersoll-Rand Co., Seattle, Wash., to March, 1918. Same company, 11 Broadway, New York City, March, 1918 to 1919. Japan manager for Ingersoll-Rand Co., Tokyo, Japan, to date.

KERR, CHARLES D., E.M. 1915
 Box 174, Eveleth, Minn.

Engineer, Sibley, Savoy and Zenith Mines, Oliver Iron Mining Co., June, 1915 to March, 1917. Engineer, Meacham and Kennedy mines, Rogers-Brown Ore Co., Crosby, Minn., March to August, 1917. U. S. service to July, 1919. State of Minnesota, Department of Mines and Mineral Lands, Hibbing, Minn., July, 1919 to March, 1920. Oliver Iron Mining Co., Eveleth, Minn., March 1920 to date.

KERSTEN, ERWIN H., E.M. 1920
 1206 S.E. 5th St., Minneapolis, Minn.

Engineer Oliver Iron Mining Co., Eveleth District. Instructor, Department of Metallurgy, School of Mines, University of Minnesota, to date.

KINGSLEY, NEIL S., E.M. 1911
 Care of Wm. H. Ziegler Co., 423 So. 5th St., Minneapolis, Minn.

With Grant-Smith Construction Co., Tye, Wash., July to August, 1911. With Libby & Nelson Construction Co., Minneapolis, August, 1911 to October, 1912. Assisting in the investigation of the low-grade iron ores of Minnesota, Minnesota School of Mines Experiment Station, October, 1912 to May, 1914. With Minneapolis Civic and Commerce Association, June, 1914 to April, 1917. U. S. service from May, 1917 to July, 1919. At present engineer and salesman with Wm. H. Ziegler Company, Minneapolis.

KINGSTON, MERTON S., E.M.....1904
Virginia, Minn.

Engineer at Fayal Mine. Superintendent of stripping. Chief engineer at Gilbert Mine. Chief engineer of Fayal District to February, 1910. Assistant Professor of Mining, Minnesota School of Mines, Minneapolis, February, 1910 to July, 1913. Superintendent and general agent, Higgins interests, Virginia, Minn., July, 1913 to May, 1916. Advisory engineer to C. A. H. Smith, New York. Operating Kingston Mining Co., Rutland Mining Co., Fault Mining Co., to date.

KNICKERBOCKER, ARTHUR K., E.M.....1908
Cushman, Arkansas.

With Calumet & Arizona Mining Co., June to August, 1908. Assayer, Edith Mine, Paris, Kern County, Cal., Aug. to Nov., 1908. Engineer, Fayal District, Oliver Iron Mining Co., Eveleth, Minn., March to June, 1909. Engineer, Gilbert, Minn., June to Nov., 1909. Assistant engineer, Shenango Furnace Co., Chisholm, Minn., Nov., 1909 to May, 1910. Assistant engineer, Great Northern Iron Ore Properties, Hibbing, Minn., May, 1910 to June, 1912. Engineer, Great Northern Iron Ore Properties, Hibbing, Minn., June, 1912 to January, 1914. Chief engineer, Hibbing District, Arthur Iron Mining Co., January, 1914 to April, 1915. Superintendent, Central District, Arthur Iron Mining Co., Hibbing, Minn., April, 1915, to April, 1917. Mining brow iron and manganese ores, Ga., N. C., and Tenn., April, 1917 to February, 1918. Mining engineer, Great Northern Iron Ore Properties, February to May, 1918. Superintendent, Northern Minnesota Ore Co., May, 1918 to April, 1921.

KNOX, LA FAYETTE, E.M.....1912
Hayden, Ariz.

Engineer and assayer, Ross Mining & Milling Co., Silverton, Colo., May to September, 1912. On construction work with the Norton Griffith Steel Construction Co., Vancouver, B. C., October, 1912 to February, 1913. Estimator, the Lussier Construction Co., Ltd., Medicine Hat, Alberta, Canada, February, 1913 to February, 1915. Engineering department, Hayden Plant, Ray Consolidated Copper Co., February, 1915 to March, 1918. U. S. service to July, 1919. Ray Consolidated Copper Co., Hayden, Ariz., September, 1919 to date.

KREMER, EDWARD G., E.M.....1912
Bessemer, Mich.

Assistant engineer, Arthur Mining Co. Engineer at Iron Mask Mine, B. C. Superintendent of Brown Ore Mines for Woodstock Iron Corp., Anniston, Ala. Chief engineer on Goegebic Iron Range for Pickands, Mather Company. At present contracting and building.

KROGH, ALVIN T., Met.E.....1916
(Home address) 3221 E. 24th St., Minneapolis, Minn.

Testing department, A. C. M. Co., Anaconda, Mont., May, 1916 to February, 1917. Flotation engineer, research department, same company, February to June, 1917. Flotation engineer, Standard Oil Co., California, July, 1917 to December, 1917. U. S. service from December, 1917 to June, 1919. Metallurgist, Republic Creosoting Co., September, 1919 to date.

KURTZMAN, PAUL S., E.M.....1906
Box 627, Hibbing, Minn.

Assistant superintendent, interurban division, Twin City Rapid Transit Co., Minneapolis, Minn., May, 1906 to March, 1907. Assistant engineer for Colorado Fuel Iron Co., Sunrise, Wyo., April, 1907 to March, 1908. Assistant engineer at Fayal Mine, Eveleth, Minn., April, 1908 to April, 1909. First assistant engineer, Republic Iron & Steel Co., Gilbert, Minn., April, 1909 to February, 1910. Superintendent, Monica & Wills Mines, Republic Iron & Steel Co., McKinley, Minn., February, 1910 to March, 1916. Mine captain, Pickands, Mather & Co., Utica Mine, Hibbing, Minn., March, 1916 to January, 1920. Superintendent, Utica Mine, Pickands, Mather & Co., January, 1920 to date.

KWONG, YIH KUN, E.M. (Met.E.).....1917
Care of K. W. Kwong, Kiangnan Dock & Engineering Works, Shanghai, China.

Chemist for the Iroquois Iron Company, September, 1918 to 1919.

LADD, GREELEY, E.M.....1913
2014 Queen Ave. S., Minneapolis, Minn.

Electrical foreman, University of Minnesota. Engineer for Superintendent of Buildings and Grounds, University of Minnesota, January, 1914 to January, 1915. Draftsman, Board of Education, Minneapolis, Minn., April, 1915. Cost accountant, Dayton Co., Minneapolis, January to July, 1917. Assistant manager, Lavioris Chemical Co., July, 1917 to November, 1918. Assistant secretary-treasurer, Lavioris Chemical Co., November, 1918 to date.

LARSON, CLARENCE L., E.M.....1910
Gillham, Arkansas.

Studying mining methods in the West, May to September, 1910. With the Calumet & Arizona Mining Co., Bisbee, Ariz., September, 1910 to June, 1911. Instructor in the Mining Department of the Imperial Polytechnic College, Nanking, China, from August to November, 1911. College closed on account of revolutionary troubles, November, 1911. Mill

foreman for the Chicksan Mining Co., Chicksan Korea, January to June, 1912. Cost engineer of Sajunkohl and Tonkohl mines for same company, June to September, 1912. Superintendent same company, October, 1912 to October, 1913. Instructor in Metallurgy, University of Idaho, Moscow, Idaho, February to July, 1914. U. S. Bureau of Mines Research Fellow at University of Utah, Salt Lake City, Utah, August, 1914 to July, 1915. Received degree of M.S. in Metallurgy, University of Utah, June, 1915. Experimental metallurgist in hydro-metallurgy, Bunker Hill & Sullivan Co., Kellogg, Idaho, July, 1915 to August, 1919. General manager, Boston & Arkansas Mining Co. at Gillham, Arkansas, August, 1919 to date.

LARSON ERNEST L., E.M.....1914
Trout Creek, Mont.

Assistant, Minnesota School of Mines Experiment Station, May, 1914 to May, 1915. Foreman, washing plant, Thompson Mine, Inland Steel Co., Crosby, Minn., May to November, 1915. Examining timber and mineral properties in Oregon and Idaho. With the Hecla Mining Co., mill and assay office, April to August, 1916. Mill testing for Hercules Mining Co., August, 1916 to February, 1917. Draftsman, same company, on construction coarse tailing retreatment plant, February to July, 1917. Mine development contract, Vermilion, S. & L. Mining Co., September, 1917 to May, 1918. U. S. service from May, 1918 to April, 1919. Mine development contract, Vermilion, S. & L. Mining Co., to date.

LEA, JOHN, E.M.....1912
1221 Hollingsworth Bldg., Los Angeles, Calif.

With Inspiration Consolidated Copper Co., May to August, 1912. Tubemillman for U. S. Smelting, Refining & Mining Co., Goldroad, Ariz., August to November, 1912. With Sullivan-Lonn Mining Co., Millet, May, 1916. With the Copper Queen, Bisbee, Ariz., May, 1916 to September, 1917. U. S. service. Experimental work until September, 1919. At present with Southwestern Engineering Company.

*LEE, LAING, Met.E.....1918

LEE, OSCAR, E.M.....1916
Morenci, Ariz.

With Anaconda Copper Mining Co., April, 1916 to April, 1918. Testing engineer, Arizona Copper Mining Co., Ltd., Morenci, Ariz., April, 1918 to date.

LEONARD, F. MORTON, E.M.....1910
Cerro de Pasco, Peru, S. A.

Assistant engineer, Pittsmont Mine, Butte, Mont., July and August, 1910. Miner and timberman, Berkeley, Speculator and Moonlight Mines.

* Deceased.

Butte, Mont., August, 1910 to May, 1911. Engineer for Butte Electric & Power Co., May to December, 1911. With Jas. Graham Machinery Co., Butte, December, 1911 to February, 1912. Engineer, B. A. & P. Ry. Co., February to June, 1912. Resident engineer, Edgewood & Bradley Hills Subdivisions, June, 1912 to February, 1914. With the Cerro de Pasco Mining Co., February, 1914 to date.

LEVORSON, A. IRVING, E.M.....1917
344 South Volulsia Ave., Wichita, Kan.

Geologist, Greenwood Co., of Minneapolis, to February, 1918. U. S. service to April, 1919. Geologist, the Greenwood Company, 515 Fourth National Bank Bldg., Wichita, Kansas, to date.

LEWIS, J. WHITNEY, E. M.....1912
Maracaibo, Venezuela.

Hoistman, Michigan-Utah Mine. Hydrographer, Price River Irrigation Co., Ltd. With mining department, Smith-Emory Co. Field geologist, Caribbean Petroleum Co., Venezuela, S. A. In general engineering work in Los Angeles and vicinity. Assistant geologist, Producers Oil Co., Tulsa, Okla. Member of firm Hager, Bates & Lewis, March, 1917 to October, 1917. Second Lieutenant, engineers. Aug. 3, 1917 to Dec. 4, 1918. Consulting geologist in Colombia and Venezuela since leaving the service.

LINDHOLM, MILTON S., E.M.....1911
(Home address) Ortonville, Minn.

Millman and assayer, Miller Mining, Milling & Tunnel Co., from June to December, 1911. Assayer for Yak Mining Co., Leadville, Colo., December, 1911 to June, 1912. Mill foreman, Miller Mining, Milling & Tunnel Co., June to November, 1912. With the Copper Queen Consolidated Mining Co., November, 1912 to January, 1914. Engineer, Societe Internationale Forestiere et Miniere du Congo, Tshikaysa, Kasai, Congo, January, 1914, to May, 1915. In charge of field work, Companhia de Pesgias, Minerias de Angola, Lunda District, Angola, North Africa, to May, 1916. With the Copper Queen, Bisbee, Ariz., May, 1916 to September, 1917. U. S. service to August, 1919. With C. & A. Mining Co., Bisbee, Ariz., to date.

LOCKE, ALFRED M., E.M.....1908
Waterloo, Iowa.

Assistant engineer, Oliver Iron Mining Co., 1908 to 1909. Salesman, United Iron Works, Spokane, Wash., 1909 to 1911. Salesman, Pacific Power & Light Co., Portland, Ore., during 1911. Rancher and irrigation engineer, Lemmon, S. D., during 1912. Salesman, Wm. H. Hale & Co., Minneapolis, Minn., 1913 to 1918. Research engineer, Waterloo Construction Machinery Co., Waterloo, Iowa., 1919. Service manager, Waterloo Const. Machinery Co., Waterloo, Iowa, to date.

LOVE, HENRY E., E.M.....1905
 Hibbing, Minn.

Assistant engineer, Adams and Spruce mines, Eveleth, May to July, 1905. Assistant engineer, Hibbing District, July to December, 1905. Chief engineer, Adams and Spruce mines, December, 1905 to January, 1907. Chief engineer, Adams District, January, 1907 to April, 1918. Assistant chief engineer, Hibbing District, April, 1918 to date.

LYTZEN, WALTER W., E.M.....1905
 Huron, Ariz.

Levelman, Northern Pacific Ry., 1905. Miner, Cora Mine, Butte, Mont. Assistant chemist, Pittsburgh & Mont. Copper Co., Butte, 1906. Draftsman and testing engineer at Washoe Smelter, Anaconda, Mont., 1906. Assistant engineer, B. & B. C. Mg. Co., 1907. Engineer, A. C. M. Co., B. & B. department, Butte, Mont., 1909 to 1918. Geologist, Consolidated Interstate-Callahan Mining Co., 1918. Consulting geologist, Big Ledge Copper Co., Prescott, Ariz. Superintendent and manager, Big Ledge Copper Co., to date.

McADAMS, HOWARD R., E.M.....1912
 Eveleth, Minn.

Draftsman, Toltz Engineering Co., St. Paul, Minn., June to October, 1912. Draftsman, St. Paul Foundry Co., October to November, 1912. Assistant mining engineer, Oliver Iron Mining Co., Adams District, November, 1912 to June, 1916. June, 1916 to December, 1916 on Mexican border with the National Guard. December, 1916 to May, 1917, with Oliver Iron Mining Co., Eveleth, Minn., May, 1917 to August, 1919, Captain in engineer corps, U. S. army. August, 1919 to date, Oliver Iron Mining Co., Eveleth, Minn.

McCARTY, ANDREW L., E.M.....1904
 See List No. V.

McCARTY, EDWARD P., E.M.....1900
 Laramie, Wyoming.

Professor of Mining, Minnesota School of Mines. General consulting engineer, 318 Palace Bldg., Minneapolis, Minn. U. S. service to December, 1918. Associate Professor of Mining Engineering, University of Wyoming, Laramie, Wyoming, to date.

*McCREERY, A. S., E.M.....1907

* Deceased.

McCULLOUGH, ERVIN W., E.M., Met.E.....1911
Care of Republic Creosoting Co., Indianapolis, Ind.

Instructor in Mining, Minnesota School of Mines. Instructor in Metallurgy, Minnesota School of Mines. Assistant Professor of Metallurgy, Minnesota School of Mines. Chief metallurgist, Republic Creosoting Co., Indianapolis, Ind., to date.

McDERMID, ARCHIE J., E.M.....1916
Quartzburg, Idaho.

Geologist, Mid-Continent Oil Fields May, 1916 to June, 1917. Miner for C. & A. Mining Co., Bisbee, Ariz., August to October, 1917. Military service, October, 1917 to July, 1919. Draftsmen on litigation work for Utah Cons. Mining Co., August, 1919 to May, 1920. Engineer and assayer for Florida Mining Co., Silver City, Idaho, May to September, 1920. Engineer for Gold Hill Mine, Quartzburg, Idaho, September, 1920 to date.

McHARDY, ROY H., E.M.....1916
Marble, Minn.

Stope engineer, Greene Cananea Co. Engineer, C. & A. Co., Bisbee, Ariz. Engineer and assayer, Iron Cap Copper Co., Globe, Ariz. Metallurgical chemist, Government service. U. S. military service to November, 1919. Engineer, Oliver Trend Mining Co., Hibbing, Minn. Engineer, Inter-State Iron Co., to date.

McINTOSH, JOSEPH B., E.M.....1898
Pachuca, Hidalgo, Mexico.

Assistant mining engineer, B. & M. Consolidated Copper & Silver Mining Co., Butte, Mont., June to December, 1898. Mining engineer, Winona Copper Co., Winona, Mich., December, 1898 to February, 1900. Constructing engineer, A. C. M. Co., at Reduction Works, Anaconda, Mont., March, 1900 to June, 1908. Constructing engineer, Boston & Montana Reduction Works, Great Falls, Mont., June to December, 1908. Constructing engineer, International Smelting & Refining Co., Tooele, Utah, December, 1908 to August, 1910. Superintendent, construction and maintenance, Garfield Smelting Co., Garfield, Utah, August, 1910 to November, 1911. Superintendent of construction, United Verde Copper Co., Jerome, Ariz., November, 1911 to February, 1913. Superintendent of construction, American Smelting & Refining Co., Murray Plant, Murray, Utah, April, 1913 to July, 1920. Chief mechanical and construction engineer, Cia de Rael del Monte y Pachuca, Pachuca, Hidalgo, Mexico, July, 1920 to date.

McKAY, HENRY S., E.M.....1905
Cananea, Sonora, Mexico.

Engineer, Calumet & Arizona Mining Co., 1905 to 1907. Chief engineer, Democrata Mining Co., 1907 to 1908. Superintendent, Democrata

- Mining Co., 1908 to 1919. General superintendent, Calumet & Sonora of Cananea Mining Co., to date.
- McKENZIE, JAMES R., E.M.....1910
 (Home address) 1910 4th St. S.E., Minneapolis, Minn.
- Field assistant, U. S. Survey, June to November, 1910. With S. J. McKenzie Lumber Co., Denham Springs, La., November, 1910 to May, 1916. Computer and instrumentman, C. & N. W. Ry., May, 1916 to September, 1917. Assistant superintendent on construction for Macdonald Engineering Co., Chicago, Ill., September, 1917 to June, 1919. Superintendent on construction for John S. Metcalf Co., Chicago, June, 1919 to date.
- McRAE, RANDOLPH J., E.M.....1907
 See List No. V.
- *MALCOLMSON, GEORGE E., E.M.....1907
- MARK, ISRAEL C., E.M.....1920
 (Home address) 826 16th Ave. N., Minneapolis, Minn.
- MARTIN, LYNN, E.M.....1912
 Glenwood, Minn.
- Miner and sampler, Leonard Mine, Butte, Mont., May to December, 1912. Graduate work, University of Minnesota, 1912 to 1913. Assistant engineer, Minnesota Highway Commission, June to January, 1914. Engineer, Spring Valley, Fillmore and Houston counties, Minnesota Highway Commission, Caledonia, Minn., January to June, 1914. District engineer, Pope County, Glenwood, Minn., June, 1914 to June, 1915. County superintendent of construction of roads and bridges, Pope County. U. S. service to September, 1917. County superintendent of construction of roads and bridges, Pope County. Division engineer, State Highway Commission, January 1 to April 1, 1920. Member, contracting firm of Harry H. Beal, to date.
- MAY, ALBERT E., B.A., 1896; E.M.....1898
 231 Rawson Road, Brookline, Mass.
- Timekeeper, Sellers Ore Co., Hibbing, Minn., 1896. Mill superintendent, North Pole Mill, Sumpter, Ore., 1897 to 1900. Reduction officer with Lathom Gold Mining Co., Ltd., at Coethe, Minas Geraes, Brazil, 1900 to 1902. Assistant manager for Eastern Oregon Mining Co., Sumpter, Ore., 1902 to 1906. Manager, Guadalupe Consolidated Mining Co., Inde, Durango, Mex., 1906 to 1913. Manager, Placerville Gold Mining Co., Placerville, Cal., 1914 to 1916. Ranching in Texas, 1916 to 1918. With Guggenheim Bros. in New York and South America, 1919 to 1920.

MELLEM, WALTER R., E.M.....1919
Care of Hobart Iron Co., Gilbert, Minn.

Mining engineer, O. I. M. Co., Eveleth, Minn., May, 1919 to July, 1920.
Mining engineer, Hobart Iron Co., July, 1920 to date.

MERRIAM, ROBERT S., E.M.....1905
509 Sherwood Bldg., Spokane, Wash.

Engineer and assayer, North American Mine, Barron, Wash. Mining engineer, Wallace, Idaho. U. S. mineral surveyor for Montana and Idaho. Engineer, Climax Molybdenum Co., Climax, Colo., July to October, 1918. Assistant superintendent, Climax Molybdenum Co., October, 1918 to 1920. Mining and consulting engineer, Spokane, Wash., May, 1920 to date.

MERRITT, LUCIEN, E.M.....1904
827-829 Met. Bank Bldg., Minneapolis, Minn.

Vice-president Nikaniss Co. President, Northern Dredge & Dock Company. Contractor to date.

MICHIE, ROY G., E.M.....1913
(Permanent address) Montevideo, Minn.

Assistant engineer and rodman, Great Northern Iron Ore Properties, Hibbing, Minn. Assistant assayer, Butte & Superior Mining Co. Mining for the Amalgamated Copper Mining Co. Construction engineer, Butte Water Co. Foreman at Helena, Mont., for the Washington Pipe & Foundry Co., of Tacoma, Wash. Foreman for the same company at Newall, S. D. With E. G. Evensta Construction Co., of Minneapolis. County engineer, Chippewa County, Minn., and engineer of Montevideo, Minn. County drainage engineer, to date.

MILLS, EUGENE C., E.M.....1897
Willows, Cal.

Instructor in Mining, Minnesota School of Mines. Mining engineer, Fayal Iron Mine, Eveleth, Minn. Superintendent Commodore Mining Co., Virginia, Minn. Superintendent, New Era Coal Co., Minot, N. D. Superintendent, Buena Vista Mining Co., West Point, Cal. Director, Polytechnic College of Engineering, Oakland, Cal. Chief engineer, Sacramento Valley Irrigation Co., Willows, Cal. Superintendent and engineer. Sacramento Valley West Side Canal Co., Willows, Cal. Consulting engineer, irrigation and drainage, Willows, Cal., to date.

MINDER, E. G., E.M.....1905
Slayton, Minn.

Engineer for the Warren Realty and Development Co., Bisbee, Ariz. Drainage engineer for Board of County Commissioners of Murray County.

Also referee and consulting engineer in judicial ditches for 13th Judicial District, to date.

MOENKE, WILLIAM F., E.M.....1906
Moorcroft, Wyo., Box 69.

Miner, Portland Mine, Victor, Colo., May to July, 1906. Second assistant engineer, Colorado Fuel & Iron Co., Sunrise, Wyo., July, 1906 to April, 1907. First assistant engineer with same company, April, 1907 to August, 1909. Chief engineer, C. F. & I. Co., August, 1909 to January, 1910. Assistant engineer, Pickands, Mather & Co., McKinley, Minn., January, 1910 to August, 1911. Chief engineer, C. F. & I. Co., Sunrise, Wyo. Geologist, (private work) to date.

MOGA, JOHN A., E.M.....1918
(Home address) 271 Charles St., St. Paul, Minn.

U. S. military service to November, 1919. Assistant metallurgist, Minneapolis Steel & Machinery Co., to date.

MOODY, REVILLO G., E. M.....1910
2741 Chicago Ave., Minneapolis, Minn.

Timekeeper, Boston Consolidated, June to October, 1910. Draftsman, Utah Copper Co., October, 1910 to February, 1911. Assistant underground engineer, February to July, 1911. Outside foreman, July, 1911 to September, 1912. Draftsman, C. A. P. Turner, Minneapolis, Minn., September, 1912, to October, 1915. Salesman, Washburn-Crosby Co., October, 1915 to May, 1916. Inspector, Minneapolis Park Board engineers, May, 1916 to June, 1917. Engineering department, City of Minneapolis, June, 1917 to date.

MORGAN, CHARLES, E.M.....1906
Woodstock, Ala.

Surveyor, Longyear Exploration Co., Hibbing, Minn. With Republic Iron & Steel Co. Engineer, Republic Iron & Steel Co., Virginia, Minn. Engineer, Brown Ore Mining Division, Republic Iron & Steel Co., Alabama. Superintendent, Woodward Iron Co., Brown Ore Mines, Woodstock, Ala., July, 1910 to date.

NEERLAND, HERMAN, E.M.....1915
Care of Warnock Bldg. Co., Sioux City, Iowa.

Assistant engineer for Inland Steel Co., Thompson and Armour mines, Crosby, Minn., May to June, 1915. Night foreman for the same company at Frosty Morning concentrating plant, June to September, 1915. State mining engineer, Woodbridge Mine, Buhl, Minn., September, 1915 to September, 1916. Construction engineer, Butler Bros. Building Co., on Stock

Yards Extension, South St. Paul, August to December, 1916. Agricultural engineer, Amery, Wis., December, 1916 to December, 1917. U. S. service to August, 1919. General foreman on construction of Aurora High School, Aurora, Minn., for A. C. Thomas-Guthrie Construction Co., St. Paul, Minn., September, 1919 to January, 1920. Assistant constructing engineer for Warnock Building Co., on the Warnock Building, Sioux City, Iowa, April to date.

NEUSTADT, BERTHOLDT R., E.M.....1906
See List No. V.

NEWELL, JOHN R., E.M.....1910
Box 1033, Spokane, Wash.

Transitman, Oregon Electric Ry., June to September, 1910. Time-keeper, Water Power Project, September to October, 1910. Transitman, Oregon Electric Ry., January to May, 1911. Assistant engineer, same company, May to October, 1911. Resident engineer on construction, same company, October, 1911 to January, 1913. Resident engineer, Columbia & Nehalem River Ry., April, 1913 to April, 1914. District engineer, Oregon State Highway Commission, April, 1914 to January, 1915. Superintendent, Jeffries & Bufton, general contractors, February to October, 1915. Construction engineer, Wahkiakum County, Wash., November, 1915 to June, 1916. Engineer and salesman for Concrete Pipe Works, Portland, Ore., June, 1916 to October, 1918. U. S. service to March, 1919. Member of firm, Concrete Pipe Co., Spokane, Wash., April, 1919 to date.

NICHOLS, CLIFFORD R., E.M.....1920
(Home address) Buhl, Minn.
Engineering work at Anaheim, California.

NISSEN, ARVID E., E.M., M.S.....1913
5219½ York Road, Baltimore, Md.

With Chas. L. Pillsbury, consulting engineer, St. Paul, Minn., May to October, 1913. M.S. degree, University of Minnesota, 1914. Inspector for the Pittsburgh Testing Laboratory, July to November, 1914. Appraisal engineer, November, 1914 to April, 1915. Metallographer, Inland Steel Co., Indiana Harbor, Ind., April to July, 1915. Foreman, No. 1, Open-Hearth, Illinois Steel Co.'s Gary works, July, 1915 to January, 1917. General foreman, No. 2 Open-Hearth Duplex Plant, Gary, Ind., January to July, 1917. Metallurgical engineer, American Graphite Co., Chicago, Ill., July, 1917 to March, 1918. Metallurgical engineer, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., March, 1918 to October, 1919. Hess Steel Corporation, Baltimore, Md., October, 1919 to date.

*NOEHL, BARTLEY F., E.M.....1907

* Deceased.

- NORD, HARRY H., E.M.....1916
 Hibbing, Minn.
 Mining engineer, Shenango Furnace Co., May, 1916 to December, 1917. U. S. service from December, 1917 to March, 1919. Mining engineer, Shenango Furnace Co., April, 1919 to December, 1919. Mining engineer, Calumet & Arizona Copper Mining Co., Bisbee, Ariz., December, 1919 to April, 1920. Mining engineer, Stambaugh Iron Co., Hibbing, Minn., April, 1920 to date.
- OBERG, ANTON C., E.M.....1907
 316 Sellwood Bldg., Duluth, Minn.
 Assistant engineer, Colorado Fuel & Iron Co., Sunrise, Wyo., May to October, 1907. Assistant mining engineer, Great Northern Iron Ore Properties, October, 1907 to August, 1909. Mining engineer, Great Northern Iron Ore Properties, August, 1909 to June, 1912. Assistant chief engineer, Arthur Iron Mining Co., Hibbing, Minn., June, 1912 to August, 1913. Chief engineer, Arthur Iron Mining Co., August, 1913, to January, 1914. Consulting engineer, Duluth, Minn., January, 1914 to date.
- O'BRIEN, J. CHARLES, E.M.....1912
 A. C. M. Co., Soda Springs, Idaho.
 Assistant engineer, A. C. M. Co. Mining engineer, A. C. M. Co. Southern Cross Mine, Southern Cross, Mont. U. S. service to April, 1919. Assistant superintendent, Southern Cross Mine., Southern Cross, Mont. Superintendent, Southern Cross Mine. Safety engineer, Emma Mine. Foreman, A. C. M. Phosphate Mine, Soda Springs, Idaho.
- O'CONNOR, EDWARD S., E.M.....1906
 P. O. Box 663, Mayville, Wis.
 Engineering corps, Fayal Mine, Eveleth, Minn., May, 1906 to January, 1909. First assistant engineer, Fayal District, January, 1909 to February, 1910. Chief engineer, Fayal district, February to August, 1910. Superintendent of mines, Northwestern Iron Co., August, 1910 to July, 1919. Mine superintendent, the Steel & Tube Company of America, Mayville Plant, July, 1919 to date.
- OFSTHUN, NORMAN H., E.M.....1913
 Miami, Ariz.
 Engineer, State Mineral Lands Department, June, 1913 to April, 1914. Mine sampler, I. O. C. Co., Miami, Ariz., April to September, 1914. Draftsman, Crown Mill Equipment Co., Milwaukee, Wis., September, 1914 to August, 1916. President Salt River Copper Co., August, 1916 to date of entering army. U. S. service to November, 1918. Mining engineer, Miami, Ariz., to date.

OLMSTEAD, JOHN S., E.M.....1908
 Box 54, Ajo, Arizona.

Surveyor, Calumet & Arizona Mining Co., Bisbee, Ariz., September, 1908 to August, 1909. Geological department, same company, August, 1909 to July, 1912. Engineer, Courtland Exploration, same company, Courtland, Ariz., July to November, 1912. Geological department, Calumet & Arizona Mining Co., Bisbee, Ariz., November, 1912 to March, 1914. Assistant engineer on experimental work, Calumet & Arizona Mining Co.'s smelter, Douglas, Ariz., March to August, 1914. Assistant engineer, Experimental Plant, New Cornelia Copper Co., Ajo, Ariz., August, 1914 to February, 1916. Chief engineer, same company, February, 1916 to March, 1917. General foreman, reduction works, same company, March, 1917 to date.

OLSON, WALTER S., E.M.....1912
 306 Williams St., St. Paul, Minn.

Miner, West Grey Rock Mine, Butte, Mont., July to December, 1912. Engineer, government service, January to July, 1913. With Teal & Olson, Cyanide Works, Mariposa, Cal., July, 1913 to 1916. Engineer with Progress Mining & Milling Co., Frawley, Colc., May, 1916 to December, 1916. With Black Diamond Mining Auger Co., St. Paul, Minn., March, 1917 to April, 1918. Second Lieut., Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., April, 1918 to January, 1919. Black Diamond Mining Auger Co., January, 1919 to March, 1920. Office engineer, Commissioner of Drainage and Waters, Old Capitol Bldg., St. Paul, Minn., May, 1920 to date.

OLUND, HENNING E., E.M.....1907
 Glendale, Cal.

Tableman, Cananea Ore Co., Mexico. Mine sampler for C. C. C. Co., American Mine, Cananea, Mex. Engineer for Rosario, M. & S. Co. Engineer, Urique Development Co. and Pilton M. & M. Co., Urique, Chihuahua, Mex. General superintendent and mining engineer for Lake Superior & Nevada Development Co., of Duluth, Minn. Engineer, Republic Smelting Corporation. Superintendent, same company, Calzona, Cal., March, 1913 to January, 1915. Leasing, Calzona Mines Co., Vidal, Cal., January, 1915 to October, 1916. Superintendent, Calzona Mines Co., October, 1916 to July, 1917. Consulting engineer for C. H. Lord Corporation, Illinois-Arizona Copper Co., Martin Securities Corporation, July, 1917 to 1918. Motor tester, air craft production, Detroit, Mich., July, 1918 to December, 1918. Consulting engineer and general superintendent, American Eagle Consolidated Mines Co., Vidal, Cal., to date.

OSTRAND, PETER M., E.M.....1910
 See List No. V.

PAN, WEN PING, Met.E.....1919
Hibbing, Minn.

Mining engineer, Oliver Iron Mining Co., Hibbing, Minn., October, 1919 to date.

PARKER, WALTER H., E.M.....1907
Minnesota School of Mines, Minneapolis, Minn.

Mining engineer for H. T. & F. Co., Berlin, Wash., from June to December, 1907. Mining engineer, International Coal Co. and Montana Coal & Iron Co., Bearcreek, Mont., from December, 1907 to August, 1911. Consulting engineer with R. M. McKinley, Vancouver, B. C., to December, 1912. Provincial manager, Saskatchewan, for Canadian Investment Co. to April, 1914. Consulting engineer, April, 1914 to April, 1917. U. S. service to September, 1919. Associate Professor of Mining, Minnesota School of Mines, September, 1919 to date.

PERRY, JOSEPH B., E.M.....1912
Morenci, Ariz.

Engineer, Pittsburgh-Dolores Mining Co. In general engineering work. Assayer and engineer, McConnel Mines Co., Mason, Nev., and churn drill work, Miami Copper Co., during 1913 and 1914. Engineer, Pittsburgh-Dolores Mining Co., Yerington, Nev., April, 1914 to March, 1915. Mine superintendent, Pittsburgh-Dolores Mining Co., March, 1915 to February, 1918. Mine superintendent, Rockland Mining Co., February, 1918 to May, 1918. Examining engineer, war minerals, R. V. Adams interests, San Francisco, May to November, 1918. Chief engineer, Metcalf division, Arizona Copper Co., Ltd., November, 1918 to May, 1919. Geological department, Morenci Branch, Phelps-Dodge Corp., May, 1919 to September, 1919. Efficiency engineer, Phelps-Dodge Corporation, September, 1919 to date.

PETERSON, ANDREW Y., E.M.....1899
Coleraine, Minn.

Assistant mining engineer, Lake Superior Consolidated Iron Mines, Duluth, May, 1899 to June, 1901. Engineer, Adams & Spruce Mines, Eveleth, to January, 1903. Assistant superintendent of exploration, Oliver Iron Mining Co., Duluth, to January, 1906. Superintendent, Hartley-Myers Mines, Chisholm, Minn., January, 1906 to January, 1911. Assistant general superintendent, Oliver Iron Mining Co., Chisholm district, January, 1911 to May, 1918. General superintendent, Canisteo district, May, 1918 to date.

PETERSON, CLARENCE D., E.M.....1920
324 Wash St., Hibbing, Minn.

Engineer, Arthur Iron Mining Co., Hibbing, Minn.

PETERSON, JOSEPH S., E.M.....1908
Smuggler, Colo.

Miner, Portland Mine, Cripple Creek, Colo., June to September, 1908. Inspector, Central Colorado Power Co., September to December, 1908. Mine sampler, surveyor, assayer, millman, Liberty Bell G. M. Co., Telluride, Colo., January, 1909 to May, 1911. Cyanide foreman, S. A. D. Co., Guayaquil, Ecuador, S. A., May, 1911 to May, 1913. General superintendent, Ophir G. M. M. & P. Co., Ophir, Colo., August, 1913 to January, 1914. Cyanide superintendent, Tomboy G. M. Co., Telluride, Colo., January, 1914 to January, 1917. Assistant general manager, same company, January, 1917 to date.

PETERSON, PAUL A., Met.E.....1917
(Home address) 450 Snelling Ave., St. Paul, Minn.

Senior inspector, aeroplanes and aeroplane engines, signal service at large. Metallurgical staff, United Alloy Steel Corps, Canton, Ohio.

POTTER, ORRIN W., E.M.....1914
1803 Princeton Ave., St. Paul, Minn.

Geologist, Wisconsin Geological Survey, May to November, 1914. Sales manager and engineer, Gas Traction Foundry Co., Minneapolis, Minn., November, 1914 to February, 1917. Engineer and production manager, same company, February, 1917 to November, 1919. Instructor in Drawing and Descriptive Geometry at University of Minnesota, to date.

*PRATT, GEORGE A., E.M.....1898

PROBST, ELMER A., E.M.....1907
Amalfi, Colombia, S. A.

Draftsman, C., M. & St. P. Ry., June, 1907 to July, 1908. Division engineer, Grand Trunk Ry., July, 1908 to March, 1915. Manager, La Viborita Co., Amalfi, Colombia, S. D., April, 1915 to date.

PROUTY, ROSWELL W., E.M.....1912
Care of Copper Queen Branch, Phelps-Dodge Corp., Bisbee, Ariz.

Engineer, Pioneer Mine, Oliver Iron Mining Co., Ely, Minn., June, 1912 to August, 1914. Assistant geologist, Detroit Copper Mining Co., Morenci, Ariz., August, 1914 to October, 1915. Efficiency engineer, Old Dominion Copper Mining & Smelting Co., Globe, Ariz., October, 1915 to February, 1916. Assistant geologist Detroit Copper Mining Co., February to May, 1916. Acting chief geologist, same company, May, 1916 to April, 1918. Division foreman, Yankie and Ryerson mines, Phelps-Dodge Corporation, Morenci, Ariz., April, 1918, to November, 1919. Head sampler,

* Deceased.

Old Dominion Co., Globe, Ariz., December, 1919 to July, 1920. Chief geologist, Copper Queen Branch, Phelps-Dodge Corp., Bisbee, Ariz., July, 1920 to date.

QUINLAN, HOWARD, E.M.....1914
(Home address) 542 Ashland Ave., St. Paul, Minn.

With H. T. Quinlan & Co. Vice-president to date.

QUINN, HOWARD E., E.M (Geol.).....1918
(Home address) Melrose, Minn.

See List No. V.

QUINN, MAX F., E.M.....1912
Sierra Mójada, Mexico.

Assistant engineer to Stewart Campbell (custom work), Hailey, Idaho. Engineer, Idora Hill Mining Co. Assayer and engineer, Iron Mountain Tunnel Co., Superior, Mont. Assayer, Pittsburgh-Dolores Mining Co., of Rockland, Nev. Engineer and assistant superintendent, Rex Consolidated Mining Co., Sunset, Idaho, to November, 1917. Superintendent, Cleveland Mining Co., Springdale, Wash., November, 1917 to March, 1918. Superintendent, the Finance & Exploration Co. of America, Hillsboro, N. M. Engineer International Commission Co., Nacozari Son, January, 1920 to August, 1920. Assistant Superintendent, A. S. & R. Company, Sierra Mojada, Mexico, to date.

RAHILLY, HAROLD J., E.M.....1911
Care of Anaconda Copper Mining Co., Butte, Mont.

Engineer, Oliver Iron Mining Co., Coleraine, Minn., May to December, 1911. Engineer, in office of Repath & McGregor, Douglas, Ariz., January, 1912 to February, 1913. Assistant chief engineer on construction, Calumet & Arizona Smelter, Douglas, Ariz., February to June, 1913. Superintendent of construction, Commonwealth Mining & Milling Co., Pearce, Ariz., June, 1913 to March, 1914. Superintendent, Minneapolis Copper Co., Cumpas, Sonora, Mex., May, 1914 to May, 1915. Mining engineer, U. S. General Land Office, Knik, Alaska, May to November, 1915. Mining engineer, U. S. Bureau of Mines, Pittsburgh, Pa., November, 1915 to April, 1916. In charge of Bureau of Mines office, Billings, Mont., April, 1916 to April, 1917. Mining engineer, Anaconda Copper Co., Butte, Mont. Mine fire superintendent, Anaconda Copper Mining Co., to date.

RAIT, DONALD M., E.M.....1903
Box 744, Warren, Ariz.

Assistant engineer, Houghton St. Ry. Co., 1903 to 1904. Engineer, Calumet and Arizona Mining Co., Warren, Ariz.

RAITER, CLIFFORD R., E.M.....1920
Alexandria, Minn.

With Chile Exploration Company, Chile, S. A., to 1921. With Minnesota Highway Department to date.

RAMSING, FRED C. (Johnson), E.M.....1915
125½ Elm St., Anaconda, Mont.

With the Anaconda Copper Mining Co., December, 1915 to date of entering army. U. S. service to November, 1918. Chemist, Research Lab., Anaconda Copper Mining Co., Anaconda, Mont., to date. Also consulting engineer for Ideal Mining Co. to date.

RAVICZ, LOUIS G., E.M.....1914
Hayden, Stone & Co., 25 Broad St., New York, N. Y.

Graduate work, the University of Minnesota, 1914 to 1915. Graduate work, Columbia, 1915 to 1916. Engineer, General Chemical Co., June to September, 1916. Assistant geologist, Cosden Oil & Gas Co., September, 1916 to July, 1917. Geologist, the Carter Oil Co., July, 1917 to July, 1918. Quartermaster Sergeant, U. S. A. to February, 1919. Petroleum geologist and engineer, Hayden, Stone & Co. to date.

RAWSON, HORACE C., E.M.....1906
(Home address) 4641 Aldrich Ave. S., Minneapolis, Minn.

Engineer, B. & Q. Mining Co., Silverton, Wash., 1907. Assistant engineer, C. F. & I. Co., Trinidad, Colo., 1908. General engineering work, Denver, Colo., 1908. With Jones, Wheeler, Crammer Engineering Co. to June, 1909. With Minneapolis Steel & Machinery Co., Denver, Colo., to May, 1910. With J. J. Cooke, contractor, Denver, Colo., from May, 1910 to January, 1911. Construction foreman for City Engineer of Minneapolis from January to July, 1911. With C. A. Boehme, architect, Minneapolis, Minn., July, 1911 to July, 1912. With Alberta Land Co., Ltd., Port Arthur, Ont., Can., July, 1912 to September, 1914. Building construction, Minneapolis, to March, 1916. With the Canadian Copper Co., Copper Cliff, Ont., March, 1916 to May, 1917. U. S. service to July, 1919. Examining and effecting sale of mineral lands in St. Lawrence County, N. Y., September, 1919. Building construction, Minneapolis, to date.

ROBERTSON, JOHN H., E.M.....1914.
Box 1405, Miami, Ariz.

Miner, millman, Old Dominion Copper Co., Globe, Ariz., June, 1914 to February, 1915. Assistant to chemist, Inspiration Consolidated Copper Co., Miami, Ariz., February to May, 1915. Millman on construction, same

company, May to November, 1915. Mill operator on operation, same company, November, 1915 to July, 1916. Secretary, Salt River Copper Co., Miami, Ariz., July, 1916 to 1918. Shift boss, Miami Copper Co., Miami, Ariz., January, 1918 to September, 1920.

ROED, OLAF A., E.M.....1917
2818 10th Ave. S., Minneapolis, Minn.

Bridge construction.

ROOD, LYNN, E.M.....1909
Care of Chas. Weinhagen & Co., St. Paul, Minn.

Assayer and surveyor, Queen of the West Mine Co., Cornucopia, Ore., June, 1909 to January, 1910. Assistant to A. H. Wheeler, architect, St. Paul, Minn., February, 1910 to June, 1911. Structural engineer, National Iron Co., Duluth, Minn., June, 1911 to September, 1916. Salesman, Farnham Printing & Stationery Co., September, 1916 to November, 1917. Estimator, Chas. Weinhagen & Co., November, 1917 to date.

ROSE, WILLIAM A., E.M.....1906
Duluth, Minn.

