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# Bulletin of The University of Minnesota

THE LAW SCHOOL

1915-1916

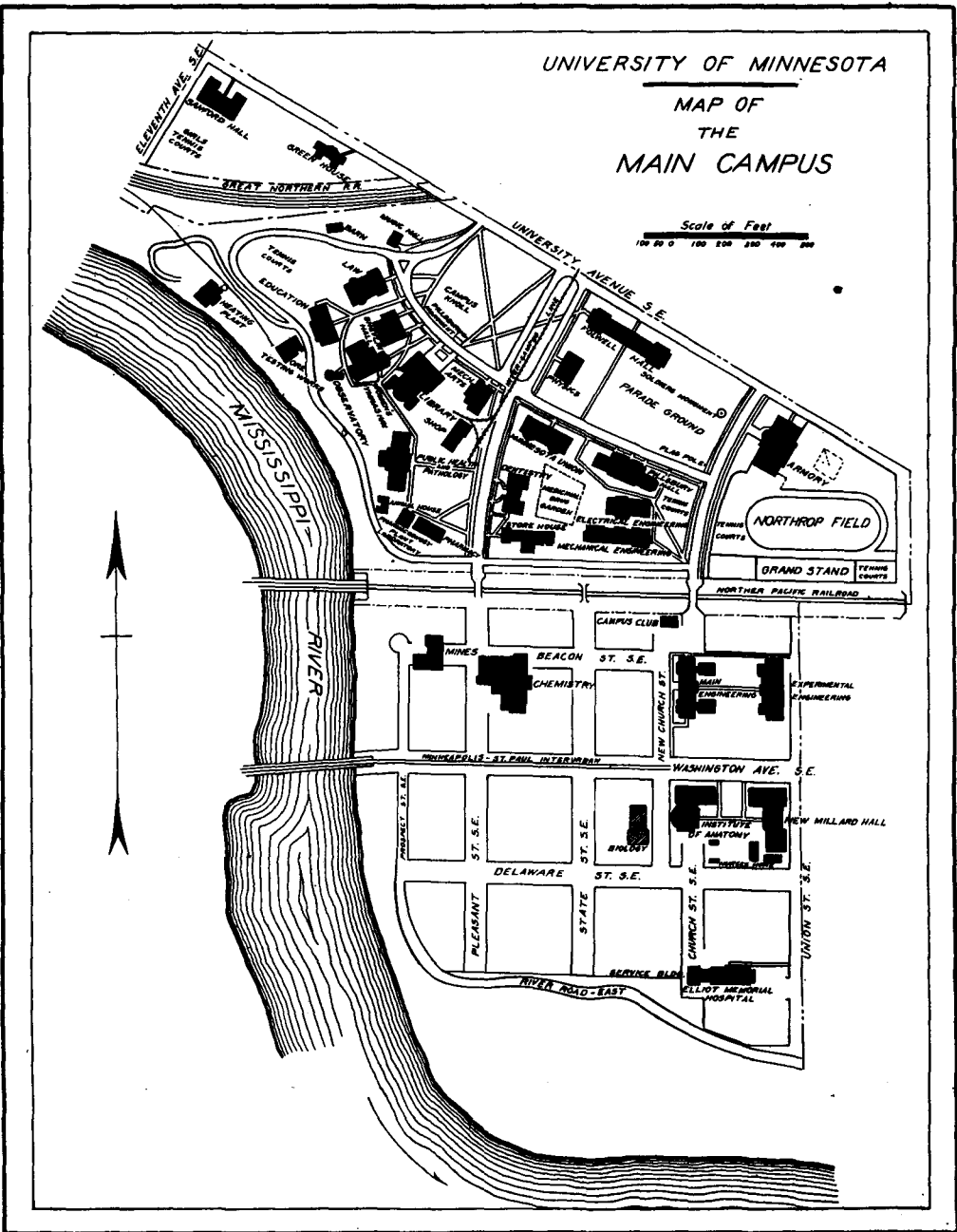


VOL. XVIII, NO. 7. MAY 1915

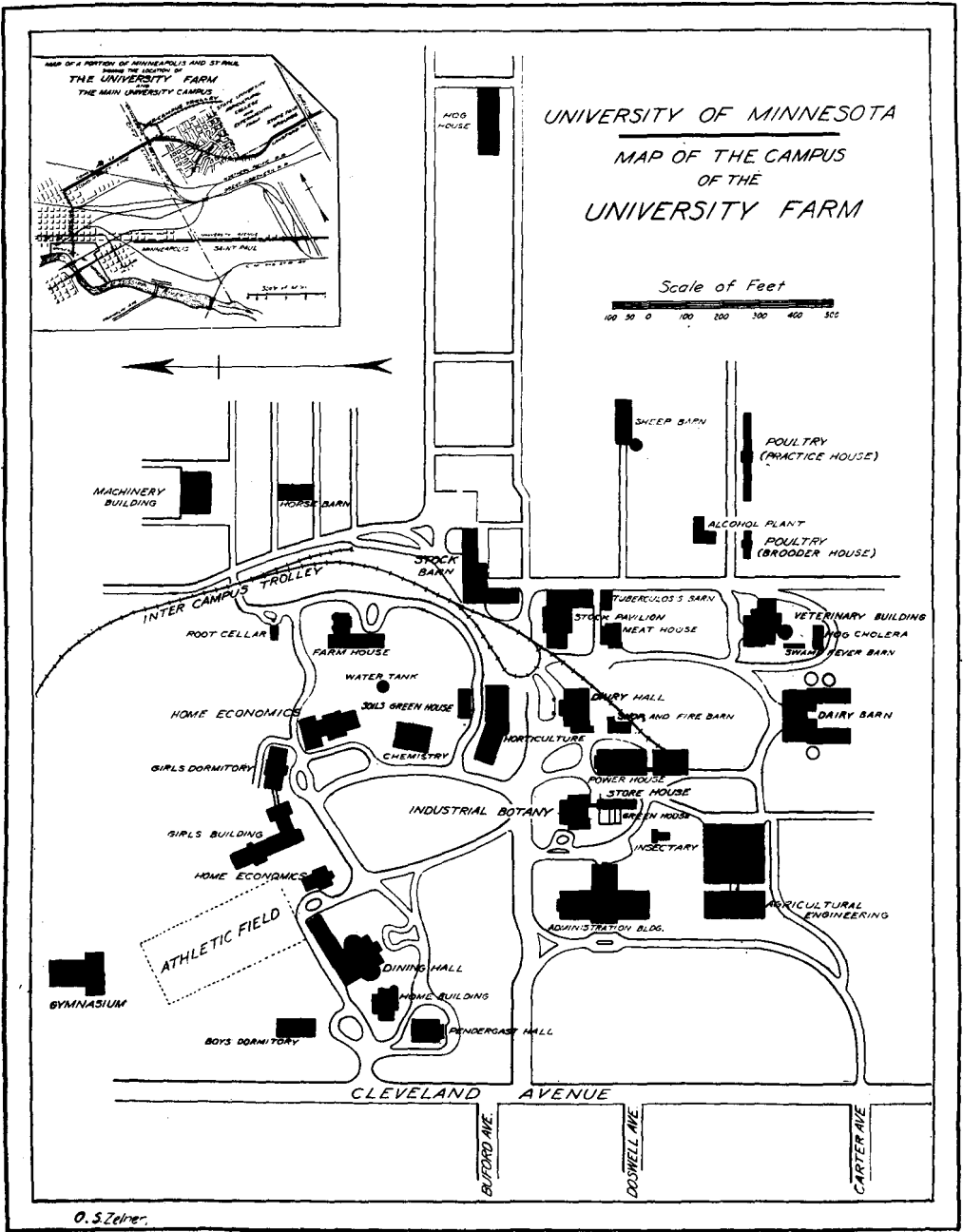
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UNIVERSITY OF MINNESOTA  
 MAP OF  
 THE  
 MAIN CAMPUS

Scale of Feet  
 100 200 300 400 500



Area of Main Campus, 108.5 acres



Area of University Farm, 422.56 acres

1915							1916													
<b>JULY</b>							<b>JANUARY</b>							<b>JULY</b>						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3	..	..	..	..	..	..	1	..	..	..	..	..	..	1
4	5	6	7	8	9	10	2	3	4	5	6	7	8	2	3	4	5	6	7	8
11	12	13	14	15	16	17	9	10	11	12	13	14	15	9	10	11	12	13	14	15
18	19	20	21	22	23	24	16	17	18	19	20	21	22	16	17	18	19	20	21	22
25	26	27	28	29	30	31	23	24	25	26	27	28	29	23	24	25	26	27	28	29
..	..	..	..	..	..	..	30	31	..	..	..	..	..	30	31	..	..	..	..	..
<b>AUGUST</b>							<b>FEBRUARY</b>							<b>AUGUST</b>						
1	2	3	4	5	6	7	..	..	1	2	3	4	5	..	..	1	2	3	4	5
8	9	10	11	12	13	14	6	7	8	9	10	11	12	6	7	8	9	10	11	12
15	16	17	18	19	20	21	13	14	15	16	17	18	19	13	14	15	16	17	18	19
22	23	24	25	26	27	28	20	21	22	23	24	25	26	20	21	22	23	24	25	26
29	30	31	..	..	..	..	27	28	29	..	..	..	..	27	28	29	30	31	..	..
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<b>SEPTEMBER</b>							<b>MARCH</b>							<b>SEPTEMBER</b>						
..	..	..	1	2	3	4	..	..	1	2	3	4	..	..	..	..	1	2		
5	6	7	8	9	10	11	5	6	7	8	9	10	11	3	4	5	6	7	8	9
12	13	14	15	16	17	18	12	13	14	15	16	17	18	10	11	12	13	14	15	16
19	20	21	22	23	24	25	19	20	21	22	23	24	25	17	18	19	20	21	22	23
26	27	28	29	30	..	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30
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<b>OCTOBER</b>							<b>APRIL</b>							<b>OCTOBER</b>						
..	..	..	..	1	2	..	..	..	..	..	..	1	..	1	2	3	4	5	6	7
3	4	5	6	7	8	9	2	3	4	5	6	7	8	8	9	10	11	12	13	14
10	11	12	13	14	15	16	9	10	11	12	13	14	15	15	16	17	18	19	20	21
17	18	19	20	21	22	23	16	17	18	19	20	21	22	22	23	24	25	26	27	28
24	25	26	27	28	29	30	23	24	25	26	27	28	29	29	30	31	..	..	..	..
31	..	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>NOVEMBER</b>							<b>MAY</b>							<b>NOVEMBER</b>						
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	..	1	2	3	4	
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>DECEMBER</b>							<b>JUNE</b>							<b>DECEMBER</b>						
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5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..

# UNIVERSITY CALENDAR

1915-1916

The university year covers a period of thirty-eight weeks, beginning on the Tuesday before the second Thursday in September. Commencement Day is always the second Thursday in June.

1915

August	31	Tuesday	Registration closes except for new students
September	1-8	Week	Fees payable except for new students
September	7-14	Week	Examinations for the removal of conditions (except Colleges of Agriculture and Forestry), entrance examinations, registration of new students, and payment of fees
September	15	Wednesday	First semester begins
September	27	Monday	Agricultural College, farm experience examination
October	4	Monday	School of Agriculture, first term begins
October	7	Thursday	Senate meeting, 4:00 p.m.
November	8	Monday	Dairy School opens
November	24	Wednesday	Thanksgiving recess begins 9:00 p.m.
November	29	Monday	Thanksgiving recess ends 8:00 a.m.
Nov. 29 to Dec. 4		Week	Second semester condition examinations, Colleges of Agriculture and Forestry
December	2	Thursday	Senate meeting, 4:00 p.m.
December	6-11	Week	Short course for ice-cream makers
December	11	Saturday	Dairy School closes
December	17	Friday	Christmas vacation begins 9:00 p.m.
December	17	Friday	School of Agriculture, first term closes
1916			
January	3-8	Week	Farmers' Short Course
January	4	Tuesday	Christmas vacation ends 8:00 a.m.
January	18	Tuesday	Registration for second semester closes
January	21	Tuesday	School of Agriculture, second term begins
January	24	Monday	Final examinations begin
January	25	Tuesday	Payment of fees for second semester closes
February	2	Wednesday	Second semester begins
February	3	Thursday	Senate meeting, 4:00 p.m.
February	12	Saturday	Lincoln's Birthday: a holiday
February	22	Tuesday	Washington's Birthday: a holiday
March	30	Wednesday	School of Agriculture closes.

## THE LAW SCHOOL

April	3-8	Week	Junior Short Course
April	19	Wednesday	Easter recess begins 9:00 p.m.
April	27	Thursday	Easter recess ends 8:00 a.m.
May	1-6	Week	Condition examinations in certain colleges
May	2	Tuesday	Traction Engineering Course begins
May	4	Thursday	Senate meeting, 4:00 p.m.
May	26	Friday	Final examinations begin
May	30	Tuesday	Memorial Day: a holiday
June	1-8	Week	Military Encampment, Fort Snelling
June	3	Saturday	Second semester closes
June	4	Sunday	Baccalaureate service
June	5	Monday	Senior class day exercises
June	7	Wednesday	Alumni Day
June	8	Thursday	Forty-fourth Annual Commencement.
June	9	Friday	Summer vacation begins
June	12	Monday	Summer Session begins

The university year for 1916-17 will begin Tuesday, September 12.

# THE LAW SCHOOL

## FACULTY

GEORGE EDGAR VINCENT, Ph.D., LL.D., President 1005 5th St. S. E.  
CYRUS NORTROP, LL.D., President, Emeritus 519 10th Ave. S. E.  
WILLIAM REYNOLDS VANCE, Ph.D., LL.B., Dean and Professor of Law  
525 10th Ave. S. E.  
HENRY J. FLETCHER, LL.M., Professor of Law 317 17th Ave. S. E.  
ERNEST G. LORENZEN, Ph.B., LL.B., J.U.D., Professor of Law  
315 11th Ave. S. E.  
EDMUND MORRIS MORGAN, M.A., LL.B., Professor of Law  
516 9th Ave. S. E.  
JAMES PAIGE, M.A., LL.M., Professor of Law 420 Oak Grove St.  
EDWARD SAMPSON THURSTON, M.A., LL.B., Professor of Law  
911 5th St. S. E.  
HENRY K. ELDER, LL.B., Instructor in Practice 308 18th Ave. S. E.

## PROFESSORIAL LECTURERS

HOWARD S. ABBOTT, B.L., Minneapolis  
HON. HOMER B. DIBELL, B.A., LL.B., Commissioner of the Supreme Court  
of Minnesota.  
WALDRON M. JEROME, B.S., LL.B., Minneapolis  
FREDERICK H. STINCHFIELD, B.A., LL.B., Minneapolis

## SPECIAL LECTURERS

ROME G. BROWN, B.A., Minneapolis  
CHARLES W. BUNN, B.S., St. Paul  
HON. EDMUND S. DURMENT, LL.B., St. Paul  
ARTHUR L. HELLIWELL, LL.M., Minneapolis  
HON. CHAS. S. JELLEY, Judge of the District Court, Hennepin County  
HUGH V. MERCER, LL.M., D.C.L., Minneapolis  
CHRISTOPHER D. O'BRIEN, St. Paul  
HON. THOMAS D. O'BRIEN, St. Paul, formerly Justice of the Supreme  
Court of Minnesota.  
HON. JOHN W. WILLIS, M.A., St. Paul, formerly Judge of the District  
Court, Ramsey County  
FRANK B. KELLOGG, St. Paul

## 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 and scientific legal education, and to prepare students for the actual practice of law in any jurisdiction where the English and American legal system prevails. Particular emphasis is laid upon the Minnesota Statutes, the special doctrines of law, and the rules of practice that obtain in this State.

In teaching the various branches of law, the so-called "case system" is employed. 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 primarily 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 in the College of Science, Literature, and the Arts, of the University of Minnesota, or some other college or university of equal grade.\* 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.

### 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 Arts,† may be admitted to the Law School as special students. Such special students are not candidates for a degree, but in case a special student succeeds in maintaining throughout his course an average grade of *B* or better, the Faculty may by special action recommend him for graduation.

Special students entering with fifty-two academic credits may become regular students by complying with the requirements for admission before the beginning of their second year in the Law School, *provided* they have passed all the subjects required of the first-year law class.

### ADVANCED STANDING

No credit is given for time spent in private reading. The candidate for graduation must spend all 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 law 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 24 credits (one year's work), as the Law Faculty may designate.

\*This requirement calls for a minimum of fifty-eight credits. The College of Science, Literature, and the Arts, of the University of Minnesota, offers a pre-legal course of two years, containing those subjects which are particularly desirable as a preliminary to the study of law.

†These requirements are stated in full in the current bulletin of the College of Science, Literature, and the Arts.

## REGISTRATION

Students should register on or before the opening of the first semester.\* Lectures in all subjects scheduled for the first semester begin promptly on the opening day of the semester, and those who join their classes later will necessarily be seriously handicapped in their work. No student will be admitted to the Law School unless he registers within one week after the opening of the first semester, except by special action of the faculty and for good cause shown.

No new student will be admitted to the work of the second semester unless he brings from another law school a certificate of advanced standing, showing his qualification to continue the second semester's work, and unless he registers before the opening of the semester. This is because the more important first-year subjects begin in the fall and are continued throughout the year, and the whole first-year work should be taken as a unit.

COMBINED SIX-YEAR COURSE LEADING TO DEGREES OF  
BACHELOR OF ARTS AND BACHELOR OF LAWS

Academic students who have by the end of their junior year completed one major and two minors and have completed courses aggregating 90 credits, may take during their senior year, the first-year law course, and upon completion of the same will be given the B.A. degree, provided they have attained a total of 118 honor points. Upon completion of the work of the second- and third-year classes in Law, such students will receive the degree of Bachelor of Laws, thus obtaining both degrees in six years.

## PRE-LEGAL COURSES

Students who contemplate studying law are strongly urged to take the combined six-year course described above and thus devote at least three years to collegiate work before entering the Law School. In the opinion of the Law Faculty, it is desirable that a prospective law student, devoting three or more years to collegiate work before undertaking the study of law, should take in his undergraduate years, courses aggregating at least two years of work in each of the following subjects: English Composition (Rhetoric), Latin, a modern language, History (particularly English and American Constitutional History), Mathematics, Economics and Political Science, and courses aggregating at least one year's work in Science, Sociology, Psychology and Logic, and Public Speaking.

## SPECIAL TWO-YEAR PRE-LEGAL COURSE

For those who can not devote more than two years to collegiate work before entering the Law School, the College of Science, Literature, and

\*See page 20 for the provisions as to penalty for late registration.

the Arts offers a special pre-legal course designed to afford special preparation for the study of law. This course is fully set forth in the bulletin of that College.

While students who have completed two years of the regular Academic course offered by the College of Science, Literature, and the Arts in accordance with the regulations of that college,† are eligible to enter the Law School, the Law Faculty strongly recommends those who enter the College of Science, Literature, and the Arts with the purpose of qualifying for admission to the Law School after two years, to take this special pre-legal course.

†The completion of a minimum of fifty-eight credits is required.

## COURSE OF STUDY

The curriculum leading to the degree of Bachelor of Laws covers a period of three academic years. The entire work of the first and second years and a portion of the work of the third year are prescribed. Second-year students are allowed to elect a limited number of additional courses, and third-year students are allowed a somewhat more liberal election.

The course consists of fourteen hours of classroom work a week during the first year, thirteen hours a week during the second year, and twelve hours a week during the third year.

Each regular student, unless excused by special action of the faculty, will be required to take courses aggregating not less than twelve nor more than fifteen hours' work a week during each semester of his first two years, and courses aggregating not less than ten nor more than fifteen hours during each semester of the third year.

In addition to the foregoing, attendance upon all special lectures scheduled is required of second- and third-year students; 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, except the extension courses, are given in the day time between the hours of 9 a.m. and 5 p.m.

### FIRST-YEAR COURSES

- 1-2. **CONTRACTS.** Offer and acceptance; contracts under seal; the Statute of Frauds; rights of beneficiaries and assignees; joint and several contracts; conditions; illegality; impossibility; duress; performance and discharge of contracts. Williston, *Cases on Contracts*, Vols. I and II. First semester, four hours; second semester, three hours. MORGAN.
- 3-4. **TORTS.** The general principles underlying the law of civil liability for wrongful conduct, and the 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. First semester, three hours; second semester, three hours. LORENZEN.
5. **CRIMINAL LAW AND PROCEDURE.** The common and statutory law of crimes, its historical development and practical application; criminal procedure. Mikell, *Cases on Criminal Law and Criminal Procedure*. First semester, three hours. PAIGE.
6. **DOMESTIC RELATIONS.** Marriage and divorce; parent and child; guardian and ward; property law peculiar to the marriage relation; rights

and liabilities of persons under the disabilities of coverture, infancy, insanity, etc. Paige, *Cases on Domestic Relations*. Second semester, two hours. PAIGE.

7. I PROPERTY (1). Real and personal property distinguished; acquisition of title to personal property; accession, confusion; gifts; finding; property rights of bailor and bailee; possessory liens; pledges; fixtures. Gray, *Cases on Property* (second edition), Vol. I. First semester, two hours. VANCE.
8. I PROPERTY (2). Real property; feudal tenures and their incidents; the several kinds of estates in land; uses and trusts; emblements; waste; rights as to air and water; easements. Gray, *Cases on Property* (second edition), Vols. I and II. Second semester, three hours. VANCE.
9. CARRIERS AND PUBLIC SERVICE COMPANIES. Origin and development of the law of public callings; common carriers of goods and passengers; telephone, telegraph, gas, electric companies; limitation of liability; state and federal regulation. Green, *Cases on Carriers*. First semester, two hours. FLETCHER.
10. AGENCY. Principal and agent, master and servant—their rights and obligations, mutually and as to third persons; creation and termination. Wambaugh, *Cases on Agency*. Second semester, three hours. THURSTON.

#### SECOND-YEAR COURSES

11. COMMON LAW PLEADING. Scope of the action, necessary allegations in declaration, and defenses in each form of action at common law; rules governing pleadings in all forms of action at common law. Whittier, *Cases on Common Law Pleading*. First semester, two hours. MORGAN.
12. CODE PLEADING. Relation of code pleading to common law pleading; requisites of complaint, answer, demurrer, reply; motions respecting pleadings; amendment; aider; bills of particulars; parties; joinder of causes of action; construction of pleadings. Sunderland, *Cases on Code Pleading*. Second semester, two hours. MORGAN.
- 13-14. II. EQUITY. Nature of equity jurisdiction; injunctions; bills of peace; interpleader; specific performance; bills for account. Ames, *Cases on Equity*, Vols. I and II. First semester, two hours; second semester, three hours. THURSTON.
- 15-16. EVIDENCE. Nature of evidence; judicial notice; burden of proof; presumptions; admissions; character evidence, confessions, hearsay; opinion evidence; real evidence; writings; parol evidence rule; competency, privilege, and examination of witnesses. Thayer, *Cases on Evidence* (second edition). First semester, two hours; second semester, two hours. JEROME.

17. II PROPERTY (1). Covenants running with land; public rights; rights with reference to waters; franchises; rents. Gray, *Cases on Property* (second edition), Vol. II. First semester, two hours. VANCE and BROWN.
18. II PROPERTY (2). Conditional and future interests, including conditional estates, reversions and remainders, rule in Shelley's case, future uses, executory devises, cross limitations, etc. Gray, *Cases on Property* (second edition), Vol. V. Second semester, two hours. FLETCHER.
19. 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). First semester, three hours. LORENZEN.
20. 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*. Second semester, two hours. PAIGE.
21. WILLS AND ADMINISTRATION. Historical originals of the law of succession; testamentary capacity; execution, revocation, and republication of wills; descent; probate of wills and administration of estates. Costigan, *Cases on Wills*. First semester, two hours. PAIGE.
22. QUASI-CONTRACTS. Omitted 1915-16.
38. 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*. Second semester, two hours. VANCE.

### THIRD-YEAR COURSES\*

- 25-26. 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 practice court. Sunderland, *Cases on Trial Practice*. First semester, three hours; second semester, two hours. MORGAN, STINCHFIELD, AND ELDER.
27. III PROPERTY (required). Adverse possession, prescription; conveying; covenants for title; estoppel; dedication, etc. Gray, *Cases on*

\*Note.—Third-year students are required to complete the courses in Practice, Private Corporations, III Property, and such other of the third-year courses as will aggregate with the above required courses not less than twenty-four credit hours, provided that no student may take less than ten nor more than fifteen hours in either semester of the third year.

*Property* (second edition), Vol. III. First semester, three hours.  
FLETCHER.

28. 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*. Second semester, two hours. ABBOTT.
- 29-30. CONSTITUTIONAL LAW.\* The nature of the American constitutional system; legislative, executive, and judicial departments; interstate commerce; constitutional limitations; police power; due process of law; taxation; eminent domain, etc. McClain, *Cases on Constitutional Law* (second edition). First semester, two hours; second semester, two hours. FLETCHER.
31. TRUSTS. Nature and incidents of the trust relationship; methods of creating trusts; rights and obligations of trustee and beneficiary; constructive trusts; charitable trusts. Kenneson, *Cases on Trusts*. First semester, three hours. THURSTON.
32. 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*. Second semester, two hours. PAIGE.
- 33-34. 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*. First semester, two hours; second semester, two hours. LORENZEN.
35. 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*. First semester, two hours. DIBELL.
36. EXTRAORDINARY LEGAL REMEDIES. Mandamus; habeas corpus; certiorari; quo warranto; prohibition. Second semester, two hours. DIBELL.
37. 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*. Second semester, two hours. LORENZEN.
38. INSURANCE. (This is the same course as that offered in the second year.) Second semester, two hours. VANCE.

\*Note.—Third-year students may elect this course for both semesters or for the first semester only.

39. III EQUITY. Interpleader, bills of peace, bills *quia timet*, reformation and rescission for mistake. Ames, *Cases on Equity*, Vol II. First semester, two hours. THURSTON.
40. 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*. Second semester, one hour. LORENZEN.
41. 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. Second semester, one hour. FLETCHER.
42. 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. First semester, one hour. FLETCHER.
44. 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. Second semester, one hour. ABBOTT.

#### WORK IN PRACTICE

The practice court has divisions corresponding to the District Court and Supreme Court of Minnesota. Each student is assigned a number of cases in which he is required to draw all necessary pleadings, to see to the service of process and pleadings, to conduct the trial, to perfect an appeal, and to prepare all papers in the appellate court. In at least one of the cases so assigned, the student must take steps to secure a provisional or extraordinary remedy.

Members of the third-year class are required to serve as assistants in the office of the Legal Aid Bureau, and to be in the office of the Bureau from 1:30 to 5:30 p.m. daily during the periods assigned for such service.

In connection with the Practice Course, examinations will be given at the end of the first and second semesters. The final examination will cover the work of both semesters.

#### SPECIAL LECTURES

During the session 1914-15, the lecture courses given were as follows:  
United States Courts

Six lectures by Charles W. Bunn, General Counsel of the Northern Pacific Railway Company.

Interstate Commerce

Six lectures by Frank B. Kellogg, of St. Paul.

Law of Waters

Eight lectures by Rome G. Brown, of Minneapolis.



#### The Police Power

Four lectures by the Hon. Thomas D. O'Brien, formerly Justice of the Supreme Court of Minnesota.

#### Procedure in the Federal Courts

Five lectures by H. V. Mercer, of Minneapolis.

The lecture courses to be given during the session of 1915-16 will be announced at the beginning of that session.

### UNIVERSITY EXTENSION COURSES IN LAW AT NIGHT

University Extension courses in substantive law not leading to a degree are offered at night by the General Extension Division of the University of Minnesota, under the immediate direction of the Law Faculty, for the benefit of such properly qualified persons as may desire legal instruction at night, primarily for business purposes.

Any student who has completed with an honor grade any subject as given in the Extension Course will be admitted to the regular Law School examination given in such subject, and, if successful in passing that examination, will be given full credit for such subject. After thus securing credit for all the subjects taught in the Extension Course in law, and thereupon completing at the Law School of the University of Minnesota the various courses in adjective law required for a degree, such student will be entitled to graduation, provided that previous to taking such examinations he could have qualified as a regular student in the Law School by having completed two years of academic work in an institution of collegiate rank.

### 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. Gross delinquency in discharging these requirements may be regarded by the faculty as sufficient reason for requiring the delinquent student to withdraw from the school.

Examinations are held at the end of each semester.

*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 twenty per cent of the lectures in any course will not receive 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; and such examination must be taken within one year from the imposition of such condition. On failure successfully to pass such examination, the student must repeat the subject in course.

Examinations for the removal of conditions are held during registration week in September each year.

A student having conditions or incompletes in first semester subjects may take an examination in *one* such subject on the day following the Easter recess, *provided* that, prior to the beginning of the Easter recess, he shall have given to the Dean, written notice of his intention to take such examination (stating the subject in question); and, subject to the same requirement as to notice, any candidate for graduation in law or arts in the following June may take two such examinations. Special examinations at any other time will be allowed only upon permission of the faculty and for good cause shown.

A student who is deficient in subjects aggregating eight or more credits (semester 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 semester, fails in two or more subjects taken in that semester may by vote of the faculty be denied the privilege of continuing in the Law School.

Except by special action of the faculty no student will be allowed to enter upon the work of the second semester of his third year as a candidate for a degree at the forthcoming commencement if he lacks more than sixteen credits of the total amount of work required for graduation.

#### 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. Students who elect such work must complete it in a satisfactory manner or withdraw in good standing before they can obtain the law degree.

## GENERAL INFORMATION

### LIBRARIES

The library of the Law School contains more than twenty-three thousand volumes, including all the American Reports, State and Federal (excepting a few reports of inferior state courts), nearly all the English and Canadian Reports, the English, Federal, and State Statutes (with a few exceptions), the standard digests, encyclopedias, legal periodicals and text-books. 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 the argument of appeals.

### CASE-BOOKS

The case-books used by the student in his course in the Law School, especially when containing his own annotations, should prove highly valuable to him in after years at the bar. Students are therefore earnestly advised to purchase their own case-books. It has heretofore been the practice, however, for the Law Library to lend case-books for the use of students. This practice will probably be discontinued after the supply of case-books now on hand has been exhausted.

### TUITION AND OTHER FEES

The tuition fee is sixty-five dollars (\$65.00) a year, payable in two equal installments at the beginning of the first and second semesters, respectively.

Students having matriculated in previous years are required to indicate registration on proper blanks not later than September 1. Fees must be paid in full on or before September 8.

For the second semester, registration must be indicated on or before January 18, and fees must be paid on or before January 25.

A penalty fee of one dollar (\$1.00) will be charged all students who do not register or pay fees within the time specified, and, after one week, a fee of twenty-five cents per day for each day's delay will be added. The Registrar will send proper blanks to all students who were in attendance the previous year, on or before August 20. Students who fail to receive blanks at that date should call for them.

The regular University fee of \$1.00 will be charged to each student taking an examination for the removal of a condition. No other fee will be charged in the Law School for any special examination.

A deposit of five dollars is required of students making use of the case-books belonging to the Law School.

In accordance with a regulation of the Board of Regents, students of all schools and colleges of the University are required to have a box in the University Post-Office, for which a rental charge of fifty cents a year is made.

#### EXPENSES

The expense of a student at the University depends largely upon the tastes and habits of the individual. Students can without difficulty obtain board and lodging near the University. Good board can be had for \$5.00 per week, and students by clubbing together can usually get board at considerably less expense.

The proximity of the University to two large cities makes it possible for students to earn a portion of their expenses while attending the Law School.

#### INQUIRIES

Further particulars as to any phase of the work of the Law School not given herein, or in the Bulletin of Information will be cheerfully given upon request. Communications addressed at any time to the Dean of the Law School, the University of Minnesota, Minneapolis, Minnesota, will receive prompt attention.

## STUDENTS

### THIRD YEAR CLASS

- Amundson, Mark H., Alexandria  
B.A., 1912
- Andersen, Thomas W., Medford, Wis.  
Arnold, Benjamin E., Brainerd  
B.A., 1911
- Beare, Thomas W., Brainerd  
Boss, Leigh C., Minneapolis  
B.A., 1913
- Brecke, Oscar A., Minneapolis  
Brown, Ray A., Minneapolis  
B.A., 1913
- Cosgrove, Dennis E., Wheatland, N. D.  
Dills, Elmer L., Albert Lea  
B.A., 1902
- Dwan, John C., Two Harbors  
B.A., 1913
- Erdall, Arthur C., Minneapolis  
Fagerstrom, Lawrence F., Minneapolis  
B.A., 1913
- Frisch, Leonard H., Minneapolis  
B.A., 1912
- Gannon, John M., Hibbing  
Ganssle, Waldorf L., Minneapolis  
Grindeland, Ingolf A., Warren  
Halvorson, Alfred, Ridgeway, Iowa  
Hilyer, Gale P., Minneapolis  
B.A., 1912
- Hovda, Henry, Mount Vernon, S. D.  
B.A., 1913
- Jaques, Lawrence, Duluth  
B.A., 1913
- Jenswold, John D., Duluth  
B.A., 1913
- Keefe, Andrew P., Minneapolis  
Lambert, Howard T., Minneapolis  
B.A., 1913
- Linstrom, Hjalmar A., Castlewood, S.  
D. B.A., 1913.
- Macartney, Grant S., St. Paul  
B.A., Yale, 1909
- Maland, Oswald, Elmore  
Martin, Harry G., Minneapolis  
Meleck, Hertz N., Minneapolis  
M.D., Hamline, 1903
- Mendowitz, Hymen Z., Minneapolis  
Miller, Arthur B., Heron Lake  
Molumby, Loy J., Elkader, Iowa  
Morse, Frank E., Eagle Lake  
B.A., Carleton, 1911
- Norby, Erling, Ada  
O'Donnell, Michael T., Duluth  
Parker, Ralph S., Brown's Valley  
Paul, Edward A., Minneapolis  
Pollock, Charles M., Minneapolis  
B.A., Wisconsin, 1912
- Quinn, Thomas F., St. Paul  
B.A., 1913
- Reinke, Clinton A., Minneapolis  
Ricker, Donald H., Minneapolis  
Slen, Theodor S., Northfield  
B.A., St. Olaf, 1912
- Stadvold, Sidney, Fosston  
Stellwagen, Sieforde M., Minneapolis  
Temmey, Leo A., Onida, S. D.  
Thompson, Nathan M., Minneapolis  
Viesselman, Percival W., Minneapolis  
B.A., 1912; M.A., 1913
- Warner, Harry A., Minneapolis  
B.A., 1913
- Weeks, Allan L., Minneapolis

### SECOND YEAR CLASS

- Abeles, Emmons L., Minneapolis  
Braithwaite, Gale B., Minneapolis  
Brandmier, John F., Superior, Wis.  
Briggs, Allan, St. Paul  
Cliff, Earl V., Ortonville  
Crounse, Robert M., Minneapolis  
B.A., 1914
- Dahlberg, Andrew H., Wayzata  
Dulebohn, John F., Mason-Dixon, Pa.  
B.A., Pennsylvania College, 1913
- Hagen, Sigurd, Underwood  
Hamlin, Lyle A., Spring Valley
- Haverstock, Henry W., Minneapolis  
Hompe, John B., Deer Creek  
King, Stafford, Deer River  
Kjellander, Harold R., Minneapolis  
Lyons, Gerald E., Cresco, Iowa  
B.A., St. Joseph College, Dubuque,  
Ia., 1913
- MacLean, Edwin L., Minneapolis  
Mitchell, William R., Amiret  
Nelson, Lester E., Litchfield  
Packer, Bert I., Delano

\*Parker, Erwin C., Brown's Valley  
 Pearson, Albert E., Long Prairie  
 B.A., 1913  
 Pearson, Albin S., Hudson, Wis.  
 Pomeroy, Donald L., Minneapolis  
 B.A., 1914  
 Robb, Maugridge S., Minneapolis  
 Shiely, Albert R., St. Paul  
 Stewart, Donald, St. Cloud

Thompson, Charles S., Minneapolis  
 B.A., Williams College, 1913  
 Thomson, Metellus, Jr., Minneapolis  
 Wilford, Lloyd A., Baldwin, Wis.  
 Williams, Elmer L., Galesburg, Ill.  
 B.A., Knox College, 1913  
 Young, Denzil R., Baker, Mont.  
 Young, Henry G., Benson

\*Changed to Science, Literature, and the Arts.

### FIRST YEAR CLASS

Acton, Harry J., Madison  
 Alley, Raymond C., Buffalo  
 Anderson, C. Gustaf, Winthrop  
 Baston, Albert P., St. Louis Park  
 Batten, James C., Minneapolis  
 Chapman, Edwin H., Minneapolis  
 Cohen, Edward, St. Paul  
 Costello, Harold C., Minneapolis  
 Dale, Charles M., Minot, N. D.  
 Frenzel, Paul W., St. Paul  
 Gausewitz, Alfred L., Minneapolis  
 Hale, Quincy H., Spring Valley  
 Hauge, Norman J., Minneapolis  
 Haugen, Oliver, Henning  
 Hicks, George M., Thief River Falls  
 B.A., 1914  
 \*Horn, Horace R., St. Paul  
 Jalkanen, Aaron J., Finlayson  
 Jenkins, William S., Jr., Minneapolis  
 B.L., Kenyon College, 1914  
 Johnson, F. Roy, Minneapolis  
 B.S., in Agr., 1912  
 Johnson, William C., Hallock  
 Kalnes, Iver M., Starbuck  
 A.B., Luther College, Decorah, Ia.,  
 1907  
 Kauffman, Cyrus F., St. Paul  
 \*Klein, George F., Minneapolis  
 Lowell, Clarence T., St. Paul

Lundsten, Donald B., Hutchinson  
 McDonough, John J., St. Paul  
 McMillan, Arthur W., Duluth  
 B.A., Carleton, 1914  
 Michael, Frank F., Jordon  
 Moorhead, William C., Minneapolis  
 Nelson, Otto J., Owatonna  
 Nelstead, Rudolph, Minneapolis  
 O'Hearn, Thomas L., Two Harbors  
 Pegelow, Charles L., Two Harbors  
 Peterson, Jay B., Minneapolis  
 Preus, Wilhelm C., Minneapolis  
 Pryor, Leland M., Hinckley  
 Rusch, Harry F., Madison, Wis.  
 B.A., Wisconsin, 1914  
 Shaughnessy, Clark D., St. Paul  
 Shelly, Walter D., Minneapolis  
 Smith, James T., Minneapolis  
 Sullivan, Joseph D., Madison Lake  
 \*Tiffany, Jay M., Aberdeen, S. D.  
 Townley, John L., Fergus Falls  
 Uldall, Jakob W., Minneapolis  
 Wanberg, Charles O., Galva, Iowa  
 Webster, Milo D., Minneapolis  
 B.A., 1905  
 Wilson, Leonard A., Lake Park  
 Young, Donald A., Minneapolis  
 Zumwinkle, Lyle E., Morton

\*Science, Literature, and the Arts, second semester.

### SPECIAL STUDENTS

#### THIRD YEAR

Moyer, Glenn D., Minneapolis  
 Schwartz, David, Minneapolis

Thomas, Paul C., St. Paul  
 West, David R., Faribault

#### SECOND YEAR

Beiseker, Marion H., Minneapolis  
 Birkeland, Harold, Minneapolis  
 Booher, Leroy F., Armour, S. D.  
 Cox, Harold W., Augusta, Wis.  
 Eaton, Burt E., Jr., Rochester  
 Gow, Arthur S., Hibbing

Peterson, Lloyd R., Minneapolis  
 Russell, Reuben C., Minneapolis  
 Simpson, Harold G., Minneapolis  
 Talus, Frank M., Chisholm  
 Thomson, George V., Minneapolis  
 Wendel, Joseph H., Anthon, Iowa

## FIRST YEAR

Abrams, Joe, Minneapolis  
 Anderson, Arthur W., New York City,  
     N. Y.  
 Baldwin, Clinton H., Redwood Falls  
 Barry, Gerald, Minneapolis  
 Brennan, John J., Minneapolis  
 \*Brennan, Lester L., Minneapolis  
 Burhans, Ira H., Superior, Wis.  
 Cohen, Joseph, Akeley  
 Davis, Harry W., Duluth  
 Drake, Gustaf E., Minneapolis  
 Esswein, Richard P., Athens, Wis.  
 Gareis, Armin J., Winthrop  
 †Harper, Fred W., Enderlin, N. D.  
 Harris, Warren L., St. Paul  
 Jalma, Michael M., Minneapolis  
 Keogan, Irwin J., Minneapolis  
 \*Laird, H. Lloyd, Jr., Minneapolis  
 London, David, Minneapolis  
 Lundquist, Harold L., Minneapolis  
 McVeety, David A., Howard Lake  
 \*Newgren, David N., St. Paul  
 Peik, Paul G., Minneapolis  
 Peterson, Edwin A., Burlington, Iowa  
 Peterson, Oscar, Granite Falls  
 \*Skinner, Franklin T., Albert Lea  
 Skogmo, John M., Minneapolis  
 Smith, Jay W., Minneapolis  
 Sykes, Everett W., Beverly, Ill.  
 Sylvester, Byrl E., Plainview  
 Westrup, William W., Winsted  
 Whiting, Nathaniel E., Fargo, N. D.  
 Wolfson, Burnett B., Minneapolis

\*Changed to Science, Literature, and the Arts.

†Changed to College of Dentistry.

Bulletin of  
The University of Minnesota

THE MEDICAL SCHOOL

1915-1916



VOL. XVIII, NO. 8, AUGUST 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.



1915							1916													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
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4	5	6	7	8	9	10	2	3	4	5	6	7	8	2	3	4	5	6	7	8
11	12	13	14	15	16	17	9	10	11	12	13	14	15	9	10	11	12	13	14	15
18	19	20	21	22	23	24	16	17	18	19	20	21	22	16	17	18	19	20	21	22
25	26	27	28	29	30	31	23	24	25	26	27	28	29	23	24	25	26	27	28	29
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AUGUST							FEBRUARY							AUGUST						
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8	9	10	11	12	13	14	6	7	8	9	10	11	12	6	7	8	9	10	11	12
15	16	17	18	19	20	21	13	14	15	16	17	18	19	13	14	15	16	17	18	19
22	23	24	25	26	27	28	20	21	22	23	24	25	26	20	21	22	23	24	25	26
29	30	31	..	..	..	..	27	28	29	..	..	..	..	27	28	29	30	31	..	..
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5	6	7	8	9	10	11	5	6	7	8	9	10	11	3	4	5	6	7	8	9
12	13	14	15	16	17	18	12	13	14	15	16	17	18	10	11	12	13	14	15	16
19	20	21	22	23	24	25	19	20	21	22	23	24	25	17	18	19	20	21	22	23
26	27	28	29	30	..	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30
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OCTOBER							APRIL							OCTOBER						
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18	19	20	21	22	23	24	16	17	18	19	20	21	22	22	23	24	25	26	27	28
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NOVEMBER							MAY							NOVEMBER						
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7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
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DECEMBER							JUNE							DECEMBER						
..	..	..	1	2	3	4	..	..	..	1	2	3	..	..	..	..	1	2	3	
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
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# UNIVERSITY CALENDAR

1915-1916

The university year covers a period of thirty-eight weeks, beginning on the Tuesday before the second Thursday in September. Commencement Day is always the second Thursday in June.

<b>1915</b>			
August	31	Tuesday	Registration closes except for new students
September	1-8	Week	Fees payable except for new students
September	7-14	Week	Examinations for the removal of conditions (except Colleges of Agriculture and Forestry), entrance examinations, registration of new students, and payment of fees
September	15	Wednesday	First semester begins
September	27	Monday	Agricultural College, farm experience examination
October	4	Monday	School of Agriculture, first term begins
October	7	Thursday	Senate meeting, 4:00 p.m.
November	8	Monday	Dairy School opens
November	24	Wednesday	Thanksgiving recess begins 9:00 p.m.
November	29	Monday	Thanksgiving recess ends 8:00 a.m.
Nov. 29 to Dec. 4	Week		Second semester condition examinations, Colleges of Agriculture and Forestry
December	2	Thursday	Senate meeting, 4:00 p.m.
December	6-11	Week	Short course for ice-cream makers
December	11	Saturday	Dairy School closes
December	17	Friday	Christmas vacation begins 9:00 p.m.
December	17	Friday	School of Agriculture, first term closes
<b>1916</b>			
January	3-8	Week	Farmers' Short Course
January	3	Monday	School of Embalming begins
January	4	Tuesday	Christmas vacation ends 8:00 a.m.
January	18	Tuesday	Registration for second semester closes
January	21	Tuesday	School of Agriculture, second term begins
January	24	Monday	Final examinations begin
January	25	Tuesday	Payment of fees for second semester closes
February	2	Wednesday	Second semester begins
February	3	Thursday	Senate meeting, 4:00 p.m.
February	12	Saturday	Lincoln's Birthday: a holiday
February	22	Tuesday	Washington's Birthday: a holiday
March	30	Wednesday	School of Agriculture closes

## THE MEDICAL SCHOOL

April	3-8	Week	Junior Short Course
April	19	Wednesday	Easter recess begins 9:00 p.m.
April	27	Thursday	Easter recess ends 8:00 a.m.
May	1-6	Week	Condition examinations in certain colleges
May	2	Tuesday	Traction Engineering Course begins
May	4	Thursday	Senate meeting, 4:00 p.m.
May	26	Friday	Final examinations begin
May	30	Tuesday	Memorial Day: a holiday
June	1-8	Week	Military Encampment, Fort Snelling
June	3	Saturday	Second semester closes
June	4	Sunday	Baccalaureate service
June	5	Monday	Senior class day exercises
June	7	Wednesday	Alumni Day
June	8	Thursday	Forty-fourth Annual Commencement.
June	9	Friday	Summer vacation begins
June	12	Monday	Summer Session begins

The university year for 1916-17 will begin Tuesday, September 12.

# THE MEDICAL SCHOOL

## THE ADMINISTRATIVE BOARD

GEORGE EDGAR VINCENT, Ph.D., LL.D., President  
ELIAS POTTER LYON, Ph.D., M.D., Dean, and Director of the Department  
of Physiology  
RICHARD OLDING BEARD, M.D., Assistant Dean and Secretary of the Med-  
ical School  
LOUIS B. BALDWIN, M.D., Superintendent of the University Hospitals  
....., Chief of the Department of Medicine  
JAMES E. MOORE, M.D., Chief of the Department of Surgery  
CLARENCE MARTIN JACKSON, M.S., M.D., Director of the Department of  
Anatomy  
JENNINGS C. LITZENBERG, B.S., M.D., Chief of the Department of Ob-  
stetrics  
ARTHUR D. HIRSCHFELDER, B.S., M.D., Director of the Department of  
Pharmacology  
HAROLD E. ROBERTSON, B.A., M.D., Acting Director of the Department of  
Pathology, Bacteriology, and Public Health  
FRED LYMAN ADAIR, B.S., M.D., Member-Elect, Representing the Faculty  
ROBERT A. HALL, Ph.D., Member-Elect, Representing the Faculty

## FACULTY

GEORGE EDGAR VINCENT, Ph.D., LL.D., President 1005 5th St. S. E.  
CYRUS NORTHROP, LL.D., President, Emeritus 519 10th Ave. S. E.  
AMOS W. ABBOTT, M.D., Emeritus Professor of Gynecology  
1717 Marquette Ave.  
EVERTON J. ABBOTT, B.A., M.D., Emeritus Professor of Clinical Medicine  
425 Dayton Ave., St. Paul  
JOHN W. BELL, M.D., Emeritus Professor of Clinical Medicine and Physi-  
cal Diagnosis 5127 Lake Harriet Blvd.  
CHARLES A. WHEATON, M.D., Emeritus Professor of Surgery  
329 Summit Ave., St. Paul  
C. EUGENE RIGGS, M.A., M.D., Emeritus Professor of Mental and Nervous  
Diseases 10 Crocus Hill, St. Paul  
THOMAS S. ROBERTS, M.D., Emeritus Professor of Pediatrics  
1603 4th Ave. S.  
JAMES T. CHRISTISON, M.D., Emeritus Professor of Pediatrics  
535 Lowry Bldg., St. Paul

---

F. L. ADAIR, B.S., M.D., Assistant Professor of Obstetrics  
820 Donaldson Bldg.

- LOUIS B. BALDWIN, M.D., Superintendent of University Hospitals  
509 E. River Road
- RICHARD OLDING BEARD, M.D., Assistant Dean and Secretary and Associate Professor of Physiology  
University of Minnesota
- E. T. BELL, B.S., M.D., Associate Professor of Pathology  
215 Walnut St. S. E.
- EDGAR D. BROWN, Ph.D., M.D., Associate Professor of Pharmacology  
3525 3d Ave. S.
- FRANK E. BURCH, M.D., Assistant Professor of Diseases of the Eye, Ear, Nose and Throat  
930 Lowry Bldg., St. Paul
- \*ABRAHAM B. CATES, M.A., M.D., Associate Professor of Obstetrics
- ALEXANDER R. COLVIN, M.D., Assistant Professor of Surgery  
342 Lowry Bldg., St. Paul
- HENRY WIREMAN COOK, B.A., M.D., Lecturer on Life Insurance  
Auditorium Bldg.
- J. FRANK CORBETT, M.D., Associate Professor of Experimental Surgery  
4401 E. Lake Harriet Blvd.
- WARREN A. DENNIS, B.L., M.D., Assistant Professor of Surgery  
942 Lowry Bldg., St. Paul
- CHARLES A. ERDMANN, M.D., Associate Professor of Applied Anatomy  
612 9th Ave. S. E.
- GEORGE B. FRANKFORTER, Ph.D., Dean of the School of Chemistry  
525 East River Road
- EMIL S. GEIST, M.D., Assistant Professor of Orthopedic Surgery  
614 Syndicate Bldg.
- ARTHUR J. GILLETTE, M.D., Professor of Orthopedic Surgery  
Seven Corners, St. Paul
- ROBERT A. HALL, Ph.D., Assistant Professor of Pharmacology  
323 6th Ave. S. E.
- A. S. HAMILTON, B.S., M.D., Associate Professor in charge of Division of Nervous and Mental Diseases  
513 Pillsbury Bldg.
- THOMAS B. HARTZELL, D.M.D., M.D., Research Professor in Mouth Infections for 1915-16  
716 Donaldson Bldg.
- ARTHUR D. HIRSCHFELDER, B.S., M.D., Professor of Pharmacology and Director of the Department  
629 5th St. S. E.
- CLARENCE MARTIN JACKSON, M.S., M.D., Professor of Anatomy and Director of the Department  
428 Walnut St. S. E.
- JOHN B. JOHNSTON, Ph.D., Dean of the College of Science, Literature, and the Arts, and Professor of Comparative Neurology  
1115 5th St. S. E.
- WINFORD P. LARSON, M.D., Associate Professor of Bacteriology  
614 9th Ave. S. E.
- ARTHUR A. LAW, M.D., Associate Professor of Surgery  
420 Syndicate Bldg.
- THOMAS G. LEE, B.S., M.D., Professor of Comparative Anatomy  
509 E. River Road

\*Deceased, June 9, 1915.

- JENNINGS C. LITZENBERG, B.S., M.D., Professor of Obstetrics and Chief  
of the Department 910 Donaldson Bldg.
- ELIAS P. LYON, Ph.D., M.D., Dean, Professor of Physiology and Director  
of the Department 421 Union St. S. E.
- ARCHIBALD MACLAREN, B.S., M.D., Associate Professor of Surgery  
914 Lowry Bldg., St. Paul
- J. F. MCCLENDON, Ph.D., Assistant Professor of Physiology  
University of Minnesota
- JOHN S. MACNIE, B.A., M.D., Assistant Professor of Diseases of the Eye,  
Ear, Nose, and Throat 506 Donaldson Bldg.
- ARTHUR T. MANN, B.S., M.D., Assistant Professor of Surgery  
910 Donaldson Bldg.
- JAMES E. MOORE, M.D., Professor of Surgery and Chief of the Depart-  
ment University of Minnesota
- ROBERT H. MULLIN, B.A., M.B., Associate Professor of Public Health  
315 11th Ave. S. E.
- WILLIAM R. MURRAY, Ph.B., M.D., Associate Professor of Diseases of  
the Eye, Ear, Nose, and Throat 621 Syndicate Bldg.
- LOUISE M. POWELL, R.N., Superintendent of the School for Nurses  
417 Delaware St. S. E.
- WALTER R. RAMSEY, M.D., Assistant Professor of Pediatrics  
942 Lowry Bldg., St. Paul
- SOREN P. REES, B.S., M.D., Assistant Professor of Medicine  
1964 Penn Ave. S.
- HARRY P. RITCHIE, Ph.B., M.D., Assistant Professor of Surgery  
914 Lowry Bldg., St. Paul
- HAROLD E. ROBERTSON, B.A., M.D., Professor of Pathology and Acting  
Director of Department of Pathology, Bacteriology, and Public Health  
507 Essex St. S. E.
- JOHN T. ROGERS, M.D., Assistant Professor of Surgery  
342 Lowry Bldg., St. Paul
- JOHN L. ROTHROCK, M.A., M.D., Assistant Professor of Gynecology  
514 Lowry Bldg., St. Paul
- RICHARD E. SCAMMON, Ph.D., Professor of Anatomy  
215 Harvard St. S. E.
- FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Associate Professor of Physi-  
ology 1307 6th St. S. E.
- JULIUS PARKER SEDGWICK, B.S., M.D., Associate Professor in charge of  
Division of Pediatrics 614 Syndicate Bldg.
- FREDERICK W. SCHLUTZ, B.A., M.D., Assistant Professor of Pediatrics  
820 Donaldson Bldg.
- SAMUEL E. SWEITZER, M.D., Assistant Professor in charge of Division of  
Dermatology 625 Syndicate Bldg.
- FRANK C. TODD, M.D., Professor of Diseases of the Eye, Ear, Nose, and  
Throat 506 Donaldson Bldg.
- S. MARX WHITE, B.S., M.D., Associate Professor of Medicine  
910 Donaldson Bldg.

- M. RUSSEL WILCOX, M.D., Assistant Professor of Physiology  
802 Donaldson Bldg.
- FRANKLIN R. WRIGHT, M.D., Assistant Professor of Genito-urinary Diseases  
707 Donaldson Bldg.
- FREDERICK J. WULLING, Phm.D., LL.M., Dean of the College of Pharmacy  
3305 2d Ave. S.
- 
- JOHN S. ABBOTT, B.A., M.D., Instructor in Surgery  
914 Lowry Bldg., St. Paul
- WILLIAM F. ALLEN, M.A., Instructor in Histology and Embryology  
3352 Prospect Terrace S. E.
- EARNEST L. BAKER, M.D., Instructor in Medicine 503 Donaldson Bldg.
- MOSES BARRON, B.S., M.D., Instructor in Pathology  
763 Holly Ave., St. Paul
- FRANK S. BISSELL, M.D., Roentgenologist and Instructor in Roentgenology  
4412 Lake Harriet Blvd.
- PAUL F. BROWN, B.A., M.D., Instructor in Surgery 3733 Nicollet Ave.
- JOHN BUTLER, M.D., Instructor in Dermatology 403 Pillsbury Bldg.
- W. E. CAMP, M.A., Instructor in Anatomy 112 Church St. S. E.
- CARL C. CHATTERTON, M.D., Instructor in Orthopedic Surgery  
Seven Corners, St. Paul
- WALLACE COLE, M.D., Instructor in Orthopedic Surgery  
925 Lowry Bldg., St. Paul
- WILLIAM H. CONDIT, B.S., M.D., Instructor in Obstetrics  
2205 Kenwood Pkwy.
- BRONSON CROTHERS, B.A., M.D., Instructor in Pediatrics  
925 Lowry Bldg., St. Paul
- CHARLES R. DRAKE, M.D., Instructor in Medicine 1035 Andrus Bldg
- E. L. GARDNER, B.S., M.D., Instructor in Medicine 1011 E. River Road
- ERNEST M. HAMMES, M.D., Instructor in Mental and Nervous Diseases  
1019 Lowry Bldg., St. Paul
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- ARTHUR T. HENRICI, M.D., Instructor in Pathology and Bacteriology and  
Research Assistant in Mouth Infections 2443 Garfield Ave. S.
- EDGAR J. HUENEKENS, B.A., M.D., Instructor in Pediatrics  
820 Donaldson Bldg.
- HARRY G. IRVINE, M.D., Instructor in Dermatology 601 Syndicate Bldg.
- WILLIAM C. JOHNSON, B.A., M.D., Instructor in Pathology  
313 8th Ave. S. E.
- JAMES A. JOHNSON, M.D., Instructor in Surgery 420 Syndicate Bldg.
- FRANCIS B. KINGSBURY, Ph.D., Instructor in Physiologic Chemistry  
209 State St. S. E.
- ANGUS W. MORRISON, B.A., M.D., Instructor in Nervous and Mental Diseases  
513 Pillsbury Bldg.
- J. A. MYERS, Ph.D., Instructor in Anatomy 624 University Ave. S. E.
- HORACE NEWHART, B.A., M.D., Instructor in Diseases of the Eye, Ear,  
Nose, and Throat 910 Donaldson Bldg.

- OSCAR OWRE, M.D., C.M., Instructor in Genito-urinary Diseases  
707 Masonic Temple
- HAROLD PEDERSON, B.A., M.D., Instructor in Medicine  
310 Pillsbury Bldg.
- C. J. V. PETTIBONE, Ph.D., Instructor in Physiologic Chemistry  
112 Church St. S. E.
- FREDERICK H. POPPE, B.A., M.D., Instructor in Surgery  
820 Donaldson Bldg.
- ALBERT C. POTTER, M.D., Instructor in Pathology and Bacteriology  
2725 3d Ave. S.
- FRED J. PRATT, M.D., Instructor in Diseases of the Eye, Ear, Nose, and  
Throat  
328 Central Ave.
- CHARLES A. REED, B.S., M.D., Instructor in Orthopedic Surgery  
420 Syndicate Bldg.
- ERNEST T. F. RICHARDS, M.D., C.M., Instructor in Medicine  
744 Lowry Bldg., St. Paul
- FREDERICK C. RODDA, M.D., Instructor in Pediatrics  
134 E. 18th St.
- ARTHUR C. STRACHAUER, M.D., Instructor in Surgery  
616 Syndicate Bldg.
- CARL A. SCHERER, B.S., M.D., Instructor in Pediatrics  
3004 4th Ave. S.
- JOHN P. SCHNEIDER, M.D., Instructor in Medicine  
Syndicate Bldg.
- JALMAR H. SIMONS, B.S., M.D., Instructor in Obstetrics  
1020 Donaldson Bldg.
- IVAR SIVERTSEN, M.D., Instructor in Gynecology  
315 Syndicate Bldg.
- HENRY L. ULRICH, B.S., M.D., Instructor in Medicine  
420 Syndicate Bldg.
- MARGARET WARWICK, B.S., M.D., Instructor in Pathology and Bacteriology  
1516 7th St. S. E.
- HARRY B. ZIMMERMAN, M.D., Instructor in Surgery  
910 Lowry Bldg., St. Paul

Members of the faculties of other schools giving instruction to medical students:

- IRA HARRIS DERBY, Ph.D., Assistant Professor of Chemistry
- EVERHART P. HARDING, Ph.D., Associate Professor of Chemistry
- WILLIAM H. HUNTER, Ph.D., Assistant Professor of Chemistry

#### TEACHING ASSISTANTS

- WILLIAM D. BEADIE, M.D., C.M., Assistant in Pediatrics  
334 Lowry Bldg., St. Paul
- CLIFTON A. BOREEN, B.S., M.D., Assistant in Dermatology  
416 Syndicate Bldg.
- HOWARD S. CLARK, B.S., M.D., Assistant in Diseases of Eye, Ear, Nose,  
and Throat  
616 Syndicate Bldg.
- ROY E. CRUZEN, Assistant in Physiology  
1121 University Ave. S. E.
- CARL B. DRAKE, B.A., M.D., Assistant in Medicine  
439 Lowry Bldg., St. Paul
- E. K. GREEN, M.D., Assistant in Surgery  
307 Reid Corners



- JAMES HAMMOND, M.D., C.M., Assistant in Obstetrics  
334 Lowry Bldg., St. Paul
- J. A. HEDDING, M.D., Assistant in Pediatrics 1029 Andrus Bldg
- ALEXANDER JOSEWITCH, B.S., M.D., Assistant in Medicine  
2505 Chicago Ave.
- STANLEY E. KERRICK, M.D., Assistant in Diseases of the Eye, Ear, Nose,  
and Throat 802 Donaldson Bldg.
- W. J. KREMER, M.D., Assistant in Genito-urinary Diseases  
523 Plymouth Ave. N
- R. T. LA VAKE, B.A., M.D., Assistant in Anatomy and Obstetrics  
413 Pillsbury Bldg.
- FRANK J. LAWLER, M.D., Assistant in Medicine 1525 E. Lake St.
- WILLIAM W. LEWIS, M.D., Assistant in Eye, Ear, Nose and Throat  
Lowry Bldg., St. Paul
- A. E. LOBERG, M.D., Assistant in Mental and Nervous Diseases  
1909 Washington Ave.
- HENRY A. LYSNE, B.S., M.D., Assistant in Pediatrics 700 20th Ave. N.
- C. O. MALAND, B.A., M.D., Assistant in Obstetrics 300 Reid Corners
- F. A. OLSON, B.A., M.D., Assistant in Medicine  
914 Lowry Bldg., St. Paul
- G. M. OLSON, M.D., Assistant in Dermatology 636 Syndicate Bldg.
- THOMAS A. PEPPARD, B.S., M.D., Assistant in Medicine  
623 Syndicate Bldg.
- CHARLES L. RODGERS, M.D., Assistant in Obstetrics 700 W. Lake St.
- W. C. RUTHERFORD, M.D., Assistant in Obstetrics Lowry Bldg., St. Paul
- L. H. RUTLEDGE, A.B., Assistant in Anatomy University of Minnesota
- C. A. STEWART, M.A., Assistant in Anatomy 1819 Fourth St. S. E.
- CHARLES E. SMITH, JR., M.D., Assistant in Pediatrics  
740 Lowry Bldg., St. Paul
- MARGARET I. SMITH, M.D., Assistant in Diseases of Eye, Ear, Nose, and  
Throat 1940 Emerson Ave. S.
- HENRY C. STUHR, M.D., Assistant in Surgery 628 Syndicate Bldg.
- GEORGE E. THOMAS, B.L., M.D., Assistant in Medicine 1 E. Lake St.
- ANTON G. WETHALL, B.S., M.D., Assistant in Genito-urinary Diseases  
325 Cedar Ave.

## TEACHING FELLOWS

- HENRY E. BINGER, M.D., in Division of Eye, Ear, Nose, and Throat
- G. L. McWHORTER, M.D., in Department of Surgery
- S. E. MOORE, LL.B., M.D., in Department of Obstetrics
- RALPH EDWIN MORRIS, M.S., M.D., in Department of Medicine
- ROOD TAYLOR, M.D., in Division of Pediatrics
- HENRY W. WOLTMANN, B.S., M.D., in Division of Mental and Nervous  
Diseases

GRADUATE SCHOLARS

R. J. RIZER, M.D., in Department of Medicine

H. J. FRIESEN, M.D., in Division of Eye, Ear, Nose, and Throat

STUDENT ASSISTANTS

REUBEN A. JOHNSON, Assistant in Pathology and Bacteriology

J. A. KITTELSON, B.A., Assistant in Anatomy

J. C. MCKINLEY, B.S., Assistant in Anatomy

E. H. NORRIS, B.S., Assistant in Anatomy

LYLE J. ROBERTS, B.A., Assistant in Physiology

RAY SHANNON, M.S., Assistant in Pathology and Bacteriology

FLORIEN VAUGHN, A.B., Assistant in Anatomy

## GENERAL INFORMATION

The twenty-eighth annual course of study in the Medical School begins Tuesday, September 7, 1915, and covers a period of nine months. A summer session of six weeks opens in the latter part of June.

### REQUIREMENTS FOR ADMISSION TO THE MEDICAL SCHOOL

(a) Two years of high school Latin, as part of the high school course required for entrance to the College of Science, Literature, and the Arts.

(b) At least two years of prescribed and elective study in the College of Science, Literature, and the Arts\* of this University or of any other approved institution. The prescribed academic studies preliminary to medicine are: rhetoric, six credits; physics, eight credits; general chemistry and qualitative analysis, or these subjects combined with organic chemistry, twelve credits; zoology, six credits; and a reading knowledge of German. It will be understood that the two or more years of collegiate study will lead, upon the satisfactory completion of one or two years of medical study, to the baccalaureate degree in science or in arts.

Students holding the bachelor's degree of any recognized college may submit credentials of practical equivalence in cultural studies, provided an adequate knowledge of biology, chemistry, and physics has been attained.

### REGISTRATION

Registration is had under the general university rules in the office of the Registrar. Registration slips and receipts for fees are to be deposited promptly in the office of the Dean of the Medical School, where final registration and classification are made, and where the student's courses of study will be arranged.

### FEEES

The annual tuition fee in the Medical School is \$150.00, payable in two installments, at the opening of the first and second semesters. No tuition fee is charged for the final hospital or advanced laboratory year, which is now requisite to the degree.

Third-year students make a deposit of \$10.00 and fourth-, fifth-,

\*Note: Carleton and Macalester Colleges offer acceptable pre-medical courses. Academic studies taken in other approved colleges will be considered by the Registrar on their merits.

and sixth-year students a deposit of \$5.00 as a caution fee. This fee covers the cost of unnecessary damage to school buildings, of breakage and loss of laboratory apparatus and material, penalties for late registration or late payment of fees, fees for condition examinations, and rentals of post-office box and lockers. Any balance remaining from this deposit will be returned to the student at the close of each year.

Arrangements have been made for the purchase of microscopes by students, either for cash or upon an installment plan.

Repetition of work in course demands the repetitional payment of fees.

Special students pay fees proportional to the studies they undertake.

A fee of \$1.00 is required for condition examinations; and a fee of \$5.00 for special examinations.

A fee of \$1.00 is required for attendance of students upon the clinical service of the City and County Hospital of St. Paul.

#### COMBINED COURSES IN ARTS AND MEDICINE

Students who are candidates for the degree of Bachelor of Arts, who have successfully completed three years, or 90 credits, of work and have won the required number of honor points, in the College of Science, Literature, and the Arts, may elect their fourth year in The Medical School and secure the remaining 30 credits and adequate honor points required for the baccalaureate degree, in that school.

Similarly, students who have completed, with the required number of honor points, the work of the first two years, or 60 credits, in the College of Science, Literature, and the Arts, may enter The Medical School and upon the successful conclusion of two years' work, with adequate honor points, will receive the degree of Bachelor of Science.

It will be understood that in either of these combined courses the required subjects, viz: rhetoric, chemistry, zoology, physics and a reading knowledge of German, must be included.

#### THE MEDICAL CURRICULUM

Students of medicine, within the regular four years of medical study, take a total of 4,200 hours of required and elective work. This total of hours is subdivided as follows: anatomy, 688 hours; physiology, 384 hours; organic chemistry or physical chemistry, and quantitative analysis, 160 hours; pathology, 416 hours; bacteriology, 152 hours; pharmacology, 160 hours; medicine, 752 hours; surgery, 640 hours; obstetrics and gynecology, 240 hours; hygiene and medical jurisprudence, 80 hours; electives, 528 hours.

With the year 1918, organic chemistry, as well as general chemistry and qualitative analysis, will become a pre-medical requirement and will not be included in the medical curriculum. It is recommended as a preliminary study at the present time, but provision will be made, until that date, for its inclusion in the schedule of the third year. A complete

list of required and elective courses will be found under Departmental Statements.

Certain approved courses in animal biology, chemistry, and other subjects taught in the University, outside the Medical School, may be taken as electives by medical students. A list of these courses may be had upon application.

The general arrangement of studies is planned for the average student of medicine. The order of studies is not absolutely fixed. As wide a range of individual freedom is permitted as may prove consistent with systematic education. The Committee on Students' Work has authority, within due bounds of sequence of subjects, to adjust a student's program to his particular preparation, needs, and abilities.

Specially qualified students, studying in the summer sessions or covering extra work during the school year, and completing the total of 4,200 required and elective hours in seven semesters, may, at their request and by special action of the Students' Work Committee, be allowed to spend a semester as *externe* or acting *interne* in a hospital under direct supervision of members of the Faculty. Such students will register for hospital work as the regular program of this semester; they will be subject to the same examinations as other students, and may not shorten the time required by the laws of the State for graduation in medicine. Such externship or acting internship will not take the place of the required hospital or advanced laboratory year necessary to the degree. Special courses for such advanced students are offered in the Summer Sessions between the fourth and fifth and between the fifth and sixth years.

### CREDITS

Students migrating from recognized medical schools will present to the Dean official credentials of admission requirements equivalent to those of this school, and also of time and subject credits. They will submit to the head of each department, in which they seek exemption or advanced standing, records of successful examinations. These may be accepted as of full value, or supplemented by review examination, at the discretion of the department. Subject credit, but not time credit will be given for work done other than in a medical school. Special work will be arranged for students taking advanced standing.

No condition of advanced standing entitles the student to take two years of any graded study coincidentally.

### CLINICAL SERVICE

Attendance upon clinics is required and will be recorded.

Seniors are assigned to clinical clerkships in the University Hospital. As clinical clerks they are under the supervision of senior internes or teaching fellows, who will assign them to duty. Hours of service extend daily from 10:00 to 12:00 and 2:15 to 4:00. They will record physical

examinations, make and record laboratory examinations, and attend hospital rounds. Patients will be examined by clinical clerks only at the direction of the attending clinician.

### EXAMINATIONS

The standing of students is determined by recitations, oral or written examinations, and review of laboratory or clinical note-books.

Examinations are held at the end of each semester upon courses closed within that period.

Final standings are determined in conference of the heads of departments at the close of each semester. Reports of such standings are filed and obtainable in the Dean's office.

A uniform marking system has been adopted for the whole University. Four passing grades, indicated by the symbols *A*, *B*, *C*, and *D*, represent differing degrees of merit. The symbol *E* represents a condition, which may be removed by examination and by such supplementary work as the department imposing it may require. *F* stands for a failure and calls for a repetition of the work in course. *I* stands for incomplete and grants the student further time for the completion of the required work.

Entrance conditions must be removed before the opening of the succeeding school year.

Subject conditions are removable at the first opportunity afforded. If not so removed, a condition becomes a failure.

Examinations for the removal of conditions and for advanced standing are held at the opening of the school year, from August 31 to September 4, 1915. Schedule of examinations may be had upon request.

An opportunity for the removal of first-semester conditions will be given at the Easter recess.

Habitual absence, unexcused; continued indifference to study; or persistently poor scholarship, may subject the student to temporary or indefinite suspension.

### REQUIREMENTS FOR GRADUATION

Compliance with the admission requirements; the prior attainment of the degree of Bachelor of Arts or Bachelor of Science, to which one year in medicine for the arts degree, and two years in medicine for the science degree, may contribute; the completion of the full four-year period of required and elective work in the Medical School; an approved hospital internship or advanced laboratory work or public health study for one year; and an unimpeachable moral character, are the essentials for graduation.

The required internship insures to the practitioner of medicine a year of varied clinical experience under competent supervision and gives to the public a greater assurance of efficiency in the graduate. The alternative of advanced laboratory work serves to encourage men and women of training who desire to enter the profession of medical teaching.

The alternative of public health study meets a growing demand for trained medical sanitarians.

## CLINICAL OPPORTUNITIES

### THE UNIVERSITY HOSPITALS

The University is fortunate in the ownership and control of the University Hospital service. The Elliot Memorial Building, the product of a bequest of the estate of the late Dr. and Mrs. A. F. Elliot, supplemented by legislative appropriations, provides a present clinic of 192 beds. It is a fireproof and sound-proof structure and is generously equipped for teaching purposes.

The University Hospital system seeks the highest attainable results in the treatment of patients and the training of students. Its clinical service is closely coöperative with the laboratory departments.

Its service is free and patients are admitted only upon the certificate of physicians of the State vouching for the applicant's inability to pay ordinary hospital charges and physician's fees, and stating the clinical character of the case. It carries a waiting list of available patients and entertains applicants from every county of the State.

A service building has been built and equipped within the past year. It provides improved kitchens, dining-rooms, store-rooms and quarters for domestic help.

For the present, the University is obliged to employ temporary buildings for the housing of pupil and graduate nurses.

The Out-patient Department of the University Hospitals is housed, at present, in a detached building upon the west side of the Mississippi River, opposite the University Campus. Its early removal to the University Campus is assured. Its service is open to free patients during the entire year and is conducted by the clinical staff of the Faculty of the Medical School. It is subdivided into medical, surgical, gynecological, obstetrical, children's, eye, ear, nose and throat, skin, genito-urinary, nervous and mental, and orthopedic clinics. It entertained 14,363 new patients and received 51,668 patients' visits during the past year.

Sections of the senior and junior classes are assigned to these clinics daily and are trained in case-history taking, physical examinations and diagnosis, in prescription writing, and in general therapeutic methods.

### AFFILIATED HOSPITALS

The City Hospital of Minneapolis and the City and County Hospital of St. Paul are closely affiliated with the Medical School of the University. One half of their clinical service is under the direction of the Faculty. Attending and consulting staffs are appointed annually upon the recommendation of the Administrative Board of the School. The combined resources of these two hospitals are represented by some 1,400 beds. Every phase of clinical service is seen in their wards and amphitheatres. To-

gether with the University Hospitals, they offer a sufficient number of internships to meet the requirements of the School.

The State Hospital for the Crippled and Deformed, at Phalen Park, has recently invited the Medical School to full participation in its clinical opportunities. Its superintending surgeon is a member of the Faculty and his assistants are largely chosen from its staff.

### LIBRARY

The library of the Medical School consists of the general clinical library and of small collections of books in the department libraries of medicine, surgery, obstetrics, anatomy, pathology and bacteriology, physiology, and pharmacology. The general clinical library is housed in Millard Hall. It is open daily from 9:00 a.m. to 10:00 p.m. Departmental collections of reference literature are readily available to students and investigators. Complete files of important periodicals are preserved and over 200 current journals are received. Within recent years, a number of valuable collections of books have been given to the Medical School.

The libraries of other schools and colleges of the University, of the Hennepin County and of the Ramsey County Medical Societies, are available to students of medicine.

### PRIZES AND FELLOWSHIPS

*The Rollin E. Cutts Prize in Surgery.*—Dr. Martha Smith Cutts, '91 medical, has established, as a memorial to her husband, the late Dr. Rollin E. Cutts, a fund of \$500, the income of which is awarded, in the form of a gold medal, to that graduating member of the senior class of the Medical School who presents the best thesis evidencing original work upon an approved surgical subject.

*The Dr. J. W. Bell Prize.*—Dr. John W. Bell, Emeritus Professor of Clinical Medicine and Physical Diagnosis, has generously provided an annual prize of \$100, awarded to the student who evidences the highest proficiency in physical diagnosis.

*The Shevlin Fellowship.*—One of four fellowships, representing the income of \$10,000, established in the Graduate School by the late Thomas H. Shevlin, is open to candidates for one full year's work in acceptable medical research.

### THE SUMMER SESSION

A summer session of six weeks' duration immediately follows the Commencement in June. The courses in this session are conducted in the University and Municipal Hospitals and in the laboratories and lecture halls of the Medical School.

Graduates who hold the degree of Doctor of Medicine of any recog-



nized institution, or are licensed to practice medicine in any state, may be admitted to the Summer Session of the School.

Undergraduates in medicine will be admitted to the Summer Session to courses of study offered for the following purposes: (1) to secure advanced standing in degree of the equivalence of these courses to those offered in the regular sessions; (2) to compensate for deficiencies in studies taken in other acceptable schools; (3) to remove conditions or failures in subjects which are equivalently covered in these courses. Clinical courses will be open to undergraduates only in case they are not fully filled by graduate students.

The courses of instruction offered and the schedule of tuition fees will be found in the Announcement of the Summer Session, which will be sent upon application.

### THE GRADUATE SCHOOL IN MEDICINE

The Graduate School in Medicine has been established as a part of the main Graduate School of the University. It offers to suitably prepared graduates in medicine, courses covering two and three years, leading, respectively, to the Degrees of Master of Science and Doctor of Science. The adequate training of specialists in medicine is one of the main purposes of the school and for this purpose a number of teaching fellowships, under annual stipends, have been created; and an additional number of graduate scholarships, under an abatement of tuition fees, to which selected graduate students receive appointment.

The field of the Graduate School in Medicine has been extended to the inclusion of the opportunities for graduate study and medical research offered by The Mayo Foundation for Medical Education and Research established at Rochester, Minnesota. The Foundation maintains a number of fellowships and graduate students may be assigned to courses of study both at the University and in the Foundation.

A Circular of Information concerning The Graduate School in Medicine is in course of preparation.

Students in the Medical School who have received the Baccalaureate degree from this or any other approved University may become candidates for the degree of Master of Arts, Master of Science, or Doctor of Philosophy in the Graduate School. In addition to the work credited to the M.D. degree, they must pursue courses of study conforming to the regulations of the Graduate School.

Students registered in the Graduate School may elect majors or minors for the graduate degrees, for which advanced courses are provided, in anatomy, embryology, histology, neurology, pathology, bacteriology, and physiology, in the Medical School.

In all cases, students must comply with the rules and regulations of the Graduate School of the University of Minnesota, further information of which may be found in the Announcement of the Graduate School.

## THE SCHOOL FOR NURSES

The School for Nurses is a department of University instruction under the control of the Medical School. It is conducted in connection with the University Hospitals. It is in charge of a Superintendent, assisted by a committee of management and by a teaching staff selected from the Faculty of the Medical School. While the undergraduates of the School for Nurses constitute in part the nursing corps of the University Hospitals, the school exists primarily for the efficient education of the nurse. It is the first school in the United States organized under direct University control.

A four years' high-school course is the minimal requirement for admission. A four months' preliminary course in foundational studies is given before entry to the hospital service. The full course covers a period of three years. It leads to the degree of Graduate in Nursing conferred, upon the recommendation of the Faculty, by the Board of Regents.

Nurses in training are received from certain affiliated hospitals for the completion of their courses of study.

For further information, call for Bulletin of The School for Nurses.

## THE SCHOOL OF EMBALMING

With the coöperation of the State Funeral Directors' Association a School of Embalming has been organized and is conducted for a period of eight weeks, commencing January 3, 1916. It is under the direction of the Administrative Board of the Medical School.

Didactic and laboratory instruction is given in anatomy, bacteriology, chemistry, public health and sanitation, in autopsies, professional embalming, and funeral management. Certificates are issued to candidates successfully completing the course, which are accepted for state license.

Circular of information will be sent upon application.

## THE SCHOOL OF PUBLIC HEALTH

The School of Public Health has been organized under the control of the Administrative Board of the Medical School. An executive committee has been appointed by the Board for the immediate direction of the work of the School. This committee consists of the President of the University, the Dean of the Medical School, the head of the Department of Sanitary Engineering, the ranking instructor in charge of the division of Public Health in the Medical School, and the Executive Officer of the State Board of Health. A teaching faculty will be chosen, of which one member will sit in the Administrative Board of the Medical School. The functions of the School will be broad. It will institute measures relating to the health of the University community; it will prepare and recommend courses of instruction in public health in the several colleges of the University; it will conduct courses of instruction for health officials and others; it will establish and maintain a public health museum; and will

coöperate with other agencies in the study of public health problems outside of the University. The School expects to offer courses during the coming year.

A Circular of Information will be issued later.

## DEPARTMENTAL STATEMENTS

### DEPARTMENT OF ANATOMY

Professors CLARENCE M. JACKSON, JOHN B. JOHNSTON, THOMAS G. LEE, Instructors WILLIAM F. ALLEN, W. E. CAMP, J. A. MYERS; Teaching Assistants R. T. LAVAKE, L. H. RUTLEDGE, C. A. STEWART; Student Assistants J. A. KITTELSON, J. C. MCKINLEY, E. H. NORRIS, FLORIEN VAUGHN.

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Departmental Office, Institute of Anatomy

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#### REQUIRED COURSES

- 1 a,b. ELEMENTARY HUMAN ANATOMY. Lectures, recitations and demonstrations. School for Nurses. 48 hours. MYERS.
- 3 a,b. GROSS HUMAN ANATOMY. Dissection, including osteology. A disarticulated skeleton loaned to every two students. Every student required to dissect lateral half of the body. Lectures and quizzes. Third year medical, 11 hours a week, first semester; 10 hours a week, second semester; total 336 hours; ten credits. JACKSON, ERDMANN, LA VAKE, MYERS.
- 5 a,b. GROSS HUMAN ANATOMY. Morphology of the various systems. Osteology. Splanchnology, with special reference to the digestive system. Dissection of the head, neck and trunk. Lectures and laboratory work. First year dental. Three periods a week, first semester; two periods a week, second semester; total 320 hours. JACKSON, ERDMANN, MYERS, STEWART.
6. HISTOLOGY AND EMBRYOLOGY. Minute structure and development of the tissues and organs. Lectures and laboratory work. First year dental. Two periods a week. LEE, ALLEN, CAMP.
51. HUMAN HISTOLOGY. Microscopic study of the various tissues and organs. Laboratory work, lectures, and recitations. Third year medical. 160 hours; five credits. SCAMMON, CAMP.
52. HUMAN EMBRYOLOGY. Development of the human body. Laboratory work, lectures, and recitations. Third year medical. Prerequisite: course 51. 96 hours; three credits. LEE, SCAMMON.
53. HUMAN NEUROLOGY. A study of the central nervous system and sense organs. Laboratory work, lectures, and recitations. Fourth year med-

ical. Prerequisite: courses 51, 52. 96 hours; three credits. JOHNSTON, ALLEN, MYERS.

## ELECTIVE COURSES

111. ANATOMICAL TECHNIQUE. Microtechnique, reconstruction and museum methods, etc. Laboratory work and occasional lectures. Fourth, fifth or sixth year medical. Limited to sixteen students. 96 hours or less. LEE, ALLEN.
113. ADVANCED HISTOLOGY. A study of special preparations, including practice in the identification of unknown specimens. Fourth, fifth or sixth year medical, or graduate students. Limited to sixteen students. Prerequisite: course 51. 96 hours, or less.
114. TOPOGRAPHIC ANATOMY. Based upon a study of serial cross-sections of the human body. Laboratory work, lectures, and recitations. Fourth, fifth or sixth year medical, or graduate students. Limited to twenty-four students. Prerequisite: course 3a,b. 96 hours, or less. JACKSON.
115. FETAL ANATOMY. Study of the human fetus, with comparison of earlier embryonic and later postnatal structure. Laboratory work. Fourth, fifth or sixth year medical, or graduate students. Limited to twenty students. Prerequisites: courses 3a,b, 52. 96 hours, or less. SCAMMON.
117. IMPLANTATION OF OVUM. A study of the implantation of the ovum and the formation of the decidua in man and mammals. Lectures and laboratory work. Fourth, fifth or sixth year medical, or graduate students. Limited to twelve students. Prerequisite: course 52. 96 hours, or less. LEE.
118. APPLIED ANATOMY. Relationships, with reference to their clinical applications. Lectures and demonstrations. Fourth, fifth or sixth year medical, or graduate students. Prerequisite: course 3a,b. 48 hours. ERDMANN.
119. SPECIAL DISSECTIONS. Dissection of special regions, including preparation of museum specimens. Fourth, fifth or sixth year medical, or graduate students. Limited to twenty-four students. Prerequisite: course 3a,b. 96 hours, or less. ERDMANN.
121. EXPERIMENTAL NEUROLOGY. A study of the morphology of the central nervous system as determined by experimental methods. Fifth or sixth year medical, or graduate students. Limited to five students. Prerequisite: course 55. 96 hours, or less. ALLEN.
- 123 a,b. ADVANCED ANATOMY. Advanced work, largely individual in character, in gross anatomy, histology, or embryology. Laboratory work. Fourth, fifth or sixth year medical, or graduate students. Admission

only upon approval of instructor. Hours and credits to be arranged. JACKSON, LEE OR SCAMMON.

- 201 a,b. RESEARCH IN ANATOMY. Research work in gross or microscopic anatomy, neurology, histology, or embryology, for properly qualified students. For graduates or others upon approval of any one of the instructors. Hours and credits to be arranged. JACKSON, JOHNSTON, LEE, SCAMMON.
- 203 a,b. ANATOMICAL SEMINAR. Presentation and discussion of research work in progress in the department, together with reviews of current anatomical literature. For graduates or others upon approval of instructor. 32 hours; one credit. JACKSON.

#### THE DEPARTMENT OF PHYSIOLOGY

Professor ELIAS P. LYON; Associate Professors RICHARD O. BEARD, FREDERICK H. SCOTT; Assistant Professors J. F. McCLENDON, M. RUSSEL WILCOX; Instructors FRANCIS B. KINGSBURY, C. J. V. PETTIBONE; Assistants ROY E. CRUZEN, LYLE J. ROBERTS.

Departmental Office, Millard Hall

#### REQUIRED COURSES

- 3 a,b. ELEMENTARY HUMAN PHYSIOLOGY. Lectures and laboratory work. School for Nurses, Home Economics students and others. 96 hours. LYON, BEARD, SCOTT, and Assistants.
- \*4. ELEMENTARY PHYSIOLOGY AND PHYSIOLOGICAL CHEMISTRY. Lectures and laboratory work. Second year dental. 144 hours. SCOTT, BEARD, PETTIBONE and Assistants.
52. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta. Lectures and laboratory work. Third year medical. 128 hours; four credits. PETTIBONE, KINGSBURY, McCLENDON.
53. GENERAL PHYSIOLOGY. The study of muscle, nerve, blood, circulation, and respiration. Lectures and laboratory work. Fourth year medical. 128 hours; four credits. LYON, BEARD, SCOTT, PETTIBONE, McCLENDON, KINGSBURY and Assistants.
54. GENERAL PHYSIOLOGY. The study of the nervous system and special senses; of digestion, metabolism, nutrition and excretion. Lectures and laboratory work. Fourth year medical. 128 hours; four credits. LYON, BEARD, SCOTT, WILCOX, and Assistants.

\*Not given in 1915-16.

## ELECTIVE COURSES

101. URINALYSIS. Advanced methods. Fourth, fifth or sixth year. First quarter. 40 hours. PETTIBONE.
- 102 a,b. ADVANCED MAMMALIAN PHYSIOLOGY. A course of classical physiologic experiments. Fourth, fifth or sixth year. 24 hours. LYON, SCOTT, CRUZEN.
103. PHYSIOLOGY OF METABOLISM. Students are placed on known diets and the results are studied chemically. Fourth, fifth or sixth year. Second quarter. 40 hours. PETTIBONE.
- 105 a,b. PHYSICAL CHEMISTRY OF CELLS AND BIOLOGIC FLUIDS. The physical chemistry of colloids, hydrogen-ion concentration, surface tension, osmotic pressure, electric conductivity; their bearing on biochemical analysis, digestion, stimulation and anesthesia, muscular contraction, and cell division. Fourth, fifth or sixth year. Prerequisites: Animal Biology and Organic Chemistry. First semester, or both semesters offered for credit. 80 hours, each semester. McCLENDON.
- 107 a,b. ADVANCED PHYSIOLOGIC CHEMISTRY. Course arranged by instructors with qualified students for special work. Fourth, fifth or sixth year. 40 hours, either semester. PETTIBONE, KINGSBURY.
- 109 a,b. ADVANCED PHYSIOLOGY. Course arranged by instructors with qualified students on special problems in physiology or physiologic chemistry. Fourth, fifth or sixth year. 40 hours, either semester. LYON, SCOTT, McCLENDON.
110. PHYSIOLOGY OF DEVELOPMENT. The physiology of the ovum, the embryo, the fetus; the functions of menstruation, ovulation, pregnancy, parturition and lactation; the functional characteristics of birth, infancy, childhood, adolescence, maturity and old age. Fourth, fifth or sixth year. 32 hours. BEARD.
- 111 a,b. FOODS AND PRACTICAL DIETETICS. A study of human foods and food values; of the principles of food selection; of caloric indices and balanced dietaries. Exercises in the practical preparation of foods. Fourth, fifth or sixth year. Limited to twelve students. 48 hours. BEARD, THOMAS.
113. EXAMINATION OF THE EYE AND EAR. A study of advanced methods. Lectures, demonstrations and laboratory exercises. Prerequisite: course 54. Fourth, fifth or sixth year. First quarter. 24 hours. WILCOX.
114. PHYSIOLOGY OF ACCOMMODATION. A study of optical principles and methods. Lectures, demonstrations and laboratory exercises. Fourth, fifth or sixth year. 24 hours. WILCOX.

- 115 a,b. CONFERENCE COURSE IN PHYSIOLOGY. A study of the internal secretions; lymph formation, edema; the tropisms in medicine; the physiology of the stomach. Informal lectures and library study. Prerequisites: courses 52, 53 and 54. 12 hours, each quarter. LYON.
- 117 a,b. SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY. For instructors and advanced students. 32 hours. LYON, HIRSCHFELDER and Staff.
- 201 a,b. RESEARCH IN PHYSIOLOGY. LYON, SCOTT, McCLENDON.
- 203 a,b. RESEARCH IN PHYSIOLOGIC CHEMISTRY. KINGSBURY, PETTIBONE.