Engineer, O. I. M. Co., December, 1907 to January, 1911. Chief engineer, O. I. M. Co., Hibbing, Minn., January, 1911 to September, 1913. Chief engineer, Pickands-Mather & Co., Duluth, September, 1913 to date.

SANCHEZ, RICHARD M., E.M.....1915
Tarma, Peru, S. A.

Assistant, Minnesota School of Mines Experimental Station, June to October, 1915. Engineer, Cuyuna-Mille Lacs Mining Co., Ironton, Minn., October, 1915 to March, 1916. Mining engineer, Société Internationale Forestiere et Minière, du Congo, March, 1916 to November, 1918. Mining engineer, Alvarado Mining and Milling Co., Parral, Chihuahua, Mex., December, 1918 to July, 1919. Mining engineer, Tarma, Peru. Engineer, for Cerro de Pasco Copper Corp., Oroya Construction Dept., Tarma, Peru, to date.

SANDERSON, HENRY S., Met.E.....1901
404 Interstate Bldg., Denver, Colo.

Consulting mining engineer and U. S. mineral surveyor, June, 1901 to date.

SANTO, JULIUS H., E.M.....1909
Eureka, Utah.

Engineer, Oliver Iron Mining Co., Hibbing, Minn., June, 1909 to January, 1910. Surveyor and assayer, Guadalupe Mine, Inde, Durango,

Mex., January, 1910 to August, 1911. Instructor, Mechanics and Mathematics, Minnesota School of Mines, August, 1911 to August, 1912. Assistant to A. E. May, Placerville Gold Mining Co., Placerville, Cal., August, 1912 to September, 1914. Operating Pacific Mine on lease, September, 1914 to September, 1915. With Walter Fitch, Jr., Inc., contractor for mine development and tunneling, Eureka, Utah. U. S. service, October, 1917 to July, 1919. Superintendent for Walter Fitch, Jr., Contracting Company, Eastern Division, Mt. Carmel, Pa., August, 1919 to July, 1920. With Walter Fitch, Jr., contractor, Eureka, Utah, to date.

SCHRADER, ERICH J., E.M.....1905
 Box F, Tonopah, Nev.

Engineer for the K. S. Mining Co., Chelan Co., Wash. Assayer and engineer, Bald Butte Mining Co., Marysville, Mont. Assayer and chemist, Minneapolis Copper Co., to August, 1907. Assistant manager, same company, to March, 1908. Manager, San Miguel Gold Mining Co., Horcasitas, Sonora, Mex., to 1912. General manager, Pittsburgh-Dolores Mining Co., Rockland, Nev., 1912 to 1917. General manager, Rockland Mining Co., Rockland, Nev., 1917 to July, 1918. Consulting mining engineer, Yerington & Reno, Nev., July, 1918 to 1919. General superintendent, Cons. Spanish Belt Silver Mining Co. to date.

SHONTS, SYDNEY L., E.M.....1904
 Wallace, Idaho.

With Federal Mining & Smelting Co., May, 1904 to January, 1905. smelters, 1906. Engineer, Pittsburgh Lead Mining Co., 1907 to 1908. In office of Bunker Hill & Sullivan Mine to February, 1906. Representative of Bunker Hill & Sullivan Mining & Concentrating Co. at the coast Manager, same company, to June, 1910. Consulting mining engineer and operator, Wallace, Idaho. Mining engineer for Bureau of Mines in investigations for War Minerals Board, Wallace, Idaho, 1918 to 1919. Consulting mining engineer, Wallace, Idaho, to date.

SMITH, EDGAR W., E.M.....1907
 1770 Hennepin Ave., Minneapolis, Minn.

Prospector for the B. & M. S. Co., May to September, 1907. Timberman, Quartette Mine, Searchlight, Nev., to May, 1909. Superintendent, Arizona Mascot Mine, Lake Superior and Nevada Development Co. Engineer and superintendent, Mammoth Mine, Goldfield, Ariz., January, 1911. Also U. S. mineral surveyor. Engineer for George U. Young, Phoenix, Ariz. Operating gravel mine, Canada Hill district, Westville, Cal. U. S. service to October, 1919. Engineer associated with Carl A. Gage, architect, 1624 Harmon Place, to date.

- SMITH, ELMO V., Met.E.....1901
1610 Walker Bank Bldg., Salt Lake City, Utah.
- Assistant foreman, erecting department, American Bridge Co., of N. Y., 1901 to 1903. Engineer in charge of Salt Lake City office of American Bridge Co. Contracting agent, American Bridge Co. Contracting manager, American Bridge Co., 1908 to date.
- SMITH, FRANKLIN W., E.M.....1903
Box 937, Bisbee, Ariz.
- Draftsman and surveyor for Clerk's Engineering Office, Bisbee, Ariz., May to August, 1903. Assistant engineer, Copper Consolidated Mining Co., August to December, 1903. Assistant engineer, Calumet & Arizona mining Co., February to May, 1904. Junior member of the firm of the Clarke Engineering Co., May, 1904 to January, 1905. Senior member of the firm of Franklin W. Smith & Co., mining engineers, January, 1905 to March, 1907. Member of the firm of Smith & Laird, mining engineers, Bisbee, Ariz., March, 1907 to June, 1910. Member, firm of Smith & Ziesemer, June, 1910 to date.
- SMITH, HOVAL A., E.M.....1901
Care of F. F. Reed, 841 Peoples Gas Bldg., Chicago, Ill.
- Assistant engineer for Calumet & Arizona Mining Co., February to July, 1902. Chief engineer, July, 1902 to January, 1905. Mining engineer, January, 1905 to date.
- SOWLE, LAWRENCE K., E.M.....1903
200 National City Bank Bldg., Cleveland, Ohio.
- Grain commission and mining at Cumpas, Sonora, Mex. Manufacturing agent. Real estate and mortgage securities to date.
- *SQUYER, DEWEY C., E.M.....1904
- STEELE, CHARLES W., E.M.....1907
Electric Steel Foundry, Portland, Ore.
- Assayer, Ramsey-Comstock Mining Co., Ramsay, Nev., June, 1907 to January, 1908. Assistant engineer, Oliver Iron Mining Co., to June, 1909. Mining captain, Higgins No. 2 Mine, Virginia, Minn., June, 1909 to July, 1911. Engineer, bridge and structural department, U. S. Steel Products Co., Portland, Ore., July, 1911 to January, 1916. Secretary, Columbia Engineering Works, Portland, Ore., to July, 1919. Sales engineer, Electric Steel Foundry, July, 1919 to date.

* Deceased.

STEVENS, HOWARD E., E.M.....1912
423 Wash St., Hibbing, Minn.

Engineer, Oliver Iron Mining Co., May, 1912 to February, 1913.
Engineer, Pickands, Mather & Co., Scranton Mine, Hibbing, Minn., February, 1913 to April, 1914. Highway engineer, the Town of Stuntz, Hibbing, Minn., April, 1914 to date.

STEWART, G. GORDON, E.M.....1910
Roseburg, Ore.

Transitman with the Oliver Iron Mining Co., Eveleth, Minn., May to September, 1910. Assistant estimator and bookkeeper for James Leck. Manager for the Real Estate Address Bureau, December, 1911 to November, 1912. Engineer, Laurel Crest Ranch, Roseburg, Ore. With Oregon State Highway Commission to date.

STRAND, HARRY W., E.M.....1918
P. O. Box 471, Hibbing, Minn.

Mining engineer, Great Northern Iron Ore Properties. Engineer and inspector, Western District Office, same company, June, 1918 to January, 1920. Mining engineer, general office, Arthur Iron Mining Co., to date.

STRANE, ARCHIE J., E.M.....1910
407 W. Broad St., Tamaqua, Pa.

U. S. surveyor, U. S. G. S. and U. S. General Land Office, U. S. Indian Reservation Survey in Montana, Arizona and Nevada, June, 1910 to September, 1911. Junior mining engineer, U. S. Bureau of Mines, Pittsburgh Experimental Station, Pittsburgh, Pa., September, 1911 to November, 1914. Assistant explosives engineer, U. S. Bureau of Mines, November, 1914 to September, 1917. Explosives engineer, head of explosives application division, Experimental Laboratories, Atlas Powder Co., Reynolds, Pa., September, 1917 to date.

STRONG, JOHN L., E.M.....1908
608 Wolvin Bldg., Duluth, Minn.

Mining engineer, Oliver Iron Mining Co., June, 1908 to date.

SUMNER RUTHERFORD B., E.M.....1900
Tooele, Utah.

Draftsman in Denver. Construction engineer, U. S. Smelting Co., West Jordan, Utah, to 1909. Engineering department, International Smelting Co. Chief draftsman, same company, 1910 to 1915. Mechanical superintendent, same company, to date.

- SWANSON, ALEX H., E.M.....1910
 See List No. V.
- *SWARTZ, SAM G., E.M.....1911
- SWEETMAN, EDWIN A., E.M.....1917
 Marble, Minn.
 Mining engineer, Inland Steel Co., Crosby, Minn., May, 1917 to March, 1918. Mining engineer, Interstate Iron Co., Virginia, Minn. Mining engineer, Interstate Mining Co., at Marble, Minn., to date.
- SWENSON, KARL P., B.S., E.M.....1907
 51 Chambers St., New York City, N. Y.
 Draftsman, Steptoe Valley Mining & Smelting Co., McGill, Nev. Surveyor and draftsman on city work for L. M. Carl, civil engineer, El Paso, Texas. Draftsman and construction engineer, Cia Minera de Penoles Mapimi, Durango, Mex. Construction engineer, Big Stick Gold Mining Co., Haynes, Ariz. With E. A. Haggott, consulting mining engineer, Los Angeles, Cal. Assistant engineer for C. A. P. Turner, consulting engineer, Minneapolis, Minn. Professor of Mining, Imperial Polytechnic College, Nanking, China. Engineer, F. W. Horne Co., Tokyo, Japan. Oriental manager, Allied Machinery Co. of America, New York, N. Y., to date.
- TANNER, WALLACE N., E.M.....1896
 520 Hennessy Bldg., Butte, Mont.
 With Montana Ore Purchasing Co., at Butte. B. & M. Copper & Silver Mining Co., Great Falls, Mont. Draftsman, Anaconda Copper Mining Co. Chief draftsman, Allis-Chalmers Co., Chicago. Engineer in Mining department of Allis-Chalmers Co. Consulting engineer. Member of firm of Armstrong & Tanner, Salt Lake City, Utah. Manager B. S. T. Concrete Block Co., St. Paul, Minn. Superintendent Anaconda Copper Mining Co., Foundry department, Anaconda, Mont. Chief engineer, Anaconda Copper Mining Co. (reduction department). Chief mechanical engineer, same company. Mechanical engineer to date.
- TARESH, JOHN, E.M.....1901
 Crescent Mills, Cal.
 With the Butte & Plumas Railway, 1901 to 1902. Draftsman and surveyor for same company, 1903 to 1904. Engineer with Mountain Copper Co., Ltd. Chemist in laboratory of same company, 1905 to 1906. With the Western Pacific Railway Co. as resident engineer and assistant engineer on construction, 1906 to 1910. On engineering staff of Natomas

* Deceased.

Consolidated Co. of California, Reclamation District No. 1001, 1910 to 1915. With Natomas Consolidated Mines Co., of California, to 1915. Ranching in Plumas County, Cal., 1915 to date.

TAYLOR, HAROLD G., E.M.....1909
1046 McKnight Bldg., Minneapolis, Minn.

With Hill Construction Co. Engineer on construction, yard master and field engineer for Inter-Ocean Steel Co. In the Steel Tire Department of Railway Steel Spring Co., Inter-Ocean Plant, Chicago Heights, Ill., June, 1909 to May, 1913. Engineer on construction, May, 1913 to June, 1914. With W. H. Hale & Co. Minneapolis, Minn., June, 1914 to September, 1915. Northwestern sales engineer Permutit Co., water rectification, September, 1915 to September, 1918. First lieutenant corps of engineers, U. S. army, to December, 1918. Northwestern sales engineer, Permutit Co., to date.

TAYLOR, WILLIAM L., E.M.....1912
Care of Plymouth Mining Co., Verona, Mich.

Engineer, E. J. Longyear Co., Brainerd, Minn., May to November, 1912. Geologist, reconnaissance survey for Barber Asphalt Paving Co. of New York, Venezuela, S. A., November, 1912 to May, 1913. Engineer, Oliver Iron Mining Co., May, 1913 to September, 1916. Cuyuna Range representative, E. J. Longyear Co., Minneapolis, September, 1916 to November, 1919. Mining department, E. J. Longyear Co., November, 1919 to August, 1920. In charge of engineering on Gogebic Range for Pickands, Mather & Co., August, 1920 to date.

TEAGUE, HAROLD W., E.M.....1900
310 Oak St., Detroit, Minn.

Mining engineer at Castle Rock, Utah. With U. S. G. S., Butte, Mont. Superintendent, Bayonne Gold Mines, Ltd., B. C., 1902 to 1906. Superintendent, Furnace Creek Extension, Greenwater, Cal., 1906 to 1908. Sampling prospects, same company, Nevada and California, 1908 to 1909. Land surveyor, city engineer, Detroit, Minn., 1910 to 1913. District engineer, State Highway Commission, Detroit, Minn. Superintendent of Highways, Becker Co., Minn., to date.

TETLIE, JOHN R., E.M.....1911
Box 431, Tonopah, Nev.

Engineer on drainage in Northern Minnesota, June to December, 1911. With Utah Copper Co., Bingham Canyon, Utah, March to September, 1912. Filter department, Belmont Mining & Development Co., Tonopah, Nev., October, 1912 to September, 1915. Solutionman, Aurora Consolidated

Mines Co., Aurora, Nev., September, 1915 to June, 1916. Assayer, same company. Instructor in Mathematics, St. Olaf College, 1918 to 1919. Shift boss for West End Cons. Mines Co. to date.

TOLL, RENSSELAER, E.M.....1900
See List No. V.

TRUESDALE, W. H., E.M. M.S.....1903
See List No. V.

URQUHART, GEORGE K., E.M.....1915
Elcor, Minn.

Transitman, Inland Steel Co., January, 1916 to April, 1916. With S. T. Harrison, mining and municipal engineer, April, 1916 to February, 1917. Mahnomen Mining Co., February, 1917 to May, 1917. U. S. service to July, 1919. Engineer, Elba and Corsica Mines, Pickands, Mather Co., to date.

VICTOR, ALBIN F., E.M.....1912
Providence Bldg., Duluth, Minn.

Vice-president and superintendent, Taylors Falls Rock Co., May, 1912 to August, 1913. Mining engineer, Northwestern Improvement Co., August, 1913 to April, 1916. Mining engineer, Cuyuna-Mille Lacs Iron Co., and Cuyuna-Duluth Iron Co., April, 1916 to September, 1917. U. S. service from September, 1917 to December, 1918. Sales manager, Lake Superior Loader Co., Duluth, Minn., to date.

WADE, HENRY H., E.M.....1915
Hopkins, Minn.

Assistant, Minnesota School of Mines Experiment Station, October, 1916 to March, 1918. Metallurgist, March 1918 to date.

WALES, ROWLAND T., E.M.....1897
283 Eastchester Road, New Rochelle, N. Y.

Assayer and chemist at Canadian Smelting Works, Trail, B. C., 1898 to 1903. Chemist at refinery of same company, 1903 to 1904. Assayer and chemist at the United Zinc and Chemical Co., Argentine, Kan., 1905. Superintendent of silver and gold department of the U. S. Metals Refining Co., of Chrome, N. J., to 1914. Installing special tanks (patent applied for) in copper department of same works to 1915. Exploiting patents and installing patented tanks for trial at Raritan Copper Works, Perth Amboy, N. J., to 1918. Owner of patents for concrete forms, owned, erected, and rented out by the Liomin & Wales Co., Inc., of New York City.

WALKER, CHARLES A., E.M.....1913
See List No. V.

WALKER, CLINTON L., E.M.....1898
650 Highland Ave., Piedmont, Oakland, Cal.
U. S. service.

WALKER, E. H., E.M.....1911
Bingham Canyon, Utah.

With Stone & Webster Engineering Co., June to August, 1911. With Utah Copper Co., August, 1911 to date.

WALLACE, CARLETON S. E.M. (Geol.).....1917
(Home address) 2003 Queen Ave. S., Minneapolis, Minn.

Captain, U. S. Marines. Wounded July 19, 1918. Employment manager, Ohm & Fink, Inc., New York City. Geologist, Sinclair Cons. Oil Co., Ranger, Texas. Millman, Golbroith Lumber Co. Pogosa Springs, Colorado, to date.

WALLACE, GEORGE W., Jr., E.M.....1906
Rock Springs, Wyo., care of U. P. Coal Co.

Assistant engineer, Colorado Fuel & Iron Co., to February, 1907. With G. W. Wallace, Sr., Cobalt, Ont., Can., to April, 1907. Engineer, St. Paul Iron Mining Co., Hibbing, Minn., to December, 1907. With U. P. Coal Co., Superior, Wyo., to March, 1908. Superintendent, Oakwood Construction Co. Chief inspector, Detroit River Tunnel Co. Superintendent of construction, Wogan Construction Co., Denver, Colo., to January, 1912. Mining engineer, Moffat Coal Co., and Consolidated Fuel Co., January, 1912, to November, 1913. Outside foreman, Utah Fuel Co., November to July, 1913. Mine foreman for same company, July, 1913 to October, 1915. Chief engineer, Kemmerer Coal Co., Kemmerer, Wyo.. October, 1915 to March, 1916. Experimental work, Duluth, March, 1916 to November, 1917. Superintendent, Kingston Mining Co., Eveleth, Minn., November, 1917, to March, 1919. Superintendent of construction with Schruth & Jackson, contractors, Minneapolis, Minn., March, 1919 to June, 1920. Mining engineer, U. P. Coal Co., Rock Springs, Wyo., June, 1920 to date.

WALLINDER, ARTHUR, E.M.....1912
Iron Mask Mine, Kamloops, B. C.

Representative, C. A. P. Turner, in Middle Northwestern Territory, May, 1912 to May, 1914. Superintendent and general manager, Iron Mask Mine, Kamloops, B. C., May, 1914 to November, 1915. Superintendent and general manager, Kamloops Copper Co., November, 1915 to date.

- WALTER, ROLLIE B., E.M.....1912
Waltman, Wyo.
- Engineer, East Butte Copper Mining Co., Pittsmt Mine, November, 1912 to March, 1913. Cellman, Butte-Duluth Mining Co., March to July, 1913. Chemist, same company, July, 1913 to February, 1914. Foreman, cellroom, same company, February to September, 1914. Miner and sampler, North Butte Mining Co., July to January, 1915. Engineer, same company, January, 1915 to November, 1916. Sample inspector, Society Minera, Backus & Johnston del Peru, Casapalea, Peru, November, 1916 to November, 1918. Ranching, central Wyoming, November, 1918 to February, 1920. Engineer, Homestead Iron Dyke Mines Co., February, 1920 to September, 1920. Ranching from September, 1920 to date.
- WALTERS, CHARLES W., E.M.....1911
Room 3533, 120 Broadway, New York City.
- Assistant to consulting mining engineer, Guggenheim Bros., and allied companies, 120 Broadway, New York City. U. S. service to date. Staff of consulting mining engineers, Guggenheim Bros.
- WARREN, FRANK M., E.M.....1899
3427 Humboldt Ave. S., Minneapolis, Minn.
- Geological field examinations in southwestern Oregon and in Idaho, 1900. Civil engineer for E. J. Longyear, 1901. Assistant engineer for J. J. Hill, 1902. Consulting engineer for Pine Land Co. and other companies in development and inspection of iron ore properties on the Mesabi and Vermilion iron ranges, 1903 to date.
- WASSON, HAROLD J., E.M.....1914
6115 Kimbark Ave., Chicago, Ill.
- Miner, Rockland Mine, Yerington, Nev., June, 1914 to March, 1916. Mining engineer, Pittsburg-Dolores Mining Co., March, 1917 to October, 1917. First Lieutenant, U. S. Service. Geologist and engineer, Marland Ref. Co., September, 1919 to September, 1920. Oil work to date.
- WEHR, ARTHUR J., E.M.....1911
Quarters 121D, Ft. Sam Houston, Texas.
- Inspector, roads and bridges, Ramsey County, Minn., May to November, 1911. Assistant to J. C. Curnow, mine superintendent, Longfellow Mine, Morenci, Ariz., January to March, 1912. Experimental sampler, A. C. Mill, Morenci, Ariz., March to December, 1912. Feed-floor foreman, Detroit Copper Co.'s smelter, Morenci Ariz., December, 1912 to April, 1913. Engineer and draftsman, same company, Rocky Gulch Division, April, 1913 to May, 1914. Engineer, Ramsey County, June, 1914 to April,

1915. Chief engineer, Mutual Iron Mining Co., McComber, Minn., April, 1915 to July, 1916. Mining engineer, Detroit Copper Mining Co., Morenci, Ariz., July, 1916 to August, 1917. Second Lieutenant of Cavalry, August, 1917. First Lieutenant Cavalry, October, 1917. Temporary Captain of Cavalry, June, 1918 to June, 1920. With 14th Cavalry. Returned to permanent grade of First Lieutenant, July, 1920. Detailed in Signal Corps, November, 1919 with 51st Telegraph Battalion, S. C., to date.

WHEELER, JAMES D., E.M. (Geol.).....1920
Oakman, Alabama.

Assistant field geologist, Sinclair Oil Company to date.

WHEELER, WALTER H., E.M.....1906
1112-10 Metropolitan Life Bldg., Minneapolis, Minn.

Mining and constructing engineer for Colorado Fuel & Iron Co., June, 1906 to May, 1907. Constructing engineer and superintendent of construction, Dawson Fuel Co., May to December, 1907. Secretary and treasurer, the Jones-Wheeler-Cranmer Engineering Co., Denver, Colo., 1908 to 1912. Consulting engineer and steel contractor, buildings, bridges, dams, grain elevators, etc., reinforced concrete and structural steel, 1912 to date. Also of Chas. H. Wheeler & Son, real estate, building and investments, Minneapolis, Minn., 1909 to date.

WHITLEY, EUGENE E., E.M.....1903
Box 705, Warren, Ariz.

General assistant and engineer for Dalton and Lark mines, Bingham Canyon, Utah. Engineer in charge of contract land subdivision for same company. Draftsman and office assistant for U. S. deputy mineral surveyor in Salt Lake City. Assistant engineer, Calumet & Arizona Mining Co., Bisbee, Ariz. Chief engineer for C. & A. Mining Co., and Pittsburgh Copper Co. Assistant superintendent of mines, Calumet & Arizona Mining Co., August, 1914 to 1920. Superintendent of mines, Calumet & Arizona Mining Co., January, 1920 to date.

WHITSON, LLOYD R., E.M.....1911
See List No. V.

WIEST, MICHAEL A., E.M.....1907
311 Phoenix Bldg., Minneapolis, Minn.

With Consolidated Mines Co., in mill and mechanical department. With the Nevada Goldfield Reduction Works, sampling department and cyanide plant. Churn drill sampling, Ray Consolidated Copper Co., Ray, Ariz. Engineer for same company from August, 1909 to August, 1911. District manager, the Mutual Life Insurance Co. of New York, 311 Phoenix Bldg., Minneapolis, Minn., September, 1911 to date.

WILKINSON, CHARLES D., E.M.....1895
951 Eddy St., San Francisco, Cal.

With Sand-Coulee Coal Co. Manager of Gold Hill Mine, Madison County, Mont. Superintendent, Tonopah Gold Mt. Mine, Tonopah, Nev. Field engineer, Nixon & Wingfield, Goldfield, Nev. Chief engineer, Goldfield Consolidated Mines Co. Assistant general manager, same company. General manager, Goldfield Daisy Mining Syndicate. General manager Goldfield Combination Fraction Mining Co., and consulting engineer for George Wingfield, December, 1909 to 1911. Consulting engineer, C. O. D. Consolidated, Goldfield-Manhattan Big Four Mining Co. and others, 1911 to March, 1916. At present consulting engineer in Nevada and California.

WILLIAMS, HOMER A., E.M.....1909
4315 Upton Ave. S., Minneapolis, Minn.

With the Harrington Construction Co. Engineer, Brandon Construction Co. Building superintendent, Clayton Bros., contractors. Building superintendent, Cameron & Co., contractors, St. Paul, May, 1913 to January, 1915. Building contractor, 302 Plymouth Bldg., January, 1915 to May, 1918. Valuation department, Soo Railroad, Minneapolis, Minn., May, 1918 to date.

WILLIAMS, PAUL S., E.M.....1915
510-511 Dan Waggner Bldg., Ft. Worth, Tex.

Assistant geologist, Mexican Gulf Oil Co., Tampico, Tamps, Mex., June, 1915 to June, 1917. U. S. service. Engineer and broker, Ft. Worth, Texas, to date.

WINTHER, ARNO, E.M.....1903
Bingham, Utah.

Engineer at Bingham and Tintic, Utah. Mining engineer for the Cerro de Pasco Mining Co. Mining engineer for Goyllarisquiza Coal Mines, Cerro de Pasco. Chief engineer, Cerro de Pasco Mining Co. Superintendent, Utah Consolidated Mining Co., to date.

WOODIS, CLARK N., E.M.....1912
Deer Tail, Colo.

General manager, Crater Mt. G. M. & T. Co. Foreman and book-keeper, Beaver Creek, Rockfall Dam, Rio Grande County, Colo., April to October, 1913. In charge electric light plant installation Red Cliff and Minturn, Colo., October, 1913 to April, 1914. With Knowlton Construction Co., Grand Valley project of the U. S. Reclamation Service, August, 1914 to June, 1915. At present ranching.

WOODRUFF, JOHN J., E.M.....1917
 Care National Carbon Co., Niagara Falls, N. Y.

With the Copper Queen Mining Co., Bisbee, Ariz., May to October, 1917. Steel inspector, Carpenter Steel Co., Reading, Pa., October, 1917 to March, 1918. Steel inspector, U. S. Signal Corps, District Office Equipment, Pittsburgh, Pa. Land appraiser, Union Pacific R. R. Co., Omaha, Neb., from January to October, 1919. Research engineer, National Carbon Company, October, 1919 to date.

ZIESEMER, HARRY M., E.M.....1907
 Box 394, Bisbee, Ariz.

Engineer, Copper Queen Consolidated Mining Co., Bisbee, Ariz., to June, 1917. Superintendent, Rival Mining Co., Duncan, Ariz., June, 1917 to January, 1918. U. S. service to January, 1919. Chief engineer, Phelps-Dodge Corporation, Copper Queen Branch, Bisbee, Ariz., February, 1919 to date.

ZIESEMER, RALPH A., E.M.....1905
 Box 394, Bisbee, Ariz.

In the office of Franklin W. Smith & Co., Bisbee, Ariz., May, 1905 to March, 1907. Mining engineer with Smith & Laird, Bisbee, March, 1907 to June, 1910. Member of firm of Smith & Ziesemer, Bisbee, Ariz., July, 1910 to date.

LIST III

FORMER MEMBERS WHO ARE FOLLOWING MINING AND METALLURGICAL WORK

BISSELL, ANGELO A.....1902
 Goldfield, Ariz.

Assayer, Tintic District, Utah, 1902. Manager, B. L. & B. M. & M. Co., 1903. General manager, Minnesota Mining & Milling Co., Alma, Colo. President and manager, London Fault Mining Co., Alma, Colo., 1907 to 1908. Superintendent Baltimore Belle Mining Co., Goldfield, Nev., 1908 to 1909. Manager, Sunrise Placer Mining Co., Manhattan, Nev., 1909. Mining engineer, Manhattan, Nev., 1910 to 1913. Superintendent of Young Mines Co., Ltd., Goldfield, Ariz., 1913 to 1915. Operating placer mines, Canada Hill District, Westville, Cal., 1915 to date.

BROWN, WALTER M.....1900
 Searchlight, Nev.

Assistant engineer, Boston & Montana Consolidated C. & S. Mining Co., Butte, Mont. Engineer, Colorado Mining Co., Butte, Mont. Superintendent, Kennett Mining Company, Ennis, Mont. Superintendent

Minneapolis-Montana Mining Company, Sand Creek, Mont. Engineer and mine superintendent, Bismarck Nugget Gulch Consolidated Mining Co., Sheridan, Mont. Superintendent of the Grant Mines Co., Virginia City, Mont. Out of professional work, and in business, Long Beach, Cal., July, 1904 to July, 1905. Member Stone & Brown, Inc., mining engineers and U. S. deputy mineral surveyors, Searchlight, Nev. President and manager, the Brown-Tolman Engineering Co., Searchlight, Goodsprings, and Las Vegas, Nev.

CALLAWAY, FREDERICK W.....1900
1007 Crocker Bldg., San Francisco, Cal.

U. S. mineral surveying, Cripple Creek, Colo., 1900 to 1901, and Sumpter, Ore. Railroad engineer, N. D., Iowa, Colorado, and Minnesota, 1901 to 1902. Colliery engineer and construction work, Williamson, W. Va., 1903 to 1906. U. S. Mineral surveying, mine surveying, and engineering, Wallace, Idaho, 1906 to 1908. Engineer in charge of litigation, Bunker Hill & Sullivan Mining & Concentrating Co., Kellogg, Idaho, 1908 to 1913 and 1915. Engineer, Alaska-Tuneau Gold Mining Co., Juneau, Alaska, 1914. Mining engineer, private practice, 1916 to 1918. U. S. service to December, 1918. Litigation preparation, Utah Cons. Mining Co., Bingham Canyon, Utah, 1919, and Hecla Mining Co., Brooke, Idaho, to May, 1920. Private consulting practice, San Francisco, Cal., to date.

COHEN, JULIUS M.....1912
Royal Apt., Broad and Girard Aves., Philadelphia, Pa.

Manager, Graphite, Ltd., November, 1912 to November, 1913. Assistant manager, Porcupine-Crown Mine, November, 1913 to January, 1916. Manager, Croesus Gold Mines, January, 1916 to September, 1917. U. S. service to September, 1919. Efficiency engineer to date.

CORY, MILTON B.....1903
1914 Aldrich Ave. S., Minneapolis, Minn.

Last record received July, 1918.

DAVENPORT, LEE B.....1900
Mokelumne Hill, Calaveras Co., Cal.

Chemist, Mogollon Exploration Co., Nome, Alaska, 1909. Foreman, Cyclopic Mine, White Hills, Ariz., 1902. Superintendent of Gold Basin Mill, Basin, Ariz., 1903. Surveyor and assayer for the Mother Lode Mining Co., Nashville, Cal., 1903 to 1905. Superintendent, Nevada Development Co., Silver Bow, Nev., 1906. Refinery foreman for the Goldfield Consolidated Mines Co., 1907 to May, 1918. Superintendent, Day Gravel Mine, Mt. Ranch, Calaveras Co., Cal., 1919. Mill superintendent for the Morning Star Mining Company to date.

DAVY, JESSE J.....1908
 (Permanent address) Preston, Minn.

Resident and assistant engineer, Northern Pacific Ry. Co., 1906 to 1909. Assistant engineer on construction and valuation, Union Pacific Ry. Co., 1909 to 1910. District engineer, Minnesota Highway Commission, 1911. President, Fillmore Sand Gravel Co. Captain 23rd Engineers, foreign service.

DONOVAN, PERCY W., E.M.....1900
 710 Security Bldg., Minneapolis, Minn.

Assayer and chemist for the National Gold Extraction Co., and Metallic Gold Extraction Co., Florence, Colo., 1900 to 1901. Superintendent of refining department, Union Plant, U. S. Reduction & Refining Co., Florence, Colo., 1902 to 1903. Columbia School of Mines, 1904 to 1905. Engineer for E. J. Longyear, 1905 to 1906. Superintendent for E. J. Longyear Exploration Co., Hibbing, Minn., 1906 to 1909. Superintendent of exploration on Cuyaua Range for E. J. Longyear Co., 1909 to September, 1916. General superintendent, contract drilling for E. J. Longyear Co., September, 1916 to August, 1917. Manager, Longco Oil Corporation, August, 1907 to July, 1920. Manager, Contract drilling department E. J. Longyear Company, to date.

EKSTROM, ALEX. J.....1913
 Bennett Mine, Keewatin, Minn.

Engineer, A. P. Silliman & Co., 1908 to 1912. Mining engineer, Meridan Iron Co., 1912 to 1913. Chief engineer, Keewatin Mining Co., 1913 to 1916. Chief engineer, Meridan Iron Co., 1916 to 1918. Mining engineer, Arthur Iron Mining Co., 1918 to 1920. Mining engineer Bennett Mining Co., 1920 to date.

FLETCHER, ROBERT H.....1907
 Helena, Mont..

Mining engineer, Pickands, Mather & Co., Mesabi Iron Range, 1906 to 1907. Engineer, Northern Division, U. S. Reclamation Service, Flathead and Milk River Projects, Montana, 1908 to 1911. Surveyor, U. S. General Land Office, Nevada and Montana, 1911 to 1914. Member of the firm, Fisk & Fletcher, Civil, Mining, and Hydraulic Engineers, Helena, Mont., 1914 to March, 1915. Consulting engineer, March, 1915 to date. Also county engineer, Lewis and Clark counties, January, 1917 to 1918. U. S. service, field artillery, to December, 1918. Leasing and operating lead and silver properties near Helena, Mont., to date. Resident engineer, State Highway Commission.

- JEWETT, FRANK G.....1903
740 McKnight Bldg., Minneapolis, Minn.
- Vice-president, E. J. Longyear Co., to July, 1916. In private professional work, July, 1916 to date. Also manager, the Greenwood Company.
- KILPATRICK, R. L.....1908
Coppermount, Alaska.
- Chief engineer, Inland Steel Co., Hibbing, 1909. Assistant superintendent, same company, 1910. Local superintendent, same company, Crosby, Minn., 1910 to 1911. Superintendent, Alaska Consolidated Mining & Smelting Co., Coppermount, Alaska, 1912 to date.
- LAWTON, JOHN E.....1911
2410 W. 33rd St., Minneapolis, Minn.
- Draftsman, Shadegg Boat & Engine Co., Minneapolis, Minn., June to August, 1909. With Moore Boat Works and Campbell Motor Co., Wayzata, Minn., August, 1909 to February, 1910. Assistant engineer, State Drainage Commission, and engineer in charge of judicial ditch No. 1, Dodge County, February, 1910 to March, 1913. Transitman U. S. War Department, March and April, 1913. Levelman, engineering department, City of Minneapolis, April, 1913 to January, 1916. Junior engineer, sewer department, Minneapolis, September, 1916 to date.
- OBER, RAYMOND E.....1902
Ironton, Minn.
- Miner, foreman, and engineer with Lake Superior Consolidated Co., Duluth, Minn. Superintendent, Beatrice Gold Mining Co., California. Engineer for the Utica Mine, Angels, Cal. Testing engineer, Washoe Smelter, Anaconda, Mont. Field engineer, Boston & Montana Mining Co., Butte, Mont., 1906 to 1909. Private practice, Dillon, Mont., 1909 to 1914. Experimental work, Washoe smelter, 1914 to 1915. General foreman, roasting and leaching department, Washoe smelter, 1915. Superintendent, Meritt Dev. Co., Cuyuna Minneapolis Iron Company, 1918 to 1919. Private practice, 1919 to date.
- OVERMIRE, CHARLES C.....1902
East Water and Hawthorne Ave., Portland, Ore.
- Estimator, American Bridge Co., Minneapolis. Contracting agent, same company. Contracting manager, same company, Seattle, Wash. Contracting manager, U. S. Steel Products Co., Portland, Ore. President, and general manager, McDougall Overmire Co., Portland, Ore. President Overmire Steel Construction Co.; president, Oregon Charcoal Iron Co., to date.

REINHOLT, OSCAR H.....1902
 671 Spreckels Bldg., San Diego, Cal.

Sampler and cost clerk, Lake Superior Consol. Iron Mines, Hibbing, 1895 to 1897. Assistant superintendent, Penobscot Mine, 1897 to 1898. Professional work in Philippine Islands to 1904. Instructor in Geology and Mineralogy, St. Olaf College, 1904 to 1905. Professional work in Western U. S. 1905 to 1920. Since May 21, 1920, engineer in the Oil and Gas Valuation Section, Bureau of Internal Revenue (Income Tax Unit), Washington, D. C.

SEARLES, JASPER E.....1899
 Salt Lake City, Utah. (539 Atlas Block.)

Designing and constructing engineer.

SUNDNESS, ODEN A.....1910
 Chisholm, Minn.

Engineer for Oliver Iron Mining Co., June, 1909 to May, 1911. Engineer, Shenango Furnace Co., Buhl, Minn., May to November, 1911. Engineer, Shenango Furnace Co., Chisholm, Minn., November, 1911 to July, 1912. Chief chemist, Shenango Furnace Co., July, 1912 to date.

VAN CLEVE, REGINALD H.....1916
 (Home address) 1801 Park Ave., Minneapolis, Minn.

Shift boss, Leetonia Mine, Hibbing, Minn., June, 1915. Second Lieutenant, foreign service.

WILLIAMS, JAMES H.....1911
 Neshwauk, Minn.

Engineer, Dale Uno Mines for Oliver Iron Mining Co., Hibbing, Minn., 1911 to 1912. Engineer, Mississippi, Mace, and Harold Mines, for Oliver Iron Mining Co., 1913 to 1914. Chief engineer, Wisconsin Steel Co., Nashwauk, Minn., 1914 to 1918. Chief engineer, International Harvester Company Mines. Assistant general superintendent, Wisconsin Steel Co., September, 1919 to date.

WILLIS, CARL S.....1903
 1052 Burnaby St., Vancouver, B. C., Canada.

Assistant superintendent, underground construction, Northwestern System, Bell Telephone Company, 1902 to 1903. Passed British examination for engineer of mines, 1904. Degree E.M. awarded. Engineer, Faulkner-Miller Mining Company, Vananda, Texada Island, B. C., 1904 to 1905. Engineer, Frank L. Mapes Properties, Cobalt and South Lorraine districts, 1906. Manager, Mapes-Johnston Mining Company, Elk Lake, Ont., 1907.

to 1908. Consulting engineer, Edward M. Steindler, Steindler Syndicate, New York City, 1908 to 1913. Consulting engineer, 1913 to 1914. Enlisted with the Canadians, 1914. Captain, 38th F. A., U. S. A., foreign service. Discharged, April, 1919. Consulting engineer in Vancouver, B. C., specializing in mines and pulp manufacture to date.

LIST IV

GRADUATES AND FORMER MEMBERS LISTED ACCORDING TO GEOGRAPHICAL LOCATION

Alabama

Bessemer—Cowin, Percy G.
Oakman—Wheeler, James D.
Woodstock—Morgan, Charles

Arizona

Ajo—Olmstead, John S.
Bisbee—Boyd, Robert R.; Dickson, Robert H.; Prouty, Roswell W.;
Smith, Franklin W.; Ziesemer, Harry M.; Ziesemer, Ralph A.;
Lindholm, Milton S.
Casa Grande—Chandler, Eugene D.
Goldfield—Bissell, Angelo A.
Hayden—Knox, Lafayette
Huron—Lytzen, Walter W.
Miami—Anderson, Arthur P.; Ofsthun, Norman H.; Robertson, John H.
Morenci—Beck, Charles S.; Lee, Oscar; Perry, Joseph B.
Ray—Truesdale, W. H.
Warren—Rait, Donald M.; Whitley, Eugene E.

Arkansas

Cushman—Knickerbocker, Arthur K.
Gillham—Larson, Clarence L.

California

Anheim—Nichols, Clifford R.
Crescent Mills—Tares, John
Glendale—Gillan, Silas L.; Olund, Henning E.
Grafton—Crowley, Jay
Kennett—Egleston, Oliver J.
Los Angeles—Bass, William C.; Clark, Fred E.; Collins, Leon T.; Lea,
John.
Mokelumne Hill, Calaveras Co.—Davenport, Lee B.
Oakland—Walker, Clinton T.

Ocean Park—Curry, Duncan E.
Pasadena—Clapp, W. Howard
San Diego—Holden, Henry H.
San Francisco—Bjorge, Guy N.; Callaway, Frederick W.; Hoass, Ole G.;
 Wilkinson, Charles D.
Willows—Mills, Eugene
Yanke Jims—Bailey, Paul T.

Colorado

Deer Tail—Woodis, Clark N.
Denver—Sanderson, Henry S.
Pogosa Springs—Wallace, Carleton S.
Smuggler—Peterson, Joseph S.

District of Columbia

Washington—Grimes, John A.; Harrington, George L.; Reinholt, Oscar H.

Idaho

Gilmore—Ekloff, V. C.
Oakley—Abbott, Theodore L.
Quartzburg—McDermid, Archie J.
Soda Springs—O'Brien, J. C.
Wallace—Shonts, Sydney L.

Illinois

Chicago—Baker, Emory; Coller, Walter A.; Fixen, Victor L.; Keller,
 Orrin E.; McKenzie, James R.; Smith, Hoval A.; Wasson, Harold J.
Roundout—Keller, Orrin A.

Indiana

Indianapolis—McCullough, Ervin W.

Iowa

Ames—Clement, Lester L.
Sioux City—Neerland, Herman
Waterloo—Locke, Alfred M.

Kansas

Wichita—Levorson, A. Irving

Kentucky

Lexington—Crouse, Charles S.

Maryland

Baltimore—Nissen, Arvid E.

Massachusetts

Brookline—May, Albert E.

Michigan

Bessemer—Kremer, Edward G.

Crystal Falls—Anderson, Edwin H.; Christianson, Alfred; Eidemilier, Howard N.

Diorite—Gavin, Lawrence T.

Houghton—Ingersoll, Guy E.

Verona—Taylor, William L.

Minnesota

Alexandria—Raiter, Clifford R.

Chisholm—Angst, Harry H.; Borgeson, Anshelm; Sundness, Oden A.

Coleraine—Peterson, Andrew Y.

Crosby—Fearing, Edward J.; Coventry, Edward D.

Detroit—Teague, Harold W.

Duluth—Farnum, Henry E.; Field, Thorold F.; Oberg, Anton C.; Rose, William A.; Strong, John L.; Victor, Albin F.

Elcor—Jerrard, W. L.; Urquhart, George K.

Elk River—Houlton, Lewis K.

Ely—Duncan, Kenneth J.

Eveleth—Boyle, Patrick J.; Dennis, Richard C.; Dopp, J. Lawrence; Ely, Robert H.; Kerr, Charles D.; McAdams, Howard R.

Gilbert—Bowman, Frank A.; Mellem, Walter R.

Glenwood—Martin, Lynn.

Hibbing—Anderson, Walter C.; Bassett, Robert H.; Brandt, John; Buresch, Charles E.; Deichen, William A.; Harmon, Sydney; Kurtzman, Paul S.; Loye, Henry; Nord, Harry H.; Pan, Wen Ping; Peterson, Clarence D.; Stevens, Howard E.; Strand, Harry W.

Hopkins—Wade, Henry H.

Ironton—Ober, Raymond E.

Keewatin—Ekstrom, Alex J.

Marble—McHardy, Roy H.; Sweetman, Edwin A.

Melrose—Quinn, Howard E.

Minneapolis—Arnold, Lewis; Christianson, Peter; Cole, Willard A.; Cory, Milton B.; Cowin, James; Craig, John J.; Donaghue, Abner J.; Donovan, Percy W.; Drake, George M.; Elliott, Jay R.; Field, Edward M.; Frank, Harry; Frelsen, Sidney; Gholz, Arthur L.; Goodwin, William R.; Hagstrom, Leonard J.; Hale, William H.; Hammond, Arthur H.; Heilig, Louis S.; Hunt, Walter E.; Jewett, Frank G.; Johnson, Algot F.; Kersten, Erwin H.; Kingsley, Neil S.; Krogh,

Alvin T.; Ladd, Greeley; Lawton, John E.; Mark, Israel C.; Merritt, Lucien; Moody, Revillo G.; Parker, Walter H.; Rawson, Horace C.; Roed, Olaf; Smith, Edgar W.; Taylor, Harold G.; Van Cleve, Reginald H.; Warren, Frank M.; Wheeler, Walter H.; Wiest, Michael A.; Williams, Homer A.

Montevideo—Michie, Roy R.

Nashauk—Williams, James H.

Preston—Davy, Jesse J.

St. Paul—Ainsworth, Robert E.; Allard, Raymond W.; Dowdell, Ralph L.; Hanson, J. Raymond; Howes, Frank T.; Johnson, Axel; Moga, John A.; Olson, Walter S.; Peterson, Paul A.; Potter, Orrin W.; Quinlan, Howard; Rood, Lynn.

Slayton—Minder, E. G.

Virginia—Kingston, Merton S.

Montana

Anaconda—Cadwell, W. Chauncey; Ramsing, Fred C.

Butte—Aronson, Sam M.; Coady, Leo J.; Rahilly, Harold J.; Tanner, Wallace N.

Helena—Fletcher, Robert H.; Heidel, C. Sumner.

Lewistown—Davies, Fred A.

Trout Creek—Larson, Ernest L.

Nevada

Kimberley—Hewitt, Ezra A.

Searchlight—Brown, Walter M.

Tonopah—Schrader, Erich J.; Tetlie, John R.

Virginia City—Burgess, Robert J.

New Mexico

Santa Fe—Harrington, Guy P.

New York

New Rochelle—Wales, Rowland

New York City—Ernster, Omer F.; Keene, Amor F.; Ravicz, Louis G.; Swenson, Karl P.; Tanner, Wallace; Walters, Charles W.

Niagara Falls—Woodruff, John J.

Watervliet—Harmon, Benjamin G.

Ohio

Cleveland—Hoyt, Samuel L.; Jackson, Charles F.; Sowle, Lawrence K.

Oklahoma

Ardmore—Hubbard, William E.
Bartlesville—Coryell, Louis S.
Tulsa—Elson, William H.

Oregon.

Portland—Steele, Charles W.; Overmire, Charles C.
Roseburg—Stewart, G. Gordon

Pennsylvania

Philadelphia—Cohen, Julius M.
Pittsburgh—Copeland, William A.
Tamaqua—Strane, Archie J.

South Dakota

Bowdle—Edwards, Frank R.
Lead—Hosted, Joseph Orrin
Trojan—Goodrich, Norman P.
Watertown—Haugen, Albert C.

Texas

Fort Worth—Bierman, Alfred C.; Williams, Paul S.
Fort Sam Houston—Wehr, Arthur J.

Utah

Bingham Canyon—Walker, E. H.; Winther, Arno
Eureka—Santo, Julius H.
Magna—Cullyford, James A.
Salt Lake City—Searles, Jasper E.; Smith, Elmo V.
Tooele—Sumner, Rutherford B.

Washington

Davenport—Campbell, William L.
Spokane—Merriam, Robert S.; Newell, John R.
Vancouver—Jones, Philo E.

West Virginia

Parkersburg—Goldberg, Bert

Wisconsin

Mayville—O'Connor, Edward S.

Wyoming

Laramie—McCarty, Edward P.
Mooncraft—Moenke, William F.
Rock Springs—Wallace, George W.
Waltman—Walter, Rollie B.

Africa

Tshikaysa, Kasai Congo, Belge—Grant, Roy C.
Yambuya, Congo, Belge—Butler, W. V.

Alaska

Coppermount—Kilpatrick, R. L.

Canada

Cobalt, Ont.—Bischoff, Harry R.
Ft. William, Ont.—Conkey, Charles R.
Kamloops—Wallinder, Arthur
Montreal—Cohen, Samuel W.
Porcupine, Ont.—Heath, Clarence L.
Porteau, B. C.—Burgess, Thomas O.
Surf Inlet, B. C.—Holler, Frederick W.
Vancouver, B. C.—Willis, Carl S.
Winnipeg—Fosness, Arthur W.

Central America

Minas de Oro, Honduras, C. A.—Brosius, Harold I.
San Juancito, Honduras—Devereux, Francis C.

China

Kirin City—Hsieh, Chung
Shanghai—Kwong, Yih Kun
Ta Tong, Chwang—Gannett, Roger W.

Chili

Rancagua—Bailey, A. K.

England

St. Maur, Newton Abbot, Devonshire—Brackenbury, Cyril

India

Burma—Calhoun, Allan B.

Japan

Tokyo—Kennedy, John J.

Mexico

Cananea, Sonora—Hondrum, Olaf; McKay, Henry S.
El Oro, Estado de Mexico—Flynn, John G.
Nacozari, Sonora—Jahn, William F.
Pachuca, Hidalgo—McIntosh, Joseph B.
Sierra Mojada—Quinn, Max F.

Philippine Islands

Aroroy, Masbate—Goldberg, Samuel B.

South America

Colombia

Amalfi—Probst, Elmer A.

Dutch Guiana

Moengo—Edwin, John

Peru

Cerro de Pasco—Armstrong, Harold K.; Leonard, F. Morton

Tarma—Sanchez, Richard M.

Venezuela

Maracaibo—Dovre, Adolph; Lewis, J. Whitney

Trinidad

Foley, Lyndon L.

LIST V.

Letters sent to the graduates at the addresses given in the following list have been returned to us. The Secretary of the School of Mines Society would greatly appreciate any information regarding the present location of these men.

ANDERSON, JOSEPH H.....	1911
725 Met. Life Bldg., Minneapolis, Minn.	
BECKER, GEORGE	1897
2540 9th Av. S., Minneapolis, Minn.	
BOWMAN, FRANK A.....	1904
Box 81, Gilbert, Minn.	
DEVEREUX, LAWRENCE	1910
1004 19th Ave. S.E., Minneapolis, Minn.	

FRITZBERG, ERNEST A.....	1910
Bivabik, Minn.	
GILTINAN, GEORGE M.....	1910
215 East Upsal St., Germantown, Pa.	
GULICK, HERVEY	1905
Colombo, Ceylon, India.	
HERRING, WILLIAM E.....	1910
Blue Earth, Minn.	
HOGANSON, GEORGE B.....	1909
Minnesota, Minn.	
HUGHES, THOMAS M.....	1896
Apartado, Postal No. 313, Guadalajara, Jalisco, Mexico.	
MCCARTY, ANDREW L.....	1904
Silver City, New Mexico.	
MCREA, RANDOLPH J.....	1907
Toronto, Can.	
NEUSTADT, BERTHOLDT R.....	1906
Smuggler, Colo.	
OSTRAND, PETER M.....	1910
Crosby, Minn.	
QUINN, HOWARD E.....	1918
Melrose, Minn.	
SWANSON, ALEX H.....	1910
Timmins, Ont., Canada.	
TOLL, RENSSELAER	1900
1912 Napa Ave., Berkeley, Cal.	
TRUESDALE, W. H.....	1903
Ray, Arizona.	
WALKER, CHARLES A.....	1913
Ducktown, Tenn.	
WHITSON, LLOYD R.....	1911
108 Union Ave. S., Fergus Falls, Minn.	

The Bulletin
of the University of
Minnesota

The College of Education
Announcement for the Year
1921-1922



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Minneapolis, Minnesota

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

1921							1922													
JULY							JANUARY							JULY						
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31	30	31
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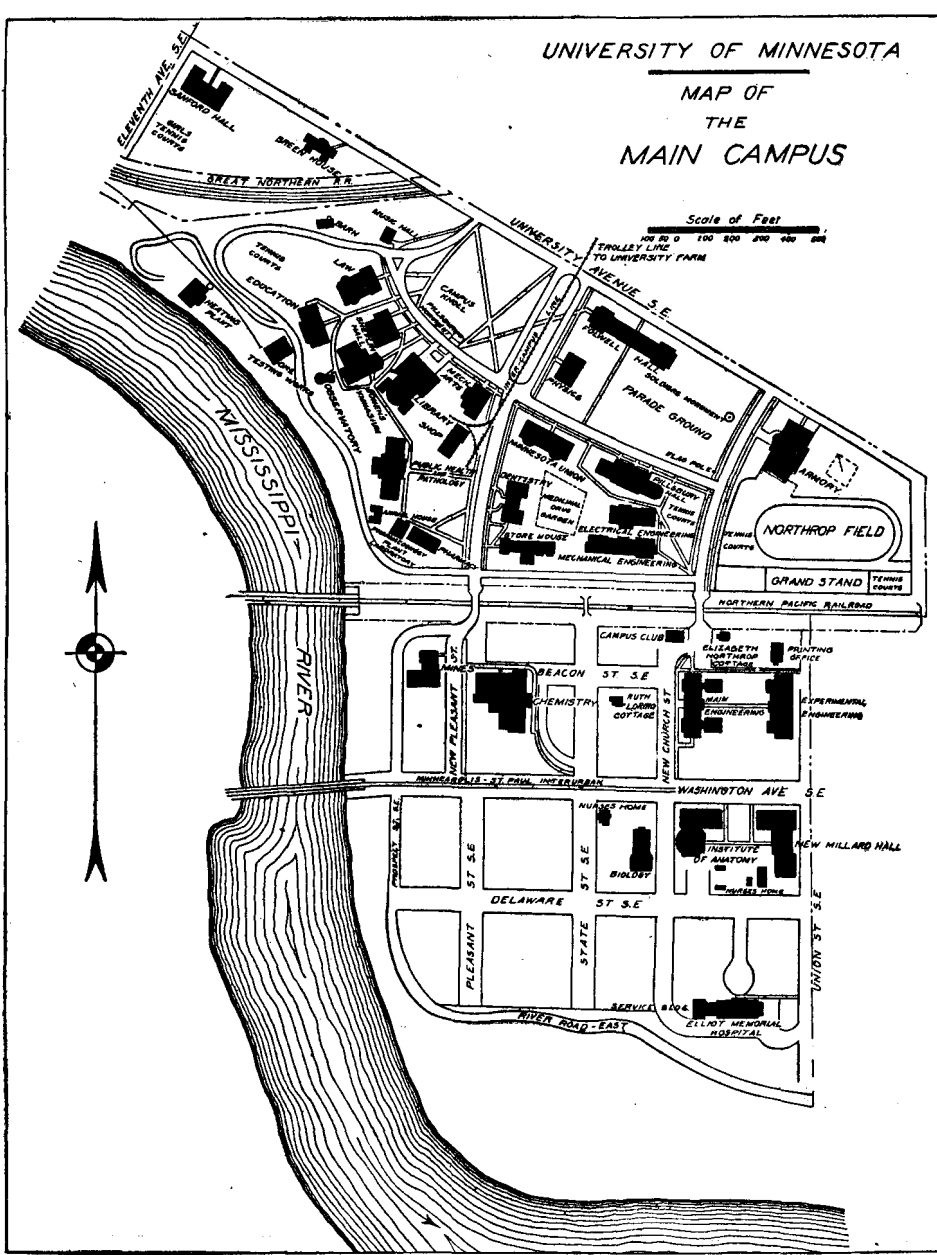
UNIVERSITY OF MINNESOTA

MAP OF
THE
MAIN CAMPUS

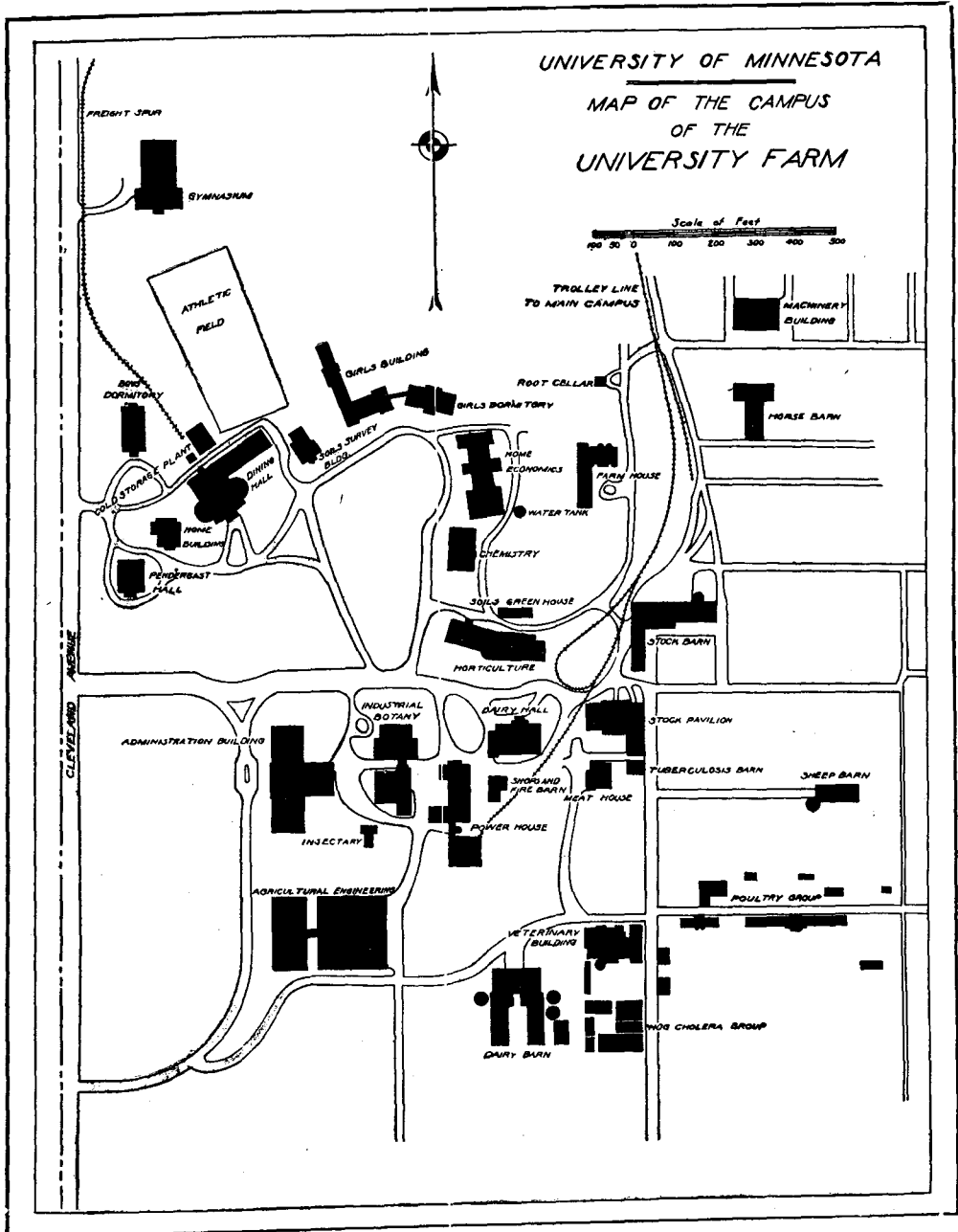
Scale of Feet

0 100 200 300 400 500

TROLLEY LINE
TO UNIVERSITY PARK



Area of Main Campus, 108.5 acres



Area of University Farm, 422.56 acres

UNIVERSITY CALENDAR

1921-1922

1921			
September	17	Saturday	Payment of fees closes, except for new students
September	19-24	Week	Registration for new students
September	20-27	Week	Examinations for removal of conditions and entrance examinations
			Physical examination for all new students
September	26-27		Changes in registration
September	27	Tuesday	Payment of fees for new students closes
September	28	Wednesday	Fall quarter begins, 8:30 a.m.
October	15	Saturday	Class Scrap Day; all classes dismissed the fourth hour
October	20	Thursday	Senate meeting, 4:30 p.m.
November	5	Saturday	Home Coming Day; classes dismissed the third and fourth hours
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	21	Wednesday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.

1922			
January	2	Monday	Registration for new students
January	4	Wednesday	Christmas vacation ends, winter quarter begins, 8:30 a.m.
February	16	Thursday	Senate meeting, 4:30 p.m.
February	20 to	March 4	Condition examinations
February	22	Wednesday	Washington's Birthday; a holiday
March	23	Thursday	Winter quarter ends, spring vacation begins, 5:20 p.m.
March	27	Monday	Registration for new students
March	29	Wednesday	Spring vacation ends, spring quarter begins, 8:30 a.m.
May	15 to	25	Condition examinations
May	18	Thursday	Senate meeting, 4:30 p.m.
May	30	Tuesday	Memorial Day; a holiday
June	11	Sunday	Baccalaureate service
June	13	Tuesday	Spring quarter closes, 5:20 p.m.
June	14	Wednesday	Fiftieth annual commencement
June	17-19		Registration days for summer session
June	20	Tuesday	Summer session begins
July	28	Friday	Summer session closes

THE COLLEGE OF EDUCATION

FACULTY

- LOTUS DELTA COFFMAN, Ph.D., President
WILLIAM WATTS FOLWELL, LL.D., President Emeritus
CYRUS NORTHROP, LL.D., President Emeritus
MELVIN E. HAGGERTY, Ph.D., Dean of the College of Education, Professor
of Educational Psychology, and Director of the Psycho-Educational
Clinic
EDWARD E. NICHOLSON, M.A., Dean of Student Affairs
GISLE C. BOTHNE, M.A., Professor of Scandinavian Languages and Litera-
tures
CLARA M. BROWN, B.A., Assistant Professor of Home Economics Education
WILLIAM H. BUSSEY, Ph.D., Professor of Mathematics
LOUIS J. COOKE, M.D., Director of Physical Education for Men
HERMIONE L. DEALEY, Ph.D., Assistant Professor of Educational Psychology
GEORGE W. DOWRIE, Ph.D., Professor of Economics
WILLIAM P. DYER, M.A., Assistant Professor of Agricultural Education
RICHARD M. ELLIOTT, Ph.D., Associate Professor of Psychology
HENRY A. ERIKSON, Ph.D., Professor of Physics
ALBERT M. FIELD, M.S., Assistant Professor of Agricultural Education
ROSS L. FINNEY, Ph.D., Assistant Professor of Educational Sociology
ISAAC W. GEIGER, Ph.D., Assistant Professor of Chemistry
HARRIET I. GOLDSTEIN, Associate Professor of Home Economics Education
ALBERT ERNEST JENKS, Ph.D., Professor of Anthropology
MAY S. KISSOCK, B.A., Assistant Professor of Physical Education for
Women
FREDERICK KLAEBER, Ph.D., Professor of Comparative and English Philology
LEONARD V. KOOS, Ph.D., Professor of Secondary Education
AUGUST CHARLES KREY, Ph.D., Associate Professor of History
FREDERICK KUHLMANN, Ph.D., Professorial Lecturer in Educational
Psychology
WINFORD P. LARSON, M.D., Professor of Bacteriology and Immunology
FRANK W. LATHROP, B.A., Assistant Professor of Agricultural Education
GEORGINA LOMMEN, B.A., M.L., Assistant Professor of High-School Rural
Training Methods Courses
ELIAS P. LYON, Ph.D., M.D., Professor of Physiology
DEXTER D. MAYNE, Professor of Agricultural Pedagogics
MAUDE J. MILLER, B.S. in H.E., Assistant Professor of Home Economics
Education
WILFORD S. MILLER, Ph.D., Professor of Educational Psychology
MERVIN G. NEALE, Ph.D., Professor of Educational Administration
J. ANNA NORRIS, M.D., Professor of Physical Education for Women

FACULTY

7

EVERETT W. OLMSTED, Ph.D., Lit.D., Professor of Romance Languages
ARTHUR F. PAYNE, M.A., Assistant Professor of Trade and Industrial
Education

JOSEPH B. PIKE, M.A., Professor of Latin
RUTH RAYMOND, B.S., Assistant Professor of Art Education

CARL O. ROSENDAHL, Ph.D., Professor of Botany
CHARLES A. SAVAGE, Ph.D., Professor of Greek
RICHARD E. SCAMMON, Ph.D., Professor of Anatomy

CARL SCHLENKER, B.A., Professor of German
CARLYLE M. SCOTT, Professor of Music

CHARLES P. SIGERFOOS, Ph.D., Professor of Zoology
HOMER J. SMITH, Ph.B., Assistant Professor of Trade and Industrial
Education

ANDREW A. STOMBERG, M.S., Professor of Scandinavian Languages and
Literatures

ASHLEY V. STORM, Ph.D., Professor of Agricultural Education
DAVID F. SWENSON, B.S., Professor of Philosophy

FLETCHER H. SWIFT, Ph.D., Professor of History of Education
JOSEPH M. THOMAS, Ph.D., Professor of Rhetoric

MARVIN J. VAN WAGENEN, Ph.D., Assistant Professor of Educational
Psychology

MILDRED WEIGLEY, M.A., Professor of Home Economics Education
NORMAN WILDE, Ph.D., Professor of Philosophy

CHARLES A. PROSSER, Ph.D., Professorial Lecturer in Trade and Industrial
Education

SAMUEL R. POWERS, M.A., Special Lecturer in Educational Administration
JEAN H. ALEXANDER, M.A., Instructor in Education

FRED E. ARMSTRONG, M.A., Instructor in Agricultural Education
ELIZABETH BACON, B.A., Instructor in Home Economics Education

WILLIAM O. BEAL, M.A., M.S., Assistant Astronomer
JOSEPHINE DE BOER, B.A., Instructor in Teachers' Courses in Romance
Languages

MARIE B. DENNEEN, B.A., Instructor in Teachers' Course in Latin
JEAN DORSEY, B.S. in H.E., Instructor in Home Economics Education

THADDEUS P. GIDDINGS, Instructor in Public-School Music
SOPHIA HUBMAN, M.A., Instructor in Teachers' Course in German

REWEY BELLE INGLIS, B.A., Instructor in Teachers' Course in English
ARTHUR M. JOHNSON, Ph.D., Instructor in Botany

LOU LOMBARD, B.A., Instructor in Home Economics Education
OLIVE B. MACCOMBER, B.S., Instructor in Home Economics Education

HAZEL SMALL MARTIN, Instructor in Art Education
WILLIAM D. REEVE, B.S., Instructor in Teachers' Course in Mathematics

GERTRUDE DUNCAN ROSS, Instructor in Art Education
LYNNE E. STOCKWELL, B.S., Instructor in Teachers' Courses in Manual
Training

LOUIS A. TOHILL, M.A., Instructor in Teachers' Course in Political Science
FREDERICK L. WHITNEY, M.A., Instructor in Theory and Practice of
Teaching

UNIVERSITY HIGH SCHOOL

ADA M. BING, B.A., Instructor in English
 JOSEPHINE DE BOER, B.A., Instructor in Romance Languages
 RUBY M. COON, B.S., Instructor in Domestic Science
 MARIE B. DENNEEN, B.A., Instructor in Latin
 AUGUST DVORAK, B.A., Instructor in Science
 SOPHIA HUBMAN, M.A., Instructor in German
 REWEY BELLE INGLIS, B.A., Instructor in English
 FRANCES MOREHOUSE, M.A., Instructor in History
 SAMUEL R. POWERS, M.A., Instructor in Science
 WILLIAM D. REEVE, B.S., Principal and Instructor in Mathematics
 EDWARD ROLLEFSON, M.A., Instructor in Science
 DORA V. SMITH, M.A., Instructor in English
 W. RAY SMITH, B.A., Instructor in Mathematics
 LYNNE E. STOCKWELL, B.S., Instructor in Manual Training
 LOUIS A. TOHILL, M.A., Instructor in History

ASSISTANTS

GRATIA M. KELLEY, B.S., Assistant in Educational Psychology
 SIGURD B. SEVERSON, B.A., Assistant in Educational Psychology

MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN
THE COLLEGE OF EDUCATION

CEPHAS D. ALLIN, LL.B., M.A., Professor of Political Science
 CLARENCE W. ALVORD, Ph.D., Professor of History
 WILLIAM ANDERSON, Ph.D., Assistant Professor of Political Science
 FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor
 of Romance Languages
 RALPH M. BARTON, B.A., Assistant Professor of Mathematics
 JOSEPH W. BEACH, Ph.D., Associate Professor of English
 RICHARD O. BEARD, M.D., Associate Professor of Physiology
 JOHN D. BLACK, Ph.D., Professor of Agricultural Economics
 ROY G. BLAKEY, Ph.D., Professor of Economics
 RAYMOND W. BRINK, Ph.D., Associate Professor of Mathematics
 THOMAS M. BRODERICK, Ph.D., Assistant Professor of Geology
 SOLON J. BUCK, Ph.D., Associate Professor of History
 OSCAR C. BURKHARD, Ph.D., Assistant Professor of German
 FREDERIC K. BUTTERS, Ph.D., Associate Professor of Botany
 ROYAL N. CHAPMAN, Ph.D., Assistant Professor of Animal Biology
 LILLIAN COHEN, Ph.D., Assistant Professor of Chemistry
 GEORGE P. CONGER, B.D., Assistant Professor of Philosophy
 LOUIS JOSEPH COOKE, M.D., Director of Physical Education for Men
 WILLIAM S. COOPER, Ph.D., Assistant Professor of Botany
 GERTRUDE SCHILL CRAM, B.A., Assistant Professor of Physical Education
 for Women

ROBERT E. CUSHMAN, Ph.D., Associate Professor of Political Science
 JAMES DAVIES, Ph.D., Assistant Professor of German
 WILLIAM STEARNS DAVIS, Ph.D., Professor of Ancient History
 Z. CLARK DICKINSON, Ph.D., Assistant Professor of Economics
 HAL DOWNEY, Ph.D., Professor of Animal Biology
 ELIAS J. DURAND, D.Sc., Professor of Botany
 RICHARD M. ELLIOTT, Ph.D., Associate Professor of Psychology
 WILLIAM H. EMMONS, Ph.D., Professor of Geology
 HENRY ANTON ERIKSON, Ph.D., Professor of Physics
 DONALD N. FERGUSON, B.A., Assistant Professor of Pianoforte
 GUY STANTON FORD, Ph.D., Professor of History
 WILLIAM K. FOSTER, LL.M., Assistant Professor of Physical Education for

Men

WILLIAM S. FOSTER, Ph.D., Associate Professor of Psychology
 JULES T. FRELIN, B.A., Assistant Professor of Romance Languages
 FREDERICK B. GARVER, Ph.D., Associate Professor of Economics
 JOSEF E. GILLET, Ph.D., Assistant Professor of Romance Languages
 NORMAN SCOTT BRIEN GRAS, Ph.D., Professor of Economic History
 FRANK F. GROUT, Ph.D., Professor of Geology and Mineralogy
 ALVIN HARVEY HANSEN, Ph.D., Associate Professor of Economics
 WILLIAM L. HART, Ph.D., Associate Professor of Mathematics
 RODNEY B. HARVEY, Ph.D., Assistant Professor of Botany
 ERNEST A. HEILMAN, Ph.D., Assistant Professor of Accounting
 LAWRENCE M. HENDERSON, Ph.D., Assistant Professor of Chemistry
 ARTHUR T. HENRICI, M.D., Associate Professor of Bacteriology and Immunology
 JAMES T. HILLHOUSE, Ph.D., Assistant Professor of Rhetoric
 CLARENCE L. HOLMES, M.A., Assistant Professor of Agricultural Economics
 NED L. HUFF, M.A., Assistant Professor of Botany
 WILLIAM H. HUNTER, Ph.D., Professor of Chemistry
 SIGURD B. HUSTVEDT, Ph.D., Assistant Professor of Rhetoric
 DUNHAM JACKSON, Ph.D., Professor of Mathematics
 ELIZABETH JACKSON, Ph.D., Assistant Professor of Rhetoric
 ALBERT ERNEST JENKS, Ph.D., Professor of Anthropology
 FRANCIS B. KINGSBURY, Ph.D., Associate Professor of Physiologic Chemistry
 MAY S. KISSOCK, B.A., Assistant Professor of Physical Education for

Women

FREDERICK KLAEBER, Ph.D., Professor of Comparative and English Philology
 LEE I. KNIGHT, Ph.D., Professor of Botany
 SAMUEL KROESCH, Ph.D., Assistant Professor of German
 VALERIA G. LADD, B.A., Assistant Professor of Physical Education for
 Women
 WINFORD P. LARSON, M.D., Professor of Bacteriology and Immunology
 KARL S. LASHLEY, Ph.D., Assistant Professor of Psychology
 FRANCIS P. LEAVENWORTH, M.A., Professor of Astronomy
 IRVILLE C. LECOMPTÉ, Ph.D., Professor of Romance Languages
 ELMER J. LUND, Ph.D., Associate Professor of Zoology

- ELIAS P. LYON, Ph.D., M.D., Professor of Physiology
 JESSE F. MCCLENDON, Ph.D., Associate Professor of Physiology
 FRANK H. MACDOUGALL, Ph.D., Associate Professor of Chemistry
 CECIL A. MOORE, Ph.D., Associate Professor of English
 BRUCE D. MUDGETT, Ph.D., Associate Professor of Economics
 HENRY F. NACHTRIEB, B.S., Professor of Animal Biology
 CHARLES W. NICHOLS, Ph.D., Assistant Professor of Rhetoric
 HOWARD S. NOBLE, B.A., M.B.A., Assistant Professor of Accounting
 OSCAR W. OESTLUND, Ph.D., Assistant Professor of Animal Biology
 EVERETT W. OLMSTED, Ph.D., Lit.D., Professor of Romance Languages
 EUGENE F. PARKER, Ph.D., Assistant Professor of Romance Languages
 CHAUNCEY J. V. PETTIBONE, Ph.D., Associate Professor of Physiologic
 Chemistry
 ANNA A. H. PHELAN, Ph.D., Assistant Professor of Rhetoric
 RUTH S. PHELPS, M.A., Associate Professor of Romance Languages
 HAROLD QUIGLEY, Ph.D., Assistant Professor of Political Science
 FRANK M. RARIG, M.A., Associate Professor of Public Speaking
 WILLIAM A. RILEY, Ph.D., Professor of Entomology
 THOMAS S. ROBERTS, M.D., Professor of Ornithology
 CARL O. ROSENDAHL, Ph.D., Professor of Botany
 MARTIN B. RUUD, Ph.D., Assistant Professor of Rhetoric
 THOMAS H. SANDERS, M.Com., Assistant Professor of Accounting
 CHARLES ALBERT SAVAGE, Ph.D., Professor of Greek
 CARL SCHLENKER, B.A., Professor of German
 CARLYLE M. SCOTT, Professor of Music
 FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Professor of Physiology
 COLBERT SEARLES, Ph.D., Professor of Romance Languages
 LESTER B. SHIPPEE, Ph.D., Assistant Professor of History
 ROYAL R. SHUMWAY, Ph.D., Associate Professor of Mathematics
 CHARLES F. SIDENER, B.S., Professor of Chemistry
 CHARLES P. SIGERFOOS, Ph.D., Professor of Zoology
 EDWARD H. SIRICH, Ph.D., Assistant Professor of Romance Languages
 M. CANNON SNEED, Ph.D., Associate Professor of Chemistry
 CLINTON R. STAUFFER, Ph.D., Professor of Geology
 J. WARREN STEHMAN, M.A., Assistant Professor of Economics
 ELMER E. STOLL, Ph.D., Professor of English
 EMERSON G. SUTCLIFFE, Ph.D., Assistant Professor of Rhetoric
 W. FRANCIS G. SWANN, D.Sc., Professor of Physics
 DAVID F. SWENSON, B.S., Professor of Philosophy
 CLARA F. SYKES, B.A., B.S., Assistant Professor of Office Management
 JOHN T. TATE, Ph.D., Professor of Physics
 JOSEPHINE E. TILDEN, M.S., Professor of Botany
 ALICE J. H. TOLG, M.D., Assistant Professor of Physical Education for
 Women
 MASON W. TYLER, Ph.D., Assistant Professor of History

¹ Absent on leave 1921-22.

FACULTY

11

ANTHONY L. UNDERHILL, Ph.D., Associate Professor of Mathematics
 GUSTAV L. VAN ROOSBROECK, Ph.D., Assistant Professor of Romance
 Languages
 MARION WELLER, B.A., Associate Professor of Textiles
¹ALBERT B. WHITE, Ph.D., Professor of History
 HERBERT WOODROW, Ph.D., Associate Professor of Psychology
 HOLBROOK WORKING, M.A., Assistant Professor of Agricultural Economics
 QUINCY WRIGHT, Ph.D., Assistant Professor of Political Science
 JEREMIAH S. YOUNG, Ph.D., Professor of Political Science
 ANTHONY ZELENY, Ph.D., Professor of Physics
 RUBY BAUGHMAN, M.A., Professorial Lecturer in Anthropology and
 Americanization Training
 J. FRANKLIN EBERSOLE, M.A., Ph.B., Professorial Lecturer in Economics
 ANTONIO HERAS, Bachiller, Licenciado en Derecho, Professorial Lecturer
 in Romance Languages
 MILDRED W. LORING, Ph.D., Professorial Lecturer in Psychology
 LOUALLEN F. MILLER, M.A., Professorial Lecturer in Physics
 IRA S. ALLISON, B.A., Instructor in Geology and Mineralogy
 HILDING E. ANDERSON, B.A., Instructor in Agricultural Economics
 RICHARD ATWATER, B.A., Instructor in Rhetoric
 GERTRUDE A. BAKER, Instructor in Physical Education for Women
 MARY BARNICLE, M.A., Instructor in Rhetoric
 CECIL C. BEAN, M.A., Instructor in Rhetoric
 CHARLES BIRD, Ph.D., Instructor in Psychology
 ANNE G. BENTON, M.A., Instructor in Bacteriology and Immunology
 LOUIS A. BOETTIGER, M.A., Instructor in Sociology and Social Work
 EDWIN S. BROWN, M.D., Instructor in Physical Education for Men
 HARRY S. CANNON, Ph.D., Instructor in German
 HERMAN H. CHAPMAN, B.A., Instructor in Accounting
 MARY ELLEN CHASE, M.A., Instructor in Rhetoric
 NELSON F. COBURN, M.A., Instructor in Romance Languages
 J. BURTON CONFREY, M.A., Instructor in Rhetoric
 ROBERT V. CRAM, Ph.D., Instructor in Latin
 W. IRVING CROWLEY, Instructor in Romance Languages
 JOSEPH E. CUMMINGS, M.A., Instructor in Economics
 FRANCES KELLEY DEL PLAINE, M.A., Instructor in Rhetoric
 LYNWOOD G. DOWNS, M.A., Instructor in German
 JOHN W. DRAPER, Ph.D., Instructor in Rhetoric
 WILLIAM P. DUNN, B.D., M.A., Instructor in Rhetoric
 GEORGE H. FAIRCLOUGH, Instructor in Music
 DONALD W. FISHER, Ph.D., Instructor in Rhetoric
 CARL FOSSE, M.S., Instructor in Chemistry
 MARGARET GABLE, M.A., Instructor in Rhetoric
 CHARLES C. GAULT, M.A., M.B., Instructor in Physiology
 GLADYS E. GIBBENS, Ph.D., Instructor in Mathematics
 PERCY C. GLIDDEN, Instructor in Physical Education for Men

¹ Absent on leave 1921-22.

RICHARD A. GRAVES, M.A., Instructor in Economics
 ESTHER M. GREISHEIMER, B.S. in E., Ph.D., Instructor in Physiology
 MARGUERITE GUINOTTE, Brevet Supérieur, Certificat d'Aptitude Pédagogique,
 M.A., Instructor in Romance Languages
 JOHN W. GRUNNER, B.A., Instructor in Geology and Mineralogy
 GERTRUDE R. HULL, Instructor in Voice
 KENNETH B. HUNTER, B.A., Instructor in Rhetoric
 RICHARD JENTE, Ph.D., Instructor in German
 HARRISON W. JOHNSON, Instructor in Music
 JOHN KIERZEK, M.A., Instructor in Rhetoric
 PAUL C. KING, B.A., Instructor in Romance Languages
 CHARLES B. KUHLMAN, M.A., Instructor in Economics
 OTTO KUHLMANN, M.A., Instructor in German
 WALTER M. LAUER, M.S., Instructor in Chemistry
 COWDEN LAUGHLIN, Ph.D., Instructor in German
 RUTH M. LINDQUIST, B.S., Instructor in Foods Management
 CHARLES F. LINDSLEY, M.A., Instructor in Public Speaking
 O. K. LUNDEBERG, B.A., Instructor in Romance Languages
 GERTRUDE K. LYON, B.A., Instructor in Physical Education for Women
 WALTER MACKELLAR, B.A., Instructor in Rhetoric
 ARIEL MACNAUGHTON, M.A., Instructor in Public Speaking
 ANDREW R. MOREHOUSE, B.A., Instructor in Romance Languages
 MARGARET K. MUMFORD, B.A., Instructor in Home Management and Nutri-
 tion
 JULIA NEWTON, B.A., State Worker in Home Economics
 WALTER R. MYERS, Ph.D., Instructor in Economics
 MARJORIE NICOLSON, Ph.D., Instructor in Rhetoric
 HARRY J. OSTLUND, B.A., Instructor in Economics
 ROSCOE E. PARKER, M.A., Instructor in Rhetoric
 VICTOR H. PELZ, M.S., Instructor in Economics
 ABE PEPINSKY, Instructor in Violin
 GERTRUDE REEVES, Instructor in Pianoforte
 LLOYD H. REYERSON, Ph.D., Instructor in Chemistry
 GRACE RICHARDS, M.A., Instructor in Rhetoric
 ADOLPH RINGOEN, Ph.D., Instructor in Animal Biology
 HARRY W. ROBBINS, M.A., Instructor in Rhetoric
 GRACE M. ROCKWOOD, B.A., Instructor in Physical Education for Women
 CARL B. ROEMER, Instructor in Physical Education for Men
 STANLEY I. RYPINS, Ph.D., Instructor in Rhetoric
 WILLIAM P. SANFORD, B.A., Instructor in Public Speaking
 LANDON A. SARVER, M.A., Instructor in Chemistry
 KARL SCHEURER, Instructor in Music
 MINNA SCHICK, M.A., Instructor in Mathematics
 GEORGE M. SCHWARTZ, M.A., Instructor in Geology and Mineralogy
 LAWRENCE SMITH, M.A., Instructor in Economics
 LEE I. SMITH, M.A., Instructor in Chemistry

FACULTY

13

GLADYS SPEAKER, M.A., Instructor in Anthropology and Americanization
Training

DAVID O. SPRIESTERSBACH, M.S., Instructor in Bacteriology and Immunology

SAMUEL R. STAUFFER, M.A., Instructor in Rhetoric

GEORGE M. STEPHENSON, Ph.D., Instructor in History

GEORGE A. THIEL, B.A., Instructor in Geology and Mineralogy

ELLA A. THORP, B.A., Instructor in Mathematics

BERT A. WALLACE, M.A., Instructor in Economics

GEORGE B. WATTS, M.A., Instructor in Romance Languages

W. COURTNEY WERNER, B.A., Instructor in Geology and Mineralogy

PAUL T. YOUNG, Ph.D., Instructor in Psychology

ASSISTANTS AND SCHOLARS

1920-21

ANIMAL BIOLOGY

JOHN A. CEDERSTROM, Ph.B., Assistant

GEORGE H. CHILDS, M.A., Teaching Fellow

EMILY PAYNE, M.A., Assistant

ANTHROPOLOGY

ALONZO GRACE, B.A., Assistant

BACTERIOLOGY AND IMMUNOLOGY

ROBERT G. GREEN, B.A., Assistant

GERMAN

ESTHER STRAND DOWNS, B.A., Teaching Fellow

ESTHER HENDRICKSON, B.A., Teaching Fellow

RHETORIC

DOROTHY HUDSON, M.A., Assistant

BENJAMIN McCLURE, B.A., Assistant

TRACY PEYCKE, B.A., Assistant

ALFRED J. SCHWEPPE, M.A., Assistant

LEE J. SEYMOUR, B.A., Assistant

MARY SLIFER, Assistant

GENERAL INFORMATION

The College of Education was authorized by special enactment of the Legislature of Minnesota in 1905 and was established by the Regents of the University of Minnesota in the following year. It has the following purposes:

1. To offer opportunity for the study of education as an important enterprise of society and as of peculiar interest to all persons whether they are preparing for teaching or not.
2. To offer inexperienced university students who intend to become teachers the technical training for their vocation.
3. To offer to university students, or those actively engaged in service, opportunity for advanced professional study under direction.
4. To offer to university students, and to all teachers of suitable attainment, appropriate training designed to prepare them for successful careers as public administrators, normal-school teachers or college teachers of education.
5. To offer opportunity for original investigation, research, and experiments in education and for the preparation for constructive contributions to educational theory and practice.

In fulfilling these purposes the College of Education offers the professional courses for the training of superintendents, principals, supervisors of special subjects, rural-school supervisors, supervisors of playgrounds and recreation activities, teachers of high-school subjects, manual-training teachers, school librarians, teachers of high-school teacher-training departments, teachers of agriculture, home economics, and trades and industries.

ADMISSION

Regular Students

To be admitted to regular standing in the College of Education, students must be able to satisfy either of the following requirements, (a) or (b).

(a) Completion of at least the Junior College requirements of the College of Science, Literature, and the Arts, or of some other approved college at the University of Minnesota or elsewhere, during which time an introductory course in general psychology shall have been pursued. No formal application is necessary for transfer from the Junior College to the College of Education if such transfer is made at the beginning of the junior year, nor is any loss of credits involved. However, no student may transfer who has not earned 90 credits and 90 honor points in the College of Science, Literature, and the Arts, including six credits in psychology.

(b) The College of Education grants to graduates of the advanced graduate course of Minnesota state normal schools 90 credits; to graduates of the advanced Latin or advanced English course of Minnesota state normal schools, 63 credits.

In special subjects like Art Education and Physical Education where a three- or four-year curriculum is provided, students may register in the College of Education in their freshman or sophomore year.

Unclassed Students

Normal-school graduates receiving 63 credits, teachers preparing for examination for the first-grade professional certificates, but who are unable to meet the regular requirements for admission, teachers in service unable to carry full work, and certain other classes of students are admitted to the College of Education as unclassified students. Each case must, however, be dealt with individually as the result of formal application to the dean.

Unclassed students in the College of Education will find it possible to pursue all subjects required for a first-grade professional certificate.

ADVANCED STANDING

By Examination

The College of Education distinctly discourages any effort to secure advanced standing in professional subjects by examination. With the establishment of correspondence courses in the General Extension Division, there are no longer the reasons which formerly existed for granting such examinations.

By Graduation from the Three-Year Course of Minnesota Normal Schools

Graduates of the three-year course in the state normal schools of Minnesota may receive not more than 112½ credits in the College of Education at the University of Minnesota; credits earned in the three-year normal-school course shall be applied in case they are deemed of equivalent merit, in the College of Education, to courses leading to certificates for supervisors in elementary grades, as principals in state graded schools, as teachers in junior high schools or in normal-school departments in high schools; students coming from the three-year course in normal schools shall not receive certificates in high-school subjects from the University without completing the prescribed courses of the University of Minnesota for such certificates.