## DEPARTMENT OF PHARMACOLOGY

Professor ARTHUR D. HIRSCHFELDER; Associate Professor E. D. BROWN;  
Assistant Professor ROBERT A. HALL.

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Departmental Office, Millard Hall

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## REQUIRED COURSES

1. a,b. 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. Primarily for School for Nurses. 64 hours. HALL.
4. COURSE IN PHARMACOLOGY. The history, origin, nature, pharmacal preparations, and uses of drugs, including the discussion of their physiologic, pharmacologic, and therapeutic actions. Lectures, demonstrations, and recitations. Second year dental. 32 hours. HALL.
52. GENERAL PHARMACOLOGY. The principles underlying the structure, physico-chemical properties, physiologic, therapeutic and toxic actions of substances, natural or synthetic, used as medicines. Lectures and recitations. Fourth year medical. 32 hours, two credits. HIRSCHFELDER, BROWN.
54. EXPERIMENTAL PHARMACOLOGY. Illustrating the preparation and actions of medicines, their relation to chemical structure and their mode of administration. Laboratory exercises. Fourth year medical. 48 hours, one credit. HIRSCHFELDER, BROWN, HALL.
61. a,b. GENERAL PHARMACOLOGY AND THERAPEUTICS. A more detailed study of drugs important in clinical practice, covering the relations of chemical structure to physiologic and therapeutic action and modes of application in clinical medicine. Fifth year medical. 64 hours. HIRSCHFELDER, BROWN.



63. THERAPEUTIC CONFERENCE. A systematic discussion of selected cases studied from case notes. Sixth year. 16 hours. HIRSCHFELDER.

## ELECTIVE COURSES

55. a,b. PRESCRIPTION WRITING. The principles of prescription writing; study of the flavoring, coloring and incompatibilities of drugs. Lectures and practical exercises. Fourth, fifth or sixth year medical; throughout the year. 16 hours. Extra time and credit may be arranged. BROWN.
57. a,b. APPLIED THERAPEUTICS. Conferences on prescription writing and treatment of cases seen by students during their work in the Dispensary. Limited to students working in the medical Dispensary. Fifth or sixth year. 6 hours. HIRSCHFELDER, BROWN.
60. EXPERIMENTAL PHARMACOLOGY. The effects of the important heart and nerve stimulants, sedatives, purgatives and antiseptics. Laboratory experiments. Primarily for dental students. 24 to 48 hours. HIRSCHFELDER, BROWN, HALL.
102. ADVANCED PHARMACOLOGY. The relation of drug action to chemical structure; the mode of action and therapeutic application of various synthetic drugs; the study of chemo-therapy. Fifth or sixth year. 32 hours. HIRSCHFELDER, BROWN, HALL.
103. a,b. EXPERIMENTAL PHARMACOLOGY. Special investigation and experimental study of one or more subjects in pharmacology, in which the student is given an opportunity of choice of the following topics:
- a. Anesthetics, general and local; the principles and dangers of anesthesia.
  - b. Stimulants and depressants of the circulation and their relation to the treatment of heart disease.
  - c. Drugs acting upon the kidneys, normal or diseased.
  - d. Urinary antiseptics and the urinary excretion of drugs.
  - e. Action and detection of poisons and their antidotes.
  - f. Detailed study of the effects in man of the common harmless drugs.
  - g. The internal secretions and gland extracts; their effect upon the action of drugs.
  - h. Action of drugs upon animal and bacterial parasites, tumors, etc. Fifth or sixth year. 24, 48 or 96 hours. HIRSCHFELDER, BROWN, HALL.
105. a,b. SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY. Reviews of recent literature bearing upon physiologic and pharmacologic subjects. Conducted by department directors, with the collaboration of the staffs and of qualified graduate or undergraduate students. 32 hours.
107. a,b. RESEARCH IN PHARMACOLOGY. HIRSCHFELDER, BROWN.

THE DEPARTMENT OF PATHOLOGY, BACTERIOLOGY, AND  
PUBLIC HEALTH

Professor H. E. ROBERTSON; Associate Professors R. H. MULLIN, E. T. BELL, W. P. LARSON; Instructors MOSES BARRON, A. T. HENRICI, W. C. JOHNSON, A. C. POTTER, MARGARET WARWICK; Assistants REUR-EN A. JOHNSON, RAY SHANNON.

Departmental Office, Institute of Public Health and Pathology

## REQUIRED COURSES

- 1 a or b. ELEMENTARY BACTERIOLOGY. Lectures, demonstrations, and laboratory studies. School for Nurses. 32 hours. HENRICI, WARWICK.
3. DENTAL BACTERIOLOGY. Lectures and demonstrations. Second year dental. 64 hours. HENRICI, WARWICK.
4. DENTAL PATHOLOGY. Lectures, demonstrations and laboratory exercises. Second year dental. 32 hours. BELL.
6. ELEMENTARY BACTERIOLOGY. Lectures, demonstrations and laboratory exercises. Students in Home Economics and others. 96 hours, three credits. WARWICK, HENRICI.
51. GENERAL PATHOLOGY. The study of pathologic processes; of regeneration and repair; and of tumors. Fourth year medical. Prerequisite: course 51, Histology. 96 hours; four credits. ROBERTSON, BELL, BARRON, POTTER, WARWICK.
- 53 a,b. SPECIAL PATHOLOGY. Studies of museum preparations and of material from autopsies and operations; the pathology of infectious diseases, as tuberculosis, syphilis, typhoid fever, etc.; the special pathology of various organs. Fourth year medical. Prerequisite: course 51, general Pathology. 232 hours; eight credits. ROBERTSON, BELL, BARRON, POTTER, WARWICK.
55. CLINICAL PATHOLOGY. Examinations of urine, blood, sputum, stomach contents, feces, exudates and transudates. Lectures, laboratory exercises and recitations. Fifth year medical. 64 hours. JOHNSON, POTTER.
58. GENERAL BACTERIOLOGY. Preparation of culture media. The morphology of bacteria; methods of staining and identification; anaerobic bacteria; principles of sterilization and disinfection; examination of air, water, milk; relation of bacteriology to the industries. Third year medical; open to others. Prerequisites: General chemistry and botany or zoology. 96 hours; four credits. LARSON, WARWICK, HENRICI.
59. SPECIAL BACTERIOLOGY. Study of pathogenic bacteria; bacteriological methods in clinical diagnosis; principles of infection and immunity, with practical application of serum reactions. Fourth year medical;

- open to others. Prerequisite: Course 58, General Bacteriology. 72 hours; three credits. LARSON, WARWICK, HENRICI.
61. a,b. COURSE IN HYGIENE. A composite course. Lectures upon the following subjects: Public Health Administration and Laws; Vital Statistics; Occupational Diseases; Transmissible Diseases; Public Health Laboratory Methods; Epidemiology; Sanitary Engineering; Laboratory Investigations of Water, Sewage, and Milk; Insects and Disease; Personal Hygiene; Dental Hygiene; School Hygiene; Infant Mortality. Sixth year medical. 64 hours. BRACKEN, MULLIN, CHESLEY, BASS, BEARD, KEENE.
63. a,b. CLINICAL PATHOLOGY. Laboratory work in sections at the Dispensary. Sixth year medical. 12 hours. WARWICK.

## ELECTIVE COURSES

- 101 a,b. PATHOLOGIC TECHNIQUE. Practical work in use of general and special methods for preparation of microscopic and gross pathologic specimens. This will include practice with freezing microtome, celloidin and paraffin embedding methods, general and special stains, preparation of museum specimens, etc. Limited to ten students. Fourth-, fifth-, and sixth-year medical. Prerequisite: Course 51, General Pathology. 48 hours. Third quarter. ROBERTSON.
103. a,b. SPECIAL PROBLEMS IN BACTERIOLOGY. A study of particular groups of bacteria. The bacteriology of special organs and parts. Fifth or sixth year medical. Prerequisites: Courses 58 and 59, bacteriology, general and special. Hours to be arranged. HENRICI.
104. SPECIAL BACTERIOLOGIC TECHNIQUE. An advanced course giving additional work in bacteriology and the opportunity of working out special problems. Fifth year medical. Limited to ten students. 48 hours. LARSON.
105. COURSE IN IMMUNITY. The study of natural and acquired immunity, including experiments to show the several types of protective substances and the principles and technique of serum diagnosis. Fifth or sixth year medical. Limited to ten students in each semester. 48 hours. LARSON.
106. ADVANCED PATHOLOGY. Demonstration and study of gross pathologic specimens with practice in the rapid recognition of various gross and microscopic lesions. Limited to fifteen students. Fourth-year medical. 48 hours. BELL and Staff.
107. DIAGNOSIS OF TUMORS. Rapid diagnosis and study of tumors and other pathologic conditions simulating tumor formation. Theoretical and practical instruction. Fifth- and sixth-year medical. Prerequisite: Course 53, Special Pathology. 48 hours. First quarter. BELL.
108. GYNECOLOGICAL PATHOLOGY. A course in the study of pathologic conditions common to the diseases of women. Fifth or sixth year medical. Prerequisite: Course 53, Special Pathology. Fourth quarter. 24 hours. ADAIR, BELL.

- 109 a,b. **AUTOPSIES.\*** The technique of performing autopsies and making proper records is studied and practical work furnished each student. Fifth- and sixth-year medical. Limited to nine students each quarter. 24 hours. Elective may be repeated if there are vacant places. Pathology Staff.
110. **NEUROPATHOLOGY.** A study of the pathologic conditions of nerve tissues in characteristic lesions. Fifth or sixth year medical. Prerequisite: Courses 52, Special Pathology. Fourth quarter; 24 hours. HAMILTON, BELL.
113. a,b. **CLINICAL LABORATORY COURSE.** Practical diagnostic study in the out-patient department laboratory. Limited to sections of four students. Fifth or sixth year medical. 18 hours. WOLTMANN, WARWICK.
201. a,b. **RESEARCH.** Graduate students, of the necessary preliminary training, may elect research either as majors or minors, in Pathology, or Bacteriology. Hours to be arranged. ROBERTSON, BELL, LARSON.
- 115 a,b. **MEDICAL ENTOMOLOGY.** A study of those insects, and their near relatives, which are disease-bearers or parasites of man; life-history, habits, and methods of control. Fourth, fifth or sixth year. Prerequisite: Animal Biology, Course 3-4, or equivalent. 32 hours, either semester. HOWARD.

\*N. B. This elective takes the place of the formerly required autopsies.

### THE DEPARTMENT OF SURGERY

Professors J. E. MOORE, ARTHUR J. GILLETTE, FRANK C. TODD; Associate Professors J. FRANK CORBETT, ARTHUR A. LAW, ARCHIBALD MACLAREN, WILLIAM R. MURRAY; Assistant Professors FRANK E. BURCH, A. R. COLVIN, WARREN A. DENNIS, EMIL S. GEIST, JOHN S. MACNIE, ARTHUR T. MANN, HARRY P. RITCHIE, JOHN T. ROGERS, FRANKLIN R. WRIGHT; Instructors JOHN S. ABBOTT, PAUL F. BROWN, CARL C. CHATTERTON, WALLACE COLE, EARLE R. HARE, J. A. JOHNSON, HORACE NEWHART, OSCAR OWRE, FREDERICK H. POPPE, FRED J. PRATT, CHARLES A. REED, ARTHUR C. STRACHAUER, HARRY B. ZIMMERMAN; Assistants HOWARD S. CLARK, E. K. GREEN, STANLEY E. KERRICK, W. J. KREMER, W. W. LEWIS, MARGARET I. SMITH, HENRY C. STUHR, ANTON J. WETHALL; Teaching Fellows G. L. McWHORTER, H. E. BINGER.

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Departmental Office, Millard Hall

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### REQUIRED COURSES

51. **SURGICAL TECHNIQUE.** A course in operative principles. Lectures and demonstrations. Fifth year. 16 hours. STRACHAUER.

52. **GENERAL SURGERY.** The diseases and injuries of tendons, fasciae, bursae, blood-vessels, nerves, brain and meninges. Lectures and demonstrations. Fifth year. 48 hours. LAW.
53. **PRINCIPLES OF SURGERY.** A study of surgical inflammations, etc.; illustrated by gross and microscopic preparations from the living subject and from experimental sources. Lectures and demonstrations. Fifth year. 56 hours. CORBETT.
54. **REGIONAL SURGERY.** The practical surgery of the several regions of the body; diseases of bones, injuries and acute diseases of joints, etc. Lectures and demonstrations. Fifth year. 48 hours. MOORE.
55. **GENERAL SURGERY.** Fractures and dislocations. Lectures and demonstrations. Sixth year. 32 hours. LAW.
- 57 a,b. **DIAGNOSTIC CLINIC.** A series of clinics upon the diagnosis of surgical conditions as presented in the hospital wards. Fifth year. 32 hours. MOORE.
- 59 a,b. **OPERATIVE CLINIC.** A course in operative procedure conducted at the University Hospitals, the Minneapolis City Hospital, and the City and County Hospital at St. Paul on Thursdays and Saturdays, throughout the year. Fifth year. 56 hours. MOORE, LAW, MACLAREN, RITCHIE, STRACHAUER, MANN, POPPE, ROGERS, DENNIS, COLVIN.
- 61 a,b. **CLINICAL CLERKSHIPS.** Direct observation of patients in hospital, under supervision of senior internes or teaching fellows; taking and recording of case histories and making of provisional diagnoses. Sixth year. 64 hours. Clinical Staff.
63. a,b. **OPERATIVE CLINIC.** A course of operations in the University Hospitals, the Minneapolis City Hospital, and the City and County Hospital at St. Paul, on Tuesdays, Thursdays, and Saturdays. Sixth year. 48 hours. MOORE, LAW, MACLAREN, RITCHIE, STRACHAUER, MANN, POPPE, ROGERS, DENNIS, COLVIN.
65. a,b. **MINOR OPERATIVE CLINICS.** Courses conducted with class sections on three days in each week at the Out-patient Department. Sixth year. 12 hours. STRACHAUER, HARE and Assistants.

## ELECTIVE COURSES

101. a,b. **COURSE IN MINOR SURGERY.** The study of diagnosis and treatment of selected cases. Sixth year. 12 hours. STRACHAUER, HARE, and Assistants.
103. **OPERATIVE COURSE ON THE CADAVER.** The technique of abdominal incision and closure; of bowel suturing, appendiceal removal, kidney exploration, nephrotomy, tracheotomy, amputations, ligations, and other problems in emergency surgery. Fifth year. 32 hours. CORBETT.

104. RESEARCHES IN SURGICAL PROBLEMS. A study of approved problems, selected by students in the course, in operative, physiological, histological, and chemical methods. Fifth year. 24 hours. CORBETT.
106. COURSE IN TUMORS. The pathology and diagnosis of tumors, classified by anatomical relation. Sixth year. 24 hours. CORBETT.
108. COURSE IN EXPERIMENTAL SURGERY. A study of surgical technique by cardinal operations upon animals. Sixth year. 40 hours. CORBETT.
110. LOCAL ANESTHESIA. Methods and applications of local anesthesia in both major and minor surgery. Sixth year. 8 hours. STRACHAUER.
112. SURGICAL QUIZ. A review of surgical studies by recitation and conference. Sixth year. 16 hours. MANN.

## DIVISION OF ORTHOPEDIA

## REQUIRED COURSES

70. ORTHOPEDIC SURGERY. A course of clinical lectures and operations conducted in each quarter, with divisions of class, at the Hospital for Crippled and Deformed at Phalen Park. Sixth year. 24 hours. GILLETTE, CHATTERTON.
- 71 a,b. ORTHOPEDIC CLINIC. A study of cases of orthopedic disease and treatment at the Out-patient Department; three weekly sessions. Sixth year. 8 hours. GEIST, REED, COLE.

## DIVISION OF GENITO-URINARY DISEASES

## REQUIRED COURSES

73. GENITO-URINARY DISEASES. The etiology, diagnosis, and treatment of this group of diseases. A course of lectures. Sixth year. 16 hours. WRIGHT.
- 75 a,b. GENITO-URINARY CLINIC. The study of cases at the bedside and in the operating rooms of the several hospitals. Sixth year. 8 hours. WRIGHT, OWRE, FREEMAN.
- 77 a,b. GENITO-URINARY CLINIC. The observation, examination, and treatment of patients in the Out-patient Service at three weekly sessions. Sixth year. 8 hours. WRIGHT, OWRE and Assistants.

## ELECTIVE COURSES

- 113 a,b. GENITO-URINARY DISEASES. The study of cases in the Out-patient clinics, giving the student the opportunity of examination and supervised treatment of patients. Sixth year. 8 hours. WRIGHT, OWRE, and Assistants.

- 115 a,b. ENDOSCOPY AND CYSTOSCOPY. Methods of investigation and treatment, conducted at the Out-patient Department. Sixth year. 8 hours. WRIGHT.

DIVISION OF EYE, EAR, NOSE, AND THROAT

REQUIRED COURSES

79. OPTHALMOLOGY AND OTOTOLOGY. Disorders and diseases of the eye and ear and their corrective, medical, and surgical treatment. Lectures and demonstrations. Sixth year. 32 hours. TODD.
81. RHINOLOGY AND LARYNGOLOGY. The diagnosis and treatment of diseases of the nose and throat. Lectures and demonstrations. Sixth year. 16 hours. MURRAY.
- 83 a,b. OPERATIVE CLINICS IN EYE, EAR, NOSE, AND THROAT. Operative procedures in the clinics of the University Hospital, the Minneapolis City Hospital, and the City and County Hospital at St. Paul. Sixth year. 28 hours. TODD, BURCH, MURRAY, MACNIE.
- 85 a,b. CLINIC IN DISEASES OF THE EYE. Study and treatment of disorders and diseases of the eye, in the Out-patient Service, at three weekly sessions. Sixth year. 12 hours. MACNIE, PRATT, KERRICK.
- 87 a,b. CLINIC IN DISEASES OF THE EAR. Study and treatment of disorders and diseases of the ear, in the Out-patient Service, at three weekly sessions. Sixth year. 12 hours. NEWHART.
- 89 a,b. CLINIC IN DISEASES OF THE NOSE AND THROAT. Study and treatment of diseases of the nose and throat in the Out-patient Service, at three weekly sessions. Sixth year. 12 hours. MURRAY.

ELECTIVE COURSES

- 115 a,b. CLINIC IN DISEASES OF THE EYE. The examination of patients, diagnosis of diseased conditions and supervised treatment; alternate days, at the Out-patient Department. Sixth year. 12 hours. MACNIE, PRATT, KERRICK.
- 117 a,b. CLINIC IN DISEASES OF THE EAR. The examination of patients, diagnosis of diseased conditions and supervised treatment; alternate days, at the Out-patient Department. Sixth year. 12 hours. NEWHART.
- 119 a,b. CLINIC IN DISEASES OF THE NOSE AND THROAT. The examination of patients, diagnosis of diseased conditions and supervised treatment; alternate days, at the Out-patient Department. Three courses. Sixth year. 12 hours. MACNIE, MURRAY, PRATT, NEWHART, KERRICK.
- 121 a,b. OPERATIVE CLINICS IN EYE, EAR, NOSE AND THROAT. Conducted at the University Hospitals. Course repeated in each quarter. Limited to ten students. Sixth year. 16 hours. TODD.

- 123 a,b. REFRACTION. Lectures and practice work in refraction. Limited to twelve students, in each semester. Sixth year. 3 hours. BURCH.
126. OPHTHALMOSCOPY. The principles and practice of this method of examination of the eye. Sixth year. 16 hours. MACNIE, PRATT.

### THE DEPARTMENT OF MEDICINE

Associate Professors S. MARX WHITE, ARTHUR S. HAMILTON, JULIUS PARKER SEDGWICK; Assistant Professors WALTER R. RAMSEY, SOREN P. REES, FREDERICK W. SCHLUTZ, SAMUEL E. SWEITZER; Research Professor THOMAS B. HARTZELL; Instructors EARNEST L. BAKER, JOHN BUTLER, BRONSON CROTHERS, CHARLES RALPH DRAKE, E. L. GARDNER, ERNEST M. HAMMES, EDGAR J. HUENEKENS, HARRY J. IRVINE, ANGUS W. MORRISON, HAROLD PEDERSON, ERNEST T. F. RICHARDS, FREDERICK C. RODDA, JOHN P. SCHNEIDER, CARL A. SCHERER, HENRY L. ULRICH; Assistants WILLIAM D. BEADIE, CLIFTON A. BOREEN, CARL B. DRAKE, J. A. HEDDING, ALEXANDER JOSEWITCH, FRANK J. LAWLER, A. E. LOBERG, H. A. LYSNE, F. A. OLSON, G. M. OLSON, THOMAS A. PEPPARD, CHARLES E. SMITH, GEORGE E. THOMAS; Teaching Fellows RALPH EDWIN MORRIS, ROOD TAYLOR, HENRY W. WOLTMANN.

Departmental Office, Millard Hall

### REQUIRED COURSES

50. COURSE IN CASE TAKING. A study of general symptomatology; the details of clinical examination and record. Lectures, recitations, and bedside demonstrations. Fourth year. 16 hours.
52. COURSE IN MEDICAL DIAGNOSIS. The methods of physical examination and diagnosis, with practical training upon the normal and abnormal subject. Fourth year. 32 hours. REES,
51. DISEASES OF THE HEART AND BLOOD VESSELS. First quarter; fifth year. 16 hours. WHITE.
53. DISEASES OF THE BRONCHI, LUNGS, AND PLEURA. Second quarter, fifth year. 16 hours.
55. GASTRIC DISEASES AND DISEASES OF THE INTESTINAL TRACT. First semester, fifth year. 32 hours. WHITE.
54. DISEASES OF THE BLOOD AND DUCTLESS GLANDS. Fourth quarter, fifth year. 12 hours.
56. DISEASES OF THE KIDNEY, AND CONSTITUTIONAL DISEASES AND INTOXICATIONS. Third quarter, fifth year. 12 hours.
58. ACUTE INFECTIOUS DISEASES. Second semester, fifth year. 24 hours. RICHARDS.



60. MOUTH INFECTIONS. The typical infections of the oral cavity and their causal relations to disease. Fourth quarter, fifth year. 8 hours. HARTZELL.
62. MEDICAL JURISPRUDENCE. The principles of law, the rules of evidence, and the duties of physicians in medico-legal cases. Third quarter, sixth year. 16 hours. SWEENEY.
- 63 a,b. CASE ANALYSIS. A study of actual case histories by the members of the class, aided by the instructor and illustrated by the presentation of the patient, and, occasionally, by the demonstration of autopsy material. Sixth year. 64 hours. WHITE.
- 65 a,b. GENERAL CLINIC IN MEDICINE. Conducted, throughout the year, in the University Hospitals, the Minneapolis City Hospital, and the City and County Hospital, St. Paul. Fifth year. 32 hours. CLINICAL STAFF.
- 67 a,b. OUT-PATIENT CLINIC. The practical study of clinical cases in the Out-patient Service. Fifth year. 24 hours.
- 69 a,b. CLINICAL CLERKSHIPS. The personal and direct observation of patients in hospital, under the supervision of senior internes or Teaching Fellows; the taking and recording of case histories and the making of provisional diagnoses. Sixth year. 144 hours. Clinical Staff.
- 71 a,b. GENERAL MEDICAL CLINICS. Conducted throughout the year, with sections of the class, in the University Hospitals, the Minneapolis City Hospital, and the City and County Hospital of St. Paul. Sixth year. 8 hours. CLINICAL STAFF.
- 73 a,b. OUT-PATIENT CLINICS. The practical study of large numbers of patients, in the diagnosis and treatment of disease, at the Out-patient Department. Sixth year. 12 hours.

## ELECTIVE COURSES

- 101 a,b. OUT-PATIENT CLINICS. The advanced study of selected cases at the Out-patient Service. Three weekly sessions throughout the year. Limited to six students. Sixth year. 12 hours.
- 103 a,b. PHYSICAL DIAGNOSIS. The study of diagnostic methods applied to selected clinical cases. Limited to four students. Fifth year. 32 hours. RICHARDS.
104. THE EXAMINATION FOR LIFE INSURANCE. The requirements of standard and special examination of applicants for life insurance. Third, quarter, fifth year. 8 hours. COOK.
105. ACUTE INFECTIOUS DISEASES. The study of the principal infections

- and their complications. Limited to 6 students. Second quarter, sixth year. 16 hours.
106. **ADVANCED PHYSICAL DIAGNOSIS.** The study of methods of diagnosis applied to diseases of the heart and lungs. Sixth year. 16 hours.
- 107 a,b. **PHYSICAL DIAGNOSIS.** A course in physical diagnosis. Limited to 4 students. Fifth year. 16 hours. GARDNER.
109. **ACUTE INFECTIOUS DISEASES, NON-CONTAGIOUS.** A comparative study of fevers. City Hospital. Limited to 6 students. First quarter, sixth year. 8 hours. REES.
- 111 a,b. **ADVANCED PHYSICAL DIAGNOSIS OF CHEST.** Practical work on tuberculous patients at Thomas' Hospital. Limited to 6 students. First quarter, sixth year. Second quarter, fifth year. 8 hours. REES.
112. **DISEASES OF RESPIRATORY TRACT.** A study of physical signs. City Hospital. Limited to 6 students. Third quarter, fifth year. 8 hours. REES.
- 113 a,b. **PROBLEMS IN ADVANCED MEDICAL DIAGNOSIS.** Limited to 4 students. Fifth year. 16 hours. ULRICH.
114. **ADVANCED WORK IN GRAPHIC RECORDING AND FUNCTIONAL DIAGNOSIS OF CARDIOVASCULAR-RENAL DISEASES,** including the use of the polygraph and electro-cardiograph and technic of tests for renal efficiency. Limited to 6 students. Third quarter, sixth year. 16 hours. WHITE and Assistants.
- 115 a,b. **CLASS CLINIC IN GENERAL MEDICINE.** University Hospital. Fifth year. 32 hours. Clinical Staff.
117. **SECTION CLINIC IN GENERAL MEDICINE.** University Hospital. Limited to 6 students for each instructor. First semester, fifth year. 16 hours. ULRICH, SCHNEIDER, MORRIS.
118. **SECTION CLINICS IN GENERAL MEDICINE.** University Hospital. Limited to 6 students for each instructor. Second semester, fifth year. 16 hours. WHITE, RIZER.

## DIVISION OF NERVOUS AND MENTAL DISEASES

## REQUIRED COURSES

- 75 a,b. **NEUROLOGY AND NEUROLOGIC DIAGNOSIS.** The general symptomatology and methods of examination of the nervous system; the etiology, pathology, diagnosis and treatment of the special diseases of the nervous system. Lectures, recitations and lantern demonstrations. Second and third quarter, fifth year. 24 hours. HAMILTON, HAMMES.

76. **PSYCHIATRY.** The principal data and methods of modern psychiatry, with the diagnosis and treatment of the various mental disorders. Lectures, recitations and demonstrations. Prerequisite: Course 75 a,b. Fourth quarter, fifth year. 16 hours. HAMILTON.
- 77 a,b. **CLINICAL NEUROLOGY AND PSYCHIATRY.** Section clinics in nervous and mental diseases, conducted at the University Hospital, the Minneapolis City Hospital, and the City and County Hospital, St. Paul. Fifth year. 20 hours. HAMILTON, HAMMES, MORRISON, WOLTMANN.
- 79 a,b. **ADVANCED SECTION CLINICS** conducted at the above hospitals throughout the year. Sixth year. 20 hours. HAMILTON, HAMMES.
- 81 a,b. **PERSONAL OBSERVATION AND STUDY** of cases of nervous and mental disease in the University Out-patient Service. Sixth year. 12 hours. MORRISON, WOLTMANN.

## ELECTIVE COURSES

119. **PATHOLOGY OF THE NERVOUS SYSTEM.** The exhibition of gross and microscopic preparations of diseased nerve tissues; the relations existing between pathologic lesions and signs and symptoms; the chief neurone systems and the principles underlying their degeneration. Limited to four students. Prerequisites: Courses 75 a,b. and 77 a,b. First quarter, sixth year. 8 hours. HAMILTON, WOLTMANN.
121. **ORGANIC NERVOUS DISEASES.** Advanced diagnosis of nervous diseases, with the view of giving each student practical experience in all the chief diagnostic procedures employed in the study of nervous diseases. Limited to 4 students. Prerequisites: Courses 75 a,b. and 77 a,b. Second quarter, sixth year. 16 hours. HAMILTON.
122. **SYPHILITIC NERVOUS AFFECTIONS.** The diagnosis and treatment of the expressions of syphilis in the central nervous system, combining clinical and laboratory teaching and referring particularly to dementia paralytica and tabes dorsalis. Limited to 6 students. Fourth quarter, sixth year. 16 hours. HAMMES.

## DIVISION OF PEDIATRICS

## REQUIRED COURSES

82. **DISEASES OF CHILDREN.** The etiology, pathology, diagnosis, and treatment of diseases peculiar to, or distinctive in, children, with particular emphasis upon their differences from adult types. Fifth year. 56 hours. SEDGWICK, RAMSEY.
- 83 a,b. **CLINIC IN PEDIATRICS.** Conducted at the University Hospitals, the Minneapolis City Hospital, Lymanhurst, and the City and County Hospital, St. Paul. Fifth year. 16 hours. SEDGWICK, SCHLUTZ, RAMSEY, HUENEKENS, RODDA.

- 85 a,b. CLINIC IN CONTAGIOUS DISEASES. Conducted in the Minneapolis City Hospital and the City and County Hospital, St. Paul. Fifth year. 16 hours. SCHLUTZ, RAMSEY, HUENEKENS AND ASSISTANTS.
- 87 a,b. CLINIC IN PEDIATRICS. An advanced clinical course, conducted at the University Hospitals and at the affiliated hospitals. Sixth year. 8 hours. SEDGWICK, RAMSEY, SCHLUTZ, RODDA, TAYLOR.
- 89 a,b. OUT-PATIENT PEDIATRIC CLINIC. The practical study of the diseases of children in the Out-patient Service. Sixth year. 12 hours. SCHLUTZ, HUENEKENS, RODDA, SCHERER AND ASSISTANTS.

## ELECTIVE COURSES

123. DISEASES OF THE NEW-BORN. The applications of X-ray diagnosis in children; the pathology and treatment of these disorders, with the presentation of illustrative cases. Limited to 6 students. No prerequisite course. Fifth and sixth years. 16 hours. SEDGWICK, TAYLOR.
124. NERVOUS DISEASES OF CHILDREN. The functional nervous disorders of childhood, with the observation and practice of electrical reactions in normal and abnormal children. Limited to 6 students. Fifth and sixth years. 16 hours. SEDGWICK.
125. CONTAGIOUS DISEASES. The advanced study of contagious diseases, including the practice of intubation and tracheotomy, with training upon the cadaver. Fifth and sixth years. 16 hours. RAMSEY.
126. COURSE IN INFANT FEEDING. Conducted at the St. Paul Baby Welfare Clinic of the H. Amherst Wilder Charity. Sixth year. 24 hours. RAMSEY.
- 127 a,b. THEORY AND PRACTICE OF INFANT FEEDING, INCLUDING DISEASES OF THE GASTRO-INTESTINAL TRACT. Limited to 6 students. In first three quarters, sixth year; in fourth quarter, fifth year. 8 hours. SCHLUTZ.
- 129 a,b. CONGENITAL DEFECTS AND CONSTITUTIONAL DISORDERS OF INFANCY AND CHILDHOOD. Limited to 6 students. In each quarter, fifth and sixth years. 8 hours. SCHLUTZ.
- 131 a,b. INFANT FEEDING. Limited to 4 students. Sixth year. 8 hours. HUENEKENS.
- 133 a,b. PEDIATRIC CLINIC, DISPENSARY. Limited to 4 students. Fifth and sixth years. 12 hours. HUENEKENS.
- 135 a,b. SYPHILIS IN CHILDREN. Conducted at the Dispensary and the University Hospitals. Limited to 4 students. Fifth and sixth years. SCHERER.

## DIVISION OF DERMATOLOGY

## REQUIRED COURSES

91. COURSE IN DERMATOLOGY. A descriptive study of the common skin diseases and of syphilis, including diagnosis and treatment. Lectures and demonstrations. Sixth year. 16 hours. SWEITZER.
- 93 a,b. CLINICAL DERMATOLOGY. Clinics conducted at the Minneapolis City Hospital and the City and County Hospital, St. Paul. Sixth year. 12 hours. SWEITZER, FREEMAN, BUTLER, IRVINE.
- 95 a,b. CLINIC IN DERMATOLOGY. The practical study of cases of skin and syphilitic disease, in the Out-patient Service. Sixth year. 8 hours. SWEITZER, BUTLER, IRVINE.

## ELECTIVE COURSES

- 137 a,b. CLINIC IN DERMATOLOGY. An elective course in the study of selected cases of skin and syphilitic diseases, at the Out-patient Department. Limited to 4 students. Sixth year. 8 hours. SWEITZER, BUTLER, IRVINE.

## THE DEPARTMENT OF OBSTETRICS

Professor J. C. LITZENBERG; Assistant Professors F. L. ADAIR, J. L. ROTHROCK; Instructors WILLIAM H. CONdit, IVAR SIVERTSEN; Teaching Assistants JAMES F. HAMMOND, CHAS. L. RODGERS, L. RUTHERFORD, JALMAR H. SIMONS, CLARENCE O. MALAND, R. T. LAVAKE; Teaching Fellow S. E. MOORE.

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Departmental Office, Institute of Anatomy

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## REQUIRED COURSES

- 51 a,b. OBSTETRICS. The physiology and pathology of pregnancy, parturition, and the puerperium. Lectures and recitations. Fifth year. 64 hours. LITZENBERG.
- 53 a,b. GYNECOLOGY. Course in gynecologic diagnosis. Lectures, demonstrations and recitations. Fifth year. 16 hours. LITZENBERG.
- 55 a,b. CLINIC IN OBSTETRICS AND GYNECOLOGY. Section clinics at the University, City, and City and County Hospitals. Fifth year. 20 hours. LITZENBERG, ROTHROCK, ADAIR.
- 57 a,b. OBSTETRICS. A study of the pathology of pregnancy and parturition and of the puerperium. Lectures, demonstrations, and case analysis. Sixth year. 32 hours. LITZENBERG, ADAIR.
- 59 a,b. GYNECOLOGY. A study of the diseases of women. Lectures, demonstrations, and case analysis. Sixth year. 32 hours. LITZENBERG, ADAIR.

- 61 a,b. CASE ANALYSIS. A course in the analytical study of cases presented to the class in obstetrics and gynecology. Sixth year. 16 hours. LITZENBERG.
- 63 a,b. OPERATIVE OBSTETRICS. Course of obstetric operations on the manikin. Lectures, demonstrations and practice by the student. Sixth year. 8 hours. LITZENBERG.
- 65 a,b. CLINIC IN OBSTETRICS AND GYNECOLOGY. Demonstration, diagnosis and treatment of cases in the Out-patient Department, giving the student opportunity to examine and study each one. Sixth year. 12 hours. ADAIR AND ASSISTANTS.
- 67 a,b. CLINIC IN OBSTETRICS AND GYNECOLOGY. Demonstration, diagnosis, and treatment of cases. Clinics conducted in the University Hospital, the City Hospital of Minneapolis and the City and County Hospital in St. Paul. Sixth year. 24 hours. LITZENBERG, ROTHROCK, ADAIR.
- 69 a,b. CLINICAL CLERKSHIPS. The personal and direct observation of patients in hospital, under supervision; the taking and recording of case histories and the making of provisional diagnoses. Sixth year. 16 hours. LITZENBERG, MOORE.
- 71 a,b. PARTURITION CLINICS. Conducted in the University Hospital and Out-patient service, the City Hospital of Minneapolis, and the City and County Hospital of St. Paul. Fifth and sixth years. LITZENBERG, ADAIR, AND ASSISTANTS.

## ELECTIVE COURSES

- 101 a,b. SEMINAR IN OBSTETRICS. Offering opportunities of advanced study. Limited to eight students. Sixth year. 8 hours. LITZENBERG.
- 103 a,b. SEMINAR IN GYNECOLOGY. Offering opportunities of advanced study in Gynecology. Limited to eight students. Sixth year. 8 hours. LITZENBERG.
- 105 a,b. SPECIAL CLINICAL COURSES. A study in the diagnosis and treatment of diseases of women and of obstetrical conditions. Course repetitively conducted at the Out-patient Department; the clinic offering a large number of cases for examination daily. Sixth year. 12 hours. ADAIR.
- 107 a,b. OBSTETRICS AND GYNECOLOGIC PATHOLOGY. Limited to six students, in the pathologic study of cases. Fifth and sixth years. 24 hours. ADAIR.
- 109 a,b. OPERATIVE GYNECOLOGY. Operative clinics, lectures and demonstrations in the operating room. Sixth year. 12 hours. LITZENBERG.
- 111 a,b. CLINICAL OBSTETRICS AND GYNECOLOGY. Course in diagnosis and

treatment, three days per week throughout the year (11 mos.) at the Out-patient Department, offered to teaching fellows and graduate scholars. ADAIR.

113 a,b. SAME AS ABOVE on alternating days.

201 a,b. ADVANCED OBSTETRICS AND GYNECOLOGY. A course extending over three years of eleven months, consisting of constant service in the wards of the University Hospital and Out-patient Department with clinical and laboratory research. Offered only to Teaching Fellows. LITZENBERG.

### ROENTGENOLOGY

An elective course in Roentgenology, which is not a departmentalized subject, will be offered to sixth-year students. It will occupy eight hours during one quarter in the first semester.

**Bulletin of  
The University of Minnesota**

**THE SCHOOL FOR NURSES**

1915-1916



VOL. XVIII, NO. 19. JUNE 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
MINNEAPOLIS, MINN.



1915							1916													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
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19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
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# UNIVERSITY CALENDAR

1915-1916

The university year covers a period of thirty-eight weeks, beginning on the Tuesday before the second Thursday in September. Commencement Day is always the second Thursday in June.

1915

August	31	Tuesday	Registration closes except for new students
September	1-8	Week	Fees payable except for new students
September	7-14	Week	Examinations for the removal of conditions (except Colleges of Agriculture and Forestry), entrance examinations, registration of new students, and payment of fees
September	15	Wednesday	First semester begins
September	27	Monday	Agricultural College, farm experience examination
October	4	Monday	School of Agriculture, first term begins
October	7	Thursday	Senate meeting, 4:00 p.m.
November	8	Monday	Dairy School opens
November	24	Wednesday	Thanksgiving recess begins 9:00 p.m.
November	29	Monday	Thanksgiving recess ends 8:00 a.m.
Nov. 29 to Dec. 4		Week	Second semester condition examinations, Colleges of Agriculture and Forestry
December	2	Thursday	Senate meeting, 4:00 p.m.
December	6-11	Week	Short course for ice-cream makers
December	11	Saturday	Dairy School closes
December	17	Friday	Christmas vacation begins 9:00 p.m.
December	17	Friday	School of Agriculture, first term closes

1916

January	3-8	Week	Farmers' Short Course
January	3		School of Embalming begins
January	4	Tuesday	Christmas vacation ends 8:00 a.m.
January	18	Tuesday	Registration for second semester closes
January	21	Tuesday	School of Agriculture, second term begins
January	24	Monday	Final examinations begin
January	25	Tuesday	Payment of fees for second semester closes
February	2	Wednesday	Second semester begins
February	3	Thursday	Senate meeting, 4:00 p.m.
February	12	Saturday	Lincoln's Birthday: a holiday
February	22	Tuesday	Washington's Birthday: a holiday
March	30	Wednesday	School of Agriculture closes.

## SCHOOL FOR NURSES

April	3-8	Week	Junior Short Course
April	19	Wednesday	Easter recess begins 9:00 p.m.
April	27	Thursday	Easter recess ends 8:00 a.m.
May	1-6	Week	Condition examinations in certain colleges
May	2	Tuesday	Traction Engineering Course begins
May	4	Thursday	Senate meeting, 4:00 p.m.
May	26	Friday	Final examinations begin
May	30	Tuesday	Memorial Day: a holiday
June	1-8	Week	Military Encampment, Fort Snelling
June	3	Saturday	Second semester closes
June	4	Sunday	Baccalaureate service
June	5	Monday	Senior class day exercises
June	7	Wednesday	Alumni Day
June	8	Thursday	Forty-fourth Annual Commencement.
June	9	Friday	Summer vacation begins
June	12	Monday	Summer Session begins

The university year for 1916-17 will begin Tuesday, September 12.

## THE SCHOOL FOR NURSES

LOUISE M. POWELL, R.N., Superintendent

In the year 1909, the Board of Regents of the University of Minnesota directed the organization of the School for Nurses, under the management of the Faculty of the Medical School and in affiliation with the service of the University Hospitals. It is the first school for nurses established anywhere as a university department of instruction and under direct ownership and control by a university.

It is the purpose of the Faculty to conduct a school for the thorough scientific training of the nurse. This is best assured by the association of the school with a teaching hospital also owned and controlled by the University. It is the desire, also, of the Faculty, to make it the means of advancing the education of nursing women in the Northwest.

While its stated requirements for admission establish a minimal standard of fitness, it invites to matriculation women of superior education and of large and earnest purpose.

The School for Nurses is subject to the general supervision of the Superintendent of the University Hospitals, 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 entire course of study covers a period of three years. The first six months are devoted to preliminary courses of instruction under a special matriculation fee. These courses, for a period of four months, are conducted in several of the departments of the Medical School by the Superintendent of the School and by a corps of faculty instructors. Examinations are held at the close of this four months' work and must be satisfactorily passed in order to permit of further advancement.

Following this period, admission is had to the hospital and the ensuing two months are given to practical training in hospital service and economics. Upon the successful completion of this preliminary course and with due consideration to 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, pharmacies, laboratories, dressing rooms, and operating rooms, and in the out-patient department and visiting service of the University Hospital. Courses of lectures, classes, and demonstrations are given by the Superintendent of the School, her assistants, and by members of the Faculty. At the close of each year examinations are conducted in both practical and didactic work.

## THE MEDICAL SCHOOL

### THE ADMINISTRATIVE BOARD

GEORGE EDGAR VINCENT, Ph.D., LL.D., President  
ELIAS P. LYON, Ph.D., M.D., Dean and Director of the Department of  
Physiology  
RICHARD OLDING BEARD, M.D., Secretary of the Medical School  
LOUIS B. BALDWIN, M.D., Superintendent of the University Hospitals  
....., Chief of the Department of Medicine  
JAMES E. MOORE, M.D., Chief of the Department of Surgery  
CLARENCE MARTIN JACKSON, M.S., M.D., Director of the Department of  
Anatomy  
JENNINGS C. LITZENBERG, B.S., M.D., Chief of the Department of Obstet-  
rics  
ARTHUR D. HIRSCHFELDER, B.S., M.D., Director of the Department of  
Pharmacology  
HAROLD E. ROBERTSON, B.A., M.D., Acting Director of the Department  
of Pathology, Bacteriology, and Public Health  
FRED L. ADAIR, B.S., M.D., Member-Elect Representing the Faculty

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## THE SCHOOL FOR NURSES

### CORPS OF OFFICERS AND INSTRUCTORS

LOUISE M. POWELL, R.N., Superintendent of the School  
ELIZABETH PIERCE, R.N., Instructor of Nurses  
GERTRUDE THOMAS, Dietitian

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F. L. ADAIR, B.S., M.D., Assistant Professor of Obstetrics  
820 Donaldson Bldg.  
RICHARD OLDING BEARD, M.D., Secretary of the Medical School and Asso-  
ciate Professor of Physiology University of Minnesota  
J. FRANK CORBETT, M.D., Associate Professor of Experimental Surgery  
4401 E. Lake Harriet Blvd.  
CHARLES A. ERDMANN, M.D., Associate Professor of Applied Anatomy  
612 9th Ave. S. E.  
GEORGE B. FRANKFORTER, Ph.D., Dean of The School of Chemistry  
525 E. River Rd.  
ROBERT A. HALL, Ph.D., Assistant Professor of Pharmacology  
323 6th Ave. S. E.  
A. S. HAMILTON, B.S., M.D., Associate Professor of Nervous and Mental  
Diseases 513 Pillsbury Bldg.  
ARTHUR D. HIRSCHFELDER, B.S. M.D., Professor of Pharmacology and  
Director of the Department 629 5th St. S. E.

- CLARENCE MARTIN JACKSON, M.S., M.D., Professor of Anatomy and Director of the Department 428 Walnut St. S. E.
- WILLIAM H. KIRCHNER, B.S., Professor of Drawing and Descriptive Geometry 722 10th Ave. S. E.
- ARTHUR A. LAW, M.D., Associate Professor of Surgery 420 Syndicate Bldg.
- JENNINGS C. LITZENBERG, B.S., M.D., Professor of Obstetrics and Chief of the Department 910 Donaldson Bldg.
- ELIAS P. LYON, Ph.D., M.D., Dean, Professor of Physiology and Director of the Department 421 Union St. S. E.
- JOHN S. MACNIE, B.A., M.D., Assistant Professor of Diseases of the Eye, JAMES E. MOORE, M.D., Professor of Surgery and Chief of the Department University of Minnesota
- WILLIAM R. MURRAY, Ph.B., M.D., Associate Professor of Diseases of the Eye, Ear, Nose, and Throat 621 Syndicate Bldg.
- J. ANNA NORRIS, M.D., Director of Physical Culture 1005 University Ave. S. E.
- WALTER R. RAMSEY, M.D., Assistant Professor of Pediatrics Lowry Bldg., St. Paul
- HARRY P. RITCHIE, Ph.B., M.D., Assistant Professor of Surgery 914 Lowry Bldg., St. Paul
- FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Associate Professor of Physiology 1307 6th St. S. E.
- JULIUS PARKER SEDGWICK, B.S., M.D., Associate Professor of Pediatrics 614 Syndicate Bldg.
- FREDERIC W. SCHLUTZ, B.A., M.D., Assistant Professor of Pediatrics 820 Donaldson Bldg.
- FRANK C. TODD, M.D., Professor of Diseases of the Eye, Ear, Nose, and Throat 506 Donaldson Bldg.
- S. MARX WHITE, B.S., M.D., Associate Professor of Medicine 910 Donaldson Bldg.
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- FRANK S. BISSELL, M.D., Roentgenologist and Instructor in Roentgenology 4412 Lake Harriet Blvd.
- ERNEST M. HAMMES, M.D., Instructor in Nervous and Mental Diseases Lowry Bldg., St. Paul
- ELMER R. HOSKINS, M.A., Instructor in Histology and Embryology 125 S. E. State
- J. A. MYERS, Ph.D., Instructor in Anatomy 624 University Ave. S. E.
- C. J. V. PETTIBONE, Ph.D., Instructor in Physiologic Chemistry 112 Church St. S. E.
- FRED J. PRATT, M.D., Instructor in Diseases of the Eye, Ear, Nose, and Throat 328 Central Ave.
- CHARLES A. REED, B.S., M.D., Instructor in Orthopedic Surgery 420 Syndicate Bldg.
- ERNEST T. F. RICHARDS, M.D., C.M., Instructor in Medicine 914 Lowry Bldg., St. Paul

JOHN P. SCHNEIDER, M.D., Instructor in Medicine 414 Syndicate Bldg.  
 ARTHUR C. STRACHAUER, M.D., Instructor in Surgery 616 Syndicate Bldg.  
 HENRY L. ULRICH, B.S., M.D., Instructor in Medicine 420 Syndicate Bldg.  
 MARGARET WARWICK, B.S., M.D., Instructor in Pathology and Bacteriology  
 1516 7th St. S. E.  
 ROBERT J. RIZER, M.D., Graduate Scholar in Medicine  
 203 Donaldson Bldg.

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### 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 for Nurses 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 number of pupil nurses entered is limited, at present, by the nursing capacity of the hospitals and by the possibilities of suitable housing. Applicants for admission are already in excess of the possibilities of acceptance. Graduate nurses are necessarily employed as directors of the service in the wards and operating rooms.

The University Hospitals are open only to free 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 is in process of completion and in its accommodations for kitchens, laundries, dining-rooms, etc., adds greatly to the convenience of the hospital system.

### UNIVERSITY RELATIONS

The School for Nurses has its headquarters at the University Hospitals. The Nurses' Homes are temporarily situated in the adjoining block. In the preliminary courses of instruction the students of the School work mainly in the lecture rooms and laboratories of the Medical School.

The medical division of the new university campus includes within it both the hospitals and the laboratory buildings of the college. 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, which was provided by a gift, amounting with interest to \$120,000, from the estate of Dr. and Mrs. A. F. Elliot, by an additional appropriation of \$40,000 from the Legislature, and by the subscription of some \$42,000 for a building site, is the first of the permanent hospital group and provides 192 beds. The service building, recently completed, connects with the west wing of the Elliot Memorial. An emergency building, with a capacity of 24 beds, is maintained in the immediate neighborhood for the temporary care of contagious cases.

Of the Medical School buildings, Millard Hall, which houses the Dean's, and Secretary's offices, and the Departments of Physiology, Pharmacology, Medicine, and Surgery, and the Institute of Anatomy, which provides for the Departments of Anatomy and of Obstetrics, are situated on the new campus; while upon the old campus still remains the Institute of Public Health and Pathology.

#### THE OUT-PATIENT DEPARTMENT SERVICE

The University owns a clinical building situated upon the west side of the Mississippi River, within a half mile of the campus, in which the dispensary service is conducted. The Dispensary is the out-patient department of the University Hospitals and is directed by the Superintendent, Dr. L. B. Baldwin. 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. 14,363 new patients have been entered and 51,668 visits have been recorded in the past year.

Students of the School for Nurses enjoy opportunities of clinical observation in the out-patient department and are assigned, during their senior year, to its nursing service. The out-patient department will soon be removed to the new campus.

#### THE LIBRARIES

The medical libraries of the University contain 12,724 bound volumes, 20,885 unbound volumes, monographs, reprints, etc., and 281 current periodicals.

The general university library contains some 185,000 bound volumes, 32,500 unbound volumes and pamphlets, and about 1,075 current periodicals. In the library catalogs a number of works selected with reference to the needs of students of the School for Nurses are to be found. Students are welcome to the free use of these libraries.



### THE COURSE OF TRAINING REQUIREMENTS FOR ADMISSION

Applicants for admission to the School for Nurses will make application in writing to the Superintendent of the School. All applications are considered by the committee in charge of the School and applicants must meet the committee in person. A class is entered at the opening of each semester. Applicants must state age and residence and credentials of graduation from a four years' 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 of 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 service 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 for Nurses, University Hospitals, Minneapolis.

### REGISTRATION AND FEES

Upon acceptance of the candidate by the School Committee, registration is made at the office of The Registrar of the University and a fee of twenty-five dollars (\$25.00) for the preliminary course of instruction is payable at the office of the University Cashier.

During the preliminary course, students provide their own board and lodging, text-books and stationery.

No fees are charged during the remaining two and one half years of the training course. After admission to the hospitals, students reside at the Nurses' Home, where comfortable rooms, board, laundry, and hospital uniforms are provided at the expense of the University. 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 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 other schools, is submitted to the Superintendent in charge.

## PLAN OF INSTRUCTION

The entire course of instruction in the School for Nurses 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, which is 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 pre-natal courses of instruction. The first four months of study are conducted in the lecture-rooms and laboratories of the Medical School, the student being non-resident during that time. In the succeeding two months, completing the first half year, she is in hospital residence and engaged in general hospital training, but is assigned to no definite hospital service.

In the last half of the first year and the first half of the second year, she is assigned to duty and receives instruction in the men's and women's medical and surgical wards of the hospital. In the second half of the second year and throughout the third year, she is assigned to special duty in the obstetrical, gynecological, orthopedic, 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 for Nurses and by members of the Faculty, upon subjects related to each department of practice. These courses are subject to examination at the close of each semester.

## 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 for Nurses as affiliated students. Upon successful completion of the work of the third year, which will be adapted, so far as possible, to their further needs, they will receive a certificate of graduation, upon recommendation of the Faculty, from the Board of Regents.

This affiliated third-year course is planned especially for those students whose training has been had in schools allied to hospitals of exclusively surgical or other special character and will afford to them the opportunity of rounding out to completion their entire course of study.

## COURSES OF STUDY

### PRELIMINARY COURSES

#### ANATOMY

Course 1 or 2. A course of lectures, recitations, demonstrations, and laboratory exercises, including:

- a. The study of the general properties of the tissue-cell; of the development of the human embryo; and of the several types of tissue.
  - b. The osseous system; composition, function, growth, and repair of bone; the skeleton and its component parts; the structure and function of joints, etc.
  - c. The muscular system; the structure and relation of the muscles, tendons, fasciae, etc.
  - d. The circulatory system; including the heart and the blood and lymph channels.
  - e. The respiratory system; the lungs and their appendages.
  - f. The excretory system; the skin, kidneys, ureters, and bladder.
  - g. The nervous system; the special sense organs; the central and peripheral mechanisms.
  - h. The reproductive system; the organs of generation.
- Three hours a week      DRs. JACKSON, ERDMANN, HOSKINS, MYERS

#### PHYSIOLOGY

Course 3 or 4. A course of lectures, demonstrations, and laboratory exercises, accompanied by oral and written recitations.

- a. Study of the general properties of tissue cells.
  - b. The material bases of the animal body.
  - c. The nutritive media,—blood, lymph and chyle.
  - d. The physiology of the nervous system; the special senses.
  - e. The physiology of nerve and muscle.
  - f. The vascular mechanism; the circulation of blood.
  - g. The respiratory organs; the physics, chemistry and nervous mechanism of respiration.
  - h. The digestive organs and the processes of digestion and absorption.
  - i. The functions of excretion in skin and kidneys.
  - j. The study of metabolism; food and nutrition.
- Four hours a week      DRs. LYON, BEARD, SCOTT, PETTIBONE

#### CHEMISTRY

Course 5 or 6. Lectures, recitations and laboratory exercises. The course gives a brief study of matter and energy; chemical and physical changes; fundamental laws of chemistry; most important elements and

compounds; electrolysis; acids; bases; salts; water, considered from physical, chemical and sanitary standpoints; qualitative examination of foods; quantitative percentages present in foods; air, volumetric composition; percentage of carbon dioxide and oxygen in respired air; carbon compounds; treatment of spots and stains.

Food chemistry; definition, origin, nature, composition and functions of food; fruits; sugars; cereals; starch; ferments; bread; fats; soaps; butter; milk; cheese; nitrogenous foodstuffs, meats, eggs, baking powder.

Two hours a week

DR. FRANKFORTER

#### PHARMACOLOGY

Course 7 or 8. Lectures, recitations and laboratory exercises.

The course includes the study of common weights and measures; methods of administration; the most important physiological actions of drugs, illustrated upon animals; the principles governing dosage; dosage of all important drugs; synthetic remedies and animal extracts; poisons and antidotes. Students are required to handle and measure out drugs.

Three hours a week

DR. HALL

#### BACTERIOLOGY AND HYGIENE

Course 9 or 10. A course of lectures, demonstrations, and recitations upon the science of bacteriology in its practical relations to nursing; discussing, especially, the relations of this science and that of micro-zoology to disease and to protective measures; the life history of important bacteria and protozoa; favorable and unfavorable conditions of bacterial and parasitic growth; the fate of the pathogenic bacteria outside the body; the general principles of disease transmission; the role of the well individual as a carrier of infection; the conditions of asepsis and immunity in the nurse; the media and agencies of infection, air, contact, water, food, milk, vomites, excreta, utensils; insects and vermin as media of infection or hosts of germs; methods of destruction of bacteria; the effects of physical and chemical agents; the practical details of hospital isolation.

Two hours a week

DR. WARWICK

#### PHYSICAL CULTURE

Course 11 or 12. A course of physical exercises for the personal development of the student, consisting of calisthenics, systematic work with light apparatus, and exercises especially directed to the training of the nurse in the adaptation of her movements to the best results in her practical work.

This course is not designed for the instruction of the nurse in physical exercises as a means of treatment, that feature of her training being reserved to a later part of the hospital curriculum.

Two hours a week

DR. NORRIS, MISS KISSOCK

## LETTERING

Course 13 or 14. A course of exercises in the art of lettering is conducted by one of the staff of the College of Engineering and is adapted to the training of the nurse in the making of records and the charting of clinical observations. Particular attention is given to the accurate forming of letters in plain architectural type and of such special characters as are employed in clinical routine.

Two hours a week

MR. KIRCHNER

## PRINCIPLES OF NURSING

Course 11 or 12. A course of lectures dealing with the personal and professional needs of the nurse and the conduct of her professional relations.

- a. The History of Nursing.
- b. The Ethics of Nursing.
- c. The Principles of Nursing.
- d. Personal Hygiene, applied to the daily life and work of the nurse.

Three hours a week

MISS POWELL

## HOSPITAL ECONOMY

This course is introductory to the student's admission to hospital service. It deals with the general principles of hospital and household economy applied to the practice of nursing. It includes a study of various types of hospital buildings; their construction, heating, lighting and plumbing; the equipment and operation of laundry, linen and serving rooms; general and special kitchens; various wards and special departments; the cost and care of hospital supplies; household chemicals and their use in all departments.

Two hours a week

MISS POWELL

## PRACTICAL DIETETICS

Course 15 or 16. A course of practical exercises and lectures in the dietetic kitchen and in the classroom.

## a. Foods

Their definition; classes; form. Food values; economic, nutritive, digestive, metabolic, esthetic; study of food composition; energy values; caloric supply; selection of dietaries with reference to values; market conditions; balanced dietaries; composition of foods.

## b. Preparation of Foods

Methods of cooking in detail; effect on food values; percentage of loss; treatment of various classes of foods; treatment of typical foods; enhancement of food values; mechanical methods of preparation; raw foods.

## c. Serving of Food

Linen, utensils, china, glass; form and adaptation to use; tray serving; esthetics of food service.

Four hours a week

MISS THOMAS

## PRACTICAL NURSING

Course 17 or 18. A course of lectures, demonstrations and practical exercises.

- A. Environment of the Patient.
  - a. The room or ward.
  - b. The service room, bath and lavatory
  - c. The serving room.
  - d. The linen room.
  - e. The bed and bedding.
  - f. Bed making.
- B. Admission of the Patient.
- C. General Care of the Patient.
  - a. The bed bath and toilet.
  - b. Preparation of the patient for the night.
  - c. Prevention of bed sores, stiffness, and cramping of muscles.
  - d. Special care of the mouth and teeth.
  - e. Washing the hair in bed.
  - f. Devices for comfort, rings, pads, etc.
- D. Observation of the Patient.
  - a. Importance of observation—what to observe.
  - b. Temperature, pulse, respiration.
  - c. Observation of feces, urine, sputum and vomites.
- E. Examination of the Patient.
  - a. Preparation of patient for routine examinations.
  - b. Method of assisting the doctors.
  - c. The doctor's order book.
- F. Charting.
  - a. The value of the bedside record.
  - b. What to record.
  - c. Exactness, legibility, neatness.
- G. Solutions.
- H. Simple Treatments.
  - a. Application of heat and cold; counter irritants.
  - c. Enemata.
  - d. The vaginal douche.
  - e. Catheterization.
  - f. Lavage; gavage; expression of stomach contents.
- I. Baths for Therapeutic Purposes.
  - a. For reduction of temperature.
  - b. Sedative baths.
  - c. Baths and packs to produce sweating.
  - d. Local baths.
  - e. Medicated baths.
- J. Preparation of Patient for Operation.
  - a. Preparation for operation.
  - b. Ether bed.
  - c. Care of the patient following operation.

- K. Medicines.
    - a. The medicine case; medicine trays.
    - b. System of giving medicines.
    - c. Method of preparing and giving hypodermic injections.
    - d. Method of giving inhalations.
    - e. Method of giving drugs by inunction.
  - L. Precautions and Disinfection in Infectious Diseases.
    - a. Precautions in the care of typhoid fever cases.
    - b. Venereal diseases.
    - c. Preparation of room for fumigation.
- Five hours a week

MISS PIERCE

## HOSPITAL TRAINING

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. These courses include the study of practical dietetics and advanced problems in household and hospital economics. The detail of these courses follows:

### UNDERGRADUATE COURSES OF STUDY

#### HYGIENE AND PUBLIC HEALTH

Course 19 or 20. a. The hygiene of the habitation; lighting, plumbing, ventilation, disposal of waste.

b. The hygiene of foods; the conditions of food supply; the principles of food preparation; the preservation and adulteration of foods; food inspection laws.

c. The hygiene of schools; the sanitation of school buildings; the health inspection of school children; the duties of school nurses.

d. The hygiene of occupations; the study of industrial diseases and of occupational dangers; the principles of industrial betterment.

e. 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.

Ten lectures and ten recitations

#### APPLIED BACTERIOLOGY

Course 21. A study of the applications of bacteriology to surgery; to infectious diseases; to venereal diseases; to disinfection and sterilization; to antitoxins and vaccines; to diseases of unknown origin.

Six lectures and six recitations

## THERAPEUTICS

Course 23. A course of lectures and recitations in the study of therapeutics, adapted to the needs and duties of the nurse.

a. Drugs acting upon the heart and blood vessels; principles governing the action of circulatory stimulants; their relation to the treatment of heart failure, collapse, etc.; methods and safeguards of administration.

b. Measures influencing secretion of kidneys and skin; the use of diuretics and diaphoretics in relation to renal and cardio-renal disease; tests of kidney function.

c. Counter-irritation, artificial hyperemia and hemostasis by drugs and by physical measures; transfusion; relation of induced hyperemia to healing of inflammation; methods of production; therapeutics of hemorrhage.

d. Treatment of anemias and diseases of blood; use of arsenic and mercury in parasitic diseases; diseases and drugs affecting bone marrow; principles governing use of mercury and arsenicals in syphilis, etc.

e. Anesthetics general and local; sedatives and narcotics; general principles of administration, dangers and precautions; choice of anesthetics.

f. Antiseptics and poisons; discussion of action of antiseptics; their application; poisonous actions; mode of action; symptoms and treatment of various common poisons.

Six lectures and six recitations

## METHODS OF LABORATORY DIAGNOSIS

Course 24. Lectures, demonstrations and practical laboratory work in methods of examining urine, blood, sputum, stomach contents and feces.

Three lectures and three laboratory exercises

## MEDICAL NURSING

Course 26. A study of the principles and practice of nursing.

a. Diagnosis. Case history, physical examination, special examinations of blood, urine, etc.; the pulse, temperature, and respiration, normal and pathological; observation, interpretation, and method of recording symptoms by the nurse.

b. Diseases of the Circulatory System. Treatment of emergencies. Diseases of the circulatory system; the heart; the blood vessels; arteriosclerosis and its results in angina pectoris, apoplexy and aneurism. Anemias; hemorrhagic diatheses.

c. Diseases of the Respiratory System. The bronchi; bronchitis, bronchial asthma, broncho-pneumonia. The pleurae; pleurisy; empyema. The lungs; pneumonia, hemoptysis.

d. Diseases of the Digestive System. The mouth; pyorrhoea; stomatitis. The stomach; gastritis, gastric ulcer, cancer. The intestines; constipation, diarrhoea, colitis. Accessory glands; cholecystitis; abscess of the liver; cirrhosis of the liver.



- e. Diseases of the kidneys.
- f. Diseases of the joints.
- g. Diseases of metabolism.
- h. Infectious diseases; a discussion of the duties of the nurse to the patient, family, public, and herself in the following diseases: typhoid fever, typhus fever, cerebro-spinal meningitis, influenza, dysentery, cholera, malaria, yellow fever, rabies.
- i. Tuberculosis; its prevalence; its causation, prevention, treatment and cure. Twenty-two lectures and recitations

#### SURGICAL NURSING

Course 29. A course of study instructive of the nurse in the care of surgical cases.

- a. Anesthesia and anesthetics.
- b. Surgical emergencies; inflammation; wounds; hemorrhage; shock; burns; fractures; dislocations.
- c. Special surgical conditions; in the stomach, carcinoma, gastric ulcer; in the liver and gall tract, abscess, gall stones, etc.; in the intestines, appendicitis, obstruction, etc.; in the kidneys and bladder; in the uterus and appendages; in the brain.
- d. Surgical infections; toxemia; wound infections; erysipelas; gangrene, etc.
- e. Surgical tuberculosis.
- f. Plastic surgery.
- g. Orthopedics. Sixteen lectures and sixteen recitations

Course 33. A course in bandaging. Demonstrations and practical exercises in the uses and methods of application of bandages of all forms. Ten hours

#### GYNECOLOGY

Course 35. A course in the study of gynecological terms and definitions which bear upon the nursing of pelvic diseases; the preparation of gynecological patients for examination; for operation; the general care of gynecological cases; special modes or treatment at the hands of the nurse.

Six lectures and six recitations

#### OBSTETRICS

- Course 37. A course of lectures and demonstrations in:
- a. The anatomy and physiology of the female generative organs.
  - b. The physiology of pregnancy; the accidents of pregnancy.
  - c. The physiology of parturition; the nursing of labor.
  - d. Complications.
  - e. Post-partum hemorrhage; puerperal fever; puerperal convulsions; puerperal insanity. Seven lectures and seven recitations

NURSING OF INFANTS AND CHILDREN

Course 27. Lectures and demonstrations upon the nursing of:

- a. The normal child; conditions of growth and development.
- b. Breast feeding; artificial feeding; mixed feeding; preparation of foods in laboratory.
- c. Stomatitis, marasmus, rachitis, syphilis. Cause, symptoms, treatment, nursing, care.
- d. Gastro-intestinal disorders; parasitic disorders.
- e. Disorders of genito-urinary tract.
- f. Tuberculosis.
- g. Rheumatism; tonsillitis; chorea; cardiac complications.
- h. Bronchitis; pneumonia; pleurisy; empyema.
- i. Diphtheria; scarlet fever; small pox; chicken pox; whooping cough; measles; mumps.
- j. Meningitis; polio-myelitis.
- k. Surgical conditions in children.

Sixteen lectures and sixteen recitations

NERVOUS AND MENTAL DISEASES

Course 34. Lectures upon the nursing of nervous and mental conditions.

- a. Insanity; its common forms and usual symptoms; principles of nursing insane patients.
- b. Epilepsy; its manifestations; immediate and general care.
- c. Neurasthenia, hysteria; their recognition and distinctive features; methods of nursing; principles and practice of rest cure; general management of nervous cases.

Five lectures and five recitations

DISEASES OF THE EYE, EAR, NOSE AND THROAT

Course 36. A course of lectures, illustrated by stereopticon, upon the anatomy and physiology of these organs. The general and local care of diseases, including instruction in applications to the eye, douches and other remedies to the ear, nose, and throat. The recognition and care of foreign bodies in eye, ear, nose, and throat. Instruction in the use of artificial and ordinary leech. The prevention and treatment of ophthalmia neonatorum. Preparation for operations and care after operation, etc.

Five lectures and five recitations

MASSAGE

Course 38, 39. A course of training, in twelve lessons of two hours each, in general manipulation of the body tissues and in those general movements which have the value of passive exercise for the sick or convalescent. This course is not designed for the training of experts in massage, mechanical movements, etc.

Twenty-four hours

## SCHOOL FOR NURSES

## DISEASES OF THE SKIN

Course 40. Lectures upon the nursing care and the methods of treatment of disorders of the skin. Six lectures and six recitations

## THE DIETETIC TREATMENT OF DISEASES

Course 42. A course of lectures upon the dietary of disease in general.

a. The conditions of digestion and metabolism in disease; the influence of age and sex; the relation of food supply to functional inactivity and tissue loss; its relation to elimination.

b. The dietetic treatment of special forms of disease; the dietary of continued fevers; of gastro-intestinal disorders; of respiratory disorders; of disorders of nutrition, including renal diseases, cardiac diseases and diabetes. Four lectures and four recitations

## SPECIAL THERAPEUTICS

Courses 44 and 46. Courses of lectures in special methods of therapy in the application of which the services of the nurse are required.

a. The use of the X-Ray in the diagnosis and treatment of disease. Four hours

b. The use of vaccines and serums. Six hours

## INVALID OCCUPATIONS

Course 47 or 48. A course of lectures, demonstrations and practical exercises designed to teach nurses some typical methods of occupation for invalids and, especially, for children.

The course is elective in the senior year. Twenty-four 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.

# STUDENTS

## GRADUATES

Ames, Margaret (Mrs. Samuel Anderson), Hutchinson	Madsen, Christenia A., R.N., Minneapolis
Angle, Maude E. F., R.N., Minneapolis	Manger, Caroline A., R.N., McIntosh
Babcock, Lena, R.N., Minneapolis	Mark, Mary E., R.N., St. Peter
Burns, Elizabeth C., R.N., Graceville	Marvin, Mary M., R.N., Zumbrot
Cornish, Mary E., R.N., Vernon Center	Ofsthun, Olive I., R.N., Glenwood
Gosman, Anna, R.N., Minneapolis	Schwarg, Carolyn, R.N., Dodge Center
Greenwalt, Dorothy, R.N., Withrow	Stewart, Lena B., R.N., Minneapolis
Lenstrom, Bera, R.N., Minneapolis	Skonnord, Olga B., R.N., Minneapolis
Lindquist, Signa E., R.N., Minneapolis	Thompson, Barbara A., R.N., Glenwood
	Waters, Vera, R.N., Beatrice, Nebraska

## THIRD YEAR

Anderson, Ruth E., Houston	Hulett, Florence G., Minneapolis
Baudin, Jane E., Duluth	Johnson, Alma D., Minneapolis
Bertie, Mildred L., Minneapolis	Nightingale, Mary M., Minneapolis
Colberg, Ruth M., St. Paul	Sellesteth, Ellen A., Glenwood
Fleming, Agnes, Minneapolis	Thompson, Lena, Enderlin, N. D.
Hollo, Myrtle M., Marshall	Winter, Clara L., Faribault

## SECOND YEAR

Bishop, Louise, St. Paul	Moore, Mabelle Harriet, Austin
Brockway, Mary G., Royalton	Moulton, Myra D., Dawson
Covert, Emily C., Billings, Mont.	Rosenthal, Cecilia A., St. Paul
Curry, M. Marie, Minneapolis	Schlutz, Mathilda, New Richland
Hayashi, Fuku, Kyoto, Japan	Swenson, Matilda F., Crookston
Holm, Sara Marie, Stillwater	Shedd, Lotta, Pasadena, Cal.

## FIRST YEAR

Bergquist, Olivia E., Minneapolis	Redpath, Mary, La Crosse, Wis.
Dunn, Margaret, Windom	Price, Katherine A., Minneapolis
Hasle, Eva, Park River, N. D.	Sheppard, Agnes M., Hutchinson
Joach, Celia E., New Prague	Smitka, Ella M., Minneapolis
Jorstad, Esther O., Kenyon	Vollbrecht, Agnes E., Hanover
Knutson, Mabel A., Fertile	Vose, Katherine, Minneapolis
Lyon, Margaret E., Minneapolis	Watland, Anne M., Jackson

## PRELIMINARY COURSE

Berg, Esther L., Duluth	Harbo, Mathilde, Minneapolis
Chaffee, Bessie C., Detroit	Runnerstrom, Elva, Waseca
Blum, Emma, Minneapolis	

## ACCREDITED NURSES

Christianson, A. Margrete, St. John's Hospital, Red Wing	Murphy, Nellie B., Litchfield Hospital, Litchfield
Byre, Martha, St. John's Hospital, Red Wing	Lehman, Laura W., St. John's Hospital, St. Paul
Draxton, Mabel E., Litchfield Hospital, Litchfield	Schroeder, Lena, St. John's Hospital, St. Paul
Hines, Delphine, St. Mary's Hospital, Rochester	Wolf, Martha K., Winona General Hospital, Winona

**Bulletin of  
The University of Minnesota**

**THE COLLEGE OF DENTISTRY**

**1915-1916**



VOL. XVIII, NO. 9. JUNE 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.

1915							1916														
<b>JULY</b>							<b>JANUARY</b>							<b>JULY</b>							
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	
..	4	5	6	7	8	9	..	2	3	4	5	6	7	..	2	3	4	5	6	7	
11	12	13	14	15	16	17	9	10	11	12	13	14	15	9	10	11	12	13	14	15	
18	19	20	21	22	23	24	16	17	18	19	20	21	22	16	17	18	19	20	21	22	
25	26	27	28	29	30	31	23	24	25	26	27	28	29	23	24	25	26	27	28	29	
..	..	..	..	..	..	..	30	31	..	..	..	..	..	30	31	..	..	..	..	..	
<b>AUGUST</b>							<b>FEBRUARY</b>							<b>AUGUST</b>							
1	2	3	4	5	6	7	..	..	1	2	3	4	5	..	..	1	2	3	4	5	
8	9	10	11	12	13	14	6	7	8	9	10	11	12	6	7	8	9	10	11	12	
15	16	17	18	19	20	21	13	14	15	16	17	18	19	13	14	15	16	17	18	19	
22	23	24	25	26	27	28	20	21	22	23	24	25	26	20	21	22	23	24	25	26	
29	30	31	..	..	..	..	27	28	29	..	..	..	..	27	28	29	30	31	..	..	
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<b>SEPTEMBER</b>							<b>MARCH</b>							<b>SEPTEMBER</b>							
..	5	6	7	8	9	10	..	5	6	7	8	9	10	..	3	4	5	6	7	8	9
12	13	14	15	16	17	18	12	13	14	15	16	17	18	10	11	12	13	14	15	16	
19	20	21	22	23	24	25	19	20	21	22	23	24	25	17	18	19	20	21	22	23	
26	27	28	29	30	..	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30	
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<b>OCTOBER</b>							<b>APRIL</b>							<b>OCTOBER</b>							
..	3	4	5	6	7	8	..	2	3	4	5	6	7	1	2	3	4	5	6	7	
10	11	12	13	14	15	16	9	10	11	12	13	14	15	8	9	10	11	12	13	14	
17	18	19	20	21	22	23	16	17	18	19	20	21	22	15	16	17	18	19	20	21	
24	25	26	27	28	29	30	23	24	25	26	27	28	29	22	23	24	25	26	27	28	
31	..	..	..	..	..	..	30	..	..	..	..	..	..	29	30	31	..	..	..	..	
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<b>NOVEMBER</b>							<b>MAY</b>							<b>NOVEMBER</b>							
..	7	8	9	10	11	12	..	7	8	9	10	11	12	..	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18	
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25	
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..	
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<b>DECEMBER</b>							<b>JUNE</b>							<b>DECEMBER</b>							
..	5	6	7	8	9	10	..	4	5	6	7	8	9	..	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16	
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23	
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30	
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# UNIVERSITY CALENDAR

1915-1916

The university year covers a period of thirty-eight weeks, beginning on the Tuesday before the second Thursday in September. Commencement Day is always the second Thursday in June.

1915

August	31	Tuesday	Registration closes except for new students
September	1-8	Week	Fees payable except for new students
September	7-14	Week	Examinations for the removal of conditions (except Colleges of Agriculture and Forestry), entrance examinations, registration of new students, and payment of fees
September	15	Wednesday	First semester begins
September	27	Monday	Agricultural College, farm experience examination
October	4	Monday	School of Agriculture, first term begins
October	7	Thursday	Senate meeting, 4:00 p.m.
November	8	Monday	Dairy School opens
November	24	Wednesday	Thanksgiving recess begins 9:00 p.m.
November	29	Monday	Thanksgiving recess ends 8:00 a.m.
Nov. 29 to Dec. 4	Week		Second semester condition examinations, Colleges of Agriculture and Forestry
December	2	Thursday	Senate meeting, 4:00 p.m.
December	6-11	Week	Short course for ice-cream makers
December	11	Saturday	Dairy School closes
December	17	Friday	Christmas vacation begins 9:00 p.m.
December	17	Friday	School of Agriculture, first term closes
1916			
January	3-8	Week	Farmers' Short Course
January	4	Tuesday	Christmas vacation ends 8:00 a.m.
January	18	Tuesday	Registration for second semester closes
January	21	Tuesday	School of Agriculture, second term begins
January	24	Monday	Final examinations begin
January	25	Tuesday	Payment of fees for second semester closes
February	2	Wednesday	Second semester begins
February	3	Thursday	Senate meeting, 4:00 p.m.
February	12	Saturday	Lincoln's Birthday: a holiday
February	22	Tuesday	Washington's Birthday: a holiday
March	30	Wednesday	School of Agriculture closes.

## COLLEGE OF DENTISTRY

April	3-8	Week	Junior Short Course
April	19	Wednesday	Easter recess begins 9:00 p.m.
April	27	Thursday	Easter recess ends 8:00 a.m.
May	1-6	Week	Condition examinations in certain colleges
May	2	Tuesday	Traction Engineering Course begins
May	4	Thursday	Senate meeting, 4:00 p.m.
May	26	Friday	Final examinations begin
May	30	Tuesday	Memorial Day: a holiday
June	1-8	Week	Military Encampment, Fort Snelling
June	3	Saturday	Second semester closes
June	4	Sunday	Baccalaureate service
June	5	Monday	Senior class day exercises
June	7	Wednesday	Alumni Day
June	8	Thursday	Forty-fourth Annual Commencement.
June	9	Friday	Summer vacation begins
June	12	Monday	Summer Session begins

The university year for 1916-17 will begin Tuesday, September 12.

*Program of Entrance Examinations 1915-1916*

Entrance examinations for admission to the various colleges of the University will be conducted according to the following schedule, in Room 112, Library Building, unless otherwise specified.

Any student finding a conflict in his program should report to the Registrar for adjustment.

Tuesday,	Sept. 7	9 a.m.	Business Subjects, Elementary Algebra, Plane Geometry
		2 p.m.	Manual Subjects, Domestic Art and Science, Agriculture, Higher Algebra, Solid Geometry
Wednesday,	Sept. 8	9 a.m.	Astronomy, Botany, Geology, Chemistry, Physiography, Zoology, Physics, Physiology
		2 p.m.	American Government, History, Economics, Commercial Geography, History of Commerce, Economic History of England, Economic History of the United States
Thursday	Sept. 9	9 a.m.	English
		2 p.m.	German, Greek, French, Latin, Scandinavian, Spanish

A representative of each department will be at the office of the head of the department each forenoon of entrance examination week from 9 to 12 to give information and advice.



# COLLEGE OF DENTISTRY

## FACULTY

- GEORGE EDGAR VINCENT, Ph.D., LL.D., President 1005 5th St. S. E.  
CYRUS NORTHROP, LL.D., President, Emeritus 519 10th Ave. S. E.  
ALFRED OWRE, B.A., C.M., M.D., D.M.D., Dean, Professor of Theory and  
Practice of Dentistry and Dental Metallurgy 2109 Blaisdell Ave.  
RICHARD OLDING BEARD, M.D., Associate Professor of Physiology  
University of Minnesota  
E. T. BELL, B.S., M.D., Assistant Professor of Pathology  
215 Walnut St. S. E.  
PETER J. BREKHUS, B.A., D.D.S., Associate Professor of Crown and  
Bridge Work 3719 Pleasant Ave.  
EDGAR D. BROWN, Phm.D., M.D., Associate Professor of Pharmacology  
3525 3rd Ave. S.  
OSCAR COOPERMAN, D.D.S., Assistant Professor in Prosthetic Dentistry  
and Dental Anatomy 638 6th Ave. N.  
RALPH W. COUNTRYMAN, D.D.S., Assistant Professor in Operative Den-  
tistry 401 Reid Corner  
NORMAN J. COX, B.S., D.M.D., Assistant Professor of Operative Dentistry  
986 15th Ave. S. E.  
GEORGE M. DAMON, D.D.S., Associate Professor of Prosthetic Dentistry  
and Dental Anatomy 3340 Portland Ave.  
IRA HARRIS DERBY, Ph.D., Assistant Professor of Chemistry  
2157 Commonwealth Ave., St. Paul  
J. FRANKLIN EBERSOLE, M.A., Assistant Professor of Economics  
312 State St. S. E.  
CHARLES A. ERDMANN, M.D., Associate Professor of Applied Anatomy  
612 9th Ave. S. E.  
CARL O. FLAGSTAD, D.D.S., Assistant Professor in Prosthetic Dentistry,  
Orthodontia and Dental Anatomy 229 Cedar Ave.  
GEORGE B. FRANKFORTER, Ph.D., Professor of Chemistry and Dean of  
the School of Chemistry 525 E. River Road  
HENRY S. GODFREY, D.M.D., Professor of Operative Dentistry  
1766 Girard Ave. S.  
ROBERT O. GREEN, D.D.S., Associate Professor of Operative Dentistry  
828 Lowry Bldg., St. Paul  
CHARLES A. GRIFFITH, D.D.S., Associate Professor of Oral Surgery  
1090 15th Ave. S. E.  
ROBERT A. HALL, Ph.D., Assistant Professor of Pharmacology  
323 6th Ave. S. E.  
THOMAS B. HARTZELL, D.M.D., M.D., Professor of Oral Surgery, Thera-  
peutics, and Clinical Pathology 716 Donaldson Bldg.

- ARTHUR D. HIRSCHFELDER, B.S., M.D., Professor of Pharmacology and  
Director of the Department 906 5th St. S. E.
- S. L. HOYT, E.M., Ph.D., Assistant Professor of Metallurgy.  
715 University Ave.
- CLARENCE M. JACKSON, M.S., M.D., Professor of Anatomy and Director  
of the Department 428 Walnut St. S. E.
- RAY R. KNIGHT, B.A., M.D., Assistant Professor of Oral Surgery, Thera-  
peutics, and Clinical Pathology 304 Pillsbury Bldg.
- WINFORD P. LARSON, M.D., Assistant Professor of Bacteriology  
614 9th Ave. S. E.
- WILLIAM F. LASBY, B.A., D.D.S., Associate Professor of Prosthetic Den-  
tistry and Orthodontia 425 Walnut St. S. E.
- HARRY C. LAWTON, D.D.S., Associate Professor of Prosthetic Dentistry,  
Orthodontia, and Dental Metallurgy 1064 Lombard Ave., St. Paul
- THOMAS G. LEE, B.S., M.D., Professor of Comparative Anatomy  
509 E. River Road
- ELIAS P. LYON, Ph.D., M.D., Professor of Physiology and Director of  
the Department 421 Union St. S. E.
- WILLIAM McDUGALL, D.D.S., Assistant Professor in Crown and Bridge  
Work 521 Syndicate Bldg.
- RICHARD S. MAYBURY, D.D.S., Assistant Professor in Operative Dentistry  
1931 4th Ave. S.
- HERMAN A. MAVES, D.D.S., Associate Professor of Operative Dentistry  
505 Donaldson Bldg.
- THOMAS W. MITCHELL, Ph.D., Assistant Professor of Business Admin-  
istration 2349 Bourne Ave., St. Paul
- FORREST H. ORTON, D.D.S., Professor of Crown and Bridge Work  
653 Goodrich Ave., St. Paul
- ALFRED A. PAGENKOPF, D.D.S., Associate Professor of Crown and Bridge  
Work 1482 Grand Ave., St. Paul
- MARK O. PATTRIDGE, D.D.S., Assistant Professor in Operative Dentistry  
802 E. Lake St.
- CARL H. PETRI, D.D.S., Assistant Professor in Prosthetic Dentistry and  
Dental Anatomy 1301 E. Franklin
- GEORGE W. REYNOLDS, D.D.S., Associate Professor of Crown and Bridge  
Work 3811 10th Ave. S.
- HAROLD E. ROBERTSON, B.A., M.D., Associate Professor of Pathology and  
Acting Director of the Department 507 Essex St. S. E.
- WILLIAM A. ROLL, D.D.S., Assistant Professor in Crown and Bridge Work  
521 Syndicate Bldg.
- CHARLES E. RUDOLPH, D.D.S., Assistant Professor in Prosthetic Dentistry  
and Dental Anatomy
- JOSEPH F. SHELLMAN, D.D.S., Assistant Professor in Operative Dentistry  
903 Lowry Bldg., St. Paul
- RICHARD E. SCAMMON, Ph.D., Associate Professor of Anatomy  
200 Harvard St. S. E.
- FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Associate Professor of Phys-  
iology 1307 6th St. S. E.

- FRANK W. SPRINGER, E.E., Professor of Electrical Engineering  
826 Delaware St. S. E.
- DAVID F. SWENSON, B.S., Associate Professor of Psychology  
979 14th Ave. S. E.
- JAMES M. WALLS, D.M.D., Professor of Operative Dentistry  
828 Lowry Bldg., St. Paul
- OSCAR A. WEISS, D.M.D., Professor of Prosthetic Dentistry and Orthodontia  
1602 Fremont Ave. N.
- AMOS S. WELLS, B.A., D.D.S., Associate Professor of Crown and Bridge Work  
Berkeley Hotel
- CHARLES WIETHOFF, D.D.S., Associate Professor of Crown and Bridge Work  
716 Donaldson Bldg.
- M. RUSSELL WILCOX, M.D., Assistant Professor of Physiology  
802 Donaldson Bldg.
- WILLIAM F. ALLEN, M.A., Instructor in Histology and Embryology  
3352 Prospect Terrace S. E.
- BERT G. ANDERSON, D.D.S., Instructor in Prosthetic Dentistry and Orthodontia  
923 Lowry Bldg., St. Paul
- C. H. BEERS, D.D.S., Instructor in Operative Dentistry  
828 Lowry Bldg., St. Paul
- EDMUND T. DANA, Ph.D., Instructor in Psychology  
419 6th St. S. E.
- MAX E. ERNST, LL.B., D.D.S., Instructor in Operative Dentistry and Dental Jurisprudence  
614 Lowry Bldg., St. Paul
- WILLIAM A. GREY, D.D.S., Instructor in Operative Dentistry  
923 Lowry Bldg., St. Paul
- MARY V. HARTZELL, D.M.D., Instructor in Comparative Dental Anatomy and Oral Surgery  
1224 Mary Place
- A. T. HENRICI, M.D., Instructor in Bacteriology  
2443 Garfield Ave. S.
- FRANCIS B. KINGSBURY, Ph.D., Instructor in Physiology and Physiologic Chemistry  
209 State St. S. E.
- WOLF KRITCHEVSKY, Ph.D., Instructor in Chemistry  
908 Logan Ave. N.
- H. J. LEONARD, B.A., D.D.S., Instructor in Oral Surgery  
515 Syndicate Bldg.
- J. F. MCCLENDON, Ph.D., Instructor in Physiology  
1307 6th St. S. E.
- HERBERT C. NELSON, D.D.S., Instructor in Crown and Bridge Work  
921 Lowry Bldg., St. Paul
- C. J. V. PETTIBONE, Ph.D., Instructor in Physiology and Physiologic Chemistry  
112 Church St. S. E.
- E. K. STRACHAN, Ph.D., Instructor in Chemistry  
826 University Ave. S. E.
- ROBERT T. THOMPSON, D.D.S., Instructor in Prosthetic Dentistry  
1015 13th Ave. S. E.
- MARGARET WARWICK, B.S., M.D., Instructor in Pathology  
1516 7th St. S. E.
- ANDREW J. WEISS, Instructor in Technics  
3708 Stevens Ave.

## ASSISTANTS

HERBERT BUSCHER, Assistant in Anatomy  
WALTER E. CAMP, B.A., Assistant in Histology  
ROY E. CRUZEN, Assistant in Physiology  
R. W. DELTON, Assistant in Prosthetic Dentistry  
R. R. HENRY, Assistant in Dental Anatomy  
A. H. NOBBS, Assistant in Operative Dentistry  
C. H. PASKE, Assistant in Crown and Bridge Work  
LYLE ROBERTS, Assistant in Physiology

## GENERAL INFORMATION

### CURRICULUM

#### *Three Year Course*

This course in the college leads to the degree of Doctor of Dental Surgery. It covers a period of three years collegiate study, each year representing nine months in actual attendance. This course will not be offered after the year of 1915-16.

#### *Four Year Course*

This course in the College of Dentistry also leads to the degree of Doctor of Dental Surgery and covers a period of four years collegiate study. It is optional in 1915 and required in 1916.

For statements of entrance requirements, registration and fees, see Bulletin of General Information.

For schedule of lectures, announcements, changes in college rules, etc., see bulletin board. The Rules for the Guidance of Students are printed in a separate booklet; in this will also be found a list of the required instruments.

### ONE-YEAR ELECTIVE COURSE

It is recommended that after the completion of the prescribed course all students devote one year of study to advanced technical subjects in dentistry, medicine, other sciences, or art.

### COMBINED ACADEMIC-DENTISTRY COURSE

The first three years of the Arts and Dentistry course are given in the College of Science, Literature, and the Arts and the last three years in the College of Dentistry. It leads to the degree of Bachelor of Arts in four years and the degree of Doctor of Dental Surgery in six years.

Students registering in this course must, before completing their registration, choose a major line of work and secure the signature of an adviser in that department. In order to complete the academic portion of their work they must obtain ninety (90) credits, including a major and two minors, one in each of the groups A, B, C (see Bulletin of the College of Science, Literature, and the Arts); and they must have an average of *good* in at least one-half of their work. The third year of Dentistry counts as equivalent to thirty (30) credits toward the B.A. degree, provided the student receives an average of *good* in one-half of such year's work.

No student may be admitted to the College of Dentistry as a candidate for the degrees of Bachelor of Arts and Doctor of Dental Surgery until he has satisfied the foregoing requirements.

## SUMMER SESSION

A Summer Course of two months is offered in the Departments of Anatomy, Chemistry, Crown and Bridge Work, Operative Dentistry, Orthodontia, Physiology, and Prosthetic Dentistry.