Normal-school graduates desiring admission to the College of Education must present a recommendation from the president of the normal school from which they were graduated, together with a record of the courses pursued and grades received.

Students admitted to the College of Education from normal schools will not be permitted to elect the following courses for credit: Education 1; Psychology 1-2. Such students will be required to carry the advanced course in History of Education.

For a statement of records to be submitted, see bulletin of general information, pages 31-32.

By Credentials from Other Colleges

Advanced standing in the College of Education by the presentation of credentials from other colleges of the University of Minnesota or colleges of similar grade elsewhere may be secured only upon petition to the faculty of the College of Education. Students may shorten the two years of residence only by meeting such additional requirements in quality and quantity of professional work as in the opinion of the faculty will make the training of such students equal to that of students regularly registered for two full years in the College of Education.

FEES

Tuition fee (per quarter)	
Residents of Minnesota.....	\$20.00
Non-residents	30.00
Deposit (first quarter only).....	5.00
Military deposit (required of all students taking drill).....	10.00
Health fee (per quarter).....	2.00
Minnesota Union or Shevlin Hall fee (per quarter).....	1.00
Post-office box (per quarter).....	.20
Special fees:	
Examination for removal of conditions.....	1.00
Examination for credit (after the first six weeks in residence).....	5.00
Special examinations	5.00
Chemistry deposit	5.00

PENALTY FEES:

Registration penalties.—A penalty fee for late registration, late change of registration, or late payment of fees shall be two dollars (\$2.00) and one dollar (\$1.00) additional for each day of delay after classes begin, provided that no student shall pay more than twelve dollars (\$12.00) of penalty in any given quarter.

THE DEGREE OF BACHELOR OF SCIENCE

Students graduating from the College of Education will receive the degree of Bachelor of Science.

GENERAL REQUIREMENTS

The following regulations refer chiefly to undergraduates; graduate students should consult the bulletin of the Graduate School. Freshmen and sophomores in Art Education and Physical Education will be guided by the faculty regulations of the College of Science, Literature, and the Arts, but will be amenable to the Students' Personnel Committee of this college.

Fifteen credit hours are regarded as the usual load. Students who wish to register for more than seventeen hours must show a record of $1\frac{1}{2}$ honor points per credit hour for the previous quarter. Students may not carry less than 13 hours without petition.

No student whose absences in any course exceed one sixth of the scheduled meetings of the class shall be admitted to the final examination without permission of the dean of the college or of the Students' Personnel Committee.

Exceptional cases of habitually poor studentship shall be subject to investigation and recommendation by the Students' Personnel Committee.

Examinations are held at the close of each quarter. A student's grade is based upon his class work and examination. Four passing grades are given, namely, A, B, C, D. Work not done satisfactorily is marked E (condition), or F (failure). Work not completed is marked I. An incomplete must be removed within one month after the opening of the following quarter; otherwise it becomes a condition. A failure can be removed only by pursuing the work again in class.

Questions of details not covered in these regulations shall be referred to the Students' Personnel Committee.

EXPLANATION OF REQUIREMENTS

The amount of work pursued by a student is estimated in credit hours; the quality or grade of his work, in honor points.

A *credit hour* is one hour per week of recitation or lecture work extending throughout one quarter, or three hours per week of laboratory work through one quarter. It is assumed that each credit hour will demand on the average three hours a week of the student's time for recitation or lecture, one hour in class and two hours of preparation; for laboratory courses, three hours in the laboratory.

Honor points are computed as follows: each credit hour with the grade of A entitles the recipient to 3 honor points; each credit hour with the grade of B entitles the recipient to 2 honor points; each credit hour with the grade of C to 1 honor point; each credit hour with the grade of D to no honor points. Illustration: A student completing a one-quarter 3-credit course and receiving the grade of A would be entitled to 9 honor points; if receiving the grade of B to 6 honor points; if receiving the grade of C to 3 honor points; if receiving the grade of D to no honor points.

SUMMARY OF REQUIREMENTS

1. *Residence*.—The minimum term of residence in the College of Education is two years beginning with the junior year. (See page 15 for **Advanced Standing**.)

2. *Amount and grade of work*.—During his entire course the student must earn: (a) 180 credit hours in addition to the required courses in drill, gymnasium, and physical education; (b) 1½ honor points per credit hour in the major subject (see footnote); (c) an average of one honor point per credit hour in all other courses pursued during the junior and senior years.

3. *Courses required and allowed*.—(a) The student must have completed (normally during the sophomore year) a general introductory course in psychology; (b) he must have satisfied all the requirements for a teacher's certificate. (See pages 18-19.)

Note: Honor points are computed on the basis of one and one-half times the number of credit hours required in the major subject, e.g., in case a major recommendation requires 36 credits, the number of honor points will be 54. From among the courses carried in a department the student may select those which he will present as meeting this requirement except that he must include all courses which are specified in the departmental announcement as required for the recommendation for the certificate.

Exceptions

(1) Students already holding a first-grade professional certificate may be excused from complying with the requirements for the University teacher's certificate but in every case students will be required to carry the minimum number of professional courses required for qualifying for a certificate.

(2) Students preparing to pursue school work in fields other than those listed above may qualify for the degree of Bachelor of Science without meeting the professional requirements for any particular certificate. In every case, however, students must petition for this privilege and will be required to earn 36 or more credits in a major field and to meet a minor requirement in at least one minor field.

GRADUATION WITH DISTINCTION

The degree of Bachelor of Science with Distinction is granted to graduates of this college who fulfill the following conditions:

1. Special excellence in major subject.
2. Application for the degree with distinction should be made at the time of entering the college, but may, however, be postponed until the opening of the senior year.
3. At the time of application the student shall, after conference with the dean of the College of Education, or some other member of the faculty appointed for that purpose, select a subject for his thesis, which must be formally approved and recorded.
4. The presentation of a satisfactory thesis upon some subject within the major field of study not later than May 1, senior year.
5. At the time of application the student must have an average of $1\frac{1}{2}$ honor points per credit hour in all previous work.
6. At the time of graduation the student must have met all conditions applying to the Bachelor's degree in Education; must show a record of $1\frac{1}{2}$ honor points per credit hour in *four fifths of all work pursued throughout his entire course*, and
7. Must be recommended to the faculty for the degree with distinction, which recommendation must be approved by the vote of the faculty of the college.

In the case of honor students wishing to qualify for the teacher's certificate, it is understood that they shall be required to elect not more than 22 credits in education, such 22 credits to include all of the prerequisite work in psychology. The required course will include Practice Teaching, Technic of Teaching, and one teachers' course.

THE UNIVERSITY TEACHER'S CERTIFICATE IN A SECONDARY-SCHOOL SUBJECT

Beginning with the year 1921-22, the University teacher's certificate will be granted only to graduates of the College of Education. Students expecting to receive this certificate upon graduation shall be registrants in the College of Education from the beginning of the junior year. Students

desiring the teacher's certificate in Home Economics or Agriculture shall also be registrants in the College of Agriculture, Forestry, and Home Economics.

All students without teaching experience, desiring a University teacher's certificate will be required to comply with the requirements listed below. Such students will also be required to complete a two years' course leading to the degree of Bachelor of Science.

Candidates for this degree may major in any department offering work in the College of Education.

The University teacher's certificate is offered in the following subjects:

Administration and Supervision	History
Agriculture	Home Economics
Americanization	Latin
Animal Biology	Manual Training
Art Education	Mathematics
Botany	Norwegian
Chemistry	Physical Education
Commercial subjects	Public-School Music
English	Physics
French	Political Science
Geography	Spanish
German	Swedish
High-School Rural Training	Teaching Subnormal Children

By a proper selection of courses students qualifying for the degree of Bachelor of Science may qualify for a certificate in more than one field.

*Prescribed Course of Study for University Teacher's Certificate
in a Secondary-School Subject*

The College of Education has adopted the following prescribed course of study, totaling 22 credits, for the University teacher's certificate, and for the degree of Bachelor of Science.

1	Brief Course in History of Education.....	5 credits
	or	
101-102-103	History of Education.....	9 credits
3	Educational Sociology.....	3 credits
55	Elementary Educational Psychology.....	3 credits
11	Technic of Teaching.....	3 credits
15	Practice Teaching.....	5 credits
	Special Methods at least.....	3 credits

The following courses should be taken in the order named, each being regarded as a prerequisite to all the courses which follow it:

- Educational Psychology 55
- Technic of Teaching 11
- Special Methods
- Practice Teaching 15

In addition to the teachers' course in the department in which the student wishes to do practice teaching, he will be required to satisfy all courses required by the subject-matter department concerned as prerequisite to the teachers' course. (See departmental statement.)

To avoid overcrowding in practice teaching in the spring quarter all students who have completed the prerequisite courses are urged to apply for admission to practice teaching in the fall and winter quarters.

ADMISSION TO PRACTICE TEACHING

All arrangements for practice teaching are made by the principal of the University High School. *Before registering for practice teaching*, Education 15, students should get an application card in the principal's office, Room 110, Education Building. The applicant should secure from the registrar's office a statement on his application card of the courses he has taken and the marks received in the subject in which he wishes to do practice teaching. The application must be signed by the adviser for the department concerned. On this application card must be listed in addition the following professional courses with the marks received:

Elementary Educational Psychology 55

Technic of Teaching 11

Teachers' Course

When signed by the principal the application card should be presented to the critic teacher who will assign the applicant to a high-school class. The application should then be filed in the principal's office.

Practice teachers are expected to attend every meeting of the high-school class to which they are assigned for the quarter, also all conferences designated by the critic teacher. Practice teachers in laboratory sciences should arrange their programs so that they will be able to attend all double periods for laboratory.

All applications for practice teaching must be approved and on file in the principal's office before the close of the quarter immediately preceding the quarter in which the practice teaching is to be done.

Students in the College of Agriculture, Forestry, and Home Economics desiring to qualify as teachers will be required to comply with the usual requirements for practice teaching. Arrangements for this work will be made by Professor Storm and Miss Weigley.

By arrangement between the Board of Regents of the University and the Directors of the Dunwoody Industrial Institute, the facilities of the latter institution have been made available to students in the College of Education to do practice teaching and other types of work for which the institution is especially fitted. The resources of this Institute are therefore used to supplement the facilities already available on the University campus for teachers in manual training, and trade and industrial subjects.

Opportunities for practice teaching of special classes of children are available in the public schools of St. Paul and Minneapolis. By special agreement between the State Board of Control and the Board of Regents

of the University the facilities of the State School for Feeble Minded and Epileptic Colony at Faribault are also available to University students for practice teaching and other forms of study.

The foregoing schedule of requirements does not apply to students who are registered in any of the special curricula in the College of Education, as for example:

Home Economics, Agriculture, Teacher-Training in High School, Teachers of Subnormal Children, Consolidated-School Principals, Special Supervisorships, Art Education, Physical Education.

PRESCRIBED COURSE FOR UNIVERSITY TEACHER'S CERTIFICATE IN ADMINISTRATION AND SUPERVISION

It is desirable that prospective superintendents and principals of graded schools, before entering upon their duties shall have had courses in school administration and school supervision in some recognized normal school or college. Students who wish to qualify for a certificate in administration and supervision will be required to earn 36 credits as follows:

Required courses, totalling 27 credits, include Education 111, 121, 160-161-162, 124-125-126, 134-135-136. *Elective credits*, totalling 9, selected from the following: Education 3, 11, 65, 106-107-108, 113, 119, 138-139, 164, 167-168, 180, 184-185-186, 201-202-203, 205-206-207, 218-219-220.

PROFESSIONAL LECTURERS

From time to time during the year lectures of general interest to students of education will be given by members of the faculty and invited speakers. All students in the College of Education are expected to attend these lectures. Special announcements will appear in the *Official Daily Bulletin*.

STUDENT ADVISERS

The following persons, members of the faculty of the College of Education, are designated as advisers to students for the year 1921-1922.

SUBJECT	NAME OF INSTRUCTOR	ROOM
Educational Administration.....	M. G. Neale.....	210Ed
History of Education.....	F. H. Swift.....	103Ed
Educational Psychology.....	M. E. Haggerty.....	103Ed
Trade and Industrial Education.....	Arthur F. Payne.....	207Ed
Agricultural Education.....	A. V. Storm.....	209Ad
Art Education.....	Ruth Raymond.....	303MA
Botany.....	A. M. Johnson.....	16AB
Chemistry.....	I. W. Geiger.....	339C
Economics.....	G. W. Dowrie.....	108MA
English, Rhetoric, Public Speaking.....	J. M. Thomas.....	222F
Geography.....		
German.....	C. Schlenker.....	211F
History.....	A. C. Krey.....	220Lib
Home Economics Education.....	Mildred Weigley.....	202HE
Latin.....	J. B. Pike.....	118F
Mathematics.....	W. H. Bussey.....	100F
Music.....	T. P. Giddings.....	103Ed
Physical Education for Women.....	J. Anna Norris.....	WGm
Physics.....	H. A. Erikson.....	20P11
Romance Languages.....	E. W. Olmsted.....	200F
Sociology.....	R. L. Finney.....	208Ed
General Science.....	S. R. Powers.....	

PRIZES

Two prizes are offered annually to students in the College of Education.

I. The Elizabeth Carse Scholarship of \$50. All students in the College of Education who have completed at least nine hours in education, with an average of at least two honor points in all college subjects are eligible for this scholarship. The basis for awarding the scholarship is as follows:

- (1) Scholarship.
- (2) Effectiveness as reported by instructors concerning
 - (a) initiative in discussion
 - (b) skill and ability in presenting ideas
 - (c) coöperative and institutional spirit.
- (3) Participation in social activities.
- (4) Demonstration of ability to organize subject-matter, and actually present it before a class. Successful teaching experience, or practice teaching, may be considered a fulfillment of this requirement.

II. The Pi Lambda Theta Prize of \$50 offered annually by Epsilon Chapter of Pi Lambda Theta, the women's honorary professional fraternity. The prize is awarded to a student in the College of Education under the following conditions:

- (1) It shall be open to any student registered in the College of Education.
- (2) The basis for decision shall be scholarship and a written paper, each of which shall be of equal value. The paper may be presented by the student himself or by some member of the faculty, and may be a written term paper, a magazine contribution, or an essay written expressly for this purpose. It shall be judged on the ability shown by the student in the consideration of the topic, on its originality, its style, and on the value of the contribution from a professional standpoint.
- (3) The papers shall be judged by a committee consisting of the dean of the College of Education, two members of the faculty and two members from the sorority, one representing the active membership and one the alumnae.

Names of candidates for the prize must be filed with the dean of the College of Education on or before March 8, and copies of papers which they propose to submit must be filed on or before April 8.

PHYSICAL EDUCATION FOR WOMEN

This department aims primarily to promote the health 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 in college; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes physical work to meet the varying needs and physical tastes of students; coöperates closely with the Woman's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this department is required of all newly entering students (see Courses 1-2-3 and 4), of all sophomores, who are permitted as free a choice among the sophomore courses as their physical condition permits.

(see "sophomore" courses; students who can not swim must register for Course 22-23 during sophomore year), and of all students permitted, for reasons connected with their physical condition, to carry less than the minimum number of credit hours. Physical examinations or consultations are required annually of all students.

Elective classes are arranged in gymnastics, dancing, swimming, field-hockey, basket-ball, baseball, and other organized games.

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 cooperation of others.

Six credits is the maximum number that can be gained by taking courses in exercise (Courses 34-35-36, 37-38-39, 40-41-42, 43-44-45).

COURSES

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.

PHYSICAL EDUCATION FOR MEN

The purpose of the department is to provide all men of the University opportunity for exercise in order to maintain and build up their general health. It also provides special training for the correction of physical defects and functional derangements.

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. Students taking the required work in physical education are examined at the close of the year. A study of these records shows a marked improvement in the standard of health of the average student during his college course.

The gymnasium, swimming-pool, and baths are open to all students of the University, who are free to use the apparatus and to pursue a course in physical training under the supervision of the director and his assistants.

Those students, taking the required course in physical education, who can not 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.

CERTIFICATES

Required in Minnesota

Every teacher in the Minnesota public schools must have a valid certificate before he can be lawfully employed. Two classes of certificates are of interest to university students:

1. A first-grade professional certificate renders its holder eligible for the following positions: (1) superintendent of schools (if candidate has

had previously two years' experience in supervising grades); (2) principal of a graded or high school; (3) instructor in any high-school subject, except those subjects which demand special certificates.

2. A special certificate authorizes the holder to teach the special subjects indicated on the certificate.

LEGAL STATUS OF THE UNIVERSITY TEACHER'S CERTIFICATE

1. Two-year certificate. The University teacher's certificate is valid for two years as a first-grade professional certificate. Holders are eligible for all positions open to holders of the first-grade professional certificate named above. The courses leading to this certificate are described on page 14.

2. Life certificate. After two years of successful teaching experience, the University teacher's certificate may become a life certificate, upon endorsement by the State Department of Education and the president of the University. This two years' experience must be gained within Minnesota. Graduates who teach in another state may, upon returning to Minnesota, apply to the State Department of Education for an extension of their University teacher's certificate for two years at the completion of which application may be made for a permanent life certificate. The fee for this extension is \$1. Holders of the University teacher's certificate who wish to have their certificate made a permanent life certificate should apply directly to the State Department of Education, St. Paul, for a permanent endorsement of the certificate. The fee for this endorsement is \$5.

SPECIALIZED CURRICULA

Specialized curricula are offered in the following subjects and detailed announcements will be found in this bulletin on the pages indicated below:

	Pages
Americanization	50
Art Education	51
Commercial Training (Sec Department of Economics).....	72
Agricultural Education	52
Home Economics Education	54
High-School Teacher Training	53
Physical Education	57
Public-School Music	63
Teachers of Subnormal Children	63

GRADUATE WORK IN EDUCATION

Graduate study.—Graduate work in education leading to the degree of Master of Arts or Doctor of Philosophy may be pursued in the Graduate School. Students who desire to undertake graduate work with education as a major must have had at least 6 credits in psychology, and, in addition to this, a total of not less than 12 credits in education. Students who desire to undertake graduate work with education as a minor must have at least 6 credits in psychology, and, in addition to this, a total of not less than 6 credits in education. Graduates holding a Bachelor's degree who have less than 12 credits in undergraduate courses in education will be obliged

to increase the number of credits required for a major or a minor in education by the difference between 12 and the number of undergraduate credits in education which they present. Such students will not, however, be barred from counting all the time spent at the University toward satisfying the residence requirements of graduate work, provided the work which they pursue is approved by the dean of the Graduate School.

Graduate work may be pursued during summer sessions. The Master's degree may ordinarily be completed in four summer sessions. For full statement of regulations, consult the Graduate School bulletin.

Students regularly enrolled for graduate work with education as a major will, upon the completion of the requirements for an advanced degree, be recommended for a University teacher's certificate.

Graduate Students

All courses bearing numbers of 100 and above are open to graduate students. Before attempting to make out their programs, graduate students in education should consult the dean of the College of Education and the dean of the Graduate School.

Graduate students who are candidates for advanced degrees are advised to take Course 126-127 and Course 208 unless they have previously had the equivalent of these courses. Courses bearing numbers 200 and above are open to graduate students only.

All graduate students majoring in education are required to meet with the department staff every alternate Monday evening from 7:15 to 9:00 for conference regarding subjects of original investigations. This work carries no credit.

Candidates for State Professional Certificates

Unclassed students, candidates for the state professional certificate, may pursue courses in residence or by correspondence or in extension classes.

SPECIAL OPPORTUNITIES FOR TEACHERS IN SERVICE

Afternoon and Saturday morning classes, correspondence lessons, extension classes, and the summer session are the chief channels through which the College of Education seeks to discharge its obligations to teachers in service.

Teacher-Training through Extension Courses

The General Extension Division offers excellent opportunities for teachers and others to pursue courses carrying credit for the Bachelor of Arts degree or for the professional state teacher's certificate, either by correspondence lessons or by joining an extension class. For further information address the General Extension Division, University of Minnesota.

Summer Session

The summer session conducted by the University offers unusual opportunities for professional training to undergraduates, graduates, superintendents and principals, teachers in service, and candidates for first-grade and second-grade state professional certificates. The summer session of 1922 will begin Monday, June 19.

Agreements between Normal Schools and the College of Education

1. That less than one year of residence at a state normal school for the purpose of preparing for kindergarten or elementary school work would not be adequate.

2. That normal schools would be willing to confer their regular diploma upon university students coming to them from the College of Education, who had had three years of college work, upon the satisfactory completion of one year in the normal schools.

3. That these provisions be limited to students previously registered in the College of Education.

4. That they should not apply to students who had entered the College of Education upon the basis of normal-school credits.

RECOMMENDATION FOR APPOINTMENT

Graduates of the College of Education qualifying for the University teacher's certificate will be recommended for teaching and other educational positions for which they are qualified. Students should register for such recommendation during the first quarter of the senior year. No fee is charged for such registration or for any service in connection with recommendation. Complete instructions and registration blanks may be secured at the office of the dean of the College of Education.

EMPLOYMENT BUREAUS

State Teachers' Employment Bureau.—The State Teachers' Employment Bureau, located in the State Historical Building, St. Paul, under the direction of Mr. E. T. Critchett, offers its services to all teachers and prospective teachers. The fee for registration is \$3.

Neither the University of Minnesota nor the State Teachers' Employment Bureau exacts any commission.

DEPARTMENTAL ANNOUNCEMENTS

Students graduating from the College of Education will be held for the departmental requirements as listed in this bulletin and will be recommended for degrees and certificates upon the basis of the announcements in this bulletin.

DEPARTMENTAL STATEMENTS

DEPARTMENT OF ART EDUCATION

Assistant Professor RUTH RAYMOND, Chairman; Instructors HAZEL S. MARTIN, GERTRUDE DUNCAN ROSS.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
<i>Design</i>				
29f-30w-31s	9	Fundamental Principles of Design.....	All	None
40f-41w-42s	9	Principles of Harmony in Form and Color...	Soph., jr., sr.	29, 30
53f-54w	6	Design for the Consumer	Jr., sr.	29, 30, 31, 40, 41
60w-61s	6	Commercial and Industrial Design.....	Jr., sr.	29, 30, 31, 40, 41, 42
<i>Drawing</i>				
32Af-33Aw-34As	3	Still-Life Drawing.....	All	None
32Asu or 33Asu or 34Asu	1	Arranged		
32Bf-33Bw-34Bs	3	Composition	All	None
32Cf-33Cw-34Cs	3	Sketch	All	None
32Csu or 33Csu or 34Csu	1	Arranged		
43Af-44Aw-45As	3	Water Color.....	Soph., jr., sr.	32, 33, 34
43Asu or 44Asu or 45Asu	1	Arranged		
43Bf-44Bw-45Bs	3	Charcoal, Pencil, Pen Technics	Soph., jr., sr.	32, 33, 34
43Cf-44Cw-45Cs	3	Sketch Course II.....	Soph., jr., sr.	31, 32, 34
43Csu or 44Csu or 45Csu	1	Arranged		
43Ad-44Ad-45Ad		Advanced Drawing (Ar)	Jr., sr.	
D.D.G.41,42,43f w,s	6	Mechanical Drawing....	All	None
D.D.G.44f,45w,46s	6	Technical Drawing, Drafting and Tracing.		
<i>Handicrafts</i>				
35i su	1	Clay-Modeling	All	None
37f	2	Elementary Weaving, Basketry, and Allied Crafts	All	None
38f,s,su	2	Elementary Pottery.....	All	None
46w su	2	Advanced Pottery.....	All	38

COLLEGE OF EDUCATION

36Aw,su	1	Cardboard and Paper Construction	All	None
36Bw,su	2	Book-Binding	All	None
50w	2	Application of Design in Needlecraft	Soph., jr., sr.	29, 30, 31
52s	2	Application of Design to Fabrics	All	29, 30
47s	2	Metal Work		
Man.Tr.11w	2	Wood Work for Primary Grades	Soph., jr., sr.	None
Man.Tr.12w	3	Wood Work for Elem. Grades	Soph., jr., sr.	None
H.Ec.57w	3	Weaving on Table Looms	Soph., jr., sr.	6 cred. in design
<i>Art History and Appreciation</i>				
Home Econ.				
52f,w,s	3	Art History and Appreciation		3 credits in design
		Arranged with the History and Greek departments and with the Art Institute and the Walker Gallery		

Teacher Training

56Af,s	3	Types of Art Instruction	Jr., sr.	12 credits in design, 12 credits in drawing, 6 credits in handicraft
56Bw,Cs	4	Types of Art Instruction	Jr., sr.	12 credits in design, 12 credits in drawing, 6 credits in handicraft
56s	3	Teachers' Course in Art	Jr., sr.	12 credits in design, 12 credits in drawing, 6 credits in handicraft
57f,58w,59s	6	Practice Teaching	Sr.	

NOTE: Handicraft courses are especially recommended to those desiring training for occupational therapy or other forms of social service.

Courses for Public-School Teachers

NOTE: Courses equivalent to parts of those listed above in design, drawing, and the handicrafts will be offered if there is sufficient demand. on Saturday mornings. Those interested should consult with the Art Education faculty.

CONTENT OF COURSES IN ART EDUCATION

29. FUNDAMENTAL PRINCIPLES OF DESIGN. Elementary problems involving *space-breaking* with parallel lines; subdivision of rectangular spaces; elements of lettering; emphasis on *value relations* in bounded spaces and surfaces; applications to problems developed in the handicraft courses. MISS RAYMOND.
30. FUNDAMENTAL PRINCIPLES OF DESIGN. The decorative use of nature material. Inspiration from nature, *not* imitation of nature forms; imagination stimulated by poetry and music; brush lettering. Emphasis on value relations limited use of color. MISS RAYMOND.

31. FUNDAMENTAL PRINCIPLES OF DESIGN. Decorative use of nature material continued in application to fabric problems. Application of design principles to problems of the *home*. Theory lying behind house decoration as subject-matter for public-school art teaching in the grades. MISS RAYMOND.
- 40, 41, 42. PRINCIPLES OF HARMONY IN FORM AND COLOR. Color theories of Munsell, Wilson, Sargent, Ross discussed and exemplified, with analysis of color harmonies and original work therein. Application of color harmony in original designs throughout the year, with reference to execution in handicraft and by commercial processes. MISS RAYMOND.
- 53, 54. DESIGN FOR THE CONSUMER. 53W. PROBLEMS OF HOUSE-PLANNING, DECORATION, AND FURNISHING; 54S. PROBLEMS OF COSTUME SELECTING AND DESIGNING. Subject-matter appropriate for art teaching in high schools, with emphasis on the governing principles. Prerequisites: three credits in design. MISS RAYMOND.
- 60, 61. COMMERCIAL AND INDUSTRIAL DESIGN. 60. ADVERTISING DESIGN AND LETTERING; 61. DESIGN FOR INDUSTRY. Subject-matter appropriate for high-school art teaching with emphasis on governing principles. Prerequisites: eighteen credits in design.
- 32-33-34. FREEHAND DRAWING AND COMPOSITION. Three one-credit units each term.
- 32A-33A-34A. STILL LIFE. Drawing from objects in charcoal and pencil. Emphasis on value relations, form, and perspective. MRS. MARTIN.
- 32B-33B-34B. COMPOSITION. Drawing from imagination. Stimulation by poetry and music. The medium: charcoal. MRS. MARTIN, MISS ROSS.
- 32C-33C-34C. SKETCH-DRAWING from the posed figure in charcoal and pencil. Action and memory drawings. Emphasis on action, form, and value relation. MRS. MARTIN, MISS ROSS.
- 43-44-45. FREEHAND DRAWING COURSE II. Three one-unit courses each term.
- 43A-44A-45A. WATER-COLOR DRAWINGS from objects. Emphasis on form, color, and technical handling. MISS RAYMOND.
- 43B-44B-45B. CHARCOAL, PENCIL, AND PEN TECHNICS. Drawings from objects in these mediums. MRS. MARTIN.
- 43C-44C-45C. SKETCH FROM POSE.
- 32C-33C-34C. CONTINUED. MRS. MARTIN, MISS ROSS.
35. CLAY-MODELING. Representation of familiar objects, and illustrative modeling. MRS. MARTIN.
37. ELEMENTARY WEAVING, BASKETRY, AND ALLIED CRAFTS with reference to use in the grades and in occupational therapy. MISS ROSS.

- 36A. CARDBOARD AND PAPER CONSTRUCTION. Subject-matter for public-school work. MRS. MARTIN.
- 36B. BOOKBINDING. Sequence of problems from simplest construction to the book-sewed on cords or tapes. MRS. MARTIN, MISS ROSS.
38. ELEMENTARY POTTERY. Hand building. MISS ROSS.
46. ADVANCED POTTERY. Work on wheels, casting, firing, and glazing. MISS ROSS.
50. APPLICATION OF DESIGN IN NEEDLECRAFT. Problems appropriate for public-school work. Peasant stitches. MISS ROSS.
52. APPLICATION OF DESIGN TO FABRICS by means of block printing, stenciling, batik, and other dyeing processes. MISS ROSS.
47. METAL WORK. Fundamental processes of shaping, saw piercing, etching, riveting, and soldering. MRS. MARTIN, MISS ROSS.
56. TEACHERS' COURSE. Survey of art-teaching practices. Study of governing principles. History and philosophy of art-teaching. Making of outlines for public-school application. MISS RAYMOND.
- 56A, B, C. TYPES OF ART INSTRUCTION. Specific problems of art-teaching in relation to practice teaching in Minneapolis public schools. Includes attendance upon art-supervisor's meetings. MISS ROSS.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

Professors MERVIN G. NEALE, Chairman; LEONARD V. KOOS, FLETCHER H. SWIFT; Special Lecturer SAMUEL R. POWERS; Instructor LYNNE E. STOCKWELL.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
Man.Tr.135	3	Organ. and Superv. of Manual Training.....	Jr., sr.	Man. Tr. 11 or 12
65w	3	The High School.....	Jr., sr.	6 cr. in psychol.
113f	3	High-School Curriculum.	Sr., grad.	Ed. 1, 3
113w-114s	4	High-School Curriculum.	Sr., grad.	Ed. 1, 3
119w	3	Elementary-School Curriculum	Sr., grad.	Ed. 1, 3
119Tf	2	Elementary-School Curriculum	Sr., grad., teachers	Ed. 1, 3
121f	3	Organ. and Superv. of the Elementary School	Sr., grad.	Ed. 1, 3
121Tw- 122Ts	4	Organ. and Superv. of the Elementary School	Sr., grad., teachers	Ed. 1, 3
124f-125w- 126s	9	Educational Administration	Sr., grad.	

DEPARTMENTAL STATEMENTS

160f-161w- 162s	6	Theory of Supervision..	Sr., grad.	Ed. 11 or equiv.
161s	3	Problems of High-School Administration	Sr., grad.	Ed. 1, 3
167f-168w	4	Junior High School....	Sr., grad.	Ed. 1, 3
174w	2	Public-School Finance...	Sr., grad.	Consult instructor
175s	3	City-School Finance....	Sr., grad.	
178f-179w	6	School Surveys.....	Sr., grad.	
180f	2	Junior College.....	Sr., grad.	Ed. 1, 3, and 113 or 164
205f-206w- 207s	6	Seminar in Educ. Admin.	Grad.	Ed. 124-125-126, Ed. 160- 161-162
208f	2	Methods of Educational Research	Grad.	
215f-216w- 217s	6	Seminar in Education in the United States....	Grad.	Ed. 1 or 101-102-103 and 3
218f-219w- 220s	6	Seminar in Secondary- School Problems.....	Grad.	

13s. ORGANIZATION AND SUPERVISION OF MANUAL TRAINING. History of manual training, aims and values, selection and installation of equipment, supplies. Courses of study for grade and high-school manual training and methods of presenting manual training to grade and high-school pupils. MR. STOCKWELL.

65s. THE HIGH SCHOOL. For high-school teachers in training. Recent growth in secondary education; types of reorganization; types of programs of study; types of high schools; the teacher's instructional and non-instructional burden; the plant; costs; state and voluntary standardization. MR. KOOS.

113f. HIGH-SCHOOL CURRICULUM. A study of types of programs of study, curricula, subjects of study, constants, variables, electives, distribution of subject-matter by years and units. MR. POWERS.

119w. ELEMENTARY-SCHOOL CURRICULUM. A study of the principles underlying the organization of subject-matter for courses in the elementary school, including a critical examination of curricula, syllabi, and school texts in the light of their function in the teaching and administration of the curriculum. MR. NEALE.

119Tf. ELEMENTARY-SCHOOL CURRICULUM. (Same as above for teachers.)

121f. ORGANIZATION AND SUPERVISION OF THE ELEMENTARY SCHOOL. A course dealing with important problems of organization, management, and supervision of elementary education, including such topics as systems of class organization, promotion schemes, programs, marking systems, records, attendance. MR. NEALE.

121Tw-122Ts. ORGANIZATION AND SUPERVISION OF THE ELEMENTARY SCHOOL. (Same as above for teachers.)

- 124f-125w-126s. EDUCATIONAL ADMINISTRATION. The present status and tendencies in the organization and administration of state and city school systems with interpretations. MR. NEALE.
- 160f-161w-162s. THEORY OF SUPERVISION. Factors conditioning quality of teaching and relation of supervision thereto; purpose and function of supervision; factors conditioning quality of supervision; status of supervision and improvement thereof; technic of supervision; testing efficiency of supervision. MR. NEALE.
- 164s. PROBLEMS OF HIGH-SCHOOL ADMINISTRATION. A study of elimination from school, secondary vocational education, the marking system, classification of students, high-school library, social organization and extra curricular activities, community relationships, teaching schedule, buildings, costs. MR. POWERS.
- 167f-168w. JUNIOR HIGH SCHOOL. A study of the special purposes of this institution and the appropriate reorganizations to achieve them; the history of the movement. MR. POWERS.
- 174w. PUBLIC-SCHOOL FINANCE. A critical study of problems of federal and state aid to public schools; sources, methods, principles, needed reforms. Students are strongly advised to take as preparatory or in conjunction with this course Economics 191f-192w, Public Finance, and Education 126f-127w, Methods of Educational Research. MR. SWIFT.
- 175s. CITY-SCHOOL FINANCE. A study of the sources of city-school funds and their expenditure; analysis of unit costs on various bases; comparative cost-accounting systems, budgets, records, and reports.
- 178f-179w. SCHOOL SURVEYS. A study of the literature and methods of school surveys, as a basis for the investigation of practical problems in school administration and supervision.
- 180f. THE JUNIOR COLLEGE. A study of this institution as an upward extension of the secondary school. Problems considered are the forces giving rise to the movement, special purposes, sources of student body, financial responsibilities involved, curriculum, faculty, relationships to schools below and above. MR. KOOS.
- 205f-206w-207s. SEMINAR IN EDUCATIONAL ADMINISTRATION. MR. NEALE.
- 208f. METHODS OF EDUCATIONAL RESEARCH. A study of the methods employed in treatment and presentation of educational problems. Designed to aid students in the preparation of theses. Suggested for all candidates for degrees. MR. SWIFT.
- 215f-216w-217s. SEMINAR IN PUBLIC EDUCATION IN THE UNITED STATES. Research course devoted to intensive study of certain factors determining the problem of public education in the United States. The following

may be considered typical problems: school support, school supervision, administrative units. MR. SWIFT.

218f-219w-220s. SEMINAR IN SECONDARY-SCHOOL PROBLEMS. MR. KOOS.

EDUCATIONAL PSYCHOLOGY

Professors MELVIN E. HAGGERTY, Chairman; WILFORD S. MILLER; Assistant Professors HERMIONE L. DEALEY, MARVIN J. VAN WAGENEN; Professorial Lecturer FREDERICK KUHLMANN; Assistants GRATIA M. KELLEY, SIGURD B. SEVERSON.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
55f,w,s	3	Elementary Educational Psychology	Jr., sr.	6 cr. in psychol.
106f-107w-108s	9	Adv. Educational Psychology	Jr., sr., grad.	55 or equiv.
111s	3	Educational Diagnosis...	Jr., sr., grad.	55 or equiv.
111Tf-112Ts	4	Educational Diagnosis (For teachers).....	Jr., sr., grad.	55 or equiv.
126f-127w	4	Methods in Educational Research	Jr., sr., grad.	
128s	2	Review of Statistical Studies	Jr., sr., grad.	126-127
134f-135w-136s	6	Mental Tests and Mental Diagnosis	Jr., sr., grad.	55 or equiv.
134f-135w-136s	3	Mental Tests and Mental Diagnosis (For teachers of subnormal children)	Jr., sr., grad.	55 or equiv.
138w-139s	4	Experimental Education.	Jr., sr., grad.	55 or equiv.
149f-150w-151s	3 to 9	Psycho-Educational Clinic	Jr., sr., grad.	Ed. 134-135-136 or equiv.
149f-150w-151s	3	Psycho-Educational Clinic (For teachers of subnormal children).....	Jr., sr., grad.	Ed. 134-135-136 or equiv.
153f-154w-155s	Ar	Research Problems.....	Sr., grad	Advanced courses necessary to pursue problems. Consult instructor
156s	2	Psychology of Vocational Education	Jr., sr., grad.	55 or equiv.
184f-185w-186s	6	Mental Deficiency.....	Jr., sr., grad.	55 or equiv.
197f	2	Seminar: Problems of Subnormality	Jr., sr., grad.	
201f-202w-203s	6	Seminar in Educational Psychology	Sr., grad.	

- 55f,w,s. **ELEMENTARY EDUCATIONAL PSYCHOLOGY.** A survey of fundamental facts of human behavior involved in educational activities open to juniors and seniors. MR. MILLER, MISS DEALEY.
- 106f-107w-108s. **ADVANCED EDUCATIONAL PSYCHOLOGY.** Advanced work in genetic psychology, origin and nature of human organism, development and control of instincts. Methods of measuring rate of learning; study of typical learning experiments. Study of group and individual differences, and their relations to educational practice. MR. VAN WAGENEN.
- 111s. **EDUCATIONAL DIAGNOSIS.** The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure based on the results of the test. MR. VAN WAGENEN.
- 111Tf-112Tw. **EDUCATIONAL DIAGNOSIS.** Same as above for teachers. MR. VAN WAGENEN.
- 126f-127w. **METHODS OF EDUCATIONAL RESEARCH.** A study of statistical and other methods as applied to educational investigation. This course is ordinarily required of all candidates for advanced degrees. MR. VAN WAGENEN.
- 128s. **REVIEW OF STATISTICAL STUDIES.** A survey of statistical studies in education with special reference to the methods employed and the reliability of the results obtained. MR. VAN WAGENEN.
- 134f-135w-136s. **MENTAL TESTS AND MENTAL DIAGNOSIS.** Study of mental variation in children, its nature, degrees, causes, and effects. A laboratory course in the study of individual differences by means of mental tests. Methods of treating superior and subnormal children in schools. MR. MILLER.
- 134f-135w-136s. **MENTAL TESTS AND MENTAL DIAGNOSIS.** A three-credit course for teachers of subnormal children. Demonstration and practice in mental diagnosis. A careful study will be made of different groups and systems of mental tests, and other clinical methods with discussion of general theory involved. MR. KUHLMANN.
- 138w-139s. **EXPERIMENTAL EDUCATION.** A laboratory course designed to train students in the use of experimental methods in the study of educational problems, particularly in the field of the psychology of learning. MR. MILLER, MR. VAN WAGENEN.
- 140f-150w-151s. **PSYCHO-EDUCATIONAL CLINIC.** Conducted in coöperation with the Department of Sociology and the Medical School clinics in pediatrics and nervous and mental diseases. Students will receive systematic instruction in giving psychological examinations and in scientific interpretation of data. MISS DEALEY.

- 149f-150w-151s. **PSYCHO-EDUCATIONAL CLINIC.** For teachers of subnormal children. Conducted in coöperation with the public schools. Examinations will be made in the schools by both the group and individual methods, and results studied in relation to medical and school data. MR. KUHLMANN.
- 153f-154w-155s. **RESEARCH PROBLEMS.** Intended for properly prepared students who desire to pursue special investigation in the field of educational psychology. MR. HAGGERTY, MR. VAN WAGENEN.
- 156s. **PSYCHOLOGY OF VOCATIONAL EDUCATION.** A practical course covering psychological facts and principles involved in vocational education, and in industrial and commercial administration. Attention is given to matters of personnel, acquisition of skill, motivation of workers, and efficiency of administration. MISS DEALEY.
- 184f-185w-186s. **MENTAL DEFICIENCY.** Survey of mental deficiency in children and adults. Physical traits, including study of brain defects, causes and heredity; psychology of mental deficiency; social problems of feeble-mindedness. Subjects treated with reference to the training of defectiveness. MR. KUHLMANN.
- 197f. **SEMINAR: PROBLEMS OF SUBNORMALITY.** Phases of subnormality studied intensively. Review of important literature and original investigation. Students required to make reports on assigned topics and submit a paper on some problem at the close of the quarter. MR. KUHLMANN.
- 201f-202w-203s. **SEMINAR IN EDUCATIONAL PSYCHOLOGY.** A research course for graduate students. Required of all students writing theses in educational psychology. MR. HAGGERTY.

HISTORY AND PHILOSOPHY OF EDUCATION

Professors FLETCHER H. SWIFT, Chairman; DAVID F. SWENSON; Assistant Professor ROSS L. FINNEY; Instructor JEAN H. ALEXANDER; Scholars

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1f,w,s	5	Brief Course in History of Education.....	Jr., sr.	6 cr. in psych.
3f,w,s	2	Educational Sociology...	Jr., sr.	6 cr. in psych.
48w,s	3	Public Education in the United States.....	Jr., sr.	6 cr. in psych.
101f	3	Found. of Modern Educ.	Jr., sr., grad.	6 cr. in psych. and 6 cr. in hist.
102w	3	Hist. of Modern Secondary and Higher Education	Jr., sr., grad.	6 cr. in psych. and 6 cr. in hist.

103s	3	Hist. of Mod. Elementary Education	Jr., sr., grad.	6 cr. in psych. and 6 cr. in hist.
114w	3	Philosophy of Education	Sr., grad.	10 cr. in educ. or philos.
129w-130s	6	Educational Classics.....	Jr., sr., grad.	1 or 101-102-103
131w-132s	6	Comparative School Systems	Jr., sr., grad.	1 or 101-102-103
148ff	2	Advanced Course in Public Education in the United States.....	Jr., sr., grad.	10 cr. in educ. or psychology or both including 6 cr. in hist.
211f-212w-213s	6	Seminar in History of Education	Grad.	101, 102, 103 or their equiv. and 6 cr. in history
215f-216w-217s	6	Seminar in Educational Sociology	Grad.	Ed. 1 or 101, 102, 103 and 3

1f,w,s. BRIEF COURSE IN HISTORY OF EDUCATION. Current school problems and educational theories in the light of their history. Emphasis upon secondary education and those aspects of education of most immediate concern to high-school teachers. MISS ALEXANDER.

3f,w,s. EDUCATIONAL SOCIOLOGY. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. MR. FINNEY.

48w. PUBLIC EDUCATION IN THE UNITED STATES. A brief survey of the factors determining the problem of public education in America, followed by a brief account of the development and organization of typical state school systems. MR. SWIFT.

48s. PUBLIC EDUCATION IN THE UNITED STATES. (Same as above.) Offered at the University Farm. MISS ALEXANDER.

101f. FOUNDATIONS OF MODERN EDUCATION. Historical analysis and interpretation of the more important elements in modern education derived from the Hebrews, Greeks, Romans, Middle Ages, and Renaissance. MR. SWIFT.

102w. HISTORY OF MODERN SECONDARY AND HIGHER EDUCATION. A survey of existing types of American and European secondary and higher schools, followed by a historical study of their origin, aims, growth. MR. SWIFT.

103s. HISTORY OF MODERN ELEMENTARY EDUCATION. The institutions, theories, and problems of modern elementary education in the light of their history. Emphasis upon the rise of state systems and upon the history of modern educational reform. MR. SWIFT.

- 114w. PHILOSOPHY OF EDUCATION. A discussion of philosophically formulated ideals of education with an attempt to reach a positive philosophy of educational values. MR. SWENSON.
- 129w-130s. EDUCATIONAL CLASSICS. An intensive study of selected writings of educational leaders; first quarter, Plato, Aristotle, Quintilian, Comenius, Locke; second quarter, Rousseau, Pestalozzi, Herbart, Froebel, and Dewey. Students may register for either quarter. MR. SWIFT, MISS ALEXANDER.
- 131w-132s. COMPARATIVE SCHOOL SYSTEMS. A survey of the existing school systems of France, England, Germany, Denmark. Emphasis upon present problems. Special reference to educational conditions in the United States. Students may register for either quarter. MISS ALEXANDER.
- 148Tf. ADVANCED COURSE IN PUBLIC EDUCATION IN THE UNITED STATES. Evolution of American ideals, institutions, and practices in elementary and secondary education. Emphasis upon movements of the early nineteenth century. Development of state school systems and the rise of the high school. MR. SWIFT.
- 211f-212w-213s. SEMINAR IN HISTORY OF EDUCATION. Historical investigation of educational problems. Designed to train students in methods of historical investigations; problems to be selected somewhat upon the basis of students' interest. MR. SWIFT.
- 215f-216w-217s. SEMINAR IN EDUCATIONAL SOCIOLOGY. A study of the social mind, the social organization, social groups, and the pressures and sanctions responsible for modification within the curriculum, methods of instruction, and forms of organization of the public school. MR. FINNEY.

THEORY AND PRACTICE OF TEACHING

Professors WILFORD S. MILLER, Chairman; GISLE C. BOTHNE, CHARLES P. SIGERFOOS, ANDREW A. STOMBERG; Associate Professor AUGUST C. KREY; Assistant Professors GERTRUDE SCHILL CRAM, ISAAC W. GEIGER, GEORGINA LOMMEN, ALICE J. TOLG; Professorial Lecturer RUBY BAUGHMAN; Instructors JOSEPHINE DE BOER, MARIE B. DENNEEN, SOPHIA HUBMAN, REWEY BELLE INGLIS, ARTHUR M. JOHNSON, MAY S. KISSOCK, ABE PEPINSKY, WILLIAM D. REEVE, LYNNE E. STOCKWELL, LOUIS A. TOHILL; Special Instructor THADDEUS P. GIDDINGS; Special Lecturer SAMUEL R. POWERS.

COLLEGE OF EDUCATION

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
11f,w,s	3	Technic of Teaching....	Jr., sr.	Ed. 55
15f,w,s	5	Practice Teaching.....	Sr., grad.	See statement
<i>Special Methods</i>				
128f	3	Technic of Teaching Adults	Jr., sr.	3 courses in American- ization
129w	3	Methods of Americaniza- tion	Jr., sr., grad.	128
131f-132w- 133s	9	Supervised Americaniza- tion Work.....	Jr., sr., grad.	128
165s	3	Nature Study.....	Jr., sr.	An. Biol. 1-2
61f,s	5	Teachers' Course in Botany	Jr., sr.	18 credits in botany
19s	3	Teachers' Course in Chemistry	Jr., sr.	Gen. chem. and qual. analysis
16w	3	Technic of Teaching Sub- normal Children.....	Jr., sr.	.....
17s	2	Practice Teaching of Subnormal Children...	Jr., sr.	.....
48	3	Methods of Problems of Secondary-School Science	Jr., sr.	Consult instructor
80f,w	4	Teachers' Course in English	Jr., sr.	See statement
55f	3	Teachers' Course in Geography	Jr., sr.	Geog. 114
71f,s	3	Teachers' Course in German	Jr., sr.	52 and 55
56	3	Teachers' Course in History	Sr.	See statement
81f,s	3	Teachers' Course in Latin	Jr., sr.	Any two of Courses 21- 33 or equiv.
Manual Training				
11w	2	Teachers' Course in Wood Work for the Primary Grades.....	Jr., sr.	None
12f	3	Teachers' Course in Wood Work for the Elementary Grades....	Jr., sr.	None
54f,s	5	Teachers' Course in Mathematics	Jr., sr.	Math. 50
75f-76w-77s	9	Public-School Music....	Jr., sr.	
78f-79w-80s	5	Adv. Public-School Music	Sr.	75-76-77
90s	3	Teachers' Course in Physics	Jr., sr.	See statement
Phys. Educ. for Women				
77f	3	Anatomy and Kinesiology	Sr.	An. Biol. 1-2

Political Science					
56s	1	Teachers' Course in Pol. Science	Jr., sr.	10 credits	
Romance Languages					
91f	3	Teachers' Course in French	Jr., sr.	13-14-15 and 1 conv. comp. course, 1 literary course	
92w	3	Teachers' Course in Spanish	Jr., sr.	35-36 and 1 conv. comp course, 1 literary course in Span.	
115w	3	Teachers' Course in Swedish	St., grad.	Scand. 10-11-12 or 4-5	
116s	3	Teachers' Course in Norwegian	St., grad.	Scand. 4-5 or 10-11-12	
152f	2	Elem. Methods in Reading	Jr., sr., grad.	1 or 101-102-103	
153f	2	Elem. Methods in English	Jr., sr., grad.	1 or 104-102-103	
154w	2	Elem. Methods in Hist.	Jr., sr., grad.	1 or 101-102-103	
155w	2	Elem. Methods in Geog.	Jr., sr., grad.	1 or 101-102-103	
156s	2	Elem. Methods in Arith.	Jr., sr., grad.	1 or 101-102-103	
157s	2	Elem. Methods in Indus. Arts	Jr., sr., grad.	1 or 101-102-103	
158s	2	Observation and Practice in Normal Training Depts.	St., grad.	152-157	

11f,w,s. **TECHNIC OF TEACHING.** Types of classroom exercises; preparation of teaching plans; hygiene of instruction; methods of treating individual differences; classroom management; the professional ethics of teaching; supervised study; marking systems; etc.; observation of high-school work.

15f,w,s: **PRACTICE TEACHING.** Teaching under supervision in the University High School and in the Minneapolis city schools, in the regular secondary-school subjects. The course calls for one period daily at the school where the work is assigned. MR. REEVE.

128. **TECHNIC OF TEACHING ADULTS.** Methods of teaching adults—the foreign-speaking, the illiterate, the fatigued—in keeping with the dignity of mature years, and the mental processes of mature minds of foreigners. MISS BAUGHMAN.

129. **METHODS OF AMERICANIZATION.** Practical methods of Americanization in use in the United States, together with facts and conditions of their success and failure. MR. JENKS, MISS BAUGHMAN.

131-132-133. **SUPERVISED AMERICANIZATION WORK.** Practical field work among foreign peoples in our vicinity. MISS BAUGHMAN.

175s. **TEACHERS' COURSE IN ANIMAL BIOLOGY. NATURE STUDY.** MR. SIGERFOOS.

- 61f.s. **TEACHERS' COURSE IN BOTANY.** A course dealing with the principles and methods of teaching botany in high schools. MR. JOHNSON.
- 19s. **TEACHERS' COURSE IN CHEMISTRY.** A consideration of the fundamental principles of chemistry with particular reference to the teaching of chemistry in the high school. Discussion of such topics as training of the teacher, laboratory equipment, etc. MR. GEIGER.
48. **METHODS AND PROBLEMS IN SECONDARY-SCHOOL SCIENCE.** Organization and methods secondary-school sciences. Attention to general science, lesson-planning, methods of presentation, assignments, measuring achievement. Open to students preparing to teach natural science. Required for practice teaching in science.
- 16w. **TECHNIC OF TEACHING SUBNORMAL CHILDREN.** A course for those preparing to become teachers in this field.
71. **TEACHERS' COURSE IN GERMAN.** Discussion of aims and methods of teaching German in secondary schools; reading and reports; arrangement of courses of study and discussion of texts based upon aims; visiting classes. The use of language tests. MISS HUBMAN.
56. **TEACHERS' COURSE IN HISTORY.** Open only to students who have 18 credits in history, including one intensive course. Deals chiefly with the practical problems of teaching history and government in the secondary schools. Students planning to teach government must have 9 credits in political science. MR. KREY.
- 81f.w. **TEACHERS' COURSE IN LATIN.** Class drill and discussion of various problems connected with secondary-school work in Latin. MISS DENNEEN.
- 11w. **TEACHERS' COURSE IN WOOD WORK FOR PRIMARY GRADES.** Course divided into three parts. First part: flat work using the coping saw and knife. Second: construction work or "putting together." Third: construction with movable parts. Applicable to grades four to six inclusive. MR. STOCKWELL.
- 12f. **TEACHERS' COURSE IN WOOD WORK FOR ELEMENTARY GRADES.** Uses and care of tools, tool processes, and uses and care of wood-working machinery. Special emphasis upon methods of presenting work to pupils. Demonstrations by members of class are an important phase of the work. MR. STOCKWELL.
- 54f.s. **TEACHERS' COURSE IN MATHEMATICS.** For students preparing to become teachers of secondary-school mathematics. Lectures, readings, discussions, methods of presentation, assignments, lesson plan, examinations, plans of beginning courses in elementary algebra and plane geometry. MR. REEVE.

- 75f-76w-77s. PUBLIC-SCHOOL MUSIC. Preparation for teachers and supervisors of music in the grades. Piano-playing, singing, and sight reading prerequisite. Four hours in class and one half-day weekly public-school visiting. Practice teaching demanded. MR. GIDDINGS.
- 78f-79w-80s. ADVANCED PUBLIC-SCHOOL MUSIC. Preparation for teachers and supervisors of music in high and normal schools. Four hours in class and one half-day weekly in public-school visiting. Practice teaching demanded. MR. GIDDINGS.
- 90s. TEACHERS' COURSE IN PHYSICS. Intended to embrace fundamental conceptions of methods of teaching high-school physics. Special emphasis put upon laboratory side of subject. One year of college physics will be considered as a prerequisite for this course. MR. POWERS.
- 77f. ANATOMY AND KINESIOLOGY. Anatomy of bones, joints, and muscles as it applies to muscular exercise. Study of gymnastic positions and movements from the standpoint of anatomy. DR. TOLG.
- 56s. TEACHERS' COURSE IN POLITICAL SCIENCE. Required for teacher's certificate in government. MR. TOHILL.
- 91f. TEACHERS' COURSE IN FRENCH. Methods of teaching French in high schools, courses of study, textbooks, etc. Lectures, observations, and reports. Open to juniors and seniors qualifying for a certificate to teach French as a major or minor subject. Credit in education only. MISS DE BOER.
- 92w. TEACHERS' COURSE IN SPANISH. Methods of teaching Spanish in the high schools. Courses of study, textbooks, etc. Lectures, observation, and reports. Open to juniors and seniors qualifying for a certificate to teach Spanish as a major or minor subject. Credit in education only. MISS DE BOER.
- 115w. TEACHERS' COURSE IN SWEDISH. For students who expect to teach Swedish in the high schools. MR. STOMBERG.
- 116s. TEACHERS' COURSE IN NORWEGIAN. For students who expect to teach Norwegian in the high schools. MR. BOTHNE.
152. ELEMENTARY METHODS IN READING. The place of reading in the rural school curriculum. Different types of lessons, equipment, materials, adaptation to needs of rural community. MISS LOMMEN.
153. ELEMENTARY METHODS IN ENGLISH. The place of English in the rural school curriculum. Different types of lessons, equipment, materials, adaptation to needs of rural community. MISS LOMMEN.
154. ELEMENTARY METHODS IN HISTORY. The place of history in the rural school curriculum. Different types of lessons, equipment, materials, adaptation to needs of rural community. MISS LOMMEN.

155. ELEMENTARY METHODS IN GEOGRAPHY. The place of geography in the rural school curriculum. Different types of lessons, equipment, materials, adaptation to needs of rural community. MISS LOMMEN.
156. ELEMENTARY METHODS IN ARITHMETIC. The place for arithmetic in the rural school curriculum. Different types of lessons, equipment, materials, adaptation to needs of rural community. MISS LOMMEN.
157. ELEMENTARY METHODS IN INDUSTRIAL ARTS. The place of industrial arts in the rural school curriculum. Different types of lessons, equipment, materials, adaptation to needs of rural community. MISS LOMMEN.
158. OBSERVATION AND PRACTICE IN NORMAL TRAINING DEPARTMENTS. MISS LOMMEN.

AGRICULTURAL EDUCATION

Professors ASHLEY V. STORM, DEXTER D. MAYNE; Assistant Professors WILLIAM P. DYER, ALBERT M. FIELD, FRANK W. LATHROP; Instructor FRED E. ARMSTRONG.

11f,w,su	3	Principles of Vocational Education	Jr., sr.†	None
21f,w	3	Vocational Education....	Jr., sr.†	None
41f,w,s	2	Apprentice Teaching....	Jr., sr.† ‡	11, 13†
42f,w¶	3	Teaching	Sr.† ‡	41, Agron. 121, 122, 123
53s,su	3	Consolidated Rural Schools	All†	None
54w,su	3	Rural Education and Community Life.....	All	None
63f-64w-65s	9	General Agriculture....	All	None
71s	3	Extension Work.....	Jr., sr.	6 cr. in farm mgmt. and agron. 6 cr. in farm crops, 15 cr. in an industry, 6 cr. agr. educ.
72f,w,s,su	3-10	Agricultural Extension Field Course.....		71 and must have broad curriculum approved by division of Agricultural Education and position approved by Division of Extension
74su§	2	Visual Presentation....	Jr., sr.	11
75f,w	3	Visual Presentation....	Jr., sr.	11
121w	2	Teachers' Course in Home and School Garden Supervision...	Approval of division	None

† Offered only to those preparing to teach.

‡ Students are admitted to this course only when recommended by the faculty of the group in which they are majoring and when accepted by the Division of Agricultural Education.

§ Special reduced courses for consolidated-school principals.

¶ It may be possible for a very limited number to take this course in the spring quarter. To do so, approval of the instructor and chief of the division will be necessary.

DEPARTMENTAL STATEMENTS

131f,s,su	5	Methods in Teaching High-School Agri- culture	Jr., sr.* †	11
151f,s	5	Organization and Man- agement	Sr.†	11, 21
161f-162w- 163s(su)	9	Fundamentals of Agri- culture	Jr., sr.† §	None
164w,su	3	Fundamentals of Agri- culture	Jr., sr† §	None
176s,su	3	Advanced Visual Pres- entation	Jr., sr.	75
181w	3	Agricultural Statistics and Graphic Repre- sentation	Soph., jr., sr.	Fr. Eng. 3. 11
191f-192w-193s- 194su	2 each	quarter Seminar in Agricultural Education	Sr.†	11 hrs. in agric. educ.

INTRODUCTORY COURSES

- 11f,w,su. PRINCIPLES OF VOCATIONAL EDUCATION. The fundamental principles upon which education is based. Emphasis is placed on those phases which are most closely related to vocational education. MR. DYER.
- 21f,w. 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. MR. MAYNE.
- 41f,w,s. TEACHING. An introductory course in teaching, including observation of class work, apprentice teaching, and special conference discussions of problems related to teaching. Intended to initiate the student into the routine of classroom procedure. Professional reading. MR. FIELD.
- 42f,w. TEACHING. 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's teaching. Review and discussion of assigned professional readings. MR. FIELD.
- 53s,su. CONSOLIDATED RURAL SCHOOLS. Building arrangements, selection of teachers, equipment, transportation of pupils, health supervision, home project work, and other problems in organization and management of consolidated rural schools from the viewpoint of the special needs of rural life. MR. DYER.
- 54s,su. RURAL EDUCATION AND COMMUNITY LIFE. Special attention will be given to those features which are desirable in a rural community for educational, recreational, ethical, and esthetic purposes and ways and means to organize the same about school as a center. MR. DYER.

* Open to juniors on approval of the chief of the division.

† Offered only to those preparing to teach.

§ Special reduced courses for consolidated-school principals.

63f-64w-65s. GENERAL AGRICULTURE. For students specializing in such divisions as Agricultural Biochemistry, Entomology and Economic Zoology, Plant Pathology, and in other colleges. A series of units by division chiefs and other agricultural specialists. MR. STORM, MR. MAYNE.

ADVANCED COURSES

71s. EXTENSION WORK.

72f,w,s,su. AGRICULTURAL EXTENSION FIELD COURSE.

74su. VISUAL PRESENTATION. To acquaint students with the various visual aids, their preparation, source, and use in the teaching process. Actual laboratory practice is given in the preparation and operation of various mediums.

75f,s. VISUAL PRESENTATION. To prepare persons for presenting materials by means of slides, films, charts, etc. Students assisted in assembling materials for their own use and in acquiring skill and technic in preparation and operation of various mediums.

121w. TEACHERS' COURSE—HOME AND SCHOOL GARDEN SUPERVISION. A lecture and laboratory course designed to give teachers the preparation necessary for the proper planning, management, and supervision of home and school gardens. MR. FIELD.

131f,s su. METHODS IN TEACHING HIGH-SCHOOL AGRICULTURE. Fundamental elements of method in teaching as related to teaching agriculture in high school. Organizing subject-matter of daily work; selection and manipulation of devices. Classroom and laboratory method. Specific plans for teaching secondary agriculture. MR. FIELD.

151f,s. ORGANIZATION AND MANAGEMENT. Organization and management of work in secondary schools, particularly of Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and coordination of work. MR. STORM, MR. DYER.

161f-162w-163s. FUNDAMENTALS OF AGRICULTURE. Essential for principals and superintendents of schools in which agriculture is taught, and valuable for students of other colleges whose time for agriculture is limited. Agricultural college experts will give work in their special fields. MR. STORM.

164w,su. FUNDAMENTALS OF AGRICULTURE. Special reduced course for consolidated-school principals.

176s,su. ADVANCED VISUAL PRESENTATION. Continuation of 75. Further work in design and construction of charts and lantern slides. Special study of motion picture machines. Actual practice in effective use of visual aids in lecture and recitation.

181w. AGRICULTURAL STATISTICS AND GRAPHIC REPRESENTATION. Course teaches application of statistical methods to agriculture and different means of representing agricultural statistics graphically. Of value to all students to enable them to interpret, present, and use agricultural statistics and graphic representations.

191f-192w-193s. 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. MR. STORM, MR. FIELD.

HOME ECONOMICS EDUCATION

Professor MILDRED WEIGLEY, Chief; Associate Professors HARRIET I. GOLDSTEIN, MARION WELLER; Assistant Professors CLARA M. BROWN, MAUDE J. MILLER; Instructors ELIZABETH BACON, JEAN M. DORSEY, AMANDA EBERSOLE, LOU LOMBARD, OLIVE MACCOMBER, HELEN RIDER; Extension Specialist JULIA O. NEWTON.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
42f,s*	5	Special Methods of Teaching Home Economics	Jr., sr.	H.E. 12, 22, Psychol. 1-2
43w	3	Organization and Methods for Related Art Teaching	Sr.	H.E. 42, 52, 53, 131
44s	3	Methods in Home Economics Extension Work	Sr.	42
46f,w	8	Observation and Teaching: Related Art.....	Sr.	42, H.E. 13, 52, 53, Educ. 55 or Agr. Educ. 11, see general statement
47f,w	8	Observation and Teaching: Foods and Home Management	Sr.	42, Ed. 55 or Agr. Ed. 11, see general statement
48f,w	8	Observation and Teaching: Textiles and Clothing	Sr.	42, Ed. 55 or Agr. Ed. 11, see general statement
49f,w	8	Observation and Teaching: General Home Economics	Sr.	42, Ed. 55 or Agr. Ed. 11, see general statement
141	3	Problems in Home Economics Education.....	Sr.	42, educ. psychol.

* Offered also in Summer School.

- 42f.s. SPECIAL METHODS OF TEACHING HOME ECONOMICS. Curricula, equipment, methods of teaching for home economics. Required of all students preparing to teach. MISS WELLER, MISS CLARA BROWN, MISS MILLER.
- 43w. 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. MISS H. GOLDSTEIN.
- 44s. METHODS IN 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. MISS LOMBARD, MISS NEWTON.
- 46f,w. OBSERVATION AND TEACHING: RELATED ART. A course similar to 47, but dealing with the teaching of related art. MISS GOLDSTEIN, MISS BACON.
- 47f,w. OBSERVATION AND TEACHING: FOODS AND HOME MANAGEMENT. Observation of teaching in regular classes; criticism and discussion of class practice, lesson plans, methods, results, and examinations; preparation of lesson plans, and directed teaching of foods and cookery, and home management. MISS MILLER, MRS. DORSEY, MISS LOMBARD.
- 48f,w. OBSERVATION AND TEACHING: TEXTILES AND CLOTHING. A course similar to 47, but dealing with the teaching of textiles and clothing. MISS CLARA BROWN, MISS BACON, MISS MACCOMBER.
- 49f,w,s. OBSERVATION AND TEACHING: GENERAL HOME ECONOMICS. A combination of 47 and 48 giving the student experience in teaching both fields of work. Required of students in the general teaching course. Those who have completed 46, 48, or 49 may register and receive 2 credits. MISS CLARA BROWN, MISS MILLER.
141. PROBLEMS IN HOME ECONOMICS EDUCATION. Problems of administration and supervision of home economics, study of curricula for the day, part-time and evening schools, consideration of the home project, the hot lunch, and other related work.

DEPARTMENT OF TRADE AND INDUSTRIAL EDUCATION

Assistant Professors ARTHUR F. PAYNE, Chairman and Advisor; HOMER J. SMITH; Professorial Lecturer CHARLES A. PROSSER.

DEPARTMENTAL STATEMENTS

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
V20f	2	History and Literature of Vocational Education	Jr., sr.	
V21s	2	Buildings, Equipment and Records for Vocational Schools.....	Jr., sr.	
V22f	2	Teaching Civics in Vocational Schools.....	Jr., sr.	V64, V65
V23s	2	Study of Materials in Vocational Schools....	Jr., sr.	
V29f	2	Teaching Vocational Mathematics	Jr., sr.	V66, V40, V67
V30w	2	Teaching Vocational Mathematics	Jr., sr.	V66-V67, V29, V40
V31s	2	Teaching Vocational Mathematics	Jr., sr.	V66-V67, V29, V30, V40
V33w	2	Teaching Vocational English	Jr., sr.	V64, V65
V34s	2	Teaching Vocational English	Jr., sr.	V64-V65, V33
V35f	2	Teaching Vocational Hygiene and Safety..	Jr., sr.	V64-V65, V40
V49f	2	Trade Analysis.....	Jr., sr.	
V50f	2	Methods of Teaching Trade Subjects.....	Jr., sr.	V40
V51w	2	Methods of Teaching Trade Subjects.....	Jr., sr.	V40, V50
V52s	2	Methods of Teaching Trade Subjects.....	Jr., sr.	V40, V50-V51
V53w	2	Practice Teaching.....	Jr., sr.	V40, V50-V51-V52
V54s	2	Practice Teaching.....	Jr., sr.	V40, V50-V51-V52
V64w	2	Teaching Related Academic Subjects.....	Jr., sr.	
V65s	2	Teaching Related Academic Subjects.....	Jr., sr.	
V66f	2	Teaching Related Technical Subjects	Jr., sr.	V40
V67w	2	Teaching Related Technical Subjects.....	Jr., sr.	V40
V70s	2	Vocational and Educational Guidance.....	Jr., sr.	
V169s	2	Methods of Establishing Part-Time Schools....	Jr., sr., grad.	15 cr. in education
V170f	2	Administration of Vocational Education.....	Jr., sr., grad.	15 cr. in education
V171w	2	Administration of Vocational Education.....	Jr., sr., grad.	15 cr. in education
V172s	2	Administration of Vocational Education.....	Jr., sr., grad.	15 cr. in education
V176f	2	Problems in Vocational Education	Jr., sr., grad.	V190-V191-V192 or equiv.
V177w	2	Problems in Vocational Education	Jr., sr., grad.	V190-V191-V192 or equiv.

No.	Credits	Title	Offered to	Prerequisite courses
V178s	2	Problems in Vocational Education	Jr., sr., grad.	V190-V191-V192 or equiv.
V190f	2	Principles of Vocational and Industrial Education	Jr., sr., grad.	15 cr. in education
V191w	2	Principles of Vocational and Industrial Education	Jr., sr., grad.	15 cr. in education
V192s	2	Principles of Vocational and Industrial Education	Jr., sr., grad.	15 cr. in education

V20f. HISTORY AND LITERATURE OF VOCATIONAL EDUCATION. The historical background and the evolution of our present systems of vocational schools and classes are given, with attention to standard terminology. The literature of vocational education is surveyed, and general help given in the use of reference works. MR. SMITH.

V21s. BUILDINGS, EQUIPMENT, AND RECORDS FOR VOCATIONAL SCHOOLS. For teachers of experience who wish to prepare for supervision and administrative positions in vocational education. Types of buildings, plans for remodeling old buildings, purchasing and arrangement of equipment, sources of supplies and of materials. MR. SMITH.

V22f. TEACHING CIVICS IN VOCATIONAL SCHOOLS. Acquaintance with texts and all other available aids for classroom teachers of this subject, with special reference to the needs of vocational classes. Unit-course outlines will be prepared and teaching difficulties will be discussed. MR. SMITH.

V23s. STUDY OF SHOP MATERIALS. A study of the chemical and physical characteristics of the various materials used in shop classes. Sources, methods of manufacture, and costs will be studied. MR. SMITH.

V29f-V30w-V31s. TEACHING VOCATIONAL MATHEMATICS. The aims, practices, and problems of related mathematics presented; texts reviewed; supplementary materials suggested; unit courses prepared; lesson plans and special methods discussed.

V33w-V34s. TEACHING ENGLISH TO VOCATIONAL CLASSES. The needs of vocational groups detailed; courses and lesson plans presented; texts and supplementary matter analyzed; suggestion made of methods for irregular class work; much classroom material furnished. MR. SMITH.

V35f. TEACHING VOCATIONAL HYGIENE. Discussion of methods, organization, and devices employed in schools and shops to promote safety and to insure efficient work and living; the study of certain vocations for content of scheduled courses or for incidental instruction. MR. SMITH.

V40f. TRADE ANALYSIS. For men and women with trade experience preparing to teach in the field of industrial education. Students will analyze

- completely one trade, classify the trade knowledge, and outline courses for specified conditions; teaching material will be organized. MR. PAYNE.
- V50f-V51w-V52s. METHODS OF TEACHING TRADE SUBJECTS. For men and women preparing to teach trade subjects. Analysis and classification of trade knowledge, a study of projects, methods of teaching on a productive basis, as required by the law, lesson outlines, organization of materials, methods of grading and examining, etc., intended only for those of sufficient trade experience to qualify under the Smith-Hughes Law. Prerequisite: Trade Analysis. MR. PAYNE.
- V53w-54s. PRACTICE TEACHING. Prerequisites to this course are Trade
- Analysis and Trade Subjects. Practice teaching will be done at Dunwoody Institute, including both shop work and related subjects. Students will first assist a regular instructor and later have full charge of classes. MR. PAYNE.
- V64w-V65s. TEACHING RELATED ACADEMIC SUBJECTS. Detailed discussion of the materials and methods of instruction in civics, hygiene, and safety, industrial history, English, and other branches designated "non-vocational" in the Smith-Hughes Law. Studies of the needs of groups, course planning. MR. SMITH.
- V66f-V67w. TEACHING RELATED TECHNICAL SUBJECTS. Discussion of the theory and practice of related instruction; study of methods and content in related mathematics, drawing, and science; preparation of course outlines; for specific groups; acquaintance with texts and supplementary materials. MR. SMITH.
- V70s. VOCATIONAL AND EDUCATIONAL GUIDANCE. A course designed for supervisors, principals, and classroom teachers interested in the general problem of vocational and educational guidance. A study is made of the causes back of the movement; definitions and objectives; methods and existing systems. MR. PAYNE.
- V169s. METHODS OF ESTABLISHING AND ORGANIZING PART-TIME SCHOOLS. A study of problems of the new movement for part-time schools as outlined in the Smith-Hughes Law. Social and economic backgrounds of the part-time school, methods of organizing classes, a study of special student groups, and courses of study. MR. PAYNE.
- V170f-V171w-V172s. ADMINISTRATION OF VOCATIONAL EDUCATION. Designed for those engaged or expecting to become engaged in the administration of vocational education. An intensive study of the Smith-Hughes Law, the methods, practices, and policies of the Federal Board of Vocational Education, administration of "State Plan" of Minnesota and in methods of administering the various types of vocational schools and classes. MR. PAYNE.

V176f-177w-178s. PROBLEMS OF VOCATIONAL EDUCATION. A research course dealing with specific problems in the field of vocational education. Among these are: the attitude of labor toward vocational education; industrial education for women and girls; the new dual system; industrial rehabilitation; etc. MR. PAYNE.

V190f-V191w-V192s. PRINCIPLES OF VOCATIONAL AND INDUSTRIAL EDUCATION. A course in the philosophy of vocational education. A study is made of the basic principles underlying the movement for vocational and industrial education as found in the fields of economics, sociology, psychology, and education. MR. PROSSER.

SPECIAL CURRICULA

AMERICANIZATION TRAINING

GENERAL STATEMENT

Students registering in this course will be required to have completed the freshman and sophomore years in the course in Americanization training or their equivalent in the College of Science, Literature, and the Arts. All students desiring the University teacher's certificate for Americanization work will be required to secure credits in the following courses in the College of Education. Such students must also be registered in the College of Education.

JUNIOR STUDIES

REQUIRED	CREDITS	ELECTIVES
American People—Older Immigrants from Europe	3	Supervised Americanization Work
		Immigrant Woman
Newer Immigrants from Europe.....	3	Race Leaders and Programs
Americanisms and Assimilation.....	3	Labor Problems
Americanization Methodology.....	3	Statistics
Methods of Americanization.....	3	Elementary Dietetics
126, Organization of Americanization Work	3	Housing Problems
Ed. 3, Educational Sociology.....	3	Home Management
Ed. 45, Educational Psychology.....	3	Social Psychology
Ed. 11, Technic of Teaching.....	3	History of Education
or		
Am. 127, Technic of Teaching Adults.....	3	
General Economics.....	5, 5	Physical Anthropology
Aliens' Viewpoints Special Lectures by		
Race Leaders.....	0	Political and Social Ethics (10 credits in any social science, jr., sr., grad.)

SENIOR STUDIES

REQUIRED	CREDITS	ELECTIVES
American Negro.....	3	Negro and Immigrant Adjustments
Government and the Immigrant.....	3	Slavic Culture
Race Leaders and Programs (If not previously elected).....	3, 3	Slavic Oral Language
Ed. 15, Practice Teaching.....	5	Genetics and Eugenics
or substitute		Social Statistics
Supervised Americanization Work.....	3, 3, 3	Seminars in Intensive Race Studies
Teachers' Course.....	..	Socialism
or substitute		Child Welfare
Am. 125, Methods of Americanization Work	3	Philippine Peoples
		Municipal Problems
		Mental Diagnosis

Students desiring a special certificate to teach in home workers' classes will be required to take the following additional courses:

No.	Credits	Title	Offered to	Prerequisite courses
70w	3	Food Preparation.....	Soph., jr., sr.	Gen. zool.; gen. chem., desired
71s	3	Elementary Dietetics....	Soph., jr., sr.	70, gen. physiol. desired
72f	3	Home Management Problems	Jr., sr.	70, 71, gen. econ. or parallel

Students desiring to secure a special certificate to teach in the evening classes or community center classes will be required to take the following additional courses:

FOR MEN	FOR WOMEN
See courses in Physical Education for Men	See courses in Physical Education for Women
	Vocational Education, Civics

SPECIAL CURRICULUM IN ART EDUCATION

The Bachelor of Science degree, with a major in Art Education, involving recommendation for supervision of art in the grades and high schools, or for departmental art teaching, requires 180 credit hours, with an average of 1 honor point in all subjects exclusive of the major and 1½ honor points per credit hour in the major subject.

Distribution of Hours

- I. Major subject—art, including the following minimal requirements:
 - 18 credits in design
 - 12 credits in drawing
 - 12 credits in handicrafts
 - 5 credits in art history and appreciation
 - 3 credits in teachers' course in art
 - 5 credits in practice teaching
- II. Minor subjects—education, with the following minimal requirements:
 - 3 credits in educational psychology
 - 5 credits in history of education
 - 3 credits in social aspects of education (educational sociology)
 - 3 credits in technic of teaching

- See teachers' course and practice teaching above
- III. Minor subject—minimal number of credits chosen from any department whose courses are accredited in the College of Education.
- IV. Required supporting courses:
- 15 credits in rhetoric
(The 9-credit course in rhetoric for technical students may be substituted.)
 - 8 credits in general psychology
 - 3 credits in textiles
 - 10 credits in history
(If high-school history of ancient, medieval periods is not offered for entrance.)
 - 10 credits in science
(If the minor subject is home economics or trade education.)
- V. Electives, which are recommended to be in a science or a social science, if the minor subject has not involved one of these departments.

SPECIAL CURRICULUM IN AGRICULTURAL EDUCATION

GENERAL STATEMENT

Students desiring to procure the state professional certificate will begin their specialization with the junior year. It would be desirable to consult the chief of the Department of Agricultural Education earlier so as to avoid any difficulties that may arise in the program of specialization.

REQUIRED COURSES

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 17 credit hours per quarter. In such cases those subjects listed below which can not be taken in the freshman and sophomore years must take precedence the following year. Registration for from 15 to 18 credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.
 - Freshman lectures. A course of nine lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter. Must be taken in the freshman year.
 - Military drill. Three hours per week throughout the freshman and sophomore years. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.
 - Physical Education 3w. Gymnasium and Swimming. Two hours per week for one quarter. Must be taken in the freshman 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. Ordinarily, if botany is registered for in the freshman year, registration for zoology should be postponed until the sophomore year, and vice versa
 - Agr. Biochem. 7f-8w, General Agricultural Biochemistry, 10 (Chem. 1-2-3 or 9-10)
 - Ag. on. 1f,w,s, Farm Crops, 3 (Soils 2)
 - An. Biol. 1f,w,s-2w,s,su, General Zoology, 10.
 - An. Husb. 1f,w, Types and Breeds of Livestock, 5.
 - Bact. 6f,w,s, Elementary Bacteriology, 4 (Chem. 1-2-3 or 9-10)
 - Bot. 1f,s-2w,f, General Botany, 10. Students entering college with a year of high-school botany satisfactory to the department may omit Bot. 1 (see footnote on page ..) and substitute 5 credits elective later in their course of study.

- Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high-school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits.
- Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. Those required to take Chem. 1-2-3 are exempt.
- Dy. Husb. 1f,s, Elements of Dairying, 5.
- Econ. 5f,s, General Economics, 5. Open to freshmen only during their third quarter.
- Econ. 6f,w, Agricultural Economics, 3 (Econ. 5)
- Farm Eng. 3f,s, Mechanical Drawing, 3.
- Farm Eng. 10f,w, Farm Engineering, 5.
- Farm Eng. 11f,w, Applied Mathematics, 5. Students presenting a half year of high-school higher algebra may omit this course and substitute 5 credits elective later in their course of study.
- Farm Eng. 21f-22w, Agricultural Physics, 10. Those presenting a year of high-school physics may omit this course and substitute 10 credits elective later in their course of study.
- Foi. 22f, Tree Crops, 1. Should be taken in freshman year parallel to Soils 2.
- Hort. 90f,s, General Horticulture, 3 (Soils 2)
- †Hort. 91s, Advanced General Horticulture, 3.
- Phys. Educ. 1f, Personal Hygiene, 1.
- Pol. Sci. 1f, American Government, 5 (Not open to freshmen)
- 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)
- Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.
- Rhet. 11f,w,s, Argumentation, 5 (Rhet. 3)
- Rhet. 22f,w,s, Public Speaking, 5 (Rhet. 3)
- *Soils 2f, Soils I, 2.
- *Soils 3s, Soils II, 3 (Chem. 1-2-3 or 9-10, Soils 1)

MAJOR IN AGRICULTURAL EDUCATION

Junior Year

(Required professional courses)

- Agr. Educ. 11f,w, Principles of Vocational Education, 3
- Agr. Educ. 21f,w, Vocational Education, 3, or Educ. 5, American School, 3.

Senior Year

- Agr. Educ. 41f,w,s, Teaching, 2 (Agr. Educ. 131)
- Agr. Educ. 42f,w, Teaching (Agr. Educ. 41, Agron. 121, 122, 123. See course description) 3.
- Agr. Educ. 131f,s,su, Methods in Teaching High-School Agriculture, (Agr. Educ. 11) 5.
- Agr. Educ. 151f,s, Organization and Management, 5 (Agr. Educ. 11, 21)
- Agr. Educ. 75f,w, Visual Presentation, 3, (Agr. Educ. 11)

MAJOR IN AGRICULTURAL EDUCATION—MANUAL TRAINING

Students desiring the certificate in Agricultural Education—Manual Training will add Agricultural Education 133, Methods and Organization in Manual Training for Vocational Agricultural Instructors (Agricultural Education 11) to the courses listed above.

¹ Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page .. of the College of Agricultural Education bulletin.

†A new course. Required of students specializing in agricultural education only.

SPECIAL CURRICULUM IN HOME ECONOMICS EDUCATION

TEACHERS' COURSE IN HOME ECONOMICS¹*Freshman Year*

1. *Non-credit courses* required for graduation in addition to the 186 credit hours. Freshman lectures. A course of lectures, one hour per week, intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter. Phys. Educ. 1f-2w-3s, Elementary Physical Training. Three hours per week throughout the 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.
 - An. Biol. 1f,w,s-2w,s,su, General Zoology, 10.
 - Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high-school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry Chem. 9-10 successfully will be allowed not more than 10 credits.
 - Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. Those required to take Chem. 1-2-3 are exempt.
 - Fam Eng. 30s, Household Physics, 5. Those presenting a year of high-school physics may omit this course and substitute 5 credits elective later in their course of study.
 - H. E. 3f,w,s, Textiles, 5.
 - H. E. 11f,w,s, Garment-Making, 3.
 - H. E. 51f,w,s, Drawing and Design, 3.
 - Phys. Educ. 11f, Personal Hygiene, 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.)
 - Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

Sophomore Year¹

1. *Non-credit courses* required for graduation in addition to the 186 credit hours. Phys. Educ. 43f,w,s, Elementary Swimming. Not required of those who can pass the swimming test in their freshman year.
2. *Freshman courses* which were not completed during the freshman year.
3. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed. From 15 to 17 credit hours should be selected each quarter.
 - Agr. Biochem. 3f,s,su, Types of Carbon Compounds, 6 (Chem. 10 cred.)
 - Bact. 6f,w,s, Elementary Bacteriology, 5.
 - H. E. 13f,w,s, Dressmaking, 5 (H. E. 3,11,51, Home Practice in Garment-Making.)
 - H. E. 21f,w,s, Foods and Cookery, 5 (Chem. 5 cred., Physiol. 3 or parallel.)
 - H. E. 22f,w,s, Food Economics, 5 (H. E. 21.)
 - Physiol. 3f,w,s, Human Physiology, 5 (Chem. 10 cred., biol. 10 cred.)
 - Psychol. 1f-2w, General Psychology, 6.
 - Rhet. 11f,w,s, Argumentation, 5 (Rhet. 3.)
 - Sociol. 1f, Introduction to Sociology, 3.
4. *Electives*.—Enough elective credits should be selected to make up with the required work of the freshman and sophomore years a total of 93 credit hours. The number selected will vary from 1 to 11 credit hours depending upon the specific high-school preparation of each student. Those whose programs permit are advised to register for Rhet. 22, Public Speaking, 5, otherwise required in the junior year.

¹The freshman and sophomore years in home economics are offered in the College of Agriculture, Forestry, and Home Economics.

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.

- Econ. 7w,s, Principles of Economics, 5
 H. E. 37f,s,su, Home Care of the Sick, 3 (Chem. 5 cred., Bact. 6)
 H. E. 40s, Child-Training, 3 (Psychol. 1-2)
 H. E. 52f,w, Art History and Appreciation, 3 (H. E. 51)
 H. E. 53f,w,s, Advanced Design, 4 (H. E. 51)
 Rhetoric 22f,w,s, Public Speaking, 5 (Rhet. 3)
 Educ. 5s, The American School, 3 (Psychol. 1-2)
 Educ. 55f,w,s, Elementary Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3
 H. E. 23f,w, Nutrition I, 5 (H. E. 22, Bact. 6, Agr. Biochem. 3)
 H. E. 42w,s,su, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2)
 H. E. 108f,w,su, Nutrition II, 5 (H. E. 23)
3. *Electives.*—Enough electives should be selected to make up, 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

- H. E. 17f,w,s,su, Advanced Clothing Construction, 3 (H. E. 13, 52, 53)
 H. E. 34f,w,s,su, Home Management: Operation and Maintenance, Lectures, 3 (H. E. 22)
 H. E. 35f,w,s,su, Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 22, Home Practice in Foods and Cookery, must parallel H. E. 34) H. E. 37 and H. E. 40 prereq. or parallel
 H. E. 45w, Home Economics Survey, 2
 H. E. 49f,w,s, Observation and Teaching, 8 (H. E. 42, Ed. 55 or Agr. Ed. 11)
 H. E. 103f,w,s,su, Dietetics, (H. E. 108)
 H. E. 123f,s, Clothing Economics, 2 (H. E. 13, 52, 53, Econ. 7)
 H. E. 131f,w,s, Home Management: House-Planning and Equipment, 5 (H. E. 52, 53)

TEACHERS' COURSE IN FOODS AND HOME MANAGEMENT

Students specializing in this course may omit the following subjects from the Teachers' Course in Home Economics:

Senior Year

- H. E. 17f,w,s,su, Advanced Clothing Construction, 3 (H. E. 13, 52, 53)
 H. E. 49f,w,s, Observation and Teaching 8 (42, Ed. 55 or Agr. Ed. 11)
 H. E. 123f,s, Clothing Economics, 3 (H. E. 13, 52, 53, Econ. 7)

They shall add the following subjects to the Teachers' Course in Home Economics:

Junior Year

- Agr. Biochem. 2w, Quantitative Methods, 5 (chem. 10 cred.)