## GRADUATE WORK

Instruction in all the departments of the College of Dentistry will be given to graduate practitioners upon registration for not less than one quarter of the College year.

Graduate Students must comply with the rules and regulations of the College of Dentistry.

## MILITARY DRILL

Beginning with the year 1915-1916 Military Drill will be required of all men in the freshman and sophomore classes.

## PHYSICAL EDUCATION

A course is offered in Physical Education for Men and Women.

## RULES AND REGULATIONS

*Examinations, Standings, and Conditions*

No student with an entrance condition will be allowed to register for any second-year subject, nor will any student with any first-year condition or failure be allowed to register for a third-year subject.

No student will be allowed to omit any freshman work in order to make up entrance conditions, except by special permission of the department affected.

Students will not be permitted to substitute private work in any branch for the regular college courses.

Final examination in every required subject is held at the close of the work at the end of the semester or quarter, according to the extent of the course given. Opportunity is offered to remove second semester conditions at the opening of the school year in September. Examinations for the removal of first semester conditions are offered at the close of the Easter recess. The examinations at the end of semester or quarter are only for those who are taking the courses, while the condition examinations are only for those who are attempting to remove conditions.

The final standing of any student in a given subject shall be determined as the result of (a) practical work (laboratory or clinical), (b) recitations, and (c) oral or (d) written examinations. All of these factors shall be taken into consideration in making up the final grading in any subject.

Students' standings shall be determined at the end of the year by a conference of the heads of the departments in which the work is pursued during that year.

All standings shall be reported officially to and from the Registrar's Office at the end of the year.

A uniform marking system has been adopted for the whole University. Four passing grades, indicated by the symbols *A*, *B*, *C*, and *D*, represent differing degrees of merit. The symbol *E* represents a condition, which may be removed by examination and by such supplementary work as the department imposing it may require. *F* stands for a failure and calls for a repetition of the work in course. *I* stands for incomplete and grants the student further time for the completion of the required work.

Conditions must be removed at the beginning of the school year in September. No student who has any conditions unremoved at the close of this examination is allowed to continue with his class without the express permission of the Dean upon the recommendation of the department concerned.

A condition not removed at the first opportunity becomes a failure subject to the rules governing failures.

Failures necessitate the taking of the work again in class.

A student carrying less than the complete schedule of work may pay fees on a clock-hour basis.

A student who is conditioned in the majority of the subjects given in any year will become a *failed* student and must repeat the entire work of that year.

Students who carry *failures* into a succeeding year may find a resultant conflict of study hours; in that event they will give preference to the unfinished studies of the lower conflicting course.

Any student reported below grade in sixty per cent of his work at the middle or close of the first semester or middle of the second semester shall be dropped from the rolls and shall not be allowed to re-enter until the opening of the following year.

*Probation.*—Such student shall then be allowed to enter on probation; and, if reported by the middle of the semester or after as delinquent in two or more subjects, he shall be dropped without further action for that year.

*Work limited.*—Students pursuing any continuous subject who have done such poor work in the first semester as to receive a condition or failure in such subject, shall not be allowed to elect another subject in place of that in which the condition or failure was received, but shall be required to devote their full time to the remaining subjects of the course.

Exception to this rule shall be made only by the Committee on Students' Work after full investigation.

*Electives.*—A student may elect a subject in another department as a substitute for the elective in the course of study on consent of the Committee on Students' Work.

#### *Attendance and Discipline*

All lectures, laboratory and infirmary courses and clinics must be taken in full and must invariably be entered upon during the week in which they begin.

All students are required to provide themselves with instruments, books, tools, and materials as prescribed by the college.

Tardiness and absences are controlled by the principle that each student must do the full work of the course.

No student whose absences in any semester exceed four weeks in the aggregate shall be admitted to final examination without special permission of the Students' Work Committee.

Any student's registration may be refused or cancelled by the Registrar at the request of the Students' Work Committee on account of absences, indifference to study, poor scholarship, disorderly or immoral conduct, and for dishonesty in classroom or laboratory work.

The practice of dentistry by students, except under the direct supervision of a preceptor, is prohibited by law in the State of Minnesota. Students violating this law will be suspended or expelled.

Except in cases of required work students are not allowed to obligate themselves in the Military Department, band, or other college activities, without permission from the Faculty.

#### *Eligibility Regulations*

No student shall take part in any public performance of a dramatic or musical club, or be eligible to election or appointment to official positions upon the boards of student publications, or take part in intercollegiate debates or oratorical contests, unless he has a clear record at the time.

#### ADVANCED STANDING

Applicants for advanced standing must present satisfactory evidence of possessing the preliminary educational qualifications required of the class they desire to enter.

They must also satisfy the professors of the branches from which they wish to be exempt, that the work pursued by them in other institutions was equal in scope and amount to that passed by the class they propose to enter.

No credits are accepted unconditionally, the Faculty reserving the privilege of examining any applicant when deemed necessary.

All certificates pertaining to advanced standing must be presented to the Dean, who will send them to the respective professors for acceptance or report of further requirements for acceptance.

#### REQUIREMENTS FOR GRADUATION

A candidate for the degree of Doctor of Dental Surgery must be twenty-one years of age, of good moral character, and, after having satisfied all the requirements for admission to the college, must have complied with all the rules and regulations of the college and obtained regular credit for all subjects of the entire course.



# COURSE OF STUDY

## THREE-YEAR COURSE

	<i>First Semester</i>		<i>Second Semester</i>	
	Credits	Hours	Credits	Hours
<b>Freshman Year</b>				
Anatomy, Dental .....	2	64	2	64
Anatomy, Gross .....	6	192	4	128
Anatomy, Histology and Embryology....			4	128
Chemistry, General and Qualitative.....	6	144		
Chemistry, Organic .....			3	96
Prosthetic Technique .....	4	160	4	160
<b>Junior Year</b>				
Crown and Bridge Technique.....	4	160	2	96
Metallurgy, Dental .....	1	16		
Orthodontia Technique .....			3	144
Operative Technique .....	4	160		
*Pathology and Bacteriology.....			4	128
Pathology and Therapeutics.....	1	16	1	16
Pharmacology, General .....			2	32
†Physiology and Physiologic Chemistry.	5	144		
Practice, Clinical .....			9	368
Prosthetic Technique .....	4	160		
<b>Senior Year</b>				
Conference Course in Theory and Prac- tice .....	1	16	1	16
Crown and Bridge Lectures and Rec....	1	16	1	16
Operative Dentistry Lec. and Rec.....	1	16	1	16
Oral Surgery Lec. and Rec.....	1	16	1	16
Orthodontia, Lec. and Rec.....	1	16	1	16
Practice, Clinical .....	12	576	12	576
<b>Electives</b>				
Anatomy, Comparative Dental.....	3	48		
Bacteriology, Special .....	3	96		
Economics, Elementary .....	3	48		
Electricity and Radiography, Dental....	3	72		
Metallography, Dental .....	3	48		
Pathology, Advanced .....	3	96		
Pharmacology, Special .....	3	48		
Psychology, Elementary .....	3	48		

\*Offered in the first semester for the class of 1915-1916

†Not offered in 1915-1916

## COLLEGE OF DENTISTRY

## FOUR-YEAR COURSE

Optional 1915—Required 1916

Freshman Year	First Semester		Second Semester	
	Credits	Hours	Credits	Hours
Anatomy, Dental .....			2	64
Animal Biology .....	3	96	3	96
*Chemistry, Advanced Gen. and Qualitative .....	3	96	3	96
English, Rhetoric .....	3	48	3	48
Physics or Technical Drawing.....	2 to 4	48 to 96	2 to 4	48 to 96
Prosthetic Dentistry .....	4	160	2	64
Sophomore Year				
Anatomy, Gross .....	4	128	4	128
Anatomy, Histology and Embryology...			4	128
Anatomy, Dental .....	4	128		
Chemistry, Organic .....	3	96		
Orthodontia Technique .....			2	96
Physiology and Physiological Chemistry			5	160
Prosthetic Technique .....	4	192		
Junior Year				
Bacteriology, General and Special.....	4	128		
Crown and Bridge Technique.....	4	192		
Dental Metallurgy .....	1	16		
Materia Medica and Therapeutics.....			3	48
Operative Dentistry Lec. and Rec.....	1	16	1	16
Operative Dentistry Technique.....	4	192		
Pathology, General and Special.....			4	128
Practice .....	2	96	10	480
Prosthetic Dentistry Lec. and Rec.....	2	32		
Senior Year				
Crown and Bridge Lec. and Rec.....	1	16	1	16
†Elective .....	3	48		
Operative Dentistry Lec. and Rec.....	1	16		
Oral Surg., Clin. Path. and Radiog. Lec. and Rec. ....			2	32
Orthodontia Lectures and Recitations...	1	16	1	16
Practice .....	12	576	12	576
Theory and Practice of Dentistry and Conference Course in Applied Economics, Jurisprudence, Psychology, Ethics, and Art.....			2	32

The requirements for admission are the same as for admission to the freshman class of the College of Science, Literature, and the Arts, and should include one unit of General Chemistry. Manual Training is recommended.

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\*Students who have not had Elementary General Chemistry may take this in the Summer School preceding the Freshman Year, or during the Freshman Year, and make up the Advanced General and Qualitative in the Summer School preceding the Sophomore Year, or, if the number is large enough to warrant it, a separate section will be formed taking the Elementary General Chemistry in the first semester and Advanced General and Qualitative in the second semester.

†At least three credits must be obtained in Psychology, Economics, or substitute subjects approved by the Students' Work Committee and may be taken in the first or second semester, evening course or summer school.

One credit hour may be either one recitation hour through one semester, two laboratory hours with outside work, or three laboratory hours without outside work. One semester equals sixteen weeks, one week, forty-eight hours.

## FEES

### THREE-YEAR COURSE

Freshman year	
Annual incidental fee.....	\$175.00
Instruments .....	100.00
Books .....	25.00
Junior year	
Annual incidental fee.....	\$175.00
Instruments .....	175.00
Books .....	35.00
Senior year	
Annual incidental fee.....	\$150.00
Instruments .....	25.00
Books .....	15.00

### FOUR-YEAR COURSE

Freshman year	
Annual incidental fee*.....	\$75.00
Sophomore year	
Annual incidental fee*.....	175.00
Junior year	
Annual incidental fee*.....	175.00
Senior year	
Annual incidental fees*.....	150.00

\*Instrumental and books similar to Three-year Course

## DEPARTMENTAL STATEMENTS

Odd numbers indicate first-semester courses; even numbers, second-semester courses. A combination of the two (e. g., 5-6) indicates courses continuing through the year. In the case of courses repeated the second semester, the suffix *a* indicates first semester; the suffix *b*, second semester.

### ANATOMY

Professors CLARENCE M. JACKSON, THOMAS G. LEE; Associate Professor CHARLES A. ERDMANN; Instructor WILLIAM F. ALLEN; Assistants WALTER E. CAMP, CHESTER A. STEWART, HERBERT BUSCHER.

COURSES					
No.	Title	Hrs.	Credits	Offered to	Prereq. courses
1-2.	Gross Anatomy .....	8	10	Fr.	None
4.	Histology and Embryology.....	8	4	Fr.	1

1-2. GROSS ANATOMY. Lectures, recitations, demonstrations, and laboratory work in gross human anatomy. Includes descriptive anatomy, with special emphasis upon the skull and the digestive tract; later a complete and careful dissection of the head and neck. Open only to dental students and especially arranged for their needs. JACKSON, ERDMANN, STEWART, BUSCHER.

3. HISTOLOGY AND EMBRYOLOGY. Lectures, recitations, laboratory work, and demonstrations. Special emphasis will be laid upon the knowledge of the development and structure of the head, mouth, jaw, teeth, and other portions of the digestive system. LEE, ALLEN, CAMP.

### CHEMISTRY

Professor GEORGE B. FRANKFORTER; Assistant Professor IRA H. DERBY; Instructors E. K. STRACHAN, WOLF KRITCHEVSKY.

COURSES					
No.	Title	Hrs.	Credits	Offered to	Prereq. courses
31.	General Chem. & Qual. Anal....	9	6	Fr.	Gen. Chem.
32.	Organic Chemistry.....	6	3	Fr.	31

31. GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS. A review of the principles of inorganic chemistry and an introduction to physical chemistry, especially as applied to solutions, alloys, etc.; an introduction to qualitative analysis, including the common metals and acids. STRACHAN and Assistants.

32. ORGANIC CHEMISTRY. An outline of the chemistry of carbon, including the preparation of some of the more important organic compounds. Special emphasis is laid on those substances used in medicine. DERBY, KRITCHEVSKY, and Assistants.

## CROWN AND BRIDGE WORK

Professor FORREST H. ORTON; Associate Professors PETER J. BREKHUS, ALFRED A. PAGENKOPF, GEORGE W. REYNOLDS, AMOS S. WELLS, CHARLES A. WIETHOFF; Assistant Professors WILLIAM McDUGALI, WILLIAM A. ROLL; Instructors HERBERT C. NELSON, CARL OTTO.

## COURSES

No.	Title	Hrs.	Credits	Offered to	Prereq. courses
1.	Crown & Bridge Technique.....	10	4	Jr.	Dent. Anat. 2
2.	Crown & Bridge Technique.....	10	4	Jr.	1
3.	Crown & Bridge Practice.....	13	5	Sr.	2
4.	Crown & Bridge Practice.....	13	5	Sr.	3

1. CROWN AND BRIDGE TECHNIQUE. A course of lectures, demonstrations, and laboratory work that includes all the more important forms of crowns and bridges. WELLS, REYNOLDS, NELSON.
2. CROWN AND BRIDGE TECHNIQUE. Continuation of Course 1 as outlined above. WELLS, REYNOLDS, NELSON.
3. CROWN AND BRIDGE PRACTICE. A course of lectures and clinical practice covering the entire field of crown and bridge work. ORTON, BREKHUS, PAGENKOPF, McDUGALL, ROLL.
4. CROWN AND BRIDGE PRACTICE. Continuation of Course 3 as outlined above. ORTON, BREKHUS, PAGENKOPF, McDUGALL, ROLL.

## DENTAL ANATOMY

Associate Professor GEORGE M. DAMON; Assistant Professors OSCAR COOPERMAN, CARL O. FLAGSTAD, CARL H. PETRI, CHARLES E. RUDOLPH.

## COURSES

No.	Title	Hrs.	Credits	Offered to	Prereq. courses
1.	Dental Anatomy.....	4	2	Fr.	None
2.	Dental Anatomy.....	4	2	Fr.	1

1. DENTAL ANATOMY. The course will consist of lectures, recitations, and such laboratory work as drawing, dissection, modeling, and carving of the teeth. DAMON, COOPERMAN, FLAGSTAD, PETRI, RUDOLPH.
2. DENTAL ANATOMY. Continuation of Course 1 as outlined above. DAMON, COOPERMAN, FLAGSTAD, PETRI, RUDOLPH.

## DENTAL METALLURGY

Professor ALFRED OWRE; Associate Professor HARRY C. LAWTON.

## COURSES

No.	Title	Hrs.	Credits	Offered to	Prereq. courses
1.	Dental Metallurgy .....	1	1	Jr.	Chem. 31, 32

1. DENTAL METALLURGY. Lectures, recitations, and demonstrations, taking up the most important metals with special reference to those used in dentistry. OWRE, LAWTON.

MILITARY SCIENCE AND TACTICS

Professor and Commandant BERNARD LENTZ; Assistant Commandant and Brigade Adjutant WALTER F. RHINOW; Band Instructor BERT ROSE.

COURSES

No.	Drill	Credits	Offered to	Prereq. courses
1-2.	Military Drill .....	None	Fr.,	None
3-4.	Military Drill .....	None	Soph.	1 yr. Drill
5-6.	Military Drill .....	3*	Jr., sr.	2 yrs. Drill
8.	Military Science .....	2†	Jr., sr.	2 yrs. Drill

1-6. MILITARY DRILL. Required of all men in the freshman and sophomore classes. Students are cautioned to report for the first drill and inform themselves of the requirements of the department.

1-2. Freshman: Practical instruction in schools of the soldier, company, and battalion; signals, ceremonies; first aid.

3-4. Sophomore: 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.

5-6. May be taken voluntarily by others outside of the freshman and sophomore classes. No credit will be allowed for such drill for less than one year.

8. MILITARY SCIENCE. Instruction in advance and rear guards, outposts, reconnaissance, camping, duties of company commander, articles of war, records.

\*No student may receive more than a total of six credits for elective work in both Physical Education and Military Drill.

†If taken in connection with Course 5-6.

OPERATIVE DENTISTRY

Professors JAMES M. WALLS, HENRY S. GODFREY; Associate Professors ROBERT O. GREEN, HERMAN A. MAVES; Assistant Professors RALPH W. COUNTRYMAN, NORMAN J. COX, R. S. MAYBURY, MARK O. PATTRIDGE, JOSEPH F. SHELLMAN; Instructors C. H. BEERS, MAX E. ERNST, WILLIAM A. GREY, J. M. LITTLE.

COURSES

No.	Title	Hrs.	Credits	Offered to	Prereq. courses
1.	Operative Technique .....	10	4	Jr.	Dent. Anat. 2
2.	Operative Practice .....	10	4	Jr.	1
3.	Operative Practice .....	13	5	Jr., sr.	2
4.	Operative Practice .....	13	5	Jr., sr.	3

1. OPERATIVE TECHNIQUE. This course consists of lectures, recitations, demonstrations, and laboratory work of a technical nature. WALLS, GREEN, COUNTRYMAN, ERNEST, MAYBURY, PATTRIDGE, SHELLMAN, BEERS, LITTLE.

2. OPERATIVE PRACTICE. This course consists of lectures, recitations, and clinical practice. WALLS, GREEN, COUNTRYMAN, ERNST, MAYBURY, PATTRIDGE, SHELLMAN, BEERS, LITTLE.

3. OPERATIVE PRACTICE. A course of lectures, recitations, conference work, demonstrations, and clinical practice covering the entire field of operative dentistry. WALLS, GODFREY, MAVES, COX, GREY.
4. OPERATIVE PRACTICE. Continuation of Course 3 as outlined above. WALLS, GODFREY, MAVES, COX, GREY.

### ORAL SURGERY

Professor THOMAS B. HARTZELL; Assistant Professors CHARLES A. GRIFFITH, RAY R. KNIGHT; Instructors H. J. LEONARD, MARY V. HARTZELL.

#### COURSES

No.	Title	Hrs.	Credits	Offered to	Prereq. courses
1.	Oral Surgery .....	4	3	Sr.	Path. & Ther.2
2.	Oral Surgery .....	4	2	Sr.	1

1. ORAL SURGERY. This course is taught by lectures, recitations, and practical demonstrations covering the field of oral diseases. Such subjects as physical diagnosis, anesthesia, and urinalysis are taught in connection with this course. HARTZELL, GRIFFITH, KNIGHT.
2. ORAL SURGERY. Continuation of Course 1 as outlined above. HARTZELL, GRIFFITH, KNIGHT.

### ORTHODONTIA

Professor OSCAR A. WEISS; Associate Professors WILLIAM F. LASBY, HARRY C. LAWTON; Assistant Professor CARL O. FLAGSTAD; Instructor BERT G. ANDERSON.

#### COURSES

No.	Title	Hrs.	Credits	Offered to	Prereq. courses
2.	Orthodontia Technique .....	9	3	Jr.	Pros. Tech. 3
3.	Orthodontia Practice .....	6½	3½	Sr.	1
4.	Orthodontia Practice .....	6½	2½	Sr.	2

2. ORTHODONTIA TECHNIQUE. A course of lectures, recitations, and laboratory work in the technique of steel and the making of regulating appliances. WEISS, LAWTON, FLAGSTAD, WEISS.
3. ORTHODONTIA PRACTICE. A course of lectures, recitations, and clinical work on the theory and practice of orthodontia. Every student is required to treat at least one irregularity of the teeth. WEISS, LASBY, ANDERSON.
4. ORTHODONTIA PRACTICE. A continuation of Course 2 as outlined above. WEISS, LASBY, ANDERSON.

### PATHOLOGY AND BACTERIOLOGY

Associate Professor HAROLD E. ROBERTSON; Assistant Professors E. T. BELL, WINFORD P. LARSON; Instructors ARTHUR T. HENRICI, MARGARET WARWICK.



*PATHOLOGY AND THERAPEUTICS—PHARMACOLOGY 21*

COURSES					
No.	Title	Hrs.	Credits	Offered to	Prereq. courses
1.	Bacteriology & Pathology*	8	4	Jr.	None

1. A course of lectures combined with laboratory exercises and demonstrations designed to illustrate the general principles and a few special applications of Pathology and Bacteriology. ROBERTSON, BELL, LARSON, HENRICI, WARWICK.

\*Offered in First Semester for class of 1915-1916

PATHOLOGY AND THERAPEUTICS

Professor THOMAS B. HARTZELL, H. J. LEONARD.

COURSES					
No.	Title	Hrs.	Credits	Offered to	Prereq. courses
1.	Pathology & Therapeutics.....	1	1	Jr.	None
2.	Pathology & Therapeutics.....	1	1	Jr.	1

1. PATHOLOGY AND THERAPEUTICS. These subjects are taught by lectures and recitations involving general pathology as a foundation of the special pathology of the oral cavity; paying particular attention to the therapeutic requirements of the lesions of the mouth and teeth. The work in pathology is supplemented by laboratory work under the care of the chair of pathology, Department of Medicine. HARTZELL, LEONARD.
2. PATHOLOGY AND THERAPEUTICS. Continuation of Course 1 as outlined above. HARTZELL, LEONARD.

PHARMACOLOGY

Professor ARTHUR D. HIRSCHFELDER; Associate Professor EDGAR D. BROWN; Assistant Professor ROBERT A. HALL.

COURSES					
No.	Title	Hrs.	Credits	Offered to	Prereq. courses
2.	General Pharmacology .....	2	2	Jr.	None
2.	Experimental Pharmacology.....	2	..	Jr.	1

2. GENERAL PHARMACOLOGY as applied to dentistry comprises a study of the properties, action, and therapeutic application of the principal drugs used in dentistry with exercises in prescription writing. HALL.
2. EXPERIMENTAL PHARMACOLOGY. Laboratory exercises affording the student the opportunity for observing the effects of the principal types of drugs upon the animal will be given to sections of the class in connection with Course 1. HIRSCHFELDER, BROWN, HALL.

## DEPARTMENT OF PHYSIOLOGY

Professor ELIAS POTTER LYON; Associate Professors RICHARD OLDING BEARD, FREDERICK H. SCOTT; Assistant Professors M. RUSSELL WILCOX; Instructors C. V. J. PETTIBONE, J. J. McCLINDON; Assistants ROY E. CRUZEN, LYLE ROBERTS.

## COURSES

No.	Title	Hrs.	Credits	Offered to	Prereq. courses
1.	Physiology & Physiologic Chemistry .....	9	5	Jr.	Chem. 31

1. PHYSICAL AND PHYSIOLOGIC CHEMISTRY.\* A course of lectures and laboratory exercises covering the essentials of Physiology and Physiologic Chemistry. LYON, SCOTT, PETTIBONE.

\*Not offered in 1915-1916.

## PROSTHETIC DENTISTRY

Professor OSCAR A. WEISS; Associate Professors GEORGE M. DAMON, WILLIAM F. LASBY, HARRY C. LAWTON; Assistant Professors OSCAR COOPERMAN, CARL O. FLAGSTAD, CARL H. PETRI, CHARLES E. RUDOLPH; Instructors BERT C. ANDERSON, ROBERT THOMPSON, ANDREW J. WEISS.

## COURSES

No.	Title	Hrs.	Credits	Offered to	Prereq. courses
1.	Prosthetic Technique .....	5	2	Fr.	None
2.	Prosthetic Technique .....	7	3	Fr.	1
3.	Prosthetic Technique .....	10	4	Jr.	2
4.	Prosthetic Practice .....	7	3	Jr.	3
5.	Prosthetic Practice .....	4½	1½	Sr.	4
6.	Prosthetic Practice .....	4½	1½	Sr.	5

1. PROSTHETIC TECHNIQUE. This course consists of lectures and technic work in the laboratory, comprising impression materials and their uses and the simpler processes of plate work. DAMON, COOPERMAN, FLAGSTAD, PETRI, RUDOLPH.
2. PROSTHETIC TECHNIQUE. Continuation of Course 1 as outlined above. DAMON, COOPERMAN, FLAGSTAD, PETRI, RUDOLPH.
3. PROSTHETIC TECHNIQUE. The course consists of lectures, recitations, and laboratory work covering the principles and practice of plate work. WEISS, LAWTON, ANDERSON, WEISS.
4. PROSTHETIC PRACTICE. A course of lectures, recitations, and clinical work covering the simpler forms of prosthetic practice. WEISS, LASBY, FLAGSTAD.
5. PROSTHETIC PRACTICE. A course of lectures, recitations, and clinical work, covering cleft palate and other special cases in addition to the general prosthetic practice. WEISS, LASBY, FLAGSTAD.
6. PROSTHETIC PRACTICE. Continuation of Course 5 as outlined above. WEISS, LASBY, FLAGSTAD.

## THEORY AND PRACTICE OF DENTISTRY

Professor ALFRED OWRE; Instructor MAX E. ERNST.

No.	Title	COURSES		Offered to	Prereq. courses
		Hrs.	Credits		
2.	Theory and Practice of Dentistry	1	2	Sr.	None

2. THEORY AND PRACTICE OF DENTISTRY. A lecture and conference course in applied Economics, Jurisprudence, Psychology, Ethics and Art. OWRE, ERNST, and Associates.

## ELECTIVES

NOTE.—One elective to be taken during either the junior or senior year.

## COMPARATIVE DENTAL ANATOMY

Instructor MARY V. HARTZELL.

No.	Title	COURSES		Offered to	Prereq. courses
		Credits			
1-2.	Comparative Dental Anatomy..	3		Jr., sr.	Anat. 1, 2, 3

1-2. COMPARATIVE DENTAL ANATOMY. A course embracing the comparative study of animal life, giving special attention to the number, form, and arrangement of the teeth. HARTZELL.

## DENTAL ELECTRICITY AND RADIOGRAPHY

Professor FRANK W. SPRINGER; Assistant Professor RAY R. KNIGHT.

No.	Title	COURSES		Offered to	Prereq. courses
		Credits			
151.	Dental Electricity .....	2		Jr., sr.	None
2.	Radiography .....	1		Jr., sr.	151

151. DENTAL ELECTRICITY. A course of lectures, recitations, and demonstrations on the elements of electricity and magnetism, the construction, use, care, and operation of batteries, motors, dynamos, switch boards, and other electrical appliances used in dental offices. SPRINGER.

2. RADIOGRAPHY. This course consists of the making, developing, and reading of dental radiographs, together with the essentials of general radiology. The students secure individual instruction and have the opportunity of doing the actual work. KNIGHT.

## DENTAL METALLOGRAPHY

Assistant Professor S. L. HOYT.

No.	Title	COURSES		Offered to	Prereq. courses
		Hrs.	Credits		
163.	Dental Metallography .....	3	3	Jr., sr.	Dent. Met. 1

163. DENTAL METALLOGRAPHY. A course in the study of Dental Alloys from the standpoint of Metallography.

## ECONOMICS

Assistant Professors J. FRANKLIN EBERSOLE, THOMAS WARNER MITCHELL.

No.	Title	COURSES		Offered to	Prereq. courses
		Credits			
1a.	Elements of Economics.....	3		Jr., sr.	None
1b.	Elements of Economics.....	3		Jr., sr.	None

1a. ELEMENTS OF ECONOMICS. A course of economic theory with special reference to present-day economic and social problems. MITCHELL, EBERSOLE.

1b. ELEMENTS OF ECONOMICS. Same as Course 1a.

## PSYCHOLOGY

Associate Professor DAVID F. SWENSON; Instructor EDMUND T. DANA.

No.	Title	COURSES		Offered to	Prereq. courses
		Credits			
5a.	Elements of Psychology.....	3		Soph., jr., sr.	None
5b.	Elements of Psychology.....	3		Soph., jr., sr.	None

5a. ELEMENTS OF PSYCHOLOGY. This course is for those who do not expect to take further work in psychology, but wish a brief outline of the subject, either as preparatory for work in philosophy or as part of their general education. The significance of mental facts for problems in philosophy. SWENSON, DANA.

5b. ELEMENTS OF PSYCHOLOGY. Same as Course 5a.

## ADVANCED BACTERIOLOGY

## ADVANCED PATHOLOGY

## SPECIAL MATERIA MEDICA

NOTE.—Courses in the above subjects will be arranged along the lines in which students elect to specialize.

14

# Bulletin of The University of Minnesota

## THE COLLEGE OF PHARMACY

1915-1916



VOL. XVIII, NO. 10. MAY 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.

1915							1916													
<b>JULY</b>							<b>JANUARY</b>							<b>JULY</b>						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3	..	..	..	..	..	..	1	..	..	..	..	..	..	1
4	5	6	7	8	9	10	2	3	4	5	6	7	8	2	3	4	5	6	7	8
11	12	13	14	15	16	17	9	10	11	12	13	14	15	9	10	11	12	13	14	15
18	19	20	21	22	23	24	16	17	18	19	20	21	22	16	17	18	19	20	21	22
25	26	27	28	29	30	31	23	24	25	26	27	28	29	23	24	25	26	27	28	29
..	..	..	..	..	..	..	30	31	..	..	..	..	..	30	31	..	..	..	..	..
<b>AUGUST</b>							<b>FEBRUARY</b>							<b>AUGUST</b>						
1	2	3	4	5	6	7	..	..	1	2	3	4	5	..	..	1	2	3	4	5
8	9	10	11	12	13	14	6	7	8	9	10	11	12	6	7	8	9	10	11	12
15	16	17	18	19	20	21	13	14	15	16	17	18	19	13	14	15	16	17	18	19
22	23	24	25	26	27	28	20	21	22	23	24	25	26	20	21	22	23	24	25	26
29	30	31	..	..	..	..	27	28	29	..	..	..	..	27	28	29	30	31	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>SEPTEMBER</b>							<b>MARCH</b>							<b>SEPTEMBER</b>						
..	..	..	1	2	3	4	..	..	..	1	2	3	4	..	..	..	..	..	1	2
5	6	7	8	9	10	11	5	6	7	8	9	10	11	3	4	5	6	7	8	9
12	13	14	15	16	17	18	12	13	14	15	16	17	18	10	11	12	13	14	15	16
19	20	21	22	23	24	25	19	20	21	22	23	24	25	17	18	19	20	21	22	23
26	27	28	29	30	..	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>OCTOBER</b>							<b>APRIL</b>							<b>OCTOBER</b>						
..	..	..	..	1	2	..	..	..	..	..	..	..	1	1	2	3	4	5	6	7
3	4	5	6	7	8	9	2	3	4	5	6	7	8	8	9	10	11	12	13	14
10	11	12	13	14	15	16	9	10	11	12	13	14	15	15	16	17	18	19	20	21
17	18	19	20	21	22	23	16	17	18	19	20	21	22	22	23	24	25	26	27	28
24	25	26	27	28	29	30	23	24	25	26	27	28	29	29	30	31	..	..	..	..
31	..	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>NOVEMBER</b>							<b>MAY</b>							<b>NOVEMBER</b>						
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	..	..	1	2	3	4
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>DECEMBER</b>							<b>JUNE</b>							<b>DECEMBER</b>						
..	..	..	1	2	3	4	..	..	..	..	1	2	3	..	..	..	..	..	1	2
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..

# UNIVERSITY CALENDAR

1915-1916

The university year covers a period of thirty-eight weeks, beginning on the Tuesday before the second Thursday in September. Commencement Day is always the second Thursday in June.

1915

August	31	Tuesday	Registration closes except for new students
September	1-8	Week	Fees payable except for new students
September	7-14	Week	Examinations for the removal of conditions (except Colleges of Agriculture and Forestry), entrance examinations, registration of new students, and payment of fees
September	15	Wednesday	First semester begins
September	27	Monday	Agricultural College, farm experience examination
October	4	Monday	School of Agriculture, first term begins
October	7	Thursday	Senate meeting, 4:00 p.m.
November	8	Monday	Dairy School opens
November	24	Wednesday	Thanksgiving recess begins 9:00 p.m.
November	29	Monday	Thanksgiving recess ends 8:00 a.m.
Nov. 29 to Dec. 4		Week	Second semester condition examinations, Colleges of Agriculture and Forestry
December	2	Thursday	Senate meeting, 4:00 p.m.
December	6-11	Week	Short course for ice-cream makers
December	11	Saturday	Dairy School closes
December	17	Friday	Christmas vacation begins 9:00 p.m.
December	17	Friday	School of Agriculture, first term closes
1916			
January	3-8	Week	Farmers' Short Course
January	4	Tuesday	Christmas vacation ends 8:00 a.m.
January	18	Tuesday	Registration for second semester closes
January	21	Friday	School of Agriculture, second term begins
January	24	Monday	Final examinations begin
January	25	Tuesday	Payment of fees for second semester closes
February	2	Wednesday	Second semester begins
February	3	Thursday	Senate meeting, 4:00 p.m.
February	12	Saturday	Lincoln's Birthday: a holiday
February	22	Tuesday	Washington's Birthday: a holiday
March	30	Wednesday	School of Agriculture closes

## COLLEGE OF PHARMACY

April	3-8	Week	Junior Short Course
April	19	Wednesday	Easter recess begins 9:00 p.m.
April	27	Thursday	Easter recess ends 8:00 a.m.
May	1-6	Week	Condition examinations in certain colleges
May	2	Tuesday	Traction Engineering Course begins
May	4	Thursday	Senate meeting, 4:00 p.m.
May	26	Friday	Final examinations begin
May	30	Tuesday	Memorial Day: a holiday
June	1-8	Week	Military Encampment, Fort Snelling
June	3	Saturday	Second semester closes
June	4	Sunday	Baccalaureate service
June	5	Monday	Senior class day exercises
June	7	Wednesday	Alumni Day
June	8	Thursday	Forty-fourth Annual Commencement
June	9	Friday	Summer vacation begins
June	12	Monday	Summer Session begins

The university year for 1916-17 will begin Tuesday, September 12.



# THE COLLEGE OF PHARMACY

## FACULTY

- GEORGE EDGAR VINCENT, Ph.D., LL.D., President 1005 5th St. S. E.  
CYRUS NORTHPROP, LL.D., President, Emeritus 519 10th Ave. S. E.  
FREDERICK J. WULLING, Ph.G., Phm.D., LL.M., Dean, Professor of  
Pharmacology and Director of the University Medicinal Plant Gar-  
dens 3305 2nd Ave. S.  
GUSTAV BACHMAN, Phm.D., Phm.M., Assistant Professor of Pharmacy  
2624 Fremont Ave. S.  
RICHARD OLDING BEARD, M.D., Associate Professor of Physiology  
The University of Minnesota  
HERBERT F. BERGMAN, B.S., Assistant Professor of Botany  
723 7th St. S. E.  
EDGAR D. BROWN, Phm.D., M.D., Associate Professor of Pharmacology  
3525 3rd Ave. S.  
FREDERICK K. BUTTERS, B.S., B.A., Assistant Professor of Botany  
815 S. 7th St.  
FREDERICK E. CLEMENTS, Ph.D., Professor of Botany 800 4th St. S. E.  
IRA H. DERBY, Ph.D., Assistant Professor of Chemistry  
2157 Commonwealth Ave., St. Paul  
GEORGE B. FRANKFORTER, M.A., Ph.D., Professor of Chemistry  
525 E. River Road  
FRANK F. GROUT, M.S., Assistant Professor of Geology and Mineralogy  
623 13th Ave. S. E.  
EVERHART P. HARDING, Ph.D., Associate Professor of Chemistry  
1316 7th St. S. E.  
NED L. HUFF, M.S., Assistant Professor of Botany 1219 7th St. S. E.  
WILLIAM H. HUNTER, Ph.D., Assistant Professor of General and Qualita-  
tive Chemistry 112 Church St. S. E.  
WINFORD P. LARSON, M.D., Assistant Professor of Bacteriology  
614 9th Ave. S. E.  
EDWIN L. NEWCOMB, P.D., Phm.M., Associate Professor of Pharmaceu-  
tical Botany and Pharmacognosy 719 6th Ave. S. E.  
HAROLD E. ROBERTSON, B.A., M.D., Professor of Bacteriology  
507 Essex St. S. E.  
CARL O. ROSENDAHL, Ph.D., Professor of Botany  
2191 Commonwealth Ave. St. Paul  
FREDERICK H. SCOTT, Ph.D., M.D., D.Sc., Associate Professor of Phys-  
iology 1307 6th St. S. E.  
CHARLES F. SIDENER, B.S., Professor of Quantitative Chemistry  
1320 5th St. S. E.  
OSCAR J. BLOSMO, Ph.C., Phm.M., Instructor in Dispensing  
529 Oak St. S. E.

## COLLEGE OF PHARMACY

- ARTHUR T. HENRICI, M.D., Instructor in Bacteriology 2443 Garfield Ave.  
 JOHN ELDON HYNES, Ph.C., M.D., Instructor in Medicine  
 3349 University Ave. S. E.  
 WOLF KRITCHEVSKY D.Sc., Instructor in Chemistry 568 6th Ave. N.  
 CHAUNCEY J. V. PETTIBONE, Ph.D., Instructor in Physiology  
 112 Church St. S. E.  
 CHARLES WM. WULLING, Phm.D., Instructor in Pharmaceutical Chem-  
 istry and Pharmacy Hotel Berkeley  
 EARLE KENNETH STRACHAN, Ph.D., Instructor in Chemistry  
 826 University Ave. S. E.  
 MARGARET WARWICK, B.S., M.D., Instructor in Bacteriology  
 1516 7th St. S. E.  
 DONALD FOLSOM, B.A., Assistant in Botany 619 9th Ave. S. E.  
 C. NAUMANN McCLOUD, Phm.D., M.D., Lecturer on First Aids to the  
 Injured 524 Lowry Bldg., St. Paul  
 JAMES L. TITUS, Phm.B., Assistant Instructor in Dispensing  
 300 Washington Ave. S. E.  
 DEL D. TURNER, Ph.C., Assistant Laboratory Instructor 1205 5th St. S. E.

## GENERAL INFORMATION

### ENTRANCE REQUIREMENTS

#### ADMISSION BY CERTIFICATE

Beginning with 1915-16, diplomas, certificates, or other evidences of the completion of a regular four-year high school course, or its educational equivalent, will be required for admission. (In accordance with an informal agreement between the College and the State Pharmaceutical Association covering the period ending with 1920, in certain meritorious cases exceptionally good drug-store or pharmaceutical laboratory experience may be accepted in place of a minor fraction of high school work). While at present a diploma from an accredited high school admits to the College, prospective applicants are strongly urged to prepare themselves in four years of English, two years of Latin, two years of either German or French, higher algebra, plane geometry, physics and botany and, if possible, chemistry and physiology. In the near future completion of these subjects will be made prerequisites to entrance.

#### ADMISSION BY EXAMINATION

Students may take examinations in subjects for which they have no certificates. A high school training covers fifteen units, a unit being a school year of standard work in a given subject. State High School Board certificates and College Entrance Examination Board certificates are accepted in lieu of examinations.

#### REGISTRATION

Registration consists in (1) the filing with the Registrar, on the blanks provided, of a statement of the work the student desires and is entitled to carry the ensuing semester, and (2) the payment of the fees for the semester.

No student will be admitted to classes until registration has been completed and the instructor has received from the Registrar the student's class card certifying to that effect. A penalty fee of one dollar is charged all students who register after the time prescribed. After the day previous to that on which classes begin the penalty increases at the rate of twenty-five cents a day. See calendar, page 3.

#### NEW STUDENTS

All applicants for admission should request their high school principals or superintendents to send a complete transcript of their records to the Registrar of the University as early as possible and not later than September 1. Upon receipt of the credentials the Registrar will notify

the applicant concerning his admission and will forward directions for registration. See calendar, page 3, for registration dates.

#### OLD STUDENTS

In August the Registrar will send to all students who were in college the preceding year complete registration material. Those who fail to receive this by August 20 should write for proper blanks. See calendar for dates of registration and payment of fees.

#### FEEES

One half of the annual incidental fee, which includes all laboratory fees, is payable at the beginning of each semester. Certificates entitling the student to admission to classes will not be issued until the fees have been paid.

##### *All Students*

Annual deposit covering all laboratories, etc. ....	\$5.00
Minnesota Union membership fee (required of men), a semester .....	1.00
Condition examination fee, each subject (for those receiving a grade of "Conditioned") .....	1.00
Gymnasium suit, for those electing this work.....	5.00

##### *Two-Year Regular Course*

First-year tuition .....	\$82.50
Second-year tuition .....	82.50

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\$165.00

##### *Three-Year Regular Course*

First-year tuition .....	\$55.00
Second-year tuition .....	55.00
Third-year tuition .....	55.00

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\$165.00

##### *First Graduate Course*

Tuition for each semester .....	\$10.00
Annual deposit .....	5.00

There are no other tuition fees. Fees are payable at the time of registration. Those desiring to take special work may pay fees on a clock hour basis, the rate being \$3 an hour; e. g., a student doing 15 hours of work a week throughout the semester, would pay \$45.00.

Students are to provide themselves with a designated set of metric weights, a set of apothecary's weights, steel spatulas, and note and drawing books. The expense of these may be kept within three dollars.

A deposit of five dollars will be made with the cashier each year, by every student, at the time of enrollment as a caution fee. The fee is intended to cover the cost of unnecessary damage to or in the college build-

ings and of breakage and loss of laboratory apparatus, material, penalties for late registration or late payment of fees, condition examinations, and the rental of post-office box, lockers, etc. The unused balance will be returned to the student at the close of each year. If responsibility for such damage can not be individually fixed, a pro rata charge upon all students will be made.

#### COURSES OF STUDY

Of the five graded courses authorized by the Regents those leading to the degrees Graduate in Pharmacy, Pharmaceutical Chemist, and Master of Pharmacy are now offered. Only the course leading to the first degree is described in this bulletin, but a limited number of applicants for the courses leading to the second and third degrees will be accepted now. Up to and including September, 1917, graduates from the first course are admitted to the course leading to the master's degree. All who apply for entrance upon the master's course in September, 1918, must possess the Ph.C. degree. A limited number of graduates from this or other colleges maintaining an equivalent standard, having the master's or an equivalent degree, will be accepted for advanced standing in the course leading to the degree Bachelor of Science in Pharmacy as the facilities of the College may permit.

#### DEGREES

This College now has authority to grant the degrees Graduate in Pharmacy (Ph.G.) for two years of work, Pharmaceutical Chemist (Ph.C.) for three years, Bachelor of Science in Pharmacy (B.S. in Pharm.) for four years, Master of Pharmacy (Phm.M.) for five years, and Doctor of Pharmacy (Phm.D.) for six years of work. In this and all other respects this College fully meets the requirements of the Education Department of the State of New York. The master's and doctor's degrees will ultimately be given by the Graduate School.

#### GRADUATION REQUIREMENTS

Regular attendance at lectures, recitations, and laboratory exercises is required. Students will not be permitted to present themselves for final examination unless they have been in attendance upon at least seven eighths of the total of work of the course.

Every person upon whom any degree is conferred must be of good moral character and must be at least twenty-one years old; must have attended two full lecture and laboratory courses, the last at this College, and must have passed examinations in the subjects required for graduation.

Drug-store experience is not a requirement for graduation.

#### ADVANCED STANDING

Applicants for advanced standing must pass the entrance examinations or present the usual equivalents. They must furnish satisfactory

evidence of time spent and subjects covered in previous professional studies, and must pass the examinations of all departments in which they desire credit, if such examinations are deemed necessary by the professors in charge. Students will not be permitted to substitute private work in any branch for the regular course work.

#### UNCLASSED STUDENTS

Unclassed or special students may enter at any time provided there is laboratory room for them. They will not be rated in their work or examined unless they make special request therefor. Work completed will be credited should the students subsequently enter the regular course, providing they meet the full entrance requirements.

#### EXAMINATION AND STANDINGS

Examinations are held at the end of the regular school year and during the last week of the first semester and are supplementary to the written and practical tests and quizzes that are held at frequent intervals during the year, and, with them, form largely the basis of final determination of fitness for promotion or graduation.

Students are not required to write graduating theses, but instead they keep complete records of their laboratory work. The records are to be kept in substantially bound books, to be approved by the faculty. The respective professors call for the records for inspection and rating once a month or oftener.

The standing of students is indicated by the letters A, B, C, D, (A highest, D lowest passing mark), E (conditioned), I (incomplete) and F (failure). Conditions may be removed as indicated below. Incomplete work must be made up before the final examinations of the following year.

In order to become eligible for final examinations students are required to attend at least four fifths of the lectures in each course. This rule is not intended for the benefit of those who seek admission after the opening of the college year, but is designed to cover cases of sickness or unavoidable absence. It does not apply to laboratory courses which must be taken in full and must be entered during the first week in which they begin.

Students having conditions in more than two major or in more than three minor subjects of the first year can not enter upon the second year's work. All entrance conditions must be removed before the next spring examination. Candidates for graduation must have removed all conditions before entering upon the second semester of the graduating year.

Condition examinations are held during the first week of the course in September and during the week following Easter vacation. The dates are usually posted in June and March. Conditioned students are required to inform themselves as to these dates as soon as they learn that they are conditioned, as no other notice is given. A fee of one dollar is charged for a condition examination. Failure at the condition examination obliges

the student to repeat the work of the respective course. Students who carry a condition into a succeeding year may find a conflict of lecture or laboratory hours. In such cases they are to give preference to the lower course.

Absence will not be excused unless satisfactory reasons are given. Habitual absence without a satisfactory excuse, continued indifference to study, or persistently poor scholarship may subject the student to temporary or permanent suspension. Students are strongly advised to be present at the beginning of the school year, but those who can not enter in the fall may enter at the beginning of the second semester, taking any of the subjects beginning then. Any of the facilities afforded by the University are open to the students of this College, subject to the approval of the Dean. Opportunity is afforded to do advanced work in all branches. Textbooks may be obtained after coming to the University.

Students find their time fully occupied. Those who feel unable to complete the work of the regular course in two years may divide it in such a manner as to complete it in three years. Practicing pharmacists who desire to take certain branches of study may avail themselves of any of the college facilities.

#### COLLEGE TRAINING FOR PHARMACISTS

The recognition of the need of substantial college training for pharmacists finds expression in many ways. In New York, Pennsylvania, Hawaii, Wisconsin, Ohio, Louisiana, and Washington, such training is obligatory either by law or by rule of the boards of pharmacy. In a number of other states credit is given for college work. In Minnesota graduates from recognized colleges are required to have only two years of practical experience while all others must have four years of drug-store experience before they become eligible for examination by the State Board of Pharmacy for full license to practice in Minnesota. Graduates of the three-year course who have gained practical experience concurrently with their college work need only one additional year of drug-store experience before they become eligible for examination for full registration.

At the Joint Conference of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties, held at Indianapolis, Indiana, in September, 1906, the following resolution was adopted:

"Special education for the practice of pharmacy is in this age a necessity and should as rapidly as possible be made compulsory. The rules of the boards of pharmacy are such as to promote and encourage it in all practical ways. The special pharmaceutical education should include substantial laboratory courses." The training advocated by these two most representative bodies and by the American Pharmaceutical Association can be obtained only at colleges or schools of pharmacy of recognized standing. It is admitted that the State of Minnesota through its University College of Pharmacy is affording instruction of the most approved kind.

*COLLEGE OF PHARMACY*

## POSITIONS FOR GRADUATES

The demand for graduates of this College has always been greater than the supply and is continually growing. Practically all members of the senior class are engaged before graduation. This College is recognized in all states, including those in which standards of efficiency have been established.

## STATE BOARD OF PHARMACY

The State Board of Pharmacy meets at the College four times each year to examine candidates for registration. For information concerning the board or state examinations, address the Secretary of the Board, Mr. E. A. Tupper, 745 E. 14th St., Minneapolis, Minnesota.

## COLLEGE OF PHARMACY ALUMNI ASSOCIATION

The Alumni Association of the College of Pharmacy meets annually at the College, usually the day before Commencement. Every member of the Association is urgently requested to report change of address to the Secretary of the Association, care of the College.

## THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES

The College of Pharmacy of the University of Minnesota is one of the colleges constituting the membership of the American Conference of Pharmaceutical Faculties.

## PHI DELTA CHI

The Theta chapter of the Phi Delta Chi fraternity was organized at the College of Pharmacy in 1904. Students of the College are eligible to membership.

## THE NORTHWESTERN BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The Northwestern Branch of the American Pharmaceutical Association, composed of the representative pharmacists of the Northwest, has its headquarters at the College of Pharmacy. About four meetings are held annually. Students of pharmacy are eligible to membership in the branch, but are privileged to attend the meetings without becoming members.

## COMMUNICATIONS

Address communications to the Dean, Professor Frederick J. Wulling, University of Minnesota, Minneapolis, Minnesota.



## DEPARTMENTAL STATEMENTS

### BACTERIOLOGY

Professor H. E. ROBERTSON; Assistant Professor WINFORD P. LARSON;  
Instructors ARTHUR T. HENRICI, MARGARET WARWICK.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
5b.	General Bacteriology.....	5	Sr.	None

- 5b. GENERAL BACTERIOLOGY. The general scope of bacteriology, the history of its development, and the biological and chemical problems involved in the life-history of bacteria will be dealt with. General and special study of the various antiseptics, disinfectants, and bactericidal substances and conditions and the testing of various germicides—chemical and physical—and the use of bacteriological methods in the examination of drinking water and milk will form an important part of the work. ROBERTSON, LARSON, HENRICI, WARWICK.

#### BOOK RESEARCH AND SEMINAR WORK

Throughout the year students are required to do book research and seminar work in the pharmaceutical library during certain hours released for the purpose from the pharmaceutical laboratory and other periods. Beginning with the coming year it is proposed to provide regularly in the college schedule two two-hour periods a week during the second semester of the graduating year for this kind of work. A room has been reserved for this purpose in the Pharmacy Building. To make this work of the utmost value the pharmaceutical library is being enlarged.

### BOTANY AND MICROSCOPY

Professors FREDERIC E. CLEMENTS, CARL OTTO ROSENDAHL; Assistant Professors HERBERT F. BERGMAN, FREDERIC K. BUTTERS, NED L. HUFF;  
Assistant DONALD FOLSOM.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
17.	General Botany.....	5	Soph., jr.	None
18.	Greenhouse Work.....	1	Soph., jr.	17

17. GENERAL BOTANY. A study of the external forms of flowering plants with the relations, modifications, and functions of their several organs;

special study of the flower with the outlines of the classification of flowering plants. Lectures, laboratory work, and field work. CLEMENTS, ROSENDAHL, BUTTERS, HUFF.

18. GREENHOUSE WORK. The facilities of the greenhouse applied in the study of outer morphology. BUTTERS.

### CHEMISTRY

Professors GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Associate Professor E. P. HARDING; Assistant Professors IRA H. DERBY, WILLIAM H. HUNTER; Instructors WOLF KRITCHEVSKY, E. K. STRACHAN.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
1.	General Chemistry.....	5	Soph., jr.	None
3.	Qualitative Analysis.....	5	Soph., jr.	1
7.	Quantitative Analysis.....	3	Jr., sr.	3
111-112.	Organic Chemistry.....	10	Jr., sr.	1 and 3
4.	Water and Food Analysis.....	3½	Sr.	5

1. GENERAL CHEMISTRY. A study of the chemical properties of the non-metallic and the metallic elements. DERBY, STRACHAN.
3. QUALITATIVE ANALYSIS. This course covers the common reactions of the metals and acids and their qualitative separation. The ionic theory and the law of mass action are discussed with especial reference to qualitative reactions. DERBY, STRACHAN.
7. QUALITATIVE CHEMISTRY. A study of the principles of gravimetric, volumetric, and gasometric estimation. SIDENER.
- 111-112. ORGANIC CHEMISTRY. This course includes work in both the aliphatic and aromatic series and the preparation of the more important compounds. FRANKFORTER, HUNTER.
4. WATER AND FOOD ANALYSIS. The chemistry of the atmosphere, water, soil, etc., the sanitary examinations of air and water and the chemistry of foods are taken up in this course. FRANKFORTER, HARDING, KRITCHEVSKY.

### CLINICAL MICROSCOPY

Professor HAROLD E. ROBERTSON; Instructor JOHN E. HYNES.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
1.	Clinical Chemistry and Microscopy	1	Sr.	None

1. CLINICAL CHEMISTRY AND MICROSCOPY. Includes (a) the macroscopic

study of urine, its colors, sediments, and finer chemical tests and (b) the microscopic study of urine sediments, blood, pus, epithelial cells, casts, etc. ROBERTSON, HYNES.

## DISPENSARY PRESCRIPTION PRACTICE

Instructor OSCAR J. BLOSMO; Assistant JAMES L. TITUS.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
1-3.	Prescription Practice.....	2½	Jr., sr.	Pharm. 5

1-3. DISPENSARY PRESCRIPTION PRACTICE. The prescription dispensing for the Out-Patient Department of the University Hospitals is in charge of the College of Pharmacy. The senior students are sectioned into divisions of three or four for practical prescription work at the dispensary under the direction of Mr. Blosmo. The dispensary practice continues throughout the college year, afternoons from one to five. BLOSMO, TITUS.

## FIRST AIDS TO THE INJURED

Lecturer C. N. McCLOUD and Assistant.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
2.	Emergency Cases.....	3	Jr., sr.	None

2. EMERGENCY CASES. A series of twelve hour lectures and demonstrations designed to qualify the pharmacist to administer upon emergency cases before the arrival of the physician. McCLOUD.

## MATERIA MEDICA

PROFESSOR WULLING; Associate Professor E. L. NEWCOMB and Assistants.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
1-2.	Inorganic Materia Medica.....	2	Soph., jr.	None
4-3.	Organic Materia Medica.....	4	Soph., jr., sr.	1

1-2. INORGANIC MATERIA MEDICA. This course runs concurrently and in close relationship with Pharmacy 8 and 11. WULLING.

4-3. ORGANIC MATERIA MEDICA. The identity, sources, habitat, family, constituents, and preparations of the U. S. P., and of some unofficial vegetable drugs are studied in this course. NEWCOMB and Assistants.

## PHARMACY

Professor WULLING; Assistant Professor GUSTAV BACHMAN; Instructors  
OSCAR J. BLOSMO, C. W. WULLING; Assistant L. D. TURNER.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
1.	History of Pharmacy.....	$\frac{1}{2}$	Soph., jr.	None
3.	Metrology .....	3	Soph., jr.	None
5.	Physics of Pharmacy.....	3	Soph., jr.	3
7.	Pharmaceutical Processes.....	$3\frac{1}{2}$	Soph., jr.	5
2.	Pharmacopoeial Preparations.....	5	Soph., jr.	7
4.	Pharmacy Quiz.....	3	Soph., jr.	3, 5, 7, 2
6.	Identification Inorganic U. S. P. Preparations .....	1	Soph., jr.	2
9.	Pharmaceutical Chemical Philos- ophy .....	$1\frac{1}{2}$	Soph., jr.	None
11.	The Pharmaceutical Chemistry of the Non-metals.....	$1\frac{1}{2}$	Soph., jr.	9
8.	U. S. P. Inorganic Salts.....	3	Soph., jr.	11
13.	Classification of Pharmaceutical Organic Compounds.....	1	Jr., sr.	8
15-16.	U. S. P. Organic Compounds and Their Preparations.....	3	Jr., sr.	13
17.	Pharmacopoeial Qualitative Analy- sis .....	5	Jr., sr.	11
18.	Pharmacopoeial Quantitative An- alysis .....	2	Jr., sr.	17
19.	Prescription Incompatibility.....	$\frac{1}{2}$	Jr., sr.	9, 13
21-22.	Prescription Dispensing.....	12	Jr., sr.	19, 2
23.	Manufacture U. S. P. Salts.....	4	Jr., sr.	8
10.	National Formulary.....	1	Jr., sr.	23
12.	Pharmaceutical Assay.....	$1\frac{1}{2}$	Jr., sr.	10
14.	Synthetic Remedies.....	$\frac{1}{2}$	Jr., sr.	15
16.	Homeopathic Pharmacy.....	$\frac{1}{2}$	Jr., sr.	21
25-26.	Identification U. S. P. Salts....	$1\frac{1}{2}$	Jr., sr.	8, 15
18.	Microchemistry .....	.....	.....	.....
27-28.	Mathematics of Pharmacy.....	1	Soph., jr.	3

- HISTORY OF PHARMACY.** This course embraces the study of the history of pharmacy, including the U. S. Pharmacopoeia through all of its revisions and the literature of pharmacy. WULLING.
- METROLOGY.** A critical study of weights and measures and balances; specific gravity, specific volume; alligation, etc. WULLING, C. W. WULLING.
- THE PHYSICS OF PHARMACY.** This course covers a review and more extended elucidation of such divisions of physics as apply to pharmaceutical processes. WULLING, C. W. WULLING, TURNER.
- PHARMACEUTICAL PROCESSES.** A study of the various laboratory processes employed in pharmaceutical manufacture. C. W. WULLING.
- PHARMACOPOEIAL PREPARATIONS.** This course includes the study and preparation of official bodies for which the Pharmacopoeia gives formulae and processes. WULLING, C. W. WULLING, TURNER.

4. PHARMACY QUIZ. A thoro review of the work covered in Courses 3, 5, 7, and 2. WULLING, C. W. WULLING.
6. IDENTIFICATION OF INORGANIC U. S. P. PREPARATIONS. The study of the appearance and physical properties of inorganic official preparations. C. W. WULLING, TURNER.
9. PHARMACEUTICAL CHEMICAL PHILOSOPHY. This course treats of the principles underlying chemistry and elucidates chemical facts and phenomena in their pharmaceutical aspects. WULLING.
11. THE PHARMACEUTICAL CHEMISTRY OF THE NON-METALS. A study of the description, properties, pharmacy, and manufacture of the non-metals used in pharmacy, including their U. S. P. preparations. WULLING.
8. U. S. P. INORGANIC SALTS. Especial reference to sources, description, properties, and manufacture. WULLING.
13. CLASSIFICATION OF PHARMACEUTICAL ORGANIC COMPOUNDS. A preparation for Pharmacy 15-16. WULLING, .....
- 15-16. U. S. P. ORGANIC COMPOUNDS AND THEIR PREPARATIONS. This course includes the critical study of cellulose and its derivatives, destructive distillation products, starches, sugars, fermentation products, organic acids, fixed oils and fats, volatile oils, waxes, and animal fats, alkaloids, glucosides, animal drugs and products, etc. WULLING. ....
17. PHARMACOPOEIAL QUALITATIVE ANALYSIS. A critical study of the identity, purity, limit, and percentage tests of the Pharmacopoeia and their application either wholly or in part to practically every official organic and inorganic salt and compound. BACHMAN, TURNER.
18. PHARMACOPOEIAL QUANTITATIVE ANALYSIS. This course includes the gravimetric, volumetric, and gasometric determinations of the U. S. Pharmacopoeia, but not pharmaceutical assay (12). WULLING, BACHMAN,
19. PRESCRIPTION INCOMPATIBILITY. Therapeutic, pharmaceutical, and chemical incompatibility is taken up in lecture and recitation work preliminary to Course 21-22. BACHMAN.
- 21-22. PRESCRIPTION DISPENSING. This course runs concurrently and in cooperation with Dispensary Prescription Practice 1, 3, and includes the critical study of the prescription and practical work in dispensing a wide range of prescriptions taken from actual medical practice. WULLING, BACHMAN, BLOSMO, TURNER.
23. MANUFACTURE OF U. S. P. SALTS. The preparation of about forty official salts included in this course. WULLING, BACHMAN, TURNER.

10. NATIONAL FORMULARY. This lecture and laboratory course includes a partial study of the National Formulary and the making of a number of its more important preparations. BACHMAN, TURNER.
12. PHARMACEUTICAL ASSAY. The quantitative determination of alkaloidal and other active constituents of a number of the potent organic drugs and preparations. BACHMAN, TURNER.
14. SYNTHETIC REMEDIES. The study of the pharmaceutical chemistry of synthetic chemicals in medical use. WULLING, .....
16. HOMEOPATHIC PHARMACY. A brief exposition of the principles underlying the preparation of homeopathic remedies, including some laboratory work. WULLING, BACHMAN.
- 25-26. IDENTIFICATION OF U. S. P. SALTS. The study of the physical identity of the more important official inorganic and organic salts. BACHMAN, C. W. WULLING, TURNER.
18. MICROCHEMISTRY. Work in the microchemistry of pharmacy is included in the work of a number of other courses, but will soon be offered as a separate course. WULLING, BACHMAN, NEWCOMB, .....
- 27-28. MATHEMATICS OF PHARMACY. While students are required to have a preparation in arithmetic, algebra, and geometry before entering, they receive frequent drills throughout the year. Students are required to take final examinations in the subject at the end of the first and second year. WULLING, BACHMAN, BLOSMO, .....

### PHARMACEUTICAL JURISPRUDENCE

Professor F. J. WULLING.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
2.	Law for Pharmacists.....	$\frac{3}{4}$	Jr., sr.	None
4.	Minnesota Pharmacy Laws.....	$\frac{3}{4}$	Jr., sr.	None

2. LAW FOR PHARMACISTS. The lectures introduce the subjects of contracts, agency, commercial paper, insurance, etc., in their application to the practice of pharmacy and discuss the liability of retail pharmacists. WULLING.
4. MINNESOTA PHARMACY LAWS. The study of the laws of Minnesota affecting the practice of pharmacy. The lectures are given by special lecturers experienced in the application and operation of the state pharmacy laws.

PHARMACEUTICAL MINERALOGY AND CRYSTALLOGRAPHY

Assistant Professor FRANK F. GROUT, and Assistant.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
24.	Mineralogy .....	1	Sr., grad.	None
66.	Crystallography .....	1	Sr., grad.	24

24. MINERALOGY. A study of the occurrence and properties of minerals of pharmaceutical importance; ores of metals used in pharmacy; non-metallic minerals and mineral waters in their mineralogic and geologic relations. GROUT.

66. CRYSTALLOGRAPHY. A survey of form and more evident physical characters as a basis for practice in sight recognition of economic minerals and their distinction from common rocks. GROUT.

PHARMACOGNOSY

Associate Professor EDWIN L. NEWCOMB and Assistant.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
1.	Medicinal Plant Study.....	4	Soph., jr.	None
3.	The Cryptogams.....		Soph., jr.	1
5-6.	Pharmaco-histology .....	10	Soph., jr.	3, Mat. Med. 4
9.	Drug Collection.....		Jr., sr.	5
11-12.	The Angiosperms.....		Jr., sr.	5
2.	Field Work.....		Jr., sr.	1

1. MEDICINAL PLANT STUDY AND DRUG PREPARATIONS. The principles underlying the preparation of plant drugs, including the study of plants cultivated in the medicinal plant garden, and herbarium work. NEWCOMB and Assistant.

3. THE PHARMACOGNOSY OF THE CRYPTOGAMS. In this course some of the drugs and economic products obtained from the cryptogams are studied. NEWCOMB and Assistant.

5-6. PHARMACO-HISTOLOGY. Includes the micrometry and the detailed study of the inner structure of parts of the higher plants as illustrated by about forty official and unofficial drugs. NEWCOMB and Assistant.

9. DRUG COLLECTION AND PREPARATION. Scientific methods of drug collection and preparation of about fifty drugs from plants grown in the medicinal plant garden. NEWCOMB and Assistant.

11-12. PHARMACOGNOSY OF THE ANGIOSPERMS. This course includes the scientific study both macroscopically and microscopically of the official seeds, roots, rhizomes, barks, woods, pith, flowers, fruits, leaves, herbs, exudations, and other plant products, and animal drugs and animal

fibers. The more important vegetable drugs occurring in the powdered form are examined and studied microscopically. Adulterants of powdered drugs and their detection are given much attention. NEWCOMB and Assistant.

2. **FIELD WORK.** At suitable times the classes are taken on field excursions to search for native medicinal plants. The study of the distinguishing characteristics of certain orders, families, and genera to which the medicinal plants belong is included in this work. NEWCOMB.

### PHYSIOLOGY

Associate Professors RICHARD OLDING BEARD, FREDERICK H. SCOTT; Instructor CHAUNCEY J. V. PETTIBONE.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
1.	Physiology .....	1	Jr., sr.	None
2.	Urinalysis .....	1	Jr., sr.	1
4.	Physiologic Chemistry.....	4	Jr., sr.	1

1. **PHYSIOLOGY.** The work covers the study of the physiological properties of the cell, the nutritive media, the nervous mechanisms in general, muscular tissues, connective tissues, and epithelial tissues. The subjects of anatomy and histology are touched upon sufficiently to lay the foundation for the proper understanding of physiological functions. Special attention is directed to the action of drugs and their effects upon the various systems. BEARD, SCOTT, PETTIBONE.
2. **URINALYSIS, QUALITATIVE AND QUANTITATIVE (Postgraduate).** Lectures, recitations, and laboratory work. The laboratory work includes the qualitative analysis of representative specimens of urine as regards their physical properties, inorganic and organic constituents, as well as the quantitative determination of chlorides, urea, ammonia, total nitrogen, sugar and albumin, together with the preparation of reagents. BEARD, SCOTT.
4. **PHYSIOLOGIC CHEMISTRY (Postgraduate).** Laboratory work and demonstrations. A practical study of the several classes of proteids, carbohydrates, fats, muscle, and bone; of gastric juice, saliva, pancreatic juice, and bile in their respective digestions; of glycogen, and of blood lymph, chyle, and milk. Practical instruction is given in the enumeration of blood cells, in the estimation of haemoglobin and of the corpuscles in mass, in the spectroscopic examination of the blood in the determination of blood tests and in the use of polariscope. BEARD, SCOTT.



## THERAPEUTICS AND TOXICOLOGY

Associate Professor EDGAR D. BROWN.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
2.	Therapeutics and Toxicology....	2	Jr., sr.	Pharmacognosy 11 and 12; Mat. Med. 1

2. THERAPEUTICS AND TOXICOLOGY. In this course drugs are studied in groups as governed by their medical properties and the therapeutic features of such groups are described. Remedial measures other than those depending upon drugs are fully considered. The effects upon the system of poisons and of poisonous doses of drugs also receive consideration. BROWN.

# STUDENTS

1915

## GRADUATE STUDENT—1

Blosmo, Oscar J., Minneapolis

## SENIORS—33

Behrends, William F., Appleton  
Borovsky, Elizabeth, Minneapolis  
\*Danz, Beatrice E. A., Minneapolis  
Dargavel, John W., Morristown  
Donner, John, Monroe, Wis.  
Gilbert, Allan M., Halstad  
Greenberg, Earl N., Minneapolis  
Hammarsten, Ragnar F., Cokato  
Heller, Charles T., Jr., St. Paul  
Howard, Olive D., St. Paul  
Klinker, Warren H., Lake City  
Lafans, Arthur R., Minneapolis  
Larson, Theodore M., Minneapolis  
Lawler, Lawrence, Minneapolis  
Leonard, Otto R., Redwood Falls  
Luedtke, Erich C., Lamberton

Manderfeld, Laura H., St. Paul  
Mlinar, William, Silver Lake  
Moudry, Francis W., Le Sueur Center  
Nelson, Robert N., Eagle Bend  
Niemi, Arthur, Hibbing  
Noreen, Victor, Winthrop  
Nott, Merlyn E., Menomonie, Wis.  
Opseth, George C., Canby  
Peterson, Rudolph, Minneapolis  
Ponthan, Marie W., St. Paul  
Reed, Frank W., Vinton, Iowa  
Sanders, N. Vere, Minneapolis  
Schatz, Emilia A., Montgomery  
Sherk, Waldemar M., Minneapolis  
Steiner, William F., Mankato  
Treacy, Arthur J., St. Paul

Vadheim, Joseph, Tyler

## JUNIORS—67

Anderson, Reuben L., Menomonie, Wis.  
Balzer, Jacob S., Mountain Lake  
Bower, Chauncey C., Wells  
Brooks, Fiske I., Minneapolis  
Bruce, Hallie F. E., Minneapolis  
Cannon, Miles O., Minneapolis  
Casey, Roy E., Biwabik  
Chan, Thomas F., Alexandria  
Clark, Lester J., Weyerhaeuser, Wis.  
Cutting, Charles P., Jr., Sleepy Eye  
Cycmanick, Jerome E., Wayzata  
Dahlin, Ivor, South St. Paul  
DeMars, Frank L., Minneapolis  
Distad, G., Raymond, Perley  
Eckles, George T., St. Charles  
Else, Merle W., Doland, S. D.  
Fournier, Benoit E., Minneapolis  
Frank, Robert Wells, Minneapolis  
Gardner, Frances M., Minneapolis  
Gauthier, Louis A., Virginia  
Gilbertson, Albert, Minneapolis  
Gilmore, Wendell A., Vinton, Iowa  
Goldberg, Isidor, St. Paul  
Gotlieb, David P., St. Paul  
Greenwalt, Frances M., Withrow  
Gronlund, Emergene L., Tyler  
Hermanson, Angeline, Tyler  
Hirscher, Alfred M., Janesville  
Johnson, Esther, Fargo, N. D.  
Johnson, Frank B., Brainerd  
Johnson, Harlan W., Virginia  
Kitterman, Glen R., Luverne  
Koehler, Ernest H., Merrill, Wis.

Kohls, Albert J., New Germany  
Lafans, Ina M., Minneapolis  
Landru, Norwood G., Hendricks  
Larson, Arthur N., Ortonville  
Lehman, Edward G., Fairmont  
Line, J. E. Hjalmar, Gilbert  
Loiselle, Frank P., Deer River  
Ludwig, Ezra L., Minneapolis  
Mahoney, James F., Avoca  
Maixner, Emil, Owatonna  
McGinn, James A., Brainerd  
Mollison, Alan W., Faribault  
Norman, Harold A., Ortonville  
Peterson, Verner C. J., Minneapolis  
Rafferty, Frank L., Wabasha  
Redfield, Frank L., Cloquet  
Reiersen, Emmett M., Lake Benton  
Robinson, Clayton D., Lake Crystal  
Salisbury, David W., Le Sueur  
Schmidt, George J., Lake City  
Schmidt, John C., Lake City  
Scott, Lloyd H., Eden Valley  
Scott, Sam, Minneapolis  
Seaman, Vernon F., Deer River  
Sheady, John F., Minneapolis  
Skartum, Reuben W., Lake Benton  
Smith, Charles J., Bird Island  
Stoppel, Albert W., Rochester  
Strate, Herbert A., St. Paul  
Sugarman, Joseph B., Minneapolis  
Tenhoff, Charles J., Welcome  
Tongen, Chester A., Zumbrota  
Townsend, Royal E., Ivanhoe

Witte, Bernard J., Jr., Anoka

\*Changed to Dental College.

**Bulletin of  
The University of Minnesota**

**THE SCHOOL OF MINES**

1915-1916



VOL. XVIII. NO. 11. JULY 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.

1915							1916													
<b>JULY</b>							<b>JANUARY</b>							<b>JULY</b>						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3	..	..	..	..	..	..	1	..	..	..	..	..	..	1
4	5	6	7	8	9	10	2	3	4	5	6	7	8	2	3	4	5	6	7	8
11	12	13	14	15	16	17	9	10	11	12	13	14	15	9	10	11	12	13	14	15
18	19	20	21	22	23	24	16	17	18	19	20	21	22	16	17	18	19	20	21	22
25	26	27	28	29	30	31	23	24	25	26	27	28	29	23	24	25	26	27	28	29
..	..	..	..	..	..	..	30	31	..	..	..	..	..	30	31	..	..	..	..	..
<b>AUGUST</b>							<b>FEBRUARY</b>							<b>AUGUST</b>						
1	2	3	4	5	6	7	..	..	1	2	3	4	5	..	..	1	2	3	4	5
8	9	10	11	12	13	14	6	7	8	9	10	11	12	6	7	8	9	10	11	12
15	16	17	18	19	20	21	13	14	15	16	17	18	19	13	14	15	16	17	18	19
22	23	24	25	26	27	28	20	21	22	23	24	25	26	20	21	22	23	24	25	26
29	30	31	..	..	..	..	27	28	29	..	..	..	..	27	28	29	30	31	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>SEPTEMBER</b>							<b>MARCH</b>							<b>SEPTEMBER</b>						
..	..	..	1	2	3	4	..	..	..	1	2	3	4	..	..	..	..	..	1	2
5	6	7	8	9	10	11	5	6	7	8	9	10	11	3	4	5	6	7	8	9
12	13	14	15	16	17	18	12	13	14	15	16	17	18	10	11	12	13	14	15	16
19	20	21	22	23	24	25	19	20	21	22	23	24	25	17	18	19	20	21	22	23
26	27	28	29	30	..	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>OCTOBER</b>							<b>APRIL</b>							<b>OCTOBER</b>						
..	..	..	..	..	1	2	..	..	..	..	..	..	1	1	2	3	4	5	6	7
3	4	5	6	7	8	9	2	3	4	5	6	7	8	8	9	10	11	12	13	14
10	11	12	13	14	15	16	9	10	11	12	13	14	15	15	16	17	18	19	20	21
17	18	19	20	21	22	23	16	17	18	19	20	21	22	22	23	24	25	26	27	28
24	25	26	27	28	29	30	23	24	25	26	27	28	29	29	30	31	..	..	..	..
31	..	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>NOVEMBER</b>							<b>MAY</b>							<b>NOVEMBER</b>						
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	..	..	1	2	3	4
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>DECEMBER</b>							<b>JUNE</b>							<b>DECEMBER</b>						
..	..	..	1	2	3	4	..	..	..	..	1	2	3	..	..	..	..	1	2	3
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..

# UNIVERSITY CALENDAR

1915-1916

The university year covers a period of thirty-eight weeks, beginning on the Tuesday before the second Thursday in September. Commencement Day is always the second Thursday in June.

1915

August	31	Tuesday	Registration closes except for new students
September	1-8	Week	Fees payable except for new students
September	7-14	Week	Examinations for the removal of conditions (except Colleges of Agriculture and Forestry), entrance examinations, registration of new students, and payment of fees
September	15	Wednesday	First semester begins
September	27	Monday	Agricultural College, farm experience examination
October	4	Monday	School of Agriculture, first term begins
October	7	Thursday	Senate meeting, 4:00 p.m.
November	8	Monday	Dairy School opens
November	24	Wednesday	Thanksgiving recess begins 9:00 p.m.
November	29	Monday	Thanksgiving recess ends 8:00 a.m.
Nov. 29 to Dec. 4	Week		Second semester condition examinations, Colleges of Agriculture and Forestry
December	2	Thursday	Senate meeting, 4:00 p.m.
December	6-11	Week	Short course for ice-cream makers
December	11	Saturday	Dairy School closes
December	17	Friday	Christmas vacation begins 9:00 p.m.
December	17	Friday	School of Agriculture, first term closes
1916			
January	3-8	Week	Farmers' Short Course
January	4	Tuesday	Christmas vacation ends 8:00 a.m.
January	18	Tuesday	Registration for second semester closes
January	21	Friday	School of Agriculture, second term begins
January	24	Monday	Final examinations begin
January	25	Tuesday	Payment of fees for second semester closes
February	2	Wednesday	Second semester begins
February	3	Thursday	Senate meeting, 4:00 p.m.
February	12	Saturday	Lincoln's Birthday: a holiday
February	22	Tuesday	Washington's Birthday: a holiday
March	30	Wednesday	School of Agriculture closes

## SCHOOL OF MINES

April	3-8	Week	Junior Short Course
April	19	Wednesday	Easter recess begins 9:00 p.m.
April	27	Thursday	Easter recess ends 8:00 a.m.
May	1-6	Week	Condition examinations in certain colleges
May	2	Tuesday	Traction Engineering Course begins
May	4	Thursday	Senate meeting, 4:00 p.m.
May	26	Friday	Final examinations begin
May	30	Tuesday	Memorial Day: a holiday
June	1-8	Week	Military Encampment, Fort Snelling
June	3	Saturday	Second semester closes
June	4	Sunday	Baccalaureate service
June	5	Monday	Senior class day exercises
June	7	Wednesday	Alumni Day
June	8	Thursday	Forty-fourth Annual Commencement
June	9	Friday	Summer vacation begins
June	12	Monday	Summer Session begins

The university year for 1916-17 will begin Tuesday, September 12.

*Program of Supplementary Examinations*

Tuesday,	Sept. 7	9-12 a.m.	Mechanics and Mathematics
		2-5 p.m.	Mining Engineering Subjects
Wednesday,	Sept. 8	9-12 a.m.	Chemistry
		2-5 p.m.	Drawing and Descriptive Geometry
		2-5 p.m.	Mechanical Engineering Subjects
Thursday,	Sept. 9	9-12 a.m.	Metallurgical Subjects
		2-5 p.m.	Physics
Friday,	Sept. 10	9-12 a.m.	Electrical Engineering Subjects
		2-5 p.m.	Geology and Mineralogy

# THE SCHOOL OF MINES

## FACULTY

- GEORGE EDGAR VINCENT, Ph.D., LL.D., President 1005 5th St. S. E.  
CYRUS NORTHROP, LL.D., President Emeritus 519 10th Ave. S. E.  
WILLIAM R. APPLEBY, M.A., Dean and Professor of Metallurgy 928 5th St. S. E.  
\*CHARLES E. VAN BARNEVELD, B.A.Sc., E.M., Professor of Mining Engineering  
OSCAR C. BURKHARD, M.A., Assistant Professor of German 719 E. River Road  
PETER CHRISTIANSON, B.S., E.M., Professor of Metallurgy 217 Union St. S. E.  
ELTING H. COMSTOCK, M.S., Professor of Mine Plant and Mechanics 1416 7th St. S. E.  
WILLIAM H. EMMONS, Ph.D., Professor of Mineralogy and Geology 611 11th Ave. S. E.  
HENRY A. ERIKSON, Ph.D., Professor of Physics 424 Harvard St. S. E.  
JOHN J. FLATHER, Ph.B., M.M.E., Professor of Mechanical Engineering 315 11th Ave. S. E.  
GEORGE B. FRANKFORTER, Ph.D., Professor of Chemistry 525 E. River Road  
FRANCIS C. FRARY, Ph.D., Assistant Professor of Chemistry 305 Walnut St. S. E.  
JULES T. FRELIN, B.A., Assistant Professor of Romance Languages 1206 5th St. S. E.  
FRANK F. GROUT, M.S., Assistant Professor of Geology and Mineralogy 617 4th St. S. E.  
SAMUEL L. HOYT, E.M., Ph.D., Assistant Professor of Metallography 1011 14th Ave. S. E.  
WILLIAM H. KAVANAUGH, M.E., Professor of Experimental Engineering 124 State S. E.  
WILLIAM H. KIRCHNER, B.S., Professor of Drawing and Descriptive Geometry 722 10th Ave. S. E.  
EDWIN M. LAMBERT, M.E., Assistant Professor of Mine Plant and Mechanics 1086 12th Ave. S. E.  
EDWARD P. McCARTY, E.M., Professor of Mining 3615 Lyndale Ave. S.  
FRANKLIN R. McMILLAN, C.E., Assistant Professor of Structural Engineering 524 8th Ave. S. E.  
EVERETT W. OLMSTED, Ph.D., Professor of Romance Languages 901 5th St. S. E.  
LEVI B. PEASE, M.S., Professor of Metallurgy 1070 16th Ave. S. E.  
WILLIAM T. RYAN, E.E., Assistant Professor of Electrical Engineering 3228 4th St. S. E.

\*On leave of absence 1913-16.

- CARL SCHLENKER, B.A., Professor of German 514 11th Ave. S. E.  
 GEORGE D. SHEPARDSON, M.A., M.E., D.Sc., Professor of Electrical Engineering 717 E. River Road  
 S. CARL SHIPLEY, B.S., M.E., Assistant Professor of Machine Construction 1517 E. River Road  
 CHARLES F. SHOOP, B.S., Assistant Professor of Experimental Engineering 811 Fulton St. S. E.  
 CHARLES F. SIDENER, B.S., Professor of Chemistry 1320 5th St. S. E.  
 GEORGE J. YOUNG, B.S., Professor of Mining Engineering 719 7th St. S. E.  
 ANTHONY ZELENY, Ph.D., Professor of Physics 613 Fulton St. S. E.  
 EDWARD W. DAVIS, B.S., Instructor in Mechanics and Mathematics 979 14th Ave. S. E.  
 ROBERT W. FRENCH, B.S., Instructor in Drawing 1018 16th Ave. S. E.  
 J. THEODORE GEISSENDOERFER, Ph.D., Instructor in German 967 14th Ave. S. E.  
 A. WALFRED JOHNSTON, M.A., Instructor in Geology 112 Church St. S. E.  
 PAUL E. KLOPSTEG, M.A., Instructor in Physics 328 Oak St. S. E.  
 ERVIN W. McCULLOUGH, E.M., Instructor in Mining 934 E. Bayliss Ave., St. Paul  
 JOHN J. MURPHY, C.E., Instructor in Mining 619 University Ave. S. E.  
 EDMUND NEWTON, E.M., Instructor in Metallurgy 941 14th Ave. S. E.  
 PETER E. PETERSON, Instructor in Foundry Practice 3709 Clinton Ave.  
 EARL PETTIJOHN, M.S., Instructor in Chemistry 2282 Carter Ave., St. Paul  
 EDWARD P. QUIGLEY, Instructor in Forge Work 2923 Chicago Ave.  
 WILLIAM H. RICHARDS, Instructor in Carpentry 1423 W. 27th St.  
 FRANK B. ROWLEY, B.S., M.E., Instructor in Drawing 217 Beacon St. S. E.  
 EDGAR K. SOPER, B.A., Instructor in Economic Geology 112 Church St. S. E.  
 WOLDEMAR M. STERNBERG, B.S.Chem., Instructor in Chemistry 3345 University Ave. S. E.  
 HERBERT K. STONE, M.A., Instructor in French 112 Church St. S. E.  
 STERLING TEMPLE, M.A., Instructor in Chemistry 1758 Blair St., St. Paul  
 RICHARD WISCHKAEMPER, M.A., Instructor in German 979 14th Ave. S. E.  
 HOMER A. DESMARAIS, B.A., Assistant in French 438 4th St. N. E.



## GENERAL INFORMATION

The School of Mines was established by the Board of Regents in 1888, upon recommendation of the General Faculty of the University. The buildings and laboratories of the School are located on the main campus of the University. The mining districts of Minnesota are within a few hours, by rail, from Minneapolis. The heartiest cooperation exists between the various mine managements and the School, so that the mining properties are at all times open to parties from the school for observation and study trips. Practical surveying, geological field work, and underground work are carried on in one or more of the districts. Students in the School of Mines have, therefore, all the advantages afforded by a large university combined with ample opportunity for field observation and experience.

At the opening of the college year 1915-1916, the School of Mines will occupy the new building provided by the Legislature of 1913. In the basement are the assay and electro-metallurgical laboratories, together with machinery room, instrument room, balance room, furnace rooms, and necessary storerooms. On the first floor are the administrative offices, offices and lecture rooms of the departments of Metallurgy and Mine Plant and Mechanics. On the second floor are the offices, lecture rooms and drafting rooms of the department of Mining, the ore dressing laboratory, and the library of the school. On the third floor are the offices, laboratories, and lecture rooms of the department of Metallography, junior drafting room, photographic dark rooms, blue printing room, and offices and computing rooms for the branch of the Experiment Station serving the Tax Commission.

## DEGREES

In the School of Mines there are three regular courses of study, viz., Mining Engineering, Mining Engineering specializing in Geology, and Metallurgy, leading to the degree of Engineer of Mines (E.M.), Engineer of Mines in Geology [E.M. (Geology)], and Metallurgical Engineer (Met.E.) respectively.

The degree of Metallurgical Engineer may be conferred upon a candidate who received the degree of Engineer of Mines in four or five years, and vice versa, provided such candidate completes an additional year's work at the School and presents a suitable thesis:

Students in the College of Science, Literature, and the Arts, in the College of Engineering and the Mechanic Arts, and in the School of Analytical and Applied Chemistry, who contemplate taking a degree in this School after completing their course, are recommended to select their electives with reference to as full a preparation as possible for the technical work of the course they propose to enter.

## CLASSIFICATION OF SUBJECTS

The work falls under the following subdivisions, supplemented by thoro courses in mechanics, mathematics, surveying, physics, chemistry, and the necessary theory and practice of structural, mechanical and electrical engineering.

(a) *Geology*—to determine the location of the ore. (b) *Mineralogy*—to determine its nature. (c) *Assaying*—to determine if it has value for treatment. (d) *Mining Engineering*—to furnish material for treatment. (e) *Ore Testing*—to determine best methods of treatment. (f) *Ore Dressing*—furnishing products for metallurgical treatment. (g) *Metallurgy*—smelting and refining ores and ore dressing products; reduction to metals.

## EXPERIMENT STATION

The School of Mines Experiment Station has been recently established to promote the development of the mining and mineral resources of the state, to assay specimens of ores, rocks, clays, and minerals; to make such assays free of charge for private parties subject to such regulations as the Board of Regents may deem necessary; to make mining and metallurgical experiments in the treatment of such substances and in the utilization of mining and metallurgical by-products; to investigate methods of mining and the use of explosives; to undertake such other mining and metallurgical problems as may seem desirable; to make all ore estimates for the Tax Commission and to do such other work along the lines above outlined as may be requested by other state departments. Coöperation has been effected with the Minnesota Geological Survey and the School of Chemistry.

The Experiment Station is prepared to assist citizens interested in these lines of work; to assay specimens of ore, rocks, clays, and minerals found within the state free of charge.

In submitting samples the sender must state the exact location where each sample was found, giving all possible additional information. This information, together with results of any test or analysis, will be on file and available to the public at the office of the Station. Citizens desiring free assay privileges must agree to give accredited representatives of the School of Mines Experiment Station and of the Geological Survey access to the property should they desire to visit the same for purposes of examination and geological study.

Correspondence will receive prompt attention, but consultations generally prove more satisfactory.

Each sample should be numbered for identification and bear the name and address of the sender. All shipments must be delivered to the Minnesota School of Mines, charges prepaid. Shipping tags will be furnished upon request.

Address all communications to William R. Appleby, Director, Minnesota School of Mines Experiment Station, The University of Minnesota, Minneapolis, Minnesota.

## LIBRARY

The library occupies a well-lighted room, 55 feet by 61 feet, on the second floor of the School of Mines building. The books have been carefully selected and form a working collection of great value, not only to the faculty and students, but also the mining men of the state. Only books relating to mining, metallurgy, metallography, geology and allied subjects are shelved in this library, the general university library as well as the public libraries of Minneapolis and St. Paul serving as reserve collections. The library is especially rich in complete sets of periodicals, transactions, and the reports of state and foreign mining departments. Foreign technical literature is well represented. A card index is kept of all articles of value and interest appearing in the leading periodicals.

## ADMISSION

The courses leading to the degrees of Engineer of Mines, Engineer of Mines (in Geology) and Metallurgical Engineer may be completed in either four or five years. Students may enter the School of Mines without preparation in Higher Algebra and Solid Geometry. Such students must enter the five-year courses. It is recommended that students who come poorly prepared in Mathematics enter the five-year courses.

Students may be admitted to the School of Mines either by certificate or examination, or both.

## ADMISSION BY EXAMINATION

Entrance examinations are offered at the University during the opening week, September 7 to 10. Candidates entering by this method must pass examinations in fifteen units so chosen as to satisfy the requirements outlined below. Certificates from the College Entrance Examination Board and from the High School Board are accepted in lieu of examinations in the subjects they represent. Those desiring to take examinations should notify the Registrar of the University in writing not later than August 31. See schedule of examinations, page 4.

## ADMISSION BY CERTIFICATE

Graduates of the following courses, provided their preparation satisfies the requirements outlined below, may be admitted.

1. Any four-year course of a Minnesota state high school or other accredited school in the state.
2. A four-year course of schools in any other state accredited to the state university of that state.
3. The Advanced Latin and Advanced English courses of the Minnesota state normal schools.

The applicant for admission should request the principal or superintendent to forward to the Registrar of the University a complete transcript of his high-school or preparatory-school record showing the num-

ber of weeks and hours per week spent upon each study, with the grades entered as *passed*, *passed with credit*, or *passed with honor*. Credential blanks prepared by the University must be used; these blanks may be secured upon application to the Registrar. Upon receipt of the credentials at the University the Registrar will notify the applicant with regard to his admission.

## ENTRANCE REQUIREMENTS

### FIVE-YEAR COURSES

English, three units; Elementary Algebra and Plane Geometry, one unit each; ten additional units, of which not more than four may be in Group F.

### FOUR-YEAR COURSES

Same as five-year courses with the addition of one-half unit each of Higher Algebra and Solid Geometry. It is recommended that students who enter these courses review Higher Algebra and Solid Geometry. Those unable to carry freshman mathematics satisfactorily will be required to drop back into the five-year course.

### LIST OF ENTRANCE SUBJECTS

The term *unit* means not less than five recitations of forty minutes each per week for a period of thirty-six weeks. In manual subjects and kindred courses, it means the equivalent of ten recitation periods per week for thirty-six weeks.

GROUP A. ENGLISH, three units.