Senior Year

- H. E. 25w, Experimental Cookery, 3 (H. E. 22)
 H. E. 109s, Advanced Nutrition, 5 (H. E. 108, Agr. Biochem. 2)
 H. E. 47f,w,s, Observation and Teaching, 8 (H. E. 42, Ed. 55 or Agr. Ed. 11)

TEACHERS' COURSE IN TEXTILES AND CLOTHING

Students specializing in this course may omit the following subjects from the Teachers' Course in Home Economics:

Junior Year

- H. E. 23f,w, Nutrition I, 5 (H. E. 22, Bact. 6, Agr. Biochem. 3)
 H. E. 108f,w,su, Nutrition II, 5 (H. E. 23)

Senior Year

- H. E. 49f,w,s, Observation and Teaching, 8 (H. E. 42, Ed. 55 or Agr. Ed. 11)
 They shall add the following subjects to the Teachers' Course in Home Economics:

Junior Year

- H. E. 55f,s, Decorative Needlework and Crafts, 3 (H. E. 3, 11, 51, 53 parallel)

Senior Year

- H. E. 18f,s, Commercial Clothing Manufacture, 4 (H. E. 17)
 H. E. 48f,w,s, Observation and Teaching (H. E. 42, Ed. 55 or Agr. Ed. 11)
 H. E. 122f,w, Advanced Textiles, 3 (H. E. 3, 51) Agr. Bioch. 2w, Quant. Chem. 6

TEACHERS' COURSE IN RELATED ART

Students specializing in this course may omit the following subjects from the Teachers' Course in Textiles and Clothing:

Junior Year

- H. E. 123f,w,s, Clothing Economy, 3 (H. E. 13, Econ. 7)

Senior Year

- H. E. 48, Observation and Teaching of Textiles and Clothing
 H. E. 18 Commercial Clothing Manufacture
 H. E. 122, Advanced Textiles

They shall add the following courses:

Junior Year

Art subjects:

- Art Educ. 32f-33w, Freehand Drawing and Composition, 6
 H. E. 58, Costume Design, 3 (H. E. 11, 53)

Senior Year

- Art Educ. 31, Fundamental Principles of Design, 3 (Art Educ. 29-30 or H. E. 51, 53)
 or Art Educ. 40f, Principles of Harmony of Form and Color, (Art Educ. 29, 30-31 or instructor's permission)
 H. E. 57w, Weaving and Other Crafts, 3 (H. E. 3, 51, 53)
 H. E. 54, Interior Design, 3 (H. E. 52, 53, 131)
 H. E., Observation and Teaching of Related Art, 8 (42 scholarship requirements)
 H. E. 43, Organization and Methods for Related Art Teaching, 3 (H. E. 52, 53, 131)

SPECIAL CURRICULUM IN HIGH-SCHOOL TEACHER TRAINING

It will be observed that this curriculum provides for education as a major with English and sociology as minors. Usually all of the courses listed will be required to receive a certificate, but previous training, experience, and the needs of the student will modify his choice of electives.

Normal-school graduates with advanced diplomas will be given junior standing in the College of Education. Upon completion of this curriculum they will receive a degree of Bachelor of Science from the University.

This curriculum has been prepared in joint conference by representatives of the State Department of Education and of the College of Education.

COURSE OF STUDY

Junior Year

FIRST QUARTER	Credits	SECOND QUARTER	Credits
Education:		Education:	
55. Educational Psychology....	3	3. Social Aspects of Education	3
Sociology:		Sociology:	
General Introduction to Soci-		Rural Community.....	3
ology	5	English:	
English:		Survey	3
General Survey.....	5		

THIRD QUARTER

	Credits
Education:	
Group I. Departmental Methods, Reading, English, Related Arts	3
Sociology:	
110 Community Organization and Social Work in Small Towns	3
English:	
Survey	5

Senior Year

FIRST QUARTER	Credits	SECOND QUARTER	Credits
Education:		Education	
11. Technic of Teaching.....	3	Group II: Departmental Meth-	
Sociology:		ods Geography, History, and	
114. Rural Social Institutions..	3	Arithmetic	
Education:		Education:	
134. Mental Tests and Diag-		135. Mental Tests and Diag-	
nosis	2	nosis	2
		Education:	
		Theory of Supervision.....	3

THIRD QUARTER

Education:	
Observation and Practice in Normal Training Departments	
Education:	
136. Mental Tests and Diagnosis	
ELECTIVES	
Advanced Educational Psychology	
Educational Diagnosis	
History of Modern Elementary Education	

SPECIAL CURRICULUM IN PHYSICAL EDUCATION

FOR WOMEN

Professor J. ANNA NORRIS, Head; Assistant Professors MAY S. KISSOCK, VALERIA G. LADD, GERTRUDE SCHILL CRAM, ALICE H. TOLG; Instructors GERTRUDE M. BAKER, HENRIETTA BROWNING, GERTRUDE K. LYON, ALICE M. ROCKWOOD.

GENERAL STATEMENT

Four-year course for teachers and supervisors

The Bachelor of Science degree, with a major in physical education, involving a recommendation for teaching or supervising physical education in schools, or in other situations, requires 180 credit hours, with an average of 1½ honor points per credit in all courses required in the major subject and an average of 1 honor point per credit hour in all other courses.

Students desiring to specialize in physical education should consult the head of the Department of Physical Education as to their fitness to undertake the work. 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 cooperation of others.

Students who, while in high school, complete a year of physics, a year of chemistry, and two years of language, may gain thereby fourteen credit hours which can be used for elective subjects.

Since the curriculum includes certain freshman subjects it is desirable to elect the course on entrance to the University.

For a teacher's certificate, minor recommendation, 18 credit hours in physical education are required.

COURSES FOR STUDENTS MAJORING IN PHYSICAL EDUCATION

Freshman Year

	Credits	Prerequisite courses
English	15	
Language	15	
Animal Biology 1f-2w, General Zool.....	10	
Sociology 1f,w,s.....	5	
Physical Education 1f-2w-3s, El. P. Tr.....	0	
Phys. Education 46-17-48, Hockey, Basket-Ball, Baseball	0	
Phys. Education 4f, Prelim. Hygiene.....	0	
Phys. Education 22s, Elem. Swimming.....	0	

Total 45 credit hours

NOTE: Four years of one language presented at entrance, none required in University.

Three years of one language presented at entrance, 5 cr. in same language required.

Two years of one language presented at entrance, 10 cr. in same language required.

Less than two years of one language presented at entrance, 20 cr. in one language required.

If student registers for less than 15 credits of language he may begin history, which would otherwise start in sophomore year.

For description of courses see bulletins of Colleges of Education and of Science, Literature, and the Arts under the departmental headings.

Sophomore Year

	Credits	Prerequisite courses
Chemistry 1-2-3, General Inorganic Chemistry (for pre-medical students).....	12	
History	10	
Psychology 1f-2w, General Psychology.....	6	
Farm Engineering 34w, Household Mechanics and Heat	4	

Anatomy 3s, Human Anatomy.....	4	
Home Economics 37f,s, Home Care of the Sick.....	1	Chem. 5
Physical Education 51f-52w, Gymnastics for Soph. Majors	2	Phys. Ed. 1-2-3
Phys. Educ. 43-44-45s, Elem. Folk Dancing and Organized Games (includes one hour lecture).....	3	
Phys. Educ. 19f-20w-21s, Soph. Major Sports.....	0	
Phys. Educ. 28f-29w Advanced Swimming.....	0	
*Education one of the required courses.....	3-5	

Total 45-47 credit hours

NOTE: If one year of chemistry is presented at entrance the student may take instead of Course 1-2-3, more intensive Course 4-5.

If one year of physics is presented at entrance no physics will be required.

For description of courses see bulletin of the College of Education and of the College of Science, Literature, and the Arts, except: for Farm Engineering 30s and Home Economics 37, see announcement of courses in Home Economics, for Anatomy 3s, see bulletin of the School of Medicine.

Students who have time for electives are advised to choose sociology or American government.

Junior Year

	Credits	Prerequisite courses
*Education, required courses.....	6	
Physiology 56f, Physiologic Chemistry.....	4	Chem. 1-2-3, Biol. 1-2
Physiology 57w-58s, Human Physiology.....	8	Phys. 56, Farm Eng. 34, Anat. 3s
Phys. Education 80f-81w, Kinesiology.....	8	An. Biol. 1-2, Anat. 3s
Phys. Education 82s, Technic of Gymnastic Teaching...	3	Phys. Ed. 80-81, 54-55
Phys. Education 83, Physical Examination.....	2	Phys. Ed. 80-81
Phys. Education 54f-55w, Gymnastics for Junior Majors	1	Phys. Ed. 51-52
Phys. Education 56s, Swimming with Technic.....	1	Phys. Ed. 28-29
Phys. Education 58w-59s, Advanced Folk Dancing with Technic (includes one hour lecture).....	2	Phys. Ed. 43-44-45
Phys. Education *60f-61w-62s, Advanced Organized Games with Technic (includes one hour lecture)..	3	Phys. Ed. 43-44-45
Phys. Education †63f-64w-65s, Major Sports with Technic	2	Phys. Ed. 19-20-21
Phys. Education 66f-67w-68s, Interpretative Dancing...	3	
Elective	3	

Total 46 credit hours

NOTE: For description of courses see bulletin of College of Education, except: for physiology, see bulletin of Medical School.

Senior Year

	Credits	Prerequisite courses
Education, finish required courses.....	3-5	
Public Speaking.....	2-5	Rhetoric ABC or 1-2-3
Physical Educ. 76w, Physical Diagnosis.....	2	Physiology 57-58
Physical Educ. 84f, Prin. of Phys. Education.....	3	Phys. Ed. 82
Physical Educ. 85w, History of Phys. Education.....	1	Educ. 1, Phys. Ed. 84
Physical Educ. 86f, Personal Hygiene.....	2	Physiology

* For required courses in education see note after sophomore year.

† 63f Hockey, two periods practice and technic ½ cr.

† 64w Basket-ball technic. One hour a week of discussion and demonstration ½ cr.

† 65s. Baseball. Two periods practice and one of technic (or perhaps one period of practice might be replaced by apparatus work in case that was more necessary). 1 cr.

Physical Educ. 87s, Community Health Problems (Social Hygiene, Sanitation and Prevention, School Hygiene)	2 Phys. Ed. 86
Physical Educ. 88f-89w-90s, Orthopedic and Remedial Gymnastics	3 Phys. Ed. 83
Physical Educ. 91w, Prin. Underlying Dancing.....	1 Phys. Ed. 66-67-68
Physical Educ. 92f,s,su, Practice Teaching on Playground	1 Phys. Ed. 60-61-62, 63-64-65
Physical Educ. 93w,s, Practice Teaching in Gymnastics	2 Phys. Ed. 84, 54-55
Physical Educ. 94s, Practice Teaching in Dancing (not offered in 1921-22).....	1 Phys. Ed. 69, 91
Physical Educ. 95w,s, Practice Teaching in Swimming	1 Phys. Ed. 56
Physical Educ. 96f,w,s, Practice Teaching in Major Sports	1 Phys. Ed. 65
Physical Educ. 69f-70w-71s, Interpretative Dancing with Technic (not offered in 1921-22).....	3 Phys. Ed. 68
Physical Educ. 72f, Gymnastics for Senior Majors	1 Phys. Ed. 55
Electives	10-15
Total	44 credit hours

NOTE: For description of courses see bulletin of College of Education except: for public speaking, see bulletin of the College of Science, Literature, and the Arts
Suggested electives, Hygiene of the Family (Phys. Ed. 33), courses in sociology, Methods in Educational Research (Ed. 126f, 127w), municipal government, political science.

COURSES

- 1-2-3. ELEMENTARY PHYSICAL TRAINING. Lighter forms of gymnastics, orthopedic exercise, folk dancing, indoor and outdoor games, individual health consultations. MISS KISSOCK, MISS LADD, DR. TOIG, MISS BROWNING, MISS ROCKWOOD.
4. PRELIMINARY HYGIENE. The most essential aspects of the care of the body. Twelve lectures. DR. NORRIS.
- 19-20-21. SOPHOMORE MAJOR SPORTS. Suitable in strength for A-B girls. MISS KISSOCK, MISS ROCKWOOD.
- 22-23. SOPHOMORE ELEMENTARY SWIMMING. For beginners. MISS LYON.
- 28-29. SOPHOMORE ADVANCED SWIMMING. For students who can pass the elementary swimming test. MISS LYON.
32. PERSONAL HYGIENE. Care of the personal health; elements of anatomy and physiology. MISS BROWNING.
33. HYGIENE OF THE FAMILY. Eugenics, prenatal care, maternity, puberty, sex education. DR. NORRIS.
- 43-44-45. FOLK DANCING AND ORGANIZED GAMES. Graded games, folk dances and track for the school and playground, two hours. A consideration of nature and function of play and practical conduct of playground, one hour. MISS KISSOCK.

- 46-47-48. HOCKEY, BASKET-BALL, AND BASEBALL. Hockey in the autumn, basket-ball in the winter, and baseball in spring. MISS KISSOCK, MISS ROCKWOOD.
- 51-52. GYMNASTICS FOR SOPHOMORES. Gymnastics, marching, and apparatus work. MISS ROCKWOOD.
- 54-55. GYMNASTICS FOR JUNIORS. Gymnastics, marching, and apparatus work. MISS ROCKWOOD.
56. SWIMMING WITH TECHNIC. Description of strokes, methods of teaching, practice in teaching and life-saving. MISS LYON.
- 58-59. ADVANCED FOLK DANCING WITH TECHNIC. Description, methods of teaching, elements of pageantry. Practice twice a week, lecture once a week. MISS BAKER.
- 60-61-62. ADVANCED ORGANIZED GAMES WITH TECHNIC. Description, and methods of teaching, one hour; practical work, two hours. MISS KISSOCK, MISS ROCKWOOD.
- 63-64-65. MAJOR SPORTS WITH TECHNIC. Hockey, practice and technic, two hours. Basket-ball, discussion and demonstration, one hour. Baseball, one hour technic, two hours practice. MISS KISSOCK, MISS ROCKWOOD.
- 66-67-68. INTERPRETATIVE 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. MISS BAKER.
- 69 70-71. INTERPRETATIVE DANCING WITH TECHNIC. More advanced than 66-67-68; includes theory and methods of teaching. (Not offered in 1921-22.) MISS BAKER.
72. GYMNASTICS FOR SENIORS. Gymnastics, marching, apparatus work. MISS BAKER.
76. PHYSICAL DIAGNOSIS. A consideration of symptoms, their significance, and differentiation. Lectures and demonstrations. DR. BARRON.
77. ANATOMY AND KINESIOLOGY. Anatomy of bones, joints, and muscles as it applies to muscular exercise. Study of gymnastic positions and movements from the standpoint of anatomy. MRS. CRAM.
- 80-81. KINESIOLOGY. Lectures and recitations on anatomical mechanism of movements; rôle of joint motion, muscular action, gravity, leverage, inertia, internal resistance in the production and modification of gymnastic movements and their efforts. MRS. CRAM.
82. TECHNIC OF GYMNASTIC TEACHING. Lectures and quizzes on terminology, and technic of teaching. Practice in teaching within departmental groups. MISS BAKER.

83. **PHYSICAL EXAMINATION.** All the important anthropometric measurements are studied, and practical application is made of them in the laboratory. DR. TOLG.
84. **PRINCIPLES OF PHYSICAL EDUCATION.** A study of the biological and educational fundamentals of physical training, the characteristics of the various systems and of the material involved in physical education. MISS BAKER.
85. **HISTORY OF PHYSICAL EDUCATION.** A review of the place motor education has had in the life history of nations; contemporary developments. DR. NORRIS.
86. **PERSONAL HYGIENE.** Application of facts of physiology and pathology to daily living. (Not offered in 1921-22.)
87. **COMMUNITY HEALTH PROBLEMS.** Elements of sanitation and prevention of disease, school hygiene, and social problems. DR. NORRIS, MISS BROWNING.
- 88-89-90. **ORTHOPEDIC AND REMEDIAL GYMNASTICS.** Lectures, demonstrations, individual work with cases. Discussion held relative to the various defects met with and treatment outlined. DR. TOLG.
91. **PRINCIPLES UNDERLYING DANCING.** MISS BAKER.
92. **PRACTICE TEACHING ON PLAYGROUND.** Municipal playgrounds are contemplated for this purpose.
93. **PRACTICE TEACHING IN GYMNASTICS.** College, high-school, and grade-school classes are contemplated for this purpose. MISS BAKER.
94. **PRACTICE TEACHING IN DANCING.** (Not offered in 1921-22.) MISS BAKER.
95. **PRACTICE TEACHING IN SWIMMING.** MISS LYON.
96. **PRACTICE TEACHING IN MAJOR SPORTS.** MISS KISSOCK.

COURSES FOR STUDENTS MINORING IN PHYSICAL EDUCATION

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1-2-3	0	Elementary Physical Train.	Required of all new students	None
32w	3	Personal Hygiene.....	Soph., jr., sr.	An. Biol. 1-2
51f-52w	2	Gymnastics for Soph. Majors	Soph., jr.	Ph. Ed. 1-2-3
54f-55w	1	Gymnastics for Junior Majors	Sr.	Ph. Ed. 51-52
22f-23w(22s)	0	Elementary Swimming...	Soph.	None
77f	3	Anatomy and Kinesiology	Sr.	An. Biol. 1-2, Anat. 4s
82s	3	Technic of Gymnastic Teaching	Sr.	Ph. Ed. 77, 54-55

No.	Credits	Title	Offered to	Prerequisite courses
Medicine 3s	3	Human Anatomy.....	Soph., jr.	An. biol.
43-44-45	3	Folk Dancing and Organized Games.....	Soph., jr., sr.	None
46-47-48	0	Hockey, Basket-Ball, and Baseball	Fr., jr., sr.,	Permission of director
Ed.	5	History of Education....		Psych. 1-2, 4-5
Ed.3	3	Ed. Sociology.....		Psych. 1-2, 4-5
Ed.45	3	Ed. Psychology.....		Psych. 1-2, 4-5
Ed.11		Technic of Teaching....		Ed. 45

SPECIAL CURRICULUM IN PUBLIC-SCHOOL MUSIC

This program of work is open only to students in the College of Education.

Junior Year

Course	First Quarter	Second Quarter	Third Quarter
Music			
14-15-16 History of Music.....	3 or	3 or	3 or
38-89-90 Ear-Training	1	1	1
45-46-47 Third-Year Pianoforte.....	4	4	4
75-76-77 Public-School Music.....	3	3	3
Education			
1 History of Education.....	5 Ed. 45 educ. psychol.	3 Ed. 3 educ. sociology or Ed. 11, Tech. of Teaching	3 3
Elective	3	3	3

Senior Year

Course	First Quarter	Second Quarter	Third Quarter
Music			
11-12-13 Analysis	1 or	1 or	1 or
20-21-22 Bach—Beethoven	2	2	2
25-26-27 Ensemble	1	1	1
48-49-50 Fourth-Year Pianoforte.....	4	4	4
78-79-80 Adv. Public-School Music...	3	3	3
Elective			

SPECIAL CURRICULUM FOR TEACHERS OF SUBNORMAL CHILDREN

In coöperation with the city schools of Minneapolis and St. Paul the course of study described below has been prepared for the training of teachers of subnormal children. Students desiring a teacher's certificate in this course should register in it at the beginning of the junior year.

Unclassed students with proper prerequisites may pursue such courses as they are qualified on the basis of previous training and experience to carry. Students earning a minimum of six credits in the starred courses and who fulfill the other requirements made by the State Department of Education will qualify for a special teaching certificate good for one year required of teachers of subnormal children in special classes for which state aid is received. All students who have not had the equivalent previously must take the course in practice teaching and handwork to qualify them for this special certificate.

The arrangement with the city schools of Minneapolis and St. Paul provides for a limited number of cadetships open to students only during the regular college year. Each cadetship will require that the student devote part of his time to study at the University and part to field service in the subnormal classes of Minneapolis and St. Paul schools. Each cadetship will pay a stipend of \$60 a month. Students desiring to apply for a cadetship are requested to file their applications with Mr. B. B. Jackson, superintendent of schools, Minneapolis, Mr. E. C. Hartwell, superintendent of schools, St. Paul, and with Mr. M. E. Haggerty, dean of the College of Education, University of Minnesota.

COURSE OF STUDY

Junior Year

FIRST QUARTER

		Credits
Education 184	Mental Efficiency.....	2
Education 134	Mental Tests.....	2
Education 37f	Elementary Weaving, etc.....	2
Physical Education 31	Plays and Games.....	0
Education 16	Technic of Teaching Subnormal Children.....	3
	Cadet teaching 12½ hours.....	5

14

SECOND QUARTER

		Credits
Education 185	Mental Deficiency.....	2
Education 135	Mental Tests.....	2
Manual Training 12f	Wood Work.....	2
Physical Education 32	Plays and Games.....	0
Sociology 1	General Sociology.....	5
Handicrafts Art Educ. 36w or su	Paper-Cutting.....	1
	Cadet teaching 12½ hours.....	2

14

THIRD QUARTER

		Credits
Education 186	Mental Deficiency.....	2
Education 136	Mental Tests.....	2
Manual Training 11w	Teachers' Course.....	2
Physical Education 33	Plays and Games.....	0
Physical Education 18	Teachers' Course in Play.....	3
Education 3	Social Aspects of Education.....	3
	Cadet teaching 12½ hours.....	2

14

Senior Year

FIRST QUARTER

		Credits
Handicrafts 35f or su	Clay-Modeling.....	1
	Adv. Technic of Teaching Subnormal Children.....	3
Education 149	Psycho-Educational Clinic.....	3
Sociology 137	Mental Case Work.....	3
Sociology 51	Background of Dependency.....	3
	Cadet teaching 12½ hours.....	2

15

DEPARTMENTAL STATEMENTS

65

SECOND QUARTER

		Credits
*Education 150	Psycho-Educational Clinic.....	3
*Home Economics 70w	Food Preparation.....	3
Sociology 138	Mental Case Work.....	3
*Sociology 52	Treatment of Dependents and Defectives.....	3
Agricultural Education 63w	Home and School Gardening.....	2
	Cadet teaching 12½ hours.....	2

16

THIRD QUARTER

		Credits
*Education 151	Psycho-Educational Clinic.....	3
*Home Economics 11	Garment-Making.....	3
Sociology 139	Mental Case Work.....	3
*Sociology 54	Child Welfare.....	3
Sociology 130	Technic of Family Treatment.....	2
Education 111	Educational Diagnosis.....	2
Agricultural Educ. 69s	Home and School Gardening.....	2
	Remedial Gymnastics.....	2
	Home Care of the Sick.....	2

18

AGRICULTURAL BIOCHEMISTRY

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
2	5	Quantitative Methods...	Jr., sr.	Chem. 10 cred.
3	6	Types of Carbon Com- pounds	Soph., jr., sr.	Chem. 10 cred.
7-8	10	General Agricultural Bio- chemistry	Soph., jr., sr.	Chem. 10 cred.
15	3	Principles of Animal Nutrition	Jr., sr.	7-8
101-102	6	Agricultural Quantitative Analysis	Jr., sr.	7-8
103	5	Dairy Chemistry.....	Jr., sr.	7-8
106	5	Chemical Technology of Agricultural Products.	Sr.	101-102
108	3	Chemistry of Wheat and Wheat Products.....	Jr., sr.	7-8
	5		Jr., sr.	101-102, or Chem. 131- 132, parallel 108
110	6	Flour Laboratory Methods	Sr.	Biol. 9 cred., org. chem.
111-112	4	Phytochemistry	Sr.	Quant. anal., parallel 111-112
113-114	3 or 5	Biochemical Laboratory Methods	Sr.	111-112, 113-114, or Physiol. 101-102 or 7-8 and 15
116	3 or 5	Chemistry of "Vita- mines" and Deficiency Diseases	Sr.	111-112, 113-114; or 103 or 110
118		Laboratory Problems in Biochemistry		

* These courses are required.

AGRONOMY AND FARM MANAGEMENT

No.	Credits	Title	Offered to	Prerequisite courses
1	3	Farm Crops.....	All	None
11	3	Farm Machinery.....	Jr., sr.	None
101	3	Farm Management I.....	Jr., sr.	1, Econ. 6
102	3	Farm Management II: Organization	Sr.	1, Econ. 6, An. Husb. 6 or 8, Soils 5
103	3	Farm Management II: Operation	Sr.	102
104	3	Farm Management III.....	Sr.	101, 102
121	3	Cereal Crops.....	Jr., sr.	1, bot. 9 cred.
122	3	Corn and Potato Crops..	Jr., sr.	1, bot. 9 cred.
123	3	Forage and Fiber Crops	Jr., sr.	1, bot. 9 cred.
131	3	Principles of Genetics...	Jr., sr.	Bot. 9 cred., an. biol. 9 cred.
132	3	Farm Crops Plant Breeding	Jr., sr.	131

ANIMAL BIOLOGY

Professors HENRY F. NACHTRIEB, HAL DOWNEY, WILLIAM A. RILEY, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate* Professor ELMER J. LUND; Assistant Professors ROYAL N. CHAPMAN, OSCAR W. QESTLUND; Instructor ADOLPH RINGOEN; Assistants GEORGE H. CHILDS, JOHN A. CEDERSTROM, EMILY H. PAYNE, EDNA M. WOLF.

REQUIREMENTS OF THE DEPARTMENT

For teacher's certificate.—For a minor recommendation: General Zoology, and at least 10 additional credits chosen from the following: General Physiology, Histology, Entomology, General Embryology, Ornithology, and Human Physiology (Medical Physiology, Course 4).

For a major recommendation: General Zoology, and at least 20 additional credits in the department. Medical Physiology (Course 4) is included among the electives.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1-2	10†	General Zoology.....	All	None
5-6-7	12†	General Zoology.....	Pre-medical	None
9-10	10†	Histology	Soph., jr., sr.	1-2 or 4 su
11	5	General Histology.....	Soph., jr., sr.	1-2 or 4 su
17-18	10†	General Physiology.....	Soph., jr., sr.	15 cr. in an. biol. or 10 cr. in an. biol. and 10 cr. in chem. or physics
23	5	Morphogenesis and Behavior of Organisms..	Soph., jr., sr.	Same as for 17, 18
	5	General Embryology....	Fr., soph., jr., sr.	1-2
37-38-39	9†	General Entomology....	Soph., jr., sr.	1-2 or 4 su
43	5	Intro. Entomology.....	Fr., soph., jr., sr.	1-2
43	5	Intro. Entomology.....	Fr., soph., jr., sr.	1-2
44	5	Animal Parasites.....	Fr., soph.	1-2 or 5-6
45-46	6†	Ornithology	Jr., sr.	1-2
59	5	General Ecology.....	Fr., soph., jr., sr.	1-2 or 4 su
102	3	Morphol. Invertebrates..	Jr., sr.	1-2 and 5 other cr. in an. biol.

* The entire course must be completed before credit is given for any quarter.

DEPARTMENTAL STATEMENTS

No.	Credits	Title	Offered to	Prerequisite courses
107	3	Protozoology	Jr., sr.	1-2 and 5 other cr. in an. biol.
109-110	10†	General Physiology.....	Jr., sr., grad.	20 cr. in an. biol.
117-118-119	9†	Ecology of Insects.....	Jr., sr., grad.	1-2 and 43s or 43su
124	5	Advanced Ecology.....	Sr., grad.	117-118-119
125-126-127	9	Advanced Entomology...	Jr., sr., grad.	1-2; 37-38 or 43
130	3	Biology Aphididae.....	Jr., sr., grad.	1-2 and 10 additional cr. in an. biol.
139-140	6	Histol. and Development of Insects.....	Jr., sr., grad.	1-2 and 37-38 or 43
144-145-146	3	Animal Parasites and Parasitism	Jr., sr., grad.	1-2 and 37-38 or 43
149-150-151	9	Blood Vertebrates	Sr., grad.	Hist., embryology, reading knowledge French, German
154-155	9	Hematology	Jr., sr.	Hist., embryology
181-182	6	General Embryology	Soph., jr., sr.	1-2 and 11
183	3	Genetics and Eugenics..	Jr., sr., grad.	1-2 or botany
197-198-199	9 or 12	Problems	Sr., grad.	1-2 and special requirements

All of the above courses carry credit in the College of Education. For description see bulletin of the College of Science, Literature, and the Arts.

ANTHROPOLOGY AND AMERICANIZATION TRAINING

Professor ALBERT ERNEST JENKS, Chairman; Professorial Lecturer RUBY BAUGHMAN; Instructors GLADYS SPEAKER, RUTH M. LINDQUIST (Home Economics), MARGARET K. MUMFORD (Home Economics); Assistant ALONZO G. GRACE.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1	5	Introduction to Anthropology	3d qu. fr., soph., jr., sr. None	
4	3	Cultural Anthropology..	Soph., jr., sr. 1	
5	3	General Immigration....	Soph., jr., sr. 1	
12	3	Ethnology	Soph., jr., sr. 1	
57-58-59§	9	Race Leaders and Programs	Jr., sr.	Three courses
70‡	3	Food Preparation in Relation to Social Work..	Soph., jr., sr.	An. Biol. 1-2
71	3	Elementary Dietetics for the Social Worker....	Soph., jr., sr.	70, Physiol. 3, or parallel
72	3	Home-Management Problems	Soph., jr., sr.	71, Econ. 7, or parallel
[108	3	Philippine Peoples.....	Jr., sr. grad.	Three courses]
110	3	Physical Anthropology and Amalgamation....	Jr., sr., grad.	1, and An. Bi. 1-2 or three courses
[112	3	The American Negro...	Jr., sr., grad.	Three courses]
113	3	The Older Immigrants..	Jr., sr., grad.	Three courses

[] Not offered in 1921-22.

† All quarters must be completed before credit is given for any quarter.

‡ Does not count as a Senior College course.

§ A student may enter any quarter.

No.	Credits	Title	Offered to	Prerequisite courses
114	3	The Newer Immigrants..	Jr. sr., grad.	Three courses
115	3	Americanisms and Assimilation	Jr. sr., grad.	Three courses
117	3	The Immigrant Woman.	Jr. sr., grad.	Three courses
118	3	Government and the Immigrant	Jr., sr., grad.	Three courses incl. 5
123-124§	6	Problems in Anthropology	Jr., sr., grad.	Three courses
128	3	Technic of Teaching Adults	Jr. sr., grad.	Three courses
129	3	Methods of Americanization	Jr., sr., grad.	128
130	3	Organization of Americanization Work.....	Jr., sr., grad.	128
131-132-133§	9	Supervised Americanization Work.....	Jr., sr., grad.	128
136	1	Americanization Directorship	Jr., sr., grad.	130 or parallel
141	3	Princip. of Adult Elem. Educ.	Jr., sr., grad.	128
142	3	Adult Elem. Learning Process	Jr., sr., grad.	141
143	3	Adult Elem. Teaching Process	Jr., sr., grad.	142
150-151-152§	9	Field Problems in Americanization	Jr., sr., grad.	128
204	3	Seminar in Anthropology	Grad.	Three courses

ASTRONOMY

Professor FRANCIS P. LEAVENWORTH, Head; Assistant Astronomer WILLIAM O. BEAL.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
4-5‡*	10	Introduction to Astronomy	3d qu fr., soph., jr. sr.	Trigonometry
7	3	Navigation	Soph., jr., sr.	Trigonometry
11†*	5	Descriptive Astronomy..	3d qu. fr., soph., jr. sr.	None
25†*	3	Stellar Astronomy.....	Soph., jr., sr.	11
51-52-53*	9	General Astronomy.....	Jr., sr.	Math. 1, 6, 7, or phys. sci. and Math. 6
62	3	Elements of Practical Astronomy	Jr., sr.	Astr. 4 or 11 or 51 and Math. 6, 7
101-102-103	9 or 18	Practical Astronomy. . .	Jr., sr., grad.	Astr. 4 or 11 or 51 and Math. 50
111 112-113	9	Celestial Mechanics.....	Sr., grad.	Math. 51
140	3	Method of Least Squares	Jr., sr., grad.	Math. 51

All of the above courses carry credit in the College of Education. For descriptions see bulletin of the College of Science, Literature, and the Arts.

* Courses 4-5, 11-25, and 51-52-53 cover much the same field. No student is advised to take more than one of these sequences.

† Does not satisfy the Junior College requirement for science.

‡ Satisfies the Junior College requirement for science.

§ A student may enter any quarter.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

Professor WINFORD P. LARSON, Chairman; Associate Professor ARTHUR T. HENRICI; Instructors ANNE BENTON, DAVID O. SPIESTERSBACH; Assistant ROBERT G. GREEN.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1	5	General Bacteriology....	Soph., jr., sr.	Chemistry 10 cr.
101	4	Special Bacteriology for Medical Students....	Jr., sr.	1
103	4	Special Bacteriology for Students of Agricul- ture	Jr., sr.	1
105	3	Household Bacteriology	Jr., sr.	1
114	3	Higher Bacteria.....	Jr., sr.	101, or 103
116	3	Immunity	Jr., sr.	101, or 103

All of the above courses carry credit in the College of Education. For descriptions of courses see bulletin of the College of Science, Literature, and the Arts.

BOTANY

Professor C. OTTO ROSENDAHL, ELIAS J. DURAND, LEE I. KNIGHT, JOSEPHINE E. TILDEN; Associate Professor FREDERIC K. BUTTERS; Assistant Professors WILLIAM S. COOPER, RODNEY B. HARVEY, NED L. HUFF; Instructor ARTHUR M. JOHNSON.

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—For a major recommendation, 30 credits in botany as follows: Courses 1-2, 7, 52, and two of either 11, 62, 63, 15.

In addition 10 credits in animal biology are required.

For a minor recommendation, 20 credits in botany including Courses 1-2, and 7. In addition 10 credits in animal biology are recommended.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1-2	10†§	General Botany.....	All	None
7	5	Taxonomy of Flowering Plants	All	2
11	5	Algae and Fungi.....	Soph., jr., sr.	2
15	5	Anatomy of Vascular Plants	Soph., jr., sr.	2
51	3	Histological Methods....	Jr., sr.	15 credits
52	5	Plant Physiology.....	Jr., sr.	15 credits
53	5	Botany of Economic Plants	Jr., sr.	15 credits
54	5	Elementary Ecology.....	Jr., sr.	15 credits

† No credit is given in either quarter until the completion of whole course.

§ Students entering college with a year of high-school botany satisfactory to the department may be admitted directly into Course 2. All such must present to the department, before registration, their high-school notebook and a statement from their teacher showing the amount and proficiency of their work.

No.	Credits	Title	Offered to	Prerequisite courses
55	5	Algae	Jr., sr., grad.	15 credits
62	5	Bryophytes & Pteridophytes	Jr., sr.	15 credits
63	5	Gymnosperms & Angiosperms	Jr., sr.	7 or 62
107	5	Bryophytes	Sr., grad.	7 and 62
108	5	Pteridophytes	Sr., grad.	7 and 62
110	5	Gymnosperms	Sr., grad.	7 and 63
113-114-115	3	Advanced Taxonomy....	Jr., sr., grad.	7
118-119	3†	Cytology	Jr., sr., grad.	51
123	3	Algae: Blue-Green.....	Jr., sr., grad.	11 or 55
124	3	Algae: Green.....	jr., sr., grad.	11 or 55
125	3	Algae: Brown.....	Jr., sr., grad.	11 or 55
126	3	Algae: Red.....	Jr., sr., grad.	11 or 55
131	5	Field Ecology.....	Sr., grad.	54
132	5	Ecological Anatomy....	Sr., grad.	54
133	5	Forest Geography of North America.....	Sr., grad.	54
141	5	Physical Phases of Plant Physiol.	Sr., grad.	52 and Gen. Org. Chem.
142	5	Plant Metabolism.....	Sr., grad.	52 and Gen. Org. Chem.
143	5	Plant Metabolism and Growth	Sr., grad.	52 and Gen. Org. Chem.
144	5	Plant Microchemistry ...	Sr., grad.	52 and Gen. Org. Chem.

For description of above courses see bulletin of the College of Science, Literature, and the Arts.

CHEMISTRY

SCHOOL OF CHEMISTRY

Professors WILLIAM H. HUNTER, CHARLES F. SIDENER; Associate Professors FRANK H. MACDOUGALL, M. CANNON SNEED; Assistant Professors LILLIAN COHEN, ISAAC W. GEIGER, LAWRENCE M. HENDERSON; Instructors CARL FOSSE, WALTER M. LAUER, LLOYD H. REYERSON. LANDON A. SARVER, LEE I. SMITH.

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Courses 6-7-8 or 9-10, 12-13, 20 or 35-36.

COURSES

Division of General Inorganic Chemistry

No.	Credits	Title	Offered to	Prerequisite courses
1-2†-3	12	Gen. Inorg. Chem.....	Pre-dents. and pre-med. only	None
4-5†	8	Gen. Inorg. Chem.....	Pre-dents. and pre-med. only	Entrance cr. in chem.
6-7†-8	15	Gen. Inorg. Chem.....	Those entering without chem.	None
9-10†	10	Gen. Inorg. Chem.....	All	Entrance cr. in chem.
11	4	Qual. Chem. Anal.....	Pre-med. and pre-dents. only	3 or 5
12-13†	10	Qual. Chem. Anal.....	All	8 or 10

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

DEPARTMENTAL STATEMENTS

71

No.	Credits	Title	Offered to	Prerequisite courses
101	2	Hist. of Chemistry.....	Sr., grad.	30
102	2 or 3	Adv. Qual. Chem.....	Jr., sr., grad.	21, 36
[103	2	Adv. Inorg. Chem.....	Jr., sr., grad.	21, 36]
104	3	Adv. Inorg. Chem.....	Jr., sr., grad.	21, 36

Division of Analytical Chemistry

No.	Credits	Title	Offered to	Prerequisite courses
20-21	10	Quant. Anal.	Soph., jr., sr.	12-13
27	4	Quant. Anal.....	Pre-med. only	11
123	3	Iron and Steel Anal....	Jr., sr., grad.	21
124	3	Mineral and Ore Anal..	Jr., sr., grad.	21
125	2 or 3	Spec. Prob. in Quant. Anal.	Jr., sr., grad.	21
126	1 or 2	Sanitary Water Anal....	Jr., sr., grad.	21 or 27

Division of Organic Chemistry

No.	Credits	Title	Offered to	Prerequisite courses
31-32†	8	Elem. Org. Chem.....	Pre-medics	11
35-36†	10	Organic Chemistry.....	Jr., sr.	15 cr. in college chem.
130	3	Inter. Org. Chem.....	Jr., sr.	36
131	3	Organic Analysis.....	Jr., sr.	21, 130
133	2	Reagents in Org. Chem.	Jr., sr.	130
137-138‡	Ar	Adv. Organic Chem. Lab.	Jr., sr.	130
139‡	Ar	Adv. Organic Chem. Lab.	Jr., sr.	138

The above courses carry credit in the College of Education. For description of courses see bulletin of the College of Science, Literature, and the Arts.

COMPARATIVE PHILOLOGY

Professor FREDERICK KLAEBER.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
101-102	4†	Science of Language....	Jr., sr., grad.	See statement
103	2	Universal Language.....	Jr., sr., grad.	Same as for 101
105	2	The Life of Words.....	Jr., sr., grad.	Same as for 101
163	3	Phonetics	Jr., sr., grad.	See statement

All of the above courses carry credit in the College of Education. For descriptions of courses see bulletin of the College of Science, Literature, and the Arts.

ECONOMICS

SCHOOL OF BUSINESS

Professors GEORGE W. DOWRIE, JOHN D. BLACK, ROY G. BLAKEY, NORMAN S. B. GRAS, JEREMIAH S. YOUNG; Associate Professors FREDERICK B. GARVER, ALVIN H. HANSEN, BRUCE D. MUDGETT; Assistant Professors Z. CLARK DICKINSON, WILLIAM L. HART, ERNEST A. HEILMAN, CLARENCE L. HOLMES, HOWARD S. NOBLE, THOMAS H. SANDERS,

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

‡ Open only to those who are taking or have taken a lecture course in Advanced Organic Chemistry.

[] Not offered in 1921-22.

J. WARREN STEHMAN, CLARA F. SYKES, HOLBROOK WORKING; Professorial Lecturer J. FRANKLIN EBERSOLE; Instructors HILDING E. ANDERSON, HERMAN H. CHAPMAN, JOSEPH E. CUMMINGS, RICHARD A. GRAVES, C. B. KUHLMAN, WALTER R. MYERS, HARRY J. OSTLUND, VICTOR H. PELZ, LAWRENCE SMITH, BERT A. WALLACE.

REQUIREMENTS OF THE DEPARTMENT

For teacher's certificate.—For major recommendation in commercial subjects, Economics 1-2, 3-4, 25-25, and 18 credits from the following group: 23, 95, 143-144, 161, 191; Geology 37, Political Science 51-52-53.

ECONOMICS

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1-2†	10	Intro. to Economic History	Fr. pre-bus. & maj. in econ.	None
3-4†	10	Principles of Economics	Soph., jr., sr.	None
14	5	Elements of Statistics...	Soph., jr., sr.	3-4
25-26†-27	8 or 11	Principles of Accounting	Soph., jr., sr.	3-4, or concurrently with 3-4
41	3	Financial Hist. of U. S. Business Law.....	Soph., jr., sr.	3-4 (See political science)
51-52-53†		Corporation Finance....	Jr., sr.	143-144
54	3	Life Insurance.....	Jr., sr.	3-4
59	3	Property Insurance....	Jr., sr.	3-4
60	3	Social Insurance.....	Jr., sr.	3-4
62	3	Colonization	Jr., sr.	3-4 (See political science)
65		Econ. of Transportation	Jr., sr.	3-4
72	3	Transportation Problems.	Jr., sr.	72
74	3	Principles of Marketing	Jr., sr.	3-4
85		Economics of Consumption		(See College of Agriculture bulletin)
90		Prin. of Organ. & Mngt.	Jr., sr.	3-4
91	3	Value and Distribution..	Jr., sr., grad.	3-4
103-104†	6	Hist. of Econ. Ideas....	Jr., sr., grad.	103-104
105	3	Land Economics.....	Sr., grad.	3-4
106§	5	Land Tenure		(See College of Agriculture bulletin)
107‡		Business Statistics.....	Jr., sr., grad.	14
112	3	Theory of Statistics....	Jr., sr., grad.	14
113	3	Econ. Hist. of Eur. and U. S., 1750 to the Present		(See History 113-114-115)]
118-119-120		Econ. Hist. of Eur., 1300-1750		(See History 116-117-118)
121-122-123†		Money and Banking....	Jr., sr., grad.	3-4
143-144†	8	Investments	Jr., sr., grad.	54, 143-144
146	3	Business Cycles.....	Jr., sr., grad.	143-144, 54 or 146
149	3	The Trust Problem.....	Jr., sr., grad.	54 and 91
153	3	Public Utilities.	Jr., sr., grad.	54
154	3	Police Power.....		(See political science)
157				

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

‡ Given at University Farm.

§ Given on both campuses.

[] Not offered in 1921-22.

No.	Credits	Title	Offered to	Prerequisite courses
158		Government and Business	(See political science)	
160	3	Economic Motives.....	Jr., sr., grad.	3-4, Psy. 1-2-3
161	3	Labor Problems and Trade Unionism.....	Jr., sr., grad.	3-4
162	3	Labor Movement in America	Jr., sr., grad.	161
167-168	6	Industrial Relations.....	Jr., sr., grad.	91 and 161
169	3	Labor and Socialist Movement in Europe..	Jr., sr., grad.	161
176	3	Commercial Policies.....	Jr., sr., grad.	3-4
191-192†	6	Public Finance.....	Jr., sr., grad.	3-4
193	3	State and Local Taxation	Jr., sr., grad.	191-192

NOTE: For courses primarily for graduates, see the School of Business bulletin. All of the above courses carry credit in the College of Education. For descriptions of courses see bulletin of the College of Science, Literature, and the Arts.

ENGLISH, RHETORIC, AND PUBLIC SPEAKING

Chairman for the Department of English, JOSEPH M. THOMAS.

Professors RICHARD BURTON, FREDERICK KLAEBER, ELMER E. STOLL, JOSEPH M. THOMAS; Associate Professors JOSEPH W. BEACH, CECIL A. MOORE, FRANK M. RARIG; Assistant Professors JAMES T. HILLHOUSE, SIGURD B. HUSTVEDT, ELIZABETH JACKSON, CHARLES W. NICHOLS, ANNA H. PHELAN, MARTIN B. RUUD, EMERSON G. SUTCLIFFE; Instructors RICHARD ATWATER, MARY BARNICLE, CECIL C. BEAN, MARY ELLEN CHASE, J. BURTON CONFREY, JOHN WILLIAM DRAPER, WILLIAM P. DUNN, DONALD W. FISHER, MARGARET GABLE, KENNETH B. HUNTER, FRANCES KELLEY DEL PLAINE, JOHN KIERZEK, CHARLES J. LINDSLEY, WALTER MACKELLAR, ARIEL MACNAUGHTON, MARJORIE NICOLSON, ROSCOE E. PARKER, GRACE RICHARDS, HARRY W. ROBBINS, STANLEY RYPINS, WILLIAM P. SANDFORD, SAMUEL R. STAUFFER; Teaching Assistants DOROTHY R. HUDSON, BENJAMIN MCCLURE, TRACY J. PEYCKE, ALFRED J. SCHWEPPE, L. J. SEYMOUR, MARY R. SLIFER.

REQUIREMENTS OF THE DEPARTMENT

For teacher's certificate in English.—

- a. English as the major subject
English-Rhetoric A-B-C; English 4 or 6 or 8, and either 44-45 or 62; Rhetoric 11-12-13 or 15-16-17, and 41-42-43 or 45-46.
- b. English as the minor subject
English-Rhetoric A-B-C; English 4 or 6 or 8; Rhetoric 11-12-13 or 15-16-17.

For a teacher's certificate in public speaking, a student must satisfy the department that he is actively interested in some phase of public speaking either as a member of a literary or debating society or as a participant in

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

a contest or dramatic performance, or as a lecturer; must have the approval of the department; and must complete the following courses: English-Rhetoric A-B-C; 11-12-13 or 15-16-17, 41-42-43, and 9 additional hours in public speaking.

COURSES IN ENGLISH

No.	Credits	Title	Offered to	Prerequisite courses
A-B-C	15	Freshman English.....	All	None
1-2-3	9	English Survey.....	Soph., jr., sr.	Rhet. 1-2-3 or 4-5-6
4	4	Old English.....	Soph., jr., sr.	A-B-C or equiv. ¹
6	4	Chaucer	Soph., jr., sr.	A-B-C or equiv.
8	4	Shakespeare	Soph., jr., sr.	A-B-C or equiv.
27	2	Hist. of the English Lang.	Soph., jr., sr.	4
40	4	Bible as Literature.....	Soph., jr., sr.	A-B-C or equiv.
[41	4	Browning and Tennyson	Soph., jr., sr.	A-B-C or equiv.]
44-45	6†	American Literature....	Soph., jr., sr.	A-B-C or equiv.
51	3	Spenser	Jr., sr.	A-B-C or equiv.
53	4	Seventeenth Century....	Jr., sr.	A-B-C or equiv.
58-59	6†	Nineteenth-Century Prose	Jr., sr.	A-B-C or equiv.
62	4	Milton	Jr., sr.	A-B-C or equiv.
64	3	Bacon	Jr., sr.	A-B-C or equiv.
66	4	English Novel.....	Jr., sr.	A-B-C or equiv.
[70	4	Masterpieces of Eliz. Drama	Jr., sr.	8]
101	2	Middle English.....	Jr., sr., grad.	4, 6
103	3	Beowulf	Jr., sr., grad.	4 and 4 credits in 6 and 8
105-106	6†	Eighteenth-Century Poetry	Jr., sr., grad.	8 cr. in Courses 4, 6, and 8
107-108	6†	Eighteenth-Century Prose	Jr., sr., grad.	8 cr. in Courses 4, 6, and 8
109-110	6†	Romantic Poets.....	Jr., sr., grad.	8 cr. in Courses 4, 6, and 8
111-112	6†	Seventeenth-Century Prose	Jr., sr., grad.	8 cr. in Courses 4, 6, and 8
123-124-125	6†	Victorian Novelists....	Jr., sr., grad.	8 cr. in Courses 4, 6, and 8
129	4	Modern Drama.....	Jr., sr., grad.	8 and 4 cr. in Courses 4 and 6
131	4	Formal Satire.....	Jr., sr., grad.	8 cr. in Courses 4, 6, and 8
133	3	Ballads	Jr., sr., grad.	8 cr. in Courses 4, 6, and 8
135 ⁶	1	Advanced Shakespeare..	Jr., sr., grad.	8 and 4 cr. in Courses 4 and 6. See note
170 ⁷	4	Advanced Chaucer.....	Jr., sr., grad.	6, and 4 cr. in Courses 4 and 8. See note

† Both quarters must be completed before credit is given.

[] Not offered in 1921-22.

¹ A-B-C as a prerequisite has for its equivalent the courses formerly numbered English 1-2-3 and Rhetoric 1-2-3.

⁶ Open without further prerequisites to students receiving B in English 8.

⁷ Open without further prerequisites to students receiving B in English 6.

DEPARTMENTAL STATEMENTS

No.	Credits	Title	Offered to	Prerequisite courses
141-142-143	6†	Historical Grammar of Eng. Lang.	Jr., sr., grad.	4 and 4 cr. in Courses 6 and 8]
144	4	Medieval Allegory.	Jr., sr., grad.	6 and 4 cr. in Courses 4 and 8]
146-147	6†	Metrical Romances.	Jr., sr., grad.	6 and 4 cr. in Courses 4 and 8
150	4	Victorian Poetry.	Jr., sr., grad.	8 cr. in Courses 4, 6, and 8
151	4	Recent Poetry.	Jr., sr., grad.	8 cr. in Courses 4, 6, and 8
152	4	Pre-Elizabethan Drama. .	Jr., sr., grad.	8 and 4 cr. in Courses 4 and 6]
155	4	American Novel.	Jr., sr., grad.	Either 8 cr. in Courses 4, 6, and 8 or 4 cr. and 44-45
160	4	Medieval Drama.	Jr., sr., grad.	8, and 4 cr. in Courses 4 and 6

COURSES PRIMARILY FOR GRADUATE STUDENTS

No.	Credits	Title	Offered to	Prerequisite courses
201	3	Old English.	Grad.	
202-203	6	Old English Poetry.	Grad.	
208	3	Piers the Plowman.	Grad.	
228-229-230	9	Seminary in Eighteenth-Century Novel.	Grad.	

COURSES IN RHETORIC

No.	Credits	Title	Offered to	Prerequisite courses
A-B-C	15	Freshman English.	All	None
4-5-6	9	Composition for Tech. Students.	All	None
11-12-13	9	Exposition, Description, Narration.	Soph., jr., sr.	1-2-3 or 4-5-6
15-16-17	9	Exposition and Argument.	Soph., jr., sr.	1-2-3 or 4-5-6
31	3	Technical Writing.	Soph., jr., sr.	4-5-6
100-101 ¹	4	Versification.	Jr., sr., grad.	See note
103-104-105	9	Studies in Structure and Style.	Jr., sr., grad.	11-12-13 or 15-16-17
107 ²	4	Imitative Writing.	Jr., sr., grad.	See note
109-110 ²	6†	Short-Story Writing.	Jr., sr., grad.	See note
111-112-113	9	Essay-Writing.	Jr., sr., grad.	11-12-13 or 15-16-17
115-116-117 ²	9	Dramatic Technic.	Jr., sr., grad.	See note
119-120-121 ⁴	9	Seminar in Writing.	Sr., grad.	See note
201-202-203 ⁵	9	Graduate Seminar.	Sr., grad.	See note

† This course must be completed before credit is given for any quarter.

[] Not offered in 1921-22.

¹ Open to those who have taken 11-12-13 or 15-16-17 and have taken or are taking 9 hours in the historical study of English poetry.

² Open to those who have taken 11-12-13 or 15-16-17 and have received a grade of A or B in at least two quarters.

³ Open to those who have taken 11-12-13 and have taken or are taking English 129.

⁴ Open with special permission to seniors and graduates. Prerequisites: Courses 1-2-3, 11-12-13, and 9 additional credits in rhetoric.

⁵ Open to graduates and to seniors taking the Honor Course. Prerequisites: Courses 1-2-3, 11-12-13 or 15-16-17 and 9 additional credits in rhetoric.

All of the above courses carry credit in the College of Education. For descriptions of courses see bulletin of the College of Science, Literature, and the Arts.

GEOLOGY AND GEOGRAPHY

Professors WILLIAM H. EMMONS, Head; FRANK F. GROUT, CLINTON R. STAUFFER; Assistant Professor THOMAS M. BRODERICK; Instructors IRA S. ALLISON, JOHN W. GRUNER, GEORGE M. SCHWARTZ, GEORGE A. THIEL, W. COURTNEY WERNER.

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate in geography.—Major recommendation: 28 credits as follows: (a) 10 credits from 29 or 1, 37, (b) 114, and one other regional course required; (c) the remaining credits from 34, 115, 116, 118, 119, 51, 67.

Minor recommendation: 19 credits as follows: (a) 10 credits from 29 or 1, 30, 37; (b) 114, and one other regional course required.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1-2 ††	10	General Geology.....	3rd qu. fr., soph., jr., sr.	Course in chem.
[4	3	Geology of Minnesota...	Soph., jr., sr.	Geol. 1]
7-8	2	General Geol. Lab.....	3rd qu. fr., soph., jr., sr.	Supports 1-2
11-12 †§	8	Introduction to Geology.	3rd qu. fr., soph., jr., sr.	None
15 †	1	Minerals and Rocks....	Jr., sr.	1 or 29
19	5	Elem. of Paleont.....	Soph., jr., sr.	1-2
21-22 †	6	Essent. of Mineralogy...	Soph., jr., sr.	Course in chem.
23-24-25 †	9	Elem. of Mineralogy....	Soph., jr., sr.	Course in chem.
27 †	1	Outlines of Mineralogy..	Jr., sr.	None
29 §	5	General Phys. og.....	Soph., jr., sr.	None
[30 §	5	Principles of Geog.....	Soph., jr., sr.	None; 1 or 29 desirable
34 §	5	Meteorology	Soph., jr., sr.	None
37 §	5	Econ. and Commerc. Geog.	Soph., jr., sr.	None
51-52 †	6	Econ. Geol.	Jr., sr.	1-2
57-58-59	9	Paleontology	Jr., sr.	1-2
61	3	Blowpipe Anal.....	Jr., sr.	22 or 25
[65	3	Crystallography	Jr., sr.	22]
67	3	Mineralogy of Chemical Materials	Jr., sr.	Chem. 21, and industrial chemistry
85	6	Field Work in North. Minn.	Jr., sr.	2
91-92-93	9	Index Fossils of N. A..	Jr., sr.	1-2

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

‡ Satisfies the Junior College requirement for science.

§ Does not satisfy the Junior College requirement for science.

¶ Does not count as a Senior College course. Not open to sophomores under the rule on p. . .

[] Not offered in 1921-22.

DEPARTMENTAL STATEMENTS

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
[101	3	Princip. of Stratig.....	Jr., sr., grad.	24-25]
105	3	Rock Study.....	Jr., sr., grad.	22 or 25
106	3	Petrography	Jr., sr., grad.	105
107-108-109	9	Paleontologic Practice...	Jr., sr., grad.	57-58-59
111	3	Ore Deposits.....	Jr., sr., grad.	2, 105
112	3	Geology of Petroleum....	Sr., grad.	111
113	3	Prob. in Ore Deposits..	Sr., grad.	112
114	5	Geog. of N. A.....	Jr., sr.	34 or 37
[115	3	Geographic Influences...	Jr., sr.	114]
[116	3	Geog. of S. A.....	Jr., sr., grad.	114]
[117	3	Resources and Trade....	Jr., sr., grad.	37, 116 or 117]
[118	3	Geography of Europe....	Jr., sr., grad.	114]
[119	3	Geography of Asia.....	Jr., sr., grad.	116, or 118]
124-125	6	Structural and Meta- morphic Geology.....	Sr., grad.	2, 105
131-132-133	9	Advanced Petrology....	Jr., sr., grad.	106
137	3	Testing Economic Minerals	Jr., sr., grad.	2, 105
140-141	6	Applied Petrography....	Jr., sr., grad.	131
144-145	6	Const. and Inter. of Geologic Maps.....	Jr., sr., grad.	2
150	Ar	Field Geol. (Black Hills)	Jr., sr. grad.	See members of depart- ment
151-152-153	9	Adv. General Geology..	Jr., sr., grad.	2
166-167	6	Mineralography	Sr., grad.	111

GRADUATE COURSES

No.	Credits	Title	Offered to	Prerequisite courses
211		Advanced Paleontology..	Consult the bulletin of the Graduate School	
214		Seminar in Ore Deposits	Consult the bulletin of the Graduate School	
220		Glacial Geology.....	Consult the bulletin of the Graduate School	
241		Field Course in Geology	Consult the bulletin of the Graduate School	
243-244		Research Course in Geology	Consult the bulletin of the Graduate School	
246		Pre-Cambrian Geology...	Consult the bulletin of the Graduate School	
247		Geology and Exploration of Lake Superior Region	Consult the bulletin of the Graduate School	
251-252		Original Problems.....	Consult the bulletin of the Graduate School	
253-254		Research Course in Ore Deposits	Consult the bulletin of the Graduate School	
263-264		Research Course in Petrology	Consult the bulletin of the Graduate School	
289-290		Research Course in Geography	Consult the bulletin of the Graduate School	

[] Not offered in 1921-22.

All of the above courses carry credit in the College of Education. For descriptions of courses see bulletin of the College of Science, Literature, and the Arts.

GERMAN

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, JAMES DAVIES, SAMUEL KROESCH; Instructors HARRY S. CANNON, LYNWOOD G. DOWNS, RICHARD JENTE, OTTO KUHLMAN, COWDEN LAUGHLIN; Teaching Fellows ESTHER STRAND DOWNS, ESTHER HENDRICKSON.

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Minor recommendation: Courses 50-51-52, 53-54-55, and six additional credits in courses numbered above 50. Major recommendation: Courses 50-51-52, 53-54-55, 56-57-58, 66, 67, and six additional credits in courses numbered above 50. Course 65 may be substituted for either Course 66 or Course 67. Course 108 is especially recommended.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
50-51-52	3	Composition	Soph., jr., sr.	11 or 14
53-54-55	3	Conversation	Soph., jr., sr.	11 or 14
56-57-58	6	Essay-Writing	Jr., sr.	52
74	3	German Poets	Soph., jr., sr.	63 or 64
63	3	Modern Drama	Soph., jr., sr.	11 or 14
64	3	Classic Drama	Soph., jr., sr.	11 or 63 or 14
65	3	Survey through reformation	Jr., sr.	3 credits above 50
66	3	Survey 18th Century	Jr., sr.	3 credits above 50
67	3	Survey 19th Century	Jr., sr.	3 credits above 50
72	3	Drama since 1880 (Sudermann)	Jr., sr.	9 credits above 50
73	3	Drama since 1880 (Hauptmann)	Jr., sr.	9 credits above 50
77	3	Faust I	Jr., sr.	6 credits above 50
100-101-102	9	Middle High German	Sr., grad.	9 credits above 50
108	3	Comparative Phonetics	Sr., grad.	See statement S. L. A. bulletin
153-154-155	9	Aspects of Literature (Hebbel, Ludwig, Anzengruber)	Sr., grad.	9 credits above 50
160-161-162	9	Lyric	Sr., grad.	9 credits above 50
225-226-227	9	Literary Problems	Grad.	

For courses in Germanic philology see statement of the Department of Comparative Philology.

All quarters must be completed before credit is given for any quarter.

All the above courses carry credit in the College of Education. For description see the bulletin of the College of Science, Literature, and the Arts.

GREEK

Professor CHARLES A. SAVAGE.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1-2-3	15†	First-Year Greek	All	None
4-5-6	10 or 15	History and Epic Poetry	All	1-2-3
7	3	Every-Day Greek	Soph., jr., sr.	1 year of lang.
51	3	Philosophy	Jr., sr.	4-5, or 4-6 or 5-6
52	3	Oratory	Jr., sr.	4-5, or 4-6 or 5-6

No.	Credits	Title	Offered to	Prerequisite courses
53	3	Dramatic Poetry.....	Jr., sr.	51 or 52
105	3	Lyric Poetry.....	Sr., grad.	51 and 53, or 52 and 53
106	3 ¹	Advanced Drama.....	Sr., grad.	53 or 105
107	3 ¹	Advanced Prose.....	Sr., grad.	51, 52, and 53 or 105
108	3 ²	Advanced Epic Poetry..	Sr., grad.	105 or 106
109	3 ²	New Testament.....	Jr., sr., grad.	51

Courses open to all. No knowledge of Greek required

42	2	Sculpture	Jr., sr.	None
43	2	Drama	Jr., sr.	None
44	2	Literature and Life....	Jr., sr.	None
45	2	Mythology	Jr., sr.	None

All of the above courses carry credit in the College of Education. For description see bulletin of the College of Science, Literature, and the Arts.

HISTORY

Professors GUY STANTON FORD, Chairman; CLARENCE W. ALVORD, WILLIAM S. DAVIS, NORMAN S. B. GRAS, ALBERT B. WHITE; Associate Professors SOLON J. BUCK, AUGUST C. KREY; Assistant Professors HAROLD QUIGLEY (Political Science), LESTER B. SHIPPEE, MASON W. TYLER, QUINCY WRIGHT (Political Science); Instructor GEORGE M. STEPHENSON.

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation: at least 36 credit hours with an average grade of 1½ honor points. At least one of the courses taken must be of intensive grade.

Minor recommendation: a minor recommendation will be given upon the completion of at least 18 credit hours with a satisfactory grade.

No major recommendation to teach history will be given unless the candidate has taken at least the general course in American history.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1-2†	10	Modern World.....	All	None
3-4†	10	England, 1066 to Present	All	None
5-6†	10	American History.....	3d qr. fr., soph., jr., sr.	None (for fr. 10 cr.)
9-10†	10	Introd. to Econ. History	3d qr. fr., soph., jr., sr.	10 cr.
11-12-13†	9	Medieval History.....	3d qr. fr., soph., jr., sr.	10 cr.
25	5	World Politics.....	3d qr. fr., soph., jr., sr.	10 cr. soc. sci.

† All quarters must be completed before credit is given for any quarter.

¹ Courses 106 and 107 are offered alternately.

² Courses 108 and 109 are offered alternately.

COLLEGE OF EDUCATION

No.	Credits	Title	Offered to	Prerequisite courses
101-102	6	French Revolution; Napoleonic Era.....	Jr., sr., grad.	20 cr. soc. sci. incl. 10 in hist. or 15 hist.
103	3	Old Orient.....	Jr., sr., grad.	20 cr. soc. sci. or 15 hist.
104	5	Near East: Modern.....	Jr., sr., grad.	20 cr. soc. sci. or 15 hist.
105	5	History of Rome.....	Jr., sr., grad.	20 cr. soc. sci. or 15 hist.
107-108	8	Europe, 1848-1914.....	Jr., sr., grad.	20 cr. soc. sci. or 15 hist.
109-110	6	English History 1815- 1920.....	Jr., sr., grad.	20 cr. soc. sci. or 15 hist.
111	4	European Background and American Immi- gration.....	Jr., sr., grad.	20 cr. soc. sci. or 15 hist.
112	4	American Immigration..	Jr., sr., grad.	20 cr. soc. sci. or 15 hist.
[113-114-115†	9	Economic History of Europe and United States.....	Jr., sr., grad.	20 cr. hist. or econ. or both]
116-117-118†	9	Economic History of Europe, 1300-1750 ...	Jr., sr., grad.	20 cr. hist. or econ. or both
119	5	Renaissance and Reform- ation.....	Jr., sr., grad.	20 cr.
120	5	Medieval Civilization....	Jr., sr., grad.	20 cr.
121-122†	6	English Background of American Colonization	Jr., sr., grad.	20 cr. hist. or pol. sci.
125	4	American Diplcm. Hist..	Jr., sr., grad.	20 cr. incl. 5-6 or 10 cr. pol. sci.
127	4	Amer. For. Rel.....	Jr., sr., grad.	20 cr. incl. 5-6 or 10 cr. pol. sci.
133	5	Pol. Hist. of Greece....	Jr., sr., grad.	20 cr. or major in Greek or Latin
134	3	Ancient Civil.: Greece..	Jr., sr., grad.	20 cr. incl. 133, or equiv. or major in Greek or Latin
135	3	Ancient Civil.: Rome....	Jr., sr., grad.	20 cr. incl. 105, or equiv. or major in Greek or Latin
137-138†	5	Eng. Leg. Institutions..	Jr., sr., grad.	20 cr. soc. sci. incl. Hist. 3-4†
140	5	Recent American Hist..	Jr., sr., grad.	20 cr. soc. sci. incl. Hist. 5-6†
141	3	West in Amer. Hist. to 1815.....	Jr., sr., grad.	20 cr. soc. sci. or 15 cr. hist.
142	3	West in Amer. Hist.: 1815-1865.....	Jr., sr., grad.	20 cr. soc. sci. or 15 cr. hist.
[144-145†	6	Hist. of Minn.....	Jr., sr., grad.	20 cr. soc. sci. incl. Hist. 5-6 or consent of instructor]
146-147†	6	Const. Hist. of U. S....	Jr., sr., grad.	15 cr. hist. or 10 cr. hist. and 10 cr. soc. sci. incl. 5 cr. pol. sci.

† The entire course must be completed before credit is given for any quarter.
[] Not offered in 1921-22.

DEPARTMENTAL STATEMENTS

No.	Credits	Title	Offered to	Prerequisite courses
148-149-150†	9	British Empire in 18th Cent.	Jr., sr., grad.	20 cr. soc. sci. incl. 10 cr. hist.
153	5	West in Amer. Pol. since 1865.....	Sr., grad.	20 cr. incl. Hist. 5-6
[154	5	Topics, Minnesota.....	Sr., grad.	20 cr. incl. Hist. 5-6]
155	5	United States, 1850-1865	Sr., grad.	20 cr. incl. Hist. 5-6
[156	5	U. S., Reconstruction...	Sr., grad.	20 cr. incl. Hist. 5-6]
157-158	10	Topics, Nineteenth Century	Sr., grad.	20 cr. incl. 107-108 or 101-102
160	5	Topics, American Colonial	Sr., grad.	20 cr. incl. 5-6 or 148-149-150
162	5	Beginnings of Parliament	Sr., grad.	20 cr., knowledge of high-school Latin
164	5	Studies in Crusades.....	Sr., grad.	20 cr., knowledge of high-school Latin
166	5	Topics, Hist. of Immigration	Sr., grad.	20 cr. consent of instructor
169	5	Econ. Hist. U. S. since Civil War.....	Sr., grad.	20 cr. hist. or econ.
[183	3	Stuart Period	Sr., grad.	20 cr. incl. 3-4]
201-202-203	9	Bibliography and Criticism		See Graduate School bulletin
205-206-207	9	Seminar, Econ. History.		See Graduate School bulletin
208-209-210	9	Seminar, Amer. History		See Graduate School bulletin

All of the above courses carry credit in the College of Education. For descriptions of courses see bulletin of the College of Science, Literature, and the Arts.

HOME ECONOMICS COURSES

No.	Credits	Title	Offered to	Prerequisite courses
3	5	Textiles	All	None
4	3	Textiles	All†	None
5-6	3	Textiles	See note††	None
11	3	Garment-Making	All	None
13	5	Dressmaking	Soph., jr., sr.	3, 11, 51, Home Pract. in Garment-Making
17	3	Advanced Clothing Construction	Jr., sr.	13, 52, 53
18	4	Commercial Clothing Manufacture	Sr.	17 or parallel
21	5	Foods and Cookery.....	Soph., jr., sr.	Chem. 5 cred. Physiol. 4 parallel
22	5	Food Economics.....	Soph., jr., sr.	21
23	5	Nutrition I.....	Jr., sr.	22, Agr. Biochem. 3 Bact. 1
24	4	Camp Cookery.....	All‡	None

† Open to juniors only in their third quarter.

‡ Not open to students in home economics.

†† For teachers only.

[] Not offered in 1921-22.

COLLEGE OF EDUCATION

No.	Credits	Title	Offered to	Prerequisite courses
34	3	Home Management: Operation and Maintenance, Lectures.....	Jr.,* sr.	22, 35, parallel, Econ. 5 or parallel
55	6	Home Management: Operation and Maintenance, Laboratory	Jr.,* sr.	22, 37 and H. E. Educ. 40 or parallel, 34 parallel Home Pract. in Foods and Cookery advised
37	3	Home Care of the Sick..	Jr., sr.	Chem. 5 cred., Bact. 1
45	2	Home Economics Survey	All	None
51	3	Drawing and Design.....		
52	3	Art History and Appreciation	Jr., sr.	51
53	4	Advanced Design.....	Jr., sr.	51
54	3	Interior Design.....	Sr.	52, 53, 131
55	3	Decorative Needlework and Other Crafts.....	Jr., sr.	51, 53 or parallel
57	3	Weaving and Other Crafts	Jr., sr.	3, 51, 53
58	3	Costume Design.....	Jr., sr.	55
61	4	Large Quantity Cookery and Marketing.....	Jr., sr.	33
63	3	Institutional Experience.	Jr., sr.	22
69	3	Institution-Management Practice	Sr.	151
70	3	Food Preparation in Relation to Social Work.	Soph.,† jr., sr.	An. Biol. 1-2, chem. 10 cred. advised.
71	3	Elementary Dietetics for the Social Workers...	Soph.,† jr., sr.	70, Physiol. 4 or parallel
72	3	Home-Management Problems	Soph.,† jr., sr.	71, Econ. 5 or parallel
103	5	Dietetics	Sr.	108
105	3	Experimental Cookery...	Jr., sr.	108
108	5	Nutrition II.....	Jr., sr.	23
109	5	Advanced Nutrition.....	Jr., sr.	108, Agr. Biochem. 2
110	3	Special Problems in Dietetics	Sr.	103
111	3	Special Food Problems..	Sr.	105, Agr. Biochem. 2
122	3	Advanced Textiles.....	Jr., sr.	3, Agr. Biochem. 2
123	2	Clothing Economics.....	Jr., sr.	13, Econ. 5
131	5	Home Management: House-Planning and Equipment	Jr., sr.	52, 53
151	4	Institution Management.	Sr.	61, 63

LATIN

Professor JOSEPH B. PIKE; Instructors MARIE B. DENNEEN, ROBERT V. CRAM.

* Open to juniors only in their third quarter.

† Open to sophomores only in their third quarter. Not open to students in home economics except by special permission of the head of the division.

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Minor recommendation: Any two of Courses 51-53 or equivalent. Major recommendation: Any two of Courses 51, 52, 53, and any two of 121-133 or equivalent.

COURSES

Junior College Courses

No.	Credits	Title	Offered to	Prerequisite courses
1-2†	10	Beginning	All	None
3	5	Caesar	All	1-2 or 1 yr. Latin
11	5	Selections	All	1, 2, 3 or 2 or 3 yrs. Latin
12	5	Selections	All	1, 2, 3 or 2 or 3 yrs. Latin
13	5	Ovid	All	1, 2, 3 or 2 or 3 yrs. Latin
21	5	Livy	All	Any 2 of 11, 12, 13 or 4 yrs. Latin
22	5	Plautus and Terence....	All	Any 2 of 11, 12, 13 or 4 yrs. Latin
23	5	Horace	All	Any 2 of 11, 12, 13 or 4 yrs. Latin

Senior College Courses

No.	Credits	Title	Offered to	Prerequisite courses
51	3	Pliny's Letters.....	Jr., sr.	Any 2 of 21, 22, 23 or equivalent
52	3	Apuleius, Short Stories.	Jr., sr.	Any 2 of 21, 22, 23 or equivalent
53	3	Suetonius, Selected Lives	Jr., sr.	Any 2 of 21, 22, 23 or equivalent
121	3	Advanced Vergil.....	Jr., sr., grad.	Any 2 of 51, 52, 53 or equivalent
[122	3	Cicero's Letters.....	Jr., sr., grad.	Any 2 of 51, 52, 53 or equivalent]
[123	3	Medieval Latin.....	Jr., sr., grad.	Any 2 of 51, 52, 53 or equivalent]
[131	3	Juvenal	Jr., sr., grad.	Any 2 of 51, 52, 53 or equivalent]
132	3	Seneca's Epistles.....	Jr., sr., grad.	Any 2 of 51, 52, 53 or equivalent
133	3	Petronius and Vulgar Latin	Jr., sr., grad.	Any 2 of 51, 52, 53 or equivalent
[201-202-203	3	Grad. Sem. Annals of Tacitus I-VI]		equivalent
211-212-213	3	Grad. Sem. Lucretius...	Sr. (major in Latin), grad.	Consult instructor
[221-222-223	3	Grad. Sem. Annals of Tacitus XI-XVI]		

Students entering second quarter. Students with two or three years of Latin may elect 12w. Students with four years Latin may elect 22w. Students entering third quarter. Students with two or three years of Latin may elect 13w. Students with four years of Latin may elect 23s.

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

[] Not offered in 1921-22.

NOTE: Courses 51, 52, and 53 are open without petition to sophomores who have the prerequisites and who satisfy the requirements given on page . . .

For description of the above courses see bulletin of the College of Science, Literature, and the Arts.

MATHEMATICS

Professors WILLIAM H. BUSSEY, DUNHAM JACKSON; Associate Professors RAYMOND W. BRINK, WILLIAM L. HART, ROYAL R. SHUMWAY, ANTHONY L. UNDERHILL; Assistant Professor RALPH M. BARTON; Instructors GLADYS E. C. GEBBENS, MINNA SCHICK, ELLA THORP.

REQUIREMENTS OF THE DEPARTMENT

For a teachers' certificate.—Minor recommendation: Courses 6, 7, 30, 50, 51, together with Courses 1 and 16 unless they were taken in high school.

Major recommendation, 8 credits in addition to the courses required for a minor recommendation.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1	5	Higher Algebra.....	All	1 yr. elem. alg.
6	5	Trigonometry.....	All	1 or prep. higher alg.
7	5	College Algebra.....	All	6
16	5	Solid Geometry.....	All	6 and 7
20	5	Mathematics of Invest- ment.....	All	6 and 7
30	5	Analytic Geometry.....	All	6 and 7
50	5	Calculus I.....	Jr., sr.	30
51	5	Calculus II.....	Jr., sr.	50
52	5	Calculus III.....	Jr., sr.	51
62-63	6	Theory of Equations....	Jr., sr.	50
70	3	History of Elem. Math..	Jr., sr.	30
71	5	Solid Analytic Geometry	Jr., sr.	50
[80-81-82*	9	Mechanics.....	Jr., sr.	50-51]
102-103-104	9	Adv. Anal. and Synthetic Geometry.....	Jr., sr.	50
106-107-108	9	Adv. Calculus and Differ- ential Equations.....	Jr., sr.	51

Course in Functions of a Real Variable, Modern Higher Algebra, The Method of Least Squares, Projective Geometry and Differential Geometry, 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.

All of the above courses carry credit in the College of Education. For description see bulletin of the College of Science, Literature, and the Arts.

MUSIC

Professor CARLYLE SCOTT, Chairman; Assistant Professor DONALD N. FERGUSON; Instructors GEORGE FAIRCLOUGH, THADDEUS GIDDINGS, GERTRUDE R. HULL, HARRISON W. JOHNSON, ABE PEPINSKY, GERTRUDE REEVES, KARL SCHEURER.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1-2-3†	9	Harmony.....	Fr., music	None
4-5-6†	6	Counterpoint.....	Fr., music	1-2-3
7-8-9†	6	Ear-Training.....	Soph. music	1-2-3
10-11-12	6	Composition.....	Jr., sr.	Consent of head of dept.
11-12-13	3	Analysis.....	Jr., sr.	1-2-3

* Course 80-81-82 may be taken simultaneously with Course 50-51.

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

‡ Required of music students without credit.

DEPARTMENTAL STATEMENTS

85

No.	Credits	Title	Offered to	Prerequisite courses
14-15-16†	9	History of Music.....	Jr., sr.	None
17-18-19†	3	Appreciation of Music..	Jr., sr.	None
20-21-22†	6	Bach and Beethoven....	Jr., sr.	14-15-16
25-26-27§	3	Ensemble	Jr., sr.	
28-29-30	6	First-Year Organ.....	Fr., music	
31-32-33	6	Second-Year Organ.....	Soph., music	
34-35-36	6 or 12	Third-Year Organ.....	Jr.	
37-38-39	6 or 12	Fourth-Year Organ.....	Sr.	
39-40-41	6 or 12	First-Year Pianoforte...	Fr. music	
42-43-44	6 or 12	Second-Year Pianoforte..	Soph., music	
45-46-47	6 or 12	Third-Year Pianoforte..	Jr.	
48-49-50	6 or 12	Fourth-Year Pianoforte..	Sr.	
51-52-53	6 or 12	First-Year Violin.....	Fr., music	
54-55-56	6 or 12	Second-Year Violin.....	Soph., music	
57-58-59	6 or 12	Third-Year Violin.....	Jr.	
60-61-62	6 or 12	Fourth-Year Violin.....	Sr.	
63-64-65	6	First-Year Vocal Train- ing	Fr., music	
66-67-68	6	Second-Year Vocal Training	Soph., music	
69-70-71	6 or 12	Third-Year Vocal Train- ing	Jr.	
72-73-74	6 or 12	Fourth-Year Vocal Training	Sr.	
81-82-83†	9	Normal Piano	Jr., sr.	
84-85-86†	9	Adv. Normal Piano.....	Sr.	81-82-83
88-89-90¶	3	Ear-Training	Jr., music	7-8-9
91-92-93	3	Orchestra	Jr., sr.	
94-95-96	6 or 12	Other Orchestral Instru- ments	Jr., sr.	
97-98-99	3	University Choir.....	Jr., sr.	Consent of head of dept.
100-101-102†	9	Romantic Movement....	Jr., sr.	14-15-16
103-104-105†	6	Advanced Harmony.....	Jr., sr.	1-2-3
106-107-108†	6	Advanced Counterpoint.	Sr.	4-5-6

PHILOSOPHY

Professors NORMAN WILDE, Head; DAVID F. SWENSON; Assistant Professor GEORGE P. CONGER.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1	5	Problems of Philosophy.	Soph., jr., sr.	None
2	5	Logic	Soph., jr., sr. ¹	None
3	5	Ethics	Soph., jr., sr.	None
10	2	Science and Religion....	Soph., jr., sr.	10 cr. in phil. or a science
50-51	10	History of Philosophy...	Soph., jr., sr.	10 cr. in phil. or 15 in phil. and soc. sci.
55	3	Esthetics	Jr., sr.	10 credits
100-101-102	9	Philosophy of Religion..	Jr., sr., grad.	10 credits
106	3	Philosophy of Education	Sr., grad.	10 cr. in phil. or edu.
[120	3	Scandinavian Philosophy	Jr., sr., grad.	10 credits]

§ Required two periods with one credit.

All of the above courses carry credit in the College of Education. For description see bulletin of the College of Science, Literature, and the Arts.

COLLEGE OF EDUCATION

No.	Credits	Title	Offered to	Prerequisite courses
124	5	Political and Social Ethics	Jr., sr., grad.	10 cr. in phil. or 20 in soc. sci.
129	3	Modern Political Thought	Jr., sr., grad.	10 cr. in phil. or 20 in social sci.
135	4	Philosophy of Plato.....	Jr., sr., grad.	10 credits in phil.
141	3	Metaphysics	Jr., sr., grad.	10 cr. in phil. including 2
147	3	Advanced Logic.....	Jr., sr., grad.	10 cr. in phil. including 2]
[151	6	Kant and His Successors	Sr., grad.	15 cr. in phil.]
161-162-163	9	Seminar	Sr., grad.	20 cr. in phil.

Nine credits in psychology will be accepted as prerequisites in philosophy, except where credits in philosophy are required.

All of the above courses carry credit in the College of Education. For descriptions see bulletin of the College of Science, Literature, and the Arts.

PHYSICAL EDUCATION

FOR MEN

Associate Professor LOUIS J. COOKE, Director; Assistant Professor WILLIAM K. FOSTER; Instructors EDWIN S. BROWN, PERCY C. GLIDDEN, CARL B. ROEMER; Assistants FRANK GILMAN, HARRY GOLDIE.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1	None	Personal Hygiene.....	Fr.	None
2	None	Gymnasium and Swimming	Fr.	None
3	2	Advanced Leaders.....	Soph., jr., sr.	Instructor's permission
4	None	Corrective Gymnastics...	All	None
5	None	Wrestling	All	Instructor's permission
6	None	Intermediate Swimming.	All	Instructor's permission
7	None	Advanced Swimming...	All	Instructor's permission
8	None	Boxing	Fr.	Instructor's permission
9	None	Intramural Athletics....	All	None

For description of courses see: pages 60-63.

PHYSICAL EDUCATION

FOR WOMEN

Professor J. ANNA NORRIS, Head; Assistant Professors MAY S. KISSOCK, VALERIA G. LADD, GERTRUDE SCHILL CRAM, ALICE J. H. TOLG; Instructors GERTRUDE M. BAKER, BEATRICE BERTHOLD, GERTRUDE K. LYON, GRACE M. ROCKWOOD.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1-2-3‡	0	Elem. Phys. Training...	Required of all new students	None
4	0	Preliminary Hygiene....	Required of all new students	None

[] Not offered in 1921-22.

‡ The third quarter of this course is open to students who have not had the first two quarters.

DEPARTMENTAL STATEMENTS

No.	Credits	Title	Offered to	Prerequisite courses
7-8-9†	0	Sophomore Physical Training	Soph.	1-2-3
10-11-12	0	Soph. Orthopedic Gymnastics	Soph.	1-2-3
13-14-15	0	Soph. Interpretative Dancing	Soph.	1-2-3
16-17-18§	0	Soph. Organized Games and Folk Dancing....	Soph.	1-2-3
19-20-21§	0	Sophomore Major Sports	Soph.	1-2-3
22-23	0	Sophomore Elementary Swimming	Soph.	1-2-3
28-29	0	Sophomore Advanced Swimming	Soph.	1-2-3, swimming test
32	3	Personal Hygiene.....	Soph., jr., sr.	An. Biol. 1-2
33	3	Hygiene of the Family..	Jr., sr.	An. Biol. 1-2
34-35-36††	3	Intermed. Physical Training	Jr., sr.	6 qtrs. of phys. tr. Per- mission of director
[37-38-39†	3	Advanced Physical Training	Sr.	10-11-12; 37-38-39. Per- mission of director]
40-41-42†	3	Interpretative Dancing..	Jr., sr.	6 qtrs. of phys. tr.
43-44-45§	3	Folk Dancing and Or- ganized Games.....	Jr., sr.	6 qtrs. of phys. tr.
46-47-48†	0	Hockey, Basket-Ball, and Baseball. No registra- tion necessary.....	Fr. jr., sr.	Permission of director
49	0	General Swimming. No registration necessary.	All	None

For description of the above courses see bulletin of the College of Science, Literature, and the Arts.

PHYSICS

Professors HENRY A. ERIKSON, W. FRANCIS G. SWANN, ANTHONY ZELENY,
JOHN T. TATE; Professorial Lecturer LOUALLEN F. MILLER.

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Sixteen quarter credits in physics.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1f,w,s,su	3	Elements of Mechanics and Sound.....	All	Trigonometry (equiv. of Math. 6)
2f,w,s,su	1	Elements of Mechanics Lab.	All	21 or reg. in 21
9s	3	Acoustics	All	None
21f,w	3	Heat	All	21
22f,w	1	Heat Lab.....	All	22, 41 or reg. in 41
31f,s	3	Light	All	21

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

‡ The third quarter of this course is open to students who have not had the first two quarters.

§ Students may enter any quarter.

[] Not offered in 1921-22.

No.	Credits	Title	Offered to	Prerequisite courses
32f,s	1	Light Laboratory.....	All	22, 51 or reg. in 51
41w,s	3	Magnetism and Electricity	All	21
42w,s	1	Magnetism and Electricity Lab.....	All	22, 61, or reg. in 61

For description of courses see bulletin of the College of Science, Literature, and the Arts.

PHYSIOLOGY

Professors ELIAS P. LYON, FREDERICK H. SCOTT; Associate Professors RICHARD O. BEARD, JESSE F. MCCLENDON, CHAUNCEY J. V. PETTIBONE; Assistant Professor FRANCIS B. KINGSBURY; Instructors CHARLES C. GAULT, ESTHER GREISHEIMER; Teaching Fellows —————

COURSES

- 4f,w,s,su. HUMAN PHYSIOLOGY. A course offered to students of the College of Science, Literature, and the Arts and the College of Education, to nurses, students in home economics, etc. Lectures and laboratory work. Prerequisites: elementary biology and chemistry, 88 hours; 5 credits. DR. LYON, DR. BEARD, MISS GREISHEIMER.
- 100f,su-101w,su. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta, and metabolism. Third-year medical students and others. Prerequisite: organic chemistry. 198 hours; 12 credits. MR. PETTIBONE, MR. KINGSBURY, MISS GREISHEIMER.
- 103f,su. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, DIGESTION, RESPIRATION, METABOLISM, NUTRITION, AND EXCRETION. Fourth-year medical students and others. Prerequisites: organic chemistry, and animal biology. 165 hours; 10 credits. MR. SCOTT, MR. MCCLENDON, and assistants.
- 104w,su. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES. Fourth-year medical students and others. Prerequisites: organic chemistry and animal biology. 88 hours; 6 credits. DR. LYON, MR. SCOTT, DR. BEARD, MR. MCCLENDON.

POLITICAL SCIENCE

Professors CEPHAS D. ALLIN, JEREMIAH S. YOUNG, ROY G. BLAKEY (Economics), NORMAN WILDE (Philosophy); Associate Professors ROBERT E. CUSHMAN, SOLON J. BUCK (History), ALVIN H. HANSEN (Economics); Assistant Professors WILLIAM ANDERSON, HAROLD S. QUIGLEY, QUINCY WRIGHT, LESTER B. SHIPPEE (History), MASON W. TYLER (History).

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate in government.—Minor recommendation: At least 18 credits in political science including American Government,

Introduction to Political Science, Government of Minnesota, and either Municipal, or State and Local, or Comparative European Government.