GROUP B. LANGUAGES: Latin, Greek, German, French, Spanish, Scandinavian, one to four units each.

GROUP C. HISTORY AND SOCIAL SCIENCES: Ancient and Modern History, one unit each; English and Senior American History, one-half unit each; American Government, Economics, Economic History of England, and Economic History of the United States, one-half unit each; Commercial Geography, and History of Commerce, one-half or one unit each.

GROUP D. MATHEMATICS. Elementary Algebra and Plane Geometry, one unit each; Higher Algebra, Solid Geometry, and Trigonometry, one-half unit each.

GROUP E. NATURAL SCIENCES. Physics and Chemistry, one unit each; Botany and Zoology, one-half or one unit each; Physiology, Astronomy, Geology, and Physiography, one-half unit each.

GROUP F. VOCATIONAL SUBJECTS: Business Law and Business Arithmetic, one-half unit each; Elementary and Advanced Bookkeeping, one unit each; Stenography and Typewriting, one or two units. Freehand Drawing, Mechanical Drawing, and Shopwork, one or two units each. Agriculture, one to four units. Normal Training subjects, one to three units, provided the applicant has had one year of subsequent teaching experience.

DESCRIPTION OF SUBJECTS ACCEPTED FOR ADMISSION

A description of the subjects accepted for admission to the University will be found in the Bulletin of General Information, which will be sent to any address upon application to the Registrar, The University of Minnesota, Minneapolis, Minnesota.

UNCLASSED STUDENTS

No unclassified students will be admitted to the School of Mines.

ADMISSION TO ADVANCED STANDING

This University accepts records from all reputable colleges and universities for credit to advanced standing. Such records are accepted as far as they are equivalent to the work done in this institution. In bringing records from other institutions, the certificate must be upon the official blank of the institution granting the certificate and should show:

- (a) The subject studied; if a language, the books, read, etc.
- (b) The number of weeks and hours per week spent upon each subject.
- (c) Ground covered in laboratory work in case of laboratory subjects.
- (d) The result. The exact grades should be stated, accompanied by an explanation of the marking system employed.

Students who desire to obtain advanced standing must present their applications and certificates to the departments concerned, obtain a written statement from the department, showing the exact credit allowed, and present this to the Enrollment Committee of the School of Mines.

EXPENSES

One half of the Annual Incidental Fee of \$55.00, which includes all laboratory charges, is payable at the opening of each semester. Cards entitling the student to admission to classes will not be issued until the fees have been paid. Books and supplies for each year of the course cost approximately \$25.00. Field-work expense during the sophomore year is estimated at \$150.00 and for the junior year at \$225.00.

DEPOSIT FEE

At the beginning of each year, in addition to the first semester incidental fee, a deposit fee of five dollars is required of every student to cover the following items:

- Change of Registration..... \$2.50
- Examination for removal of condition at set time.... \$1.00 per subject
- Rental of post-office box, University post-office (required  
of all) ..... .50 per year
- Locker rental, locker key deposit..... \$.50 to \$1.00 per year
- Laboratory breakages, or damage to University property.
- Penalties for late registration or late payment of fees.

A penalty fee of one dollar (\$1.00) must be paid by all students who register or pay fees after the prescribed time. (See calendar,

page 3.) After the day previous to that on which classes begin, the penalty for delay increases at the rate of twenty-five cents a day.

The unused balance of the deposit fee will be returned at the end of each year. If, at any time during the college year, the amount of charges against a student exceed the amount of the deposit, a second fee of five dollars (\$5.00) will be required.

#### SPECIAL FEES

The following special items may be included in the expenses of a student:

Minnesota Union membership.....	\$1.00 per semester
Special examination for removal of condition, at other than the set time .....	5.00
Examination on subject taken out of class.....	5.00
No fee for such examinations on first entering the University, if taken within the first six weeks.	
Military uniform .....	15.00
Gymnasium suit .....	5.00

#### THE ELLIOT SCHOLARSHIP LOAN FUND

To fulfill the wish of the late Dr. A. F. Elliot to aid young men who find their efforts to obtain a practical education embarrassed through lack of means, the sum of \$5,000 was placed in the hands of the Board of Regents as a scholarship fund. The income from this fund is loaned students in the School of Mines on the following conditions: the financial needs of the applicant, his scholarship, moral character, enthusiasm shown in his work, and promise of usefulness in his profession. When money is available, it may be loaned to pay the expenses of worthy students during sickness. The loans are to be repaid, without interest, at the earliest convenience of the recipients.

#### GRADUATION

Students completing courses of study to the satisfaction of the Faculty are entitled to receive the appropriate degrees. Any person may undergo, at suitable times, examinations in any subject. If such person pass in all the studies and exercises of a course, he is entitled to the appropriate degree, provided that at least one full year be spent at the University before such degree shall be granted, and provided the examination in every case be held before a committee of the Faculty appointed for that purpose.

Seniors must be in regular attendance at all classes until after the final examinations held at the end of the second semester. Irregular attendance will debar a student from entering all final examinations.

#### THESIS

The thesis work is intended to bring in review and connect the work in Mining and Metallurgy, Geology and Mineralogy, Mechanical and Electrical Engineering, Mathematics and Mechanics.

It has been found that this purpose is most satisfactorily accomplished by assigning to each student a project, embracing the prospecting, development, and equipment of a group of mining claims, for candidates for the degree of Engineer of Mines; the investigation of a problem in mining geology, for candidates for the degree of Engineer of Mines (in Geology); and the investigation of a metallurgical problem, for candidates for the degree of Metallurgical Engineer.

As much latitude as possible will be allowed the student in the choice of type of deposit and location. He must select a suitable project during the summer preceding the senior year. Outlines are furnished setting forth the lines of investigation necessary to obtain the required data. The junior field work affords ample opportunity therefor.

Prior to the reopening of Field Work at the School of Mines, Tuesday, September 7, 1915, each student is required to submit to the department concerned an outline embodying the principal features of the project, together with a topographic map and a sufficient number of photographs to represent clearly the locality. Unless this outline is submitted when due and is accepted by the department, final registration for the first semester, senior year, will not be permitted.

Students may, if they so desire, take a reasonable number of samples on which to make assays and hand laboratory tests during the ore-testing laboratory work given in the first semester, senior year.

All preliminary work must be done and final work on the project must be under way by December 1. On April 7 the text of the thesis must be completed and submitted for final approval. Completed work (type-written and bound) together with all tracings and one set of clear blue prints therefrom must be in and accepted not later than April 30. Theses will not be accepted or examined after these dates. Unless the above conditions are complied with no student can expect to graduate with his class.

These theses shall become the property of the School.

#### SPECIAL NOTES

Students failing to receive a semester mark of 75 per cent in any subject shall have the privilege of a supplementary examination before the opening of the following year.

Each student must obtain from the Registrar his average in all subjects and present himself for supplementary examinations, according to the program given on page 4.

Failure of the Registrar to notify a student of deficiencies will not be accepted as a reason for neglecting to report for necessary supplementary examinations. Students failing to report for supplementary examinations will be compelled to take work over in class as in case of failures.

Students failing to pass supplementary examinations will become members of the succeeding class and must register for those subjects in which they have failed. They may take in addition other subjects not more than one year in advance of their class, with the exception of mining

and metallurgical courses, based upon requirements of the various courses and daily program. They may also take certain electives in other colleges provided suitable arrangements can be made.

Students failing to receive a semester mark of 50 per cent in any subject shall not be allowed to pursue any dependent subject.

The Faculty may exclude students from attending classes in any subject upon recommendation of the department concerned.

All students must report in time to make suitable arrangements with departments concerned in case of conflicts in program.

Students failing to present themselves for final examination at the end of the first or second semester will be given zero on the examinations.

Students whose absences in either semester exceed four weeks in the aggregate are not permitted to take examinations without special permission of the Faculty.

All subjects elected in other colleges become part of the School of Mines curriculum. All students are required to receive credits in these subjects before graduation.

During the academic year students will be held responsible for the receipt of official communications sent to them through the University post-office. During the summer vacation they will be held responsible for the receipt of such communications sent to their home address as given on their registration blank for the preceeding academic year, unless formal notification of their correct address is filed with the Registrar and the Dean.



## COURSES OF STUDY

### UNIFORM CURRICULUM TO END OF SOPHOMORE YEAR

The courses leading to the degrees of Engineer of Mines, Engineer of Mines in Geology, and Metallurgical Engineer, are uniform for the first three years of the five-year courses and for the first two years of the four-year courses.

### FIVE--YEAR COURSES

#### FIRST YEAR

##### *First Semester*

Chemistry 5\*, General and Analytical, 5†  
Mathematics 1, Computation and Mensuration, 4  
Mathematics 3, Mine Accounting, 6  
Mechanical Engineering 1, Shop Work, 6  
Mineralogy 23, Elements of Mineralogy, 8  
Military Drill

##### *Second Semester*

Chemistry 6, General and Analytical, 7, Chem. 5  
Mathematics 2, Algebra, 4  
Mechanical Engineering 1, Shop Work, 6  
Metallurgy 2, Assaying, 12, Chem. 5, Mineral. 23  
Mineralogy 24, Descriptive Mineralogy, 4, Mineral. 23  
Military Drill

#### FRESHMAN YEAR

##### *First Semester*

Chemistry 11, Quantitative Analysis, 7, Chem. 5, 6  
Drawing 11, Engineering Drawing, 10  
Geology 105, Elements of Rock Study, 4, Mineral. 24  
Mathematics 5, Algebra and Trigonometry, 6, Math. 1, 2  
Metallurgy 3, General and Iron, 3, Chem. 6, Met. 2  
Military Drill

\*Odd numbers indicate first-semester courses; even numbers, second-semester courses. A combination of the two (e. g., 5-6) indicates courses continuing through the year. In the case of courses repeated the second semester, the suffix *a* indicates first semester; the suffix *b*, second semester.

†Figure following the descriptive name of a course indicates number of hours a week. Course names following indicate prerequisite courses.

*Second Semester*

Chemistry 12, Quantitative Analysis, 7, Chem. 11  
 Drawing 12, Engineering Drawing, 8, Draw. 11  
 Mathematics 6, Trigonometry and Analytical Geometry, 6, Math. 5  
 Geology 1b, General Geology, 3, Mineral, 24  
 Geology 106, Petrology, 4, Geol. 105  
 Metallurgy 4, Wrought Iron and Steel, 3, Met. 3  
 Military Drill

## SOPHOMORE YEAR

*First Semester*

Drawing 13, Descriptive Geometry, 2, Draw. 12, Math. 6  
 Mathematics 7, Calculus, 5, Math. 6  
 Geology 73, Historical and Economic Geology, 3, Geol. 106  
 Metallurgy 105, Base Metals, 4, Met. 4  
 Mining 1, Mine Surveying, 3, Math. 6  
 Physics 1, General, 3, Math. 6  
 Physics 3, General Laboratory Practice, 2, with Physics 1

*Second Semester*

Drawing 14, Drafting, 4, Draw. 13  
 Mathematics 8, Calculus, 3, Math. 7  
 Metallurgy 106, Precious Metals, 4, Met. 105  
 Mining 2, Mine Surveying, 3, Min. 1  
 Mining, 6, 1  
 Physics 2, General, 3, Physics 1  
 Physics 4, General Laboratory Practice, 2, with Physics 2  
 Field Work. Months of May, June, July and August  
     Mining 2f, Surveying, Min. 2, beginning about May 1  
     Geology 1f, Geol. 1b, 105, beginning about June 15  
     Underground Mining Work, beginning about July 1

## FOUR-YEAR COURSES

## FRESHMAN YEAR

*First Semester*

Chemistry, 5 General and Analytical, 5  
 Drawing 11, Engineering Drawing, 10  
 Mathematics 5, Algebra and Trigonometry, 6  
 Mineralogy 23, Elements of Mineralogy, 8  
 Military Drill

*Second Semester*

Chemistry 6, General and Analytical, 7, Chem. 5  
 Drawing 12, Engineering Drawing, 8, Draw. 11  
 Mathematics 6, Trigonometry and Analytical Geometry, 6, Math. 5

Metallurgy 2, Assaying, 12, Chem. 5, Mineral. 23  
 Mineralogy 24, Descriptive Mineralogy, 4, Mineral. 23  
 Military Drill

## SOPHOMORE YEAR

*First Semester*

Chemistry 11, Quantitative Analysis, 7, Chem. 5, 6  
 Drawing 13, Descriptive Geometry, 2, Draw. 12, Math. 6  
 Geology 105, Elements of Rock Study, 4, Mineral. 24  
 Mathematics 7, Calculus, 5, Math. 6  
 Metallurgy 3, General and Iron, 3, Chem. 6, Met. 2  
 Mining 1, Mine Surveying, 3, Math. 6  
 Physics 1, General, 3, Math. 6  
 Physics 3, General Laboratory Practice, 2, with Physics 1  
 Military Drill

*Second Semester*

Chemistry 12, Quantitative Analysis, 7, Chem. 101  
 Drawing 14, Drafting, 4, Draw. 13  
 Geology 1b, General Geology, 3, Mineral. 24  
 Geology 106, Elements of Rock Study, 4, Mineral. 24  
 Mathematics 8, Calculus, 3, Math. 7  
 Metallurgy 4, Wrought Iron and Steel, 3, Met. 3  
 Mining 2, Mine Surveying, 3, Min. 1  
 Mining 6, 1  
 Physics 2, General, 3, Physics 1  
 Physics 4, General Laboratory Practice, 2, with Physics 2  
 Military Drill  
 Field Work. Months of May, June, July, and August  
 Mining 2f, Surveying, Min. 2, beginning about May 1  
 Geology 1f, Geo. 1b, 105, beginning about June 15  
 Underground Mining Work, beginning about July 1

## COURSES IN MINING ENGINEERING

### COURSES LEADING TO THE DEGREE OF E.M.

#### FIVE-YEAR COURSES

##### JUNIOR YEAR

###### *First Semester*

Chemistry 25, Ore and Slag Analysis, 7, Chem. 12  
Experimental Engineering 21, Steam Laboratory, 4, with Mech. 11  
Geology 111, Ore Deposits, 4, Geol. 106  
Mechanics 9, 5, Math. 8  
Mechanics 11, Mine Plant, 3, Math. 8  
Mining 7, Ore Dressing, 5, Geol. 106  
Mining 9, 5, Min. 6

###### *Second Semester*

Experimental Engineering 22, Strength of Materials, 4, with Mech. 10  
Geology 112, Problems in Ore Deposits, 4 Geol. 111  
Mechanics 10, 6, Mech. 9  
Mechanics 12, Mine Plant, 6, Mech. 11  
Mining 10, 5, Min. 9  
Mining 4, Mine Mapping, 6, Min. 2f  
Field Work. Months of May, June, July, and August  
    Metallurgy 6f, beginning about May 1  
    Mining 10f, beginning about May 15  
    Underground Mining Work, beginning about June 1

##### SENIOR YEAR

###### *First Semester*

Electrical Engineering 53, Electric Power, 5, Physics, 3, 4  
Mechanics 13, Water Power, 5, Mech. 10  
Mechanics 15, Engineering Construction, 5, Mech. 10  
Metallurgy 7, Ore Testing, 10, Met. 106, Min. 8.  
Mining 11, 5, Min. 10  
Mining 13, Thesis, 2, Min. 10f

###### *Second Semester*

Experimental Engineering 24, Experimental Laboratory, 4, Exp. Eng. 21  
Mechanics 16, Mine Plant Design, 10, Mech. 15  
Metallurgy 12, Special Problems, 4, Met. 7  
Mining 12, 5, Min. 11  
Mining 14, Thesis 12, Min. 13

## FOUR-YEAR COURSES

## JUNIOR YEAR

*First Semester*

Experimental Engineering 21, Steam Laboratory, 4, with Mech. 11  
 Geology 73, Historical and Economic Geology, 3, Geol. 106, 1b  
 Mechanics 9, 5, Math. 8  
 Mechanics 11, Mine Plant, 3, Math. 8  
 Metallurgy 105, Base Metals, 4, Met. 4  
 Mining 7, Ore Dressing, 5, Geol. 106  
 Mining 9, 5, Min. 6

*Second Semester*

Experimental Engineering 22, Strength of Materials, 4, with Mech. 10  
 Mechanics 10, 6, Mech. 9  
 Mechanics 12, Mine Plant, 6, Mech. 11  
 Metallurgy 106, Precious Metals, 4, Met. 105  
 Mining 10, 5, Min. 9  
 Mining 4, Mine Mapping, 6, Min. 2f  
 Field Work. Months of May, June, July, and August  
     Metallurgy 6f, beginning about May 1  
     Mining 10f, beginning about May 15  
     Underground Mining Work, beginning about June 1

## SENIOR YEAR

*First Semester*

Chemistry 25, Ore and Slag Analysis, 7, Chem. 12  
 Electrical Engineering 53, Electric Power, 5, Physics 3, 4  
 Geology 111, Ore Deposits, 4, Geol. 106  
 Mechanics 13, Water Power, 5, Mech. 10  
 Mechanics 15, Engineering Construction, 5, Mech. 10  
 Metallurgy 7, Ore Testing, 10, Met. 106, Min. 8  
 Mining 11, 5, Min. 10  
 Mining 13, Thesis, 2, Min. 10f

*Second Semester*

Experimental Engineering 24, Experimental Laboratory, 4, Exp. Eng. 21  
 Geology 112, Problems in Ore Deposits, 4, Geol. 111  
 Metallurgy 12, Special Problems, 4, Met. 7  
 Mechanics 16, Mine Plant Design, 10, Mech. 15  
 Mining 12, 5, Min. 11  
 Mining 14, Thesis, 12, Min. 13

## COURSES LEADING TO THE DEGREE OF E.M. (GEOLOGY)

## JUNIOR YEAR

*First Semester*

Geology 73, Historical & Economic Geology 3, 106, 1b

Geology 57, Paleontology 3, 1b

German 15 or 17, 3, German 16 for 17

or

French 1 or 3, 3, French 2 for 3

Metallurgy 155, Metallography 4

Mining 9, 5, Min. 6

Elective 6 to 10

*Second Semester*

Geology 124, Structural and Metamorphic Geology 3, 73

Geology 58, Paleontology 3, 57

German 16 or 18, 3 German 15 or 17

or

French 2 or 4, 3, French 1 or 3

Metallurgy 156, Metallography 4, 155

Mining 10, 5, Min. 9

Mining 4, Mine Mapping 6, Min. 2f

Elective 3

Field work to be arranged

## SENIOR YEAR

*First Semester*

Geology 111, Ore Deposits 4, 73

Geology 151, Advanced General Geology, 3

Geology 113, Laboratory course in Economic Geology, 4, with 111

German 17 or 23, 3, German 16 or 18

or

French 3 or 5, 3, French 2 or 4

Mining 11, 5, Min. 10

Thesis, 2

Elective 3

*Second Semester*

Geology 112, Problems in Ore Deposits 4, Geol. 111

Geology 152, Advanced General Geology, 3

Geology 144, Construction and Interpretation of Geologic Maps, 3, Geol.

111

Geology 138, Testing of Economic Minerals, 3

German 18 or 24, 3, German 17 or 23

or

French 4 or 6, 3, French 3 or 5

Mining 12, 5, Min. 11

Thesis, 4

## DEPARTMENT OF MINING ENGINEERING

Mining Engineering extends through the sophomore, junior, and senior years. The subjects given, together with the sequence necessary, are treated in the accompanying outline of the course.

In the senior year, problems in hoisting, hauling, pumping, ventilation, and similar subjects become an important part of the work.

## MINE SURVEYING

The work in surveying is given in the sophomore year and is designed solely for mining engineers. The work begins with the elements of plane surveying, with special reference to the computations necessary, followed by the higher theoretical work in plane surveying and its application to the problems met in underground surveying. Beginning with the first Monday in May, the class devotes seven weeks to field work at some convenient point on the Mesabi or Vermilion Range. The exact location will be announced in March of each year.

The students will be divided into squads of two to four. Each squad must provide itself with a 6-foot steel tape graduated to hundredths. The duration of the course will be seven weeks (5½ days of 8 hours each constitute a week). Each student will be required to complete satisfactorily the following exercises and surveys:

1. Chaining and taping
2. Compass work
3. Adjustment and use of wye and dumpy levels
4. Adjustment of mining transit
5. Reading angles
6. Traverse with transit and steel tape
7. Azimuth traverse with stadia.
8. Determination of meridian, latitude, and time by solar and stellar observations
9. Survey of mining claim according to the regulations of the U. S. Government
10. Measurement of earthwork.
11. Laying out railroad tangents, curves, and crossings
12. Exercises in plane table work and geological surveying
13. The survey of a mine

A full equipment of surveying instruments of the latest and best makes is furnished to each squad for this work.

This is followed by a course in Mine Mapping during the second semester of junior year.

Students who furnish satisfactory evidence of proficiency in this work may be given credit therefor. The department, however, reserves the right in any case to require such students to take a theoretical or a practical examination or both.

## FIELD WORK IN MINING

*Sophomore Year*

After the close of the field work in Geology (last two weeks in June), members of the sophomore class are required to engage for six weeks in underground mining work on the Minnesota or Michigan iron ranges, for which they may receive wages.

*Junior Year*

Upon termination of the junior field work in Metallurgy (about May 15), the members of the junior class, who are candidates for the degree of Engineer of Mines, are required to devote two weeks to the study of mine plant and mine operation under the direction of the department. This work will be given in one of the leading western metal mining districts, exact location to be announced in April of each year. Thereafter, during the months of June, July, and August, the student is required to spend at least six weeks in actual underground mining work in the West, for which he may receive wages. The department will render all possible assistance in locating students in the camps of their choice. Each student must keep a diary and record therein, in minute detail, all observations and sketches. He must in person submit this diary to the department on the date of the reopening of field work. In judging the character of the student's field work, equal importance will be attached to the completed report and to the original field notes. The department reserves the right to reject note-books considered below the standard that should be demanded of candidates for senior work.

Field work will reopen at the School of Mines, Tuesday, September 7, 1915. No senior will be registered after that date. Registration will cover Field Work, Electric Power, and Geology.

The final reports covering Field Work in Mining and Metallurgy must be prepared at the School of Mines under the direct supervision of the departments concerned. The program covering this work is as follows: Metallurgy, September 7-14, inclusive; Mining, September 15-27.

On September 27 all seniors who expect to graduate must register for the remaining subjects. Prior to this date the student must submit a typewritten report on field work fully illustrated with sketches drawn to scale covering all the metallurgical and milling operations, together with details of plant and equipment. Final registration will not be allowed until after final report on field work is made. All final reports, therefore, must be presented on or before September 27. These reports shall become the property of the School.

The completion of sophomore and junior field work is a requisite for graduation, and satisfactory evidence thereof must be submitted to the department. Should a student, for sufficient reason, fail to complete this work in regular course, he may, with the consent of the department, be permitted to pursue his regular studies. In all such cases, however, the degree will be withheld until all field work is completed.



## ORE DRESSING

The lectures and recitations in Ore Dressing extend through the second semester of the junior year, and comprise the detailed study of ore dressing and concentrating machinery, together with the study of typical combinations of dressing machines as found in the several mining districts of the United States. In connection with the theoretical work, the ore dressing and testing plant of the School is utilized for practical illustrations.

## COURSES IN METALLURGY

### COURSES LEADING TO THE DEGREE OF MET. E.

#### FIVE-YEAR COURSES

##### JUNIOR YEAR

###### *First Semester*

Chemistry 25, Ore and Slag Analysis, 7, Chem. 12  
Experimental Engineering 21, Steam Laboratory, 4, with Mech. 11  
Geology 111, Ore Deposits, 4, Geol. 106  
Mechanics 9, 5, Math. 8  
Mechanics 11, Mine Plant, 3, Math. 8  
Mining 7, Ore Dressing, 5, Geol. 106  
Mining 9, 5, Min. 6

###### *Second Semester*

Experimental Engineering 22, Strength of Materials, 4, with Mech. 10  
Geology 112, Problems in Ore Deposits, 4, Geol. 111  
Mechanics 10, 6, Mech. 9  
Mechanics 12, Mine Plant, 6, Mech. 11  
Mining 10, 5, Min. 9  
Mining 4, Mine Mapping, 6, Min. 2f  
Field Work. Months of May, June, July and August  
Metallurgy 6f, beginning about May 1  
Mining 10f, beginning about May 15  
Underground Mining Work, beginning about June 1

##### SENIOR YEAR

###### *First Semester*

Electrical Engineering 53, Electric Power, 5, Physics 3, 4  
Mechanics 13, Water Power, 5, Mech. 10  
Mechanics 15, Engineering Construction, 5, Mech. 10  
Metallurgy 7, Ore Testing, 10, Met. 106, Min. 8  
Metallurgy 11, Special Problems, 8, Met. 106, Min. 8  
Metallurgy 109, Electrometallurgy, 3, Met. 106

###### *Second Semester*

Chemistry 144, Electrochemistry, 5, Chem. 102  
Chemistry 24, Iron and Steel Analysis, 7, Chem. 12  
Experimental Engineering 24, Experimental Laboratory, 4, Exp. Eng. 21  
Mechanics 18, Mill and Smelter Design, 10, Mech. 15  
Metallurgy 152, Metallography, 6, Met. 106

Metallurgy 12, Special Problems, 4, Met. 7  
 Metallurgy 14, Thesis, 10, Met. 11

#### FOUR-YEAR COURSES

##### JUNIOR YEAR

###### *First Semester*

Experimental Engineering 21, Steam Laboratory, 4, with Mech. 11  
 Geology 73, Historical and Economic Geology, 3, Geol. 105, 1b  
 Mechanics 9, 5, Math. 8  
 Mechanics 11, Mine Plant, 3, Math. 8  
 Metallurgy 105, Base Metals, 4, Met. 4  
 Mining Engineering 7, Ore Dressing, 5, Geol. 106  
 Mining Engineering 9, 5, Min. 6

###### *Second Semester*

Experimental Engineering 22, Strength of Materials, 4, with Mech. 10  
 Mechanics 10, 6, Mech. 9  
 Mechanics 12, Mine Plant, 6, Mech. 11  
 Metallurgy 106, Precious Metals, 4, Met. 105  
 Mining 10, 5, Min. 9  
 Mining 4, Mine Mapping, 6, Min. 2f  
 Field Work. Months of May, June, July, and August  
     Metallurgy 6f, beginning about May 1  
     Mining 10f, beginning about May 15  
     Smelter Work, beginning about June 1

##### SENIOR YEAR

###### *First Semester*

Chemistry 25, Ore and Slag Analysis, 7, Chem. 12  
 Electrical Engineering 53, Electric Power, 5, Physics 3, 4  
 Mechanics 13, Water Power, 5, Mech. 10  
 Mechanics 15, Engineering Construction, 5, Mech. 10  
 Metallurgy 7, Ore Testing, 10, Met. 106, Min. 8  
 Metallurgy 11, Special Problems, 8, Met. 106, Min. 8  
 Metallurgy 109, Electrometallurgy, 3, Met. 106

###### *Second Semester*

Chemistry 144, Electrochemistry, 5, Chem. 102  
 Chemistry 24, Iron and Steel Analysis, 7, Chem. 12  
 Experimental Engineering 24, Experimental Laboratory, 4, Exp. Eng. 21  
 Mechanics 18, Mill and Smelter Design, 10, Mech. 15  
 Metallurgy 152, Metallography, 6, Met. 106  
 Metallurgy 12, Special Problems, 4, Met. 7  
 Metallurgy 14, Thesis, 10, Met. 11

## DEPARTMENT OF METALLURGY

This department is well supplied with representative ores of all the most important metals, drawings of furnaces, models and samples of all the different furnace products. The lectures treat of all the principal methods now in use. The practical work consists in visits to smelting and refining works which are accessible. The work in Metallurgy extends through three years.

## ASSAYING

The lectures treat of and describe apparatus, reagents, assay furnaces, fuels, etc., in connection with this subject. The principles of assaying and sampling are fully explained. A collection of representative ores of various metals with a collection of corresponding slags are shown, and instruction is given as to nature and quantity of fluxes. Special and rapid methods of testing slags and metallurgical products as employed in western smelting works are emphasized.

The laboratory course includes preparing and testing reagents, making cupels, etc., and assaying samples of ores, furnace and mill products, and bullion; different charges are tried and practical conclusions drawn.

Great importance is attached to the work in the laboratory. A large, well-ventilated furnace room in which are located muffle and crucible furnaces, and another room of similar dimensions equipped with desks, pulp and bead balances, afford accommodations to a large number of students. Ores of various metals of known value are given the students who are required to make up the necessary charges and submit their reports in detail. This work is offered to students completing the necessary courses in Mineralogy and Chemistry.

## ORE TESTING

The lectures treat of the use and purposes of all the machinery connected with the subject, supplemented by detailed drawings. There are complete testing works, connected with the department where the student may see the working of, and handle for himself crushers, rolls, Huntington mill, concentrating machinery, such as vanners, buddles, jigs, pan for amalgamation, settlers, reverberatory furnaces for oxidizing and oxidizing-chloridizing roasts, leaching and chlorination plants, as well as sizing apparatus and hydraulic separators. Sufficiently large amounts of ore are given to make the necessary tests upon the different machines and the students report the best method of treatment. The first semester of the senior year is devoted to instruction and laboratory work, and is required of students both in Mining and Metallurgy.

The ore-testing works meet educational, as well as commercial, needs.

*Educational.*—The ore-testing plant acquaints the student with the construction and manipulation of the principal typical machines used in the leading ore-dressing establishments of the country. It is here that students in Mining and Metallurgical Engineering get the requisite practical experience. They handle all machines and operate on sufficiently

large amounts of material to determine the methods best suited to a given ore to extract the largest amount of metal with the least possible loss.

*Commercial.*—Ore-testing works are an important factor in mining and metallurgical projects. The commercial object is to determine the best method of treating a given ore so as to yield the largest percentage of the metal it contains at the least possible cost. Samples varying from 500 pounds to car-load lots can be treated by various methods.

As the funds appropriated for the erection of such a plant were sufficient to purchase only the necessary machinery, the business men of Minneapolis generously provided a suitable building. This building, 94 by 66 feet, is built of brick and stone.

*Machinery.*—The plant contains all the machinery necessary to illustrate the various processes of ore testing, viz., a Bridgman mechanical sampler size B; a link belt bucket elevator; a pulley feeder complete; a pair of 12½ by 12 geared rolls complete; a four compartment spitzkasten; a three compartment Hartz jig; a Collum jig complete with cone for driving; a three and a half foot Huntington mill complete; a three-stamp mill, 275-pound stamps; a five-stamp mill, 850-pound stamps; a Challenge automatic feeder for five-stamp battery; a suspended Challenge feeder for three-stamp battery; a Tulloch feeder for Huntington mill; a single deck buddle, twelve feet in diameter; a four-foot plain belt Frue vanner; a Cammett concentrator; a Hooper pneumatic concentrator; a Century drop motion jig; a three-foot amalgamating pan; a five-foot settler; a Bruckner roasting furnace, with fire box on wheels; a chlorination barrel; a battery tightener; a two-horse-power vertical boiler; a steam drying pan; three trommels, with driving arrangement and gears; a one-thousand pound Reedy elevator, complete with worm gear; two overhead crawls, each with eighty-foot track; one-ton pulley block; a quarter-ton pulley block; a scoop car, with flat wheels; two twenty-horse-power electric motors; three MacDermott automatic samplers, etc.

#### FIELD WORK IN METALLURGY

At the end of the junior year opportunity is given the student to study metallurgical operations at one or more smelting works. This work will begin about May 1. Not over two weeks' time will be devoted to this work.

Upon termination of the junior field work in Metallurgy and two weeks in Mining (not later than June 1), the members of the junior class who are candidates for the degree of Metallurgical Engineer, are required to spend at least six weeks in practical work in one or more of the smelters of the West, for which they may receive wages. The department will render all possible assistance in locating students in the camps of their choice. Each student must keep a diary and record therein, in minute detail, all observations and sketches. He must, in person, submit this diary to the department on date of reopening of field work. In judging the character of the student's field work equal importance will be attached to the completed report and to the original field notes. The department

reserves the right to reject note-books considered below the standard that should be demanded of candidates for senior work.

Field work will reopen at the School of Mines, Tuesday, September 7, 1915. No senior will be registered after that date. Registration will cover Field Work, Electric Power, and Geology.

The final reports covering field work in Metallurgy and Mining must be prepared at the School of Mines under the direct supervision of the departments concerned. The program covering this work is as follows: Metallurgy, September 7-14, inclusive; Mining, September 15-27.

On September 27 all seniors who expect to graduate must register for the remaining subjects. Prior to this date the student must submit a typewritten report on field work fully illustrated with sketches drawn to scale covering all the metallurgical and milling operations, together with details of plant and equipment. Final registration will not be allowed until after final report on field work is made. All final reports, therefore, must be presented on or before September 27. These reports shall become the property of the School.

#### METALLOGRAPHY

Courses in Metallography are offered to seniors who are candidates for the degree of Metallurgical Engineer, students in the Colleges of Science, Literature, and the Arts, Engineering, Chemistry, and the Graduate School.

These courses deal with the microscopic examination of metals, alloys, and ores. The lectures treat of and describe the apparatus used in connection with this subject, the methods of preparing specimens, the physical, chemical, and metallurgical principles involved, and the interpretation of the results of microscopic examination. A collection of specimens, micro-photographs, and lantern slides covering wrought iron, low carbon, structural, rail, and tool steels, brasses, bronzes, and other industrial alloys are available for study and comparison. The laboratory course includes the microscopic and pyrometric study of metals, alloys, and ores. The laboratory is equipped with microscopes, electric and portable gas furnaces, and pyrometers of the latest and improved types. A special dark room is available for the preparation of microphotographs.

## DEPARTMENTAL STATEMENTS

### CHEMISTRY

Professors GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Assistant Professor FRANCIS C. FRARY; Instructors EARL PETTIJOHN, WOLDEMAR M. STERNBERG, STERLING TEMPLE.

#### COURSES

No.	Title	Lect. or Lab.		Required of	Prereq. courses
		rec. hrs.	hrs.		
5.	Gen. & Anal. Chemistry....	3	2	All Fr.	..
6.	Gen. & Anal. Chemistry....	1	6	All Fr.	5
11.	Quantitative Analysis.....	1	6	All Soph.	6
12.	Quantitative Analysis.....	1	6	All Soph.	11
24.	Iron & Steel Analysis.....	1	6	Sr. Met. E.	12
25.	Ore & Slag Analysis.....	1	6	Sr. E. M. & Met. E.	12
144.	Electrochemistry.....	1	4	Sr. Met. E.	12

5-6. GENERAL AND ANALYTICAL CHEMISTRY. An introduction to descriptive, physical, and metallurgical chemistry and qualitative analysis. FRANKFORTER, TEMPLE, and Assistants.

11-12. QUANTITATIVE ANALYSIS. The course includes a general discussion of quantitative methods, with laboratory work in gravimetric analysis, first semester, followed by a discussion of standard solutions and the necessary stoichiometric calculations with laboratory work in volumetric analysis, second semester. SIDENER, PETTIJOHN, STERNBERG, and Assistants.

24. IRON AND STEEL ANALYSIS. Includes technical methods for the determination of the common constituents of iron ores, iron, and steel, with training in rapid work. SIDENER, PETTIJOHN, and STERNBERG.

25. ORE AND SLAG ANALYSIS. Rapid technical method for the determination of certain constituents in ores and slags. SIDENER, PETTIJOHN, and STERNBERG.

144. ELECTROCHEMISTRY. A discussion of electro-analytical methods and industrial electrochemical processes, and their underlying principles. FRARY.

### DRAWING AND DESCRIPTIVE GEOMETRY

Professor WILLIAM H. KIRCHNER; Instructors ROBERT W. FRENCH, FRANK B. ROWLEY.

#### COURSES

No.	Title	Lect. or Lab.		Required of	Prereq. courses
		rec. hrs.	hrs.		
11.	Engineering Drawing.....	..	10	All Fr.	..
12.	Engineering Drawing.....	..	8	All Fr.	11
13.	Descriptive Geometry.....	2	..	All Soph.	12, Math. 6
14.	Drafting.....	..	4	All Soph.	13

11. **ENGINEERING DRAWING.** Sketching, lettering, representation, parallel and radial projection, elements of engineering, representation of details of machines and structures, interpretation of working drawings. KIRCHNER, FRENCH.
12. **ENGINEERING DRAWING.** Continuation of Course 11 as outlined above. The elements of general drafting, mechanical drawing as a language. Lines, views, dimensions, standards, signs, abbreviations, and explanatory notes. Maps and sketches. Brush and pen conventions. ROWLEY, FRENCH.
13. **DESCRIPTIVE GEOMETRY.** Projection: central and special cases, principles and applications, representation of lines, planes, and solids, and of their relations; tangencies, intersections, and developments. Recitations, lectures, and solution of problems. KIRCHNER.
14. **DRAFTING.** Graphics, machine drafting, and structural drafting. Instruction in drafting room methods. FRENCH.

### ELECTRICAL ENGINEERING

Professor GEORGE D. SHEPARDSON; Assistant Professor WILLIAM T. RYAN.

#### COURSES

No.	Title	Lect. or Lab.		Required of	Prereq. courses
		rec. hrs.	hrs.		
53.	Electric Power.....	2	2	Sr. E. M. & Met. E.	Physics 3, 4
53.	<b>ELECTRIC POWER.</b> Elements of theory and practice of electrical measurements, wiring, dynamos, motors, and electric lighting. RYAN.				

### EXPERIMENTAL ENGINEERING

Professor WILLIAM H. KAVANAUGH; Assistant Professors CHARLES F. SHOOP, FRANKLIN R. McMILLAN.

#### COURSES

No.	Title	Lect. or Lab.		Required of	Prereq. courses
		rec. hrs.	hrs.		
21.	Steam Laboratory.....		4	Jr. E. M. & Met. E.	With Math. 11
22.	Strength of Materials.....		4	Jr. E. M. & Met. E.	With Math. 10
24.	Experimental Laboratory.....		4	Sr. E. M. & Met. E.	21
21.	<b>STEAM LABORATORY.</b> Exercises in valve setting, indicator practice, calibration of steam gauges, efficiency of screws and hoists. SHOOP.				
22.	<b>STRENGTH OF MATERIALS.</b> Laboratory work, investigating the strength and physical qualities of iron, steel, brass, copper, belting, chains, beams, brick, and stone. McMILLAN.				
24.	<b>EXPERIMENTAL LABORATORY.</b> Hydraulic measurements. Calibration of weirs, nozzles, meters, and other hydraulic apparatus, calorimetry; tests of pumps, engines, and boilers. KAVANAUGH.				



## GEOLOGY AND MINERALOGY

Professor WILLIAM H. EMMONS; Associate Professor CLINTON R. STAUFFER; Assistant Professor FRANK F. GROUT; Instructors A. WALFRED JOHNSTON, EDGAR K. SOPER; Assistants T. M. BRODERICK, J. P. GOLDSBERRY.

## COURSES

No.	Title	Lect. or Lab. rec. hrs. hrs.	Required of	Prereq. courses
1b.	General Geology . . . . .	3 ..	All Soph.	24
1f.	Field Work . . . . .	2 wks	All Soph.	1b and 105
23.	Elements of Mineralogy . . . . .	4 4	All Fr.	..
24.	Descriptive Mineralogy . . . . .	2 2	All Fr.	23
57.	Paleontology . . . . .	3 ..	Jr. E. M. (Geol.)	1b
58.	Paleontology . . . . .	3 ..	Jr. E. M. (Geol.)	57
73.	Histor. & Econ. Geology . . . . .	3 ..	All Jr.	1b and 105
105.	Elements of Rock Study . . . . .	4	All Soph.	24
106.	Petrology . . . . .	4	All Soph.	105b
111.	Ore Deposits . . . . .	4 ..	Sr. E. M. & E. M. (Geol.)	106
112.	Problems in Ore Deposits . . . . .	4	Sr. E. M. & E. M. (Geol.)	111
113.	Laboratory Course in Econ. Geology . . . . .	4	Sr. E. M. (Geol.)	With 111
124.	Struct. & Metamorph. Geol. . . . .	3 ..	Jr. E. M. (Geol.)	73 and 105
138.	Testing Econ. Minerals . . . . .	4	Elective	24 and 73
144.	Construction & Interpre- tation of Geologic Maps . . . . .	4	Elective	73
151.	Advanced General Geology . . . . .	3 ..	Sr. E. M. (Geol.)	73
152.	Advanced General Geology . . . . .	3 ..	Sr. E. M. (Geol.)	151

- 1b. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, and structural geology, with a brief introduction to Historical Geology. JOHNSTON.
- 1f. FIELD WORK. A two-week excursion to the Iron Ranges for practice in field methods, such as tracing contacts, working out structures and constructing and interpreting geologic maps. JOHNSTON and Assistants.
23. ELEMENTS OF MINERALOGY. The crystal systems; morphological, physical, and chemical character of minerals; occurrence, genesis, and uses of minerals; classifications and description of common minerals. Determinative work in laboratory, blowpipe analysis, sight identification. BRODERICK, GOLDSBERRY.
24. DESCRIPTIVE MINERALOGY. A continuation of Course 23, special attention being given to metalliferous and rock-forming minerals. Laboratory determination and sight identification. The use of the goniometer and microscope. Laboratory work, reference reading, and field excursions. BRODERICK, GOLDSBERRY.
57. PALEONTOLOGY. A study of fossil forms with special reference to those of geological importance. STAUFFER.
58. PALEONTOLOGY. Faunas and their correlation. A continuation of Course 57. STAUFFER.

73. HISTORICAL AND ECONOMIC GEOLOGY. (a) Historical Geology. The geologic history of North America, with special references to its syngenetic mineral deposits. (b) Economic Geology. A study of the non-metallic minerals of economic value, and discussions of the geologic guides to prospecting for these deposits. EMMONS, SOPER.
105. 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 methods of identification and description of rocks. BRODERICK.
106. PETROLOGY. The identification and study of minerals and rocks by optical methods; the study of igneous rocks, crystalline schists, and metamorphic rocks. The origin and classification of rocks. BRODERICK.
111. 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. EMMONS, SOPER.
112. PROBLEMS IN ORE DEPOSITS. Field excursions, map work, lectures on field and laboratory methods. EMMONS, SOPER.
113. LABORATORY COURSE IN ECONOMIC GEOLOGY. A study of ores, rocks and geological structure of selected American and foreign mining districts. Correlated reading. EMMONS.
124. STRUCTURAL AND METAMORPHIC GEOLOGY. The conditions, processes, and results of metamorphism; structural features resulting from deformation under varying conditions of load. JOHNSTON.
138. TESTING ECONOMIC MINERALS. Methods of determining quality of mineral deposits, described and illustrated by laboratory tests of coal, oil, building stone, and metallic ores.
144. CONSTRUCTION AND INTERPRETATION OF GEOLOGIC MAPS. Hours to be arranged. Methods of geological examination; problems in construction and interpretation of geologic maps and sections, with special reference to underground mapping of metalliferous areas; field practice in plane table methods of topographic and geologic mapping. SOPER.
151. ADVANCED GENERAL GEOLOGY. Geologic processes and their results; development of the North American continent. STAUFFER.
152. ADVANCED GENERAL GEOLOGY. A continuation of Course 151. STAUFFER.

## GERMAN

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, WALTER R. MYERS; Instructors J. THEODORE GEISSENDOERFER, RICHARD WISCHKAEMPER.

COURSES

No.	Title	Lect. or rec. hrs.	Required of	Prereq. courses
15.	Beginning German.....	3	Jr. E. M. (Geol.)	..
16.	Beginning German.....	3	Jr. E. M. (Geol.)	15
17.	Scientific Intermediate.....	3	Jr. or Sr. E. M. (Geol.)	16
18.	Scientific Intermediate.....	3	Jr. or Sr. E. M. (Geol.)	17
23.	Advanced Scientific.....	3	Sr. E. M. (Geol.)	18
24.	Advanced Scientific.....	3	Sr. E. M. (Geol.)	23

15-16. BEGINNING. Pronunciation, grammar, conversation, and composition; selected reading in easy prose and verse. BURKHARD.

17-18. SCIENTIFIC INTERMEDIATE. This course is arranged to meet the needs of students in the School of Mines. Text: Merckel's *Bilder aus der Ingenieurtechnik*. BURKHARD, MYERS.

23-24. ADVANCED SCIENTIFIC READING. Reading of monographs and periodicals. GEISSENDOERFER, WISCHKAEMPER.

MECHANICAL ENGINEERING

Professor JOHN J. FLATHER; Assistant Professor S. CARL SHIPLEY; Instructors PETER PETERSON, EDWARD QUIGLEY, WILLIAM H. RICHARDS.

COURSES

No.	Title	Lab. hrs.	Required of	Prereq. courses
1a.	Pattern Making.....	6 (9 wks)	1st-yr. E. M. & Met. E.	..
1b.	Foundry.....	6 (9 wks)	1st-yr. E. M. & Met. E.	..
1c.	Forge.....	6 (9 wks)	1st-yr. E. M. & Met. E.	..
1d.	Machine & Bench Work....	6 (9 wks)	1st-yr. R. M. & Met. E.	..

1a. PATTERN MAKING. Use of tools, lathe and bench work, making of timber joints, core boxes and flasks. RICHARDS, UBRICH.

1b. FOUNDRY. Molding, core making, mixing and casting metals. PETERSON.

1c. FORGE. Use of tools, forging, welding, tool dressing and tempering. QUIGLEY.

1d. MACHINE AND BENCH WORK. Use of tools and elementary machine operations. SHIPLEY.

METALLURGY

Professors WILLIAM R. APPLEBY, PETER CHRISTIANSON, LEVI B. PEASE; Assistant Professor SAMUEL L. HOYT.

COURSES

No.	Title	Lect. or rec. hrs.	Lab. hrs.	Required of	Prereq. courses
2.	Assaying.....	4	8	All Fr.	Chem. 5, Mineral, 23
3.	Gen. Met. & Iron and Steel.	3	..	Soph. E. M. & Met. E.	2, Chem. 6

No.	Title	Lect. or rec. hrs.	Required of	Prereq. courses
4.	Wrought Iron & Steel.....	3	Soph. E. M. & Met. E.	3
6f.	Field Work in Metallurgy.....	10 dys	Jr. E. M. & Met. E.	Satisfactory completion of Jr. year
7.	Ore Testing.....	2	8 Sr. E. M. & Met. E.	106, Min. 7
8.	Metallurgy.....	3	.. Soph. E. M. (Geol.)	2
11.	Special Problems in Met.....	8	8 Sr. Met. E.	106, Min. 7
12.	Special Problems in Met.....	4	4 Sr. E. M. & Met. E.	106, Min. 7
14.	Thesis and Specifications.....	10	10 Sr. Met. E.	11
105.	Met. of Base Metals.....	4	.. Jr. E. M. & Met. E.	4
106.	Met. of Precious Metals.....	4	.. Jr. E. M. & Met. E.	105
109.	Electrometallurgy.....	3	.. Sr. Met. E.	106
152.	Metallography.....	2	4 Sr. Met. E.	106
153.	Metallography.....	3	4 Elective	Chem. 12, Phys. 1 and 2
154.	Metallography.....	3	4 Elective	153
155.	Metallog. for Geologists.....	2	2 Elective	Geol. 4, 5 & 18
156.	Metallog. for Geologists.....	2	2 Elective	155
157.	Metallog. for Engineers.....	2	4 Elective	Mech. Eng. 3 and 4
160.	Metallog. for Chemists.....	2	2 Elective	Chem. 12, Phys. 1 and 2
162.	Ad. Metallog. for Eng.....	2	4 Elective	157
163.	Dental Metallog.....	3	.. Elective	..
201.	Ad. Metallog.....	..	To be ar. Elective	154
202.	Ad. Metallog.....	..	To be ar. Elective	201

2. ASSAYING. Determination of values of ores, metallurgical products, and bullion. APPELBY and Assistants.
3. GENERAL METALLURGY AND METALLURGY OF IRON. Including the subjects of combustion, fuels, refractory materials and furnaces. Lectures and recitations on metallurgy of iron. CHRISTIANSON.
4. METALLURGY OF WROUGHT IRON AND STEEL. Consideration of the principles of manufacture, details of plant construction, and chemical and physical phenomena. CHRISTIANSON.
- 6f. FIELD WORK IN METALLURGY. Study of metallurgical operations at smelters and mills. Detailed report is required covering plants visited. CHRISTIANSON, PEASE.
7. ORE TESTING. Determinations of methods of ore treatment, stamping, concentration, cyanidation, roasting, chlorination, lixiviation, and amalgamation. APPELBY and Assistants.
8. METALLURGY. A short course covering the metallurgy of the principal metals. PEASE.
11. SPECIAL PROBLEMS IN METALLURGY. Research work preparatory to thesis. APPELBY and Assistants.
12. SPECIAL PROBLEMS IN METALLURGY. PEASE.
14. THESIS AND SPECIFICATIONS. Detailed investigations of ore treatment.

- with report including designs and specifications for suitable plants. APPLEBY, COMSTOCK, and Assistants.
105. METALLURGY OF THE BASE METALS. Lead, copper, zinc, and mercury. Consideration of smelting methods and principles involved in refining methods. PEASE.
  106. METALLURGY OF THE PRECIOUS METALS. Gold, silver, and platinum. Methods and principles of cyanidation, chlorination, amalgamation, and lixiviation as applied to the treatment of the above. PEASE.
  109. ELECTROMETALLURGY. A study of the reduction of ores, refining of metals, and production of metals by electrolytic deposition; and the use of the electric furnace for smelting of ores, refining metals, and the manufacture of refractory alloys. CHRISTIANSON.
  152. METALLOGRAPHY. A study of the microstructure of metals and alloys as affected by heat and industrial treatments, together with the influence of changes of structure on their properties. Special attention is given to siderurgic products. HOYT.
  - 153-154. METALLOGRAPHY. The microscopical and thermal analysis of metals and alloys. Metallographic technique. The physical and chemical properties of metals and alloys. The commercial alloys, their heat and other industrial treatments. The metallography of iron and steel. HOYT.
  - 155-156. METALLOGRAPHY APPLIED TO THE STUDY OF GEOLOGY. Application of metallographical principles and methods of research to geology, with special attention to the genesis of rocks and ore bodies. The microscopical examination of opaque minerals by reflected light. HOYT.
  157. METALLOGRAPHY FOR ENGINEERING STUDENTS. Metallurgy of iron and steel. Microscopic and thermal analysis of steel and cast iron; heat and mechanical treatment. The properties of iron and steel as affected by composition and treatment. Laboratory work. HOYT.
  160. METALLOGRAPHY FOR CHEMICAL STUDENTS. The preparation of metallic alloys; their microscopical and thermal analysis. Steel and other commercial alloys with particular reference to chemical metallurgy. Corrosion of steel and non-ferrous alloys. Metallography applied to analytical chemistry. HOYT.
  162. ADVANCED METALLOGRAPHY FOR ENGINEERING STUDENTS. Metallography applied to engineering practice; machine design, structural engineering, electrical engineering. Engineering specifications involving the use of metals and alloys. HOYT.
  163. DENTAL METALLOGRAPHY. Study of the dental alloys from the standpoint of metallography. HOYT.

201-202. **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 on the recent advances in metallography. **HOYT.**

### MINE PLANT AND MECHANICS

Professor **ELTING H. COMSTOCK**; Assistant Professor **EDWIN M. LAMBERT**;  
Instructor **EDWARD W. DAVIS.**

#### COURSES

No.	Title	Lect. or Lab.		Required of	Prereq. courses
		rec. hrs.	hrs.		
1.	Computation & Mensuration	3	..	All 1st-yr. students	..
3.	Mine Accounting.....	..	6	All 1st-yr. students	..
4.	Algebra.....	4	..	All 1st-yr. students	..
5.	Algebra & Trigonometry...	6	..	All Fr.	1 & 2
6.	Spherical Trig. & Anal. Geom.	6	..	All Fr.	5
7.	Calculus.....	5	..	All Soph.	6
8.	Calculus.....	3	..	All Soph.	7
9.	Mechanics.....	5	..	All Jr.	8
10.	Mechanics.....	6	..	All Jr.	9
11.	Mine Plant.....	3	..	Jr. E. M. & Met. E.	8
12.	Mine Plant.....	6	..	Jr. E. M. & Met. E.	11
13.	Hydraulics & Water-Power.	5	..	All Sr.	10
15.	Engineering Construction...	1	4	Sr. E. M. & Met. E.	10
16.	Mine Plant Design.....	..	10	Sr. E. M.	15
18.	Mill and Smelter Design....	..	6	Sr. Met. E.	15

- 1. COMPUTATION AND MENSURATION.** Demonstrations of most important theorems of solid geometry. Volumes, approximate volumes, prismatic formula, etc. Approximate computation, graphs, and graphical computation, logarithms and logarithmic computation, areas and approximations of areas, use of slide rule. **DAVIS.**
- 3. ELEMENTARY MINE ACCOUNTING.** Elementary accounting in general; applications to mine accounts; primary records, labor, supply, mine and mill products, and fund sheets; secondary records, invoice, labor and supply, mine and mill cost sheets, trial balance. **LAMBERT.**
- 4. ALGEBRA.** Equations with one, two, or more unknown quantities, inequalities, involution and evolution, theory of exponents, surds, quadratic equations both numerical and literal, equations with one or more unknown quantities that can be solved by means of quadratic equations, progressions. **DAVIS.**
- 5. ALGEBRA AND TRIGONOMETRY.** Functions and functional notation, factor and remainder theorems, factors and values of functions, determinants, development of functions, theory of equations, permutations and combinations; trigonometric ratios, right triangles, general definitions of trigonometric functions, analytic relations, addition formulas, trigonometric equations, and oblique triangles. **DAVIS.**
- 6. SPHERICAL TRIGONOMETRY AND ANALYTICAL GEOMETRY.** General proper-

ties and solution of spherical triangles; systems of coördinates, loci, equations and properties of the straight line, transformation of coördinates, equations and properties of conics, general equations of the second degree, higher plane curves, space coördinates, point, plane, straight line, quadric surfaces. DAVIS.

7. CALCULUS. Nature of differentiation, elementary forms, geometric applications, rates, successive differentiation, maxima and minima, expansion of functions, indeterminate forms, partial derivatives, change of variable. LAMBERT.
8. CALCULUS. Elementary integration, undetermined coefficients, rational fractions, rationalization, formulas of reduction, hyperbolic functions, some differential equations of mechanics. LAMBERT.
9. MECHANICS. Composition and resolution of forces, laws of equilibrium, practical applications, rectilinear motion, circular motion, curvilinear motion in general, dynamics of rigid bodies, impact, work and energy; elementary mechanics of materials. LAMBERT.
10. MECHANICS. Mechanical and elastic properties of materials of construction; beams, shafts, columns, reinforced concrete, hollow cylinders and spheres, rollers, plates; theory of internal stress. LAMBERT.
- 11-12. MINE PLANT. Discussion of the machinery and appurtenances employed in the equipment of mines. Air compression, mechanical features of hoisting, pumping, ventilation, underground transportation. Electricity applied to mining. COMSTOCK.
13. HYDRAULICS AND WATER-POWER. Laws of the equilibrium, pressure, and flow of liquids, estimation of power to be developed at a power site, dams and appendages, theory of water wheels and turbines, speed control, power-house equipment, transmission. COMSTOCK.
15. ENGINEERING CONSTRUCTION. Theory of structures, loading, analytic and graphic resolution of stresses in framed structures, stresses in mining structures, design of mining structures. COMSTOCK.
16. MINE PLANT DESIGN. A study of power possibilities, costs, etc., and designs of a power plant, surface equipment, and structures for a mine. COMSTOCK.
18. MILL AND SMELTER DESIGN. A study of the construction and mechanical equipment of mills and smelters in connection with thesis work. COMSTOCK.

## MINING ENGINEERING

Professors GEORGE J. YOUNG, EDWARD P. McCARTY; Instructors ERVIN W. McCULLOUGH, JOHN F. MURPHY.

## COURSES

No.	Title	Lect. or Lab.		Required of	Prereq. cours s
		rec. hrs.	hrs.		
1.	Mine Surveying.....	3	..	All Soph.	Math. 6
2.	Mine Surveying.....	3	..	All Soph.	1
2f.	Field Work.....	7 wks	..	All Soph.	2
4.	Mine Mapping.....	6	..	All Jr.	2f
6.	Mining.....	1	..	All Soph.	..
7.	Ore Dressing.....	5	..	All Jr.	..
9.	Mining.....	5	..	All Jr.	6
10.	Mining.....	5	..	All Jr.	9
10f.	Practical Mining.....	2 wks	..	All Jr.	Satisfactory completion of Jr. year
11.	Mining.....	5	..	Sr. E. M. & E. M. (Geol.)	10
12.	Mining.....	5	..	Sr. E. M. & E. M. (Geol.)	11
13.	Thesis.....	2	..	Sr. E. M.	10f
14.	Thesis.....	8	..	Sr. E. M.	13

- 1, 2. **MINE SURVEYING.** Computation, platting, and problems with special reference to mine surveying. MURPHY.
- 2f. **FIELD WORK.** Practice in general surveying during the month of May. Practice in underground surveying during the first two weeks of June. This work is given on the Iron Ranges. McCARTY, MURPHY.
4. **MINE MAPPING.** Mine mapping in accordance with prevalent practice in the western mining districts. Ore and stripping estimates and mine maps based on Mesabi Range practice. MURPHY.
6. **MINING.** Examination and testing, and use of explosives. McCULLOUGH.
7. **ORE DRESSING.** Examination of ores, crushing, sizing classification, and methods of mechanical separation. McCULLOUGH.
9. **MINING.** Occurrence of ore bodies, prospecting, churn and diamond drilling, drilling, blasting, excavation, surface transportation, tunneling and drifting. YOUNG.
10. **MINING.** Shaft-sinking, support of underground excavations, hoisting, drainage, ventilation, underground transportation. YOUNG.
- 10f. **PRACTICAL MINING.** Study of mining operations. Mine plant and equipment and practical mining work; a mine to be selected by department during months of May, June, July, and August. YOUNG, COMSTOCK, and Assistants.
11. **MINING.** Open pit, quarrying, underground methods, coal mining, mining alluvial deposits. YOUNG.
12. **MINING.** Mine management, mining law, economics of mining, mine examination, mine sanitation and hygiene. YOUNG.
- 13, 14. **THESIS.** Conference. Design and specifications of mining details required in thesis study. YOUNG.



## PHYSICS

Professors HENRY A. ERIKSON, ANTHONY ZELENY;\* Instructor PAUL E. KLOPSTEG.

## COURSES

No.	Title	Lect. or Lab.		Required of	Prereq. courses
		rec. hrs.	hrs.		
1.	General Physics.....	3	..	All Soph.	Math. 6
2.	General Physics.....	3	..	All Soph.	1
3.	General Lab. Practice.....	2	..	All Soph.	With 1
4.	General Lab. Practice.....	2	..	All Soph.	With 2

1. GENERAL PHYSICS. Mechanics of solids and fluids, sound and heat. Treatment experimental rather than mathematical; the fundamental principles. ERIKSON, KLOPSTEG.
2. GENERAL PHYSICS. Light, electricity, and magnetism. Treatment experimental; the fundamental principles, including those of radioactivity, ionization, X-radiation, and the electrical constitution of matter. ERIKSON, KLOPSTEG.
3. GENERAL LABORATORY PRACTICE. Physical measurements in the mechanics of solids and fluids, and in heat and sound, giving the student a knowledge of experimental methods, and an intimate acquaintance with the fundamental facts of the subject. ERIKSON.
4. GENERAL LABORATORY PRACTICE. Physical measurements in light, electricity, and magnetism. ERIKSON.

## ROMANCE LANGUAGES

Professor EVERETT WARD OLMSTED; Assistant Professor JULES T. FRELIN; Instructors E. H. SIRICH, HERBERT K. STONE; Assistant HOMER DESMARAIS.

## COURSES

No.	Title	Rec. hrs.	Required of	Prereq. courses
1.	Beginning French.....	3	Jr. E. M. (Geol.)	..
2.	Beginning French.....	3	Jr. E. M. (Geol.)	1
3.	Intermediate French.....	3	Jr. or Sr. E. M. (Geol.)	2
4.	Intermediate French.....	3	Jr. or Sr. E. M. (Geol.)	3
5.	Survey French Lit.....	3	Sr. E. M. (Geol.)	4
6.	Survey French Lit.....	3	Sr. E. M. (Geol.)	5

- 1-2. BEGINNING FRENCH. Stress on accurate pronunciation, reading, reading vocabulary, and the essentials of grammar. Daily oral and written exercises (dictation and reproduction in French). DESMARAIS.
- 3-4. INTERMEDIATE. French grammar, composition, and reading; increased use of French in the classroom. Selections from modern prose and poetry. FRELIN, DESMARAIS.
- 5-6. GENERAL SURVEY OF FRENCH LITERATURE. Lectures, recitations, and assigned readings. Designed to cover the whole period in historical outline. Selections from representative authors. OLMSTED.

\*Absent on leave, 1915-16.

## STUDENTS

### SENIORS—15

Butler, W. Victor, Minneapolis  
Christenson, Alfred, Madelia  
Clark, Malcolm W., Northfield  
Coller, Walter A., St. Paul  
Collins, Leon T., Pine Island  
Haugan, Albert C., Hanska  
Harmon, Sydney, St. Paul  
Heilig, Louis S., Minneapolis

Johnson, Fred C., Willmar  
Kerr, Charles D., Little Falls  
Neerland, Herman,  
Sanchez, Richard M., Tarma, Peru, S.  
A.  
Urquhart, George K., St. Paul  
Wade, Henry R., Hopkins  
Williams, Paul S., Minneapolis

### JUNIORS—12

Abrahamson, Hjalmar, Wadena  
Aronson, Sam, St. Paul  
Buresch, Charles E., Lakefield  
Craig, John J., Minneapolis  
Davies, Fred A., Minneapolis  
Dovre, Adolph, Sleepy Eye

\*Field, Reginald, Mobridge, S. D.  
Krogh, Alvin T., Minneapolis  
Lee, Oscar, St. Paul  
McDermid, Archie J., Duluth  
McHardy, Roy H., Minneapolis  
Nord, Harry H., Ashland, Wis.

### SOPHOMORES—20

Anderson, Edwin H., Oakes, N. D.  
Breslauer, Mirton B., Spokane, Wash.  
Capser, Leo W., St. Paul  
Cassily, Thomas E., St. Paul  
Coryell, Lewis S., Osceola, Wis.  
Dennis, Richard C., Ashland, Wis.  
Elson, William H., St. Paul  
Ernster, Omer F., Brainerd  
Fearing, Edward J., Little Falls, Minn.  
Frank, Harry, Minneapolis

Hicks, John, St. Paul  
Levorsen, A. Irving, Fergus Falls  
Kwong, Yih-Kum, Shanghai, China  
Nichols, Clifford R., Buhl, Minn.  
Peterson, Paul A., St. Paul  
Shattuck, Warner A., Bisbee, Ariz.  
Strand, Harry W., Marine Mills  
Sweetman, Edwin A., Aitkin  
Wallace, Carleton S., Minneapolis  
Woodruff, John J., Minneapolis

### FRESHMAN—30

Ainsworth, Robert E., Minneapolis  
Allard, Raymond W., St. Paul  
Armstrong, Harold H., Minneapolis  
Bailey, A. Kittredge, Minneapolis  
Bradt, Harlan H., Minneapolis  
Caswell, Alexis, Jr., Minneapolis  
Clark, Fred E., Minneapolis  
Copeland, William A., St. Paul  
Cowin, Percy G., Minneapolis  
Cutler, F. A., Jr., Minneapolis  
Dane, Carleton M., St. Paul  
Dowdell, Ralph L., St. Paul  
Foley, Lyndon L., Minneapolis  
Gannett, Roger W., Minneapolis  
Hauser, Karl W., St. Paul

Hauser, Louis A., St. Paul  
Hurley, Frank W., St. Paul  
Ingersoll, Guy E., Hibbing  
Jerrard, Walter L., St. Cloud  
Johnson, Russell V., Lanesboro  
Kulberg, Sam, Minneapolis  
McGilvra, Donald B., Minneapolis  
Moga, John A., St. Paul  
Quinn, Howard E., Melrose  
Ringwood, Thomas E., Ashland, Wis.  
Rosenberg, Maurice M., Minneapolis  
Sinclair, Gilbert, Minneapolis  
Sponberg, Edwin C., Hibbing  
Stickney, Robert A., Ingleswood, N. J.  
Sullivan, Daniel C., Stillwater

### FIRST YEAR—9

Abramson, Jake, Minneapolis  
Alverson, Miles C., Medford, Wis.  
Donaghue, Abner J., Minneapolis  
Hollister, Paul M., Madison, S. D.  
Hoving, George E., Fergus Falls

Kersten, Erwin H. W., Minneapolis  
Rye, Hjalmer, Aurora  
Scott, Wendell K., St. Cloud  
Wadsworth, Lawrence H., Minneapolis

\*Deceased.

Bulletin of  
The University of Minnesota

THE SCHOOL OF CHEMISTRY

1915-1916



VOL. XVIII, NO. 12. JUNE 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.

1915							1916													
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	3	..	..	..	..	..	..	1	..	..	..	..	..	..	1
4	5	6	7	8	9	10	2	3	4	5	6	7	8	2	3	4	5	6	7	8
11	12	13	14	15	16	17	9	10	11	12	13	14	15	9	10	11	12	13	14	15
18	19	20	21	22	23	24	16	17	18	19	20	21	22	16	17	18	19	20	21	22
25	26	27	28	29	30	31	23	24	25	26	27	28	29	23	24	25	26	27	28	29
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AUGUST							FEBRUARY							AUGUST						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
1	2	3	4	5	6	7	..	..	1	2	3	4	5	..	..	1	2	3	4	5
8	9	10	11	12	13	14	6	7	8	9	10	11	12	6	7	8	9	10	11	12
15	16	17	18	19	20	21	13	14	15	16	17	18	19	13	14	15	16	17	18	19
22	23	24	25	26	27	28	20	21	22	23	24	25	26	20	21	22	23	24	25	26
29	30	31	..	..	..	..	27	28	29	..	..	..	..	27	28	29	30	31	..	..
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SEPTEMBER							MARCH							SEPTEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	1	2	3	4	..	..	..	1	2	3	4	..	..	..	..	..	1	2
5	6	7	8	9	10	11	5	6	7	8	9	10	11	3	4	5	6	7	8	9
12	13	14	15	16	17	18	12	13	14	15	16	17	18	10	11	12	13	14	15	16
19	20	21	22	23	24	25	19	20	21	22	23	24	25	17	18	19	20	21	22	23
26	27	28	29	30	..	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30
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OCTOBER							APRIL							OCTOBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	..	..	..	..	..	..	1	1	2	3	4	5	6	7
3	4	5	6	7	8	9	2	3	4	5	6	7	8	8	9	10	11	12	13	14
10	11	12	13	14	15	16	9	10	11	12	13	14	15	15	16	17	18	19	20	21
17	18	19	20	21	22	23	16	17	18	19	20	21	22	22	23	24	25	26	27	28
24	25	26	27	28	29	30	23	24	25	26	27	28	29	29	30	31	..	..	..	..
31	..	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	..	..	1	2	3	4
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
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DECEMBER							JUNE							DECEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	1	2	3	4	..	..	..	..	1	2	3	..	..	..	..	..	1	2
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..

## UNIVERSITY CALENDAR

1915-1916

The university year covers a period of thirty-eight weeks, beginning on the Tuesday before the second Thursday in September. Commencement Day is always the second Thursday in June.

1915			
August	31	Tuesday	Registration closes except for new students
September	1-8	Week	Fees payable except for new students
September	7-14	Week	Examinations for the removal of conditions (except Colleges of Agriculture and Forestry), entrance examinations, registration of new students, and payment of fees
September	15	Wednesday	First semester begins
September	27	Monday	Agricultural College, farm experience examination
October	4	Monday	School of Agriculture, first term begins
October	7	Thursday	Senate meeting, 4:00 p.m.
November	8	Monday	Dairy School opens
November	24	Wednesday	Thanksgiving recess begins 9:00 p.m.
November	29	Monday	Thanksgiving recess ends 8:00 a.m.
Nov. 29 to Dec. 4	Week		Second semester condition examinations, Colleges of Agriculture and Forestry
December	2	Thursday	Senate meeting, 4:00 p.m.
December	6-11	Week	Short course for ice-cream makers
December	11	Saturday	Dairy School closes
December	17	Friday	Christmas vacation begins 9:00 p.m.
December	17	Friday	School of Agriculture, first term closes
1916			
January	3-8	Week	Farmers' Short Course
January	4	Tuesday	Christmas vacation ends 8:00 a.m.
January	18	Tuesday	Registration for second semester closes
January	21	Friday	School of Agriculture, second term begins
January	24	Monday	Final examinations begin
January	25	Tuesday	Payment of fees for second semester closes
February	2	Wednesday	Second semester begins
February	3	Thursday	Senate meeting, 4:00 p.m.
February	12	Saturday	Lincoln's Birthday: a holiday
February	22	Tuesday	Washington's Birthday: a holiday
March	30	Wednesday	School of Agriculture closes

## SCHOOL OF CHEMISTRY

April	3-8	Week	Junior Short Course
April	19	Wednesday	Easter recess begins 9:00 p.m.
April	27	Thursday	Easter recess ends 8:00 a.m.
May	1-6	Week	Condition examinations in certain colleges
May	2	Tuesday	Traction Engineering Course begins
May	4	Thursday	Senate meeting, 4:00 p.m.
May	26	Friday	Final examinations begin
May	30	Tuesday	Memorial Day: a holiday
June	1-8	Week	Military Encampment, Fort Snelling
June	3	Saturday	Second semester closes
June	4	Sunday	Baccalaureate service
June	5	Monday	Senior class day exercises
June	7	Wednesday	Alumni Day
June	8	Thursday	Forty-fourth Annual Commencement
June	9	Friday	Summer vacation begins
June	12	Monday	Summer Session begins

The university year for 1916-17 will begin Tuesday, September 12.

# THE SCHOOL OF CHEMISTRY

## FACULTY

- GEORGE EDGAR VINCENT, Ph.D., LL.D., President 1005 5th St. S. E.  
CYRUS NORTHPROP, LL.D., President Emeritus 519 10th Ave. S. E.  
GEORGE B. FRANKFORTER, M.A., Ph.D., Dean and Professor of Chemistry  
525 E. River Road  
CEPHAS D. ALLIN, LL.B., M.A., Associate Professor of Political Science  
721 7th St. S. E.  
WILLIAM R. APPLEBY, M.A., Professor of Metallurgy  
928 5th St. S. E.  
RICHARD O. BEARD, M.D., Associate Professor of Physiology  
University of Minnesota  
GEORGE N. BAUER, Ph.D., Professor of Mathematics  
1115 E. River Road  
EDGAR D. BROWN, Ph.D., M.D., Associate Professor of Pharmacology  
3525 3d Ave. S.  
OSCAR C. BURKHARD, M.A., Assistant Professor of German  
719 E. River Road  
FREDERIC K. BUTTERS, B.S., B.A., Assistant Professor of Botany  
815 7th St. S.  
PETER CHRISTIANSON, B.S., E.M., Professor of Metallurgy  
217 Union St. S. E.  
FREDERIC E. CLEMENTS, Ph.D., Professor of Botany 800 4th St. S. E.  
LOUIS J. COOKE, M.D., Director of the Gymnasium 909 6th St. S. E.  
IRA H. DERBY, Ph.D., Assistant Professor of Chemistry  
2157 Commonwealth Ave., St. Paul  
HAL DOWNEY, Ph.D., Associate Professor of Animal Biology  
802 4th St. S. E.  
E. DANA DURAND, Ph.D., Professor of Economics 915 6th St. S. E.  
J. FRANKLIN EBERSOLE, M.A., Assistant Professor of Economics  
312 State St. S. E.  
WILLIAM H. EMMONS, Ph.D., Professor of Geology and Mineralogy  
719 7th St. S. E.  
HENRY A. ERIKSON, Ph.D., Professor of Physics 424 Harvard St. S. E.  
JOHN J. FLATHER, Ph.B., M.M.E., Professor of Mechanical Engineering  
315 11th Ave. S. E.  
DANIEL FORD, M.A., Assistant Professor of Rhetoric  
619 13th Ave S. E.  
FRANCIS C. FRARY, Ph.D., Assistant Professor of Chemistry  
305 Walnut St. S. E.  
JOHN H. GRAY, Ph.D., Professor of Economics 412 Walnut St. S. E.  
FRANK F. GROUT, M.S., Assistant Professor of Mineralogy  
623 13th Ave. S. E.

## SCHOOL OF CHEMISTRY

- ROBERT A. HALL, Ph.D., Assistant Professor of Pharmacology  
323 6th Ave. S. E.
- EVERHART P. HARDING, Ph.D., Associate Professor of Chemistry  
1316 7th St. S. E.
- ARTHUR D. HIRSCHFELDER, B.S., M.D., Professor of Pharmacology  
906 5th St. S. E.
- SAMUEL L. HOYT, E.M., Ph.D., Assistant Professor of Metallurgy  
715 University Ave. S. E.
- NED L. HUFF, M.A., Assistant Professor of Botany  
1219 7th St. S. E.
- WILLIAM H. HUNTER, Ph.D., Assistant Professor of Chemistry  
112 Church St. S. E.
- WILLIAM H. KAVANAUGH, M.E., Professor of Experimental Engineering  
124 State St. S. E.
- WILLIAM H. KIRCHNER, B.S., Professor of Drawing and Descriptive  
Geometry  
722 10th Ave. S. E.
- ALOIS F. KOVARIK, Ph.D., Associate Professor of Physics  
604 11th Ave. S. E.
- WINFORD P. LARSON, M.D., Assistant Professor of Pathology, Bacteri-  
ology, and Public Health  
614 9th Ave. S. E.
- BERNARD LENTZ, Professor Military Science and Tactics  
1318 7th St. S. E.
- ELIAS P. LYON, Ph.D., M.D., Dean, Professor of Physiology  
421 Union St. S. E.
- LOUIS W. MCKEEHAN, Ph.D., Assistant Professor of Physics  
1512 Brook Ave. S. E.
- JOHN V. MARTENIS, M.E., Assistant Professor of Mechanical Engineer-  
ing  
206 Harvard St. S. E.
- THOMAS WARNER MITCHELL, Ph.D., Assistant Professor of Economics  
2349 Bourne Ave., St. Paul
- WALTER R. MYERS, Ph.D., Assistant Professor of German  
1629 University Ave. S. E.
- HENRY F. NACHTRIEB, B.S., Professor of Animal Biology  
905 6th St. S. E.
- EDWARD E. NICHOLSON, M.A., Assistant Professor of Chemistry  
914 7th St. S. E.
- J. ANNA NORRIS, M.D., Director of Physical Education for Women  
1005 University Ave. S. E.
- SIDNEY F. PATTISON, M.A., Assistant Professor of Rhetoric  
314 University Ave. S. E.
- LEVI B. PEASE, M.S., Professor of Metallurgy  
1070 16th Ave. S. E.
- ANNA H. PHELAN, Ph.D., Assistant Professor of Rhetoric  
612 10th Ave. S. E.
- FRANK B. ROWLEY, B.S., M.E., Assistant Professor of Drawing  
217 Beacon St. S. E.
- WILLIAM T. RYAN, E.E., Assistant Professor of Electrical Engineering  
3228 4th St. S. E.
- WILLIAM A. SCHAPER, Ph.D., Professor of Political Science  
625 Fulton St. S. E.



- CARL SCHLENKER, B.A., Professor of German 514 11th Ave. S. E.  
 FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Associate Professor of Physiology  
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 S. CARL SHIPLEY, B.S., M.E., Assistant Professor of Machine Construction 1517 E. River Road  
 CHARLES F. SHOOP, B.S., Assistant Professor of Experimental Engineering 108 Beacon St. S. E.  
 CHARLES F. SIDENER, B.S., Professor of Chemistry 1320 5th St. S. E.  
 CHARLES P. SIGERFOOS, Ph.D., Professor of Zoology 1023 University Ave. S. E.  
 MARGARET SWEENEY, Ph.D., Professor of Rhetoric 424 5th Ave. S. E.  
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 ANTHONY L. UNDERHILL, Ph.D., Assistant Professor of Mathematics 615 6th St. S. E.  
 M. RUSSELL WILCOX, M.D., Assistant Professor of Physiology 802 Donaldson Bldg.  
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 ROSS ALLEN BAKER, Ph.D., Instructor in Chemistry 429 8th Ave. S. E.  
 FRANK W. BLISS, M.A., Instructor in Chemistry 1016 17th Ave. S. E.  
 LILLIAN COHEN, Ph.D., Instructor in Chemistry 415 E. 14th St.  
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 ROBERT W. FRENCH, B.S., Instructor in Drawing 1018 16th Ave. S. E.  
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 HARRY G. HAYES, Ph.D., Instructor in Economics 422 4th St. S. E.  
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 A. WALFRED JOHNSTON, M.A., Instructor in Geology 112 Church St. S. E.  
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Chemistry 209 State St. S. E.
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1309 7th St. S. E.
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- VALERIA LADD, B.A., Instructor in Physical Education for Women
- J. F. McCLENDON, Ph.D., Instructor in Physiology 1307 6th St. S. E.
- FRANKLIN R. McMILLAN, C. E., Instructor in Experimental Engineering  
321 Oak St. S. E.
- WALLACE H. MARTIN, M.E., Instructor in Mechanical Engineering  
1475 Cleveland Ave., St. Paul
- LILLIAN L. NYE, M.A., Instructor in Chemistry 1625 7th St. S. E.
- PETER E. PETERSON, Instructor in Foundry Practice 3709 Clinton Ave.
- C. J. V. PETTIBONE, Ph.D., Instructor in Physiology and Physiologic  
Chemistry 112 Church St. S. E.
- EARL PETTIJOHN, M.S., Instructor in Chemistry 2282 Carter Ave., St. Paul
- FREDERICK POPPE, M.S., Instructor in Chemistry 1110 7th St. S. E.
- EDWARD P. QUIGLEY, Instructor in Forge Work 2923 Chicago Ave.
- EDITH J. RAYNOR, Instructor in Physical Education for Women
- WILLIAM H. RICHARDS, Instructor in Shop Work 1423 W. 27th St.
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314 University Ave. S. E.
- EDGAR K. SOPER, M.A., Instructor in Economic Geology  
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3345 University Ave. S. E.
- EARLE K. STRACHAN, Ph.D., Instructor in Chemistry  
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1758 Blair St. St. Paul
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- HELEN A. WHITNEY, M.A., Instructor in Rhetoric 619 13th Ave. S. E.
- RICHARD WISCHKAEMPER, M.A., Instructor in German  
504 Beacon St. S. E.

## GENERAL INFORMATION

The School of Chemistry is now housed in the new fireproof laboratory. The building is located on the main axis of the new campus. It contains about one hundred and fifty rooms devoted to various lines of chemical work. The general, qualitative, and quantitative laboratories are of special interest. Each is well equipped and large enough to accommodate approximately six hundred students. There are also organic laboratories, and several suites of rooms devoted to industrial (including photography), technological and research work. The laboratory contains a good working chemical library and a growing technological museum.

The School of Chemistry offers three courses. Two of these, the Analytical and the five-year course in Arts and Chemistry, offer the student a thoro training in pure chemistry and the allied sciences—aiming to lay a broad foundation for a later more specialized training. They prepare the student for work as a graduate assistant or as instructor in a college, for scientific positions in the state and government service, and for analytical and research positions; the type of position which the graduate is fitted to occupy being dependent upon his personality and ability.

The four-year Analytical Course leads to the degree of Bachelor of Science in Chemistry, while the five-year course leads to the degree of Bachelor of Arts after four years, and Bachelor of Science in Chemistry at the end of the fifth.

The third or Applied Course extends over five years, leading to the degree of Bachelor of Science at the end of four years and Chemical Engineer at the end of the fifth. The course aims to fit the student to take a position in the manufacturing department of a chemical industry, and give him the fundamental knowledge upon which he may build his success. It is becoming more and more the practice in the chemical industries to fill the higher positions from the men who have had a chemical engineering training or its equivalent.

Shevlin Fellowship.—Through the generosity of Mr. Thomas H. Shevlin, \$500 per annum has been donated for the establishment of a fellowship in Chemistry. Any graduate from a reputable college who has specialized in chemistry, and who is able to pursue research work successfully, is eligible. The holder of this fellowship is not required to do any teaching or to pay fees to the University, but is expected to devote all his time to study and research. Applications should be received by March 15.

Assistants.—The School of Chemistry now employs nine assistants at \$500 per annum, who are supposed to give from 12-15 hours per week to the teaching of chemistry. The object of these assistantships is to

provide the departments with efficient assistance, especially in connection with large laboratory classes; and to give the assistants as wide an experience as possible in teaching under competent direction. In addition to the teaching each assistant is expected to pursue some line of research whether or not he is working for a higher degree.

School of Chemistry Society.—The School of Chemistry Society is an organization of students of the school which meets once a month to consider topics of general interest. The society also occasionally procures lecturers to deliver addresses, which are open to the public.

American Chemical Society.—A local section of the American Chemical Society has been organized in Minnesota with headquarters at the University. All students interested are cordially invited to attend its meetings.

The following rule of the College of S. L. and A. applies to candidates for the B.A. degree in the Five-Year Course in Arts and Chemistry: "Requirements for graduation are expressed in credit hours, indicating amount of work; and in honor points, indicating grade of work. Honor points are computed as follows: each credit hour with the grade of A carries three honor points; each credit hour with the grade of B, two honor points; each credit hour with the grade of C, one honor point."

In all these courses a credit is such an amount of work as will require three hours a week of a student's time. One hour of recitation is assumed to require two hours of preparation at home. In the case of laboratory work which does not require outside preparation, three hours of work count for one credit. The credit allowed for lectures varies from one-third to one credit a lecture a week, depending on the amount of outside preparation required of the student for the lecture.

Figures following the descriptive name of a course indicate the number of credits.

#### EXPLANATION OF COURSE NUMBERS

Odd numbers indicate first-semester courses; even numbers, second-semester courses. A combination of the two (e. g., 5-6) indicates courses continuing through the year. In the case of courses repeated the second semester, the suffix *a* indicates first semester; the suffix *b*, second semester.

## COURSES OF STUDY

### ANALYTICAL CHEMISTRY

#### FRESHMAN YEAR

Chemistry 5-6, General and Analytical, 6  
Drawing 21-22, Technical, 4  
Mathematics 2a and 9b, Algebra, Trigonometry, and Analytical Geometry,  
10  
Geology 21, Elements of Mineralogy, 3 (first semester)  
\*Metallurgy 2, Assaying, 4 (second semester)  
Rhetoric 1-2, Rhetoric and Composition, 6  
Military Drill, three hours.  
Physical Education for Men, one hour (first semester only)  
or  
Physical Education for Women, three hours

#### SOPHOMORE YEAR

Animal Biology, 1-2, General Zoology, 6  
or  
Botany 1-2, General, 6  
or  
Mathematics 11a and 51b, Calculus, 6  
Chemistry 9, Inorganic Preparations, 2 (first semester)  
Chemistry 10, Glass Blowing, 1 (second semester)  
Chemistry 11-12, Quantitative Analysis, 8  
German 1-2 or 5-6 or 21-22, 12 or 6  
Physics, 1-2, General, 6  
Physics 3-4, Laboratory, 2  
Military Drill, three hours.

#### JUNIOR YEAR

##### *First Semester*

†Chemistry 15, Photochemistry, 2  
Chemistry 23, Iron and Steel Analysis, 2  
Chemistry 35, Organic Chemistry, 4  
Chemistry 121, Physical, 2  
Chemistry 123, Physico-chemical Laboratory, 1  
Geology 1, General, 3  
‡Metallurgy 3, General and Iron, 3

\*Women must take Geology 22 instead of Metallurgy 2.

†During the junior and senior years the student, if prepared, has the privilege of specializing for not less than two semesters along one of the following lines: Organic Chemistry, Physical Chemistry, Analytical Chemistry, Applied Chemistry, Phytochemistry, Physiological Chemistry, Geochemistry, Bromatology.

‡These courses are not open to women. An elective may be taken in any science, with the approval of the Student's Work Committee.

*Second Semester*

Chemistry 106, Mineral and Ore Analysis, 2  
 Chemistry 36, Organic, 4  
 †Chemistry 114, Organic Analysis, 3  
 Chemistry 122, Physical, 2  
 Chemistry 124, Physico-chemical Laboratory, 1  
 Chemistry 144, Electrochemistry, 2  
 ‡Metallurgy 4, Wrought Iron and Steel, 3

## SENIOR YEAR

*First Semester*

Chemistry 17, Inorganic Colloquium, 2  
 Chemistry 109, Water Analysis, 1  
 Chemistry 131, Food Analysis, 2  
 Chemistry 135, Gas and Coal Analysis, 2  
 Chemistry 141, Industrial, 3  
 †Chemistry 143, Sugar, 1  
 ††Metallurgy 105, Base Metals, 4  
 Thesis, 2

*Second Semester*

Chemistry 18, Organic Colloquium, 2  
 Chemistry 132, Food Analysis, 2  
 †Chemistry 134, Microchemistry, 1  
 Chemistry 162, History, 2  
 ††Metallurgy 106, Precious Metals, 4  
 or  
 Bacteriology 58, General, 4  
 Thesis, 5

## FIVE-YEAR COURSE IN ARTS AND CHEMISTRY

## FRESHMAN, SOPHOMORE, AND JUNIOR YEARS

During the first three years of the course the student is registered in the College of Science, Literature, and the Arts, and subject to its rules. (See Bulletin of the College of Science, Literature, and the Arts.) In order to obtain the degree of Bachelor of Arts at the end of his fourth year and Bachelor of Science in Chemistry at the end of the fifth, he must

†During the junior and senior years the student, if prepared, has the privilege of specializing for not less than two semesters along one of the following lines: Organic Chemistry, Physical Chemistry, Analytical Chemistry, Applied Chemistry, Phytochemistry, Physiological Chemistry, Geochemistry, Bromatology.

‡Not open to women. An elective may be taken in any science with the approval of the Student's Work Committee.

complete at least ninety credit hours, including fifteen credit hours in starred courses, in the College of Science, Literature, and the Arts during the first three years. These ninety credits must embrace the following subjects and groups of subjects. (For definition of terms and groups, see Bulletin of the College of Science, Literature, and the Arts.)

(1) A minor of at least eighteen credits in Group A of the College of Science, Literature, and the Arts, six credits of this to be Rhetoric 1-2, and at least twelve credits of it to be in German.

(2) A minor of eighteen credits or more in Group B of the College of Science, Literature, and the Arts.

(3) The following courses:

General Chemistry and Qualitative Analysis, or equivalent

Quantitative Analysis, one year

Technical Drawing, 21-22, one year

Geology 21, one semester

\*Metallurgy 2 (men) or Geology 22 (women), one semester

Biological Science, one year

General Physics with laboratory work, one year

Mathematics, ten credits

Glass Blowing, one credit

#### SENIOR YEAR

During his fourth year he must complete the work required in the junior year of the Analytical Course of the School of Chemistry, and during the four years he must earn 120 honor points (see page 10)

The degree of Bachelor of Arts is voted by the College of Science, Literature, and the Arts at the end of the fourth year, when the student must present a total of not less than one hundred and twenty approved credits, including the two minors above mentioned and at least fifteen credits in courses starred in the Bulletin of the College of Science, Literature, and the Arts. Credits in professional work taken during the fourth year are accepted provided such work has a prerequisite of at least two years of college work.

In this way the student has at the end of the fourth year completed practically all of the required work of the first three years in the School of Chemistry, and also such other work as will enable him to fulfill the requirements for the B.A. degree.

#### POST-SENIOR YEAR

The fifth year is the same as the fourth year of the course in Analytical Chemistry, and upon its completion he will be entitled to the degree of Bachelor of Science in Chemistry.

\*Not open to women, who will take Geology 22 instead of Metallurgy 2.

## \*APPLIED CHEMISTRY

## FRESHMAN YEAR

Chemistry 5-6, General and Analytical, 6  
 Drawing 1, Freehand, 2 (first semester)  
 Drawing 2, Mechanical, 2 (second semester)  
 Drawing 3 and 4, Descriptive Geometry, 4  
 Mathematics 2a and 9b, Algebra, Trigonometry, and Analytical Geometry,

10

Geology 21, Elements of Mineralogy, 3 (first semester)  
 Metallurgy 2, Assaying, 4 (second semester)  
 Rhetoric 1-2, Rhetoric and Composition, 6  
 Military Drill, three hours

## SOPHOMORE YEAR

Chemistry 11-12, Quantitative Analysis, 8  
 Drawing 7-8, Drafting, 4  
 Mathematics 11a and 51b, Calculus, 6  
 Mechanical Engineering 1-2, Elementary Shop Practice, 4  
 Physics 7-8, General Physics for Engineers, 8  
 Physics 9-10, General Laboratory Practice for Engineers, 2  
 Military Drill, three hours

## JUNIOR YEAR

Chemistry 10, Glass Blowing, 1 (second semester)  
 Chemistry 35-36, Organic, 8  
 Chemistry 106, Mineral and Ore Analysis, 2 (second semester)  
 German 1-2 or 5-6 or 21-22, 12 or 6  
 Physics 101-102, Dynamics, 6  
 Mechanical Engineering 3-4, Pattern Making, Foundry and Machine Shop,  
 6  
 Mechanical Engineering 15, Mechanism and Kinematics, 4

## SENIOR YEAR

*First Semester*

Chemistry 23, Iron and Steel Analysis, 2  
 Chemistry 109, Water Analysis, 1  
 Chemistry 121, Physical, 2  
 Chemistry 123, Physico-chemical Laboratory, 1  
 †Geology 1, General, 3  
 Mechanical Engineering 115, Machine Design, 5  
 Metallurgy 3, General and Iron, 3

\*Not open to women.