Bureau for Research in Government.—This bureau is organized to conduct and direct special investigations into practical politics and administrative problems, national, state, and local. Mr. Anderson will act as director, but all members of the staff will take part in the work of the bureau. Advanced and graduate students are strongly urged to take advantage of its facilities.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1	5	American Government..	Soph., jr., sr., and fr. with 10 cr. in hist.	None
3	5	Comparative European Government	Soph., jr., sr.	1
7	5	State and Local Govern- ment	Soph., jr., sr. and fr., pre- legal	1
11	5	Municipal Government..	Soph., jr., sr.	1
15	5	Introduction to Political Science	Soph., jr., sr.	1
25	5	World Politics.....	Soph., jr., sr.	1, and 10 credits in hist.
51-52-53	9	Business Law.....	Jr., sr.	10 cr. in pol. sci. or 10 cr. in econ. or 5 cr. in each
58	5	Elementary Law.....	Jr., sr.	10 cr. in pol. sci. or 5 in pol. sci. and 5 in sociol.
65	3	Contemporary Political Problems	Jr., sr.	10 cr.
107-108		See history statement.		
109-110		See history statement.		
111	3	Government of Minne- sota	Jr., sr., grad.	1, and 7, or 11, or 31
115	3	Municipal Problems.....	Jr., sr., grad.	11, or 15 cr.
117		See Civil Engineering 53-38.		
121	4	International Law: Peace	Jr., sr., grad.	10 cr. in pol. sci. or Hist. 107-108
122	4	International Law: War and Neutrality.....	Jr., sr., grad.	121
123	4	Development of Interna- tional Law and Organ- ization	Jr., sr., grad.	122
125	4	American Diplomatic History	Jr., sr., grad.	10 cr. in pol. sci. or Hist. 5-6
127	4	American Foreign Rela- tions	Jr., sr., grad.	122, or 125, or 15 cr. in pol. sci., including Course 25 and 1 star- red course
129	3	Far Eastern Politics.....	Jr., sr., grad.	122, or 125, or 15 cr. in pol. sci., including Course 25, or 10 cr. in pol. sci. and Hist. 107- 108

COLLEGE OF EDUCATION

No.	Credits	Title	Offered to	Prerequisite courses
145	3	Legislative Power and Methods	Jr., sr., grad.	15 cr.
146-147		See history statement.		
151	4	Constitutional Law: The American Federal System	Jr., sr., grad.	15 cr. including 1 starred course
152	4	Constitutional Law: Fundamental Rights and Immunities.....	Jr., sr., grad.	15 cr. including 1 starred course
158	3	Government and Business		13 cr. in pol. sci. or in economics
161	3	Comparative Federal Government	Jr., sr., grad.	15 cr.
165-166	6	Government of the British Empire.....	Jr., sr., grad.	15 cr. or Hist. 109-110
167	3	British Politics.....	Jr., sr., grad.	15 cr. or Hist. 109-110
169		See economics statement.		
171	3	Municipal Corporations..	Jr., sr. grad.	15 cr.
175	4	Law of Labor.....	Jr., sr., grad.	13 cr. in pol. sci. or in econ.
181	3	Modern Political Thought	Jr., sr., grad.	15 cr. in soc. sci. or to in philos.
185	5	Political and Social Ethics	Jr., sr., grad.	15 cr. in soc. sci. or to in philos.
191-192		See economics statement.		
193		See economics statement.		
201-202-203	9	Seminar in Public Law	Grad. and sr. with suitable preparation	Consent of instruc.
211-212-213	9	Seminar in Modern Government and Political Theory	Grad. and sr. with suitable preparation	Consent of instruc.
221-222-223	9	Seminar in Local Government and Administration	Grad. and sr. with suitable preparation	Consent of instruc.

All of the above courses carry credit in the College of Education. For description see bulletin of the College of Science, Literature, and the Arts.

PSYCHOLOGY

Associate Professors RICHARD M. ELLIOTT, Chairman; WILLIAM S. FOSTER, HERBERT WOODROW; Assistant Professors MABEL R. FERNALD, KARL S. LASHLEY, Z. CLARK DICKINSON; Professorial Lecturer MILDRED W. LORING; Instructors CHARLES BIRD, PAUL T. YOUNG.

DEPARTMENTAL STATEMENTS

COURSES				
No.	Credits	Title	Offered to	Prerequisite courses
1-2-3	6-9	General Psychology.....	Soph., jr., sr.	None
4-5	4†	Introductory Laboratory Psychology	Soph., jr., sr.	With or after 1-2
7	4	Introductory Lab. Psychology (Identical with 4-5 combined).....	Soph., jr., sr.	1-2
101-102	6†	Experimental General Psychology	Jr., sr., grad.	1-2 and either 4-5 or 7
108-109	6†	Advanced General Psychology	Sr., grad.	101-102 or by permission
114-115	6†	Human Behavior.....	Jr., sr., grad.	1-2 and either 4-5 or 7; 10 cr. an. biol. or by permission
119-120	6†	Animal Behavior.....	Jr., sr., grad.	1-2 and either 4-5 or 7; 10 cr. an. biol. or by permission
121	3	Neuro-Psychology	Jr., sr., grad.	1-2 and either 4-5 or 7; 10 cr. an. biol. or by permission
125-126	6†	Differential Psychology..	Jr., sr., grad.	1-2 and either 4-5 or 7
127	5	Social Psychology.....	Jr., sr., grad.	1-2 and either 4-5 or 7
135-136	6†	Dynamic Psychology....	Jr., sr., grad.	1-2 and either 4-5 or 7
144-145	6†	Abnormal Psychology..	Jr., sr., grad.	1-2 and either 4-5 or 7
200-201-202		Seminar in the History of Psychology.....	Grad.	
205		Advanced Differential Psychology	Grad.	
210-211-212		Research Problems.....	Grad.	
215-216-217		Seminar in Physiological Psychology	Grad.	
220-221-222		Journal Club and Seminar in Contemporary Trends in Psychology	Grad.	

All of the above courses carry credit in the College of Education. For description see bulletin of the College of Science, Literature, and the Arts.

All quarters must be completed before credit is given.

ROMANCE LANGUAGES

Professors EVERETT W. OLMSTED, Head; COLBERT SEARLES, IRVILLE C. LECOMTE; Associate Professor RUTH S. PHELPS; Assistant Professors FRANCIS B. BARTON, JULES T. FRELIN, JOSEPH E. GILLET, EUGENE F. PARKER, EDWARD H. SIRICH, GUSTAVE VAN ROOSBROECK; Professorial Lecturer ANTONIO HERAS; Instructors MARGUERITE GUINOTTE, PAUL C. KING, ANDREW MOREHOUSE, ARTURO TORRES-RIOSECO, GEORGE B. WATTS, NELSON F. COBURN, W. IRVING CROWLEY, O. K. LUNDEBERG; Assistant R. IRVING ASHMAN.

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

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Minor recommendation: in addition to Courses 1-2 and 3-4, 18 credits in one language. Major recommendation: in addition to Courses 1-2 and 3-4, 36 credits in one language.

Courses in French or Spanish conversation.—May be taken only when accompanied by the corresponding courses in composition. No credit will be given for work done in a course in conversation unless the course in composition is passed also. Courses in composition may be taken separately.

Admission to advanced courses.—No student will be allowed to elect courses more advanced than intermediate French or Spanish, who has not received a grade of C or better in the intermediate courses.

FRENCH

No.	Credits	Title	Offered to	Prerequisite courses
1-2†	10	Beginning French	All	None
3-4	10	Intermediate French	All	1-2, or 2 yrs. high-school French
8-9-10‡	9	Scientific French	Pre-med.	3 or equiv.
[11-12-13†	9	Educ., Journalism, Commerce	All	3-4 or 3 yrs. high-school French]
[14-15-16†	3	Commercial Correspondence	All	3-4 or 3 yrs. high-school French]
20	5	Oral and Written French	All	3-4 or 3 yrs. high-school French
21-22-23†	9	Survey of French Literature	All	3-4 or 3 yrs. high-school French
24-25†	10	Survey of French Literature	All	3-4 or 3 yrs. high-school French
50-51-52†	3	French Conversation*	Jr., sr.‡	3-4
53-54-55†	3	French Composition	Jr., sr.‡	3-4
56-57-58†	3	Adv. French Conversation*	Jr., sr.‡	20 or 50-51-52
59-60-61†	3	Adv. French Composition	Jr., sr.‡	20 or 53-54-55
62-63-64†	6	Practical French Phonetics	Jr., sr.‡	21-22-23 and 20 (or 50-51-52 and 53-54-55) and permission of dept.
80-81-82†	9	French Lit., 19th Century	Jr., sr.‡	21-22-23 or *24-25
[100-101-102†	6	French Oral Diction	Jr., sr., grad.	56-57-58]
103-104-105†	3	French Syntax and Comp.	Jr., sr., grad.	59-60-61
[106	5	Adv. French Phonetics	Jr., sr., grad.	56-57-58; 59-60-61, one century course and permission of dept.]
115-116-117†	9	French Lit., 17th Century	Jr., sr., grad.	21-22-23 or 24-25

* Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately.

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

‡ Open without petition to sophomores who have the prerequisites.

[] Not offered in 1921-22.

† Students may enter any quarter.

DEPARTMENTAL STATEMENTS

No.	Credits	Title	Offered to	Prerequisite courses
118-119-120†	9	French Lit., 18th Century	Jr., sr., grad.	21-22-23 or 24-25
121-122-123†	9	French Lit., 16th Century	Jr., sr., grad.	80-81-82. or 115-116-117 or 118-119-120]
141-142-143†	6	Realistic Novel, 19th Century	Jr., sr., grad.	80-81-82
1450-151-152†	6	French Dramatic Literature	Jr., sr., grad.	80-81-82 or 115-116-117]
153-154-155†	6	French Lyric Poetry.....	Jr., sr., grad.	20-21-22 or 24-25
156-157-158†	6	French Classicism.....	Jr., sr., grad.	115-116-117]
159-160-161†	6	French Criticism.....	Jr., sr., grad.	80-81-82]
162-163-164†	6	French Lit. Craftsmanship	Jr., sr., grad.	80-81-82 and 115-116-117]
171-172-173†	6	Explication de Textes..	Sr., grad.	56-57-58, 59-60-61, and 115-116-117 or 118-119-120]
174-175-176†	6	Lectures in French.....	Jr., sr., grad.	50-51-52, 53-54-55; (or 20) and 80-81-82
177-178-179†	6	Adv. Lectures in French	Sr., grad.	56-57-58, 59-60-61, and 115-116-117 or 118-119-120]
191-192-193†	3	Research Methods and Material	Sr., grad.	Consent of instr.

ITALIAN

No.	Credits	Title	Offered to	Prerequisite courses
1-2†	10	Beginning Italian.....	Soph., jr., sr.	None
80	5	Italian Survey: Renaissance Period...	Jr., sr.	1-2
181	5	Italian Survey: Romantic Period.....	Jr., sr.	1-2]
153-154-155†	6	Italian Lyrics.....	Jr., sr., grad.	80 or 81]
159-160-161†	6	Dante, Petrarch, Boccaccio	Jr., sr., grad.	80 or 81
162-163-164†	3	Dante (in English).....	Jr., sr., grad.	Eng. 1-2-3 or Fr. 21-22-23. (Required of students taking 159-160-161)

SPANISH

No.	Credits	Title	Offered to	Prerequisite courses
1-2†	10	Beginning Spanish.....	All	None
3-4	10	Intermediate Spanish...	All	1-2 or 2 yrs. high-school Spanish
20	5	Oral and Written Spanish	All	3-4 or 3 yrs. high-school Spanish
50-51-52†	3	Spanish Conversation*..	Jr., sr.‡	3-4
53-54-55†	3	Spanish Composition....	Jr., sr.‡	3-4
56-57-58†	3	Adv. Spanish Conversation*	Jr., sr.‡	50-51-52 or 20

* Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately.

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

‡ Open without petition to sophomores who have the prerequisites.

[] Not offered in 1921-22.

COLLEGE OF EDUCATION

No.	Credits	Title	Offered to	Prerequisite courses
59-60-61†	3	Adv. Spanish Composi- tion	Jr., sr.‡	53-54-55 or 20
[62-63-64†	6	Practical Spanish Phonetics	Jr., sr.‡	65-66-67, and 20 (or 50- 51-52 and 53-54-55)†
65-66-67†	9	Survey of Spanish Lit..	Jr., sr.‡	3-4
68-69†	10	Survey of Spanish Lit..	Jr., sr.‡	3-4
[70-71-72†	6	South Amer. Life and Institutions	Jr., sr.‡	20, or 50-51-52 and 53- 54-55]
[73-74-75†	3	Span. Commer. Cor- respondence	Jr., sr.‡	20, or 53-54-55]
80-81-82†	9	Spanish Lit., 19th Century	Jr., sr.‡	65-66-67 or 68-69
83-84-85†	6	Span. Amer. Literature..	Jr., sr.‡	20 or 50-51-52 and 53-54- 55
[100-101-102†	6	Spanish Oral Diction....	Jr., sr., grad.	56-57-58]
[103-104-105†	3	Spanish Syntax.....	Jr., sr., grad.	59-60-61]
[115-116-117†	9	Spanish Lit., Golden Age	Jr., sr., grad.	65-66-67 or 68-69]
[141-142-143†	6	Spanish Novel.....	Jr., sr., grad.	65-66-67 or 68-69]
[150-151-152†	6	Spanish: Dramatic Lit....	Jr., sr., grad.	65-66-67 or 68-69]
156-157-158†	6	Spanish Lit., 16th Cen- tury	Jr., sr., grad.	65-66-67 or 68-69
[159-160-161†	6	Cervantes	Jr., sr., grad.	65-66-67 or 68-69]
174-175-176†	6	Lectures in Spanish.....	Jr., sr., grad.	20 (or 50-51-52 and 53- 54-55) and 65-66-67
[177-178-179†	6	Adv. Lectures in Spanish	Sr., grad.	56-57-58, 59-60-61, and one literary course above Survey]
194-195-196†	6	Introd. to Old Spanish Readings and Histor- ical Grammar.....	Sr., grad.	Permission of instructor

All of the above courses carry credit in the College of Education. For description see bulletin of the College of Science, Literature, and the Arts.

SCANDINAVIAN LANGUAGES

Professors GISLE C. J. BOTHNE, Chairman; Andrew A. STOMBERG.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1-2	10	Beginning Norwegian...	All	None
3	5	Intermediate Norwegian.	All	1-2, or 1 yr. h.s.
4-5	10	Adv. Norwegian (Sur- vey)	Soph., jr., sr.	1-2-3 or 2 yrs. h.s.
7-8	10	Beginning Swedish.....	All	None
9	5	Intermediate Swedish...	All	7-8, or 1 yr. h.s.
10-11	10	Advanced Swedish.....	Soph., jr., sr.	7-8-9 or 2 yrs. h.s.
12	5	Anc. and Med. Scand. Hist.	Soph., jr., sr.	10-11, or 4-5 or Hist. 1-2
45	3	Scandinavian Mythology.	Jr., sr., grad.‡	None
101-102-103	9	Modern Norweg. Litera- ture	Jr., sr., grad.	4-5

* Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately.

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

‡ Open without petition to sophomores who have the prerequisites.

[] Not offered in 1921-22.

DEPARTMENTAL STATEMENTS

96

No.	Credits	Title	Offered to	Prerequisite courses
104-105	6	Mod. Scand. History....	Jr., sr., grad.	10-11-12 or 4-5 or 15 cr. in hist.
107-108-109	9	Mod. Swed. Literature..	Jr., sr., grad.	10-11-12
110	3	Ibsen	Sr., grad.	101-102-103
111-112-113	6	Old Norse (Icelandic)..	Sr., grad.	Consent of instr.
114	3	Strindberg	Sr., grad.	107-108-109
117	5	Earlier Norweg. Literature	Jr., sr., grad.	4-5
[130-131-132	9	Danish Lit. of 19th Century	Jr., sr., grad.	4-5]
[134-135	6	The Landsmaal Movement and Literature..	Sr., grad.	101-102-103 or 130-131-132]
136	3	Björnson	Sr., grad.	101-102-103 or 130-131-132
201-202-203		Seminar in History of Scandinavian Languages, including Semasiology	See Graduate School bulletin	
204-205-206		Seminar in Old Norwegian	See Graduate School bulletin	
209-210		Seminar in Modern Swedish Languages and Literature.....	See Graduate School bulletin	
215-216-217		Seminar in Modern Norwegian Literature.....	See Graduate School bulletin	

All of the above courses carry credit in the College of Education. For description see bulletin of the College of Science, Literature, and the Arts.

SOCIOLOGY AND SOCIAL WORK

Professors LUTHER L. BERNARD, Acting Chairman; FRANK J. BRUNO; Associate Professor MANUEL C. ELMER; Assistant Professors ROSS L. FINNEY, GUSTAV A. LUNDQUIST; Lecturers OTTO W. DAVIS, WILLIAM W. HODSON, EDWARD C. WAITE; Instructors LOUIS A. BOETTIGER, CHARLES E. LIVELY; Supervisor of Field Work MILDRED D. MUDGETT.

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Minor recommendation: nine credits in addition to beginning, intermediate, and advanced. Major recommendation: eighteen credits in addition to beginning, intermediate, and advanced.

COURSES

No.	Credits	Title	Offered to	Prerequisite courses
1	5	Introduction to Sociology	Soph., jr., sr., & 3rd qr. fr.	None
6	3	Modern Social Reform Movements	Soph., jr., sr.	1
14	3	Rural Sociology.....	Soph., jr., sr.	1 for arts students. None for seniors in professional schools

[] Not offered in 1921-22.

COLLEGE OF EDUCATION

No.	Credits	Title	Offered to	Prerequisite courses
51	3	Background of Depend- ency and Defectiveness	Jr., sr.	10 cr. in social; or 10 cr. in social and pol. sci., econ., or psych.
52	3	Treatment of Dependents and Defectives.....	Jr., sr.	51
53	3	Treatment of Delin- quents	Jr., sr.	Same as for 51
55	3	Housing Problems.....	Jr., sr.	Same as for 51
60	3	Child Welfare.....	Jr., sr.	51 and 52
61	3	Legal Protection of the Child	Jr., sr.	60
97-98-99	3, 6 or 9	Supervised Field Practice Work	Jr., sr.	Consent of dir.
100	3	Social Psychology.....	Jr., sr., grad.	1 and Psych. 1-2
101	3	Social Organization.....	Jr., sr., grad.	Three courses one of which may be in psych., philos., econ., pol. sci., anthro., or educ.
102	3	Social Control.....	Jr., sr., grad.	Same as for 101
110	2	Community Organization and Social Work in Small Towns.....	Jr., sr., grad.	Same as for 51
114	3	Rural Social Institutions	Jr., sr., grad.	Same as for 51
119	3	The Family.....	Jr., sr., grad.	Three courses 1 of which may be in home econ., econ., pol. sci., anthropol., or law
120	3	Social Progress.....	Jr., sr., grad.	Same as for 101
122	3	Methods of Social In- vestigation	Jr., sr., grad.	Three courses
123	3	Social Statistics.....	Jr., sr., grad.	122
128	2	Charitable Admin. Finance and Publicity	Jr., sr., grad.	Three courses
130	2	Technic of Family Treatment	Jr., sr., grad.	51, 52
132	2	Juvenile Courts and Probation	Jr., sr., grad.	51, 52, 53
133	3	Medical Social Service..	Jr., sr., grad.	51, 52, and one other Senior College course
140	3	History of Social Theory	Jr., sr., grad.	Same as for 101
141	3	Contemporary Social Theory	Jr., sr., grad.	140
204-205-206	6	Seminar in Social Theory	Grad.	Consent of instruc.
221-222-223	0	Graduate Field Training	Grad.	Consent of director
138	3	Mental Case Work.....	Jr., sr., grad.	Same as for 133
139	3	Mental Case Work.....	Jr., sr., grad.	138

All of the above courses carry credit in the College of Education. For descrip-
tion see bulletin of the College of Science, Literature, and the Arts.

PROGRAM
ART EDUCATION

COURSES

No.	Title	Hours	Days	Room	Instructor
29f-30w-31s	Fundamental Principles of Design	(II) III (IV)	TThS	401F 404F	Miss Raymond
40f-41w-42s	Principles of Harmony in Form and Color.....	(I) II (III)	TThS	406F	Miss Raymond
53f-54w	Design for the Consumer....	V (VI) (VII) (VIII)	MWF	402F	Miss Raymond
60w-61s	Commercial and Industrial Design	(V) VI (VII)	TTh and Ar	402F	
32Af-33Aw- 34As	Still Life Drawing.....	(I) (II) (III) (VI) (V) (VI) (VII)	M M	401, 402, 404F	Mrs. Martin
32Asu or 33Asu or 34A su Ar					
32Bf-33Bw- 34Bs	Composition	(I) II, III (IV)		402, 404F	Mrs. Martin, Miss Ross
32Cf-33Cw- 34Cs	Sketch	(I) (II) (III) (IV)	F	402, 404F	Mrs. Martin, Miss Ross
		(I) (V) (VI) (VII)	TThS W		
32Csu or 33Csu or 34Csu Ar					
43Af-44Aw- 45As	Water Color.....	(I) II, III (IV)	M	406, 411F	Miss Raymond
43Asu or 44Asu or 45Asu Ar					
43Bf-44Bw- 45Bs	Charcoal, Pencil, Pen Technics	(I) II, III (IV)	W	406F	Mrs. Martin
43Cf-44Cw- 45Cs	Sketch, Course II.....	(I) (II) (III) (IV)	F	401, 402F	Mrs. Martin, Miss Ross
43Csu or 44Csu or 45Csu Ar					
13Ad-44Ad- 45Ad	Advanced Drawing (Ar)	I, II	MWF	13ME	Mr. Kirchner
D.D.G.41, 42, 43f,w,s	Mechanical Drawing.....	V, VI	MWF		Mr. Cederberg
D.D.G.44f, 45w, 46s	Technical Drawing, Drafting, and Tracing.....	V, VI, VII	TTh	Ar	Mr. Kirchner, Mr. Schuck
35f.su 37f	Clay-Modeling	V, VI (VII) (VIII)	W	411F	Mrs. Martin
	Elementary Weaving, Basketry, and Allied Crafts	V, VI (VII) (VIII)		106F	Miss Ross

COLLEGE OF EDUCATION

No.	Title	Hours	Days	Room	Instructor
38f,s,su	Elementary Pottery.....	V, VI (VII) (VIII)	MF	411 and Kiln Room	Miss Ross
46w,su	Advanced Pottery.....	V, VI, (VII). (VIII)	MF	411 and Kiln Room	Miss Ross
36Aw,su	Cardboard and Paper Con- struction	V (VI)	TTh	404F	Mrs. Martin
36Bw,su	Book-Binding	V, VI (VII)	MW	404F	Mrs. Martin, Miss Ross
50w	Application of Design in Needlecraft	(V) (VI) VII	MF	406F	Miss Ross
52s	Application of Design to Fabrics	V, VI (VII)	TTh	404F	Miss Ross
47s	Metal Work.....	V, VI (VII)	WF	411F	Mrs. Martin, Miss Ross
Man.Tr.11w	Wood Work for Primary Grades	VI, VII	TTh	Ed Shop	Mr. Stockwell
Man. Tr.12f	Wood Work for Elem. Grades	VI, VII	MWF	Ed Shop	Mr. Stockwell
H.E.57w	Weaving on Table Looms..			307HE	Miss Morse
<i>Art History and Appreciation</i>					
Home Econ. 52f,w,s	Art History and Appreciation arranged with the History and Greek departments and with the Art Institute and the Walker Gallery				Miss Goldstein, Mr. Savage, Miss Raymond, Mrs. Martin
<i>Teacher Training</i>					
56Af,s	Types of Art Instruction....	(I) II, III (IV) VI, VII	TTh	402F	Miss Ross
56Bw,Cs	Types of Art Instruction....	(V) (VI) (VII) (VIII)	MW TTh		Miss Raymond
56s	Teachers' Course in Art....	(V) VI (VII)	MWF	402F	Miss Raymond
57f,58w,59s	Practice Teaching.....	V, VI, VII	TTh	Public Schools	Miss Raymond

NOTE: Three hours are required for 1 credit in laboratory courses. The hours in parenthesis are laboratory hours and may be adjusted to suit individual schedules.

NOTE: Handicraft courses are especially recommended to those desiring training for occupational therapy or other forms of social service.

Courses for Public-School Teachers

NOTE: Courses equivalent to parts of those listed above in design, drawing, and the handicrafts will be offered if there is sufficient demand, on Saturday mornings. Those interested should consult with the Art Education faculty.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

COURSES

No	Title	Hours	Days	Room	Instructor
M.T.13s	Organization and Supervision of Manual Training.....	I	MWF	115Ed	Mr. Stockwell
65w	The High School.....	II	TThS	102Ed	Mr. Koos
113f	High-School Curriculum.....	II	TThS	102Ed	Mr. Powers
113w-114s	High-School Curriculum.....	III, IV	S	112Ed	Mr. Powers
119w	Elementary-School Cur- riculum	VII	MWF	102Ed	Mr. Neale
119Tf	Elementary-School Cur- riculum	I, II	S	113Ed	Mr. Neale

PROGRAM

99

No.	Title	Hours	Days	Room	Instructor
121f	Organ. and Superv. of the Elementary School.....	VII	MWF	102Ed	Mr. Neale
121Tw-122Ts	Organ. and Superv. of the Elementary School.....	I, II	S	113Ed	Mr. Neale
124f-125w-126s	Educational Admin.....	VIII	MWF	205Ed	Mr. Neale
160f-161w-162s	Theory of Supervision.....	III, IV	S	102Ed	Mr. Neale
164s	Problems of High-School Administration	II	TThS	102Ed	Mr. Powers
167f-168w	Junior High School.....	VIII, IX	Th	112Ed	Mr. Powers
174w	Public-School Finance.....	VI	TTh	102Ed	Mr. Swift
175s	City School Finance.....	VII	MWF	102Ed	
178f-179w	School Surveys.....	VIII	MWF	203Ed	
180f	Junior College.....	VIII, IX	Th	102Ed	Mr. Koos
205f-206w-207s	Seminar in Educ. Admin....	Ar	Ar	111Ed	Mr. Neale
208f	Methods of Educ. Research..	III, IV	S	113Ed	Mr. Swift
215f-216w-217s	Seminar in Education in the United States.....	VIII, IX	W	Ar	Mr. Swift
218f-219w-220s	Seminar in Secondary-School Problems	Ar	Ar	111Ed	Mr. Koos

EDUCATIONAL PSYCHOLOGY

COURSES

No.	Title	Hours	Days	Room	Instructor
55f,s	Elementary Educational Psychology	I	MWF	Psy	Mr. Miller, Miss Dealey
55w	Elementary Educational Psychology	IV	MWF	Psy	Mr. Miller, Miss Dealey
106f-107w-108s	Advanced Educational Psychol.	III	MWF	Psy	Mr. Van Wageningen
111s	Educational Diagnosis.....	II	MWF	Psy	Mr. Van Wageningen
111Tf-112Tw	Educational Diagnosis (for teachers)	I, II	S	Psy	Mr. Van Wageningen
126f-127w	Methods in Educ. Rsch.....	VIII, IX	T	Psy	Mr. Van Wageningen
128s	Review of Statistical Studies	VIII, IX	T	Psy	Mr. Van Wageningen
134f-135w-136s	Mental Tests and Mental Diagnosis	VI, VII	TTh	Psy	Mr. Miller
134f-135w-136s	Mental Tests and Mental Diagnosis (For teachers of subnormal children).....	I, II	S	Psy	Mr. Kuhlmann
138w-139s	Experimental Education.....	VIII, IX	MW	Psy	Mr. Miller, Mr. Van Wageningen
149f-150w-151s	Psycho-Educational Clinic....	11:30 to 1:30	MWF	MH	Miss Dealey

No.	Title	Hours	Days	Room	Instructor
149f-150w- 151s	Psycho-Educational Clinic...	1:00-3:00	F	Ar	Mr. Kuhlmann
153f-154w- 155s	Research Problems.....	Ar	Ar	Ar	Mr. Haggerty, Mr. Van Wageningen.
156s	Psychol. Problems of Vocational Education.....	I, II	S	Psy	Miss Dealey
184f-185w- 186s	Mental Deficiency.....	III, IV	S	Psy	Mr. Kuhlmann
197f	Seminar: Problems of Subnormality	VIII, IX	F	Psy	Mr. Kuhlmann
201f-202w- 203s	Seminar in Educational Psychology	Ar	Ar	203	Mr. Haggerty

HISTORY AND PHILOSOPHY OF EDUCATION

COURSES

No.	Title	Hours	Days	Room	Instructor
1f	5 Brief Course in History of Education.....	II	MWThFS	102Ed	Miss Alexander
	Sec. 1	IV	MTWFS	205Ed	Miss Alexander
	2	VI	MTWThF	205Ed	Miss Alexander
	3				
1w	Brief Course in History of Education	II	MTWThF	205Ed	Miss Alexander
1s	Brief Course in History of Education	II	MTWThF	205Ed	Miss Alexander
3f	Educational Sociology.....	II	MWF	205Ed	Mr. Finney
	Sec. 1	III	MWF	205Ed	Mr. Finney
	2	III	MWF	205Ed	Mr. Finney
3w,9 48w	Educational Sociology.....	III	MWF	205Ed	Mr. Finney
48s	Public Education in the United States.....	VI	MWF	102Ed	Mr. Swift
	Public Education in the United States (offered at U Farm).....	VI	MWF	Farm	Miss Alexander
101f	Found. of Modern Educ.....	VII	MWF	205Ed	Mr. Swift
102w	Hist. of Mod. Sec. Educ. and Higher Education.....	VII	MWF	205Ed	Mr. Swift
103s	Hist. of Mod. Elem. Education	VII	MWF	205Ed	Mr. Swift
129w-130s	Educational Classics.....	VI	MWF	205Ed	Mr. Swift, Miss Alexander
131w-132s	Comparative School Systems.	III	MWF	102Ed	Miss Alexander
148Tf	Advanced Course in Public Education in the United States	I, II	S	205Ed	Mr. Swift
211f-212w- 213s	Seminar in History of Education	VIII, IX	F	Ar	Mr. Swift

PROGRAM

101

THEORY AND PRACTICE OF TEACHING

COURSES

No.	Title	Hours	Days	Room	Instructor
11f,w,s	Technic of Teaching.....	I	MWF	205Ed	
15f,w,s	Practice Teaching.....	Ar	Ar	Ar	Mr. Reeve
<i>Special Methods</i>					
128f	Technic of Teaching Adults..	I	MWF	25F	Miss Baughman
129w	Methods of Americanization..	I	MWF	12F	Miss Baughman
131f-132w-	Supervised Americanization				
133s	Work	VI	T and Ar	12F	Miss Baughman, Miss Speaker, Mr. Grace
56Af,s	Types of Art Instruction....	(I) II, III (IV), VI, VII	Th	402F	Miss Ross
56s	Teachers' Course in Art....	(V) VI (VII)	MWF	402F	Miss Raymond
57f,58w,59s	Practice Teaching in Art....	V, VI, VII	TTh	Public Schools	Miss Raymond
175s	Nature Study.....	V, VI, VII	TTh	213AB	Mr. Sigerfoos
61f,s	Teachers' Course in Botany..	VII	MTWThF	210P	Mr. Johnson
19s	Teachers' Course in Chem- istry	III	MWF	315C	Mr. Geiger
16w	Technic of Teaching Sub- normal Children.....	VIII	MWF	Psy	
17s	Practice Teaching of Sub- normal Children.....	Ar	Ar	Ar	Mr. Haggerty
48w	Methods and Problems of Secondary-School Science..	VII	MWF	Ar Ed	Mr. Powers
80f,w	Teachers' Course in English	II	MWThF	206Ed	Miss Inglis
55f	Teachers' Course in Geog..	I	MWF	ArP	
71f,s	Teachers' Course in German..	II	MWF	112Ed	Miss Hubman
56f,s	Teachers' Course in History	VIII	MWF	111Lib	Mr. Krey
81f,w	Teachers' Course in Latin... I		MWF	101Ed	Miss Denneen
M.T.11w	Teachers' Course in Wood Work for Primary Grades..	VI, VII	TTh	24Ed	Mr. Stockwell
M.T.12f	Teachers' Course in Wood Work for Elementary Grades	VI, VII	MWF	24Ed	Mr. Stockwell
54f s	Teachers' Course in Mathe- matics	IV	MTWThF	102Ed	Mr. Reeve
75f-76w-77s	Public-School Music.....	4-5:30	WF	117Ed	Mr. Giddings
78f-79w-80s	Adv. Public-School Music...	4-5:30	WTh	113Ed	Mr. Giddings
90s	Teachers' Course in Physics..	VII	MWF	8Ed	Mr. Powers
77f	Anatomy and Kinesiology... Lect.	III	MWF	201WGM	
	Lab.	V	MWF	151WGM	
56s	Teachers' Course in Pol. Sci.	VII	M	204Ed	Mr. Tohill
91f	Teachers' Course in French..	II	MWF	111Ed	Miss de Boer
92w	Teachers' Course in Spanish	II	MWF	111Ed	Miss de Boer
116s	Teachers' Course in Nor- wegian	Ar	Ar	206F	Mr. Stomberg
115w	Teachers' Course in Swedish	Ar	Ar	206F	Mr. Bothne
152f	Elem. Methods in Reading...	I, II	S	203Ed	Miss Lommen
153f	Elem. Methods in English...	III, IV	S	203Ed	Miss Lommen
154w	Elem. Methods in History...	I, II	S	203Ed	Miss Lommen

COLLEGE OF EDUCATION

No.	Title	Hours	Days	Room	Instructor
155w	Elem. Methods in Geography	III, IV	S	203Ed	Miss Lommen
156s	Elem. Methods in Arithmetic	I, II	S	203Ed	Miss Lommen
157s	Elem. Methods in Industrial Arts	III, V	S	203Ed	Miss Lommen
158s	Practice Teaching and Observation in Normal Training Departments	Ar	Ar	Ar	Miss Lommen

AGRICULTURAL EDUCATION

COURSES

No.	Title	Hours	Days	Room	Instructor
11f,w,su	Principles of Vocational Education	II	TThS	307Ad(F)	Mr. Dyer
41f,w	Vocational Education	I	TThS	307Ad(F)	Mr. Mayne
41f,w,s	Apprentice Teaching	II	MWF or Ar	317Ad(F)	Mr. Field
42f,w ¹	Teaching	I	MWF or Ar	317Ad(F)	Mr. Field
53s,su	Consolidated Rural Schools	Ar	Ar	Ar	Mr. Dyer
54w,su	Rural Education and Community Life	Ar	Ar	Ar	Mr. Dyer
63f-64w-65s	General Agriculture	Ar	Ar	Ar	Mr. Storm, Mr. Mayne, Mr. Field
71s	Extension Work	II	TThS	137Ad(F)	Mr. Storm, et al
72f,w,s,su	Agricultural Extension Field Course	Ar	Ar	Ar	Mr. Storm, et al
74su ²	Visual Presentation	Ar	Ar	317Ad(F)	
75f,w	Visual Presentation	Ar	Ar	317Ad(F)	
121w	Teachers' Course in Home- and School-Garden Supervision	Ar	Ar	Ar	Mr. Field
131f,s,su	Methods in Teaching High-School Agriculture	III	MTWThFS	317Ad(F)	Mr. Field
151f,s	Organization and Management	IV	MTWFS	317Ad(F)	Mr. Storm, Mr. Dyer
161f-162w-163s(su)	Fundamentals of Agriculture	Ar	Ar	Ar	Mr. Storm, et al
164s,su ²	Fundamentals of Agriculture	Ar	Ar	Ar	Mr. Field, et al
176s,su	Advanced Visual Presentation	Ar	Ar	Ar	
181w	Agricultural Statistics and Graphic Representation	Ar	Ar	Ar	
191f-192w-193s-194su	Seminar in Agric. Educ.	Ar	Ar	Ar	Mr. Storm, Mr. Field

¹ It may be possible for a very limited number to take this course in the spring quarter. To do so, approval of the instructor and chief of the division will be necessary.

² Special reduced courses for consolidated-school principals.

PROGRAM

103

HOME ECONOMICS EDUCATION

COURSES						
No.	Title	Hours	Days	Room	Instructor	
40f 42f,s ¹	Child Training.....	IV	MWF	203HE	Miss Binzel	
	Special Methods of Teaching Home Economics.....	VII	MTWThF	313HE	Miss Miller, Miss Clara Brown	
43w	Organization and Methods for Related Art Teaching.	IV	MWF	402HE	Miss H. Goldstein	
44s	Methods in Home Economics Extension Work.....	IV	MWF	309HE	Miss Lombard, Miss Newton	
46f,w	Observation and Teaching: Related Art.....					
	Lect.	VIII	TTh	213HE		
47f,w	Teaching Observation and Teaching: Foods and Home Manage- ment	Ar	Ar	Ar	Miss Brown, Miss Bacon	
	Lect.	VIII	TTh	213HE	Miss Miller, Mrs. Dorsey	
	Teaching	Ar	Ar	Ar	Miss Lombard, Miss Rider	
48f,w	Observation and Teaching: Textiles and Clothing.....					
	Lect.	VIII	TTh	213HE	Miss Clara Brown, Miss Ebersole, Mrs. MacComber	
49f,w	Teaching Observation and Teaching: General Home Economics..	Ar	Ar	Ar		
	Lect.	VIII	TTh	213HE	Miss Miller, Miss Brown	
14t	Teaching Problems in Home Economics Education	Ar	Ar	Ar		
		Ar	Ar	Ar	Ar	

TRADE AND INDUSTRIAL EDUCATION

The following is a tentative program. Before registering, students should consult the adviser of the department in Room 207, College of Education.

COURSES						
No.	Title	Hours	Days	Room	Instructor	
V190f-V191w- V192s	Vocational and Industrial Education	VIII, IV	T	205Ed	Mr. Prosser	
V176f V177w- V178s	Problems in Vocational Edu- cation	VIII, IX	Th	205Ed	Mr. Payne	
V170f-V171w- V172s	Administration of Vocational Education	III, IV	S	202Ed	Mr. Payne	

¹ Offered also in the Summer School.

COLLEGE OF EDUCATION

No.	Title	Hours	Days	Room	Instructor
V169s	Methods of Establishing Part-Time Schools.....	I, II	S	202Ed	Mr. Payne
V70s	Educational and Vocational Guidance	VIII, IX	T	202Ed	Mr. Payne
V66f-V67w	Teaching Related Technical Subjects	VIII, IX	M	102Ed	Mr. Smith
V64w-V65s	Teaching Related Academic Subjects	III, IV	S	206Ed	Mr. Smith
V53w-s	Practice Teaching.....	VIII, IX	M	202Ed	Mr. Payne
V50f-V51w-V52s	Methods of Teaching Trade Subjects	VIII, IX	W	202Ed	Mr. Payne
V40f	Trade Analysis.....	I, II	S	202Ed	Mr. Payne
V35f	Teaching Vocational Hygiene and Safety.....	III, IV	S	206Ed	Mr. Smith
V33w-V34s	Teaching Vocational English	VIII, IX	Th	206Ed	Mr. Smith
V29f-V30w-V31s	Teaching Vocational Mathematics	VIII, IX	W	102Ed	Mr. Smith
V22f	Teaching Civics in Vocational Schools	VIII, IX	Th	102Ed	Mr. Smith
V23s	Study of Materials in Vocational Schools.....	VIII, IX	M	102Ed	Mr. Smith
V20f	History and Literature of Vocational Education.....	VIII, IX	F	102Ed	Mr. Smith
V21s	Buildings, Equipment, Records for Vocational Schools	VIII, IX	F	202Ed	Mr. Smith

PHYSICAL EDUCATION

FOR WOMEN

COURSES

No.	Title	Hours	Days	Room	Instructor
1-2-3	Elem. Physical Training....	IV	MWF	3,151,153WGm	Ar
		V	MWF	3,151,153WGm	Ar
		VI	MWF	3,151,153WGm	Ar
		VII	MWF	3,151,153WGm	Ar
		III	TThS	3,151,153WGm	Ar
4f	Preliminary Hygiene.....	I	M	201WGm	Dr. Norris
		II	T	201WGm	Dr. Norris
		IV	T	201WGm	Dr. Norris
		VII	T	201WGm	Dr. Norris
		III	W	201WGm	Dr. Norris
19-20-21	Sophomore Major Sports....	VIII	MW	151WGm	Ar
		IV	MW	51WGm	Ar
22f-23w(22s)	Sophomore Elem. Swimming	VI	MW	51WGm	Ar
		II	TTh	51WGm	Ar
		III	MTh	51WGm	Ar
		III	TF	51WGm	Ar
		IV	TS	51WGm	Ar
		VI	TTh	51WGm	Ar
		VII	TTh	51WGm	Ar
		VII	MW	51WGm	Ar
		III	WS	51WGm	Ar
		III	TThS	201WGm	Ar
28f-29w(23s)	Soph. Advanced Swim.....	VII	MW	51WGm	Ar
32w	Personal Hygiene.....	III	WS	51WGm	Ar
		III	TThS	201WGm	Ar

PROGRAM

No.	Title	Hours	Days	Room	Instructor
33s	Hygiene of the Family.....	II			
43-44-45	Folk Dancing and Organized Games	V	MWF	201WGm	Dr. Norris
46-47-48	Hockey, Basket-Ball, Baseball	VIII	TThF	151WGm	Miss Kissock
51f-52w	Gymnastics for Sophomores..	II	TTh	151WGm	Ar
54f-55w	Gymnastics for Juniors.....	VII	TTh	153WGm	Miss Rockwood
56s	Swimming, technic.....	II			
58w-59s	Adv. Folk Dancing, technic.	VIII	W	51WGm	Miss Rockwood
60-61-62	Adv. Org. Games, technic..	II	F		
63-64-65	Major Sports, technic.....	VI	MW	153WGm	
		VIII	MF	151WGm	
		VII	F		
66-67-68	Interpretative Dancing.....	III	TTh	153WGm	Miss Kissock, Miss Rockwood
72f	Gymnastics for Seniors.....	VIII	MWF	153WGm	Miss Baker
76w	Physical Diagnosis.....	Ar	MW	153WGm	Miss Baker
77f	Anatomy and Kinesiology....	I	Ar		Dr. Barron
80f-81w	Kinesiology	II	TThS Lect.		
82s	Technic of Gym. Teaching..	IV	MWF Lab.	201WGm	Mrs. Cram
		IV	MWFS	201WGm	Mrs. Cram
		II	TS Lect.	201WGm	Mrs. Cram
		VII	TTh Lab.	153WGm	
83s	Physical Examination.....	V	TTh Lab.		
84f	Prin. of Physical Educ.....	III	MTTh	201WGm	Dr. Tolg
85w	Hist. of Phys. Educ.....	IV	TThS	201WGm	Miss Baker
87s	Community Health Problems	I	T	201WGm	Dr. Norris
88-89-90	Orthopedic and Remedial Gymnastics	II	WF	201WGm	
91w	Principles Underlying Dancing	VI	TTh, Ar	3WGm	Dr. Tolg
92s	Practice Teaching, Playground	Ar	T	151WGm	Miss Baker
93w	Practice Teaching Gymnastic	Ar		Ar	
94s	Practice Teaching, Dancing..	Ar		Ar	
95s	Practice Teaching, Swimming	Ar		Ar	
96f,w,s	Practice Teaching, Major Sports	Ar		Ar	