†Students wishing to specialize in Electrochemistry, Gas Engineering, or Sugar Technology, may elect special subjects in place of subjects marked thus.



*Second Semester*

Chemistry 122, Physical, 2  
Chemistry 124, Physico-chemical laboratory, 1  
Chemistry 144, Electrochemistry, 2  
†Economics 1b, Elements, 3  
Mechanical Engineering 122, Steam Engine, 3  
Metallurgy 4, Wrought Iron and Steel, 3  
Political Science 1b, American Government, 3

## POST-SENIOR YEAR

*First Semester*

Chemistry 135, Gas and Coal Analysis, 2  
Chemistry 141, Industrial, 3  
Chemistry 143, Sugar, 1  
†Elective, 3 or 5  
Electrical Engineering 157, Electric Power, 3  
Mechanical Engineering 123, Steam Boilers, 1  
Thesis, 4 or 2

*Second Semester*

†Chemistry 132, Food Analysis, 3  
Chemistry 142, Industrial, 3  
Electrical Engineering 158, Electric Power, 3  
†Elective, 2 or 3  
Political Science 26, Commercial Law, 2  
Thesis, 4

†Students wishing to specialize in Electrochemistry, Gas Engineering, or Sugar Technology, may elect special subjects in place of subjects marked thus.

## DEPARTMENTAL STATEMENTS

### CHEMISTRY

Professors GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Associate Professor EVERHART P. HARDING; Assistant Professors IRA H. DERBY, FRANCIS C. FRARY, WILLIAM H. HUNTER, EDWARD E. NICHOLSON; Instructors ROSS ALLEN BAKER, FRANK W. BLISS, LILLIAN COHEN, J. GERHARD DIETRICHSON, WOLF KRITCHEVSKY, LILLIAN L. NYE, EARL PETTIJOHN, FREDERICK W. POPPE, WOLDEMAR STERNBERG, EARLE K. STRACHAN, STERLING TEMPLE; Assistants CURTIS W. APPELBY, R. D. MAY, WILLIAM METHLEY, H. A. MURTA, A. T. NEWMAN, ADOLPH NIETZ, A. O. UTNE.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Division of General and Inorganic Chemistry</i>				
1-2.	General Chemistry .....	6	Those entering without Chemistry	None
21-22.	Inorganic and Qual. Chem.	10	Those entering without Chemistry	None
3-4.	Adv. Gen. Chem. and Qual. Anal. ....	6	Fr., soph., jr.	Entrance credit in Chemistry
5-6.	Gen. and Anal. Chem. ....	6	Fr. in Chemistry and Mines	Entrance credit in Chemistry
7-8.	Qualitative Analysis.....	6	Soph., jr., sr.	1-2
9.	Inorganic Preparations....	2	Soph., jr.	3-4, 5-6, 7-8, or 21-22
10.	Glass Blowing .....	1	Soph., jr.	None
17.	Inorganic Colloquium.....	2	Sr.	11-12
20.	Teachers' Course.....	2	Jr., sr.	3-4, 5-6, 7-8, or 21-22
161.	Chemical Literature.....	1	Sr., grad.	3-4, 5-6, 7-8, or 21-22, 35-36
162.	History of Chemistry.....	2	Sr., grad.	35-36
169-170.	Chemistry of the Rare Elements .....	4	Jr., sr., grad.	11-12
<i>Division of Analytical Chemistry</i>				
11-12.	Quantitative Analysis ....	8	Soph., jr., sr.	3-4, 5-6, 7-8, or 21-22
23.	Iron and Steel Analysis...	2	Jr., sr.	11-12
25.	Ore and Slag Analysis....	3	Sr. in Mines	23
106.	Mineral and Ore Analysis.	2	Jr., sr., grad.	11-12
107-108.	Adv. Quantitative Analysis	4 or 6	Sr., grad.	23
109.	Water Analysis .....	1	Sr., grad.	11-12

No.	Title	Credits	Offered to	Prereq courses
<i>Division of Organic Chemistry</i>				
	18. Organic Colloquium .....	2	Sr.	35-36
35-36.	Organic Chemistry.....	8	Soph., jr., sr.	3-4 or 7-8
113.	Toxicology .....	2	Sr., grad.	35-36
114.	Organic Analysis.....	3	Jr., sr., grad.	35-36
115.	Adv. Organic Chemistry...	2	Sr., grad.	35-36
116.	Theoretical Organic Chem.	2	Sr., grad.	35-36
117.	Coal Tar Dyes.....	2	Sr., grad.	35-36
118.	Chemistry of the Essential Oils .....	2	Sr., grad.	35-36
119.	Chemistry of the Newer Medicinal Compounds...	2	Sr., grad.	35-36
<i>Division of Physical Chemistry</i>				
121-122.	Physical Chemistry.....	4	Jr., sr., grad.	11-12
123-124.	Physico-chemical Lab....	2	Jr., sr., grad.	See statement
125-126.	Adv. Physical Chemistry...	6	Sr., grad.	121-122
128.	Radiochemistry .....	2	Jr., sr., grad.	7-8 or 11-12
129-130.	Adv. Physico-chemical Lab- oratory .....	3 to 6	Sr., grad.	123-124
171-172.	Solutions .....	4	Sr., grad.	121-122, 123-124
<i>Division of Technological Chemistry</i>				
27-28.	Chemistry in Every Day Life .....	4	Jr., sr.	3-4, 7-8 or 21-22
131.	Food Analysis .....	2	Sr., grad.	11-12
132.	Food Analysis .....	2	Sr., grad.	11-12
134.	Microchemistry .....	1	Sr., grad.	11-12
135.	Gas and Coal Analysis....	2	Sr., grad.	11-12
137.	Paint Analysis .....	2	Sr., grad.	11-12
<i>Division of Industrial Chemistry</i>				
15.	Photochemistry .....	2	Jr., sr.	3-4, 5-6, 7-8 or 21-22
16.	Color Photography.....	2	Jr., sr.	15
141.	Industrial Chemistry.....	3	Sr., grad.	11-12
142.	Industrial Chemistry.....	3	Sr., grad.	35-36, 141
143.	Sugar Chemistry.....	1	Sr., grad.	35-36
144.	Electrochemistry .....	2	Jr., sr., grad.	11-12
145.	Electric Furnaces.....	2	Jr., sr., grad.	11-12
147.	Electrochemical Prepara- tions .....	2	Jr., sr., grad.	11-12, 35-36
153.	Elements of Photo-engrav- ing .....	2	Sr., grad.	15
154.	Adv. Photoengraving.....	2	Sr., grad.	153
155.	Wood Chemistry.....	2	Jr., sr., grad.	35-36
156.	Wood Pulp Technology....	2	Jr., sr., grad.	155

#### DIVISION OF GENERAL AND INORGANIC CHEMISTRY

- 1-2. GENERAL CHEMISTRY. Includes a study of the metallic and non-metallic elements, with a brief introduction to organic chemistry. COHEN and Assistants.
- 3-4. ADVANCED GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS. Lectures and laboratory work. A discussion of the general chemical theories and laws, with qualitative analysis. FRANKFORTER, DIETRICHSON, and Assistants.

- 5-6. GENERAL AND ANALYTICAL CHEMISTRY. An introduction to descriptive, physical, and metallurgical chemistry and qualitative analysis. TEMPLE and Assistants.
- 7-8. QUALITATIVE ANALYSIS. Includes the general reactions of the metals and acids with their qualitative separation. Besides this mechanical work, the ionic theory and the law of mass action are discussed with special reference to common qualitative reactions. NICHOLSON, BLISS, and Assistants.
9. INORGANIC PREPARATIONS. The preparation of inorganic salts supplemented by Thorpe's *Inorganic Preparations*. HARDING.
10. GLASS BLOWING. Includes the methods used in the construction and repair of simple glass apparatus. FRARY.
17. COLLOQUIUM IN INORGANIC CHEMISTRY. A thoro quiz in inorganic chemistry. DIETRICHSON.
20. TEACHERS' COURSE. Offered to those who are interested in the teaching of chemistry. COHEN.
- 21-22. INORGANIC AND QUALITATIVE CHEMISTRY. This includes a study of the non-metals, metals and qualitative analysis, together with a thoro discussion of the fundamental laws and theories of chemistry. COHEN.
161. CHEMICAL LITERATURE. The course aims to familiarize the students with chemical literature and will include required reading, reports, and bibliographical work. KRITCHEVSKY.
162. HISTORY OF CHEMISTRY. Includes a full discussion of alchemy and chemistry. COHEN.
- 169-170. CHEMISTRY OF THE RARE ELEMENTS. The descriptive chemistry of the rare elements and their analytical separation. NICHOLSON.

## DIVISION OF ANALYTICAL CHEMISTRY

- 11-12. QUANTITATIVE ANALYSIS. Includes a general discussion of quantitative methods, with laboratory work in gravimetric analysis, first semester, followed by a discussion of standard solutions and the necessary stoichiometric calculations, with laboratory work in volumetric analysis, second semester. SIDENER, PETTIJOHN, STERNBERG, and Assistants.
23. IRON AND STEEL ANALYSIS. Includes technical methods for the determination of the common constituents of iron ores, iron and steel, with training in rapid work. SIDENER, PETTIJOHN, STERNBERG.
25. ORE AND SLAG ANALYSIS. Rapid technical methods for the determination of certain constituents in ores and slags. SIDENER, PETTIJOHN, STERNBERG.

106. MINERAL AND ORE ANALYSIS. Theory and practice in accurate analysis of silicate rocks, and the rapid determination of certain constituents of ores. SIDENER.
- 107-108. ADVANCED QUANTITATIVE ANALYSIS. The work in this course will be adapted as far as possible to the needs and desires of the individual student. SIDENER.
109. WATER ANALYSIS. The course includes an exhaustive discussion of the chemical and sanitary properties of water. FRANKFORTER.

## DIVISION OF ORGANIC CHEMISTRY

18. COLLOQUIUM IN ORGANIC CHEMISTRY. A thoro quiz in general organic chemistry. FRANKFORTER.
- 35-36. ORGANIC CHEMISTRY. Includes the aliphatic and the aromatic series, with the preparation of the more important compounds. FRANKFORTER, KRITCHEVSKY, and Assistants.
113. GENERAL TOXICOLOGY. A discussion of the chemistry of the various poisonous compounds, both organic and inorganic; also methods of their isolation from animal tissue, together with tests for same. FRANKFORTER.
114. ORGANIC ANALYSIS. Practice in elementary analysis, determination of special groups, and identification of pure compounds. HUNTER.
115. ADVANCED ORGANIC CHEMISTRY. Treats in a detailed manner of the general reactions of organic chemistry, such as substitutions, condensations, etc. HUNTER.
116. THEORETICAL ORGANIC CHEMISTRY. This course will take up theories which apply especially to carbon compounds, such as relation of properties to constitution, carbon valence, theory, etc. HUNTER.
117. THE COAL-TAR DYES. The chemistry of the coal-tar dyes and their intermediate products. KRITCHEVSKY.
118. THE CHEMISTRY OF THE ESSENTIAL OILS. A discussion of the constituents of the essential oils, including the terpenes and perfumes. FRANKFORTER.
119. CHEMISTRY OF THE NEWER MEDICINAL COMPOUNDS. Includes a discussion of the chemistry of synthetic organic substances which have medicinal properties. (Continued in Pharmacology second semester.) FRANKFORTER, HUNTER.

## DIVISION OF PHYSICAL CHEMISTRY

- 121-122. PHYSICAL CHEMISTRY. A consideration of the theories and laws, phenomena and processes which form the basis of chemical science. Charts, models, and experiments are employed to supplement and

illustrate the discussions. Open only to those who have had or are taking Course 35-36. DERBY.

- 123-124. **PHYSICO-CHEMICAL LABORATORY.** Physico-chemical methods and measurements. Open only to students pursuing Course 121-122, or who have had it or its equivalent. DERBY.
- 125-126. **ADVANCED PHYSICAL CHEMISTRY.** The theories of chemistry treated systematically from the standpoint of thermo-dynamics and the molecular theory. Suited to the needs of candidates for the higher degrees and all others interested in the advances of modern physical chemistry. STRACHAN.
128. **RADIOCHEMISTRY.** The occurrence, methods of isolation and investigation, and physico-chemical properties of the radioactive substances, together with a brief consideration of the chemical, geological, and biological bearing of the subject. DERBY.
- 129-130. **ADVANCED PHYSICO-CHEMICAL LABORATORY.** Advanced measurements in physical chemistry adapted to the desires and qualifications of the individual student. Assigned reading will accompany the experimental work. DERBY.
- 171-172. **SOLUTIONS.** A systematic study of the phenomena and theories of solution, including the solution process, diffusion, osmosis, electrical properties, etc., with their various applications to other sciences. DERBY.

#### DIVISION OF TECHNOLOGICAL CHEMISTRY

27. **CHEMISTRY IN EVERY DAY LIFE.** A discussion of the inorganic substances used in every day life. FRANKFORTER.
28. **CHEMISTRY IN EVERY DAY LIFE.** A discussion of the organic substances used in every day life. HARDING.
131. **FOOD ANALYSIS.** Includes the chemical analysis of the various food products and the detection of the common adulterants. HARDING.
132. **FOOD ANALYSIS.** Continuation of Course 131. HARDING.
134. **MICROCHEMISTRY.** Includes the precipitation, examination, and identification of minute quantities of substances, and the examination of food materials, fibers, etc., by means of the microscope. HARDING.
135. **GAS AND COAL ANALYSIS.** Comprises the methods of collecting and storing gases preliminary to their analysis; methods of manufacturing commercial gases, their chemical analysis, calorific and photometric; also ultimate and proximate analysis of coals and their calorific determination. HARDING.
137. **PAINT ANALYSIS.** Comprises the quantitative separation of pigments and vehicles; a chemical and physical examination of the

vehicles; and qualitative and quantitative analyses of the pigments.  
HARDING.

## DIVISION OF INDUSTRIAL CHEMISTRY

15. PHOTOCHEMISTRY. Includes a discussion of the general principles of photochemistry and their application to dry-plate photography and the ordinary printing processes. FRARY.
16. COLOR PHOTOGRAPHY. Theory and practice in the preparation and use of orthochromatic and panchromatic plates; photography in natural colors. FRARY.
141. INDUSTRIAL CHEMISTRY. Includes the discussion of methods and apparatus used in chemical technology, the testing of commercial chemical products, and excursions. FRARY.
142. INDUSTRIAL CHEMISTRY. Continuation of Course 141. FRARY.
143. SUGAR CHEMISTRY. Includes the technology of sugar manufacture. NICHOLSON.
144. ELECTROCHEMISTRY. A discussion of electro-analytical methods and industrial electrochemical processes, with their underlying principles. FRARY.
145. ELECTRIC FURNACES. Theory and practice in the design, construction, and operation of electric furnaces. FRARY.
147. ELECTROCHEMICAL PREPARATIONS. Theory and practice in the electrochemical preparation of organic and inorganic substances. FRARY.
153. ELEMENTS OF PHOTOENGRAVING. Includes a study of the preparation of wet plates, zinc etchings, and heliogravures. FRARY.
154. ADVANCED PHOTOENGRAVING. Includes the preparation of screen negatives and copper half-tones. FRARY.
155. WOOD CHEMISTRY. Includes a general survey of the chemistry of the carbohydrate group, special attention being given to the resins, the terpenes, cellulose and lignocellulose. FRANKFORTER.
156. WOOD PULP TECHNOLOGY. Preparation of the various wood products, as pure cellulose, commercial wood pulp and paper. Special attention will also be given to factory control of these processes. FRARY.

## COURSES OPEN TO GRADUATE STUDENTS

- 201-202. Research Work in Quantitative Analysis. SIDENER.
- 203-204. Research Work in Inorganic Chemistry. FRANKFORTER.
- 205-206. Research Work in Organic Chemistry. FRANKFORTER.
- 207-208. Research Work in Organic Chemistry. HUNTER.
- 209-210. Research Work in Organic Chemistry. KRITCHEVSKY.

- 211-212. Research Work on the Rare Elements. NICHOLSON.  
 213-214. Research Work in Physical Chemistry. DERBY.  
 215-216. Research Work in Physical Chemistry. STRACHAN.  
 217-218. Research Work on Foods. HARDING.  
 219-220. Research Work on Fuels. HARDING.  
 221-222. Research Work in Industrial Chemistry. FRARY.  
 223-224. Research Work in Electrochemistry. FRARY.  
 225-226. Research Work in Photochemistry. FRARY.

## ANIMAL BIOLOGY

Professors HENRY F. NACHTRIEB, CHARLES P. SIGERFOOS; Associate Professor HAL DOWNEY; Instructor GEORGE DELVIN ALLEN.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
1-2.	General Zoology.....	6	Fr., soph.	None
7-8.	Histology and Embryology...	6	Fr., soph.	1-2
12.	Histological Technique.....	3	Fr., soph.	7
15-16.	General Physiology.....	6	Fr., soph.	1-2

- 1-2. **GENERAL ZOOLOGY.** A survey of the animal kingdom, emphasizing the principles of structure, physiology, embryology, classification, and evolution of animals. Textbooks, lectures, quizzes, and laboratory work. SIGERFOOS, ALLEN.
- 7-8. **HISTOLOGY AND EMBRYOLOGY.** A comparative microscopic study of the origin and structure of the tissues of vertebrates and invertebrates, and of the organs of mammals. A preparatory course for most of the advanced courses. Textbook, lectures, and laboratory. DOWNEY and Assistant.
12. **HISTOLOGICAL TECHNIQUE.** Practical work in the preparation of histological and embryological material. DOWNEY.
- 15-16. **GENERAL PHYSIOLOGY.** The functional characteristics of living substance as seen in the cell, tissues, organs, and organisms; theories of the origin of life and death. Textbook, lectures, demonstrations, and laboratory. NACHTRIEB and Assistant.

For other and more advanced courses, see the Bulletin of the College of Science, Literature, and the Arts.

## BOTANY

Professors FREDERIC E. CLEMENTS, CARL OTTO ROSENDAHL, JOSEPHINE E. TILDEN; Assistant Professors HERBERT F. BERGMAN, FREDERIC K. BUTTERS, NED L. HUFF; Instructors DONALD FOLSOM, FRANCES L. LONG, HARVEY STALLARD, J. E. WEAVER.



COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a.	General Botany .....	3	All	None
1b.	General Botany .....	3	All	None
2.	Structural Botany .....	3	All	1 or 3 a
4.	Field and Garden Botany....	3	All	1 or 3 a
<i>Intermediate Courses</i>				
7-8.	Taxonomy .....	3 or 6	Soph., jr., sr.	6 credits: see note under course
9-10.	Physiology and Ecology.....	3 or 6	Soph., jr., sr.	6 credits
11-12.	Industrial Botany .....	3 or 6	Soph., jr., sr.	6 credits, including 2 or 3

INTRODUCTORY COURSES

- 1a. GENERAL BOTANY. A study of the external form and organs of flowering plants, root, stem, leaf, fruit and seed, and of their relations to each other, together with simple greenhouse experiments to illustrate the various functions. CLEMENTS, BUTTERS, HUFF, BERGMAN, FOLSOM, LONG, STALLARD.
- 1b. GENERAL BOTANY. Same as Course 1a.
2. STRUCTURAL BOTANY. A study of the microscopic structure of flowering plants, the cell, tissues and tissue systems, as seen in the root, stem, leaf, etc. BUTTERS, STALLARD.
4. FIELD AND GARDEN BOTANY. Greenhouse, garden and field study of the form, behavior, naming and relationships of flowering plants, together with individual problems in the pollination, reproduction and propagation of common flower types. CLEMENTS, FOLSOM, LONG.

*Intermediate Courses*

Either semester of the following courses open to students with the proper prerequisites.

- 7-8. TAXONOMY. 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. Course 8 (but not 7) open to those who have taken Course 4. ROSENDAHL.
- 9-10. PHYSIOLOGY AND ECOLOGY. Greenhouse and field study of physical factors and plant responses, absorption, transport, water, loss, nutrition, growth, fertilization, reproduction, and adaptation: field study of habitat, migration, competition, invasion, and succession. CLEMENTS, WEAVER.
- 11-12. INDUSTRIAL BOTANY. Laboratory study of the plants which are useful to man, including those which furnish food, shelter, clothing, etc. TILDEN.

## DRAWING AND DESCRIPTIVE GEOMETRY

Professor WILLIAM H. KIRCHNER; Assistant Professor FRANK B. ROWLEY; Instructors ROBERT W. FRENCH, LYALL DECKER.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
1-2.	Engineering Drawing.....	8	Fr.	See statement
3-4.	Descriptive Geometry.....	8	Fr.	See statement
7-8.	Drafting .....	6	Soph.	1-2, 3-4
21-22.	Technical Drawing.....	4	All	None

1-2 ENGINEERING DRAWING. The elements of general drafting. Mechanical drawing as a language. Lines, views, sections, dimensions, standards, signs, abbreviations, and explanatory notes. Sketching, lettering, tracing, and blue-printing. Representation of details of machines and structures, and the interpretation of working drawings. Open to students in Mathematics 2 and 9 or equivalent. FRENCH, DECKER.

3-4. DESCRIPTIVE GEOMETRY. First semester: Introductory course; Systems of representation, methods, loci, and constructions. Second semester: Central projection and special cases; representation of lines, planes, and solids, and of their relations; tangencies, intersections, and development; recitations, lectures. Taken concurrently with Course 1-2. Open to students in Mathematics 2 and 9 or equivalent. KIRCHNER, ROWLEY.

7-8. DRAFTING. Graphics. Working drawings of machinery. Assembly drawings, outline drawings, diagrammatic drawings, lay-out drawings, and detail drawings. Instruction in drafting-room methods and systems. ROWLEY.

21-22. TECHNICAL DRAWING. Theoretical and practical graphics, the reading and making of working plans. Projection, sketching, lettering, conventions, renderings, and translations. KIRCHNER, FRENCH.

## ECONOMICS

Professors JOHN H. GRAY, E. DANA DURAND; Assistant Professors J. FRANKLIN EBERSOLE, THOMAS WARNER MITCHELL; Instructors LLOYD M. CROSGRAVE, H. G. HAYES, A.C. JAMES.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>General Courses</i>				
3a or 3b.	Elements of Economics.	3	Soph., jr., sr.	None
<i>Production</i>				
2a or 2b.	Industries and Commerce of the United States .....	3	Soph., jr., sr.	None
13.	Economic Geography of Foreign Countries.....	3	Soph., jr., sr.	3 credits

No.	Title	Credits	Offered to	Prereq. courses
<i>Business Administration</i>				
34.	Business Management...	3	Soph., jr., sr.	3
35-36.	Accounting Principles...	6†	Soph., jr., sr.	None
<i>Finance</i>				
43a or 43b.	Banking .....	3	Soph., jr., sr.	3
145.	The Modern Business Corporation .....	3	Jr., sr., grad.	6 credits inc. 3
146.	Public Utilities.....	3	Jr., sr., grad.	145

†Both semesters must be completed before credit is given for the first semester.

## GENERAL COURSES

3a or b. ELEMENTS OF ECONOMICS. A study of the principles that underlie the present industrial order with reference to present-day economic and social problems. HAYES, JAMES, and Assistants

## PRODUCTION

- 2a. INDUSTRIES AND COMMERCE OF THE UNITED STATES. Same as 2b, but given at the College of Agriculture. DURAND.
- 2b. INDUSTRIES AND COMMERCE OF THE UNITED STATES. Agricultural, mining, and manufacturing industries and internal and foreign commerce. Leading individual industries, geographical distribution, methods of organization, production and marketing, and relationships to one another. Textbook, lectures and assigned readings. DURAND.
13. ECONOMIC GEOGRAPHY OF FOREIGN COUNTRIES. Economic basis of modern civilization; localization of industries; principal extractive, manufacturing, and distributive industries of leading foreign countries, especially markets for American manufacturers. Textbook with lectures and special reports.

## BUSINESS ADMINISTRATION

34. BUSINESS MANAGEMENT. The principles of efficiency in business operation and forms of organization to apply them; the typical departments of a business; their functions, office organization and administration. Textbook, assigned readings, and lectures. MITCHELL.
- 35-36. 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; corporation accounts. A laboratory course with supplementary lectures. MITCHELL.

## FINANCE

- 43a or 43b. PRINCIPLES AND PRACTICE OF BANKING. Contemporary banking institutions, their organization and operation; loans, reserves, note issues, clearing houses, domestic and foreign exchange; the bank-

ing systems of foreign countries; and the Federal Reserve banks of the United States. EBERSOLE.

145. MODERN BUSINESS CORPORATION. The organizing, financing, and managing of corporations; the position of the corporation before the law; methods of accounting; the relation of the government to the corporation; the question of trusts in its various phases. GRAY.
146. PUBLIC UTILITIES. Economic and legal bases of classification, the relative advantages of public ownership and regulation. Central and municipal regulation compared. The basis of rates; relative rates; rates and service. Different theories of valuation. GRAY.

### ELECTRICAL ENGINEERING.

Professor GEORGE D. SHEPARDSON; Assistant Professor WILLIAM T. RYAN.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
157-158.	Electric Power .....	6	Sr.	Physics 11, 12

- 157-158. ELECTRIC POWER. An elementary study of the electrical problems involved in the generation, distribution, measurement, and utilization of power, supplemented by numerous practical problems. RYAN.

### EXPERIMENTAL ENGINEERING

Professor WILLIAM H. KAVANAUGH; Assistant Professor CHARLES FRANKLIN SHOOP; Instructor FRANKLIN R. McMILLAN.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
101.	Materials Testing Laboratory..	2	Sr., grad.	M. & M. 77
102.	Steam Laboratory.....	2	Sr., grad.	M. E. 20

101. MATERIALS TESTING LABORATORY. Investigation of the strength and physical properties of iron, steel, brass, copper, wood, belting, ropes, chains, cement, and concrete. Supplemented by lectures on the various materials of construction and standard methods of testing. KAVANAUGH, SHOOP, McMILLAN.
102. STEAM LABORATORY. Valve setting, indicator practice, calibration of gauges, calorimetry, efficiency of screws, hoists, and other machines. SHOOP.

### GEOLOGY AND MINERALOGY

Professor WILLIAM H. EMMONS; Assistant Professor FRANK F. GROUT;\*  
Instructors A. WALFRED JOHNSTON, EDGAR K. SOPER; Assistants  
THOMAS M. BRODERICK, JOHN P. GOLDSBERRY.

\*Absent on leave 1915-16.

No.	Title	Credits	Offered to	Prereq. courses
1.	General Geology.....	3	Soph., jr., sr.	None
3.	Laboratory Work.....	1	Soph., jr., sr.	With Course 1
5.	Economic Geology.....	3	Jr., sr.	1
6.	Historical Geology.....	3	Soph., jr., sr.	1
8.	Laboratory Work.....	1	Soph., jr., sr.	With Course 6
21.	Elements of Mineralogy....	3	Soph., jr., sr.	See statement
22.	Elements of Mineralogy....	3	Soph., jr., sr.	21
65.	Morphology of Minerals....	3	Jr., sr.	22
104.	Crystal Measurement.....	3	Jr., sr., grad.	65
105a.	Elements of Rock Study....	3	Jr., sr., grad.	See statement
105b.	Elements of Rock Study....	3	Jr., sr., grad.	See statement
106.	Petrology.....	3	Jr., sr., grad.	105
111.	Ore Deposits.....	4	Sr., grad.	6, 22, 105
112.	Problems in Ore Deposits....	2	Sr., grad.	111
124.	Structural and Metamorphic Geology.....	3	Sr., grad.	6, 22, 105

1. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic and structural geology, with a brief introduction to historical geology. Lectures, laboratory work, field excursions, map study, and conferences. EMMONS, JOHNSTON, BRODERICK.
3. LABORATORY WORK. Supplements Course 1 with study of rocks and ores, topographic and geologic maps, and reference reading. Open only to students taking Course 1. JOHNSTON, BRODERICK and Assistants.
5. 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. SOPER.
6. HISTORICAL GEOLOGY. The geological history of the North American continent; the more important types of fossils and their relations. EMMONS, SOPER.
8. HISTORICAL GEOLOGY LABORATORY WORK. The interpretation of geologic maps and sections; structural relations; study of fossils and rock specimens. Open only to students taking Course 6. JOHNSTON.
21. ELEMENTS 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. Open to students who have had or are taking Chemistry. BRODERICK, GOLDSBERRY.
22. ELEMENTS OF MINERALOGY. A continuation of Course 21, special attention being given to metalliferous and rock-forming minerals. Laboratory determinations and sight identification. The use of the goniometer and microscope. Laboratory work, reference reading, and field excursions. BRODERICK, GOLDSBERRY.

65. MORPHOLOGY OF MINERALS. Crystallography, embracing projection and the geometric relations of crystal planes; crystal nomenclature; the relation of optical properties to morphology. A study of crystal models, crystal drawing, identification of minerals from crystal measurements and mathematical calculation. GOLDSBERRY.
104. CRYSTAL MEASUREMENT. The measurement of crystal angles with the two-circle goniometer; gnomonic projection and crystal drawing; the mathematical and graphic determination of crystallographic constants; the determination of minerals by means of crystal measurements. GOLDSBERRY.
- 105a. 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 methods of identification and description of rocks. Lectures, text, and laboratory work. Open to students who have had Course 1, and who have had or are taking Course 22. BRODERICK.
- 105b. ELEMENTS OF ROCK STUDY. Same as Course 105a. BRODERICK.
106. PETROLOGY. The identification and study of minerals and rocks by optical methods; the study of igneous rocks, crystalline schists, and metamorphic rocks. The origin and classification of rocks. Laboratory work, lectures, and reference reading. BRODERICK, GOLDSBERRY.
111. 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. EMMONS, SOPER.
112. PROBLEMS IN ORE DEPOSITS. Field excursions, map work, lectures on field and laboratory methods. EMMONS, SOPER.
124. STRUCTURAL AND METAMORPHIC GEOLOGY. The conditions, processes, and results of metamorphism; structural features resulting from deformation under varying conditions of load. JOHNSTON.

### GERMAN LANGUAGE AND LITERATURE

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, WALTER R. MYERS; Instructors JAMES DAVIES, J. THEODORE GEISSEN-DOERFER, RICHARD WISCHKAEMPER.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
1-2.	Beginning .....	12†	All	None
21-22.	Scientific Intermediate.....	6†	All	1-2 or equivalent
5-6.	Prose and Poetry.....	6†	All	2 yrs. prep. German
23-24.	Advanced Scientific Reading.	6†	All	3-4 or 5-6 or 4 yrs. prep. German

†Both semesters must be completed before credit is given for either semester.

1-2. BEGINNING. Pronunciation, grammar, conversation, and composition; selected reading in easy prose and verse. MYERS, DAVIES.

21-22. SCIENTIFIC INTERMEDIATE. This course aims to give students a reading knowledge of German for use in scientific studies. Wait's *German Science Reader* (or equivalent). Not open to those who have obtained credit for Course 3-4 or Course 17-18. May be supplemented by Course 27-28. GEISSENDOERFER.

5-6. PROSE AND POETRY. Geography, history, and legend. Review of German grammar throughout the year. Not open to those who have obtained credit in Courses 3-4 or 17-18 or 21-22. This course may be supplemented by Course 27-28. BURKHARD, MYERS, DAVIES, GEISSENDOERFER.

23-24. ADVANCED SCIENTIFIC READING. Reading of monographs and periodicals. Not open to those who have credit for Course 7-8. May be supplemented by Course 29-30. WISCHKAEMPER.

MATHEMATICS.

Professor GEORGE N. BAUER; Assistant Professor ANTHONY L. UNDERHILL.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
2a.	Alg. Cont. and Pl. Trig.....	5	Fr., soph.	1 or prep. Higher Algebra
2b.	Alg. Cont. and Pl. Trig.....	5	Fr., soph.	1 or prep. Higher Algebra
9a.	Pl. and Solid Analyt. Geom...	5	Fr., soph., jr., sr.	2a, 2b, or 4
9b.	Pl. and Solid Analyt. Geom...	5	Fr., soph., jr., sr.	2a, 2b, or 4
11a.	Differential Calculus.....	3	Soph., jr., sr.	7, 9a, or 9b
11b.	Differential Calculus.....	3	Soph., jr., sr.	7, 9a, or 9b
51a.	Integral Calculus.....	3	Jr., sr.	11a or 11b
51b.	Integral Calculus.....	3	Jr., sr.	11a or 11b

2a. ALGEBRA, CONTINUED, THROUGH LOGARITHMS AND PLANE TRIGONOMETRY. Progressions, mathematical induction, determinants, theory of equations, Trigonometry. UNDERHILL.

2b. Same as Course 2a.

9a. PLANE AND SOLID ANALYTICAL GEOMETRY. Rectilinear and polar coordinates, loci and their equations, transformation of coordinates, the straight line, conic sections, higher plane curves, and an introduction to Solid Analytical Geometry. UNDERHILL.

9b. Same as Course 9a.

11a. DIFFERENTIAL CALCULUS. Differentiation of algebraic and transcendental functions, development of functions, indeterminate forms, maxima and minima, treatment of tangents, sub-tangents, normals,

sub-normals, asymptotes, direction and rate of curvature, evolutes, envelopes, and singular points. BAUER, UNDERHILL.

11b. Same as Course-11a.

51a. INTEGRAL CALCULUS. Integration of the various forms, integration as summation, rectification of curves, quadrature of plane and curved surfaces, cubature of volumes, equations in loci by means of the calculus, successive integration with applications to moments of inertia, areas and volumes. BAUER, UNDERHILL.

51b. Same as Course 51a.

### MECHANICAL ENGINEERING.

Professor JOHN J. FLATHER; Assistant Professors JOHN V. MARTENIS, S. CARL SHIPLEY; Instructors WALLACE H. MARTIN, PETER PETERSON, EDWARD QUIGLEY, WILLIAM H. RICHARDS, HENRY UBRICH.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
1-2.	Elementary Shop Practice...	4†	Fr., soph.	None
3a.	Pattern Making and Foundry Practice .....	3	Soph., jr.	1-2
3b.	Pattern Making and Foundry Practice .....	3	Soph., jr.	1-2
4a.	Machine Shop Practice.....	3	Soph., jr.	1-2
4b.	Machine Shop Practice.....	3	Soph., jr.	1-2
15.	Mechanism and Kinematics..	4	Jr.	Math. 11
*115.	Machine Design .....	5	Sr.	Physics 101-102
‡117.	Machine Design .....	3	Sr.	Physics 101-102
‡118.	Machine Design .....	3	Sr.	Physics 101-102
119.	Gas Engines and Producers.	3	Soph.	Chem. 38 or 135
130.	Steam Engines and Boilers..	4	Jr.	Physics 101-102

\*Year 1915-16 only.

†Both semesters must be completed before credit is given for the first semester.

‡Atter 1915-16.

### REQUIREMENTS OF THE DEPARTMENT

Courses offered by the department are arranged in progressive order, and it is essential\*that subjects be taken in proper sequence. Courses may be elected only by those having sufficient preparation.

1-2. ELEMENTARY SHOP PRACTICE. A general course in shop work, including pattern making, foundry, forge and machine work. RICHARDS, UBRICH, PETERSON, QUIGLEY, SHIPLEY.

3a. PATTERN MAKING AND FOUNDRY PRACTICE. An advanced course dealing with patterns for steam and gas engines, machine tool parts, and other special machinery; molding, core making, mixing; brass, bronze, aluminum and grey iron castings; machine molding and special processes. PETERSON.

3b. PATTERN MAKING AND FOUNDRY PRACTICE. Same as 3a.



- 4a. MACHINE SHOP PRACTICE. Machine operations, manufacturing methods and time studies. SHIPLEY.
- 4b. MACHINE SHOP PRACTICE. Same as 4a.
- 15. MECHANISM AND KINEMATICS. Transmission of motion without consideration of the strength of parts; gears, linkages, screws, epicyclic trains, graphical diagrams of paths, speeds, and accelerations of mechanisms; centroids; cams; roulettes, tooth profiles; kinematic pairs. MARTENIS.
- 115. MACHINE DESIGN. Same as 117-118. Offered only in 1915-16.
- 117. MACHINE DESIGN. Calculation and design of such machine parts as fastenings, bearings, rotating pieces, pulleys and spur gearing. Recitations, lectures, and drawing-room practise. FLATHER, MARTENIS.
- 118. MACHINE DESIGN. Continuation of Course 117. FLATHER, MARTENIS.
- 119. GAS ENGINES AND PRODUCERS. Principles of operation of gas and oil engines. Application of indicator diagrams. A study of power gas producers of various types; their construction and operation. Recitations and lectures. SHIPLEY, MARTIN.
- 130. STEAM ENGINES AND BOILERS. Mechanics of steam engine. Steam distribution. Mechanism of steam engine; governing. Steam engine indicator. Compounding. Theory and practice in design of steam boilers, chimneys, boiler settings, and accessories, smoke prevention, mechanical stokers. FLATHER, MARTIN.

METALLURGY

Professors WILLIAM R. APPLEBY, PETER CHRISTIANSON, LEVI B. PEASE;  
 Assistant Professor SAMUEL L. HOYT.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
2.	Assaying .....	4	Fr., soph.	Geol. 21; Chem. 5
3.	Gen. Metallurgy and Met. of Iron .....	3	Jr.	Chem. 6
4.	Met. of Wrought Iron and Steel .....	3	Jr.	3
105.	Met. of the Base Metals...	4	Sr.	2
106.	Met. of the Precious Metals	4	Sr.	105
109.	Electrometallurgy .....	3	Sr.	2
153-154.	Metallography .....	10	Sr.	Chem. 6; Phys- ics 1, 2
160.	Metallography .....	3	Sr.	Chem. 6; Phys- ics 1, 2

- 2. ASSAYING. Determination of values of ores, metallurgical products and bullion. APPLEBY and Assistants.

3. **GENERAL METALLURGY AND METALLURGY OF IRON.** Including the subjects of combustion, fuels, refractory materials and furnaces. CHRISTIANSON.
4. **METALLURGY OF WROUGHT IRON AND STEEL.** Consideration of the principles of manufacture, details of plant construction, and chemical and physical phenomena. CHRISTIANSON.
105. **METALLURGY OF THE BASE METALS.** Lead, copper, zinc, and mercury. Consideration of smelting methods and principles involved in refining methods. PEASE.
106. **METALLURGY OF THE PRECIOUS METALS.** Gold, silver, and platinum. Methods and principles of cyanidation, chlorination, amalgamation, and lixiviation, as applied to the treatment of the above. PEASE.
109. **ELECTROMETALLURGY.** A study of reduction of ores, refining of metals, and production of metals by electrolytic deposition; and the use of the electric furnace for smelting of ores, refining metals, and the manufacture of refractory alloys. CHRISTIANSON.
- 153-154. **METALLOGRAPHY.** The microscopical and thermal analysis of metals and alloys. Metallographic technique. The physical and chemical properties of metals and alloys. The commercial alloys, their heat and other industrial treatments. The metallography of iron and steel. HOYT.
160. **METALLOGRAPHY FOR CHEMICAL STUDENTS.** The preparation of metallic alloys; their microscopical and thermal analysis. Steel and other commercial alloys with particular reference to chemical metallurgy. Corrosion of steel and non-ferrous alloys. Metallography applied to analytical chemistry. HOYT.

### MILITARY SCIENCE AND TACTICS

Professor and Commandant BERNARD LENTZ; Assistant Commandant and Brigade Adjutant WALTER F. RHINOW; Band Instructor BERT ROSE.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
1-2.	Military Drill .....	None	Fr.	None
3-4.	Military Drill .....	None	Soph.	1 yr. Drill
5-6.	Military Drill .....	3*	Jr., sr.	2 yrs. Drill
8.	Military Science .....	2†	Jr., sr.	2 yrs. Drill

\*Not more than a total of six credits is given for elective work in both Military Drill and Physical Education.

†If taken in connection with Course 5-6.

- 1-6. **MILITARY DRILL.** Required of all men in the freshman and sophomore classes. Students are cautioned to report for the first drill and inform themselves of the requirements of the department.

1-2. Freshman: Practical instruction in schools of the soldier, company, and battalion; signals, ceremonies; first aid.

3-4. Sophomore: Practical and theoretical instruction in schools in the company and battalion; advance and rear guard drill; practical and theoretical instruction in guard duty. Gallery practice. Ceremonies.

5-6. May be taken voluntarily by others outside of the freshman and sophomore classes. No credit will be allowed for such drill for less than one year.

8. MILITARY SCIENCE. Instruction in advance and rear guards, outposts, reconnaissance, camping, duties of company commander, articles of war, records.

PATHOLOGY, BACTERIOLOGY, AND PUBLIC HEALTH

Assistant Professor W. P. LARSON; Instructors A. T. HENRICI and MARGARET WARWICK.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
58.	General Bacteriology .....	4	All	Gen. Chem. and either Zool. or Bot.
59.	Special Bacteriology .....	3	All	Bact. 58
104.	Special Bacteriological Technique .....	3	All	Bact. 58
58.	GENERAL BACTERIOLOGY. Preparation of culture media. The morphology of bacteria. Methods of staining and of identification. Anaerobic bacteria. Principles of sterilization and disinfection. Examination of air, water, milk. Relation of bacteriology to the industries. LARSON, WARWICK, HENRICI.			
59.	SPECIAL BACTERIOLOGY. Study of pathogenic bacteria. Bacteriological methods in clinical diagnosis. Principles of infection and immunity with practical application of serum reactions. LARSON, WARWICK, HENRICI.			
104.	SPECIAL BACTERIOLOGICAL TECHNIQUE. An advanced course offering an opportunity for additional work in bacteriology and affording the opportunity for working out special problems. Limited to ten students. LARSON.			

PHARMACOLOGY

Professor ARTHUR D. HIRSCHFELDER; Associate Professor E. D. BROWN; Assistant Professor ROBERT A. HALL.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
102.	Adv. Pharmacology .....	2	Sr., grad.	Chem. 119
103-104.	Experimental Pharmacology	6	Sr., grad.	102

102. **ADVANCED PHARMACOLOGY.** A study of the relation of drug action to chemical structure; of the mode of action and therapeutic application of various synthetic drugs; and of chemo-therapy. Designed especially for students in the School of Chemistry. HIRSCHFELDER, BROWN, HALL.
- 103-104. **EXPERIMENTAL PHARMACOLOGY.** Elective courses requiring special investigation and experimental study of one or more subjects in pharmacology, in which the student is given an opportunity of choice of the following topics:
- a. Anesthetics, general and local; the principles and dangers of anesthesia.
  - b. Stimulants and depressants of the circulation and their relation to the treatment of heart disease.
  - c. Drugs acting upon the kidneys, normal or diseased.
  - d. Urinary antiseptics and the urinary excretion of drugs.
  - e. Action and detection of poisons and their antidotes.
  - f. Detailed study of the effects in man of the common harmless drugs.
  - g. The internal secretions and gland extracts; their effect upon the action of drugs.
  - h. Action of drugs upon animal and bacterial parasites, tumors, etc.

## PHYSICAL EDUCATION

### FOR MEN

Director LOUIS J. COOKE; Assistant Director WILLIAM K. FOSTER; Instructor JOHN C. WEST; Assistant N. W. JOHNSTONE.

### GENERAL STATEMENT

The purpose of the department is to provide all men of the University opportunity for exercise to maintain and build up their general health. It also provides special training to correct physical defects and functional derangements.

A physical examination is required at the beginning of the year of all new matriculants and of all others using the department privileges, 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, and 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.

All students are required to pass a first- and a second-semester efficiency swimming test. Those who cannot swim must report to the swimming instructor at the beginning of the first semester and arrange

hours at which they can report for instruction until they are able to meet the swimming requirements.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
1.	Personal Hygiene.....	None	All	None
3-4.	Gymnastics .....	None	Fr.	None
5-6.	Intermediate Gymnastics.....	None	Fr.	See statement
7-8.	Advanced Leaders.....	2†	Soph., jr., sr.	1, 3-4, 5-6
9-10.	Corrective Gymnastics.....	None	All	None
10-12.	Wrestling .....	None	Soph., jr., sr.	3-4
13-14.	Advanced Gymnastics.....	None	Soph., jr., sr.	3-4
15-16.	Intermediate Swimming.....	None	All	Nor c
17-18.	Advanced Swimming.....	None	All	15-16

†Both semesters must be completed before credit is given.

1. PERSONAL HYGIENE. Two hours a week; first six weeks of the first semester. Examination at close of course. Open to all. COOKE.

A special lecture on sex hygiene is given during the first ten days of the autumn semester, with required attendance on the part of all freshmen.

3-4. GYMNASTICS. Two hours a week, on days not consecutive, from November 1 to end of second semester. Required qualifications in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. COOKE, FOSTER.

5-6. INTERMEDIATE GYMNASTICS. Three hours a week, on days not consecutive, from November 1 to April 1. Elective for freshmen showing exceptional ability in elementary apparatus work. FOSTER, WEST.

7-8. CLASS LEADERS (Advanced). Three hours a week. (No student may receive more than a total of six credits for elective work in both Physical Education and Military Drill.) FOSTER, WEST.

9-10. CORRECTIVE GYMNASTICS. Three hours a week, on days not consecutive. Special individual courses for students physically defective. JOHNSTONE.

11-12. WRESTLING. Course in competitive wrestling. Most promising candidates chosen to represent Minnesota at the Western Intercollegiate Gymnastic and Wrestling Meet. No credit for gymnasium work is given for this course. (Optional.) FOSTER, WEST.

13-14. ADVANCED GYMNASTICS. Same as Course 11-12 except that it is in gymnastics instead of wrestling. Includes course in ground tumbling, horizontal bar, parallel bars, side horse, and flying rings. FOSTER, WEST.

15-16. SWIMMING, INTERMEDIATE. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. JOHNSTONE.

17-18. SWIMMING, ADVANCED. JOHNSTONE.

## PHYSICAL EDUCATION

FOR WOMEN

Assistant Professor J. ANNA NORRIS; Instructors MAY S. KISSOCK, EDITH J. RAYNOR, VALERIA LADD.

## INTRODUCTORY STATEMENT

This department aims to look after the health of its women students. It gives physical examination and advice to all newly entering students; conducts systematic yearly consultations with and examines, when necessary, all upper class students; gives courses in hygiene; organizes physical work to meet the various needs and physical tastes of students; cooperates closely with the Woman's Athletic Association in encouraging and organizing athletic sports; investigates cases of illness in dormitory and boarding houses and gives sanitary inspection of boarding houses.

The office is open at regular hours to all students who desire consultation regarding their physical condition.

A large, new, well-equipped gymnasium will be ready for use in the autumn of 1915.

For further information, see bulletin of the College of Science, Literature and the Arts.

## PHYSICS

Professors HENRY A. ERIKSON, ANTHONY ZELNY; Associate Professor ALOIS F. KOVARIK; Assistant Professor LOUIS W. MCKEEHAN; Instructors E. O. DIETERICH, EARLE H. KENNARD, PAUL E. KLOPSTEG.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
1.	General Physics.....	3	Soph., jr., sr.	Math. 2 or 4 or registration in Math. 2 or 4
2.	General Physics.....	3	Soph., jr., sr.	1
3.	General Laboratory Practice .....	1	Soph., jr., sr.	See statement
4.	General Laboratory Practice .....	1	Soph., jr., sr.	See statement
7.	General Physics for Engineers .....	4	Soph., jr., sr.	Math. 2 or 4. See statement
8.	General Physics for Engineers .....	4	Soph., jr., sr.	7. See statement
9.	Gen. Lab. Practice for Engineers .....	1	Soph., jr., sr.	See statement
10.	Gen. Lab. Practice for Engineers .....	1	Soph., jr., sr.	See statement
13.	Electrokinetics .....	4	Jr., sr.	(12) 1914-15
14.	Sound and Light.....	4	Jr., sr.	(11) 1914-15
121-122.	Dynamics .....	6	Jr., sr., grad.	2 or 10 or (12) and Math. 51

1. GENERAL PHYSICS. Mechanics of solids and fluids, sound, and heat. Treatment experimental rather than mathematical; the fundamental principles. The first part of a general course 1-2. Should be taken in conjunction with Course 3, but may be taken separately. ZELENY, KLOPSTEG, DIETERICH.
2. GENERAL PHYSICS. Light, electricity and magnetism. Treatment experimental; the fundamental principles, including those of radioactivity, ionization, X-radiation, and the electrical constitution of matter. The second part of a general course 1-2. Should be taken in conjunction with Course 4, but may be taken separately. ZELENY, KLOPSTEG, DIETERICH.
3. GENERAL LABORATORY PRACTICE. Physical measurements in the mechanics of solids and fluids, sound, and heat, giving the student a knowledge of experimental methods, and an acquaintance with the fundamental facts of the subject. Open to all who have completed or are taking Course 1. McKEEHAN, KENNARD, DIETERICH.
4. GENERAL LABORATORY PRACTICE. Physical measurements in light, electricity and magnetism. Open to all who have completed or are taking Course 2, and have completed Course 3. McKEEHAN, KENNARD, DIETERICH.
7. GENERAL PHYSICS FOR ENGINEERS. Mechanics of solids and fluids, sound, and heat; numerous problems to illustrate the principles. Must be taken in conjunction with Course 9. Open also to Academic students. The first part of a general course 7-8, 9-10. KOVARIK, McKEEHAN.
8. GENERAL PHYSICS FOR ENGINEERS. Light, electricity and magnetism. Must be taken in conjunction with Course 10. Open also to Academic students. The second part of a general course 7-8, 9-10. KOVARIK, McKEEHAN.
9. GENERAL LABORATORY PRACTICE FOR ENGINEERS. Physical measurements in the mechanics of solids and fluids, sound, and heat. Must be taken in conjunction with Course 7. McKEEHAN.
10. GENERAL LABORATORY PRACTICE FOR ENGINEERS. Physical measurements in light, electricity and magnetism. Must be taken in conjunction with Course 8. McKEEHAN.
13. ELECTROKINETICS. The phenomena accompanying the passage of electricity through solids, liquids, and gases. One lecture, two recitations, and one two-hour laboratory period a week. ERIKSON, KENNARD, KLOPSTEG.
14. SOUND AND LIGHT. Wave motion and the various phenomena of sound and light. One lecture, two recitations, and one two-hour laboratory period a week. ERIKSON, KENNARD, KLOPSTEG.

121-122. DYNAMICS. Some problems essential for advanced physics and chemistry. McKEEHAN.

### PHYSIOLOGY

Professor ELIAS P. LYON; Associate Professors RICHARD O. BEARD, FREDERICK H. SCOTT; Assistant Professor M. RUSSELL WILCOX; Instructors FRANCIS B. KINGSBURY, J. F. McCLENDON, C. J. V. PETTIBONE.

#### \*COURSES

No.	Title	Credits	Offered to	Prereq. courses
3 a,b.	Elem. Human Physiology....	3†	All	1 yr. Chem. ½ yr. Biol.
4.	Elementary Physiology and Physiologic Chemistry .....	5†	All	Elem. Chem. and Biol. or Anat.
52.	Physiological Chem. ....	5	Jr., sr.	Chem. 13-14 or 35-36
53.	Physiol. Muscle, etc.....	5	Jr., sr.	An. Biol. 1-2
54.	Physiol. Nerv. Sys., etc.....	5	Jr., sr.	An. Biol. 1-2

\*For a full list of courses offered by the department, see the bulletin of the Medical School.

†Students may not receive credit for both Courses 3 and 4.

#### ‡INTRODUCTORY COURSES

- 3a, b. ELEMENTARY HUMAN PHYSIOLOGY. Primarily for Home Economics students; open to others. Lectures and laboratory work. LYON, BEARD, PETTIBONE.
4. ELEMENTARY PHYSIOLOGY AND PHYSIOLOGIC CHEMISTRY. Covers the essential facts. Lectures and laboratory work. SCOTT, PETTIBONE, and others.

#### ADVANCED COURSES

52. PHYSIOLOGIC CHEMISTRY. The chemistry of the components of the animal body; foods, digestion, and the excreta. Lectures and laboratory work. PETTIBONE, KINGSBURY, McCLENDON.
53. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, RESPIRATION. Lectures and laboratory work. LYON, BEARD, PETTIBONE, McCLENDON, KINGSBURY.
54. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SENSES, DIGESTION, METABOLISM NUTRITION AND EXCRETION. Lectures and laboratory work. LYON, SCOTT, WILCOX, McCLENDON.

‡Not given 1915-16.



## POLITICAL SCIENCE

Professor WILLIAM A. SCHAPER; Associate Professors CEPHAS D. ALLIN,  
JEREMIAH S. YOUNG, Assistant BENJAMIN W. PALMER.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
1a.	American Government.....	3	Soph., jr., sr.	None
1b.	American Government.....	3	Soph., jr., sr.	None
5.	European Municipal Administration .....	3	Soph., jr., sr.	1
6.	American Municipal Administration .....	3	Soph., jr., sr.	1
7a.	State and Local Government...	3	Soph., jr., sr.	1
7b.	State and Local Government...	3	Soph., jr., sr.	1
26.	Commercial Law .....	2	Sr.	1 or Econ. 1

1a. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system. SCHAPER, YOUNG, ALLIN, PALMER.

1b. AMERICAN GOVERNMENT. Same as Course 1a.

5. EUROPEAN MUNICIPAL ADMINISTRATION. A study of French, German, Austrian and English cities; the forms of government, parties and elections; achievements in finance, police, sanitation, city planning and other public services undertaken. SCHAPER.

6. AMERICAN MUNICIPAL ADMINISTRATION. A study of the organization and chief functions of American cities; their growth, relation to the state, forms of charters, inefficiency and corruption, reform measures; and the administration of finance, police, health and other activities. SCHAPER.

7a. STATE AND LOCAL GOVERNMENT. A comparison of typical American state governments, with special attention given to Minnesota; relation of the state to the United States and to the local units of government; recent democratic experiments; social and economic legislation. YOUNG, PALMER.

7b. Same as Course 7a.

26. COMMERCIAL LAW. The principles of law governing ordinary business transactions. This course will deal with the general law of contracts including sales, bankruptcy, and agency. YOUNG, PALMER.

## RHETORIC

Professors JOSEPH M. THOMAS, MARGARET SWEENEY; Assistant Professors DANIEL FORD, SIDNEY F. PATTISON, ANNA H. PHELAN; Instructors OLIVE M. GILBREATH, JAMES T. HILLHOUSE, CHARLES E. SKINNER, ARTHUR J. TIEJE, HELEN A. WHITNEY.

## SCHOOL OF CHEMISTRY

No.	Title	COURSES		
		Credits	Offered to	Prereq. courses
1a-2b.	Composition and Rhetoric..	6	Fr.	None
1b-2a.	Composition and Rhetoric.	6	Fr.	None
11-12.	Exposition, Descrip., Nar- ration .....	6	Soph., jr.,sr.	1-2
15-16.	Exposition and Argument.	6	Soph., jr.,sr.	1-2
103-104.	Studies in Structure and Style .....	6	Jr., sr., grad.	1-2, 11-12 or 15-16

1a-2b. COMPOSITION AND RHETORIC. Practical training in the art of writing; the principles of structure and analysis of specimens of good prose. THOMAS, FORD, PATTISON, SKINNER, GILBREATH, HILLHOUSE, TIEJE, SWEENEY, PHELAN, WHITNEY.

1b-2a. COMPOSITION AND RHETORIC. Same as Course 1a-2b.

11-12. EXPOSITION, DESCRIPTION, AND NARRATION. In the first semester the analysis of specimens of exposition; short themes and fortnightly essays, with emphasis on careful planning and amplification. In the second semester, the same general plan applied to description and narration. Not open to those who have credit for Course 15-16. PATTISON, WHITNEY, PHELAN, SKINNER, GILBREATH.

15-16. EXPOSITION AND ARGUMENT. In the first semester, exposition; the second semester, argument. The study of a text and the analysis of specimens, accompanied by weekly essays and shorter themes. Not open to those who have credit for Course 11-12. THOMAS, TIEJE.

103-104. STUDIES IN STYLE AND STRUCTURE. Theory of style and structure; 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. FORD.

17

# Bulletin of The University of Minnesota

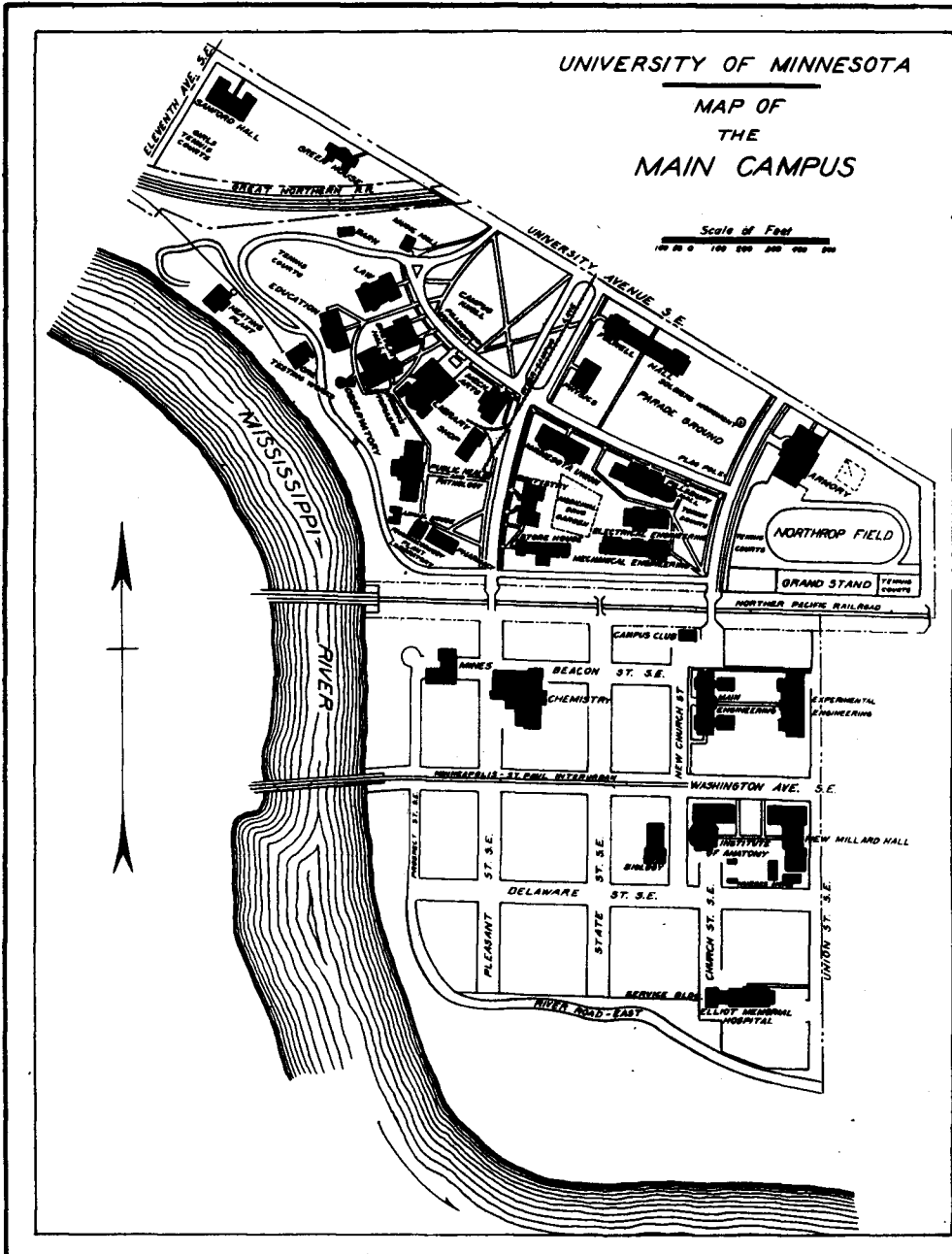
THE COLLEGE OF EDUCATION

1915-1916

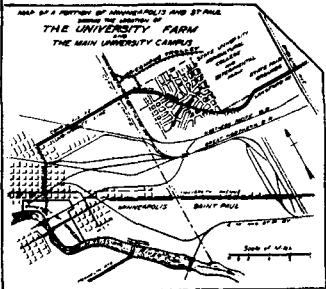


VOL. XVIII, No. 13, SEPTEMBER 1915

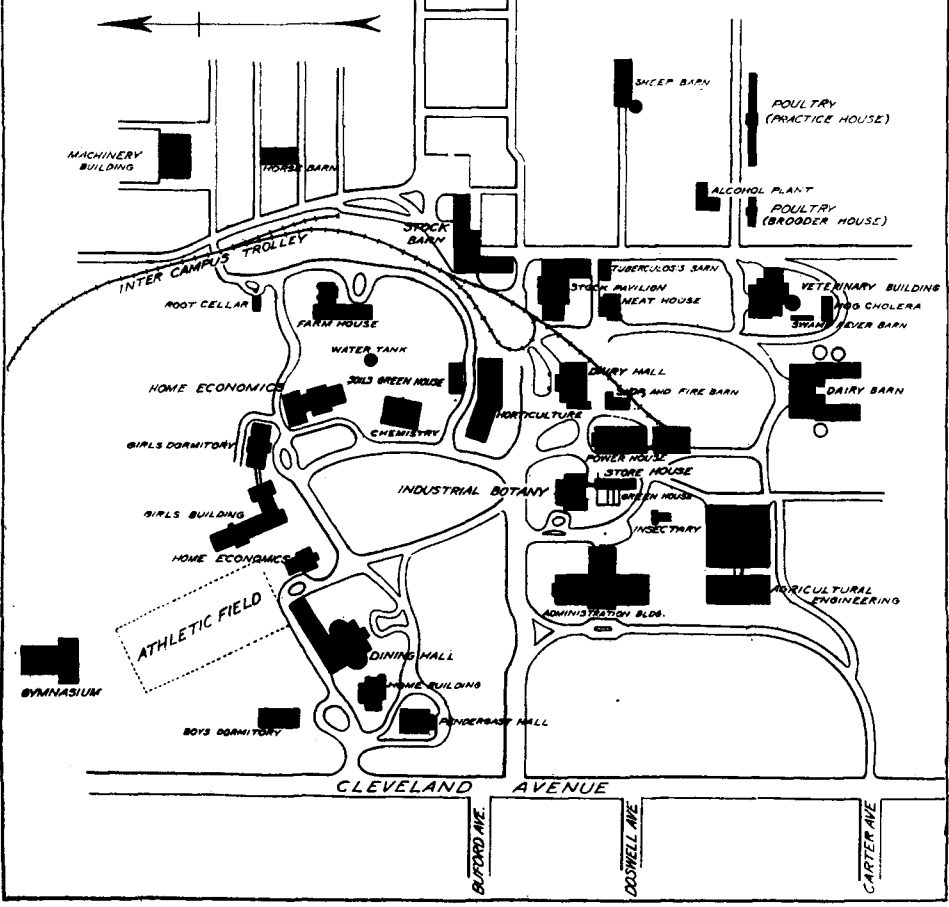
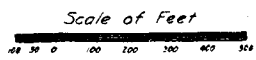
Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.



Area of Main Campus, 108.5 acres



UNIVERSITY OF MINNESOTA  
 MAP OF THE CAMPUS  
 OF THE  
 UNIVERSITY FARM



O. S. Zeller.

Area of University Farm, 422.56 acres

1915							1916													
<b>JULY</b>							<b>JANUARY</b>							<b>JULY</b>						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3	..	..	..	..	..	..	1	..	..	..	..	..	..	1
4	5	6	7	8	9	10	2	3	4	5	6	7	8	2	3	4	5	6	7	8
11	12	13	14	15	16	17	9	10	11	12	13	14	15	9	10	11	12	13	14	15
18	19	20	21	22	23	24	16	17	18	19	20	21	22	16	17	18	19	20	21	22
25	26	27	28	29	30	31	23	24	25	26	27	28	29	23	24	25	26	27	28	29
..	..	..	..	..	..	..	30	31	..	..	..	..	..	30	31	..	..	..	..	..
<b>AUGUST</b>							<b>FEBRUARY</b>							<b>AUGUST</b>						
1	2	3	4	5	6	7	..	..	1	2	3	4	5	..	..	1	2	3	4	5
8	9	10	11	12	13	14	6	7	8	9	10	11	12	6	7	8	9	10	11	12
15	16	17	18	19	20	21	13	14	15	16	17	18	19	13	14	15	16	17	18	19
22	23	24	25	26	27	28	20	21	22	23	24	25	26	20	21	22	23	24	25	26
29	30	31	..	..	..	..	27	28	29	..	..	..	..	27	28	29	30	31	..	..
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<b>SEPTEMBER</b>							<b>MARCH</b>							<b>SEPTEMBER</b>						
..	..	..	1	2	3	4	..	..	..	1	2	3	4	..	..	..	..	1	2	
5	6	7	8	9	10	11	5	6	7	8	9	10	11	3	4	5	6	7	8	
12	13	14	15	16	17	18	12	13	14	15	16	17	18	10	11	12	13	14	15	
19	20	21	22	23	24	25	19	20	21	22	23	24	25	17	18	19	20	21	22	
26	27	28	29	30	..	..	26	27	28	29	30	31	..	24	25	26	27	28	29	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
<b>OCTOBER</b>							<b>APRIL</b>							<b>OCTOBER</b>						
..	..	..	..	1	2	3	..	..	..	..	..	..	1	1	2	3	4	5	6	7
3	4	5	6	7	8	9	2	3	4	5	6	7	8	8	9	10	11	12	13	14
10	11	12	13	14	15	16	9	10	11	12	13	14	15	15	16	17	18	19	20	21
17	18	19	20	21	22	23	16	17	18	19	20	21	22	22	23	24	25	26	27	28
24	25	26	27	28	29	30	23	24	25	26	27	28	29	29	30	31	..	..	..	..
31	..	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>NOVEMBER</b>							<b>MAY</b>							<b>NOVEMBER</b>						
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	..	..	1	2	3	4
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>DECEMBER</b>							<b>JUNE</b>							<b>DECEMBER</b>						
..	..	..	1	2	3	4	..	..	..	..	1	2	3	..	..	..	..	1	2	
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
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## UNIVERSITY CALENDAR

1915-16

The university year covers a period of thirty-eight weeks, beginning on the Tuesday before the second Thursday in September. Commencement Day is always the second Thursday in June.

1915			
August	31	Tuesday	Registration closes except for new students
September	1-8	Week	Fees payable except for new students
September	7-14	Week	Examinations for the removal of conditions (except Colleges of Agriculture and Forestry), entrance examinations, registration of new students, and payment of fees
September	15	Wednesday	First semester begins
September	27	Monday	Agricultural College, farm experience examination
October	4	Monday	School of Agriculture, first term begins
October	7	Thursday	Senate meeting, 4:00 p.m.
November	8	Monday	Dairy School opens
November	24	Wednesday	Thanksgiving recess begins 9:00 p.m.
November	29	Monday	Thanksgiving recess ends 8:00 a.m.
Nov. 29 to Dec. 4	Week		Second semester condition examinations, Colleges of Agriculture and Forestry
December	2	Thursday	Senate meeting, 4:00 p.m.
December	6-11	Week	Short course for ice-cream makers
December	11	Saturday	Dairy School closes
December	17	Friday	Christmas vacation begins 9:00 p.m.
December	17	Friday	School of Agriculture, first term closes
1916			
January	3-8	Week	Farmers' Short Course
January	4	Tuesday	Christmas vacation ends 8:00 a.m.
January	18	Tuesday	Registration for second semester closes
January	21	Tuesday	School of Agriculture, second term begins
January	24	Monday	Final examinations begin
January	25	Tuesday	Payment of fees for second semester closes
February	2	Wednesday	Second semester begins
February	3	Thursday	Senate meeting, 4:00 p.m.
February	12	Saturday	Lincoln's Birthday: a holiday
February	22	Tuesday	Washington's Birthday: a holiday

## COLLEGE OF EDUCATION

March	30	Wednesday	School of Agriculture closes
April	3-8	Week	Junior Short Course
April	19	Wednesday	Easter recess begins 9:00 p.m.
April	19-22		Superintendents' and Principals' Short Course
April	27	Thursday	Easter recess ends 8:00 a.m.
May	1-6	Week	Condition examinations in certain colleges
May	2	Tuesday	Traction Engineering Course begins
May	4	Thursday	Senate meeting, 4:00 p.m.
May	26	Friday	Final examinations begin
May	30	Tuesday	Memorial Day: a holiday
June	1-8	Week	Military Encampment, Fort Snelling
June	3	Saturday	Second semester closes
June	4	Sunday	Baccalaureate service
June	5	Monday	Senior class day exercises
June	7	Wednesday	Alumni Day
June	8	Thursday	Forty-fourth Annual Commencement
June	9	Friday	Summer vacation begins
June	12	Monday	Summer Session begins

The university year for 1916-17 will begin Tuesday, September 12.



# THE COLLEGE OF EDUCATION

## FACULTY

- GEORGE EDGAR VINCENT, Ph.D., LL.D., President 1005 5th St. S. E.  
CYRUS NORTHROP, LL.D., President Emeritus 510 10th Ave. S. E.  
LOTUS D. COFFMAN, Ph.D., Dean and Professor of Education  
1115 E. River Road  
EDWARD E. NICHOLSON, M.A., Chairman of Joint Administrative Board  
914 7th St. S. E.
- GEORGE N. BAUER, Ph.D., Professor of Mathematics  
JOSEPHINE T. BERRY, M.A., Professor of Nutrition  
2176 Scudder Ave., St. Paul  
GISLE BOTHNE, M.A., Professor of Scandinavian Languages  
1206 7th St. S. E.
- FREDERIC EDWARD CLEMENTS, Ph.D., Professor of Botany 508 5th Ave. S.E.  
LOUIS JOSEPH COOKE, M.D., Director of Physical Education for Men  
909 6th St. S. E.
- HARDIN CRAIG, Ph.D., Professor of English 2725 Humboldt Ave. S.  
WILLIAM H. EMMONS, Ph.D., Professor of Geology 719 7th St. S. E.  
HENRY A. ERIKSON, Ph.D., Professor of Physics 424 Harvard St. S. E.  
GEORGE B. FRANKFORTER, Ph.D., Professor of Chemistry 525 E. River Road  
JOHN HENRY GRAY, Ph.D., Professor of Economics 415 Walnut St. S. E.  
M. E. HAGGERTY, Ph.D., Professor of Educational Psychology  
JOHN CORRIN HUTCHINSON, B.A., Professor of Greek 3806 Blaisdell Av. S.  
ALBERT ERNEST JENKS, Ph.D., Professor of Anthropology 812 4th St. S. E.  
RAYMOND A. KENT, M.A., Assistant Professor of Education and Principal  
of the University High School 828 University Ave. S. E.  
DAVID L. KIEHLE, LL.D., Professor of Education, Emeritus  
226 58th St. E., Portland, Oregon
- FREDERICK KLAEBER, Ph.D., Professor of Comparative Philology  
619 9th Av. S. E.
- WILLIAM H. KIRCHNER, B.S., Professor of Drawing and Descriptive  
Geometry 722 10th Ave. S. E.
- AUGUST C. KREY, Ph.D., Assistant Professor of History  
1201 7th St. S. E.
- FRANCIS P. LEAVENWORTH, M.A., Professor of Astronomy  
317 17th Ave. S. E.
- WINFORD P. LARSON, M.D., Assistant Professor of Bacteriology  
614 9th Ave. S. E.
- J. ANNA NORRIS, M.D., Director of Health and Physical Education for  
Women 1005 University Ave. S. E.
- EVERETT WARD OL MSTED, Ph.D., Professor of Romance Languages  
2727 Lake of the Isles Blvd

JOSEPH B. PIKE, M.A., Professor of Latin	1025 6th St. S. E.
CHESSLEY JUSTIN POSEY, M.S., Assistant Professor of Geography	1627 Melbourne Ave. S. E.
ALBERT W. RANKIN, B.A., Professor of Education	916 5th St. S. E.
WILLIAM A. SCHAPER, Ph.D., Professor of Political Science	615 Fulton St. S. E.
CARL SCHLENKER, B.A., Professor of German	514 11th Ave. S. E.
CARLYLE SCOTT, Professor of Music	3322 Lyndale Ave. S.
CHARLES P. SIGERFOOS, Ph.D., Professor of Zoology	1023 University Ave.
ANDREW A. STOMBERG, M.S., Professor of Scandinavian Languages	531 Walnut St. S. E.
ASHLEY V. STORM, M.A., Professor of Agricultural Education	1827 4th St. S. E.
FLETCHER HARPER SWIFT, Ph.D., Professor of Education	1910 4th St. S. E.
JOSEPH M. THOMAS, Ph.D., Professor of Rhetoric	
ALBERT BEEBE WHITE, Ph.D., Professor of History	325 6th Ave. S. E.
NORMAN WILDE, Ph.D., Professor of Philosophy	901 6th St. S. E.

## INSTRUCTORS

LILLIAN COHEN, Ph.D., Instructor in Chemistry	415 E. 14th St.
REWEY BELLE INGLIS, B.A., Instructor in Methods of Teaching High School English	2436 Bryant Ave. S.
JAMES W. NORMAN, M.A., Instructor in Education	
WILLIAM D. REEVE, B.S., Instructor in Methods of Teaching High School Mathematics	
THEOPHILUS H. SCHROEDEL, B.A., Instructor in German	977 14th Av. S. E.

## LECTURERS

ALBERTA ACKERMAN, Lecturer in Methods of High School Teacher Training Departments	
MABEL CARNEY, Lecturer in Methods of High School Teacher Training Departments	
MAY H. DILLS, Lecturer in Methods of High School Teacher Training Departments	
THADDEUS P. GIDDINGS, Lecturer in Public School Music	84 Spruce Place
DAVID H. HOLBROOK, Lecturer in Vocational Guidance	4051 Sheridan Ave. S.
CORAL L. OSBORN, Lecturer in Methods of High School Teacher Training Departments	
RAY L. SOUTHWORTH, M.A., Lecturer in Manual Training	3925 12th Ave. S.
JUDSON R. TOWNE, B.S., Lecturer in Methods of High School Physics	

## UNIVERSITY HIGH SCHOOL

BESSIE BEMIS, B.S., Instructor in Cooking	2101 Knapp St., St. Paul
VETTA GOLDSTEIN, Instructor in Design	2298 Priscilla St., St. Paul

FACULTY

9

FEWEY BELLE INGLIS, B.A., Instructor in English      2436 Bryant Ave. S.  
RAY L. LELAND, B.S., Instructor in History  
WILLIAM D. REEVE, B.S., Instructor in Mathematics  
ELSIE M. SMITHIES, B.A., Instructor in Latin  
SOPHIA HUBMAN, M.A., Instructor in German  
CHARLES J. PIEPER, B.S., Instructor in Science  
MAUDE M. F. SCHAFER, Ph.B., Assistant Instructor in English  
JOHN A. SHOEMAKER, B.A., Assistant Instructor in Mathematics and  
Science

GRADUATE SCHOLAR

HARRY N. FITCH, B.A.

## GENERAL INFORMATION

The College of Education, the teachers' professional college of the University, was authorized by special enactment of the Legislature of Minnesota in 1905 and was established by the Regents of the University in the following year. It prepares superintendents, principals, teachers of high-school subjects, manual training teachers, school-librarians, and teachers of high-school training departments. The preparation of teachers of home economics and agriculture is under the direction of the two respective departments of the College of Agriculture.

The College of Education and the University High School are located in the new Education Building. The University High School occupies the basement floor and all of the first floor except rooms 103 and 106, reserved for the dean. The College occupies the second floor.

### *University High School*

The primary purpose of the University High School is to give opportunity for practice teaching for prospective teachers. The maintenance of typical school conditions is assured by two facts—all work, including the practice teaching, is directly under the guidance of experienced and successful teachers, and the school, altho not eligible for state aid, has been placed under state inspection. For further information, consult Bulletin of the University High School.

### ADMISSION

Students looking forward to teaching should consult with the Dean of the College of Education or the Chairman of the Program Committee early in their course.

Not infrequently seniors discover that a slight difference in arrangement of studies in their course made during their freshman or sophomore years would have made them much more eligible for teaching positions.

Students are held responsible for arranging their courses so as to meet all requirements. To do this intelligently they should secure from the Registrar's office or the office of the Dean of the College of Education the following bulletins and pamphlets:

Bulletin of General Information

Bulletin and program of the College of Education

Bulletin and program of the College of Science, Literature, and the Arts

Bulletin of the University High School

Information for New Students

The Minnesota Code

The Minnesota Blue Book

High School Board Rules, State Department of Education, Bulletin No. 45, May, 1915

State Department of Education Bulletin No. 50, March, 1914.  
See also page 18 of this Bulletin.

#### *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 freshman and sophomore years 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 College of Science, Literature, and the Arts to the College of Education, nor is any loss of credits involved. Students able to meet the requirements set forth above simply make known their desire at the Registrar's office at the time of registration and they will thereupon be furnished with College of Education registration cards.

(b) Graduation from an approved normal school of Minnesota or of some other state. See below under *Advanced Standing*.

#### *Unclassed Students*

Normal school graduates receiving forty-two credits, teachers preparing for examination for the First Grade Professional Certificate, 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. Such students who receive a mark of at least one grade above the minimum required for passing will be exempt from the examinations in all strictly professional subjects, such as Psychology, History of Education, General Pedagogy, School Administration, and in certain other subjects required for this certificate.

### ADVANCED STANDING

#### *By Examination*

The tendency of the College of Education is distinctly toward discouraging 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. (See also statement, *Practice Teaching*, page 20.)

#### *Graduates of Minnesota Normal Schools*

The College of Education grants to graduates of the Advanced Graduate Course of Minnesota State Normal Schools sixty credits of advanced

standing (approximately two years' credit); to graduates of the Advanced Latin or Advanced English courses, forty-two credits.

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; Philosophy 1-2, or 5; Rhetoric 1-2; History 1-2.

For a statement of records to be submitted, see Bulletin of General Information, pp. 25-26.

#### CLASS ROUTINE AND SCHOLASTIC REQUIREMENTS

The following regulations refer chiefly to undergraduates; graduate students should consult the bulletin of the Graduate School.

Classes are held mornings and afternoons of every week day except Saturday afternoon. (For teachers' afternoon and Saturday classes see page 16.)

No student may elect work during any semester in more than five departments. Students must elect at least fourteen hours a week. Students may ordinarily elect not more than seventeen credit hours. A student who has, during the preceding semester or two semesters, earned an average of one and one-half honor points for each credit hour taken and who has had no condition or failure the preceding semester, may elect eighteen hours, upon approval by the Administrative Board of a petition for permission to do the same. For explanation of Credit Hours and Honor Points, see page 14.

Students whose absences exceed four weeks in the aggregate during a semester are not permitted to take the semester examinations without permission of the Administrative Board. Any student reported below grade in sixty per cent of his work, or in three subjects, at the middle or close of the first semester or middle of the second semester is dropped from the rolls and not allowed to re-enter the University until the opening of the following year.

Examinations are held at the close of each semester. A student's grade is based upon his class work and examination. Four passing grades are given, namely, A, B, C, and D. Work not done satisfactorily is marked I (incomplete), E (condition), or F (failure). An incomplete must be removed within one month after the opening of the following semester; otherwise it becomes a condition.

A failure must be removed by pursuing the work again in class the next time the course is offered.

#### 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 also had 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. The University prepares students for special certificates in: (1) Music; (2) Drawing; (3) Home Economics; (4) Manual Training; (5) Agriculture; (6) Commercial Subjects.

3. High School Training Teachers and Teacher-Librarians. In addition to the courses preparing for special certificates the College of Education offers courses to prepare teachers for high-school rural training departments and high school teacher-librarians. The State Department issues no special certificates for these two classes of teachers, but gives an official endorsement to students who complete these courses in the College of Education.

#### *The University Teachers' Certificate*

1. Two-Year Certificate. The University Teachers' Certificate, granted to every graduate of the College of Education, 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.

2. Life Certificates. After two years of successful teaching experience, the University Teachers' 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 Teachers' Certificate for two years at the completion of which, application may be made for a permanent life certificate. The fee for this extension is \$1.00. Holders of the University Teachers' 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 \$5.00.

#### THE DEGREE OF BACHELOR OF ARTS (IN EDUCATION)

The degree of Bachelor of Arts (in Education) may be conferred by the College of Education upon any student who fulfills all the requirements stated below.

#### *Summary of Requirements*

1. Amount and grade of work.—During his entire course the student must earn: (a) one hundred and twenty credit hours in addition to the required exercises in drill, gymnasium, and physical education; (b) one hundred and twenty honor points; (c) one and one-half honor points per credit hour in his major subject.

2. Courses required and allowed. (a) The student must have completed (normally during sophomore year) a general introductory course in psychology (e. g. Philosophy 1-2, or 5, or an equivalent of the same); (b) he must have satisfied all the requirements for the University Teachers' Certificate (see statement of prescribed course, page 19).

3. Distribution of Work—Major and Minors. A student must take a sufficient number of courses so distributed among at least three distinct departments concerned with the work of the secondary school as to secure one major and two minors. Either Education or Psychology may be counted as a major or a minor in this group.

4. Residence. At least thirty credits must be earned in residence in this college. If the term of residence is only one year, that year must be the senior year; and in any case, at least half of the work of the senior year must be done in residence. Attendance at the summer session counts as residence.

#### *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 semester, or three hours per week of laboratory work through one semester. 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 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 three honor points; each credit hour with the grade of B to two honor points; each credit hour with the grade of C to one honor point; each credit hour with the grade of D to no honor points. Illustration: A student completing a one-semester three-credit course and receiving the grade A would be entitled to nine honor points; if receiving the grade B to six honor points; if receiving the grade C to three honor points; if receiving the grade D to no honor points.

*Major and Minors.*—Twelve credits is the minimum requirement for a minor and eighteen credits for a major, in the College of Education. Usually a minor will demand from fifteen to eighteen credits with a corresponding increase for the major, depending upon the combination which the student has selected with a view to future teaching. Only in special cases will the minimum mentioned above be accepted. The definite determination of the credits required is left in each case to the department concerned, for a statement of which consult the departmental statements appearing further on in this bulletin.

#### GRADUATION WITH DISTINCTION

The degree of Bachelor of Arts in Education with Distinction is granted to graduates of this College who fulfill the following conditions:

- A. Special excellence in major subject;
- B. 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;

C. 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;

D. The presentation of a satisfactory thesis upon some subject within the major field of study not later than May 1, senior year;

E. At the time of application the student must have an average of one and one-half honor points per credit hour in all previous work;

F. At the time of graduation the student must have met all conditions applying to the ordinary Bachelor's Degree in Education; must show a record of one and one-half honor points per credit hour in *four-fifths of all work pursued throughout his entire course*; and

G. 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.

#### GRADUATE WORK IN EDUCATION

*Graduate Study.*—Graduate courses 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 in Education must have had at least a year's work in psychology and in addition to this, a total of not less than twelve credits in Education. Graduates, holding a Bachelor's degree, who have less than twelve 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 twelve and the number of undergraduate credits in Education which they present. Such students will not, however, be debarred from counting all the time spent at the University toward satisfying the residence requirement of graduate work, provided the work which they pursue is approved by the Dean of the Graduate School.

*During summer session* graduate work may be pursued. The Master's degree may ordinarily be completed in four summer sessions. For full statement of regulations, consult Graduate School Bulletin.

#### TEACHING ASSISTANTS IN MINNEAPOLIS PUBLIC SCHOOLS

The College of Education in coöperation with the Minneapolis public schools has adopted a plan to go into effect in the fall of 1915, which provides for employing in the Minneapolis high schools a certain number of University graduates to be known as "teaching assistants." The adoption of this plan is in essence the establishment in the Minneapolis public schools of a certain number of teaching fellowships for graduate students. These teaching assistants will receive compensation for their work in the schools proportionate to the amount of time devoted to teaching; \$300 for the first year; \$400 for the second year.

For each assistant a definite course, combining graduate professional study and teaching experience will be outlined. Altho the plan pro-

vides an abundance of teaching experience, the greater emphasis will be thrown upon advanced professional study.

*Work in Minneapolis schools.*—Teaching assistants shall be on duty at the schools from 8:30 until 12:15. Their work will be divided between teaching and assisting. During their first year they shall not instruct more than two classes per day, that is, one-third of a regular teacher's teaching periods. If they continue a second year, the portion of their time devoted to class instruction may be increased to three periods a day. Their work as teaching assistants shall be limited to the hours during which they are in duty in the schools and no additional work other than preparation for teaching their regular courses shall be required of them outside of the above set schedule of hours.

*Applications for positions* as teaching assistants should be made directly to the Principal of the University High School. The number of such positions cannot be absolutely determined in advance of the opening of the Schools.

#### 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.

##### *Afternoon and Saturday Classes*

A special announcement of late afternoon and Saturday morning classes arranged especially for teachers, together with a statement of the requirements for admission and method of registration will be issued by the College of Education early in September.

##### *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 teachers' 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 under the direction of the Dean of the College of Education 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 1916 will begin Monday, June 12.

#### EMPLOYMENT BUREAUS

*Appointment Bureau.*—Through its Appointment Bureau the College of Education endeavors to place its own graduates and those of the College of Science, Literature, and Arts in positions best suited to their

training and experience. Students looking forward to teaching should register during the first semester of their senior year; *no fee, however, will be charged to those who register before February 15.* Complete instructions and registration blanks may be secured at the office of the Appointment Bureau (for room number see directory posted in corridor).

*State Teachers' Employment Bureau.*—The State Teachers' Employment Bureau, located in the State Capitol, St. Paul, under the direction of Mr. E. T. Critchett, offers its services to all teachers and prospective teachers. The fee for registration is \$3.00.

Neither the College of Education nor the State Teachers' Employment Bureau exacts any commission.

## COURSES OF STUDY

### NEW COURSES

Courses to be offered for the first time during the year 1915-1916 will be found chiefly within the following fields: School Administration, Educational Psychology, Foreign Schools, High School Rural Training, Teacher-Librarian Training, Manual Training, Vocational Guidance, and Industrial Education.

### GUIDANCE IN THE SELECTION OF COURSES

#### *Superintendents and Graded School Principals*

It is probable that within a year the State High School Board will require that prospective superintendents and principals of graded schools who have not had at least two years' experience in a supervisory position in a school of at least two departments shall, before entering upon their duties, have had courses in School Administration and School Supervision in some recognized normal school or college, totaling at least five semester credits. The following courses will be credited toward this requirement: 121, 123, 124, 125, and 126. Course 121 is a general introduction to all other courses in School Administration and is especially recommended to those beginning a study of this field.

#### *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. Attention is called to the fact that course 125 is ordinarily required of all candidates for advanced degrees. Courses bearing numbers 200 and above are open to graduate students only.

All graduate students majoring in Education are expected to meet with the department staff every alternate Monday evening from 7:15 to 9:00 for conference regarding subjects of original investigation. This work carries no credit. See also pages 15-16 of this Bulletin.

#### *Candidates for State Professional Certificate*

Unclassed students, candidates for the State Professional Certificate, may pursue courses in residence or by correspondence or in extension classes. For guidance in the selection of courses relating to this certificate, consult statement, State Professional Teachers' Certificate, page 13.

#### *Undergraduates*

Students should consult carefully the departmental descriptions of courses required for admission to teachers' course. The teachers' courses in each department must be taken in advance of or contemporaneously with practice teaching. Many departments require more than a minor for

admission to teachers' courses in the case of students who wish to offer the subject only as a minor.

See the following topics in this bulletin: (1) University Teachers' Certificate, page 13; (2) major and minors, page 14; (3) special training courses, pages 20-23; (4) admission, page 10; (5) prerequisite for teachers' courses, page 20; (6) starred courses, page 24.

#### UNDERGRADUATE COURSE

A two years course leading to the degree of Bachelor of Arts (in Education) entitles the recipient in every case to a University Teachers' Certificate.

Candidates for this degree may major in any department offering work in the College of Education.

Recipients of the degree of Bachelor of Arts (in Education) and of the University Teachers' Certificate may, by a proper selection of studies during their regular course, become eligible for recommendation or endorsement for manual training, high school teacher-librarian or high-school teacher-training department.

*Prescribed course of study for University Teachers' Certificate.*—The College of Education has adopted the prescribed course of study outlined below, to be required of all candidates for the University Teachers' Certificate and for the degree of Bachelor of Arts (in Education), the same to become effective in September, 1915.

No.	Title	Credits	To be taken	
			Semester	Year
1.	Brief History of Education.....	3	1 or 2	Jr.
	or			
101-102.	History of Education.....	6	1 and 2	Jr.
3.	Social Aspects of Education.....	3	1 or 2	Jr.
111.	Technique of Teaching.....	3	1 or 2	Sr.
115.	Practice Teaching (see statement below).....	3	1 or 2	Sr.
	Teachers' Courses (i.e., courses in special methods) covering at least two high schools subjects and totaling at least three credits.....	3	1 or 2 or 1	Jr. Sr.

A general introductory course in psychology is a prerequisite for all courses in Education. Credits gained by it, however, are not counted as professional credits toward the teachers' certificate.

†In some cases the amount of work necessary to meet this requirement will total six credits. In other cases a single teachers' course totaling only three credits is arranged in such a way as to cover two subjects, thereby satisfying this requirement. An example of this is the teachers' course in English and Rhetoric.

*Members of the class of 1916* will be granted the degree and the teachers' certificate upon the basis in effect at the time of their registration in the College of Education. Therefore, in lieu of the prescribed course, they may offer the following: (1) a general introductory course in psychology (Philosophy 1-2 or 5) and (2) courses 1 or 101-102 in Education, together with (3) additional work in Education to make a total of eighteen credits, including those specified in Philosophy. In these additional credits must be included Practice Teaching, and teachers' courses in two subjects, together carrying at least three credits.

*Graduates of normal schools* who, upon entering the College of Education, receive credit for any of the courses specified above will be allowed to elect in the place of the same other strictly professional subjects.

#### PRACTICE TEACHING

Opportunity for Practice Teaching is provided in part by the University High School and in part by the Minneapolis City Schools.

Education 1 or 101-102, 3, 111, and the teachers' course in the department in which the student wishes to do practice teaching, together with all subjects required by the department concerned as prerequisite to the teachers' course (see departmental statement) are prerequisite to the course in Practice Teaching. No student will be permitted to do practice teaching who has not been definitely recommended by the department in which the subject lies as being well-prepared from the standpoint of subject matter. In cases where the teachers' course extends throughout two semesters, students will in exceptional cases be permitted to do their practice teaching during the second semester of their teachers' course.

#### *Applications and Credentials*

All assignments to Practice Teaching are made by the Principal of the University High School. Before registering for this work students must consult with him and submit: (1) the departmental recommendation referred to above and (2) a statement from the Registrar showing the courses they are offering as prerequisites including, (a) the courses in Education, (b) the courses in the department concerned. This statement must show when these courses were taken and the grade received and it must be followed by a formal statement that the student has satisfied all the prerequisites for practice teaching.

*Credits allowed in Agriculture and Home Economics.*—A maximum of eighteen credits is elective from courses in Agriculture and Home Economics, but it should be noted that prospective teachers of these subjects must secure from the State Department of Education in advance of their contract to teach, a special certificate in the subject concerned. Students looking forward to the teaching of Agriculture or Home Economics are advised under ordinary circumstances to register in the College of Agriculture.

### SPECIAL TRAINING COURSES

#### AGRICULTURE

The preparation of Teachers of Agriculture is under the direction of the Division of Agricultural Education. (See Bulletin of the College of Agriculture).

#### COMMERCIAL TRAINING

The demand for university graduates as commercial teachers has been greater than the University has been able to meet. A new require-

ment of the State Department that teachers of commercial subjects must be college graduates will intensify this demand. The University has as yet made no arrangements to offer the technical subjects required for this work, such as stenography, typewriting, penmanship, bookkeeping, etc. Nevertheless, by a proper selection of courses in English, rhetoric, foreign languages, history, economics, psychology, and education, students who have secured a knowledge of the technical subjects elsewhere can get a broad and sound foundation for this work during their university course.

The following courses are especially recommended to students looking forward to this work: English 1-2; Rhetoric 1-2 and 11-12; Languages—German, Spanish, or French; History 1-2 and 3-4; Economics 1-3, 13, 18, 19, 31, 33, 34, 35, 36, 42, 43, 47, 48, 142, 145, 146; Political Science, 1, 13, 14; Psychology 1-2; Education, all courses prescribed for the University Teachers' Certificate.

#### HOME ECONOMICS

The preparation of teachers of Home Economics is under the direction of the Department of Home Economics, College of Agriculture. (See statement above under *Agriculture*, also departmental statement, pages 30 and 53 of this bulletin, and Bulletin of College of Agriculture.)

#### MANUAL TRAINING

During the year 1914-1915 plans were effected looking towards a complete reorganization of the preparation of manual training teachers. Mr. R. L. Southworth, a graduate from the manual training course, Teachers' College, Columbia University, whose experience as a manual training instructor in public school work has covered every type of work in the grades and high school, will have general supervision and direction of all the work. Under Mr. Southworth's direction, all work will be presented from the standpoint of the needs and conditions of the public schools, special attention being given to the present tendency to relate manual training to communal and industrial needs.

Students looking forward to teaching manual training may, under the present arrangements, offer manual training as a minor in the College of Education. Under Manual Training in the departmental statements will be found a prescribed course of study to be required of all students whom the College of Education will recommend for certificates as teachers of manual training.

#### TEACHER-LIBRARIANS

Owing to the existence of a large number of small high schools, and to a recent ruling of the State High School Board made in 1915 which requires every state-aided high school to provide trained service for the high school library, there will undoubtedly be an urgent and increasing demand during the next few years for teachers who have had some definite library training and who will divide their time between teaching and the care of the school library. The College of Education will offer for the first time during the year 1915-1916, under the direction of Miss

Martha Wilson, State Supervisor of School Libraries, a brief course for training high school teacher-librarians. Those who complete the three courses named below will receive a teacher-librarian certificate and three credits in the Department of Education.

These courses extend over two years and will be confined to Saturday mornings from 11:00-11:50 with additional laboratory periods, to be arranged. Course 1 will be offered the first semester of 1915-1916 and 1916-1917; course 2, the second semester of 1915-16; course 4, the second semester of 1916-17. Students who begin library training the first semester of their junior year will be able by the end of their senior year to have satisfied the requirements for work as high school teacher-librarians. Students beginning the first semester of their senior year may complete their training by pursuing the course in the summer school.

For description of courses, see departmental statement, page 31.

#### HIGH SCHOOL TRAINING DEPARTMENTS

A complete reorganization of the work designed to prepare teachers of high-school training departments has been effected and a definite course of study under the direction of the College of Education has been arranged. This course is open only to teachers who have had two years of rural teaching experience and who in addition to this are graduates from the advanced course of a Minnesota State Normal School or, who possess equivalent professional preparation. Note: To this second requirement exceptions may be made in the case of teachers already engaged in high-school training departments and in certain other individual cases where circumstances justify the same.

In the conduct of the course the College of Education will be assisted by Miss Mabel Carney, State Supervisor of Teachers' Training Departments, who will offer a course of monthly lectures and conferences extending throughout the year. The courses in the methods of teaching the elementary studies will be in the hands of teachers actually engaged in High School Training Departments.

Ordinarily two years will be required to complete this course. However, teachers already engaged in high-school training departments and holding First Grade Professional Certificates and who are unable to absent themselves from their duties for more than a year will be permitted to deviate from the prescribed course of study and to elect such subjects as will be of most immediate use to them in their work.

The State Department of Education issues no special certificate for teachers of high-school rural training departments. It gives its official endorsement to teachers whom it considers satisfactory from the standpoint of preparation, experience, and personal qualifications.

Students who complete the course offered by the College of Education for teachers of training departments will be eligible for the endorsement of the State Department of Education for heads of training departments in high schools. The course as outlined provides Education as a major study, with Economics and English as minors. The selection of these two subjects as minors has been based upon the nearness of



their relation to the work of the rural school teacher. The education courses are all required, but other minors may be selected upon approval.

For an outline of the prescribed course of study, consult departmental statement, pages 32-33.

#### TEACHERS OF DEFECTIVES

During the past year the College of Education, in coöperation with the department of Psychology, has been able to prepare a limited number of teachers of mental defectives. Plans are now in progress for a further development of this phase of teacher preparation and it is hoped that by coöperating with the state institutions for defectives upon a basis somewhat similar to that adopted in connection with the Minneapolis schools for teaching-assistants, it may prove possible in the near future to organize effective training courses for teachers of the blind, and the deaf and dumb, as well as for teachers of mental defectives. Students interested in preparing for this type of work should consult with the Dean of the College.

#### KINDERGARTEN AND ELEMENTARY TEACHERS

The College of Education offers opportunity for advanced study to teachers who have had adequate normal school training and who wish to take further preparation for work as principals or supervisors of elementary schools. The college, however, recognizes clearly that the training of elementary school teachers and of kindergarteners does not lie within its province. Nevertheless, the following agreements between the presidents of the State Normal Schools of Minnesota and the Executive Faculty of the College of Education, reached at an informal conference, April 3, 1915, make it possible for students in the College of Education, who discover during their course that their taste and ability lie in the elementary field, to transfer from the College of Education to one of the normal schools at the opening of their senior year and thus prepare themselves as elementary teachers or as kindergarteners without loss of time.

##### *Agreements between Normal Schools and 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 the 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.

#### PUBLIC SCHOOL MUSIC

See course 27-28 under statement of Department of Music.

## DEPARTMENTAL STATEMENTS

### EXPLANATION OF COURSE NUMBERS

Odd numbers indicate first-semester courses; even numbers, second-semester courses. A combination of the two (e. g., 5-6) indicates courses continuing through the year. In the case of courses repeated the second semester, the suffix *a* indicates first semester; the suffix *b*, second semester.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200. Strictly graduate courses are numbered from 201 up.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

### EDUCATION

Professors LOTUS D. COFFMAN, ALBERT W. RANKIN, FLETCHER H. SWIFT, M. E. HAGGERTY; Assistant Professor RAYMOND A. KENT; Instructors R. B. INGLIS, J. W. NORMAN, W. D. REEVE; Lecturers ALBERTA ACKERMAN, MABEL CARNEY, MAY H. DILLS, T. P. GIDDINGS, D. H. HOLBROOK, CORAL L. OSBORN, RAY L. SOUTHWORTH, JUDSON R. TOWNE.

### REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, eighteen credits, including Philosophy 1-2, or equivalent.

*For a Major*, twenty-four credits, including Philosophy 1-2, or equivalent. Six credits in Psychology are prerequisite for all courses in Education.

No.	Title	COURSES		Prereq. courses
		Credits	Offered to	
1a.	Brief Course in the History of Education.....	3	Jr., sr.	Phil. 1-2
1b.	Brief Course in the History of Education.....	3	Jr., sr.	Phil. 1-2
3a.	Social Aspects of Education	3	Jr., sr.	Phil. 1-2
3b.	Social Aspects of Education	3	Jr., sr.	Phil. 1-2
101.	History of Educ. to Reformation.....	3	Jr., sr., grad.	Phil. 1-2 and 6 credits in dept. of Hist.
101t.	History of Educ. to Reformation.....	3	Teachers only	Phil. 1-2
102.	History of Educ. since Reformation.....	3	Jr., sr., grad.	Phil. 1-2 and 6 credits in dept. of Hist.
102t.	History of Educ. since Reformation.....	3	Teachers only	Phil. 1-2

No.	Title	Credits	Offered to	Prereq. courses
104.	Principles of Method . . . . .	3	Sr., grad.	1 or 101-102 and 3
105.	Educational Psychology . . . . .	3	Sr., grad.	1 or 101-102 and 3
107-108.	Prob. in High School Training Departments . . . . .	0	Jr., sr., grad.	1 or 101-102
110.	Rural School Curriculum . . . . .	2	Sr., grad.	3 and 111
111a.	Technique of Teaching . . . . .	3	Jr., sr., grad.	Phil. 1-2
111b.	Technique of Teaching . . . . .	3	Jr., sr., grad.	Phil. 1-2
114.	Current Problems in Elementary Teaching . . . . .	3	Sr., grad.	1 or 101-102 and 3
115a.	Practice Teaching . . . . .	3	Sr., grad.	See statement
115b.	Practice Teaching . . . . .	3	Sr., grad.	See statement
119.	School Curricula . . . . .	3	Sr., grad.	1 or 101-102 and 3
121.	School Organization and Administration . . . . .	3	Sr., grad.	1 or 101-102 and 3
123.	Theory of Supervision . . . . .	3	Sr., grad.	1 or 101-102 and 3
124.	Educational Administration . . . . .	3	Sr., grad.	121
125.	Methods in Educational Research . . . . .	2	Sr., grad.	1 or 101-102 and 3
126.	Units and Scales for Measuring Results . . . . .	2	Sr., grad.	1 or 101-102 and 3
128.	Auxiliary Education . . . . .	3	Sr., grad.	105
131.	Foreign School Systems . . . . .	3	Sr., grad.	1 or 101-102 and 3
131t.	Foreign School Systems . . . . .	3	Teachers only	1 or 101-102 and 3
141.	School Sanitation and Public Health . . . . .	3	Sr., grad.	1 or 101-102 and 3
142.	Industrial Education . . . . .	2	Sr., grad.	1 or 101-102 and 3
143.	Problems in Vocational Guidance . . . . .	0	Jr., sr., grad.	Phil. 1-2
144.	Vocational and Moral Guidance . . . . .	3	Sr., grad.	1 or 101-102 and 3
146.	History and Principles of Religious Education . . . . .	3	Jr., sr., grad.	Phil. 1-2
152.	Elem. Meth. in Reading . . . . .	1	Jr., sr., grad.	1 or 101-102
153.	Elem. Meth. in English . . . . .	1	Jr., sr., grad.	1 or 101-102
154.	Elem. Meth. in Ind. Arts . . . . .	1	Jr., sr., grad.	1 or 101-102
155.	Elem. Meth. in History . . . . .	1	Jr., sr., grad.	1 or 101-102
156.	Elem. Meth. in Geography . . . . .	1	Jr., sr., grad.	1 or 101-102
157.	Elem. Meth. in Arithmetic . . . . .	1	Jr., sr., grad.	1 or 101-102
201-202.	Seminar Selected Problems in Educational History . . . . .	2	Grad.	101-102 and 6 credits in History Dept.
203-204.	Seminar in Educational Psychology . . . . .	2	Grad.	105
205-206.	Seminar in Educational Administration . . . . .	2	Grad.	124, 125, 126

## HISTORY OF EDUCATION

- 1a or 1b. A BRIEF COURSE IN THE 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. SWIFT, NORMAN.
101. HISTORY OF EDUCATION TO THE REFORMATION. An interpretative historical study of educational institutions and ideals, designed for those who wish a more comprehensive historical view than can be gained in Education 1. The foundations of modern education—Hebrew, Greek, Roman, Medieval. SWIFT.
- 101t. Same as Course 101, but for teachers only. A year course. SWIFT.
102. HISTORY OF EDUCATION SINCE THE REFORMATION. Modern educational movements, current theories, and standards in the light of their history. For fuller description of general character of course, see course 101. SWIFT.
- 102t. Same as course 102, but for teachers only. A year course. (Not offered in 1915-1916.) SWIFT.
- 201-202. SEMINAR. Selected problems in Educational History. Research course designed for graduate students. SWIFT.

## PRINCIPLES OF EDUCATION

104. PRINCIPLES OF METHOD. An advanced course in principles of method with special application to high-school subjects. HAGGERTY.
- 111a or 111b. TECHNIQUE OF TEACHING. Types of classroom exercises; preparation of teaching plans; hygiene of instruction; classroom management; the professional ethics of teaching; observation of high-school work. COFFMAN, .....

## EDUCATIONAL PSYCHOLOGY

105. EDUCATIONAL PSYCHOLOGY. An advanced course in psychology of the learning process. HAGGERTY.
- 203-204. SEMINAR IN EDUCATIONAL PSYCHOLOGY. A research course for graduate students. Problems in educational psychology. HAGGERTY.

## SCHOOL ADMINISTRATION

- 3a or 3b. SOCIAL ASPECTS OF EDUCATION. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. KENT, RANKIN.
- 107-108. PROBLEMS OF THE HIGH SCHOOL TRAINING DEPARTMENT. Lectures and conferences upon the problems of high-school teacher-training departments. No credit. CARNEY.
110. RURAL SCHOOL CURRICULUM. The problems of organization of the elementary school curriculum with reference to the rural school and rural life. ....

114. **CURRENT PROBLEMS IN ELEMENTARY TEACHING.** An advanced course in current problems. Definite problems will be assigned to each student to be worked out under the direction of the instructor through readings, visitation of schools and conferences and class discussion. RANKIN.
119. **SCHOOL CURRICULA.** The curriculum as related to social, industrial, and economic conditions; a survey of the grammar grades and of the high school. Consideration of the possibilities of developing a curriculum better adapted to community needs. RANKIN.
121. **SCHOOL ORGANIZATION AND ADMINISTRATION.** An introductory course in school administration for students of teaching experience and for those looking forward to work as principals and superintendents. RANKIN.
123. **THEORY OF SUPERVISION.** The problems involved in the training of teachers in service; studies of qualities of merit in teachers; factors in selecting teachers; the distribution of subject matter by grades; the time allotment of studies. COFFMAN.
124. **EDUCATIONAL ADMINISTRATION.** The interpretation of present tendencies in the administration of state and city school systems. COFFMAN.
125. **METHODS IN 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. COFFMAN.
126. **UNITS AND SCALES FOR MEASURING EDUCATIONAL RESULTS.** An intensive study of the application of units and scales for measuring achievement in reading, composition, spelling, handwriting, and arithmetic. COFFMAN.
128. **AUXILIARY EDUCATION.** A study of educational provisions for defectives, blind, deaf, speech, mental. Institutions, subject matter, and methods. HAGGERTY.
- 205-206. **SEMINAR IN EDUCATIONAL ADMINISTRATION.** COFFMAN.

#### SCHOOL SANITATION AND HYGIENE

- 141a. **SCHOOL SANITATION AND PUBLIC HEALTH.** A course in school hygiene in its broader aspects. Designed for all teachers and supervisors who are responsible for the health of school children. Treats of medical supervision and other problems arising from school environment. RANKIN.

#### FOREIGN SCHOOLS

131. **FOREIGN SCHOOL SYSTEMS.** A study of existing school systems of other countries with a view to possible suggestion for development of public education in the United States. The emphasis in this course

will be placed upon present conditions: in 1915-16, French Schools.  
SWIFT.

131t. Same as 131, but for teachers only. SWIFT.

#### INDUSTRIAL EDUCATION AND VOCATIONAL GUIDANCE

142. INDUSTRIAL EDUCATION. Existing types of industrial and vocational schools and systems of training. Comparison of conditions in America and foreign countries. Organization of course of study.

143. PROBLEMS IN VOCATIONAL GUIDANCE. A general introductory course in vocational guidance. Weekly conferences and discussions. Original investigations of current problems under the direction of the instructor, supplemented by reading and lectures. No credit. HOLBROOK.

144. VOCATIONAL AND MORAL GUIDANCE. This course is designed for all who are interested in the problem of directing boys and girls toward their life work through education. It is of special value to superintendents, principals, and teachers of civics. (Not offered in 1915-16).

#### MORAL AND RELIGIOUS EDUCATION

146. HISTORY AND PRINCIPLES OF RELIGIOUS EDUCATION. Part I: The influence of religion and religious education as social and spiritual forces among certain selected types. Part II: Principles of education as applied to religious instruction and training. This course may be pursued as a graduate course under certain conditions. SWIFT.

#### PRACTICE TEACHING

115a or 115b. 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. (See statement of prerequisites and regulations governing Practice Teaching, page 20.)

#### METHODS OF TEACHING

1. General Method—See above courses 104 and 111.
2. Teachers' Courses or Courses in Special Methods of Teaching High School Subjects.

A description of the methods courses offered in the Rural Training Department is given immediately after the following tabular statement. A full description of all other Teachers' Courses together with their prerequisites appears in each departmental statement. For the year 1915-1916 the courses in English and Rhetoric and Physics receive credit only as courses in Education.

A recent ruling of the State Department of Education requires courses in special methods of at least two different high-school sub-

jects and totaling at least three credits, for all applicants for the State Professional Teacher's Certificate. In some cases the amount of work necessary to meet this requirement will total six credits. In other cases a single teachers' course totaling only three credits is arranged in such a way as to cover two subjects, thereby satisfying this requirement; an example of this is the teachers' course in English and Rhetoric.

Department	Course No.	Credits	Offered to	Instructor
Animal Biology.....	31-32	3	Soph., jr., sr.	Sigerfoos
Botany.....	121-122	6	Jr., sr., grad.	Clements
Chemistry.....	20	2	Jr., sr.	Cohen
*English (and Rhetoric).....	130	3	Jr., sr.	Inglis
Geography.....	55	2	Jr., sr.	Posey
German.....	59-60	2	Jr., sr.	Schlenker
History and Political Science.....	56-57	3	Jr., sr.	Krey
Latin.....	101-102	6	Jr., sr.	Pike
*Library Methods.....	1, 2, 4	3	Jr., sr.	Wilson
*Manual Training.....	11-12	2	Jr., sr.	Southworth
Mathematics.....	54a-54b	2	Jr., sr.	Reeve
Music.....	27-28	6	Jr., sr.	Giddings
Norwegian.....	110	2	Jr., sr.	Bothne
*Physics.....	89-90	2	Jr., sr.	Towne
Political Science and History.....	56-57	3	Jr., sr.	Krey and Schaper
Rhetoric.....	130	3	Jr., sr.	Inglis
†Swedish.....		3	Jr., sr.	Stomberg
*Elementary Methods—				
in Arithmetic*.....	157	1	Sr.	Ackerman
in English*.....	153	1	Sr.	Dills
in Geography*.....	156	1	Jr.	Ackerman
in History*.....	155	1	Sr.	Osborn
in Industrial Arts*.....	154	1	Jr.	Osborn
in Reading*.....	152	1	Jr.	Dills

\*Receives credit only in Department of Education.

†Not offered in 1915-16.

HIGH SCHOOL TRAINING DEPARTMENT METHODS

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. DILLS.
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. DILLS.
154. 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. OSBORN.
155. 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. OSBORN.

156. **ELEMENTARY METHODS IN GEOGRAPHY.** The place of geography in the rural school curriculum. Different types of lessons, equipment, materials, adaptation to needs of rural communities. ACKERMAN.
157. **ELEMENTARY METHODS IN ARITHMETIC.** The place of arithmetic in the rural school curriculum. Different types of lessons, equipment, materials, adaptation to needs of rural communities. ACKERMAN.

### AGRICULTURAL EDUCATION

Students in the College of Education may upon the approval of the Dean of the College of Education and of the Chief of the Division of Agricultural Education pursue courses in the College of Agriculture to the amount of eighteen credits.

Students should consult the descriptions of the Departments of Economics and Sociology in this bulletin where they will find several courses dealing with the problems of rural life and of agriculture: e. g., Economics 18, Agricultural Economics and Sociology 14, Rural Sociology.

### MANUAL TRAINING

Lecturer RAY L. SOUTHWORTH; Assistant Professors FRANKLIN R. McMILLAN, S. CARL SHIPLEY; Instructors EDWARD P. QUIGLEY, WILLIAM H. RICHARDS.

#### REQUIREMENTS OF THE DEPARTMENT

*For a Minor*—The seventeen credits required in the prescribed course outlined below, or their equivalent.

*For a Major*—Manual training cannot be offered as a major.

*For a Teacher's Certificate*—Completion of the following prescribed course or its equivalent.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
1.	Constructive Drawing . . . . .	1½	Jr.	None
2.	Mechanical Drawing . . . . .	2	Jr.	1
3.	Woodwork . . . . .	2	Jr.	None
4.	Woodwork . . . . .	1½	Jr.	3
6.	Woodturning and pattern making . . . . .	2	Jr.	1,3
7.	Forge . . . . .	2	Sr.	1-6
8.	Machine Shop . . . . .	2	Sr.	1-7 and 9
9.	Clay, Cement and Foundry . . . . .	2	Sr.	1-6
11-12.	Method and Organization..	2	Sr.	1-6

NOTES:—(1) In all Manual Training courses, each credit hour calls for at least three hours of shop work.

(2) In courses 1 and 2 students provide their own instruments and materials. A laboratory fee of three dollars per course will be charged for courses 3-9, inclusive.



1. **CONSTRUCTIVE DRAWING.** Essentials of constructive drawing from the educational usage viewpoint—lettering, reading and making working drawings, projection drawing, and the use of drawing tools. Visualization, the relation of information and technique, and constructive design. SOUTHWORTH.
2. **MECHANICAL DRAWING.** Applied machine drawing as based upon the study of fastenings and power transmission. Sketching, tracing, blueprinting, shading, tinting, elementary machine design and the use of hand and reference books. SOUTHWORTH.
3. **WOODWORK.** Typical elementary bench work suitable for the sixth, seventh, and eighth grades. Tool operation, tool use, typical materials of construction, working from drawings, individual design, and a study of the source of materials. Shop fee, \$3.00. SOUTHWORTH.
4. **WOODWORK.** This phase of the work will be based upon elementary cabinet work. The design and construction of typical projects will be studied. Joints, fastenings and wood finishes. Shop fee, \$3.00. SOUTHWORTH.
5. **WOOD TURNING AND PATTERN MAKING.** Use and care of the lathe, educational and commercial values of wood turning, spindle, screw chuck or face plate and hollow chuck or mandrel work. Elementary pattern work as adapted to the use of high schools. Shop fee, \$3.00. RICHARDS.
7. **FORGE.** The treatment of the fire, soft and hard iron, steel welding, hardening, tempering, annealing, tool making and one problem in decorative wrought iron from the student's own design. Shop fee \$3.00. QUIGLEY.
8. **MACHINE SHOP.** Chipping, filing, sheet iron and copper, the lathe, drill press, planer, milling machine, shaper, and the grinding machine. A simple machine will be designed and carried through the various shop processes, by the student. Shop fee, \$3.00. SHIPLEY.
9. **CLAY, CEMENT, AND FOUNDRY.** Clay—designing and decoration of clay objects; cement construction—flat, cored, and reinforced work; foundry work—the essentials necessary for school use. Shop fee, \$3.00. McMILLAN, QUIGLEY, SOUTHWORTH.
- 11-12. **METHODS AND ORGANIZATION—TEACHERS' COURSE.** Aims and organization of manual training, its place in the school curriculum, social, industrial, and psychological significance. Courses of study adaptable to different types of communities and school systems. A comparative and critical study of methods. SOUTHWORTH.

## TEACHER-LIBRARIAN TRAINING

Lecturer, MARTHA WILSON.

The satisfactory completion of the following courses will render a student eligible for a high-school teacher-librarian certificate. (See statement, page 22.)

No.	Title	COURSES		Prereq. courses
		Credits	Offered to	
1.	Elementary Library Methods for Teachers.....	1	Jr., sr.	None
2.	Library Organization.....	1	Jr., sr.	1
4.	Cataloging.....	1	Jr., sr.	1

1. **ELEMENTARY LIBRARY METHODS FOR TEACHERS.** Introductory course—problems of the high-school library, arrangement, selection of books, catalogs, book lists, methods of ordering books and library cards; training teachers to teach students the use of the high-school library. WILSON.
2. **LIBRARY ORGANIZATION.** Library organization, including classification, arrangement, and school library administration. WILSON.
4. **CATALOGING.** Definite training in elementary cataloging, the making of a dictionary catalog, and the use and adaptation of Library of Congress and other printed catalog cards. (Not offered in 1915-16). WILSON.

## HIGH SCHOOL RURAL TRAINING

Director, LOTUS D. COFFMAN; Lecturers, MABEL CARNEY, ALBERTA ACKERMAN, MAY H. DILLS, CORAL L. OSBORN.

## REQUIREMENTS OF THE DEPARTMENT

1. *For Admission.* (1) Two years of rural teaching experience; (2) Advanced diploma from a State Normal School. For exceptions, see statement, page 22.

2. *For Recommendation for State Endorsement.* For explanation, see page 13 of this bulletin.

Students who complete the following course will be eligible for recommendation for the endorsement of the State Department of Education as teachers of high-school rural training departments.

In the following course, Education is selected as a major. The two minors recommended are English and Economics. The Education courses, in *italics*, are all required, but previous training, experience and needs of the student may modify his choice of minors and of other electives. Normal School graduates are credited with the History of Education and Introductory Psychology, consequently these courses are not included in the following outline. (See also page 22.)

## PRESCRIBED COURSE FOR HIGH SCHOOL RURAL TRAINING TEACHERS

*Junior Year*

First Semester		Second Semester	
EDUCATION:	Credit	EDUCATION:	Credit
107. <i>Problems of the Training Department</i> (monthly lectures and conferences). MISS CARNEY.	None	108. <i>Continuation of 107</i> .....	None
3a. <i>Social Aspects of Educ.</i> ....	3	152. <i>Elem. Meth. in Reading</i> ...	1
		154. <i>Elem. Meth. in Ind. Arts</i> ..	1
		156. <i>Elem. Meth. in Geography</i> ..	1
PHILOSOPHY:		ECONOMICS:	
17. <i>Methods of Study</i> .....	3	18. <i>Rural Economics</i> .....	3
ECONOMICS:		32. <i>Phys. and Human Geog.</i> ..	3
3a. <i>Elements of Economics</i> ...	3	ENGLISH:	
31. <i>Phys. and Human Geog.</i> ..	3	2. <i>General Survey</i> .....	3
ENGLISH:		HOME ECONOMICS*†.....	3
1. <i>General Survey</i> .....	3		

*Senior Year*

First Semester		Second Semester	
EDUCATION:	Credit	EDUCATION:	Credit
107. <i>Problems of the Training Department</i> (monthly lectures and conferences). MISS CARNEY..	None	108. <i>Continuation of 107</i> .....	None
111a. <i>Technique of Teaching</i> ....	3	110. <i>Rural School Curriculum</i> ..	2
123. <i>School Supervision</i> .....	3	142. <i>Industrial Education</i> .....	2
153. <i>Elem. Meth. in English</i> ..	1	115. <i>Practice Teaching</i> .....	3
155. <i>Elem. Meth. in History</i> ..	1	PHILOSOPHY:	
157. <i>Elem. Meth. in Arithmetic</i> ..	1	106. <i>Child Development</i> .....	3
ENGLISH:		ENGLISH:	
63. <i>19th Century Literature</i> ..	3	122. <i>American Literature</i> .....	3
AGRICULTURE*.....	3		

Descriptions of all courses in above course not definitely referred to in footnotes will be found in the proper Departmental Statement.

\*Courses to be selected according to individual interests after conference with head of department.

†A course in Home Economics especially designed for teachers of high school training departments will be arranged in case the number of registrations and the community of needs of students warrants this.

## ANIMAL BIOLOGY

Professors HENRY FRANCIS NACHTRIEB, JOHN B. JOHNSTON, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate Professor HAL DOWNEY; Assistant Professors ELMER J. LUND, OSCAR W. OESTLUND; Instructors GEORGE DELVIN ALLEN, CHARLES E. JOHNSON; Assistants ADOLPH RINGOEN, HELEN SANBORN; Teaching Fellow HERBERT E. METCALF.

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits.

*For a Major*, twenty-four credits.

*For B.A. with Distinction*, freshman year, Course 1-2; sophomore year, the student may elect from Courses 7-8, 15-16, 19-20, 23-24; during the junior year the student must elect from Courses 31 to 144, and must include some line of work begun in the sophomore year which he expects to pursue during the senior year under 161-162.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

*For a Teacher's Certificate* an average of B in Courses 1-2, 31-32, 28, and nine other credits in Animal Biology and six credits in Botany.

## JOURNAL CLUB

The professors, instructors and advanced students of the department meet once a week to review and discuss current zoological literature and to listen to reports from those carrying on investigations.

## COURSES

*Introductory Courses*

No.	Title	Credits	Offered to	Prerequisites
1-2.	General Zoology.....	6†	All	None
7-8.	Histology-Embryology ...	6†	Soph., jr., sr.	1-2
12.	Histological Technique...	3	Soph., jr., sr.	1-2 and 7-8
15-16.	General Physiology.....	6†	Soph., jr., sr.	1-2
19-20.	Comparative Anatomy of Vertebrates .....	6†	Soph., jr., sr.	1-2
23-24.	Entomology .....	6†	Soph., jr., sr.	1-2
28.	Ornithology .....	3	Soph., jr., sr.	1-2
30.	Neurology .....	3	Soph., jr., sr.	1-2
31-32.	Nature Study.....	3	Jr., sr.	12 credits
51.	Protozoology .....	3‡	Jr., sr.	9 credits inc. 1-2
56.	Morphology of Invertebrates .....	3‡	Jr., sr.	9 credits inc. 1-2
79.	Mammalogy .....	2	Jr., sr.	1-2 19-20

*Advanced and Graduate Courses*

101-102. Advanced Entomology....	6	Jr., sr., grad.	1-2, 23-24
115-116. Morphology of Vertebrates	6 or 12	Jr., sr., grad.	1-2, 7-8 or 19-20
119-120. Vertebrate Histology.....	6	Sr., grad.	1-2, 7-8, 12
123-124. Blood of Vertebrates....	6 or 12†	Sr., grad.	1-2, 7-8, 12, 137-138, reading knowledge of French and German.
125-126. Comparative Neurology...	6†	Honors and grad.	7-8 or 19-20 and six other credits in Zoology or Human Anat.
131-132. Embryology .....	6†	Jr., sr., grad.	1-2, 7-8
143-144. Genetics and Eugenics...	6	Sr., grad.	1-2, 7-8, 15-16
161-162. Problems .....	6 or 12	Sr., grad.	1-2 and other courses prescribed by department.

†Both semesters must be completed before credit is given for the first semester.

‡Courses 51 and 56 may be combined for a year-course.

31-32. NATURE STUDY—TEACHERS' COURSE. Discussions, reference, field and laboratory work, through the year, twice a week first semester or once a week second semester. Especially for the fitting of teachers in secondary schools. SIGERFOOS.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 31-33.

## ART

It is expected that adequate opportunities for work in the fine arts and architecture will be offered to the students of this college in the near future. The following course is offered through the coöperation of the Minneapolis Society of Fine Arts. Mr. Breck, Director of the Minneapolis Institute of Arts, will lecture on Ancient Art; Miss Margaret T. Jackson, Director's Assistant at the Institute, on Christian, Romanesque, Gothic, and Renaissance Art; and Mr. Robert Koehler, Director Emeritus of the Minneapolis School of Art, on Art from the XVII Century to the present day.

**HISTORY OF ART:** A general survey of the history of Occidental Art from the earliest times to the present day. Two lectures a week and required reading. Second semester. Prerequisite, History 1-2 or twelve credits in Greek, Latin, or English.

## ASTRONOMY

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

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, Courses 51-52 and 101-102 (the latter taken as a three-hour course) or Courses 13-14 and 101-102 (the latter taken as a three-hour course).

*For a Major*, Courses 21, 51-52, and 101-102 (the latter taken as a six-hour course), and Mathematics 4.

*For B.A. with Distinction*, the general requirements (page 14), Courses 51-52, 101-102 (as a six-hour course), and six credits in Physics.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

## ASTRONOMICAL OBSERVATORY

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.

## COURSES

No.	Title	Credits	Offered to	Prereq. Courses
9-10.	Descriptive Astronomy..	3	Soph., jr., sr.	None
11a or 11b.	Descriptive Astronomy..	3	Soph., jr., sr.	None
13-14.	Descriptive Astronomy and Observatory Practice .....	6	Soph., jr., sr.	None
21.	Spherical Trigonometry with Applications.....	3	Soph., jr., sr.	Math. 1-2 and 6, or Math. 3-4 and 6
51-52.	General Astronomy.....	6	Jr., sr.	1 yr. Math.
62.	Elements of Practical Astronomy .....	3	Jr., sr.	1 yr. Math.
101-102.	Practical Astronomy....	6 or 12	Jr., sr.	Math. 7 and 11
140.	Method of Least Squares	2	Sr., grad.	Math. 51

All of the above courses receive credit in the College of Education. For description see College of Science, Literature and the Arts bulletin, pages 34 and 35.

## BACTERIOLOGY

Assistant Professor W. P. LARSON; Instructors, A. T. HENRICK, MARGARET WARWICK.

COURSES				
No.	Title	Credits	Offered to	Prerequisite
58a or 58b.	General Bacteriology....	4	All	Gen. Chem. and either Zool. 1-2 or Bot. 1
59.	Special Bacteriology....	3	All	Bact. 58
104.	Special Bacteriological Technique .....	3	All	Bact. 58

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, page 35.

## BOTANY

Professors FREDERIC E. CLEMENTS, CARL OTTO ROSENDAHL, JOSEPHINE E. TILDEN; Assistant Professors HERBERT F. BERGMAN, FREDERIC K. BUTTERS, NED L. HUFF; Assistants DONALD FOLSOM, FRANCES L. LONG, HARVEY STALLARD.

### REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, 12 credits, of which not more than six credits may be in introductory courses.

*For a Major*, 24 credits.

*For B.A. with Distinction*, the general requirements (page 14); 36 credits in Botany, of which 24 shall be selected from advanced Courses 105-106 to 119-120 inclusive. Those electing this course are urged to secure 12 credits during the sophomore year.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

*For a Teacher's Certificate*, an average of at least one honor point for each credit hour in one introductory and one intermediate course, and in Course 121-122.

Students entering the department without preparation must take Course 1, followed by 2, 3b or 4. Students coming from an approved high school course must take Course 3a followed by 2 or 4. Those who expect to pursue botany for a single year only will take Course 3b or 4 during the second semester, while those who expect to take a major in botany are advised to take Course 2.

### COURSES

<i>Introductory Courses</i>				
No.	Title	Credits	Offered to	Prerequisite
1a or 1b.	General Botany.....	3	All	None
2.	Structural Botany.....	3	All	1 or 3a
3a or 3b.	Evolution of Plants.....	3	All	1 or approved High School Botany
4.	Field and Garden Botany	3	All	1 or 3a

*Intermediate Courses*

No.	Title	Credits	Offered to	Prereq. courses
5-6.	Plant Morphology.....	6	Soph., jr., sr.	6 credits: see statement
7-8.	Taxonomy .....	6	Soph., jr., sr.	6 credits: see statement
9-10.	Physiology and Ecology..	6	Soph., jr., sr.	6 credits
11-12.	Industrial Botany.....	6	Soph., jr., sr.	6 credits, inc. 2 or 3
13-14.	Mycology .....	6	Soph., jr., sr.	6 credits

*Advanced Courses*

103.	Foodstuffs and Textiles..	3	Jr., sr., grad.	9 credits
105-106.	Algae .....	6	Jr., sr., grad.	9 credits
107-108.	Mosses and Ferns.....	6	Jr., sr., grad.	9 credits, inc. 2 or 3, or 5-6
110.	Gymnosperms .....	3	Jr., sr., grad.	7-8 or 107-108
111-112.	Advanced Taxonomy.....	6	Jr., sr., grad.	7-8
113-114.	Advanced Ecology.....	6	Jr., sr., grad.	9-10
115-116.	Advanced Physiology....	6	Jr., sr., grad.	9-10
117-118.	Cytology .....	6	Jr., sr., grad.	18 credits
119-120.	Advanced Industrial Botany .....	6	Jr., sr., grad.	11-12
121-122.	Plant Studies and Methods .....	6	Jr., sr., grad.	12 credits

121-122. PLANT STUDIES AND METHODS. The subject of nature study and high-school botany presented as they are to be taught; the material taken up in detail in proper sequence, and training in method afforded by practice in the University High School. CLEMENTS.

For description of all other courses see College of Science, Literature, and the Arts bulletin, pages 37-39.

## CHEMISTRY

Professors GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Associate Professor EVERHART P. HARDING; Assistant Professors IRA H. DERBY, FRANCIS C. FRARY, WILLIAM H. HUNTER, EDWARD E. NICHOLSON; Instructors ROSS A. BAKER, FRANK W. BLISS, LILLIAN COHEN, J. GERHARD DIETRICHSON, WOLF KRITCHEVSKY, LILLIAN L. NYE, EARL PETTIJOHN, FREDERICK POPPE, WOLDEMAR STERNBERG, EARLE K. STRACHAN, STERLING TEMPLE; Assistants CURTIS W. APPLEBY, WALTER M. LAUER, R. D. MAY, H. A. MURTA, A. T. NEWMAN, ADOLPH NIETZ, A. O. UTNE.

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits.

*For a Major*, twenty-four credits.

In Chemistry the purpose of the honors course is served by the Five-Year Course in Arts and Chemistry. (See page 27, College of Science, Literature, and the Arts bulletin.)

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of



Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

For a *Teacher's Certificate*, an average of at least one and one-half honor points for each credit hour in Courses 1-2 or 3-4 and 7-8 or 11-12; and 20.

## COURSES

*Division of General and Inorganic Chemistry*

No.	Title	Credits	Offered to	Prereq. courses
1-2.	General Chemistry.....	6†	Those entering without Chemistry	None
21-22.	Inorganic and Qualitative Chemistry .....	10†	Those entering without Chemistry	None
3-4.	Adv. Gen. Chem. and Qualitative Analysis....	6†	Fr., soph., jr.	Entrance credit in Chemistry
7-8.	Qualitative Analysis....	6†	Soph., jr., sr.	1-2
10.	Glass Blowing.....	1	Jr., sr.	None
17.	Inorganic Colloquium....	2	Sr.	11-12
20.	Teachers' Course.....	2	Sr.	3-4 or 7-8, or 21-22
169-170.	Chemistry of the Rare Elements .....	4†	Jr., sr.	11-12

*Division of Analytical Chemistry*

11-12.	Quantitative Analysis....	8†	Soph., jr., sr.	3-4 or 7-8, or 21-22
107-108.	Advanced Quantitative Analysis .....	6†	Jr., sr.	11-12

*Division of Organic Chemistry*

13-14.	Medical Organic Chemistry .....	6	Soph.	3-4 or 7-8, or 21-22
18.	Organic Colloquium.....	2	Sr.	35-36
35-36.	Organic Chemistry.....	8†	Jr., sr.	3-4 or 7-8, or 21-22
115.	Adv. Organic Chemistry.	2	Sr.	35-36
116.	Theoretical Organic Chem.	2	Sr.	35-36

*Division of Physical Chemistry*

121-122.	Physical Chemistry.....	4†	Jr., sr.	36-36 Physics 2 and 4
123-124.	Physico-chemical Lab....	2†	Jr., sr.	See statement
125-126.	Adv. Physical Chemistry.	6†	Sr.	121-122
128.	Radiochemistry .....	2	Jr., sr.	3-4 or 7-8, or 21-22 Physics 2 and 4

*Division of Technological Chemistry*

27-28.	Chemistry in Every Day Life .....	4†	Jr., sr.	3-4 or 7-8, or 21-22
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## Division of Industrial Chemistry

No.	Title	Credits	Offered to	Prereq. courses
15.	Photochemistry .....	2	Jr., sr.	3-4 or 7-8, or 21-22
16.	Color Photography.....	2	Jr., sr.	15

†Both semesters must be completed before credit is given for the first semester

20. TEACHERS' COURSE. For those who expect to teach Chemistry. COHEN.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 40-42.

## COMPARATIVE PHILOLOGY

Professor FREDERICK KLAEBER.

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, Courses 101, 102, 105, 108, 109, 110.

*For a Major*, Courses 101, 102, 105, 108, 109, 110, with German 3-4 (or 5-6) and 7-8 as prerequisites.

*For B.A. with Distinction*. The required credits in the major may be elected from the undergraduate courses of the department and English 8, 101, 103 and German 107-108.

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.

*Starred Courses*. The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

No.	Title	Credits	Offered to	Prereq. courses
101.	Science of Language.....	2	Jr.,sr., grad.	See statement
102.	Life of Words.....	2	Jr.,sr., grad.	Same as for 101
104.	Germanic Philology.....	2	Jr.,sr., grad.	Same as for 101
105.	Universal Language.....	2	Jr.,sr., grad.	Same as for 101
106.	Science of Language (Advanced) .....	2	Jr.,sr., grad.	Same as for 101
108.	Comparative Phonology..	2	Jr.,sr., grad.	German 7-8
109-110.	History of German Language .....	4†	Sr., grad.	German 53, 54

†Both semesters must be completed before credit is given for either semester.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, page 43.

## DRAWING AND DESCRIPTIVE GEOMETRY

Professor WILLIAM H. KIRCHNER; Assistant Professors FRANK B. ROWLEY, OTTO S. ZELNER; Instructors ROBERT W. FRENCH, LYALL DECKER.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
21-22.	Technical Drawing.....	4	All	None
21-22.	TECHNICAL DRAWING. Theoretical and practical graphics, the reading and making of working plans. Projection, sketching, lettering, conventions, renderings, and translations. KIRCHNER, FRENCH.			

## ECONOMICS

Professors JOHN H. GRAY, E. DANA DURAND; Assistant Professors ROY G. BLAKEY, J. FRANKLIN EBERSOLE, THOMAS WARNER MITCHELL; Instructors LLOYD M. CROSGRAVE, H. G. HAYES, A. C. JAMES, ROBERT J. McFALL; in the General Extension Division, Associate Professor CLARE L. ROTZEL; Assistant Professors GERHARD A. GESELL, CHARLES H. PRESTON; Instructor RAYMOND V. PHELAN.

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits

*For a Major*, twenty-four credits, including Course 4.

*For B.A. with Distinction*, thirty credits in the major line of work with the usual supporting credits, and not less than sixty credits altogether in Group B (page 22).

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

*For a Teacher's Certificate* in business subjects, a major in Economics, including Accounting and Economic Geography.

*Vocational Course in Business Education.* Freshmen who signify their intention of taking the proposed four-year vocational course in preparation for business (see College of Science, Literature, and the Arts bulletin, page 22) may elect Economics 1a the first semester followed by Economics 3b or Economics 2b, or both, the second semester. For these students 1a is prerequisite to 3b.

The departments of Economics, Political Science, History, and Sociology and Anthropology constitute a social science group. The subjects are intimately inter-related, and they are all of special importance to students who intend to engage in law, business, public service at home or abroad, journalism, the work of charities and corrections, or to give instruction in one of the social sciences. Students who are interested in the work of any one of the departments of the social science group ought to be familiar with at least the elements of the subjects offered in the other departments. A student who takes his major in any one of them ought to have more than the elements of the others.

## SUGGESTIONS AS TO COURSES IN THE DEPARTMENT

In order to aid students who have some idea as to their intended profession or calling to make a wise choice of courses, the accompanying tabular statement has been prepared.

These recommendations are merely suggestive and more courses are sometimes recommended than suffice to make up a technical minor or major in order that students may choose those courses which interest them the most.

Courses 3 and 4 are not included in these recommendations, as they must, in any case, precede the advanced courses, since they are required of all taking a major in Economics.

Students desiring merely a general acquaintance with Economics as part of a liberal education and as a preparation for citizenship are recommended to take the general courses and such others, amounting at least to a minor, as their interests may indicate.

## ECONOMICS

In preparation for	Courses advised for a minor	Additional advised for a major
Law	91, 22, 145, 146	43, 143, 73, 104
Public Service	2, 91, 145, 146	164, 35-6, 101
Consular and Diplomatic Service	2, 31-2, 13, 22, 71, 101	43, 143, 73, 34
Journalism	2, 91, 73, 145, 146, 43	164, 161, 101, 104, 143
Engineering or Railway Service	46, 73, 146, 145	161, 35-6, 34, 131
Chemistry or Manufactures	2, 15, 22, 31-2, 146, 161	34, 35-6, 131, 101
Mining	2, 72, 146, 161, 31-2, 143	13, 22, 141
Banking and Finance	43, 47, 101, 143, 145	42, 35-6, 138, 141, 144, 255-56
General Business	2, 13, 22, 31-2, 43, 143	23, 24, 34, 35-6, 141, 145
Forestry or Agriculture	13, 15, 17, 22, 31-2	35-6, 43, 73, 143, 251-2
Teaching Business Subjects	2, 13, 31-2, 43, 103	34, 35-6, 42
Medicine	2, 43, 164	42, 34, 35-6
Social Service Work	2, 161, 162	164, 104, 31-2, 261-62
The Ministry	2, 161, 162	164, 104, 31-2
Public Accountancy	35-6, 34, 132	131, 46, 47, 43, 141, 145, 146, 101, 253-54
Insurance	34, 35-6, 46, 47	23, 24, 145, 146, 141

## COURSES

*General Courses*

No.	Title	Credits	Offered to	Prereq. courses
1a or 1b.	Indust. Hist. since 1750..	3	Soph., jr., sr.	None†
3a or 3b.	Elements of Economics..	3	Soph., jr., sr.	None†
4a or 4b.	Advanced Economics....	3	Soph., jr., sr.	3
5.	Economic Development...	3	Soph., jr., sr.	None
31-32.	Physical and Human Geography .....	6†	Soph., jr., sr.	None
101.	Statistics .....	3	Jr., sr., grad.	6 credits inc. 3
104.	Hist. of Economic Ideas.	3	Jr., sr., grad.	3 and 4
105-106.	Economic Conference....	None	Sr., grad.	Accompanies seminars

*Production, Transportation and Commerce*

2a or 2b.	Industries and Commerce of the United States...	3	Soph., jr., sr.	None†
13.	Econ. Geography of For- eign Countries .....	3	Soph., jr., sr.	3 credits
15.	Forest Economics and Conservation .....	3	Jr., sr.	3
18.	Agricultural Economics..	3	Jr., sr.	3
251-252.	Seminar in Agr. Econom- ics .....	6†	Sr., grad.	3, 17. and 6 other credits in Economics or Farm Man- agement
22.	Commercial Policies.....	3	Soph., jr., sr.	3
72.	Economics of Colonization	3	Jr., sr.	6 credits inc. 3
74.	Railway Problems.....	3	Jr., sr.	6 credits inc. 3

*Business Administration*

34.	Business Management....	3	Soph., jr., sr.	3
35-36.	Accounting Principles....	6†	Soph., jr., sr.	None
37.	Marketing of Products...	3	Jr., sr.	3
38.	Advertising, Salesmanship and Commercial Credit.	3	Soph., jr., sr.	3
131.	Cost Accounting.....	3	Jr., sr., grad.	3 and 35-36
132.	Accounting Problems.....	3	Jr., sr., grad.	3 and 35-36
133.	Accounting Systems.....	3	Sr., grad.	35-36, and 131 or 132
134.	Auditing .....	3	Sr., grad.	35-36, and 131 or 132
138.	Bank Administration.....	3	Jr., sr., grad.	3 and 43, and consent of in- structor
253-254.	Seminar in Accounting...	6†	Sr., grad.	12 credits inc. 35-36; and 131

*Finance*

42.	Financial History.....	3	Soph., jr., sr.	3
43a or 43b.	Banking .....	3	Soph., jr., sr.	3
46.	Property Insurance.....	3	Soph., jr., sr.	3
47.	Personal Insurance.....	3	Soph., jr., sr.	3
91.	Public Finance.....	3	Jr., sr.	6 credits inc. 3
92.	State and Local Taxation	3	Jr., sr.	91

No.	Title	Credits	Offered to	Prereq. courses
141.	Investment and Speculation .....	3	Jr., sr., grad.	3 and 43 or 143
143.	Money and Prices.....	3	Jr., sr., grad.	3 and 42 or 43
144.	Commercial Crises.....	3	Jr., sr., grad.	3 and 43 or 143
145.	The Modern Business Corporation .....	3	Jr., sr., grad.	6 credits inc. 3
146.	Public Utilities.....	3	Jr., sr., grad.	145
255-256.	Seminar in Money and Banking .....	6†	Sr., grad.	12 credits inc. 43
257-258.	Seminar in Econ. Development and Taxation..	6†	Sr., grad.	12 credits
259-260.	Seminar in Corporations.	6†	Sr., grad.	12 credits
<i>Economic Reforms</i>				
161.	Labor Problems.....	3	Jr., sr., grad.	3 and 4
163.	Economic Conditions in Cities .....	3	Jr., sr., grad.	6 credits inc. 3
164.	Economic Functions of the State .....	3	Jr., sr., grad.	6 credits inc. 3
165.	History and Theory of Socialism .....	3	Jr., sr., grad.	6 credits inc. 3
166.	Trade Unionism and Allied Problems.....	3	Jr., sr., grad.	6 credits inc. 3
168.	Wages .....	3	Jr., sr., grad.	164 or 166 and consent of instructor
261-262.	Seminar in Labor Problems .....	6†	Sr., grad.	161 or 163 and 164

†Both semesters must be completed before credit is given for the first semester.

‡See announcements concerning the proposed vocational course in business education on pages 22 and 44, College of Science, Literature, and the Arts Bulletin.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 47-52.

## ENGLISH

Professors RICHARD BURTON, HARDIN CRAIG, FREDERICK KLAEBER, ELMER E. STOLL; Assistant Professors JOSEPH W. BEACH, OSCAR W. FIRKINS, GEORGE N. NORTHROP.

### REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits, including Course 1-2.

*For a Major*, twenty-four credits, including Course 1-2, 3, 5, 8, 55.

*For B.A. with Distinction*, the general requirements (see College of Science, Literature, and the Arts bulletin, page 22), a major in English; a reading knowledge of French, German, Italian, Greek, or Latin, and a final year's work in seminar for which a sequence shall have been specially arranged.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and

should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

For a *Teacher's Certificate*, at least a minor in English and a minor in Rhetoric with an average of one and one-half honor points for each credit hour.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
1-2.	General Survey Eng. Lit.	6	Soph., jr., sr.	Rhet. 1-2
3.	Old English .....	3	Soph., jr., sr.	None
4.	Advanced Old English...	3	Soph., jr., sr.	3
5a or 5b.	Chaucer .....	3	Soph., jr., sr.	1-2
6.	Spenser .....	3	Soph., jr., sr.	1-2
8.	History of English Language .....	1	Jr., sr.	3
55.	Shakespeare .....	3	Jr., sr.	1-2
56.	Advanced Shakespeare...	3	Jr., sr.	55
59-60.	Modern Drama.....	6†	Sr.	1-2
62.	Milton .....	3	Jr., sr.	1-2
63.	19th Century Literature.	3	Jr., sr.	1-2
66.	Browning-Tennyson .....	3	Jr., sr.	1-2
67.	English Novel.....	3	Jr., sr.	1-2
72.	English and Scottish Popular Ballads.....	3	Jr., sr.	1-2
75.	Recent English Poetry...	2	Jr., sr.	See statement
101.	Middle English .....	2	Jr., sr., grad.	1-2 and 3, or 3 and 4
103.	Piers the Plowman.....	2	Jr., sr., grad.	1-2 and 3, or 3 and 4
105.	18th Century Poetry.....	3	Jr., sr., grad.	1-2
107.	18th Century Prose.....	3	Jr., sr., grad.	1-2
108.	Romantic Movement.....	3	Jr., sr., grad.	1-2
109-110.	English Humorists .....	6	Jr., sr., grad.	1-2
111-112.	17th Century Prose.....	6†	Jr., sr., grad.	1-2
113-114.	Drama .....	6	Sr., grad.	12 credits
115.	English Idiom .....	2	Jr., sr., grad.	1-2
118.	Bible as Literature.....	3	Jr., sr., grad.	1-2
119-120.	Principles of Literary Criticism .....	6†	Jr., sr., grad.	1-2
122.	American Literature.....	3	Jr., sr., grad.	1-2
123-124.	Seminar in Novelists.....	4	Sr., grad.	See statement
125-126.	Biography .....	4	Sr., grad.	See statement
128.	17th Century Drama.....	3	Jr., sr., grad.	55 or 131
130.	Teachers' Course.....	3‡	Jr., sr., grad.	See statement
131.	Elizabethan Drama.....	3	Jr., sr., grad.	55

†Both semesters must be completed before credit is given for the first semester.

‡Carries credit only in the department of Education.

130. **TEACHERS' COURSE.** Methods of teaching English in high schools. Course of study, textbooks, and equipment; visits to Minneapolis and St. Paul high schools; theme-correcting. Open to juniors, seniors, and graduates qualifying for Practice Teaching. Credit only in Education. **INGLIS.**

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 57-60.

## GEOLOGY AND MINERALOGY

Professor WILLIAM H. EMMONS; Associate Professor CLINTON R. STAUFER; Assistant Professors FRANK F. GROUT\*, CHESSLEY J. POSEY; Instructors A. WALFRED JOHNSTON, EDGAR K. SOPER; Assistant T. M. BRODERICK; Teaching Fellow J. P. GOLDSBERRY; in the General Extension Division. Assistant Professor EDWARD M. LEHNERTS.

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits.

*For a Major*, twenty-four credits. It is strongly recommended that a field course be included when this is practicable.

*For B.A. with Distinction*, Courses 11, 29, 105, 111, 124, and a field course; and twelve credits selected from the following courses:

- 57, 58, 108, 109 in Paleontology
- 65, 104, 136 in Mineralogy
- 106, 115 in Petrology
- 112, 124, 138, 144 in Economic Geology
- 106, 124, 112 in Structural Geology
- 31, 32, 116, 118 in Geography

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

*For a Teacher's Certificate*, requirements the same as for a major, with an average of at least one and one-half honor points for each credit hour.

## SEQUENCE OF COURSES IN DEPARTMENT OF GEOLOGY AND MINERALOGY FOR THOSE WHO PLAN TO TEACH PHYSIOGRAPHY OR GEOGRAPHY

*For a Major*

Required courses	Credits	Desirable re-enforcing courses
Geology 1 or 29 or 31.....	3	Geology 8
Geology 4 or 6.....	3	Geology 9
Geology 15a.....	1	Geology 11
Geology 15b.....	1	Geology 21, 22, 105
Geology 32.....	3	Geology 160 or 188
Geology 34.....	3	Geology 151
Geology 36.....	3	Geology 153
Geology 55.....	2	Physics 1-2
Geology 116 or 118.....	3	Botany or Zoology 1-2
Economics 12.....	3	Chemistry 1-2
	—	Courses in Economics, History, Sociology, Education



For a Minor

Required courses	Credits	Desirable re-enforcing courses
Geology 1 or 29 or 31.....	3	Geology 4 or 6
Geology 36.....	3	Geology 8
Geology 118.....	3	Geology 15a
Geology 116, 34, 32 or Economics 12....	3	Geology 15b
	—	Geology 9
	12	Geology 151
		Geology 153
		Geology 32 or 34 or 116 or Economics 12

SUGGESTED COURSE FOR ONE WHO EXPECTS TO TEACH PHYSIOGRAPHY OR GEOGRAPHY

	Credits	Course	Credits	Course
		<b>FIRST SEMESTER</b>		<b>SECOND SEMESTER</b>
<b>FRESHMAN:</b>	3	Rhetoric 1	3	Rhetoric 2
	3	Chemistry 1	3	Chemistry 2
	5	German or French 1	5	German or French 2
	3	Mathematics 3	3	Mathematics 4
	3	History 3	3	History 4
<b>SOPHOMORE:</b>	3	<i>General Geology 1</i>	3	<i>Historical Geology 6</i>
	3	History 5	3	History 6
	3	German or French	3	German or French
	3	Botany or Zoology 1	3	Botany or Zoology 2
	3	Astronomy 11	3	<i>Meteorology 34</i>
	3	Economics 1a	3	Sociology 1b or 3b
<b>JUNIOR:</b>	3	Physics 1	3	Physics 2
	3	Economics 13	3	Economics 71
	3	History 151	3	History 182
	3	Education 3a	3	<i>Geography 36</i>
	3	<i>Mineralogy 27a</i>	3	<i>Geography 116</i>
	3	<i>Physical Geography 31</i>	3	<i>Human Geography 32</i>
	6	Summer Field Trip 160 or 188		
<b>SENIOR:</b>	3	Education 101	3	Education 120
	3	<i>Advanced Geology 151</i>	3	<i>Advanced Geology 152</i>
	3	Practice Teaching	3	<i>Geography 118</i>
	2	<i>Geol. (55) Teacher's Course</i>	3	Sociology or Economics or Education
	3	Sociology or Economics or Education	3	Psychology 14
	3	Psychology 5a		

Total hours, 73

Total hours, 65

COURSES

No.	Title	Credits	Offered to	Prereq. courses
1.	General Geology.....	3	Soph., jr., sr.	None
3.	Laboratory Work.....	1	Soph., jr., sr.	Supports 1
4.	Geology of Minnesota..	3	Soph., jr., sr.	1
5.	Economic Geology.....	3	Jr., sr.	1
6.	Historical Geology.....	3	Soph., jr., sr.	1
8.	Historical Geology Laboratory .....	1	Soph., jr., sr.	Supports 4 and 6
10.	Elements of Paleontology .....	3	Soph., jr., sr.	1
11.	Paleontology .....	5	Jr., sr.	6

No.	Title	Credits	Offered to	Prereq. courses
15a or 15b.	Minerals and Rocks....	1	Jr., sr.	1
21-22.	Elements of Mineralogy	6	Soph., jr., sr.	See statement
27a or 27b.	Outlines of Mineralogy.	1	Jr., sr.	None
29.	General Physiography...	3	Soph., jr., sr.	None
31-32.	Phys. and Human Geography .....	6†	Soph., jr., sr.	None
34.	Meteorology .....	3	Soph., jr., sr.	1 or 29
36.	Geography of North America .....	3	Soph., jr., sr.	1 or 29
55.	Teachers' Course in Geography .....	2	Jr., sr., grad.	See statement
57.	Paleontology .....	3	Jr., sr.	6 and 10
58.	Paleontology .....	3	Jr., sr.	57
61.	Physical Mineralogy....	3	Jr., sr.	22
65.	Morphology of Minerals	3	Jr., sr.	22
104.	Crystal Measurement...	3	Jr., sr., grad.	65
105a or 105b.	Elements of Rock Study .....	3	Jr., sr., grad.	See statement
106.	Petrology .....	3	Jr., sr., grad.	105
108.	Paleontologic Practice..	3	Jr., sr., grad.	58
109.	Advanced Paleontology.	3	Jr., sr., grad.	58
110.	Advanced Paleontology.	3	Jr., sr., grad.	109
111.	Ore Deposits.....	4	Sr., grad.	6, 22, 105
112.	Problems in Ore Deposits	2	Sr., grad.	111
115.	Advanced Petrology.....	3	Sr., grad.	106
116.	Geography of Latin America .....	3	Jr., sr., grad.	1, 29, or 31-32 and 3 credits in Geog.
118.	Geography of Eurasia..	3	Jr., sr., grad.	Same as for 116
124.	Structural and Metamorphic Geology.....	3	Sr., grad.	6, 22, 105
136.	Advanced Mineralogy...	3	Jr., sr., grad.	22
138.	Testing Economic Minerals .....	3	Jr., sr., grad.	6, 22, 105
144.	Interpretation of Geologic Maps .....	3	Jr., sr., grad.	111
151.	Advanced General Geology .....	3	Jr., sr., grad.	6
152.	Advanced General Geology .....	3	Jr., sr., grad.	151
160.	Field Geology.....	6	Jr., sr., grad.	See statement
188.	Field Work in Geography .....	6	Jr., sr., grad.	1 or 29

†Both semesters must be completed before credit is given for the first semester.

55. **TEACHERS' COURSE IN GEOGRAPHY.** A critical study of the materials and methods of teaching secondary school geography. The relation of human activities to environment will be emphasized. For teachers of high school geography. Six credits from the Department of Geology required as prerequisites; three from Courses 1, 29, 31; and three from Courses 36, 116, 118, 188. POSEY.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 62-65.

## GERMAN

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, WALTER R. MYERS; Instructors JAMES DAVIES, J. THEODORE GEISSEN-DOERFER, ARTHUR R. GRAVES, ALFRED E. KOENIG, ROBERT P. MORE, THEOPHILUS H. SCHROEDEL, HAROLD W. SOULE, RICHARD WISCHKAEMPER; Teaching Fellow ARNOLD W. SHUTTER.

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits not including Course 1.

*For a Major*, twenty-four credits.

*For B.A. with Distinction*, the general requirements (see College of Science, Literature, and the Arts bulletin, page 22.) Students doing major work in German must complete the following requirements for the junior and senior years: fifteen credits during the junior year in courses numbered between 51 and 100, of which Courses 53-54 and 55-56 are required; eight credits during the senior year, including at least one course numbered between 101 and 200, and one course numbered above 200; and the special thesis, to be completed under the direction of the instructor in charge of the latter course.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

*Teacher's Certificate in German.* For a *minor* recommendation, courses 29-30, 53-54, 55-56, 59-60; for a *major* recommendation, in addition to the foregoing courses at least four other credits obtained in starred courses. In either case the student must have an average standing of one and one-half honor points for each credit hour for all German courses taken.

For courses in Germanic Philology see the statement of the Department of Comparative Philology.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
1a or 1b.	Beginning .....	6†	All	None
2a or 2b.	Intermediate .....	6	All	1
3-4.	Intermediate .....	6†	All	1 or equivalent
7-8.	Drama .....	6†	Fr., soph., jr., sr.	3-4, or 5-6, or 4 yrs. prep. German
9-10.	Historical Prose.....	6†	Fr., soph., jr., sr.	3-4, or 5-6, or 4 yrs. prep. German
27-28.	Elementary Conversation and Composition.....	4†	Fr., soph., jr.	See statement
29-30.	Advanced Conversation...	2†	Soph., jr., sr.	See statement
31-32.	Intermediate Composition.	2†	Soph., jr., sr.	See statement

No.	Title	Credits	Offered to	Prereq. courses
51.	Faust I.....	2	Soph., jr., sr.	7-8, or 9-10, or 23-24
52.	Faust II.....	2	Soph., jr., sr.	51
53.	Survey .....	3	Soph., jr., sr.	7-8, or 9-10, or 23-24
54.	Survey .....	3	Soph., jr., sr.	53
55-56.	Advanced Composition...	2†	Jr., sr.	31-32
57-58.	Oral Diction.....	4†	Jr., sr.	See statement
59-60.	Teachers' Course.....	2†	Jr., sr.	29-30 and 53-54
61.	Romantic School.....	2	Jr., sr.	7-8, or 9-10, or 23-24
62.	Drama of Last Thirty Years .....	2	Jr., sr.	2 credits in starred courses
63.	Poetry of Classic Period (Schiller) .....	2	Jr., sr.	7-8, or 9-10, or 23-24
64.	Poetry of Classic Period (Goethe) .....	2	Jr., sr.	7-8, or 9-10, or 23-24
107-108.	Middle High German....	4†	Jr., sr., grad.	4 credits in starred courses
109-110.	History of German Lan- guage .....	4†	Sr., grad.	4 credits in starred courses
111-112.	16th Century Literature..	4†	Sr., grad.	4 credits in starred courses
113-114.	Lessing .....	4†	Sr., grad.	4 credits in starred courses
117-118.	Goethe .....	4†	Sr., grad.	4 credits in starred courses
119-120.	Drama of Schiller.....	4†	Sr., grad.	4 credits in starred courses
127-128.	18th and 19th Century Lyrics .....	4†	Sr., grad.	4 credits in starred courses
129-130.	German Novel.....	4†	Sr., grad.	4 credits in starred courses
131-132.	German Novelle.....	4†	Sr., grad.	4 credits in starred courses
133-134.	English Influences.....	4†	Sr., grad.	4 credits in starred courses
135-136.	Schiller's Aesthetic The- ories .....	4†	Sr., grad.	4 credits in starred courses
137-138.	Grillparzer .....	4†	Sr., grad.	4 credits in starred courses
225-226.	Literary Problems Seminar	4†	Honors and grad.	
231-232.	Faust Seminar.....	4†	Honors and grad.	

†Both semesters must be completed before credit is given for either semester.

59-60. TEACHERS' COURSE. Lectures, readings, and reports; observation of classes. SCHLENKER.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 67-70.

## GREEK

Professors JOHN CORRIN HUTCHINSON, CHARLES ALBERT SAVAGE.

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits.

*For a Major*, twenty-four credits (exclusive of Courses 59 to 64 inclusive).

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
1-2.	First-Year Greek .....	10†	All	None
3-4.	History and Epic Poetry....	6†	Soph., jr., sr.	1-2
7.	Dramatic Poetry.....	3	Soph., jr., sr.	3-4
51.	Philosophy .....	3	Jr., sr.	3-4
52.	Oratory .....	3	Jr., sr.	3-4
53-54.	Composition .....	2	Sr.	51-52
101.	Lyric Poetry .....	3	Sr., grad.	51 or 52
102.	Tragedy .....	3	Sr., grad.	7 or 101
103.	The Septuagint.....	3	Sr., grad.	51
104.	The New Testament.....	3	Sr., grad.	51

*Courses open to all, no knowledge of Greek being required.*

61.	Greek Drama .....	1 or 2	Jr., sr.	None
62.	Greek Literature and Life..	2	Jr., sr.	None
63-64.	Greek Mythology .....	2	Jr., sr.	None
59-60.	Greek Archaeology .....	1 or 2	Jr., sr.	None

†Both semesters must be completed before credit is given for the first semester.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 71 and 72.

## HISTORY

Professors GUY STANTON FORD, WILLIAM STEARNS DAVIS, ALBERT BEEBE WHITE; Associate Professor WALLACE NOTESTEIN; Assistant Professors SOLON J. BUCK, AUGUST CHARLES KREY; Resident Lecturer, EDGAR E. ROBINSON; Teaching Fellows RUTH E. MARSHALL, ROY TOWNE.

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits.

*For a Major*, twenty-four credits.

*For B.A. with Distinction*, see general statement (page 14).

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

*For a Teacher's Certificate*, eighteen credits in History, including at least three credits in intensive courses. In addition the student must take History 54.

The Departments of History, Economics, Political Science, Sociology and Anthropology constitute a social science group. The subjects are closely inter-related, and are of especial importance to students who intend to engage in law, business, public service at home or abroad, journalism, and the work of charities and corrections, or to give instruction in one of the social sciences. Students who are interested in any one of the departments of the social science group ought to be familiar with at least the elements of the subjects offered in the other departments. A student who takes his major in any one of them ought to have more than the elements of the others.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
1-2.	Medieval and Mod. History .....	6	All	None
1b.	European History to Reformation .....	3	All	None
3-4.	English History to 1783..	6	All	2 yrs. prep. History (Am. Govt. may be inc.)
5-6.	American History.....	6	Soph., jr., sr.	6 credits
7.	English History, 1750-1915	3	Soph., jr., sr.	6 credits
9.	National Movements....	3	Soph., jr., sr.	6 credits
10.	Nineteenth-Century Europe	3	Soph., jr., sr.	6 credits
13.	Medieval Civilization....	3	Soph., jr., sr.	6 credits
14.	Renaissance and Reformation .....	3	Soph., jr., sr.	6 credits
21.	Selected Topics in Greek History .....	3	Jr., sr.	9 credits
23.	Selected Topics in Roman History .....	3	Jr., sr.	9 credits
56-57.	Teachers' Course.....	3	Jr., sr.	See statement
101.	Revolutionary and Napoleonic Era .....	3	Jr., sr., grad.	9 credits
104.	The Near East.....	3	Jr., sr., grad.	9 credits
121-122.	History of Greece.....	6	Jr., sr., grad.	See statement
123-124.	History of Rome.....	6	Jr., sr., grad.	See statement
126.	History of Old Orient...	3	Jr., sr., grad.	9 credits
133-134.	Ancient Civilization.....	6	Jr., sr., grad.	See statement
143-144.	History of the Upper Mississippi and Minnesota.	6	Jr., sr., grad.	9 credits inc. 5-6
145.	History of American Diplomacy .....	3	Jr., sr., grad.	9 credits or a major in Political Science
146.	Civil War and Reconstruction .....	3	Jr., sr., grad.	9 credits
141-142.	The West in American History .....	3	Jr., sr., grad.	9 credits inc. 5-6
153-154.	Social and Economic History of United States..	6	Sr., grad.	12 credits or a major in Economics

No.	Title	Credits	Offered to	Prereq. courses
161.	English Parliament.....	3	Jr., sr., grad.	See statement
163.	English Judiciary.....	3	Jr., sr., grad.	See statement
171-172.	Germany since 1640.....	6	Sr., grad.	See statement
173.	Era of Reform in Prussian History .....	6	Sr., grad.	See statement
181.	English Backgrounds of Colonial History.....	3	Jr., sr., grad.	9 credits inc. 3-4
182.	English Colonization in America .....	3	Jr., sr., grad.	9 credits inc. 5-6 or 181.
184.	Stuart Period .....	3	Sr., grad.	12 credits inc. 3-4

56-57. THE TEACHING OF HISTORY AND GOVERNMENT. Open only to students who have eighteen credits in History, including a starred 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. KREY et al.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 74-76.

### HOME ECONOMICS

Professor JOSEPHINE T. BERRY; Assistant Professors MABEL B. TRILLING, MARION WELER, LUCILE WHEELER, GRACE I. WILLIAMS; Instructors BESSIE E. BEMIS, HARRIET GOLDSTEIN, AMY P. MORSE, DOROTHY MOTL, ETHEL L. PHELPS; Lecturer MARTHA B. MOORHEAD.

#### REQUIREMENTS OF THE DEPARTMENT

For a Minor, six credits in the Food Study group (Courses 21 and 22), together with Physiology 3 and Bacteriology 58.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
1a or 1b.	Textiles .....	2	All	None
11a or 11b.	Garment Making.....	3	All	None
13a or 13b.	Dressmaking .....	3	All	1, 11
21a or 21b.	Foods and Cookery....	3	All	Chem, 3, 7, or 21; along with Physiol. 3
22a or 22b.	Food Economics.....	3	All	21
33.	Home Care of the Sick.	1	All	Chem, 3, 7, or 21; Bacteriol. 58.
51a or 51b.	Drawing and Design....	3	All	None
53a or 53b.	Historic Ornament and Advanced Design.....	3	All	51

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, page 77.

## HUMAN ANATOMY

Professors CLARENCE M. JACKSON, JOHN B. JOHNSTON, THOMAS G. LEE, RICHARD E. SCAMMON; Associate Professor CHARLES E. ERDMANN; Instructors WILLIAM F. ALLEN, JAY A. MYERS.

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits.

*For a Major*, twenty-four credits.

Prerequisites in Animal Biology may be counted as a part of the work for a minor or major.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
3-4.	Gross Human Anatomy.....	10	Soph., jr., sr.	An. Biol. 1-2
51.	Human Histology .....	5	Jr., sr.	An. Biol. 7-8
52.	Human Embryology .....	3	Jr., sr.	An. Biol. 7-8
101.	Human Neurology.....	3	Sr., grad.	Anat. 51 and 52, or An. Biol. 7-8 or 19-20
*114.	Topographic Anatomy.....	3	Sr., grad.	3-4
116.	Foetal Anatomy.....	3	Sr., grad.	3-4 and 52 or An. Biol. 137

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, page 78.

## HUMAN PHYSIOLOGY

Professor ELIAS P. LYON; Associate Professors RICHARD O. BEARD, FREDERICK H. SCOTT; Assistant Professor M. RUSSEL WILCOX; Instructors FRANCIS B. KINGSBURY, J. F. McCLENDON, C. J. V. PETTIBONE; Assistants ROY E. CRUZEN, LYLE J. ROBERTS.

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits, which may include Animal Biology 1-2.

*For a Major*, Animal Biology 1-2 and eighteen credits, including Physiology 52, 53 and 54. In these eighteen credits may be included Anatomy 51 and Animal Biology 15-16.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.



COURSES				
No.	Title	Credits	Offered to	Prereq. Courses
3a or 3b.	Elem. Human Physiology.	3†	All	1 yr. Chem.
4.	Elementary Physiology and Physiologic Chemistry..	5†	All	‡ yr. Biol. Elem. Chem. and Biol. or Anat.
52.	Physiologic Chemistry....	4	Jr., sr.	Organ. Chem.
53.	Physiol. Muscle, etc.....	4	Jr., sr.	An. Biol. 1-2
54.	Physiol. Nerv. Sys., etc..	4	Jr., sr.	An. Biol. 1-2
101.	Urinalysis: Advanced Methods .....	2	Jr., sr.	Physiol. 52
103.	Metabolism .....	2	Jr., sr.	Physiol. 52
105-106.	Physical Chem. of Cells and Tissues .....	3 or 6	Jr., sr., grad.	Organ. Chem. and An. Biol. 1-2
115-116.	Advanced Physiologic Chemistry .....	Ar.	Jr., sr., grad.	Ph. 52
117-118.	Advanced Physiology.....	Ar.	Jr., sr., grad.	Physiol. 53
120.	Physiology of Development .....	2	Jr., sr.	An. Biol. 1-2 or Phy. 3
125.	Foods and Practical Diets .....	2	Jr., sr.	Gen'l Chem. and Qual. Anal. and Phy. 3 or 4
127.	Seminar .....	1	Sr., grad.	Physiol. 53, 54

†Students may not receive credit for both Courses 3 and 4.

For a full list of courses offered by the department, see the Bulletin of the Medical School.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 79 and 80.

## LATIN

Professors JOSEPH B. PIKE, JOHN E. GRANRUD.

### REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, Courses 5, 6, 57 and 58 for those entering with four years of Latin; Courses 1, 2, 5 and 6 for those entering with two or three years of Latin.

*For a Major*, eighteen credits for those entering with four years of Latin; twenty-four credits for all others.

*For a Teacher's Certificate*, Courses 5, 6, 57, 58, 101, and 102, with an average of at least one and one-half honor points per credit hour.

*For B.A. with Distinction*. The general requirements (page 14) and a fair reading knowledge of German or French or Greek. Six credits in Latin a semester during the junior and senior years are to be selected from Courses 57 to 204. (Students who do not desire a recommendation for teaching Latin may, by selecting courses that are given in alternate

years, secure enough work for the honors course without being obliged to take Courses 101 and 102.) Instead of taking all the work indicated above in Latin, the student may substitute six credits in Greek (third-year Greek or above), or six credits in Greek or Roman History, or six credits in ancient Philosophy.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
1.	Selections from Latin Authors .....	3†	All	2 or 3 yrs. Latin
2.	Selections from Latin Authors .....	3†	All	2 or 3 yrs. Latin
5.	Livy .....	3†	All	Courses 1 and 2 or 4 yrs. Latin
6.	Plautus and Terence.....	3†	All	Courses 1 and 2 or 4 yrs. Latin
57.	Horace .....	3†	Soph., jr., sr.	6
58.	Pliny .....	3†	Soph., jr., sr.	57
101.	Adv. Caesar.....	3	Jr., sr.	58
102.	Adv. Virgil.....	3	Jr., sr.	58
104.	Latin Writing .....	2	Jr., sr., grad.	58
105.	Roman Elegy .....	3	Jr., sr., grad.	58
106.	The Roman Novel.....	3	Jr., sr., grad.	58
107.	Letters of Cicero.....	3	Jr., sr., grad.	58
108.	Tacitus .....	3	Jr., sr., grad.	58
110.	Roman Satire .....	3	Jr., sr., grad.	58
9.	Roman Architecture.....	1	Jr., sr.	None
10.	Roman Art .....	1	Jr., sr.	None
201-202.	Lucretius .....	3	Grad. and honor stud.	Consult dept.
203-204.	Seneca .....	3	Grad. and honor stud.	Consult dept.

†Both semesters must be completed before credit is given for the first semester.

101. ADVANCED COURSE IN CAESAR—TEACHERS' COURSE. Selections from books five to seven of the Gallic War; the principles of indirect discourse; intermediate Latin composition; class drill and discussion of various problems connected with secondary school work in Latin. PIKE.

102. ADVANCED COURSE IN VIRGIL—TEACHERS' COURSE. An interpretation of selections from books seven to twelve of the Aeneid; review of portions of books one to six; the quantitative method of pronouncing Latin verse; metrical rendering of selected passages; class drill. PIKE.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 81-83.

MATHEMATICS

Professor GEORGE N. BAUER; Associate Professor WILLIAM H. BUSSEY;  
 Assistant Professors ROYAL E. SHUMWAY, HERMON L. SLOBIN, A. L.  
 UNDERHILL; Instructors LINCOLN K. ADKINS, JAMES S. MIKESH.

REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve or sixteen credits according as the freshman course taken is three or five hours a week.

*For a Major*, twenty-four credits.

*For B.A. with Distinction*, the general requirements (page 14). In junior and senior years any courses above 50 may be presented, except course 54. In Astronomy, course 101-102, and in Physics, course 121-122, and with the consent of the major department other courses open only to juniors and seniors, may be presented.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

*Requirements for a Teachers' Certificate.* Course 54; preparatory to Course 54 a student is required to choose some sequence of courses leading to and including Course 51; for possible sequences and prerequisites consult head of department. A student must secure an average of at least one and one-half honor points per credit hour through Course 51, and Course 54; and an average of at least one honor point per credit hour in all other courses taken in the department. Course 6 must be included if not offered for admission.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
1.	Higher Alg., Part I.	5	Fr., soph.	El. Alg.
2a or 2b.	Alg. (cont.) and Pl. Trig. ....	5	Fr., soph.	1 or prep. Higher Alg.
3a or 3b.	Higher Alg., Part II	3	Fr., soph.	Prep. Higher Algebra
4a or 4b.	Trigonometry .....	3	Fr., soph.	3
6.	Solid Geometry.....	2	Soph., jr., sr., who have not had solid geom.	1-2, or 3-4
7.	Plane Analyt. Geom- etry .....	3	Soph., jr., sr.	2 or 4
9a or 9b.	Pl. and Solid Analyt. Geometry .....	5	Fr., soph., jr., sr.	2 or 4
11a or 11b.	Differential Calculus.	3	Soph., jr., sr.	7 or 9
21.	Spherical Trig. with Applications .....	3	Soph., jr., sr.	1 and 2 or 3 and 4, and Solid Geom.
51a or 51b.	Integral Calculus....	3	Jr., sr.	11

No.	Title	Credits	Offered to	Prereq. courses
54a or 54b.	Teachers' Course....	2	Jr., sr.	11
62.	Theory of Equations	3	Jr., sr.	11
101.	Solid Anal. Geom- etry .....	3	Jr., sr., grad.	11
102.	Advanced Plane Anal. Geometry...	3	Jr., sr., grad.	11
104.	Modern Synthetic Geometry .....	3	Jr., sr., grad.	11
106a or 106b.	Differential Equations	3	Sr., grad.	51
107.	Adv. Differential Calculus .....	3	Jr., sr., grad.	51
108.	Adv. Integral Cal- culus .....	3	Jr., sr., grad.	51 and 101
119a or 119b.	Modern Higher Alge- bra .....	3	Sr., grad.	51
125-126.	Differential Geometry	6	Sr., grad.	51
127a or 127b.	Infinite Series.....	3	Sr., grad.	17 credits be- sides Alg. and Trig.
140.	Method of Least Squares .....	2	Sr., grad.	51

Freshmen who have an entrance credit in First Part Higher Algebra and who intend to specialize in Mathematics should take Course 2a the first semester and Course 9b the second semester, rather than Courses 3 and 4.

**54a or 54b. TEACHERS' COURSE.** Text and assigned readings. Special attention paid to the fundamental principles of Algebra and Geometry. SHUMWAY.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 84-86.

## MUSIC

### REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits, not including Courses 11-12 and 21-22.

*A Major* is offered only to those who take the four-year course in Arts and Music.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

For the curriculum of the four-year course in Arts and Music, leading to the degree of Bachelor of Arts in Music, see College of Science, Literature, and the Arts bulletin, page 24. The tabular statement and description of courses given below are for the guidance of other students in the College of Science, Literature, and the Arts who desire to elect Music.

Students entering the University for the purpose of studying Music, but not wishing to complete the course leading to a degree, must register for Courses 1-2 and two other three-hour subjects outside the Department of Music.

A Certificate of Proficiency in Music will be granted to students who, having completed the theoretical courses and two years of pianoforte, are able to play one of the standard concertos and, in addition, show marked musical ability.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
1-2.	Harmony .....	6	Jr., sr.	None
3-4.	Counterpoint .....	4	Jr., sr.	See statement
5-6.	Form and Composition.....	2	Jr., sr.	1-2, and 3
7-8.	Analysis .....	2	Jr., sr.	1-2
9-10.	History of Music.....	6	Jr., sr.	None
11-12.	Appreciation of Music.....	1	Jr., sr.	None
13-14.	Bach and Beethoven.....	4	Jr., sr.	None
15.	Acoustics .....	3	Jr., sr.	None
17-18.	Pianoforte .....	4 or 8	Jr., sr.	None
19-20.	Violin .....	4 or 8	Jr., sr.	None
21-22.	Voice .....	4	Jr., sr.	None
23-24.	Cello .....	4 or 8	Jr., sr.	None
25-26.	Other Orchestral Instruments	4 or 8	Jr., sr.	None
27-28.	Public School Music.....	6	Jr., sr.	See statement
29-30.	Normal Piano.....	4	Jr., sr.	2 yrs. of Piano
31-32.	Ensemble Playing.....	2	Jr., sr.	2 yrs. of Piano
33-34.	Chorus .....	2	Jr., sr.	None
35-36.	Orchestra .....	2	Jr., sr.	None

27-28. PUBLIC SCHOOL MUSIC. This course is planned especially to prepare students for the positions of teachers and supervisors of music in public, high, and normal schools.

Entrance Requirements: Ability to play piano, sing well, and read readily. Four hours weekly in class, and one half day weekly spent in public school visiting. Practice-teaching is demanded. In addition, courses in piano, voice training, harmony, orchestra, history of music and appreciation of music are recommended. GIDDINGS.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 88 and 89.

## PHILOSOPHY AND PSYCHOLOGY

Professor NORMAN WILDE; Associate Professor DAVID F. SWENSON\*; Assistant Professor HERBERT H. WOODROW; Professorial Lecturer JOSEPH PETERSON; Instructors J. F. DASHIELL, AUSTIN S. EDWARDS, CHESTER E. KELLOGG.

## REQUIREMENTS OF THE DEPARTMENT

For a *Minor*, twelve credits.

\*Absent on leave, 1915-16

For a Major, twenty-four credits, either in Philosophy or in Psychology. The following courses are classified under Philosophy: 9, 13, 51, 56, 65, 109, 121, 122, 124, 126, 127, 129-130, 134. A major in Philosophy must include Courses 9, 121, and 122, as well as a minimum of three, or a maximum of six, credits in the psychological group. The following courses are classified under Psychology: 1-2, 5, 17, 54, 56, 57, 101, 105, 106, 108, 109, 115-116; a major in Psychology must include Courses 1-2 and 101, as well as a minimum of three, or a maximum of six, credits from the philosophical group.

For B.A. with Distinction, besides the general requirements (page 22), a major in either Philosophy or Psychology, and twenty-four credits in starred courses.

Starred Courses. The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

For University Teachers' Certificate, a general introductory course in Psychology is prerequisite for all courses in Education. This course carries no credit as an Education course.

## COURSES

## Introductory Courses

No.	Title	Credits	Offered to	Prereq. courses
1-2.	General Psychology..	6	Soph.	None
5a or 5b.	Elements of Psychology .....	3	Soph., jr., sr.	None
9a or 9b.	Logic .....	3	Soph., jr., sr.	None

## Continuation Courses

13.	Introduction to Philosophy .....	3	Jr., sr.	3 credits
17.	Methods of Study...	3	Jr., sr.	Course 5 or 1-2
51a or 51b.	Ethics .....	3	Jr., sr.	6 credits
54.	Psychology of Religion .....	3	Jr., sr.	6 credits inc. 5 or 1-2
55.	Psychological Interpretation .....	3	Jr., sr.	6 credits inc. 5 or 1-2
56.	Esthetics .....	3	Jr., sr.	6 credits
57.	Social Psychology...	3	Jr., sr.	6 credits inc. 5 or 1-2
65.	Philosophy of Religion .....	3	Jr., sr.	6 credits
101a or 101b.	Experimental Psych.	3	Jr., sr., grad.	1-2
105.	Mental Retardation..	2	Jr., sr., grad.	1-2
106.	Child Development..	3	Jr., sr., grad.	1-2
108.	Comparative Psychology .....	3	Jr., sr., grad.	101
109.	Psychological Principles .....	3	Sr., grad.	12 credits inc. 9. and 1-2

No.	Title	Credits	Offered to	Prereq. courses
115-116.	Seminar in Psychology .....	6	Sr., grad.	12 credits in Psychology
121.	Ancient Philosophy..	3	Jr., sr., grad.	6 credits
122.	Modern Philosophy..	3	Jr., sr., grad.	6 credits
124.	Nineteenth Century Philosophy .....	3	Sr., grad.	12 credits in Philosophy
126.	Logic of Science....	3	Jr., sr., grad.	9 credits, inc. Course 9
127.	Metaphysics .....	3	Sr., grad.	12 credits
129-130.	Seminar in Philosophy .....	6	Sr., grad.	12 credits in Philosophy
134.	Philosophy of Plato..	3	Sr., grad.	121 or 122 or 124

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 90-92.

## PHYSICAL EDUCATION

### FOR MEN

Director LOUIS J. COOKE; Assistant Director WILLIAM K. FOSTER; Instructor JOHN C. WEST; Assistant N. W. JOHNSTON.

### 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 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.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
1.	Personal Hygiene.....	None	All	None
3-4.	Gymnastics .....	None	Fr.	None
5-6.	Intermediate Gymnastics....	None	Fr.	See statement
7-8.	Advanced Leaders.....	2†	Soph., jr., sr.	1, 3-4, 5-6
9-10.	Corrective Gymnastics.....	None	All	None
11-12.	Wrestling .....	None	Soph., jr., sr.	3-4
13-14.	Advanced Gymnastics.....	None	Soph., jr., sr.	3-4
15-16.	Intermediate Swimming.....	None	All	None
17-18.	Advanced Swimming.....	None	All	15-16

†Both semesters must be completed before credit is given for the first semester.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 93 and 94.

## PHYSICAL EDUCATION

## FOR WOMEN

Assistant Professor J. ANNA NORRIS; Instructors MAY S. KISSOCK, EDITH G. RAYNOR, VALERIA LADD.

## INTRODUCTORY STATEMENT

This department aims to look after the health of the women students. It gives physical examination and advice to all newly entering students; conducts systematic yearly consultations with, and examines when necessary, all upper class students; gives courses in hygiene, organizes physical work to meet the various needs and physical tastes of students; coöperates closely with the Woman's Athletic Association in encouraging and organizing athletic sports; investigates cases of illness in dormitory and boarding houses.

Office open at regular hours to all students who desire consultation regarding their physical condition.

Work in this department is required of all newly entering students (see Courses 1-2 and 11), 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 required annually of all students.

Elective work without credit arranged in social dancing, gymnastic dancing, swimming, fencing, basket-ball, baseball, skating, etc. Students' standing not recorded in Registrar's office, but department takes responsibility of dropping from class such students as do not meet standards of class. Shower bath fees are attached to courses in gymnastic dancing (\$1.00 per semester for elementary, \$.50 for advanced) and to basket ball (\$.50 for season).

A large, new, well-equipped gymnasium will be ready for use in the autumn of 1915.



COURSES

No.	Title	Credits	Offered to	Prereq. courses
1-2.	Elementary Physical Training.	..	All. Required of all fr.	None
3-4.	Intermediate Physical Training	3	Soph., jr., sr.	Equivalent of 1- 2
5-6.	Advanced Physical Training...	3	Jr., sr.	3-4
11.	Preliminary Hygiene.....	3	Required of all new students.	None
13.	Personal Hygiene.....	3	Soph., jr., sr.	An. Biol. 1-2
14.	Hygiene of the Family.....	3	Sr.	Course 13

\*Six credits the maximum number that can be gained by taking courses in exercise (courses 3-4, 5-6); only one of these courses may be taken for credit in a semester.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, page 95.

PHYSICS

Professors HENRY A. ERIKSON, ANTHONY ZELNY\*; Associate Professor ALOIS F. KOVARIK; Assistant Professor LOUIS W. McKEEHAN; Instructors E. O. DIETERICH, ARTHUR F. GORTON, EARLE H. KENNARD, PAUL E. KLOPSTEG, OTTO J. ZOBEL.

REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits.

*For a Major*, twenty-four credits.

*For B.A. with Distinction*, the general requirements (page 14); Courses 13 and 14; work chosen from any courses above 50, except 89-90; mathematics 106, 107, 108, 140, and any course in mathematics open only to juniors and seniors if approved by the department. Thesis in connection with any course in Physics above 150.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

*For a Teacher's Certificate*, fifteen credits, including Courses 89 and 90.

Sequence of courses suitable for the preparation of high-school teachers in Physics: General Physics, Courses 1, 2, 3, 4 or 7, 8, 9, 10; Course 81, Physical Manipulation and Laboratory Technique; Course 31, Acoustics; Course 52, Light; Course 89-90, Teachers' Course.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
1.	General Physics.....	3	Soph., jr., sr.	Math. 2 or 4, or registration in Math. 2 or 4

\*Absent on leave, 1915-16.

No.	Title	Credits	Offered to	Prereq. courses
2.	General Physics.....	3	Soph., jr., sr.	1
3.	General Laboratory Practice .....	1	Soph., jr., sr.	See statement
4.	General Laboratory Practice .....	1	Soph., jr., sr.	See statement
7.	General Physics for Engineers .....	4	Soph., jr., sr.	Math. 2 or 4, see statement
8.	General Physics for Engineers .....	4	Soph., jr., sr.	7. See statement
9.	Gen. Lab. Practice for Engineers .....	1	Soph., jr., sr.	See statement
10.	Gen. Lab. Practice for Engineers .....	1	Soph., jr., sr.	See statement
13.	Electrokinetics .....	3	Jr., sr.	(12) 1914-15
31.	Acoustics .....	3	Soph., jr., sr.	See statement
52.	Light .....	3	Jr., sr.	4 or 10, and Math. 11
81.	Physical Manipulation and Laboratory Technique..	2	Jr., sr.	4, 10 or 14
82.	Physical Instruments of Precision .....	2	Jr., sr.	81
89-90.	Teachers' Course.....	2	Sr.	1-4, or 7-10, or 11-14
121-122.	Dynamics .....	6	Jr., sr., grad.	2 or 10 or (12) and Math. 51
155.	Spectrometry .....	3	Sr., grad.	52 and 82
161.	Advanced Electricity and Magnetism .....	3	Jr., sr., grad.	13
162.	Electrical Measurements..	2	Jr., sr., grad.	13
165.	Electrical Measurements of Precision .....	3	Sr., grad.	162
177.	Radioactivity .....	3	Sr., grad.	13 and Math. 11
178.	Radioactivity Measurements .....	3	Sr., grad.	177
181.	Adv. Physical Measurements .....	3	Sr., grad.	82
182.	Adv. Physical Measurements .....	3	Sr., grad.	181
191.	Elementary Physical Investigation .....	3	Sr., grad.	82
192.	Elementary Physical Investigation .....	3	Sr., grad.	191

†Carries credit only in Department of Education.

89-90. TEACHERS' COURSE. Methods of presentation; selection of lecture and laboratory experiments; laboratory management. Open to seniors who have taken a general course in physics. TOWNE.

For the year 1915-16 this course is given only in the Department of Education.

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 96-99.

## POLITICAL SCIENCE

Professors WILLIAM A. SCHAPER, JEREMIAH S. YOUNG; Associate Professor CEPHAS D. ALLIN; Assistant BENJAMIN W. PALMER.

## REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits.

*For a Major*, twenty-four credits.

*For B.A. with Distinction*, see general requirements (page 14).

*For Teacher's Certificate* in Government, nine credits in Political Science and eighteen credits in History.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

The Departments of Economics, Political Science, History, and Sociology and Anthropology constitute a social science group. The subjects are intimately inter-related, and they are all of especial importance to students who intend to engage in law, business, public service at home or abroad, journalism, the work of charities and corrections, or to give instruction in one of the social sciences. Students who are interested in the work of any one of the departments of the social science group ought to be familiar with at least the elements of the subjects offered in the other departments. A student who takes his major in any one of them ought to have more than the elements of the others.

## COURSES

*Introductory Courses*

No.	Title	Credits	Offered to	Prereq. courses
1a or 1b.	American Government....	3	Soph., jr., sr.	None

*General Courses*

3.	Comparative Government.	3	Soph., jr., sr.	1
5.	European Municipal Administration .....	3	Soph., jr., sr.	1
6.	American Municipal Administration .....	3	Soph., jr., sr.	1
7a or 7b.	State and Local Government .....	3	Soph., jr., sr.	1
9.	Colonial Administration..	3	Soph., jr., sr.	1
51.	Business Law, I.....	3	Jr., sr.	6 credits in Pol. Sci., or 6 in Econ., or 3 in each
52.	Business Law, II.....	3	Jr., sr.	*51
54.	Latin American Relations	3	Jr., sr.	6 credits

## COLLEGE OF EDUCATION

*Special Courses*

No.	Title	Credits	Offered to	Prereq. courses
25.	American Gov't. (Engineers) .....	2	Sr.	None
26.	Commercial Law (Engineers) .....	2	Sr.	25
27.	American Gov't. (Agriculture) .....	3	Soph., jr., sr.	None
56-57.	Teachers' Course.....	3	Jr., sr.	See statement

*Advanced Courses*

101.	Constitutional Law.....	3	Jr., sr., grad.	6 credits
102.	Modern Political Thought	3	Jr., sr., grad.	6 credits
104.	Political Parties.....	3	Jr., sr., grad.	6 credits or 1 and History 5-6
105.	Comparative Administration .....	3	Jr., sr., grad.	6 credits
106.	Legislative Power and Methods .....	3	Jr., sr., grad.	6 credits
108.	Police Power.....	3	Jr., sr., grad.	6 credits
109.	Diplomacy .....	3	Jr., sr., grad.	6 credits or 1 and History 156
110.	International Law.....	3	Jr., sr., grad.	1 and 3, or 109
112.	Comparative Federal Gov't	3	Jr., sr., grad.	6 credits
114.	Government of the British Empire .....	3	Jr., sr., grad.	6 credits, or 1 and History 7
201-202.	Seminar .....		6	12 credits Sr., grad.

56-57. **TEACHERS' COURSE.** Lectures on teaching Government in the secondary schools, given in coöperation with the Department of History and credited as part of History 56-57. **SCHAPER.**

All of the above courses receive credit in the College of Education. For description see College of Science, Literature, and the Arts bulletin, pages 99-102.

**RHETORIC AND PUBLIC SPEAKING**

**Professors** JOSEPH M. THOMAS, MARGARET SWEENEY; **Assistant Professors** DANIEL FORD, CHARLES W. NICHOLS, SIDNEY F. PATTISON, ANNA H. PHELAN, FRANK M. RARIG; **Instructors** OLIVE M. GILBREATH, HALDOR GISLASON, JAMES T. HILLHOUSE, CHARLES E. SKINNER, ARTHUR J. TIEJE, HOWARD T. VIETS, HELEN A. WHITNEY, .....

**REQUIREMENTS OF THE DEPARTMENT**

*For a Major*, twenty-four credits, which may include not more than six credits in Public Speaking.

*For a Minor in Rhetoric*, twelve credits in addition to Course 1-2, including Course 11-12 or 15-16.

For a *Minor in Public Speaking*, twelve credits in Public Speaking.

For *B.A. with Distinction*, the general requirements (page ..). A reading knowledge of either Latin, French, or German. At least fifteen credits in departmental starred courses (see College of Science, Literature, and the Arts bulletin), six of these credits to be in Course 119-120.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

For a *Teachers' Certificate*, at least a minor in Rhetoric and a minor in English, with an average of one and one-half honor points for each credit hour.

Students expecting to qualify for Practice Teaching should follow one or the other of the courses in Rhetoric outlined below.

- (a) *Minor Sequence*: Courses 1-2, 11-12, 41-42.
- (b) *Major Sequence*: to consist of the courses outlined above and in addition six credits (to be earned during the senior year) chosen from the following: Courses 102, 103-104, 107, 110, 111-112, 16.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
1-2.	Composition and Rhetoric	6	Fr.	None
1b.	Composition and Rhetoric	3	Fr.	None
2a.	Composition and Rhetoric	3	Fr.	None
3-4.	Composition for Engineers	6	Fr. Eng.	None
11-12.	Exposition, Description, Narration .....	6	Soph., jr., sr.	1-2
15-16.	Exposition and Argument	6	Soph., jr., sr.	1-2
31-32.	Technical Writing.....	4	Sr., Engineers	3-4
41-42.	Public Speaking.....	6	Soph., jr., sr.	1-2
45-46.	Argumentation and Debate	6	Soph., jr., sr.	See statement
47.	Advanced Debate.....	3		See statement
81-82.	Interpretative Reading...	6	Jr., sr.	1-2, 41-42
83-84.	Advanced Public Speaking	6	Jr., sr.	1-2, 41-42
102.	Versification .....	3	Jr., sr., grad.	1-2, 11-12 or 15-16
103-104.	Studies in Structure and Style .....	6	Jr., sr., grad.	1-2, 11-12 or 15-16
107.	Imitative Writing.....	3	Jr., sr., grad.	1-2, 11-12 or 15-16
110.	Short-Story Writing.....	3	Jr., sr., grad.	1-2, 11-12 or 15-16
111-112.	Essay Writing.....	6	Jr., sr., grad.	1-2, 11-12 or 15-16
115-116.	Dramatic Technique.....	4	Sr., grad.	See statement
119-120.	Seminar in Writing.....	4	Sr., grad.	See statement
130.	Teachers' Course.....	3†	Jr., sr., grad.	See statement
201-202.	Seminar in Rhetoric....	6	Sr., grad.	See statement

†Carries credit only in the department of Education.

130. **TEACHERS' COURSE.** Methods of teaching English in the high schools. Discussion of course of study, textbooks, and equipment. Visits to Minneapolis and St. Paul high schools. Practical work in theme-correcting. Open to those who have completed, or are completing, a minor in Rhetoric and a minor in English and are qualifying for Practice Teaching. This course carries credit only in the department of Education. INGLIS.

For description of all other courses, see College of Science, Literature, and the Arts bulletin, pages 102-106.

#### PUBLIC SPEAKING

*Honorable Mention in Public Speaking.* Students who have won honors in debate or oratory, if the department deems them worthy, may receive honorable mention on the commencement program. To be eligible for such distinction a student must (1) have represented his class in the freshman-sophomore debate, or won a place in the freshman-sophomore oratorical contest; (2) have taken part in an inter-society debate; (3) have represented the University in an intercollegiate debate, or won a place in the Pillsbury oratorical contest.

#### ROMANCE LANGUAGES

Professors EVERETT WARD OLMSTED, COLBERT SEARLES; Assistant Professor JULES T. FRELIN; Instructors HARRY E. ATWOOD, NELSON F. COBURN, MARCEL MORAUD, CHARLES E. MULLER, RUTH S. PHELPS, EDWARD H. SIRICH; Teaching Fellows GEORGE S. BARNUM, EARL A. BARRETT.

#### REQUIREMENTS OF THE DEPARTMENT

*For a Minor,* twelve credits not including Course 1.

*For a Major,* twenty-four credits not including Courses 1 and 3.

*For B.A. with Distinction.* General requirements (page 14); a reading knowledge of Latin or German, and two years' work in Spanish or Italian. In the junior year, Courses 55-56, 101-102, 51-52, 53-54; in the senior year, courses 103-104, 107-108, 111-112, 113-114. Substitutions for these courses may be granted by the department in special cases. Alternation of courses required in the junior and senior years is allowable.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

*For a Teacher's Certificate.* In addition to course 5-6, which presupposes courses 1 and 3, two Conversation-Composition courses, two literary courses, and reinforcing work in Spanish as a minimum.

				COURSES	
No.	Title	Credits	Offered to	Prerequisites	
1a or 1b.	Beginning French.....	6	Fr., soph., jr., sr.	None	
3a or 3b.	Intermediate French....	6	Fr., soph., jr., sr.	1 or equivalent	
	5-6. Gen. Survey Fr. Lit...	6	Fr., soph., jr., sr.	3 or equivalent	
	7-8. Elementary Fr. Conver.	2	Fr., soph., jr., sr.	3 or equivalent	
	9-10. Elementary Fr. Compos.	2	Fr., soph., jr., sr.	3 or equivalent	
31a or 31b.	Beginning Spanish.....	6	Fr., soph., jr., sr.	None	
	33-34. Beginning Spanish.....	6	Fr., soph., jr., sr.	None	
	35-36. Intermediate Spanish...	6	Fr., soph., jr., sr.	31 or equivalent	
	37-38. Elementary Span. Conver. ....	2	Fr., soph., jr., sr.	35-36 or equivalent	
	39-40. Elementary Span. Compos. ....	2	Fr., soph., jr., sr.	35-36 or equivalent	
	41-42. Beginning Italian.....	6	Fr., soph., jr., sr.	None	
†	43-44. Intermediate Italian....	4	Soph., jr., sr.	41-42 or equivalent	
	51-52. Advanced French Conversation .....	2	Soph., jr., sr.	7-8 or equivalent	
	53-54. Advanced French Composition .....	2	Soph., jr., sr.	9-10 or equivalent	
	55-56. French Lit. Nineteenth Century .....	4	Soph., jr., sr.	5-6 or equivalent	
	101-102. French Lit. Eighteenth Century .....	6	Jr., sr., grad.	5-6 or equivalent	
	103-104. French Lit. Seventeenth Century .....	6	Jr., sr., grad.	5-6 or equivalent	
†	105-106. French Lit. Sixteenth Century .....	4	Jr., sr., grad.	101-102 or 103-104 or equivalent	
	107-108. French Lit. Classicism.	4	Jr., sr., grad.	103-104 or equivalent	
	109-110. Lectures in French....	6	Jr., sr., grad.	5-6; 51-52 or equivalent	
	111-112. French Oral Diction....	4	Jr., sr., grad.	51-52 or equivalent	
	113-114. French Syntax and Composition .....	2	Jr., sr., grad.	52-54 or equivalent	
	131-132. Spanish Novel.....	4	Jr., sr., grad.	33-34 or equivalent	
	141-142. Dante, Petrarch, Boccaccio .....	4	Jr., sr., grad.	41-42 or equivalent	

†Not offered in 1915-16

Note: Courses 7-8 and 9-10 must be taken together.  
 Courses 51-52 and 53-54 must be taken together.  
 Courses 1, 3 and 31 are double courses.

Students are advised to take Course 55-56 as a natural preparation for Courses 101-102 and 103-104.

Permission to register for Courses from 55-56 to 109-110 inclusive may be granted by the department in special cases.

Both semesters of any year-course must be completed before credit is allowed for the first semester.

## SCANDINAVIAN

Professors GISLE BOTHNE, ANDREW A. STOMBERG.

### REQUIREMENTS OF THE DEPARTMENT

*For a Minor*, twelve credits, not including Courses 1-2 and 5-6.

*For a Major*, twenty-four credits.

*For B.A. with Distinction*, the general requirements (page 14) and one year of Scandinavian in addition to what is required for a major.

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

*For a Teachers' Certificate*, twelve credits in addition to Course 110.

### COURSES

No.	Title	Credits	Offered to	Prereq. courses
1.	Beginning Norwegian....	6	All	None
2.	Advanced Norwegian....	6	Soph., jr., sr.	1
3-4.	Advanced Norwegian....	6†	Soph., jr., sr.	1
5.	Beginning Swedish.....	6	All	None
6.	Advanced Swedish.....	6	Soph., jr., sr.	5
7-8.	Advanced Swedish.....	6†	Soph., jr., sr.	5
9.	Beginning Norwegian....	2	See statement	None
10.	Advanced Norwegian....	2	See statement	9
101-102.	Modern Norwegian Literature .....	6†	Jr., sr.	1-2 and 3-4
103.	Earlier Norwegian Literature .....	3	Sr., grad.	101-102
104.	Henrik Ibsen .....	2	Sr., grad.	101-102
107-108.	Swedish Literature.....	6†	Jr., sr., grad.	5 and 6
110.	Teachers' Course in Norwegian .....	2	Sr., grad.	1 and 2 or 5 and 6
113-114.	Old Norse (Icelandic)...	4	Sr., grad.	See statement

†Both semesters must be completed before credit is given for the first semester.

110. TEACHERS' COURSE IN NORWEGIAN. For students who expect to teach Norwegian in the high schools. BOTHNE.

For description of all other courses see College of Science, Literature, and the Arts bulletin, pages 109-111.



SOCIOLOGY AND ANTHROPOLOGY

Professors ALBERT ERNEST JENKS, ARTHUR J. TODD; Instructor PAUL I. NEERGAARD; Lecturers FRANK J. BRUNO, OTTO W. DAVIS, CHARLES C. STILLMAN, GEORGE EDGAR VINCENT; Superintendents of State Board of Control Institutions.

REQUIREMENTS OF THE DEPARTMENT

For a *Minor*, twelve credits.

For a *Major*, twenty-four credits.

For *B.A. with Distinction*, see general requirements (page 14).

*Starred Courses.* The College of Education has as yet adopted no system of starred courses. Nevertheless, candidates for the degree of Bachelor of Arts with Distinction will in some cases be obliged, in order to meet the departmental requirements, to be guided by this system and should therefore consult the departmental statements in the Science, Literature, and the Arts bulletin.

For *Recommendation for Teaching*, credits in the following courses: 1, or 3, 5, 113, 114, 117.

For *Recommendation for Social Work*, credits in the following courses: 1, 9 or 10, 113, 114.

Modern university education is not complete unless the graduate has obtained the social point of view. To this end the Department offers elementary courses dealing with peoples, with social forces, institutions, and movements. Its more advanced courses are designed especially for students majoring in the Social Sciences; namely, Economics, History, Political Science, and Sociology and Anthropology.

COURSES

*Introductory Courses*

No.	Title	Credits	Offered to	Prereq. courses
1a or 1b.	Introduction to Anthropology .....	3	Soph., jr., sr.	None
3a or 3b.	Introduction to Sociology.	3	Soph., jr., sr.	None
5.	Cultural Anthropology....	3	Jr., sr.	None

*Special Courses*

7.	Studies in Social Psychology .....	None	Stud. in dept.	None
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*General Courses*

9.	Poverty .....	2	Jr., sr.	1 or 3
10.	Poverty (continued).....	2	Jr., sr.	1 or 3
11.	Housing Problems.....	2	Jr., sr.	1 or 3, and one other course
12.	Ethnology .....	3	Jr., sr.	1 and one other course
14.	Rural Sociology.....	3	Jr., sr.	1 or 3

*Advanced Courses*

102.	Social Theory.....	3	Jr., sr., grad.	1 or 3, 9 or 10, and one other course
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No.	Title	Credits	Offered to	Prereq. courses
104.	State Board of Control Institutions .....	2	Jr., sr., grad.	1 or 3, 9 or 10, and one other course
108.	The Philippine People....	3	Jr., sr., grad.	1 and 5
110.	Physical Anthropology....	3	Jr., sr., grad.	See statement
112.	The American Negro.....	3	Jr., sr., grad.	1 or 3, 12 or 113
113.	The American People....	3	Jr., sr., grad.	1 or 3, and one other course
114.	The American People (con- tinued) .....	3	Jr., sr., grad.	1 or 3, 113, and one other course
117.	Social Psychology.....	3	Jr., sr., grad.	See statement
119.	Modern Social Institutions	3	Jr., sr., grad.	1 or 3, 9 or 10, and one other course
121-122.	Seminar in Sociology....	3	Sr., grad.	For sr., four cor- related courses
123.	Seminar in Anthropology.	3	Sr., grad.	For sr., four cor- related courses

All of the above courses receive credit in the College of Education. For description, see bulletin of the College of Science, Literature, and the Arts, pages 111-114.

# INDEX

GENERAL	Pages
Absences .....	12
Admission .....	10-12
Afternoon classes for teachers...	16
Agriculture, special certificate....	13
Agricultural college campus, map	3
Agriculture, credits allowed.....	20
Appointment bureau, College of Education .....	16
Appointment bureau, state.....	17
Bachelor of Arts degree .....	13-14
Bachelor of arts with distinction	14
Blind, teachers of .....	23
Calendar .....	5-6
Campus, map of .....	2-3
Certificates .....	12
First grade professional .....	11, 13
Life .....	13
Required in Minnesota .....	12
Special .....	13, 22
State professional .....	16, 18
University teachers' .....	13, 19
Classes, arrangement .....	12
College of Education—Aim, estab- lishment, location .....	10
Conditions .....	12
Correspondence courses .....	16
Courses of study in education....	18-33
Courses of study in other de- partments .....	34-72
Course of study, guidance..	10-11, 18-19
Course of study, prescribed.....	19-20
Credit hours .....	13, 14
Defectives, teachers of .....	23
Departmental statements:	
Education .....	18-33
Other departments .....	34-72
Distinction, graduation with .....	14-15
Elementary teachers .....	23
Employment bureaus .....	16-17
Examinations, exclusion from....	12
Extension courses .....	16
Faculty, register .....	7-9
Failures .....	12
Commercial training .....	13, 20, 41, 42
Fellowships (see teaching assist- ants) .....	15-16
General information .....	10-17
Graded school principals (see also short course) .....	18
Grades .....	12
Graduate scholars .....	9
Graduate students .....	18

	Pages
Graduate study .....	15-16
Graduation with distinction .....	14-15
High school rural training 22, 26, 32-33	
Home economics .....	13, 20, 21, 53
Honor points .....	13, 14
Kindergarten training .....	23
Library course .....	21-22, 31-32
Manual training .....	13, 21, 30
Major (see also departmental statements) .....	14
Map of campus .....	2-3
Mental defectives, teachers of...	23
Minors (see also departmental statements) .....	14
Normal schools, agreements with	23
Normal school graduates..	11-12, 19-22
Practice teaching .....	19, 20, 28
Prescribed course of study.....	19-20
Principals, courses for .....	18
Program of studies .....	12, 14, 16, 18
Residence .....	14
Regular students .....	11
Rural training departments (see, High school training depart- ments)	
Saturday classes .....	16
Scholastic requirements .....	12
Short course, date of .....	6
Starred courses (see also, depart- mental statements) .....	24
State teachers' employment bureau .....	17
Students:	
Graduate .....	15, 16, 18
Normal school .....	11, 12, 19, 22
Regular .....	11
Unclassed .....	11, 18
Studies, selection of .....	18-19
Superintendents, courses for ...	18
Superintendents' short course...	6
Summer session .....	15, 16
Teacher high school training de- partments .....	22, 26, 32-33
Teacher librarians (see, Library course)	
Teachers in service .....	16
Teaching assistants .....	15-16
Unclassed students .....	11, 18
Undergraduates, courses for....	18-19
University high school .....	10
University teachers certificates...	13, 19
Two-year .....	13
Life certificates .....	13

## COURSES AND DEPARTMENTAL STATEMENTS

EDUCATION	Pages
Departmental statements, Education .....	18-33
Administration .....	27
Agricultural education .....	20, 30
Auxiliary education .....	27
Curricula .....	27
Deaf, teachers of .....	23
Defectives, teachers of (see also auxiliary education)...	23
Drawing (see also art) ...	13, 30, 41
Dumb, teachers of .....	23
Educational psychology .....	26
Elementary methods .....	29
Elementary teaching, problems of .....	27
Foreign schools .....	27
Commercial subjects... ..	13, 20, 41, 42
Forge .....	31
History of education .....	26
High school training departments .....	22, 26, 32-33
Home economics .....	13, 20, 21, 53
Industrial education .....	28
Kindergarten training .....	23
Library course .....	21, 22, 31-32
Manual training .....	13, 21, 30
Mental defectives, teachers of .....	23
Methods .....	28-30
Methods, elementary .....	29
Method, Principles of (see also technique of teaching) .....	26
Moral education .....	28
Organization and administration .....	27
Pattern making .....	31
Practice teaching .....	20, 28
Prescribed course of study... ..	19-20
Principles of education .....	26
Religious education .....	28
Research, methods in .....	27
Rural school curriculum .....	26
Sanitation and hygiene .....	27
School administration, course in .....	26-27
Shop .....	31
Social aspects of education... ..	26
Supervision .....	27
Teachers' courses (see methods, see also departmental statements)	
Teachers high school training department .....	22, 26, 32-33

	Pages
Technique of teaching .....	26
Units and scales .....	27
Vocational education and guidance .....	27
Woodwork and wood turning..	31
OTHER DEPARTMENTS	
Anatomy .....	54
Anthropology .....	71
Art .....	35
Astronomy .....	35
Bacteriology .....	36
Biology .....	34-35
Botany .....	37
Chemistry .....	38
Comparative philology .....	40
Descriptive geometry .....	41
Domestic science (see home economics)	
Drill .....	13
Economics .....	41-44
English .....	44-45
French (see romance languages)	
Geography (see also geology)..	48
Geology .....	46
German .....	49-50
Greek .....	51
Gymnastics .....	13
History .....	51
Home economics .....	13, 20, 21, 53
Italian (see romance languages)	
Latin .....	55-56
Mathematics .....	57-58
Minerology .....	46
Music .....	58-59
Norwegian (see Scandinavian)	
Oratory (see public speaking)	
Philology .....	40
Philosophy .....	59
Physical education .....	13, 61-62
Physiology .....	54
Physics .....	63-64
Political science .....	65
Psychology (see also under Education) .....	26, 59
Psychology, prerequisite for all courses in Education...	24
Public speaking .....	66
Rhetoric .....	66
Romance languages .....	68
Scandinavian .....	70
Sociology .....	71
Spanish (see romance languages)	
Swedish (see Scandinavian)	

**Bulletin of**  
**The University of Minnesota**  
COLLEGE OF EDUCATION

UNIVERSITY HIGH SCHOOL

1915-1916



VOL. XVIII. NO. 22. AUGUST 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.

1915							1916														
<b>JULY</b>							<b>JANUARY</b>							<b>JULY</b>							
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	
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11	12	13	14	15	16	17	9	10	11	12	13	14	15	9	10	11	12	13	14	15	
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<b>AUGUST</b>							<b>FEBRUARY</b>							<b>AUGUST</b>							
1	2	3	4	5	6	7	..	..	1	2	3	4	5	..	..	1	2	3	4	5	
8	9	10	11	12	13	14	6	7	8	9	10	11	12	6	7	8	9	10	11	12	
15	16	17	18	19	20	21	13	14	15	16	17	18	19	13	14	15	16	17	18	19	
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<b>SEPTEMBER</b>							<b>MARCH</b>							<b>SEPTEMBER</b>							
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12	13	14	15	16	17	18	12	13	14	15	16	17	18	10	11	12	13	14	15	16	
19	20	21	22	23	24	25	19	20	21	22	23	24	25	17	18	19	20	21	22	23	
26	27	28	29	30	..	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30	
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<b>OCTOBER</b>							<b>APRIL</b>							<b>OCTOBER</b>							
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3	4	5	6	7	8	9	2	3	4	5	6	7	8	8	9	10	11	12	13	14	
10	11	12	13	14	15	16	9	10	11	12	13	14	15	15	16	17	18	19	20	21	
17	18	19	20	21	22	23	16	17	18	19	20	21	22	22	23	24	25	26	27	28	
24	25	26	27	28	29	30	23	24	25	26	27	28	29	29	30	31	..	..	..	..	
31	..	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11	
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18	
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25	
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<b>DECEMBER</b>							<b>JUNE</b>							<b>DECEMBER</b>							
..	..	..	1	2	3	4	..	..	..	..	1	2	3	..	..	..	..	..	1	2	
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9	
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19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23	
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30	
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## SCHOOL CALENDAR

1915-1916

The School year covers a period of thirty-six weeks, beginning on the second Tuesday in September.

1915

September	6-11	Week	Registration of pupils
September	15	Wednesday	First semester begins
November	24	Wednesday	Thanksgiving recess begins 9:00 p.m.
November	29	Monday	Thanksgiving recess ends 8:00 a.m.
December	17	Friday	Christmas vacation begins 9:00 p.m.

1916

January	4	Tuesday	Christmas vacation ends 8:00 a.m.
February	2	Wednesday	Second semester begins
February	12	Saturday	Lincoln's Birthday: a holiday
February	22	Tuesday	Washington's Birthday: a holiday
April	19	Wednesday	Easter recess begins 9:00 p.m.
April	27	Thursday	Easter recess ends 8:00 a.m.
June	2	Friday	Commencement

## THE UNIVERSITY HIGH SCHOOL

### FACULTY

GEORGE EDGAR VINCENT, Ph.D., LL.D., President, University of Minnesota  
CYRUS NORTROP, LL.D., President, Emeritus  
LOTUS D. COFFMAN, Ph.D., Dean and Professor of Education  
RAYMOND A. KENT, M.A., Assistant Professor of Education, Principal of  
the University High School

### INSTRUCTORS

RAY L. LELAND, B.S., History  
REWEY BELLE INGLIS, B.A., English  
WILLIAM D. REEVE, B.S., Mathematics  
JOSEPH BROWN PIKE, M.A., Latin  
SOPHIA HUBMAN, M.A., German  
CHAS. J. PIEPER, B.S., Science  
BESSIE BEMIS, B.S., Domestic Science  
VETTA GOLDSTEIN, Drawing and Design  
ETHEL L. PHELPS, B.S., Domestic Art  
ELSIE M. SMITHIES, B.A., Assistant in Latin  
MAUDE M. F. SHAFER, Ph.B., Assistant in English  
JOHN A. SHOEMAKER, B.A., Assistant in Mathematics and in Science



# THE UNIVERSITY HIGH SCHOOL

## PURPOSE AND PLAN

The University High School has been established by the College of Education to give an opportunity for the study of problems of high-school instruction and administration and for the application of the most approved methods and ideals of secondary education. All students in the University of Minnesota who expect on graduation to receive a diploma admitting them to teach in the public schools of the state are required by state law to do certain work in observing and in teaching high-school subjects under normal conditions. The University High School offers such opportunity for a limited number.

The school is housed in a new, thoroly modern, and fireproof building, erected upon the campus of the University of Minnesota. This building is seventy feet in width, and one hundred fifty feet in length, and includes three stories. The basement floor is given over to physical and biological laboratories, home economics, manual training rooms, lockers, and service rooms. On the second floor are offices, recitation rooms, and the general assembly room. On the third floor are additional recitation rooms, and the offices, seminar, and lecture room of the College of Education. The building is equipped to carry on the various lines of work in a secondary school. Present accommodations will allow an enrollment of about one hundred twenty-five.

The University High School offers a regular four-year course. Any pupil in it who completes successfully an approved course of study will be admitted to the University of Minnesota without examination. The school does not aim, however, merely to provide pupils for college entrance. It is in no sense a preparatory department of the University. A general education is offered anyone, even tho he does not expect to enter any higher school. Those who find it possible to take only a part of a high-school course are allowed to choose such subjects as most suit their needs.

The corps of instruction includes a principal and a number of special teachers in various departments of high-school subjects. The University High School provides opportunities whereby students in the University definitely preparing to become teachers may do practice teaching in the regular class exercises of the school. During a part of the time of every subject taught in the school, instruction is partially given over to such college students. These students also assist pupils individually outside of the regular class periods. No class and no pupil, however, will be solely under the charge of any such student teacher. All work and all classes are under the direct charge and supervision of an experienced teacher who is a regular instructor in the High School, who possesses high schol-

arship and professional training, who does the larger part of the teaching himself, and who is responsible for all the work done in his department, including that by these students. Moderate sized classes, competent teaching, and supervision of the individual work of the pupils are characteristic features in the school.

#### ADMISSION

The purpose of the school, as well as its limitation of space, require that only a limited number of pupils be enrolled. Pupils are admitted to the University High School on presentation of certificates of honorable dismissal from a school of recognized standing, and upon proper credentials as to their character and the character and quantity of the work done in that school. They may be required also to pass examinations to determine their proper classification. In so far as places are vacant, applicants may be admitted to any one of the four classes.

The school calendar will correspond to the calendar of the University. The week of September 6-11, 1915, will be given over to registration of pupils. Assignments will be made on Tuesday, September 14, and recitations will begin on Wednesday, September 15.

Applications for admission will be considered in the order in which they are received. They may be made in person to the Principal, in room 110, Education Building, University of Minnesota. It is not the custom of the University High School to admit applicants after the first of the semester. There are no tuition charges. Students are expected to purchase their own text books, stationery, and any other material required by the instructors in charge of the subjects they study. The school reserves the right to refuse registration to any applicant or to request the discontinuance of attendance by any pupil after he is registered.

#### CREDITS AND GRADUATION

The requirements for graduation include the completion of an approved program of studies aggregating sixteen units of credit, one unit expressing the value of one subject with five regular recitation periods a week pursued through the entire school year. Inasmuch as the University High School considers its diploma an endorsement of the individual upon whom it is bestowed, the school will refuse at any time to confer its diploma upon any one who fails in character or deportment to measure up to the standards set by the school. Each student is required to take such physical examinations and exercises each year as may seem advisable to promote general health and correct physical defects. He may be required to attend such lectures as may be provided by the school on topics of interest to the pupils. Required work in physical training counts nothing in credits toward graduation. Literary work done acceptably under supervision of regular instructors may count toward credit in English. No student is allowed to take more or less than four standard subjects except by permission of the Principal. Instrumental music, voice

culture, and certain other kinds of outside work may be given credit toward graduation. To receive such credit the work must (1) be such as can be clearly verified and (2) have been done under adequate supervision. In each case the Principal will be the judge of the amount of credit to give.

#### PROGRAM OF STUDIES

Each student should select his program of studies with great care and not before he has had the advice of his parents and the Principal. Because the University High School provides generously for electives, it is the more necessary that each pupil think carefully before he decides what studies to take. Is he preparing for the University? For what College? Does he already know what vocation he wishes to follow? In what subjects has he exceptional ability? What weaknesses has he that may be overcome by wisely chosen courses of study? If he can not be in school four years, how long can he attend? These are some of the questions that must be answered in making an intelligent selection.

Every student who is preparing to enter the University should note that the following requirements are fixed:

1. Four years of English or three years of English accompanied by two years of two foreign languages.

2. A major series of three or more units (years) and a minor series of two or more units (years) each series chosen from foreign languages, history and social sciences, mathematics, or natural science.

- a. At least two years of mathematics are required. If one chooses the minor from the mathematics group, the major must be chosen from some other group. That is, one can not take three years of mathematics and count it as both a major and a minor.

- b. To form a language series, at least two years of the same language must be taken.

- c. In selecting the additional units to make up the fifteen required for university entrance, avoid selecting more than four from the vocational subjects, such as manual arts and home economics.

At the time of registering, each student should consult the Principal and other teachers who will be present for the purpose of helping, until he has a well-balanced program worked out for himself.

The school day begins at eight o'clock on the five regular school days of the week.

# SUBJECTS OFFERED IN THE UNIVERSITY HIGH SCHOOL

1915-1916

## FIRST YEAR

*Required*

English 5  
General Science 5

*Elective*

Select two units { Algebra 5  
Ancient History 5  
Drawing and Design  $\frac{1}{2}$  (five double periods)  
Shop work (five double periods)

## SECOND YEAR

*Required*

English 5

*Elective*

Select three units { Algebra 5  
Plane Geometry 5  
Botany 5  
Modern History 5  
Ancient History 5  
General Biology or Physiology and Hygiene  $\frac{1}{2}$  (5) (and extra laboratory periods)  
Garment Making and Foods and Cookery (five double periods)  
Shop Work (five double periods)

## THIRD YEAR

*Required*

English 5  
American History

*Elective*

Select three units { Latin 5  
German 5  
Adv. Algebra  $\frac{1}{2}$  (5)  
Solid Geometry  $\frac{1}{2}$  (5)  
Chemistry 5 (and extra laboratory periods)  
Zoology 5 (and additional laboratory periods)  
Com. Geog.  $\frac{1}{2}$  (5)  
House Planning and Furnishing  $\frac{1}{2}$  (five double periods)  
Mechanical Drawing (five double periods)  
Physics 5 (additional laboratory periods)

## FOURTH YEAR

*Required*

English 5  
Government  $\frac{1}{2}$  (5)  
Economics  $\frac{1}{2}$  (5)

*Elective*

Select three units { Latin 5  
German 5  
Adv. Alg.  $\frac{1}{2}$  (5)  
Solid Geometry  $\frac{1}{2}$  (5)  
Chemistry 5 (and additional laboratory periods)  
Physics 5 (and additional laboratory periods)  
Textiles, Foods and Cookery  $\frac{1}{2}$  (five double periods)  
Dressmaking, House Management  $\frac{1}{2}$  (five double periods)

14

# Bulletin of The University of Minnesota

THE GRADUATE SCHOOL

1915-1916



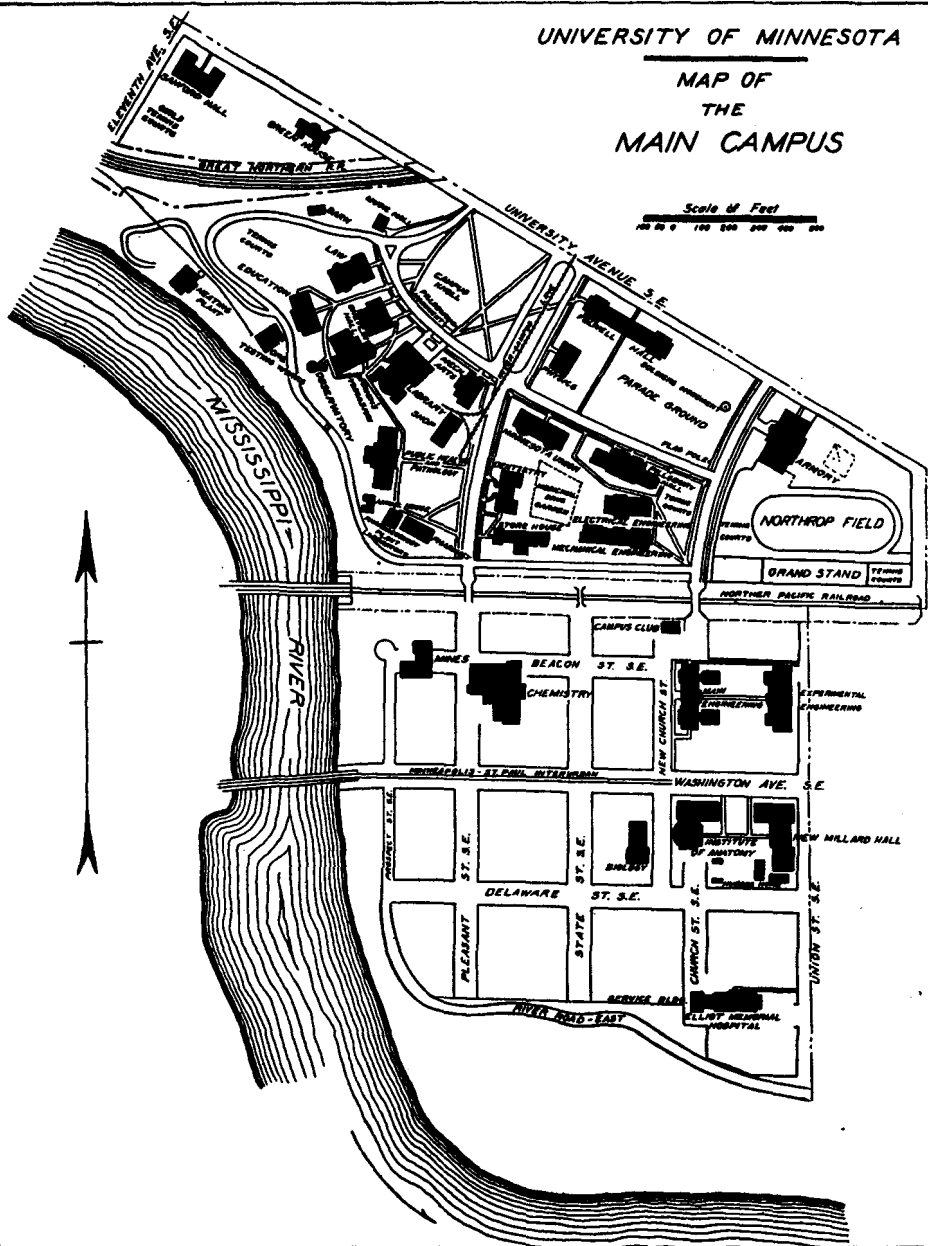
VOL. XVIII, NO. 14. JULY 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.

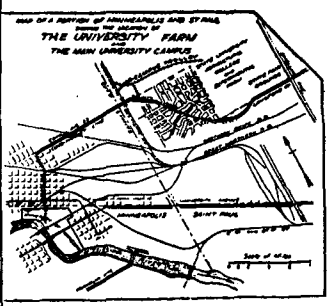
UNIVERSITY OF MINNESOTA

MAP OF  
THE  
MAIN CAMPUS

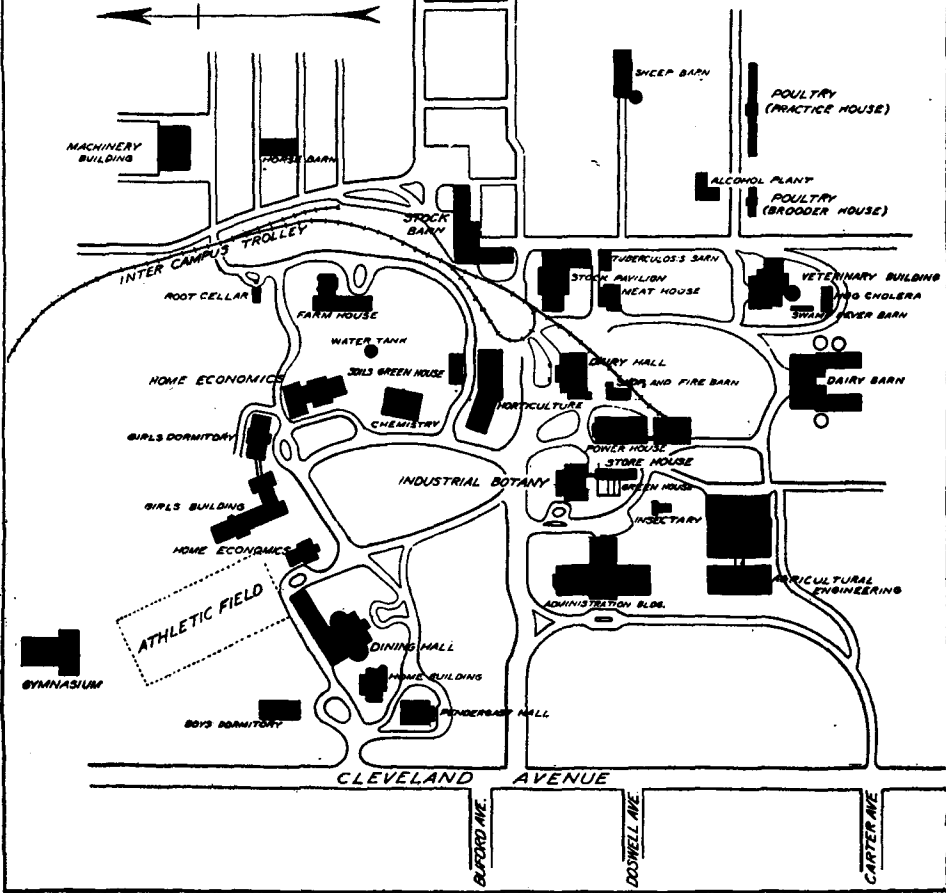
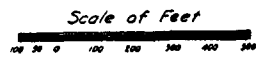
Scale of Feet  
0 100 200 300 400 500



Area of Main Campus, 108.5 acres



UNIVERSITY OF MINNESOTA  
MAP OF THE CAMPUS  
OF THE  
UNIVERSITY FARM



O. S. Zetser.

Area of University Farm, 422.56 acres

1915							1916													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
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4	5	6	7	8	9	10	2	3	4	5	6	7	8	2	3	4	5	6	7	8
11	12	13	14	15	16	17	9	10	11	12	13	14	15	9	10	11	12	13	14	15
18	19	20	21	22	23	24	16	17	18	19	20	21	22	16	17	18	19	20	21	22
25	26	27	28	29	30	31	23	24	25	26	27	28	29	23	24	25	26	27	28	29
..	..	..	..	..	..	..	30	31	..	..	..	..	..	30	31	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
1	2	3	4	5	6	7	..	..	1	2	3	4	5	..	..	1	2	3	4	5
8	9	10	11	12	13	14	6	7	8	9	10	11	12	6	7	8	9	10	11	12
15	16	17	18	19	20	21	13	14	15	16	17	18	19	13	14	15	16	17	18	19
22	23	24	25	26	27	28	20	21	22	23	24	25	26	20	21	22	23	24	25	26
29	30	31	..	..	..	..	27	28	29	..	..	..	..	27	28	29	30	31	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SEPTEMBER							MARCH							SEPTEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	1	2	3	4	..	..	..	1	2	3	4	..	..	..	1	2	3	4
5	6	7	8	9	10	11	5	6	7	8	9	10	11	3	4	5	6	7	8	9
12	13	14	15	16	17	18	12	13	14	15	16	17	18	10	11	12	13	14	15	16
19	20	21	22	23	24	25	19	20	21	22	23	24	25	17	18	19	20	21	22	23
26	27	28	29	30	..	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
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..	..	..	..	..	1	2	..	..	..	..	..	..	1	1	2	3	4	5	6	7
3	4	5	6	7	8	9	2	3	4	5	6	7	8	8	9	10	11	12	13	14
10	11	12	13	14	15	16	9	10	11	12	13	14	15	15	16	17	18	19	20	21
17	18	19	20	21	22	23	16	17	18	19	20	21	22	22	23	24	25	26	27	28
24	25	26	27	28	29	30	23	24	25	26	27	28	29	29	30	31	..	..	..	..
31	..	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	..	..	1	2	3	4
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
DECEMBER							JUNE							DECEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	1	2	3	4	..	..	..	..	1	2	3	..	..	..	..	1	2	3
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..



## UNIVERSITY CALENDAR

(As applicable to the Graduate School)

1915-1916

The University year covers a period of thirty-eight weeks, beginning on the Tuesday before the second Thursday in September. Commencement Day is always the second Thursday in June.

1915

September	7-14	Week	Registration of new students and payment of fees
September	15	Wednesday	First semester begins
October	1	Friday	Last day for registration of graduate students without penalty
November	15	Monday	Last day for filing at the Dean's office of all thesis subjects as approved by the Department Committees
November	24	Wednesday	Thanksgiving recess begins 9:00 p.m.
November	29	Monday	Thanksgiving recess ends 8:00 a.m.
December	11	Saturday	Last day for final examinations in the field of the minor of candidates for the Doctor's degree
December	17	Friday	Christmas vacation begins 9:00 p.m.
1916			
January	4	Tuesday	Christmas vacation ends 8:00 a.m.
January	18	Tuesday	Registration for second semester closes
February	2	Wednesday	Second semester begins
February	4	Friday	Last day for registration of graduate students without penalty
February	5	Saturday	Last day for filing at the Dean's office notice of candidacy for the Doctor's degree
February	12	Saturday	Lincoln's birthday: a holiday
March	1	Wednesday	Last day for filing applications for the Shevlin Fellowships and Howard Scholarship and departmental scholarships
April	19	Wednesday	Easter recess begins 9:00 p.m.
April	27	Thursday	Easter recess ends 8:00 a.m.
May	1	Monday	Last day for filing at the Dean's office of final notice of candidacy for the Master's degree at the coming Commencement.
May	18	Thursday	Last day for filing at the Dean's office of three copies of completed Master's thesis.

## GRADUATE SCHOOL

May	20	Saturday	Last day for written examinations in the field of the major of candidates for the Doctor's degree. Last day for filing at the Dean's office of three copies of all theses submitted for the Doctor's degree.
May	30	Saturday	Decoration Day: a holiday
June	1	Thursday	Last day for oral examination and certification to the Dean of successful candidates for the Doctor's degree Last day for meeting of Department Committees to pass on or examine orally candidates for the Master's degree.
June	4	Sunday	Baccalaureate service
June	7	Wednesday	Alumni Day
June	8	Thursday	Forty-second Annual Commencement
June	12	Monday	Summer Session begins

The University year for 1916-17 will begin Tuesday, September 12.

# THE GRADUATE SCHOOL

## ORGANIZATION

The Graduate School has exclusive control of all graduate work carried on in the University. The administration of the School is committed to the Dean and an Executive Committee of seven members. The Graduate Faculty is composed of those properly approved as qualified to offer courses carrying graduate credit.

## 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 by the Executive Committee.

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's additional work before beginning real graduate work at the University of Minnesota, he would do better 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.

## FEEES

All students taking full work in the Graduate School except those in clinical medicine and surgery are required to pay an incidental fee of fifteen dollars a semester, or a proportionate fee for less work. The tuition fee for graduate work in medicine and surgery is twenty-five dollars a semester. Fellows, scholars, and members of the scientific and instructional staff in the University may register for graduate work without payment of fees or tuition.

## THE SHEVLIN FELLOWSHIPS

Four graduate fellowships have been established by the late Thomas H. Shevlin, of Minneapolis, each yielding \$500 per annum. They are

awarded annually. Candidates for these fellowships will 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. No appointment will be made in 1915-16.

#### 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 desiring to pursue advanced work. Applications should be filed with Dean of Graduate School before March 1.

#### DEPARTMENTAL SCHOLARSHIPS

Besides the above stipends there are some twenty-five scholarships assigned to various departments, yielding \$225 and exemption from tuition and fees. The holders may be required to render services not to exceed ten hours a week in laboratory or office work, or more than three hours in classroom assistance. Where these regulations are observed, 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, some yielding as high as \$600, as well as teaching fellowships at \$600, 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.

#### CANDIDACY FOR A DEGREE

Students may become candidates for advanced degrees, either the Master's or Doctor's, only on recommendation of the group committee in the field of their major work and with the approval of the Executive Committee of the Graduate Faculty.

Among the conditions affecting such approval will be the quantity and quality of the undergraduate work which the candidate has done in the subjects he desires to pursue as major and minor work. The major work must be in a department in which the candidate has had at least three years of work if it be a department open to freshmen, or two years of work if it be a department not open to freshmen. Part or all of this preliminary work may consist of designated prerequisite courses.

The minor subject must be selected in a department in which the

candidate has had at least one year's work, or he must have had in a closely allied department a year's work which is actually designated as a prerequisite to the minor report.

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.

#### REQUIREMENTS FOR THE MASTER'S DEGREE

The requirements for the degree of Master of Arts or Master of Science are covered 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. The work of that year must cover courses in the fields of the major and minor and the preparation of a satisfactory thesis.

*The Master's thesis.*—Before the fifteenth of November the candidate should file at the office of the Dean the subject of his thesis. This subject must be approved by his adviser and by the Executive 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 this thesis. The thesis must be finished and three copies deposited in the office of the Dean by the eighteenth of May of the year in which he presents himself as a candidate for the degree. One original and two carbon copies in proper form will suffice. 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. One week before Commencement the candidate must deposit the original typewritten copy of the thesis with the Registrar and pay the fee to cover the cost of binding.

*Form of thesis.*—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 foot-notes may be single spaced.

*Courses.*—Candidates for advanced degrees must select, with the approval of their adviser and of the Dean, graduate courses offered in this Bulletin amounting to not less than six or more than nine scheduled hours each semester. The usual study list of a candidate for the Master's degree will carry the thesis, two courses in the major, and one in the minor.

*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. To receive credit toward a graduate degree their rating in class work must be an average of *B* for the year's work in any course.

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, an hour's oral examination in the work offered for the degree including the thesis.

*The candidate's committee.*—When the thesis subject has been announced and approved, the Dean will appoint a committee of three to have general supervision of the candidate's work and pass upon the acceptability of the thesis. The instructor in charge of the student's major work will, as a rule, be chairman of this committee. This chairman shall have charge of the special written and oral examinations at the end of the year. The report of the committee upon the thesis must be unanimous as to its acceptability. All reports concerning examinations, thesis, etc., must be in the office of the Dean at least one week before Commencement.

#### DOCTOR'S DEGREES

Two degrees of this grade, namely, Doctor of Philosophy (Ph.D.), and Doctor of Science (D.Sc.), are conferred for attainments still more advanced than are required for the corresponding Bachelor's and Master's degrees. The Doctor's 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 his special field, to be shown, first, by the preparation of his 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 years of graduate study to the subjects approved for candidacy, of which the last year must be spent in residence at the University of Minnesota.

This requirement of time devoted exclusively to work toward the degree will not be met by candidates who merely devote the intervals of professional or other regular employment to graduate work. Such candidates will sometimes need to spend a period two or three times as long as that just mentioned. It is usually not advisable for persons so engaged to try to become candidates for a Doctor's degree, but rather to undertake only such special graduate work as they may find to their advantage, without reference to any degree.

The same definition of residence applies in this case as in that already given in connection with the Master's degree.

*Assistants and instructors.*—The restriction mentioned in connection with the Master's degree, whereby assistants and instructors largely engaged in classroom and other instructional work are debarred from obtaining full credit for time so spent, toward a degree, applies equally to work for the Doctor's degree.

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

*Preliminaries to candidacy.*—A graduate student applying to be en-

rolled as candidate for a Doctor's degree should fulfill the requirements already specified for those applying for the Master's degree and, in addition, possess a reading knowledge of French and German certified to by the professors respectively in charge of those languages not later than the beginning of the last year of residence. Knowledge of Latin will also be required in certain cases, when, for example, the major is in medieval history, or philosophy, as the department may prescribe.

The applicant must, moreover, have made before enrollment such noteworthy advancement in his major as to secure the written approval of his candidacy by the department in which he proposes to take his major.

Such written approval should state that in view of the work already done by the applicant the department has become convinced of his capacity and of his probable ability to carry through an investigation in his special field to a successful conclusion and embody it in a satisfactory thesis, and furthermore is prepared to accept him as candidate.

This approval of the department will after due consideration be passed on by the Executive Committee. It will frequently not be possible to secure such enrollment before the completion of one year of study in the Graduate School, but it must be secured at least a year before attaining the degree.

*Preliminary work, major and minor work.*—The requirements already detailed in reference to the distribution and kind of work for the Master's degree hold for the Doctor's degree also, but in this case the special problem for the thesis must be selected with the advice and consent of the department committee in which the candidate's major lies, at least one year before the degree is to be conferred. Announcement of the fact must be transmitted to the Executive Committee through the Dean, together with the written approval of the department, before the beginning of the last academic year. On recommendation of the department committee of the major, the Executive Committee may excuse the candidate from complying with the above requirement as to a part or the whole of the additional courses, in order that more time may be devoted to the thesis. The work upon the minor should not extend into the candidate's final year.

*Preliminary notice.*—Each candidate for a Doctor's degree at any Commencement will notify the Dean in writing by the first of the preceding February of his intention to present himself for the degree, and he will make a full statement of the work which he will offer for the degree, his major, his minor, and the subject of his thesis, together with the names of those with whom the work is being done. The statement should be endorsed as approved by the chairman of his major department.

*Examinations for the Doctor's degree.*—Candidates for the Doctor's degree are required to take the regular examinations in all the courses for which they are registered, as in the case of the Master's degree.

Candidates are required to take two degree examinations, a preliminary and a final. The preliminary degree examination is a written examination upon the minor subject or subjects given by the department

committees concerned. Upon recommendation of a department committee, this examination may be given in connection with the courses taken by the candidate, provided that such examination be a more exhaustive one than that given to other students taking such courses. When the preliminary examination is not given in connection with a course, it shall be taken not less than six months prior to the final examination. All such examinations must be approved as satisfactory by the department committee concerned and so certified to on the candidate's registration book before he can be admitted to final examination on his major, and when so certified to will be final for that subject.

*The thesis* 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, and the thesis must contain such extended references to the bibliography of the subject as to make it in every way a scholarly production.

It must be approved as satisfactory by the candidate's committee before he can be admitted to his final oral examinations.

*Presentation of Doctor's thesis.*—At least four weeks before Commencement the candidate will deposit at the Dean's office his thesis typewritten in triplicate copy to facilitate reading by the committee. No special size or form is required, since it is to be printed subsequently.

*The candidate's committee.*—In case of the Doctor's degree the candidate's committee will include the same members as in the case of the Master's degree, and will be enlarged so as to include, besides these, the department committees in which the candidate's major and minor subjects lie, and such other members of the Faculty as the Dean may appoint. It is the duty of the chairman to call the meetings of this committee and duly inform the Dean in writing, of the time and place of such meetings as are held for final oral examinations.

*Doctor's final examinations.*—The final examinations on the major will be both written and oral.

The written examinations will occur at least four weeks before commencement, and will be conducted by the department committee of the candidate's major. It will cover in an exhaustive manner the whole field of the major.

If the thesis, as well as the written examination on the major, are adjudged to be satisfactory, and all other requirements have also been met, the candidate's committee, enlarged as previously provided for, will be convened by its chairman at least two weeks before Commencement and proceed to the final oral examination. At the conclusion of the oral examination, after the candidate is withdrawn, the committee will canvass the work of the candidate as a whole, and in case it regards him as entitled to his degree, it will report the fact to the Dean at least twelve days before Commencement, and transmit to him for the use of the Executive Committee, two copies of the thesis and the final written examina-



ation papers of the major and minor subjects, together with his registration book.

*Printing theses, etc.*—The candidate will have a copy of his thesis deposited with the Registrar one week before Commencement together with a sufficient bond or such sum of money as according to the estimate of the Registrar, will be required to print one hundred copies of it for the use of the University, and as many additional copies as the candidate may order for himself.

*Presentation to the Faculty.*—Each candidate recommended by the Executive Committee of the Graduate School for a Doctor's degree will be presented at a meeting of the Faculty called for the purpose, by the professor in charge of his major subject, who will then read a written statement of the academic life of the candidate, of the character and scope of his examinations, and the scope and value of his thesis.

The candidate will be asked to give a brief outline of his research, and any member of the Faculty will then be at liberty to propound any questions he will respecting the candidate to his instructors or to the candidate himself respecting his work. Upon the evidence before it the Faculty will then decide by vote whether the candidate shall be recommended to the Regents for his degree.

#### 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. The rest of the residence needed to cover the academic year of thirty-six weeks may be completed after the thesis is begun by registering early and remaining in residence working under direction after the Summer Session has closed. 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 intend to offer work in the summer for an advanced degree should register for purposes of record with the Dean of the Graduate School.

Members of the Graduate Faculty may, with the approval of the Dean, offer summer work for graduate students apart from the work regularly listed in the Summer Session bulletin. Students taking such properly authorized summer work may be allowed by the Executive Committee to substitute it for an equal amount of residence during the academic year.

#### GRADUATE WORK IN MEDICINE

Besides the graduate work in the laboratory departments of the Medical College announced in this bulletin, graduate work 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. 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 of the residence work may be done. A number of teaching fellowships supported by the University and others on the Mayo Foundation are open to qualified students pursuing graduate work in clinical medicine. A special circular covering this work may be obtained from the Registrar.

## DEPARTMENTAL STATEMENTS

### AGRICULTURAL CHEMISTRY

Professor ROSCOE W. THATCHER; Assistant Professor RODNEY M. WEST.

#### COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101. **QUANTITATIVE ANALYSIS.** The principles involved in gravimetric and volumetric analyses. The course includes the gravimetric determination of iron, sulfur, phosphorus, magnesium, and chlorine; acidimetry, alkalimetry; the volumetric determination of iron and calcium; and iodimetry. WEST.
102. **AGRICULTURAL QUANTITATIVE ANALYSIS.** Methods of proximate analysis of agricultural products, including the determination of moisture, ash, fats, starch, sugars, fiber, proteins, and the different nitrogenous constituents of foods and feeding stuffs. WEST.
104. **CHEMISTRY OF WHEAT AND ITS MILLED PRODUCTS.** The analysis of wheat, flour, and mill-feeds; milling and baking tests; factors affecting the composition of wheat; relation of the composition of wheat and flour to bread-making qualities. THATCHER.
105. **DETECTION OF ADULTERATION OF FOODS AND FEEDING STUFFS.** The use of proximate analyses and special tests for the determination of quality and the detection of adulteration of foods and feeds. Includes chemical and microscopical examinations. THATCHER.
106. **AGRICULTURAL PRODUCTS AND BY-PRODUCTS.** The composition of the principal products and by-products of agriculture and their utilization as raw material in various industries, and the methods of chemical control work in these industries. WEST.
108. **CHEMISTRY OF WHEAT AND WHEAT PRODUCTS.** A lecture course, with collateral library reference work, on the chemical technology of the production and milling of wheat and the conversion of its products into human food. THATCHER.
110. **FLOUR LABORATORY METHODS.** A laboratory course in the methods of analyses of wheat and its products; milling tests of wheat; and baking and special tests of flour. THATCHER.
111. **BIOCHEMISTRY.** An advanced course in the chemistry of fats, carbohydrates, tannins, proteins, enzymes, and colloids, and their relation to the vital processes involved in plant and animal growth and nutrition. THATCHER.

113. **BIOCHEMICAL LABORATORY METHODS.** Special methods of examination of plant and animal tissues for particular fats, carbohydrates, proteins, and enzymes. THATCHER.
114. **ENZYMES.** An advanced study of the nature of enzyme action including methods of preparation and investigation of enzymes, their physical and chemical properties and their method of action. (Offered in alternate years, not offered in 1915-16.) THATCHER.

PRIMARYLY FOR GRADUATE STUDENTS

- 201-202. **SEMINAR.** Regular meetings for the discussion of methods of research, formulation of research problems, and reviews of current literature. THATCHER.
- 203-204. **RESEARCH PROBLEMS.** Special work on particular research problems other than the student's major thesis. Facilities are provided for biochemical investigations and for advanced studies in plant, animal, or human nutrition. THATCHER.

### AGRICULTURAL EDUCATION

Professor A. V. STORM; Associate Professor W. H. BENDER.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 131a. **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. Classroom and laboratory method. Specific plans for teaching secondary agriculture. BENDER.
- 131b. Same as 131a.
- 151a. **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. STORM.
- 151b. Same as 151a.

PRIMARYLY FOR GRADUATES

- 221a. **GRADUATE PROBLEMS.** Making investigations, gathering data and formulating plans regarding agricultural education. STORM, BENDER.

### AGRICULTURAL ENGINEERING

Professor JOHN T. STEWART.

PRIMARYLY FOR GRADUATE STUDENTS

202. **SPECIAL PROBLEMS.** Open to graduates of Engineering and Agricultural Colleges. Investigation, collection of data, and compilation of

facts, relating to various problems of engineering applied to agriculture. Offered to students having necessary preparation for line of work. STEWART.

### AGRONOMY AND FARM MANAGEMENT

Professor ANDREW BOSS; Associate Professor H. K. HAYES; Assistant Professor MAXWELL J. DORSEY.

#### COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

102. FARM MANAGEMENT II. A course in which the business side of farming is emphasized. Special attention is given to farm organization, equipment and operation. BOSS.
103. PRINCIPLES OF GENETICS. A course of lectures designed to familiarize the student with the underlying principles of breeding. Heredity, variation, and evolution are emphasized. HAYES.
105. FARM MANAGEMENT PROBLEMS. An advanced course, including a study of farm practices, farm equipment, cost of production, and efficiency of labor. BOSS.
106. PLANT BREEDING. A course which emphasizes the practical side of plant breeding. The method of breeding each of the important crops is studied separately, with attention to experiment station investigations and to methods used by plant breeders. HAYES.

#### COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202. ADVANCED PLANT BREEDING. Research problems in plant breeding with opportunities for original investigation. HAYES, DORSEY.
- 205-206. ADVANCED FARM MANAGEMENT. Research problems in organization and operation of large farm enterprises. BOSS.
- 207-208. FARM MANAGEMENT SURVEYS. Research work in farm management surveys of a certain territory, or of special types of farming. BOSS.

### ANATOMY

Professors CLARENCE M. JACKSON, JOHN B. JOHNSTON, THOMAS G. LEE, RICHARD E. SCAMMON.

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

#### COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101. HUMAN NEUROLOGY. A study of the gross and microscopic structure of the central nervous system and sense organs of man. (3) JOHNSTON.
- 107a (or 107b). COMPARATIVE NEUROLOGY OF VERTEBRATES. JOHNSTON.

111. **ANATOMICAL TECHNIQUE.** Lectures and laboratory work upon the principles and practice of microtechnique (3). LEE.
114. **TOPOGRAPHIC ANATOMY.** Based upon a study of cross sections of the human body (3). JACKSON.
116. **FOETAL ANATOMY.** Dissection of the foetus and new-born (3). SCAMMON.
117. **IMPLANTATION OF THE OVUM IN MAN AND MAMMALS.** A comparative study with laboratory work. LEE.
- 119-120. **ADVANCED ANATOMY.** Individual topics for advanced work in gross anatomy, histology, embryology, or neurology will be assigned to students who have completed the elementary courses in the corresponding subjects. JACKSON, LEE, JOHNSTON, SCAMMON.

PRIMARILY FOR GRADUATE STUDENTS

- 201-202. **RESEARCH IN ANATOMY.** Qualified students may undertake the investigation of problems in anatomy, including histology, embryology, and neurology. JACKSON, LEE, JOHNSTON, SCAMMON.
- 203-204. **ANATOMICAL SEMINAR.** Reviews of the current literature and discussion of research work being carried on in the department. JACKSON.

ANIMAL BIOLOGY

Professors HENRY F. NACHTRIEB, JOHN B. JOHNSTON, CHARLES P. SIGERFOOS; Associate Professor HAL DOWNEY; Assistant Professor OSCAR W. OESTLUND.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101-102. **ADVANCED ENTOMOLOGY.** Advanced work in the ecology and taxonomy of insects. Lectures, laboratory and field work. OESTLUND.
- 115-116. **MORPHOLOGY OF VERTEBRATES.** An advanced course in comparative or special anatomy of vertebrates, including anatomical technique. Students qualified will be directed into lines of research. Conference, reference and laboratory work. JOHNSTON.
- 119-120. **VERTEBRATE HISTOLOGY.** Primarily advanced work on vertebrate tissues. Conference, reference, and laboratory work. DOWNEY.
- 123-124. **BLOOD OF VERTEBRATES.** A comparative study of blood and blood-forming organs of vertebrates. Major portion of time to be devoted to research. DOWNEY.
- 131-132. **EMBRYOLOGY.** A brief survey of general embryology and the organogeny of the vertebrates with special reference to the circulatory system. Conference, reference, and laboratory work with Kellicott's *General Embryology*, and *Outlines of Chordate Development* as texts. NACHTRIEB.

- 143-144. **GENETICS AND EUGENICS.** Facts and theories of heredity and the application of the laws governing natural inheritances for the improvement of a race. Lectures, reference, conference, and laboratory work. Not offered in 1915-16.
- 161-162. **PROBLEMS.** Advanced work in some special line. DOWNEY, JOHNSTON, JOHNSTON, LUND, NACHTRIEB, OESTLUND, SIGERFOOS.

## FOR GRADUATE STUDENTS

Hours and days for advanced graduate work are arranged with the instructor in charge of the line of work to be pursued.

- 201-202. Research in entomology. OESTLUND.
- 215-216. Research on the morphology of vertebrates. JOHNSON.
- 217-218. Research on the gross and microscopic anatomy of the Ganoids. NACHTRIEB.
- 219-220. Research in animal histology. DOWNEY.
- 221-222. Research on vertebrate connective tissue with special reference to the cellular elements. DOWNEY.
- 223-224. Research in vertebrate hematology. DOWNEY.
- 231-232. Research in invertebrate embryology. SIGERFOOS.
- 237-238. Research in vertebrate embryology. NACHTRIEB.
- 241-242. Research in neurology. JOHNSTON.
- 251-252. Research in the physiology of the lower organisms with special reference to the Protozoa. LUND.

## ANTHROPOLOGY

See Sociology and Anthropology

## 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.

## COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101-102. **PRACTICAL ASTRONOMY.** Theory and use of astronomical instruments in determining time, latitude, longitude, positions of heavenly bodies; astronomical photography, with measures of plates; study of the method of least squares. Three or six hours a week. LEAVENWORTH.
140. **METHOD OF LEAST SQUARES.** The combination and adjustment of ob-

servations and the discussion of their precision as applied especially to engineering physics, and astronomy. Two hours a week. LEAVENWORTH.

PRIMARILY FOR GRADUATE STUDENTS

201-202. **ADVANCED PRACTICAL ASTRONOMY.** Three hours a week. LEAVENWORTH.

205-206. **ASTROPHOTOGRAPHY.** Photography of the heavenly bodies, measurement of plates, determination of positions, parallax, etc. Three hours per week. LEAVENWORTH.

209-210. **CALCULATION OF ORBITS.** Three hours a week. BEAL.

211-212. **CELESTIAL MECHANICS.** Three hours a week. BEAL.

BACTERIOLOGY

See Pathology and Bacteriology

BOTANY

Professors **FREDERIC E. CLEMENTS, CARL OTTO ROSENDAHL, JOSEPHINE E. TILDEN**; Assistant Professor **FREDERIC K. BUTTERS.**

The graduate courses in Botany are designed to prepare students directly for scientific positions in the United States Department of Agriculture and in the agricultural colleges and experiment stations of the various states. Such positions are those of ecologist, physiologist, systematic botanist, mycologist, agrostologist, algologist, etc., in the Bureau of Plant Industry, and of ecologist in the Forest Service. In coöperation with the Department of Plant Pathology and Botany in the College of Agriculture, training is given for the positions of plant pathologist and of seed expert in the Bureau of Plant Industry and in the state experiment stations. Positions in some of these lines are open to women as well as men. In addition to the general courses which are prerequisites, Courses 101-102, 105-106, 111-112, and 119-120 are most important in this preparation, followed by still more advanced courses determined by the training sought.

FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

101-102. **APPLIED ECOLOGY.** A study of the physiological processes and the ecological principles and methods involved in the production of field, garden and forest crops. Either semester open to students who have had introductory botany, physiology and ecology. CLEMENTS.

103. **PLANT FOODSTUFFS AND TEXTILES.** A special study of the botany of foods, textile fibers and fabrics, together with an inquiry into the relation of plants to household processes and problems. For young women. TILDEN.

105-106. **ALGAE.** A detailed comparative study of the structure and classification of the algae, including an examination of blue-green and green freshwater forms and the more important brown and red marine species. TILDEN.



- 107-108. **COMPARATIVE MORPHOLOGY OF MOSSES AND FERNS.** Designed for students who wish to pay special attention to the morphology and taxonomy of liverworts, mosses, and ferns. Lecture, laboratory and field work. BUTTERS.
110. **MORPHOLOGY AND TAXONOMY OF GYMNOSPERMS.** A comparative study of cycads, conifers, and their allies, their structure and history with especial attention to the classification of living forms. Lectures, reference reading, and laboratory work. Not offered in 1915-16. BUTTERS.
- 111-112. **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. Laboratory, field work, lectures and quizzes. ROSENDAHL.
- 113-114. **ADVANCED ECOLOGY.** Critical study of plant habitats by means of instruments and the adaptations produced by water and light, with a careful examination of causes and reactions of plant formations. Class discussions and quizzes, field and greenhouse work. CLEMENTS.
- 115-116. **ADVANCED PLANT PHYSIOLOGY.** Study of the relations of factor, function, and structure in the various organs of the plant, with special reference to absorption, transpiration, photosynthesis, respiration, irritability, and reproduction. Class discussions and quizzes, greenhouse and field work. CLEMENTS.
- 117-118. **CYTOLOGY.** A survey of cell structure and the various phenomena of division, fusion, and metamorphosis, together with a review of the history of cytological investigation. Methods of cytological research indicated in the laboratory. ROSENDAHL.
- 119-120. **ADVANCED INDUSTRIAL BOTANY.** A study of the origin, distribution and cultivation of plants yielding products of economic value, the nature and uses of these products and the processes by which they are obtained from the plants. TILDEN.

## PRIMARILY FOR GRADUATE STUDENTS

- 201-202. **RESEARCH PROBLEMS IN MORPHOLOGY.** Research work may be pursued upon the morphology of vascular plants. Important literature and necessary material will be provided for whatever research is entered upon. ROSENDAHL, BUTTERS.
- 203-204. **RESEARCH PROBLEMS IN TAXONOMY.** The herbarium of 300,000 specimens of vascular plants offers facilities for monographic work, especially on the plants of temperate North America, and problems in plant geography in the same region. ROSENDAHL.
- 205-206. **RESEARCH PROBLEMS IN ALGOLOGY.** Work on special groups or along following lines: fresh-water algae of Minnesota; algae of Min-

neapolis and St. Paul water supplies; hot spring algae; lime-depositing algae; marine algae, from Vancouver, Hawaiian Islands, Tahiti, New Zealand, Australia. TILDEN.

- 207-208. RESEARCH PROBLEMS IN PHYSIOLOGY AND ECOLOGY. Research work in ecology and physiology along following lines; the physical factors of the habitat by instruments; plant functions and adaptations; experimental production of new forms; development and structure of vegetation, especially migration, competition, etc. CLEMENTS.
- 209-210. RESEARCH PROBLEMS IN CYTOLOGY AND EMBRYOLOGY. Research work may be taken along following lines: minute structure of cell; microchemistry of cell; development of sporangia and spores; fecundation; development of embryo; origin and development of primary tissues; development of organs, correlation, etc. CLEMENTS, ROSENDAHL.
- 211-212. RESEARCH PROBLEMS IN INDUSTRIAL BOTANY. Economic plant material from Tahiti, New Zealand, and Australia is available for original investigation. Certain important food and fiber plants of the tropics are in especial need of study. TILDEN.

## CHEMISTRY

Professors GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Associate Professor EVERHART P. HARDING; Assistant Professors IRA H. DERBY, FRANCIS C. FRARY, WILLIAM H. HUNTER, EDWARD E. NICHOLSON; Instructor WOLF KRITCHEVSKY.

### COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

106. MINERAL AND ORE ANALYSIS. Theory and practice in accurate analysis of silicate rocks, and the rapid determination of certain constituents of ores. SIDENER.
- 107-108. ADVANCED QUANTITATIVE ANALYSIS. The work in this course will be adapted as far as possible to the needs and desires of the individual student. SIDENER.
109. WATER ANALYSIS. The course includes an exhaustive discussion of the chemical and sanitary properties of water. FRANKFORTER.
113. GENERAL TOXICOLOGY. A discussion of the chemistry of the various poisonous compounds, both organic and inorganic; also methods of their isolation from animal tissue, together with tests for same. FRANKFORTER.
114. ORGANIC ANALYSIS. Practice in elementary analysis, determination of special groups, and identification of pure compounds. HUNTER.
115. ADVANCED ORGANIC CHEMISTRY. The course treats in a detailed manner of the general reactions of organic chemistry, such as substitutions, condensations, etc. HUNTER.

116. **THEORETICAL ORGANIC CHEMISTRY.** This course will take up theories which apply especially to carbon compounds, such as relation of properties to constitution, carbon valence theory, etc. HUNTER.
117. **THE COAL-TAR DYES.** The chemistry of the coal-tar dyes and their intermediate products. KRITCHEVSKY.
118. **THE CHEMISTRY OF THE ESSENTIAL OILS.** A discussion of the constituents of the essential oils, including the terpenes and perfumes. FRANKFORTER.
119. **CHEMISTRY OF THE NEWER MEDICINAL COMPOUNDS.** The course includes a discussion of the chemistry of synthetic organic substances which have medicinal properties. (Continued in Pharmacology second semester.) FRANKFORTER, HUNTER.
- 121-122. **PHYSICAL CHEMISTRY.** Consideration of theories and laws, phenomena and processes forming basis of chemical science. Charts, models, and experiments employed to supplement and illustrate discussions. Open only to those who have had or are taking Course 111-112. DERBY.
- 123-124. **PHYSICO-CHEMICAL LABORATORY PRACTICE.** Physico-chemical methods and measurement. Open only to students pursuing Course 121-122, or who have had it or its equivalent. DERBY.
- 125-126. **ADVANCED PHYSICAL CHEMISTRY.** Theories of chemistry treated systematically from the standpoint of thermo-dynamics and the molecular theory. Suited to the needs of candidates for the higher degrees and all others interested in the advances of modern physical chemistry. STRACHAN.
128. **RADIOCHEMISTRY.** The occurrence, methods of isolation and investigation, and physico-chemical properties of the radioactive substances, together with a brief consideration of the chemical, geological, and biological bearing of the subject. DERBY.
- 129-130. **ADVANCED PHYSICO-CHEMICAL LABORATORY.** Advanced measurements in physical chemistry adapted to the desires and qualifications of the individual student. Assigned reading will accompany the experimental work. DERBY.
131. **FOOD ANALYSIS.** The course includes the chemical analysis of the various food products and the detection of the common adulterants. HARDING.
132. **FOOD ANALYSIS.** Continuation of Course 131. HARDING.
134. **MICROCHEMISTRY.** This course includes the precipitation, examination, and identification of minute quantities of substances, and the examination of food materials, fibers, etc., by means of the microscope. HARDING.

135. GAS AND COAL ANALYSIS. Course comprises methods of collecting and storing gases previous to their analysis; methods of manufacturing commercial gases; their chemical analysis, calorific and photometric determination; also ultimate and proximate analysis of coals and their calorific determination. HARDING.
137. PAINT ANALYSIS. This course comprises the quantitative separation of pigments and vehicles; a chemical and physical examination of the vehicles; and qualitative and quantitative analyses of the pigments. HARDING.
141. INDUSTRIAL CHEMISTRY. This course includes the discussion of methods and apparatus used in chemical technology, the testing of commercial chemical products, and excursions. FRARY.
142. INDUSTRIAL CHEMISTRY. Continuation of Course 141. FRARY.
143. SUGAR CHEMISTRY. The course includes the technology of sugar manufacture. NICHOLSON.
144. ELECTROCHEMISTRY. A discussion of electro-analytical methods and industrial electrochemical processes, with their underlying principles. FRARY.
145. ELECTRIC FURNACES. Theory and practice in the design, construction, and operation of electric furnaces. FRARY.
147. ELECTROCHEMICAL PREPARATIONS. Theory and practice in the electrochemical preparation of organic and inorganic substances. FRARY.
155. WOOD CHEMISTRY. The course includes a general survey of the chemistry of the carbohydrate group, special attention being given to the resins, the terpenes, cellulose and lignocellulose. FRANKFORTER.
156. WOOD PULP TECHNOLOGY. Preparation of various wood products as pure cellulose. Commercial methods for preparation of wood pulp and manufacture of paper constitute a large part of work. Factory control of these processes is also given special attention. FRARY.
161. CHEMICAL LITERATURE. The course aims to familiarize the students with chemical literature and will include required reading, reports, and bibliographical work. KRITCHEVSKY.
- 169-170. CHEMISTRY OF THE RARE ELEMENTS. The descriptive chemistry of the rare elements and their analytical separation. NICHOLSON.
- 171-172. SOLUTIONS. A systematic study of the phenomena and theories of solution, including the solution process, diffusion, osmosis, electrical properties, etc., with their various applications to other sciences. DERBY.

## COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202. Research Work in Quantitative Analysis. SIDENER.
- 203-204. Research Work in Inorganic Chemistry. FRANKFORTER.
- 205-206. Research Work in Organic Chemistry. FRANKFORTER.

- 207-208. Research Work in Organic Chemistry. HUNTER.  
 209-210. Research Work in Organic Chemistry. KRITCHEVSKY.  
 211-212. Research Work on the Rare Elements. NICHOLSON.  
 213-214. Research Work in Physical Chemistry. DERBY.  
 215-216. Research Work in Physical Chemistry. STRACHAN.  
 217-218. Research Work on Foods. HARDING.  
 219-220. Research Work on Fuels. HARDING.  
 221-222. Research Work in Industrial Chemistry. FRARY.  
 223-224. Research Work in Electrochemistry. FRARY.  
 225-226. Research Work in Photochemistry. FRARY.

## COMPARATIVE PHILOLOGY

Professor FREDERICK KLAEBER.

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.

NOTE ON THE GROUPING OF GRADUATE COURSES IN THE DEPARTMENTS OF COMPARATIVE PHILOLOGY, ENGLISH, GERMAN, AND SCANDINAVIAN

Candidates for the Master's degree in these departments are advised to choose at least three courses from one of the following groups:

GROUP I. GERMANIC PHILOLOGY—

Comparative Philology 101 (Science of Language), 102 (Life of Words), 106 (Advanced Science of Language), 108 (Comparative Phonology), 203-204 (Gothic), 207-208 (Old Saxon), 209-210 (Old High German).

English 201 (Anglo-Saxon), 204 (Beowulf).

German 107-108 (Middle High German), 109-110 (History of the German Language).

Scandinavian 201-202 (History of the Scandinavian Languages), 203-204 (Old Norse).

GROUP II. EARLIER GERMANIC LITERATURE—

Comparative Philology 207-208 (Old Saxon).

English 101 (Middle English), 103 (Piers the Plowman), 58 (Elizabethan Literature), 211-212 (Drama in England before Shakespeare), 204 (Beowulf).

German 111-112 (The Reformation), 107-108 (Middle High German), 125-126 (Seminar in German Drama).

Scandinavian 103 (Early Norwegian Literature), 107-108 (Swedish Literature), 203-204 (Advanced Old Norse).

#### GROUP III. LATER GERMANIC LITERATURE—

English 106 (Eighteenth-Century Literature), 108 (Romantic Movement), 109-110 (English Humorists), 111-112 (Seventeenth-Century Prose), 113-114 (Drama: Structure and Evolution), 123-124 (Meredith), 215-216 (Drama as a Form and Phase of Modern Thought), 225-226 (Political Prose of the Protectorate).

German 115-116 (Faust), 113-114 (Age of Frederick the Great), 119-120 (Drama of Schiller), 103-104 (History of German Literature), 127-128 (Lyric Poetry of the Seventeenth and Eighteenth Centuries), 101-102 (German Literature of the Nineteenth Century).

Scandinavian 101-102 (Modern Norwegian Literature), 107-108 (Swedish Literature), 104 (Henrik Ibsen), 112 (Modern Danish Literature), 209-210. (Swedish Language and Literature), 109 (Strindberg).

101. GENERAL INTRODUCTION TO THE SCIENCE OF LANGUAGE. Prerequisite, one of 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) six credits Old English; (4) Courses 3 and 5 in English. KLAEBER.

102. THE LIFE OF WORDS. Etymology and semasiology. Growth of vocabulary; change of words in form and meaning. Special reference to English and Germanic languages. Prerequisites same for Course 101. Alternates with Course 110. Not given in 1915-16. KLAEBER.

104. INTRODUCTION TO GERMANIC PHILOLOGY. Prerequisites the same as those for Course 101. A fair knowledge of German necessary. KLAEBER.

105. 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. Alternates with Course 109. Not given in 1915-16. KLAEBER.

106. SCIENCE OF LANGUAGE (Advanced Course). Investigation of linguistic problems. Study of standard works. Reports on recent publications. Prerequisites the same as those for Course 101. Alternates with Course 108. KLAEBER.

108. COMPARATIVE PHONOLOGY OF ENGLISH AND GERMAN. Elements of phonetics; history of English and German sounds; orthography.

Prerequisites same as for Course 101. Students must have completed German 3-4 (or 5-6) and 7-8. Alternates with Course 106. Not given in 1915-16. KLAEBER.

- 109-110. HISTORY OF THE GERMAN LANGUAGE. Lectures, discussions, assigned readings. Prerequisites. German 53-54. This course is identical with German 109-110. KLAEBER.

PRIMARYLY 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. 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. KLAEBER.
205. URGERMANISCHE GRAMMATIK. Lectures and study of standard works (Brugmann, Kluge, Noreen, Streitberg, *et al.*). KLAEBER.
- 207-208. OLD SAXON. Old Saxon grammar; interpretation of the *Heliand* and *Genesis*. KLAEBER.
- 209-210. OLD HIGH GERMAN. Braune's *Althochdeutsche Grammatik*; Braune's *Althochdeutsches Lesebuch*. This course is identical with German 105-106. KLAEBER.
- 211-212. RESEARCH SEMINAR. Competent graduate students will be advised and assisted in research along special lines. KLAEBER.

DAIRY AND ANIMAL HUSBANDRY

Professors THEOPHILUS L. HAECKER; Assistant Professor THOMAS G. PATERSON.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

106. ADVANCED MEATS AND JUDGING. Work along this line is a continuation of that begun in Course 9. More attention is given the more important details concerning meat, and a minute study of its physical and chemical composition is required. PATERSON.

PRIMARYLY FOR GRADUATE STUDENTS

- 201-202. RESEARCH PROBLEMS IN ANIMAL NUTRITION. A study of the laws of animal nutrition with special reference to the relation of feed nutrients to animal growth and animal products. HAECKER.

ECONOMICS

Professors JOHN H. GRAY, E. DANA DURAND; Assistant Professors ROY G. BLAKEY, J. FRANKLIN EBERSOLE, THOMAS WARNER MITCHELL; Instructors LLOYD M. CROSGRAVE, H. G. HAYES.

## COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101. **THEORY AND PRACTICE OF STATISTICS.** Principles of collection, tabulation, and interpretation of statistical material, illustrated by present-day statistical data. Lectures, assigned readings, and special investigations by individual members of the class. DURAND.
104. **PRO-SEMINAR IN THE HISTORY, SCOPE AND METHODS OF ECONOMICS.** History of economic thought; scope and logical methods, relation to other social sciences; methods of investigation and instruction. Assigned readings, reports, and class discussions.
- 105-106. **ECONOMIC CONFERENCE.** Monthly meetings of the instructional staff, and advanced students in Economics. Lectures on bibliography by Mr. Gerould; papers prepared for advanced courses presented for criticism; reports on current economic events and literature. No graduate credit.
131. **COST ACCOUNTING.** Analysis of production cost; methods of recording materials, labor and machine costs; apportioning indirect expenses; relation of cost to general accounts; use of cost data to enforce operating efficiency. Laboratory lectures. MITCHELL.
132. **ACCOUNTING PROBLEMS.** A selection from C. P. A. examinations and other sources of difficult problems that confront the public accountant. MITCHELL.
133. **ACCOUNTING SYSTEMS.** The special accounting problems of building societies, banks, department stores, insurance companies, railroad companies and other types with a description of their accounting systems. MITCHELL.
134. **AUDITING.** Preparation for, and conduct of, an audit; the auditor's report and certification, and legal responsibilities. Textbook, assigned readings, class discussions, and lectures. MITCHELL.
138. **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. EBERSOLE.
141. **INVESTMENT AND SPECULATION.** The social process of saving and investment; government, municipal, corporation, and real estate loans; stock exchange operations and money market influences as they affect the prices and net yield of prime securities. EBERSOLE.
143. **MONEY AND PRICES.** The functions of money; the nature and effects of credit; changes in general prices, their causes and effects, international movements of gold; monetary standards and currency systems; the problem of securing an ideal money. EBERSOLE.
144. **PANICS, COMMERCIAL CRISES, AND CYCLES OF TRADE.** American busi-



- ness conditions since 1890 with regard to the great cycles of alternate prosperity and depression, the financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. EBERSOLE.
145. THE MODERN BUSINESS CORPORATION. The organizing, financing, and managing of corporations; the position of the corporation before the law; methods of accounting; the relation of the government to the corporation; the question of trusts in its various phases. GRAY.
146. PUBLIC UTILITIES. Economic and legal bases of classification, the relative advantages of public ownership and regulation. Central and municipal regulation compared. The basis of rates; relative rates; rates and service. Different theories of valuation. GRAY.
161. LABOR PROBLEMS. Modern labor problems: woman and child labor, industrial education, unemployment, poverty, industrial hygiene, welfare work, profit sharing, coöperation, labor unions, strikes, boycotts, conciliation, and arbitration; economic causes and effects of immigration. CROSGRAVE.
162. ECONOMIC CONDITIONS IN AMERICAN CITIES. The causes of economic dependence in American cities; the standard of living; the constructive agencies for economic betterment. Lectures, assigned readings, and visits of inspection in the Twin Cities. CROSGRAVE.
163. HISTORY AND THEORY OF SOCIALISM. Economic utopias from Plato to Proudhon. Special attention to the theory, history and practical significance of modern socialism. Lectures, assigned readings, and discussions. CROSGRAVE.
164. THE ECONOMIC FUNCTIONS OF THE STATE. The proper limits of state interference with private property, freedom of contract and individual liberty. Police powers of the state. Legislation concerning factories, female and child labor, minimum wage, social insurance, etc. CROSGRAVE.
166. TRADE UNIONISM AND ALLIED PROBLEMS. Development and present activities of American trade unions. Economic and legal aspects of collective bargaining, closed shops, strikes, boycotts, employers' associations. Conciliation and arbitration. Social significance and probable future of trade unionism. CROSGRAVE.
168. WAGES. The history of real and money wages during the last four centuries. Theories of wages from Adam Smith to the present. Wage statistics. Wage regulation with intensive study of minimum wage laws. CROSGRAVE.

## COURSES PRIMARILY FOR GRADUATE STUDENTS

- 251-252. SEMINAR IN ECONOMIC DEVELOPMENT AND TAXATION. Research problems in the marketing and distribution of farm products, agri-

cultural credit, farm ownership and tenancy, and agricultural organizations. DURAND.

- 253-254. SEMINAR IN ACCOUNTING. Student reports and theses dealing with accounting systems, published reports, and interpretations of the accounts of business establishments located in or near the Twin Cities. MITCHELL.
- 255-256. SEMINAR IN MONEY AND BANKING. The various unsettled monetary and banking problems of the United States will furnish topics for individual investigation. EBERSOLE.
- 257-258. SEMINAR IN ECONOMIC DEVELOPMENT AND TAXATION. Original investigation of various industries in the Middle West. The development of tax systems. Present problems in taxation.
- 259-260. SEMINAR IN CORPORATION AND TRUST PROBLEMS. Practical and independent investigation by each student, under the guidance of the instructor, or some specific problem pertaining to corporations, trusts, and other monopolies. GRAY.

### EDUCATION

Professors LOTUS D. COFFMAN, M. E. HAGGERTY, ALBERT W. RANKIN, FLETCHER H. SWIFT; Assistant Professor RAYMOND A. KENT.

Preliminary requirements: Students who desire to undertake graduate work in Education must have had at least a year's work in psychology and in addition to this a total of not less than two years of undergraduate work in Education.

#### DEPARTMENTAL CONFERENCES

Every alternate Monday all graduate students majoring in Education are expected to meet with the departmental staff from 7:15 to 9 p.m. for conference regarding subjects of original investigation. This work carries no credit.

#### COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

Note: Candidates for the University State Teachers' Certificate may offer Courses 101-102 in place of Education 3.

101. HISTORY OF EDUCATION TO THE REFORMATION. An interpretative historical study of educational institutions and ideals. The foundations of modern education—Hebrew, Greek, Roman, and medieval. Special emphasis upon the development of secondary and higher education. SWIFT.
- 101t. Same as Course 101, but for teachers only. A year course. SWIFT.
102. HISTORY OF EDUCATION SINCE THE REFORMATION. Modern educational movements, current theories, and standards in the light of their his-

- tory. For fuller description of general character of course, see Course 101. SWIFT.
- 102t. Same as Course 102, but for teachers only. A year course. Not offered in 1915-1916. SWIFT.
104. PRINCIPLES OF METHOD. An advanced course in principles of method with special application to high school subjects.
105. EDUCATIONAL PSYCHOLOGY. An advanced course in psychology of the learning process. HAGGERTY.
- 111a. SOCIAL ASPECTS OF EDUCATION. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. Required of all candidates for the University State Teachers' Certificate. KENT.
- 111b. Same as Course 111a. RANKIN.
114. CURRENT PROBLEMS IN ELEMENTARY TEACHING. An advanced course in current problems. Definite problems will be assigned to each student to be worked out under the direction of the instructor by readings, visitation of schools and conferences and class discussion. RANKIN.
119. SCHOOL CURRICULA. The curriculum as related to social, industrial, and economic conditions; a survey of the grammar grades and of the high school. Consideration of the possibilities of developing a curriculum better adapted to community needs. RANKIN.
121. SCHOOL ORGANIZATION AND ADMINISTRATION. An introductory course in school administration. For students of teaching experience and for those looking forward to work as principals and superintendents. RANKIN.
123. THEORY OF SUPERVISION. The problems involved in the training of teachers in service; studies of qualities of merit in teachers; factors in selecting teachers; the distribution of subject matter by grades; the time allotment of studies. COFFMAN.
124. EDUCATIONAL ADMINISTRATION. The interpretation of present tendencies in the administration of state and city school systems. COFFMAN.
125. METHODS IN 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. COFFMAN.
126. UNITS AND SCALES FOR MEASURING EDUCATIONAL RESULTS. An intensive study of the application of units and scales for measuring achievement in reading, composition, spelling, handwriting, and arithmetic. COFFMAN.

- 141a. SCHOOL SANITATION AND PUBLIC HEALTH. A course in school hygiene in its broader aspects. Designed for all teachers and supervisors who are responsible for the health of school children. Treats of medical supervision and other problems arising from school environment. RANKIN.
131. FOREIGN SCHOOL SYSTEMS. Study of existing school systems of other countries with a view to suggestions for development of public education in the United States. Emphasis in this course will be placed upon present conditions. 1915-16, French Schools. SWIFT.
- 131t. Same as 131, but for teachers only. See special announcement of courses for Twin City Teachers. SWIFT.
146. HISTORY AND PRINCIPLES OF RELIGIOUS EDUCATION. Part I: Influence of religion and religious education as social and spiritual forces among certain types. Part II: Principles of education applied to religious instruction. May be pursued as a graduate course under certain conditions. SWIFT.

PRIMARYLY FOR GRADUATE STUDENTS

- 201-202. SEMINAR, SELECTED PROBLEMS IN EDUCATIONAL HISTORY. Research course. SWIFT.
- 203-204. SEMINAR IN EDUCATIONAL PSYCHOLOGY. Problems in Educational Psychology. HAGGERTY.
- 205-206. SEMINAR IN EDUCATIONAL ADMINISTRATION. COFFMAN.

ELECTRICAL ENGINEERING

Professors GEORGE D. SHEPARDSON, FRANK W. SPRINGER; Assistant Professors EDWARD P. BURCH, WILLIAM T. RYAN; Instructor HUBERT M. TURNER.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101-102. 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. SPRINGER, TURNER.
103. ELECTRICAL LABORATORY. To be taken with Course 101-102. Electrical engineering measurements, calibration of instruments, operation and characteristic curves of generator and motor. Lectures and practice. SPRINGER, TURNER.
104. ELECTRICAL LABORATORY. A continuation of Course 103. SPRINGER, TURNER.
- 105-106. ALTERNATING CURRENTS. Phenomena, measurement, and use of alternating currents; theory of line, transformer, generator, and motor; types of apparatus. SHEPARDSON, SPRINGER, TURNER.

107. ELECTRICAL LABORATORY. To be taken with Course 105-106. Experimental study of alternating currents, regulation and efficiency tests of alternators, transformers, motors, and rotaries. SPRINGER, TURNER.
108. ELECTRICAL LABORATORY. A continuation of Course 107. SPRINGER, TURNER.
111. 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. SHEPARDSON.

PRIMARILY FOR GRADUATE STUDENTS

- 201-202. ELECTRICAL DESIGN. The design of direct and alternating generators and motors, and alternating current transformers; complete working drawings and specifications to accompany each design. RYAN.
205. CENTRAL STATIONS. Lectures, recitations, and assigned problems and readings, treating of the operation, design, and construction of electric power generating stations. RYAN.
206. ELECTRICAL TRANSMISSION. Considerations 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. RYAN.
211. TRANSIENT-TIME ELECTRIC PHENOMENA. A study of the transient phenomena accompanying a change of circuit conditions, with their differential equations. Abnormal currents, voltages, and frequencies produced by starting currents of transformers, short circuits of alternators, switching, and arcing grounds. SHEPARDSON, TURNER.
214. TRANSIENT-SPACE ELECTRIC PHENOMENA. A continuation of Course 211. Distributed capacity and inductance; a distribution of current in conductors, flux in iron; standing waves, traveling waves, free oscillation; phenomena at transition points of complex circuits; power and energy of complex circuits. SHEPARDSON, TURNER.
215. RADIO-SIGNALLING APPARATUS. Maxwell's electromagnetic theory; experimental work of Hertz; phenomena of electric oscillations in simple and coupled circuits; production of electro-magnetic waves and their propagation through space; detectors; measuring instruments. TURNER.
218. RADIO-TRANSMISSION. Syntony of transmitting and receiving stations; persistent and non-persistent oscillators; wave distortion, interference, absorption by obstacles; effect of curvature of the earth; attenuation of waves with distance; limiting factors in wireless transmission; types of antennae. TURNER.
219. TELEGRAPH AND TELEPHONE APPARATUS. Theoretical and experi-

- mental study of apparatus used for signalling, telegraphy, and telephony. Lectures and laboratory. SHEPARDSON.
220. TELEGRAPH AND TELEPHONE CIRCUITS. Theoretical and experimental study of telephone circuits and the phenomena of telephonic transmission; applications of hyperbolic functions to line phenomena. SHEPARDSON.
- 221-222. 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. SPRINGER.
226. 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. SHEPARDSON.
- 229-230. ELECTRICAL LABORATORY. Efficiency tests and special problems. SHEPARDSON, SPRINGER.
232. ELECTRICAL DESIGN. Special problems. RYAN.

## ENGLISH

Professors RICHARD BURTON, HARDIN CRAIG, FREDERICK KLAEBER, ELMER STOLL; Assistant Professors JOSEPH W. BEACH, OSCAR W. FIRKINS, GEORGE N. NORTHROP.

## COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101. INTRODUCTION TO MIDDLE ENGLISH. An outline of Middle English grammar, including the interpretation of selected texts. Alternates with Course 103. Two times a week, one hour. KLAEBER.
103. PIERS THE PLOWMAN. A critical study of *Piers the Plowman*. Alternates with Course 101. Not offered in 1915-16. Two times a week, one hour. KLAEBER.
105. EIGHTEENTH-CENTURY POETRY. Rise of Naturalism and Romanticism. Eighteenth-century English poetry from Pope to Burns, with special reference to the rise and growth of naturalism and romanticism. Not offered in 1915-16. Three times a week, one hour. CRAIG.
107. 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. Three times a week, one hour. CRAIG.
108. THE ROMANTIC MOVEMENT. The Romantic School of poets from Wordsworth to Keats and the influence of the revolution in France. Not offered in 1915-16. Three times a week, one hour. CRAIG.

- 109-110. ENGLISH HUMORISTS. Comic spirit in modern literature; humor, wit, comedy, and satire, with reference to their use in criticism of life. Illustrations from dramatists, novelists, essayists, and poets. Not offered in 1915-16. Three times a week, one hour. BEACH.
- 111-112. SEVENTEENTH-CENTURY PROSE. First semester; general survey of prose of century to 1660. Second semester: literature of the Restoration, particularly Dryden. Course 3-4 in History a desirable prerequisite. Not offered in 1915-16. Three times a week, one hour. NORTHROP.
- 113-114. THE DRAMA: STRUCTURE AND EVOLUTION. First semester: theory of the drama, and history up to the nineteenth century. Second semester: recent drama, continental, English. Open only to those who have completed the first semester. Three times a week, one hour. FIRKINS.
115. ENGLISH IDIOM. A discussion of current idiom with the purpose of relating it to underlying principles of historic development. Twice a week, one hour. BURTON.
118. THE BIBLE AS LITERATURE. A literary study of the Old Testament with special attention to forms and the critical study of selected readings. Three times a week, one hour. BURTON.
- 119-120. PRINCIPLES OF LITERARY CRITICISM. Elements in literature, e.g., clearness, vigor, beauty, etc.; exposition of literary types, e.g., the lyric, epic, short story, etc., in relation to standards of judging. Before registering, consult instructor. Three times a week, one hour. FIRKINS.
122. AMERICAN LITERATURE. Lectures on American literature, with extensive readings from the principal poets and prose writers of this country. Three times a week, one hour. CRAIG.
- 123-124. SEMINAR IN NOVELISTS. Henry James first semester, Thomas Hardy second. Credit may be given on completion of one semester. Open upon approval of instructor to graduate students and seniors having twelve credits in English. Once a week, two hours. BEACH.
- 125-126. BIOGRAPHY. Development of English biography, attention to notable journals, etc. Open to graduate students having undergraduate major in English or history. Upon approval of instructor, to seniors with twelve credits in English. Once a week, two hours. NORTHROP.
128. SEVENTEENTH-CENTURY DRAMA. The drama from the Restoration to the rise of sentimental comedy, special attention being given to the Comedy of Manners, from Etharage to Farquhar. Three times a week, one hour. STOLL.
131. ELIZABETHAN DRAMA. A study of Elizabethan and Jacobean dramatists (Shakespeare not included) from Lyly to Shirley. Three times a week, one hour. STOLL.

PRIMARILY FOR GRADUATE STUDENTS

201. ANGLO SAXON. Comparative study of Anglo-Saxon (Old English) grammar and reading of prose texts. Once a week, two hours. KLAEBER.
204. BEOWULF. Critical reading of the poem of *Beowulf*. Once a week, two hours. KLAEBER.
- 211-212. THE DRAMA IN ENGLAND, BEFORE SHAKESPEARE. The various forms of the early drama; sources and texts of medieval plays, medieval players, the stage, and the function of the early drama. Once a week, two hours. CRAIG.
- 215-216. THE DRAMA, AS A FORM AND PHASE OF MODERN THOUGHT. A study of the dramas of Ibsen. Once a week, two hours. BURTON.
- 221-222. THE DRAMA IN THE RENAISSANCE. An investigation of the more important dramatic species and character types in England and on the Continent, so far as represented in the Elizabethan age. Once a week, two hours. Not offered in 1915-16. STOLL.
- 225-226. POLITICAL PROSE OF THE PROTECTORATE. Intensive study of Clarendon and of the letters of this period. Not offered in 1915-16. Once a week, two hours. NORTHROP.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professor FREDERICK L. WASHBURN; Associate Professor ARTHUR G. RUGGLES; Assistant Professors CHARLES W. HOWARD, WILLIAM MOORE.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101-102. SYSTEMATIC ENTOMOLOGY. RUGGLES.
- 103a. ADVANCED HISTOLOGY AND MORPHOLOGY OF INSECTS. Lectures and laboratory work. RUGGLES.
104. METHODS IN ECONOMIC ENTOMOLOGY. Methods of breeding insects; identification of insects in various stages; photography of insects; general field work, etc. MOORE.
- 105-106. SPECIAL PROBLEMS. Investigation of special problems for those intending to specialize in entomology. Problems may be chosen in any section of the Division. Those taking the course are expected to be in attendance during the Summer Session. WASHBURN, RUGGLES, HOWARD, MOORE.

PRIMARILY FOR GRADUATE STUDENTS

- 201-202. RESEARCH WORK. Graduate students will be guided in investigation in the field of entomology. WASHBURN, RUGGLES, HOWARD, MOORE.



## EXPERIMENTAL ENGINEERING

Professor WILLIAM H. KAVANAUGH; Assistant Professors CHARLES FRANKLIN SHOOP, FRANKLIN R. McMILLAN.

## COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101. MATERIALS TESTING LABORATORY. Investigation of the strength and physical properties of iron, steel, brass, copper, wood, belting, ropes, chains, cement, and concrete. Supplemented by lectures on the various materials of construction and standard methods of testing. KAVANAUGH, SHOOP, McMILLAN.
102. STEAM LABORATORY. Valve setting, indicator practice, calibration of gauges, calorimetry, efficiency of screws, hoists, and other machines. SHOOP, McMILLAN.
103. EXPERIMENTAL LABORATORY. Calibration of dynamometers and measurement of power, study of lubricants; tests of injectors and ejectors, steam turbines, gas, gasoline, hot air and steam engines and boilers, complete power and lighting plants. Automobile and locomotive testing. KAVANAUGH.
104. HYDRAULIC LABORATORY. Hydraulic measurements. Calibration of weirs, nozzles, orifices, and meters. Tests of water motors, rams, pulsometers, steam and power pumps, etc. SHOOP, McMILLAN.
105. EXPERIMENTAL LABORATORY. Hydraulic measurements. Tests of water motors, steam and power pumps; measurement of power; tests of gas and steam engines, boilers, and complete power and lighting plants. KAVANAUGH.
107. EXPERIMENTAL LABORATORY. Tests of the properties of cement, concrete, and reinforced concrete. Strength of beams, columns, joints, and frame structures. McMILLAN.

## PRIMARILY FOR GRADUATE STUDENTS

- 201-202. EXPERIMENTAL LABORATORY. Special research work and commercial tests. KAVANAUGH, SHOOP, McMILLAN.

## FARM MANAGEMENT

See Agronomy and Farm Management.

## • FORESTRY

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

## COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202. RESEARCH PROBLEMS IN SYLVICULTURE. WENTLING.

203-204. RESEARCH PROBLEMS IN MANAGEMENT AND WORKING PLANS.  
ALLISON.

The choice of subject must be made by the candidate and approved by the Director and Instructor. The laboratories of the Botany Department and the facilities of the Forest Experiment Stations at Cloquet and Itasca are available to students taking this work.

GEOLOGY AND MINERALOGY

Professor WILLIAM H. EMMONS; Associate Professor CLINTON R. STAUFFER; Assistant Professors FRANK F. GROUT,\* CHESSLEY J. POSEY; Instructors A. WALFRED JOHNSTON, EDGAR K. SOPER.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

104. CRYSTAL MEASUREMENT. The measurement of crystal angles with the two-circle goniometer; gnomonic projection and crystal drawing; the mathematical and graphic determination of crystallographic constants; the determination of minerals by means of crystal measurements. EMMONS, et al.
- 105a. ELEMENTS OF ROCK STUDY. Occurrence and genesis of igneous, sedimentary, metamorphic rocks; their composition, structure, texture, and alteration. Classification, methods of identification and description of rocks. Open to students who have had Course 1 and are taking Course 22. EMMONS, et al.
- 105b. ELEMENTS OF ROCK STUDY. Same as Course 105a.
106. PETROLOGY. The identification and study of minerals and rocks by optical methods; the study of igneous rocks, crystalline schists, and metamorphic rocks. The origin and classification of rocks. Laboratory work, lectures, and reference reading. EMMONS, et al.
108. PALEONTOLOGIC PRACTICE. The collection, preparation, and study of materials with a view to gaining a working knowledge of groups of fossils. Open to students who have taken or are taking Course 57. STAUFFER.
109. PALEONTOLOGIC GEOLOGY. The Ordovician fauna with special emphasis on the Ordovician of Minnesota and neighboring states. STAUFFER.
110. PALEONTOLOGIC GEOLOGY. A continuation of Course 109. STAUFFER.
111. ORE DEPOSITS. The nature, distribution, and genesis of ore deposits of the United States; relations of ore deposits to geological structure; the deformation and superficial alteration of ore deposits. EMMONS, SOPER.
112. PROBLEMS IN ORE DEPOSITS. Field excursions, map work, lectures on field and laboratory methods. EMMONS, SOPER.

\*Absent on leave, 1915-16.

115. **ADVANCED PETROLOGY.** The origin and adulteration of rocks; their mineral and chemical composition; petrographic provinces, particularly those of the United States and Minnesota; advanced petrologic methods, microscopic, physical, and chemical. Not offered 1915-16. GROUT.
116. **GEOGRAPHY OF LATIN AMERICA.** The regional geography of the Latin-American countries; their geology, topography, climate, natural resources, people, industries, and trade. The trade relations between Latin-American countries and the United States given special attention. Alternates with Course 118. POSEY.
118. **GEOGRAPHY OF EURASIA.** Regional geography of Eurasia; its geology, topography, climate, natural resources, people, industries, and trade. Attention to attitude of the major European countries to the "new" lands of Asia. Alternates with Course 116. Not offered 1915-16. POSEY.
124. **STRUCTURAL AND METAMORPHIC GEOLOGY.** The conditions, processes, and results of metamorphism; structural features resulting from deformation under varying conditions of load. JOHNSTON.
136. **ADVANCED MINERALOGY.** Lectures on advanced mineralogic methods. The origin, occurrence, and association of minerals. Laboratory work continuing Course 22. Alternates with Course 138. Not offered in 1915-16. GROUT.
138. **TESTING ECONOMIC MINERALS.** Methods of determining quality of mineral deposits, described and illustrated by laboratory tests of coals, oil, building stone, and metallic ores. Alternates with Course 136. Not offered in 1915-16. GROUT.
144. **CONSTRUCTION AND INTERPRETATION OF GEOLOGIC MAPS.** Methods of geological examination; problems in construction and interpretation of geologic maps and sections, with special reference to underground mapping of metalliferous areas; field practice in plane table methods of topographic and geologic mapping. EMMONS, SOPER.
151. **ADVANCED GENERAL GEOLOGY.** Geologic processes and their results; development of the North American continent. STAUFFER.
152. **ADVANCED GENERAL GEOLOGY.** A continuation of Course 151. STAUFFER.
160. **FIELD GEOLOGY.** Six weeks in the field in the summer vacation period. Fields for 1914, the Mesabi and Vermilion ranges. Credit given only on completion of a satisfactory report. JOHNSTON.

## PRIMARILY FOR GRADUATE STUDENTS

211. **ADVANCED PALEONTOLOGY.** Selected groups of fossils. Class work supplemented by reference readings and thesis. STAUFFER.
214. **SEMINAR IN ORE DEPOSITS.** 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 direction of instructor. As far as practicable, methods follow standards of Federal and State Surveys. EMMONS, STAUFFER.
245. **OPAQUE MINERALS.** Microscopic study of polished surfaces of ores and rocks to determine their deformation, metamorphism, and secondary enrichment; study of the phase rule in its application to geologic problems.
246. **PRE-CAMBRIAN GEOLOGY.** The problems of pre-Cambrian correlation and structure; the pre-Cambrian stratigraphy of North America. Given in alternate years. Not offered in 1915-16. JOHNSTON.
247. **GEOLOGY AND EXPLORATION OF LAKE SUPERIOR REGION.** The geology of the Lake Superior iron districts. 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. JOHNSTON.
- 251-252. **ORIGINAL PROBLEMS.** Morphology and physical measurements of minerals. Hours to be arranged. Not offered in 1915-16. 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 under direction of instructor. As far as practicable, methods follow standards of Federal and State Surveys. EMMONS, GROUT.
- 263-264. **RESEARCH COURSE IN PETROLOGY.** Advanced work in petrology; Individual work on 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. EMMONS, GROUT.
- 289-290. **RESEARCH COURSE IN GEOGRAPHY.** Students will be required to do semi-independent work on selected subjects. POSEY.

#### GERMAN

Professor SCHLENKER; Assistant Professors BURKHARD, MYERS; Instructors GEISSENDOERFER, GRAVES, SCHROEDEL.

For courses in Germanic Philology see the statement of the Department of Comparative Philology.

- 107-108. BEGINNING MIDDLE HIGH GERMAN. Phonology, accent, the syntax of Middle High German with reference to New High German. *Der arme Heinrich, Nibelungenlied*, selected poems of Walther. Lectures on the epic and on German life in 12th and 13th centuries. SCHLENKER AND SCHROEDEL.
- 109-110. HISTORY OF THE GERMAN LANGUAGE. Its development, with special reference to modern German. Based on Behagel's *Deutsche Sprache*, Etymology, word formation, syntax, comparison of English and German, etc. KLAEBER.
- 111-112. SIXTEENTH CENTURY LITERATURE. A study of the literary movements of the period and of the principal authors. Lectures, assigned readings and reports. Not offered in 1915-16.
- 113-114. LESSING. His life and works. Assigned readings and reports. Not given in 1915-16.
- 117-118. GOETHE. His life and works. Assigned readings and reports. Not offered in 1915-16.
- 119-120. THE DRAMA OF SCHILLER. Plays considered with reference to development of the dramatic idea, from expression of the Storm and Stress movement in the early plays to the classic form of the last works. Not given in 1915-16.
- 127-128. LYRIC POETRY OF THE EIGHTEENTH AND NINETEENTH CENTURIES. Historical review of the best lyric poetry and the chief writers. DAVIES.
- 129-130. THE GERMAN NOVEL. A study of the social forces and the foreign influences manifesting themselves in the German novel. Not given in 1915-16.
- 131-132. THE GERMAN NOVELLE. A study of the technique and development. Assigned readings and reports. BURKHARD.
- 133-134. ENGLISH INFLUENCES IN GERMAN LITERATURE. A study of the literary relations between England and Germany, with special reference to the effect upon German literature. The subject matter of the course will be varied from year to year. MYERS.
- 137-138. GRILLPARZER. His life and works. Assigned readings and reports. GEISSENDOERFER.
- 143-144. HEINE. His life and works. Assigned readings and reports. GRAVES.

PRIMARILY FOR GRADUATE STUDENTS

- 225-226. LITERARY PROBLEMS SEMINAR. The subject to be investigated will

be announced from year to year. Subject for 1915-16, the Social Drama. SCHLENKER.

231-232. FAUST SEMINAR. Not given in 1915-16.

### GREEK

Professors JOHN CORRIN HUTCHINSON, CHARLES ALBERT SAVAGE.

#### COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101. LYRIC POETRY. Selections from the elegiac, iambic, lyric, and bucolic poets. Three times per week. HUTCHINSON.
102. TRAGEDY. Aeschylus or Sophocles. Special attention given to the development of the drama, and to the literary form and dramatic representation of the plays read. Three times per week. SAVAGE.
103. THE SEPTUAGINT. Especially intended for those who are preparing for the ministry or for some other form of religious work. Three times per week. HUTCHINSON.
104. THE NEW TESTAMENT. Especially intended for those who are preparing for the ministry or for some other form of religious work. Three times per week. HUTCHINSON.

#### PRIMARILY FOR GRADUATE STUDENTS

201. PHILOSOPHY (advanced). Plato's *Republic*. Three times per week. HUTCHINSON.
203. ORATORY (Advanced). A study of the development of oratorical style among the Greeks. Three times per week. SAVAGE.
204. EPIC POETRY (advanced). The *Iliad* or *Odyssey*. An intensive study of Homer with some attention to the Homeric question. Three times per week. HUTCHINSON.
205. SEMINAR IN ORATORY OR PHILOSOPHY. Given in connection with Demosthenes' *De Corona* or Plato's *Republic*. Once per week. HUTCHINSON, SAVAGE.
206. SEMINAR IN EPIC OR DRAMATIC POETRY. Given in connection with Courses 102 and 204. Once per week. HUTCHINSON, SAVAGE.

### HISTORY

Professors GUY STANTON FORD, WILLIAM STEARNS DAVIS, ALBERT BEEBE WHITE; Associate Professor WALLACE NOTESTEIN; Resident Lecturer EDGAR ROBINSON; Assistant Professors SOLON J. BUCK, AUGUST CHARLES KREY.

## COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS.

101. THE FRENCH REVOLUTION AND THE NAPOLEONIC PERIOD. Not offered in 1915-16. FORD.
104. THE NEAR EAST. Russia, Turkey and the Balkan States since 1453, with special reference to causes of the war of 1914. Three times a week. DAVIS.
- 121-122. HISTORY OF GREECE. Greek states until their incorporation into Roman Empire. Prerequisites nine credits in history, or six credits and major in Greek, and no previous course in Greek history. Alternates with Course 22. Three times a week. DAVIS.
- 123-124. HISTORY OF ROME. Social and political development with considerable attention to cultural subjects. Prerequisites, nine credits in history or six credits and a major in Latin. Alternates with Course 24. Not offered in 1915-16. DAVIS.
126. HISTORY OF THE OLD ORIENT. Origins of Egyptians, Babylonians, Assyrians and Persians. Main features of their history and civilization. History of Hebrews discussed so far as it bears upon general Oriental problems. Alternates with Course 104. Not offered in 1915-16. DAVIS.
- 133-134. ANCIENT CIVILIZATION. First semester, Greece; second, Rome. Social and intellectual life, especially factors persisting to the present. Prerequisites, twelve credits in history, or major in Greek or Latin and six credits in history. Three times a week. DAVIS.
- 141-142. THE WEST IN AMERICAN HISTORY. The westward movement of population and civilization; its political, economic and social aspects; and the results upon national development. Not offered in 1915-16. BUCK.
- 143-144. HISTORY OF THE UPPER MISSISSIPPI AND GREAT LAKES REGION TO 1815. Exploration, occupation and struggles for control. History of Minnesota from 1815—the settlement and development, political, economic and social conditions of a typical American commonwealth. Three hours a week. BUCK.
145. HISTORY OF AMERICAN DIPLOMACY. A survey of the relation of the United States with foreign countries from the Declaration of Independence to the present day. Three times a week. ROBINSON.
146. THE CIVIL WAR AND RECONSTRUCTION. A study of the causes of the war, the comparative resources of the two sections, political and military development and the readjustment to normal conditions. Three times a week. ROBINSON.

## ADVANCED OR INTENSIVE COURSES

- 153-154. SOCIAL AND ECONOMIC HISTORY OF THE UNITED STATES. A sketch

- of social and economic conditions in the colonies, followed by a more intensive study with special emphasis on the period since the Civil War. Two times a week. ROBINSON.
161. THE BEGINNINGS OF PARLIAMENT. Parliamentary beginnings from Norman conquest to Edward I, based wholly on original sources. Prerequisites, twelve credits in history, including Courses 3-4; permission of instructor; knowledge of high-school Latin. Alternates with Course 163. Twice a week. WHITE.
163. ORIGIN OF THE ENGLISH JUDICIAL SYSTEM. The origin and early development of the most distinctive features in England's present day courts and procedure. Prerequisites, same as Course 161 with which it alternates. Not offered in 1915-16. WHITE.
- 171-172. GERMAN HISTORY. A general survey with special reference to the rise of Brandenburg-Prussia since 1640. Prerequisites, the permission of the instructor; twelve credits in History, or History 1-2 and a major in German. Not given in 1915-16. FORD.
173. ERA OF REFORM IN PRUSSIAN HISTORY. An intensive study of the years 1806-1815 in Prussian and German History. Prerequisites the same as History 171-172. Two times a week. FORD.
181. ENGLISH BACKGROUNDS OF AMERICAN HISTORY. Alternates with Course 7. A survey of the political and social institutions of England in the reign of Charles I, with special emphasis upon the local institutions. Two times a week. NOTESTEIN.
182. ENGLISH COLONIZATION IN AMERICA. Alternates with Course 184. A study of institutions in New England and Virginia. Two times a week. NOTESTEIN.
184. STUART PERIOD. English 111-112 is strongly recommended as a desirable reinforcing subject. Alternates with Course 182. Not offered in 1915-16. NOTESTEIN.

PRIMARILY FOR GRADUATE STUDENTS

- 201-202. HISTORICAL BIBLIOGRAPHY AND CRITICISM. Required of candidates for advanced degrees in History who do not present evidence of similar training elsewhere. Two times a week. FORD, NOTESTEIN.
- 203-204. SEMINAR IN ROMAN HISTORY. DAVIS.
- 205-206. SEMINAR IN AMERICAN HISTORY. BUCK, ROBINSON.
- 207-208. SEMINAR IN EUROPEAN HISTORY. Not offered in 1915-16. FORD.
- 209-210. SEMINAR IN ENGLISH HISTORY. WHITE, NOTESTEIN.



## HOME ECONOMICS

Professor JOSEPHINE T. BERRY.

## COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101-102. NUTRITION. A study of the chemistry and physiology of metabolism, involving a qualitative examination of the food principles; of the body tissues; of salivary, gastric, and pancreatic digestion; of blood, bile, milk; urine analysis; metabolism experiments. BERRY and Assistants.
103. 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. BERRY and Assistants.

## PRIMARILY FOR GRADUATE STUDENTS

- 201-202. SEMINAR. Meetings for the discussion of current literature, the formulation of research problems, and appropriate methods of research. BERRY.
- 203-204. RESEARCH PROBLEMS IN NUTRITION. BERRY.

## HORTICULTURE

Associate Professor LEROY CADY; Assistant Professors WILFRID G. BRIERLEY, MAXWELL J. DORSEY, RICHARD WELLINGTON.

## COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101. ADVANCED FRUIT-GROWING. Lectures, laboratory, and special problems. A study in detail of the various tree fruits. BRIERLEY.
104. TROPICAL FRUITS. Lectures, references, and special problems. A study of the various tropical and citrus fruits. Not given in 1915-16. BRIERLEY.
131. ADVANCED MARKET GARDENING. Lectures, references, and special problems. A study in detail of the various vegetables. Not given in 1915-16. BRIERLEY.
191. HORTICULTURAL LITERATURE. This course includes a critical study of foreign and native horticultural literature and methods used in the preparation of fruit monographs and bulletins. A knowledge of French and German will be a valuable asset. Lectures. WELLINGTON.
192. ORCHARD AND GARDEN MANAGEMENT. Lectures, references, laboratory, and special problems. A study of the principal problems connected with the management of orchard, small fruit, and vegetable tracts. BRIERLEY.

## PRIMARILY FOR GRADUATE STUDENTS

- 201-202. FRUIT-GROWING RESEARCH. Special problems in fruit culture.

Students will be required to continue the work over at least one summer. Open to those who have specialized in fruit-growing. WELLINGTON, BRIERLEY.

- 203-204. FRUIT-MARKETING RESEARCH. Special problems in fruit-harvesting, by-products, storage, and marketing. Students must arrange schedules to allow for concentration on problem at most appropriate season. BRIERLEY, WELLINGTON.
- 205-206. FRUIT-BREEDING RESEARCH. Consists of (a) some thesis problem, (b) development of laboratory technique in breeding. Work involves reading in heredity, cytology, biometry. Students required to continue work over one summer. Open to limited number specializing in fruit-breeding. DORSEY.
- 231-232. 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. WELLINGTON, BRIERLEY.

#### LATIN

Professors JOSEPH B. PIKE, JOHN E. GRANRUD.

The degree of Master of Arts: For a major in Latin courses 201-202 and one course each semester selected from courses 103 to 110. The student will be expected to select for his thesis some problem in connection with one of these courses. In addition, 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. 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 semester 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 authors will be required.

103. THE ROMAN NOVEL. *Cupid and Psyche* of Apuleius and *Trimalchios' Dinner of Petronius*. A study of the ancient novel. Three times a week. PIKE.
104. LATIN WRITING. Study of Latin Prose Style. Alternates with Course 103. Not offered in 1915-16. Twice a week. PIKE.
105. ROMAN ELEGY. Selections from Catullus, Tibullus, Propertius and Ovid. The origin, development and technique of Roman Elegy. Three times a week. GRANRUD.
107. LETTERS OF CICERO. Selections from his correspondence. A study of

- his life and times, his literary art and methods. Alternates with Course 105. Not offered in 1915-16. Three times a week. GRANRUD.
108. TACITUS. Selections from his works. A study of the development of Roman historical literature and of the sources, methods and literary characteristics of Tacitus. Three times a week. GRANRUD.
110. ROMAN SATIRE. Selections from Juvenal. The beginnings, evolution, and distinctive qualities of Roman Satire. Juvenal as a literary artist and a moralist. Alternates with Course 108. Not offered in 1915-16. Three times a week. GRANRUD.
- 201-202. LUCRETIVS. Graduate seminar in the interpretation of the text of the *De natura rerum* with a study of Lucretius' philosophy and his sources. Once a week (double hour), a third hour by arrangement. PIKE.
- 203-204. SENECA. Graduate Seminar in selections from works of Seneca. Annotations of selections not annotated in modern tongues. Study of Stoicism. Alternates with Course 201-202. Not offered in 1915-16. Once a week (double hour), third hour by arrangement. PIKE.

### MATHEMATICS

Professors GEORGE N. BAUER, WILLIAM E. BROOKE, WILLIAM H. KIRCHNER, FRANCIS P. LEAVENWORTH; Associate Professor WILLIAM H. BUSSEY; Assistant Professors HANS H. DALAKER, BURT L. NEWKIRK, ROYAL R. SHUMWAY, HERMON L. SLOBIN, A. L. UNDERHILL.

The mathematical club, consisting of members of the faculty and advanced students, meets every two weeks throughout the university year. It offers an opportunity to acquire breadth of knowledge of mathematics as a whole. The work consists of reports of current research and lectures on classical mathematical achievements of the past.

The following courses in pure and applied mathematics are offered by members of the Department of Mathematics of the College of Science, Literature, and the Arts and the Departments of Drawing and Descriptive Geometry and Mathematics and Mechanics of the College of Engineering.

#### OPEN TO GRADUATE AND ADVANCED UNDERGRADUATE STUDENTS

101. SOLID ANALYTIC GEOMETRY. (Three hours.) Elementary theorems of projection, coördinates, the plane, the line in space, quadric surfaces, transformation of coördinates, tangents, poles and polars, the general equation of the second degree. BUSSEY.
102. ADVANCED PLANE ANALYTIC GEOMETRY. (Three hours). BUSSEY.
104. MODERN SYNTHETIC GEOMETRY. (Three hours.) A study of geometry based upon the method of central projection without the use of coördinates. BUSSEY.

106. DIFFERENTIAL EQUATIONS. (Three hours.) An introductory course dealing with the interpretation and methods of solving ordinary differential equations. SLOBIN.
107. ADVANCED DIFFERENTIAL CALCULUS. (Three hours.) Infinitesimals of different orders, partial and total derivatives, introduction to infinite series, Taylor's and Maclaurin's Expansions together with applications of the calculus to plane curves. UNDERHILL.
108. ADVANCED INTEGRAL CALCULUS. (Three hours.) The definite integral as the limit of a sum, improper integrals, the Beta and Gamma functions, elliptic integrals, differentiation and integration under the sign of integration, applications to geometry and mechanics. BAUER.
- 109-110. PROJECTIVE GEOMETRY. (Three hours.) General considerations and constructions. Representation, projection, and transformation. Collineation. Curves and polar systems. Applications. KIRCHNER.
- 111-112. ADVANCED DESCRIPTIVE GEOMETRY. Methods of representation; parallel and central projection. Geometrography, axonometry, and photogrammetry. KIRCHNER.
- 113a. PERSPECTIVE. The principles and practice of perspective, including shadows, reflections, distortions, corrections, systems, methods, the practical problem, and inverse constructions. KIRCHNER.
- 113b. PERSPECTIVE. Same as Course 113a. KIRCHNER.
- 117a. VECTOR ANALYSIS. Applications to geometry, mechanics, and physics. BROOKE.
- 117b. VECTOR ANALYSIS. Same as Course 117a. BROOKE.
- 119a. MODERN HIGHER ALGEBRA. (Three hours.) SHUMWAY.
- 119b. MODERN HIGHER ALGEBRA. (Three hours.) Same as Course 119a. SHUMWAY.
- 125-126. DIFFERENTIAL GEOMETRY. (Three hours.) Course 101, which is a prerequisite, may be taken simultaneously. Application of calculus to the geometry of plane curves, space curves and surfaces. UNDERHILL.
- 127a. INFINITE SERIES. (Three hours.) Open to seniors and graduate students who have gained seventeen credits beside algebra and trigonometry. BAUER.
- 127b. INFINITE SERIES. Same as Course 127a. BAUER.
140. METHOD OF LEAST SQUARES. (Three hours.) The combination and adjustment of observations and the discussion of their precision as applied especially to engineering physics and astronomy. LEAVENWORTH.
- 146-147. ADVANCED CALCULUS WITH APPLICATIONS. (Three hours.) De-

- signed to extend the engineer's working knowledge of the calculus. Text: Wilson's *Advanced Calculus*. BROOKE.
151. MECHANICS OF MATERIALS. (Three hours.) The theory of beams, columns, shafts, reinforced concrete, hollow cylinders and spheres, rollers, and plates. The general theory of internal stress. BROOKE, NEWKIRK.
152. HYDRAULICS. (Three hours.) Laws of the equilibrium, pressure, and flow of liquids; theory of the action of pumps, compression and flow of gases. BROOKE, NEWKIRK.
153. THERMODYNAMICS. (Three hours.) The thermodynamics of steam and gas engines. The mechanical theory of heat as applied to steam, oil, gas, and hot air engines, and to compressors; including the use of steam tables, entropy diagrams, etc. BROOKE.
154. STEAM AND HYDRAULIC TURBINES. (Three hours.) Various types of turbines, velocity, impulse, and reaction; nozzles, vanes, discs, bearings, governors, thermodynamic analysis and efficiency. BROOKE.

PRIMARILY FOR GRADUATE STUDENTS

- 201a or 201b. THEORY OF NUMBERS. (Three hours.) BUSSEY.
- 203-204. THEORY OF FINITE GROUPS. (Three hours.) BUSSEY.
- 205a or 205b. INFINITE DISCONTINUOUS GROUPS AND AUTOMORPHIC FUNCTIONS. (Three hours.) DALAKER.
- 207a or 207b. HIGHER PLANE CURVES. (Three hours.) SLOBIN.
- 209-210. THEORY OF FUNCTIONS OF A COMPLEX VARIABLE. (Three hours.) BAUER, DALAKER.
211. THEORY OF FUNCTIONS OF REAL VARIABLES. (Three hours.) UNDERHILL.
212. CALCULUS OF VARIATIONS. (Three hours.) UNDERHILL.
- 215-216. ADVANCED DIFFERENTIAL EQUATIONS. (Three hours.) Ordinary and partial differential equations; general theory of linear differential equations; most important differential equations of mathematical physics; elements and applications of theory of functions arising in theory of differential equations. SLOBIN.
- 217-218. DIFFERENTIAL EQUATIONS OF MECHANICS AND APPLICATIONS. (Three hours.) BROOKE.
- 251-252. ADVANCED ANALYTIC MECHANICS. (Three hours.) BROOKE.
- 253-254. ADVANCED TECHNICAL MECHANICS. (Three hours.) Special problems in the dynamics of machinery; vibrations, balancing, whirling shafts, rapidly rotating disks, dynamical stability, monorail car, gyroscopic compass, flying machines. NEWKIRK.

255-256. THE MATHEMATICS THEORY OF ELASTICITY. (Three hours.)  
BROOKE.

### MECHANICAL ENGINEERING

Professor JOHN J. FLATHER; Assistant Professor JOHN V. MARTENIS; Instructor WALLACE H. MARTIN.

#### COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

111. INDUSTRIAL MANAGEMENT. Shop and factory organization and management; cost and wage systems. Depreciation of equipment. Machine burden. Time studies. FLATHER.
112. INDUSTRIAL MANAGEMENT. Same as Course 111. FLATHER.
117. MACHINE DESIGN. Calculation and design of such machine parts as fastenings, bearings, rotating pieces, pulleys, spur gearing, bevel gears, spiral gears, and rope driving. Recitations, lectures and drawing room practice. FLATHER, MARTENIS.
118. MACHINE DESIGN. Continuation of Course No. 117. FLATHER, MARTENIS.
119. GAS ENGINES AND PRODUCERS. Principles of two-cycle and four-cycle engines; cylinder construction and arrangement; valve gears and starting mechanisms; speed control, ignition, and cooling. Application of the indicator and consideration of indicator diagrams. A study of the power-gas producer. MARTIN.
120. MACHINE DESIGN. Application of graphical methods to the design of valve-gears and link motions. Zeuner diagrams, indicator cards, Lectures and drawing-room practice. FLATHER, MARTENIS.
121. STEAM ENGINE DESIGN. Calculations and working drawings for a high speed automatic steam engine. Theoretical diagrams and determination of details. FLATHER, MARTIN.
123. GAS ENGINE DESIGN. Calculations and working drawings for a single cylinder stationary gas engine. Theoretical diagrams and details of parts. FLATHER, MARTIN.
124. ADVANCED MACHINE DESIGN. Original design, including machinery for changing size and form, cranes, pumping and transmission machinery and engineering appliances. Lectures, problems and drawing room practice. FLATHER, MARTIN.
125. TOOL DESIGN. Design of tools for manufacturing inter-changeable parts; jigs and milling fixtures. FLATHER.
126. TOOL DESIGN. Same as Course 125. FLATHER.
127. POWER PLANT DESIGN. Problems, designs and estimates for power

plants, central stations and factory equipment. Selection of motive powers, relative advantages of steam and producer gas plants, choice of engines and boilers; pumps, shafting, piping, and accessories. FLATHER.

128. POWER PLANT DESIGN. Same as Course 127. FLATHER.
130. STEAM BOILERS AND ENGINES: Construction of steam boilers, settings, furnaces and stokers, smoke prevention, chimneys, evaporation. Mechanics of steam engine; slide valve; Zeuner diagram, Corliss and other valves; governors; indicator cards; compounding. FLATHER, MARTIN.
131. MEASUREMENT OF POWER. A study of the methods employed in measuring power. Dynamometers. Prony brakes; power required to drive machine tools and shafting. FLATHER.
132. COMPRESSED AIR. Air compressors and motors, and the transmission of power by compressed air. Recitations and lectures. MARTENIS.
134. REFRIGERATING MACHINERY. Principles of refrigeration. A study of the various types of refrigerating machines, refrigerants, and applications to ice-making, cold storage, cooling of air, liquids and solids. Lectures and recitations. MARTENIS.
137. RAILWAY TECHNOLOGY. The object of this course is to familiarize the student with the practical details of construction of locomotives, and consists in part of systematic course of visits to the various railroad shops in the vicinity; lectures and recitations. MARTENIS, MARTIN.
139. LOCOMOTIVE CONSTRUCTION. Lectures, reading, and recitations on design and construction of locomotives, supplementing Course 137. MARTENIS.
140. RAILWAY DESIGN. This course treats (a) of link and valve motions; continuation of Course 139 with special applications of Stephenson and Walschaert gears; (b) of locomotives and car details; (c) of locomotive boiler; (d) of assembled parts. FLATHER.

PRIMARILY FOR GRADUATE STUDENTS

- 201-202. SEMINAR. FLATHER, MARTENIS, MARTIN.

METALLOGRAPHY

Assistant Professor SAMUEL L. HOYT.

- 153-154. METALLOGRAPHY. Microscopic and thermal analysis of metals and alloys. Metallographic technique. Properties of metals and alloys. Commercial alloys. Metallography of iron and steel. Three lectures, four laboratory hours per week; both semesters. Prerequisites, Chemistry 1, Physics 1. HOYT.

- 155-156. METALLOGRAPHY APPLIED TO THE STUDY OF GEOLOGY. Application of metallographical principles to geology. Attention to genesis of rocks and ore bodies. Microscopical examination of opaque minerals. Two lectures, two laboratory hours per week; both semesters. Prerequisites, Geology 4, 5, Mineralogy 18. HOYT.
- 201-202. ADVANCED METALLOGRAPHY. Technical and scientific research. Study of steel rails, automobile and locomotive parts, tool steels, etc. Special problems in metallography. Outside reading. Seminar work on recent advances in metallography. Hours to be arranged. Prerequisite, Metallurgy 154. HOYT.

### PATHOLOGY AND BACTERIOLOGY

Professors H. E. ROBERTSON, E. C. ROSENOW,\* L. B. WILSON,\* Associate Professors E. T. BELL, WINFORD P. LARSON, WILLIAM C. MCCARTHY.\*

#### COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- †101-102. GENERAL PATHOLOGY. The circulatory system, degeneration and necrosis, inflammation, regeneration and repair, tumors. Lectures, demonstrations, and laboratory work. BELL.
- 103-104. ADVANCE PATHOLOGICAL TECHNIQUE AND SPECIAL PROBLEMS. BELL.
111. SPECIAL BACTERIOLOGY. This course is a continuation of the study of general bacteriology. LARSON.
- 113-114. ADVANCED BACTERIOLOGICAL TECHNIQUE AND SPECIAL PROBLEMS. This course deals with special methods of isolation of particular pathogenic species of bacteria, together with special means for their cultivation. It necessitates the bacteriological study of feces, urine, sputum, exudates, etc. LARSON.

#### PRIMARILY FOR GRADUATE STUDENTS

- 201-202. RESEARCH IN PATHOLOGY. BELL.
- 211-212. RESEARCH IN BACTERIOLOGY. LARSON.

\*On the Mayo Foundation. Work by these members of the Graduate School faculty at Rochester will be announced in the special circular on graduate work in medicine.

†May be accepted in special cases as a minor if students major in another department.

### PHARMACOLOGY\*

Professor ARTHUR D. HIRSCHFELDER; Associate Professor EDGAR D. BROWN; Assistant Professor ROBERT A. HALL.

102. ADVANCED PHARMACOLOGY. The relation of drug action to chemical structure; the mode of action and therapeutic application of various

\*Courses 52, 54, 61a and 61b (cf. Medical Bulletin) may receive graduate credit by special approval.



- synthetic drugs; the study of chemo-therapy. HIRSCHFELDER, BROWN, HALL.
- 103 a,b. EXPERIMENTAL PHARMACOLOGY. Special investigation and experimental study of one or more subjects in pharmacology, in which the student is given an opportunity of choice of several topics. HIRSCHFELDER, BROWN, HALL.
- 105 a,b. SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY. Reviews of recent literature bearing upon physiologic and pharmacologic subjects. Conducted by department directors, with the collaboration of the staffs and of qualified graduate or undergraduate students.
- 107 a,b. RESEARCH IN PHARMACOLOGY. HIRSCHFELDER, BROWN.

## PHILOSOPHY AND PSYCHOLOGY

Professor NORMAN WILDE; Associate Professor DAVID F. SWENSON;\* Assistant Professor HERBERT WOODROW; Professorial Lecturer JOSEPH PETERSON.

## COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101a or 101b. EXPERIMENTAL PSYCHOLOGY. Laboratory experiments in the chief mental processes, to give first-hand familiarity with methods and results. Three times a week. WOODROW.
105. MENTAL RETARDATION. A study of abnormalities in the development of exceptional children; methods of training. Once a week. WOODROW.
109. PSYCHOLOGICAL PRINCIPLES. Not given in 1915-16.
110. COMPARATIVE PSYCHOLOGY. A study of animal behavior and an interpretation of its psychological significance. Three times a week. PETERSON.
121. ANCIENT AND MEDIEVAL PHILOSOPHY. Outline of history of thought desirable in general education. Emphasis placed upon human significance of philosophy rather than technical aspect. Main work, philosophies of Plato and Aristotle, but later development traced as far as Renaissance. WILDE.
122. MODERN PHILOSOPHY. Continues Course 121. Representative systems of modern philosophy from the Renaissance to the nineteenth century; to prepare students to understand philosophical tendencies of the present; study of Bacon, Descartes, Spinoza, Leibnitz, Locke, Berkeley, Hume, Kant. WILDE.
123. THE PHILOSOPHY OF THE NINETEENTH CENTURY. Continues Course

\*Absent on leave, 1915-16.

122. Idealism of Fichte and Hegel, Pessimism of Schopenhauer and Von Hartmann, Associationalism of Hartley, James, and John Stuart Mill, Philosophy of Evolution, Positivism of Comte, Pragmatism, Materialism, New Realism.
126. LOGIC OF SCIENCE. Introduction to philosophy through the medium of the special sciences, its aim being to suggest a system of the sciences through a discussion of nature and relations of their fundamental principles. Not given 1915-16.
127. METAPHYSICS. A critical and constructive study of theories of knowledge and reality. Not given 1915-16.
- 129-130. 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 topic for year ascertained by consultation with department. WILDE.
134. THE PHILOSOPHY OF PLATO. The reading and discussion of the principal dialogues with a view to understanding the problem and method of Greek philosophy as illustrated in the writings of Plato. WILDE.

#### CLINIC IN MENTAL DEVELOPMENT

A free clinic for the study of irregular mental development has been organized by the department. Associate Professor J. P. Sedgwick, of the Medical School, has charge of the physical examinations. Besides the diagnosis of physical and mental condition, treatment is outlined and methods of training are suggested or carried out.

#### PHYSIOLOGY

Professor ELIAS POTTER LYON; Associate Professors RICHARD OLDING BEARD, FREDERICK H. SCOTT; Assistant Professors M. RUSSEL WILCOX; J. F. McCLENDON; Instructors FRANCIS B. KINGSBURY, C. J. V. PETTIBONE.

101. URINALYSIS. Advanced methods. PETTIBONE.
- 102 a,b. ADVANCED MAMMALIAN PHYSIOLOGY. A course of classical physiologic experiments. LYON, SCOTT.
103. PHYSIOLOGY OF METABOLISM. Students are placed on known diets and the results are studied chemically. PETTIBONE.
- 105 a,b. PHYSICAL CHEMISTRY OF CELLS AND BIOLOGIC FLUID. Physical chemistry of colloids, hydrogen ion concentration, surface tension, osmotic pressure, electric conductivity; their bearing on biochemical analysis, digestion, stimulation, anesthesia, muscular contraction, cell division. Prerequisite, animal biology, organic chemistry. First semester, or both semesters. McCLENDON.

- 107 a,b. **ADVANCED PHYSIOLOGIC CHEMISTRY.** Course arranged by instructors with qualified students for special work. PETTIBONE, KINGSBURY.
- 109 a,b. **ADVANCED PHYSIOLOGY.** Course arranged by instructors with qualified students on special phases of physiology. LYON, SCOTT, McCLENDON.
110. **PHYSIOLOGY OF DEVELOPMENT.** The physiology of the ovum, the embryo, the fetus; the functions of menstruation, ovulation, pregnancy, parturition and lactation; the functional characteristics of birth, infancy, childhood, adolescence, maturity and old age. BEARD.
- 111 a,b. **FOODS AND PRACTICAL DIETETICS.** A study of human foods and food values; of the principles of food selections; of caloric indices and balanced dietaries. Exercises in the practical preparation of foods. BEARD.
113. **EXAMINATION OF THE EYE AND EAR.** A study of advanced methods. Lectures, demonstrations and laboratory exercises. Prerequisite Course 54. WILCOX.
114. **PHYSIOLOGY OF ACCOMMODATION.** A study of optical principles and methods. Lectures, demonstrations and laboratory exercises. WILCOX.
- 115 a,b. **CONFERENCE COURSE IN PHYSIOLOGY.** A study by quarters of (1) the internal secretions; (2) lymph formation, edema; (3) the tropisms in medicine; (4) the physiology of the stomach. Informal lectures and library study. Prerequisites, Courses 52, 53 and 54. LYON.
- 117 a,b. **SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY.** For instructors and advanced students. LYON, HIRSCHFELDER, and staff.
- 201 a,b. **RESEARCH IN PHYSIOLOGY.** LYON, SCOTT, McCLENDON.
- 203 a,b. **RESEARCH IN PHYSIOLOGIC CHEMISTRY.** KINGSBURY, PETTIBONE.

### PLANT PATHOLOGY

Professor EDWARD M. FREEMAN; Assistant Professor ELVIN C. STAKMAN.

- 101-2. **ADVANCED PATHOLOGY.** Cultural and laboratory methods in plant pathology. Study of bacterial and fungous plant parasites and of plant diseases not known to be of parasitic origin. Problems in plant diseases. Required of those specializing in pathology or entomology. Prerequisites, Pathology 1 and 4. Four times a week. STAKMAN.
- 201-2. **GRADUATE PATHOLOGY.** Open to graduates who have had two years of general botany and Pathology 1, 101, 102 and Pathology 4, or its equivalent. A special historical study of the botanical basis of plant pathology. Special problems. For minor or major. Twice a week. FREEMAN.

- 203-4. SPECIAL PROBLEMS IN GRADUATE PATHOLOGY. Special assignment of work in laboratory and field problems in pathological research. Arrange. FREEMAN AND STAKMAN.

### POLITICAL SCIENCE

Professors WILLIAM A. SCHAPER, JEREMIAH S. YOUNG; Associate Professor CEPHAS D. ALLIN.

#### COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101. AMERICAN CONSTITUTIONAL LAW. Constitutional law, its origin and nature; American constitutions, how made and amended; the courts and the development of the Constitution; Federal and State relations; the territories, their acquisition and government; citizenship. SCHAPER.
102. MODERN POLITICAL THOUGHT. Nature and purpose of the modern state; sovereignty; the growth of democracy; the decline of individualism; the increase of governmental activities; great contributions to political thought from Hobbes, Locke, and Rousseau to the present time. SCHAPER.
104. POLITICAL PARTIES. Not offered in 1915-16. SCHAPER.
105. COMPARATIVE ADMINISTRATION. Administration as a science; its origin and development; an analysis of administrative systems of the United States, England, France, and Germany, with special reference to the law of officers, merit systems, and special administrative tribunals. YOUNG.
106. LEGISLATIVE POWER AND METHODS. Source and scope of the legislative power; methods used by legislative bodies; current public questions; formulation and defense of legislative bills. Text, lectures, cases, and special topics. YOUNG.
108. THE POLICE-POWER. The nature and scope of the police power; the public welfare, including safety, order, morals, and protection against business fraud and oppression; the fundamental rights under the police power. YOUNG.
109. DIPLOMACY. The growth of international relations; the mode of conducting foreign affairs; diplomatic and consular service; the framing, interpretation, and termination of treaties and compacts. ALLIN.
110. INTERNATIONAL LAW. Nature, sources, and sanction of international law; the status of nations, the rules of peace, neutrality, and war, and the arbitration movement. ALLIN.
112. 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 Imperial federation. ALLIN.

114. THE GOVERNMENT AND POLITICS OF THE BRITISH EMPIRE. The origin, nature and operation of the British constitution, political parties and principles in Great Britain and the Colonies. ALLIN.
- 201-202. SEMINAR IN POLITICAL SCIENCE. Research in the field of Political Science; the discussion of current problems in politics and administration. SCHAFER, YOUNG, ALLIN.

## PHYSICS

Professor ANTHONY ZELENY\*; Associate Professors HENRY A. ERIKSON, ALOIS F. KOVARIK; Assistant Professor EARLE H. KENNARD; Instructor LOUIS W. MCKEEHAN.

## COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 121-122. DYNAMICS. Some problems essential for advanced physics and chemistry. MCKEEHAN.
155. SPECTROMETRY. Laboratory course. Measurements involving the use of prism spectrosopes, plane transmission and reflection gratings, concave grating, echelon grating, and the interferometers. Not offered in 1915-16. KOVARIK.
161. ADVANCED ELECTRICITY AND MAGNETISM. Not offered in 1915-16. ZELENY.
162. ELECTRICAL MEASUREMENTS. Devoted mainly to the study and measurement of capacity, inductance, and magnetic induction. ZELENY.
165. ELECTRICAL MEASUREMENTS OF PRECISION. Making of standard cells, calibration of Wheatstone box bridge; adjustment of resistances, ammeters, and voltmeters; use of the potentiometer; problems involving capacity, inductance, and magnetic flux; measurement of temperatures by electrical methods. Not offered, 1915-16. ZELENY.
177. RADIOACTIVITY. Lectures, experimental and descriptive; the various theories and methods of investigation. Detailed study of the radioactive elements. KOVARIK.
178. RADIOACTIVITY MEASUREMENTS. Laboratory technique in radioactivity. KOVARIK.
181. ADVANCED PHYSICAL MEASUREMENTS. Individual work in the laboratory on topics specially chosen to serve best the needs and capacity of each student; intended to introduce him to some of the more intricate physical measurements. ZELENY, ERIKSON, KOVARIK, MCKEEHAN.
182. ADVANCED PHYSICAL MEASUREMENTS. Continuation of Course 181.

\*Absent on leave, 1915-16.

191. **ELEMENTARY PHYSICAL INVESTIGATION.** The experimental or theoretical study of physical phenomena, the nature or laws of which are not yet understood. ZELNY, ERIKSON, KOVARIK, McKEEHAN, KENNARD.

192. **ELEMENTARY PHYSICAL INVESTIGATION.** Continuation of Course 191.

COURSES PRIMARILY FOR GRADUATE STUDENTS

221-222. **ADVANCED ANALYTICAL MECHANICS.** Dynamics and statics of particles and rigid bodies. Elasticity and hydromechanics. McKEEHAN.

247. **THE KINETIC THEORY OF GASES.** Kinetic explanation of the principal properties of gases at ordinary and at low pressures, with a few applications to liquids and solids. Not offered in 1915-16. KENNARD.

248. **THERMAL RADIATION AND QUANTUM THEORY.** The properties of black radiation; laws of Kirchhoff, Stefan and Wien. Equipartition of energy and its bearing on thermal radiation; Planck's quantum hypothesis and radiation law. Other applications of quantum theory. Not offered in 1915-16. KENNARD.

249-250. **TEMPERATURE AND HEAT MEASUREMENTS.** Precision measurements with liquid and gas thermometers, thermoelectric and resistance thermometers, and radiation pyrometers; self-recording instruments. Modern methods employed in the measurement of the thermal constants at all temperatures. Lectures, laboratory work. Not offered in 1915-16. ZELNY.

251. **ADVANCED OPTICS.** Not offered in 1915-16.

261-262. **MATHEMATICAL THEORY OF ELECTRICITY AND MAGNETISM.** A comprehensive study of the modern Maxwell-Lorentz theory, including the electromagnetic theory of light. KENNARD.

271. **DISCHARGE OF ELECTRICITY THROUGH GASES.** Conductivity imparted to gases by X-rays, ultra-violet light, radioactive substances, glowing metals; discharge of electricity from points in vacuum tubes; spark and arc discharges; methods of measuring velocity of ions. Not offered in 1915-16. KOVARIK.

274. **NEGATIVE ELECTRICITY, POSITIVE ELECTRICITY, AND X-RAYS.** Lectures on the most recent work. KOVARIK.

276. **ELECTRON THEORY.** Not offered in 1915-16. ERIKSON.

287-288. **THEORETICAL PHYSICS.** Not offered in 1915-16.

293-294. **RESEARCH IN ELECTROKINETICS.** Experimental investigations. This course may be continued through any desired number of years. Not offered in 1915-16. ZELNY.

295-296. **RESEARCH IN IONIZATION.** Experimental investigations. This course may be continued through any desired number of years. ERIKSON, KOVARIK.

- 297-298. RESEARCH IN RADIOACTIVITY. Experimental investigations. This course may be continued through any desired number of years. KOVARIK.

## PSYCHOLOGY

See Philosophy and Psychology.

## RHETORIC

Professors JOSEPH M. THOMAS, MARGARET SWEENEY; Assistant Professors DANIEL FORD, SIDNEY F. PATTISON, ANNA H. PHELAN; Instructor CHARLES E. SKINNER.

## COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

102. 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. Three times a week. SKINNER.
- 103-104. 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. Three times a week. FORD.
- 111-112. ESSAY WRITING. Practice in didactic, biographical, critical, informal essays. Two essays a semester. Individual aid given to student in gathering material, planning each paper, and criticism each essay. Analysis of modern essays. Three times a week. PATTISON.
- 119-120. SEMINAR IN WRITING. Criticism of manuscripts submitted; lectures upon fundamental principles of English composition. Open with special permission to seniors and graduate students who have completed Courses 1-2, 11-12, or 15-16, and one other course. Twice a week. THOMAS.

## PRIMARILY FOR GRADUATE STUDENTS

- 201-202. SEMINAR IN RHETORIC. Lectures, reports, and theses on special problems of rhetorical theory. Prerequisites, Courses 1-2, 11-12, or 15-16, and at least one other course. For those who are specializing in rhetoric and composition. Three times a week. THOMAS.

## ROMANCE LANGUAGES

Professors EVERETT WARD OLMSTED, COLBERT SEARLES; Instructors FRANCIS D. BARTON, MARCEL MORAUD, RUTH S. PHELPS, EDWARD H. SIRICH.

- 101-102. FRENCH LITERATURE, EIGHTEENTH CENTURY. Discussions based upon texts and collateral reading. SEARLES.

- 103-104. FRENCH LITERATURE, SEVENTEENTH CENTURY. Discussions based upon texts and collateral reading. OLMSTED.
- 105-106. FRENCH LITERATURE, SIXTEENTH CENTURY. Not given in 1915-16.
- 107-108. FRENCH LITERATURE. Classicism. Literary studies of the classic French monuments. SEARLES.
- 109-110. LECTURES IN FRENCH: L'évolution du roman au XIX siècle. MORAUD.
- 111-112. FRENCH ORAL DICTION: Dissertations orales sur des sujets variés.
- 113-114. FRENCH SYNTAX AND COMPOSITION. Special studies in characteristic problems of French syntax.
- 131-132. SPANISH NOVEL. A study of the development of Spanish fiction from the picaresque novel to that of the present day. OLMSTED.
- 141-142. DANTE, PETRARCH, BOCCACCIO. An introduction to the works of these authors; reading in class, lectures, reports and collateral reading. PHELPS.

PRIMARILY FOR GRADUATE STUDENTS

- 201-202. OLD FRENCH. Two hours per week devoted to French Philology and one hour to the reading of Old French texts. SIRICH.
- 203-204. OLD SPANISH. Two hours per week devoted to Spanish Philology and one hour to the reading of Old Spanish texts. SIRICH.
- 205-206. FRENCH SEMINAR. SEARLES.
- 231-232. SPANISH SEMINAR. OLMSTED.

SCANDINAVIAN

Professors GISLE BOTHNE, ANDREW A. STOMBERG.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101-102. MODERN NORWEGIAN LITERATURE. Norwegian literature from 1814 to the present day. BOTHNE.
103. EARLIER NORWEGIAN LITERATURE. History of Literature. Norwegian and Danish folk-songs, Holberg, Oplysningstiden. BOTHNE.
104. IBSEN. Lectures, reading, and interpretation. BOTHNE.
- 105-106. HISTORY OF NORTHERN EUROPE. History of Scandinavian countries from the earliest period to recent times. Prerequisites: Courses 1-2 and 3-4 or 5-6 and 7-8, or Courses 1-2, 3-4, or 14 in History. Knowledge of Scandinavian languages not required. Not offered in 1915-16. STOMBERG.



- 107-108. SWEDISH LITERATURE. History of Swedish literature from 1719 to the present time. History of the literature and study of modern authors, including Selma Lagerlöf, Geijerstam, Strindberg. STOMBERG.
109. STRINDBERG. Lectures, reading, and interpretation. STOMBERG.
112. MODERN DANISH LITERATURE. From Oehlenschläger to the present time. BOTHNE.
- 113-114. OLD NORSE (Icelandic). Grammar and reading. Gunnlaugs Saga Ormstungu. BOTHNE.

PRIMARILY FOR GRADUATE STUDENTS

- 201-202. SEMINAR IN HISTORY OF SCANDINAVIAN LANGUAGES. BOTHNE.
- 203-204. SEMINAR IN OLD NORSE. THE ELDER EDÐA. Not offered in 1915-16. BOTHNE.
- 209-210. SEMINAR IN MODERN SWEDISH LANGUAGE AND LITERATURE. The course is based upon Schuck and Warburg's *Illustrerad Svensk Litteraturhistoria* and includes a study of special authors. STOMBERG.
- 215-216. SEMINAR IN NORWEGIAN LITERATURE. The various phases of the cultural development of modern Norway are discussed. The complete works of Bjornson or Ibsen are especially studied. BOTHNE.

SOCIOLOGY AND ANTHROPOLOGY

Professors ALBERT E. JENKS, ARTHUR J. TODD.

102. SOCIAL THEORY. The foundations of sociology; the leading American, English, French, and German writers and their methods of approach to the science and the leading results they have secured. Textbook, readings, lectures, essay. Three hours a week. TODD.
104. STATE BOARD-OF-CONTROL INSTITUTIONS. 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. TODD and specialists from the institutions studied.
108. THE PHILIPPINE PEOPLE. Comparative study of the four large ethnic and cultural groups of people in the Philippine Islands; policy of the insular civil government as it affects American home interests in the Orient. Lectures, readings, and essay. Three hours a week. Not offered in 1915-16. JENKS.
110. PHYSICAL ANTHROPOLOGY. Theory of evolution as applied to natural and cultural man; theory of eugenics and its application. Prerequisites, Course 1, 5 or Course 1-2 in Animal Biology, and one other course in this department. Three hours. JENKS.

112. **THE AMERICAN NEGRO.** The negro in Africa; development of the American negro; present characteristics, conditions, developing tendencies, and probable future of the American negro. Lectures, readings, and essay. Not offered in 1915-16. JENKS.
113. **THE AMERICAN PEOPLE.** Dominant characteristics of the diverse foreign peoples now in the United States; their modification in America; the importance of these peoples to the American nation. Lectures, readings, and essay. Three hours. JENKS.
114. **THE AMERICAN PEOPLE (Continued).** A continuation of Course 113. Essential and unique historical Americanisms, and their value and virility for the future; facts and forces of amalgamation and assimilation in America; America's ethnic problems. Lectures, readings, and essay. Three hours. JENKS.
117. **SOCIAL PSYCHOLOGY.** An introduction to the study of the reciprocal influence of minds in society upon one another. Prerequisites: Course 3 and one other course, and Course 1-2 or 5 in the department of Philosophy and Psychology. PETERSON.
119. **MODERN SOCIAL INSTITUTIONS.** Fundamental social institutions in their relation to human progress. TODD.
121. **SOCIAL PROBLEMS.** An advanced course of method and independent research. One hour. TODD.
123. **PROBLEMS IN ANTHROPOLOGY.** An advanced course of method and independent research. One hour. JENKS.

### SOILS

Professor FREDERICK J. ALWAY; Associate Professor ROSS A. GORTNER.

Students who register for graduate work in Soils are required to have had 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 required to take Geology 1 and 21 during their first year of graduate work.

101. **PHYSICAL PROPERTIES OF SOILS.** Mechanical analysis of soils; determination of physical constants; study in both laboratory and field, of the movement of water in soils. Three afternoons per week. ALWAY.
103. **ANALYSIS OF FERTILIZERS.** A laboratory course in the analysis of the different products used as fertilizers or as soil amendments. Three afternoons per week. GORTNER.
104. **CHEMICAL ANALYSIS OF SOILS.** The determination of the most im-

portant soil constituents by the various methods used both in the United States and in Europe. Five afternoons per week. GORTNER.

201-202. 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. ALWAY.

203-204. SEMINAR IN SOILS. Study of methods of investigation of soils, review of current literature, presentation and discussion of papers on research. Once a week. ALWAY.

### STRUCTURAL ENGINEERING

Associate Professor J. I. PARCEL; Assistant Professor F. R. McMILLAN.

#### COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

155. STRUCTURAL DESIGN. The complete detail design of a pin-connected steel railway bridge truss, with a study of specifications, office designing methods, etc. Three times per week. PARCEL.
156. STRUCTURAL DESIGN. A study of some of the more important features in the design of cantilever and arch bridges, large steel frame buildings, etc. Three times per week. PARCEL.
157. THEORY OF STRUCTURES. An elementary study of the theory of deflection and the general method of attack in the analysis of indeterminate frames. The theory is supplemented by numerous problems. Three times per week. PARCEL.
158. THEORY OF STRUCTURES. A continuation of 157, with especial attention to the application of the general methods of analysis to the continuous girder, the swing bridge and the arch. Three times per week. PARCEL.
159. PRINCIPLES OF REINFORCED CONCRETE CONSTRUCTION. Theory of reinforced concrete beams, slabs and columns; study of test data; applications in design. First semester, three meetings per week, lectures and recitations. McMILLAN.
160. REINFORCED CONCRETE DESIGN. Design of reinforced concrete buildings, retaining walls, foundations, abutments, viaducts and arches. Second semester, three meetings per week, lectures and drafting periods. McMILLAN.

#### PRIMARILY FOR GRADUATE STUDENTS

201. THEORY OF STATICALLY INDETERMINATE STRUCTURES. A detailed critical study of the fundamental theory and a comparison of the different methods of attack. Twice a week. PARCEL.
202. STATICALLY INDETERMINATE STRUCTURES. Arches, suspension bridges,

- secondary stresses, and certain special problems in indeterminate frames. Twice a week. PARCEL.
203. REINFORCED CONCRETE ANALYSIS. For those who have had equivalent of C. E. 157. Review of literature of reinforced concrete, study of test data and analysis of stresses in reinforced concrete structures. One or two semesters, twice a week. McMILLAN.

#### VETERINARY MEDICINE

Professor MYRON H. REYNOLDS.

- 201-202. PROBLEMS IN ANIMAL SANITATION. Losses to animal husbandry from disease. Causes and prevention of such losses. Organization of sanitary control work. REYNOLDS.
- 203-204. PROBLEMS IN PHYSIOLOGIC AND HISTOLOGIC FEATURES OF ANIMAL NUTRITION. Includes especially juices involved in the processes of nutrition.

# The University of Minnesota

COLLEGES OF SCIENCE, LITERATURE, AND THE  
ARTS, AND EDUCATION

## THE SUMMER SESSION

JUNE 14-JULY 23

1915



BULLETIN OF THE UNIVERSITY OF MINNESOTA  
VOL. XVIII, NO. 24, MARCH 1915

Entered at the Post Office  
in Minneapolis as second-class matter  
MINNEAPOLIS, MINN.

## ORGANIZATION OF THE UNIVERSITY

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

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS

THE DEPARTMENT OF AGRICULTURE, including--

THE COLLEGE OF AGRICULTURE

THE COLLEGE OF FORESTRY, including--

FOREST EXPERIMENT STATIONS AT ITASCA AND CLOQUET

THE CENTRAL SCHOOL OF AGRICULTURE, UNIVERSITY FARM

THE NORTHWEST SCHOOL OF AGRICULTURE, CROOKSTON

THE WEST CENTRAL SCHOOL OF AGRICULTURE, MORRIS

THE EXPERIMENT STATIONS, including--

THE MAIN STATION, ST. ANTHONY PARK

THE NORTHWEST EXPERIMENT STATION, CROOKSTON

THE NORTH CENTRAL EXPERIMENT STATION, GRAND RAPIDS

THE WEST CENTRAL EXPERIMENT STATION, MORRIS

THE NORTHWEST DEMONSTRATION FARM AND EXPERIMENT STATION, DULUTH

THE SOUTHEAST DEMONSTRATION FARM AND EXPERIMENT STATION, WASECA

THE FRUIT BREEDING FARM, ZUMBRA HEIGHTS

THE LAW SCHOOL

THE MEDICAL SCHOOL, including--

THE SCHOOL FOR NURSES

THE COLLEGE OF DENTISTRY

THE COLLEGE OF PHARMACY

THE SCHOOL OF MINES, including--

MINNESOTA SCHOOL OF MINES EXPERIMENT STATION

THE SCHOOL OF ANALYTICAL AND APPLIED CHEMISTRY

THE COLLEGE OF EDUCATION

THE GRADUATE SCHOOL

THE UNIVERSITY EXTENSION SERVICE, including--

GENERAL EXTENSION DIVISION

AGRICULTURAL EXTENSION DIVISION

## THE BOARD OF REGENTS

The Hon. FRED B. SNYDER, Minneapolis, President of the Board	1916
GEORGE EDGAR VINCENT, Minneapolis The President of the University	- - - - <i>Ex Officio</i>
The Hon. WINFIELD SCOTT HAMMOND, St. James The Governor of the State	- - <i>Ex Officio</i>
The Hon. C. G. SCHULZ, St. Paul The Superintendent of Education	- - - - <i>Ex Officio</i>
The Hon. PIERCE BUTLER, St. Paul	- - - - - 1916
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The Hon. W. J. MAYO, Rochester	- - - - - 1919
The Hon. MILTON M. WILLIAMS, Little Falls	- - - - - 1919
The Hon. JOHN G. WILLIAMS, Duluth	- - - - - 1920
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The Hon. A. E. RICE, Willmar	- - - - - 1921
The Hon. CHARLES L. SOMMERS, St. Paul	- - - - - 1921

## EXECUTIVE OFFICERS

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 ERNEST B. PIERCE, B.A., Registrar  
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 ELIAS POTTER LYON, Ph.D., M.D., Dean of the Medical School  
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 WILLIAM R. APPLEBY, M.A., Dean of the School of Mines  
 GEORGE B. FRANKFORTER, Ph.D., Dean of the School of Chemistry  
 GEORGE F. JAMES, Ph.D., Dean of the College of Education  
 GUY STANTON FORD, Ph.D., Dean of the Graduate School  
 RICHARD R. PRICE, M.A., Director of University Extension  
 MARGARET SWEENEY, Ph.D., Dean of Women

## THE SUMMER SESSION

### COLLEGES OF SCIENCE, LITERATURE AND THE ARTS, AND EDUCATION

#### FACULTY OF INSTRUCTION

- GEORGE E. VINCENT, Ph.D., LL.D., President of the University  
JEREMIAH S. YOUNG, Ph.D., Director, Summer Session; Political Science  
LINCOLN K. ADKINS, M.S., Mathematics  
WILLIAM T. ALLEN, M.A., Histology and Embryology  
FRANK AYDELOTTE, Litt. B., English and Rhetoric  
University of Indiana  
ROSS A. BAKER, Ph.D., Chemistry  
WILLIAM T. BAWDEN, Ph.D., Specialist in Industrial Education  
Bureau of Education, Washington, D. C.  
WILLIAM O. BEAL, Ph.D., Astronomy  
RICHARD O. BEARD, M.D., Physiology  
ALLEN R. BENHAM, Ph.D., English  
University of Washington  
GEORGE H. BETTS, Ph.D., Psychology and Education  
Cornell College, Iowa  
S. E. BOOMER,, M.A., Physics  
Southern Illinois State Normal University  
WALTER E. CAMP, B.A., Human Embryology  
SAMUEL A. CHALLMAN, B.A., Education  
Commissioner of School Buildings  
HARDIN CRAIG, Ph.D., English  
HANS H. DALAKER, B.A., Mathematics  
JESSE B. DAVIS, M.A., Vocational Education  
Grand Rapids High School, Michigan  
GERHARD DIETRICHSON, Ph.D., Chemistry  
JOHN FRANKLIN EBERSOLE, M.A., Economics  
CHARLES A. ERDMANN, M.D., Anatomy  
GEORGE B. FRANKFORTER, Ph.D., Chemistry  
DONALD FOLSOM, M.A., Botany  
J. THEODORE GEISSENDOERFER, Ph.D., German  
T. P. GIDDINGS, Public School Music  
Supervisor of Music, Minneapolis Public Schools  
WILLIS W. GRANT, Machine Work  
JOHN H. GRAY, Ph.D., Economics and Sociology  
THOMAS L. HARRIS, Ph.D., Sociology  
Carleton College



- ARTHUR T. HENRICI, M.D., Bacteriology  
 CHARLES M. HOLT, B.A., Reading  
 ELMER R. HOSKINS, M.A., Human Histology  
 CLARENCE M. JACKSON, M.S., M.D., Anatomy  
 LAMBERT L. JACKSON, Ph.D., Mathematics  
 Principal, Baldwin School, Montclair, N.J.  
 GEORGE F. JAMES, Ph.D., Education  
 ROY C. JONES, M.S., in Arch., Architecture  
 RAYMOND A. KENT, M.A., Education  
 HERBERT A. KELLAR, M.A., History  
 WILLIAM H. KIRCHNER, B.S., Mathematics  
 PAUL E. KLOPSTEG, M.A., Physics  
 AUGUST C. KREY, Ph.D., History  
 EDWARD M. LEHNERTS, M.A., Geology  
 RUPERT C. LODGE, M.A., Philosophy  
 ELIAS P. LYON, Ph.D., M.D., Physiology  
 R. M. MACLEAN, Education  
 State Graded School Inspector  
 LOUIS W. MCKEEHAN, Ph.D., Physics  
 JAY A. MYERS, Ph.D., Gross Human Anatomy  
 WALTER R. MYERS, Ph.D., German  
 HENRY NACHTRIEB, B.S., Animal Biology  
 EVERETT W. OLMSTED, Ph.D., French  
 CHAUNCEY J. V. PETTIBONE, Ph.D., Physiologic Chemistry  
 ANNA H. PHELAN, Ph.D., Rhetoric  
 JOSEPH B. PIKE, M.A., Latin  
 CHESLEY J. POSEY, M.A., Geography  
 CHARLES H. PRESTON, B.A., Economics  
 E. PROKOSCH, Ph.D., German  
 University of Texas  
 SARA RIVET, B.A., Botany  
 RASMUS SABY, Ph.D., Political Science  
 Cornell University, New York  
 RICHARD E. SCAMMON, Ph.D., Anatomy  
 FREDERICK A. SCOTT, Ph.D., D.Sc., Physiology  
 COLBERT SEARLES, Ph.D., French  
 EDWARD G. SIRICH, Ph.D., Spanish  
 CHARLES E. SKINNER, M.A., Rhetoric  
 HERMAN L. SLOBIN, Ph.D., Mathematics  
 ROY L. SOUTHWORTH, Manual Training  
 Minneapolis Public Schools  
 ANDREW A. STOMBERG, M.S., Scandinavian  
 FLETCHER H. SWIFT, Ph.D., Education  
 STERLING TEMPLE, M.A., Chemistry  
 MARGARET WARWICK, B.S., M.D., Bacteriology  
 ALBERT B. WHITE, Ph.D., History

## GENERAL INFORMATION

The University of Minnesota offers each year a considerable list of courses for summer work. They are planned for college students, for experienced teachers, and for other men and women who seek the advantage of advanced study.

### LOCATION

These summer courses are given on the main campus in Minneapolis, and the full equipment of the University in buildings, libraries, laboratories, observatory, and museums is at the service of students, who may in addition, under certain restrictions, use other large public and semi-public libraries both in St. Paul and in Minneapolis.

The climate of the city is especially favorable for summer residence, and in addition the vicinity offers much that is worthy the attention of visitors and students. The neighborhood of the Twin Cities is rich in natural beauty, while the cities themselves, with their parks, lakes, public buildings, libraries, and art galleries, afford students ample opportunities for the profitable use of leisure hours. Numerous personally conducted excursions will be arranged.

### ORGANIZATION

The summer courses are arranged not merely for college students, but also for the benefit of experienced teachers, particularly those who are seeking a State Professional Certificate or are looking forward to more specialized work. Courses have been organized, therefore, in nearly all of the required and optional subjects of the State Professional Certificate, while high school teachers will find an opportunity to pursue advanced courses in the subjects of the secondary curriculum. These courses will be conducted by trained specialists.

All of the courses offered carry university credit, and they amount to much more than the total number of hours required for the Bachelor's degree. By taking advantage of these opportunities, teachers and others who have not finished their university work may be enabled to meet a considerable part of the requirements for graduation. Earnest and capable college students, by combining summer study with the courses of the academic year, may, with no great difficulty, gain in three years the necessary credits for the Bachelor's degree.

## GRADUATE WORK

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. The rest of the residence needed to cover the academic year of thirty-six weeks may be completed after the thesis is begun by registering early and remaining in residence working under direction after the Summer Session has closed. 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.

Students who intend to offer work in the summer for an advanced degree should register for purposes of record with the Dean of the Graduate School.

Members of the Graduate Faculty may, with the approval of the Dean, offer summer work for graduate students apart from the work regularly listed in the Summer Session bulletin. Students taking such properly authorized summer work may be allowed by the Executive Committee to substitute it for an equal amount of residence during the academic year.

## INSTRUCTORS

To assist the members of the University Faculty, the following men have been engaged from other institutions: Frank Aydelotte, University of Indiana, in English and Rhetoric; William T. Bawden, Bureau of Education, Industrial Education; George H. Betts, Cornell College, Psychology and Education; Allen R. Benham, University of Washington, English; S. E. Boomer, Southern Illinois State Normal University, Physics; Samuel A. Challman, Commissioner of School Buildings, Education; Jesse B. Davis, Grand Rapids High School, Michigan, Vocational Education; T. P. Giddings, Supervisor of Music, Minneapolis Public Schools, Music; Lambert L. Jackson, Principal, Baldwin School, Montclair, New Jersey, Mathematics; R. M. MacLean, State Graded School Inspector, Education; E. Prokosch, University of Texas, German; Rasmus Saby, Cornell University, Political Science; and Roy L. Southworth, Minneapolis Public Schools, Manual Training.

Some of these men are authors of well known books as well as lecturers with a national reputation.

## GENERAL OFFICES

The office of the Director of the Summer Session is Room 103, Mechanic Arts. During registration days the Director and members of

the faculty may be found in the President's office. The offices of the Registrar and the Cashier are on the first floor of the Library building.

### ADMISSION

The courses of the Summer Session are open to all men and women who after consultation with the respective instructors are found qualified to pursue the chosen work to advantage, but those who desire to secure university credit are required to show credentials entitling them to college admission under the existing rules of the University.

### REGISTRATION

Registration will begin at nine o'clock on Friday morning, June 11 and continue until one o'clock Saturday afternoon, June 12. Class work will open on Monday morning, June 14. After Wednesday, June 16, no students will be received except by special permission. Those who desire to enroll will make application to the committee in the entrance lobby of the Library Building. Students are expected to bring with them their credentials showing from what schools they have been graduated, including particularly their diplomas from high schools, normal schools, or colleges, or their certificates of admission to, and work done in, each of those grades of schools.

When the applications are approved by the committee, the students will report to the Registrar. Those who desire credit toward the State Professional Teachers' Certificate will be careful to indicate their wish on the registration blank.

### CREDITS

Each course represents normally two periods daily for four days each week throughout the six weeks of the session, and carries three university credits. No student may secure more than six credits in the session except by permission of the Director.

Students who do not enroll for credit will be given, on application, certificates of attendance showing the character of the work done.

### HOURS

During the Summer Session each day is divided into periods as follows: a.m., first hour, 8:00-8:50; second, 9:00-9:50; third, 10:00-10:50; fourth, 11:00-11:50; p.m., fifth hour, 2:00-2:50; sixth, 3:00-3:50. As indicated elsewhere, each course takes usually two periods in succession, with merely a ten-minute rest between.

## GENERAL ASSEMBLY

A General Assembly of the faculty and students will be held on Tuesdays and Thursdays, 10 to 10:30 a.m. The exercises will include music, readings and short, snappy talks. On Tuesdays and Thursdays the third and fourth period classes will continue a half hour later.

## GENERAL LECTURES

A series of popular lectures open to the students, faculty, and the general public will be given at 4 p.m.

The lecturers will include President Vincent, members of the faculty, Superintendent Frank E. Spaulding of the Minneapolis Schools, E. M. Phillips, State High School Inspector, William T. Bawden, Specialist on Industrial Education, Abram Simon, a Jewish lecturer, and other noted speakers.

## EXAMINATIONS

At the close of the Summer Session examinations for the State Professional Certificate will be conducted at the University by the State Examining Board.

## PROFESSIONAL TRAINING OF TEACHERS

At the 1913 session of the Legislature the following act was passed: "From and after August 1, 1915, all candidates for teachers' certificates by examination, renewal, or endorsement of credentials, except those who have taught successfully for at least eighteen months in the public schools *prior to such date*, or those receiving a second or limited certificate, must have completed such a course of professional training for teaching not exceeding thirty-six weeks, as may be prescribed by the state superintendent. Training courses in the state university, in state normal schools, in state high schools, or in private schools fully and fairly the equivalent of those given in state schools and approved by the said superintendent shall be accepted as meeting the requirements for teachers' training under this section."

College graduates who wish to qualify as high school teachers, and who have not had the required teaching experience or professional training may qualify by attending two sessions, 1915 and 1916, of the University Summer School for the full term of six weeks. The work must total not less than six credits each session and must include:

1. Special study from the high school teachers' viewpoint during each summer session of some one subject which the candidate expects to teach.

2. One other general professional subject such as history of education, educational psychology, principles of teaching, general pedagogy,

school administration, or any other professional subject offered in the summer school.

A provisional certificate will be issued for some designated school upon satisfactory completion of one summer session of professional work and upon the recommendation of the dean of the college of education or of the Director of the Summer School. This certificate may be renewed as a professional certificate after one year's successful teaching and the completion of a second summer session of professional training and study in 1916.

### STATE PROFESSIONAL TEACHERS' CERTIFICATE

The State Professional Certificate of the first grade is issued to applicants who have secured a state first grade teachers' certificate, who have taught successfully not less than eighteen months in a public school in the State, and who have passed successfully examinations in the following studies: Psychology, General Pedagogy, History of Education, School Organization and Law; in at least two of the following: Higher Algebra, Solid Geometry, and Trigonometry; in at least two of the following: American Literature, English Literature, Rhetoric; in at least three of the following: Ancient History, Modern History, English History, United States History; in at least three of the following: Astronomy, Botany, Chemistry, Geology and Physiography, Physics, Political Science, Zoology.

Candidates for the above certificate may secure credit accepted by the State Department in Psychology, History of Education, General Pedagogy, School Organization, and in the laboratory sciences, Physics, Chemistry, Botany, and Animal Biology (Zoology). In no other subjects will credit be given directly, but the courses in the other studies required for this certificate will be planned with the idea of directly preparing students for the examinations conducted by the State Department.

Students taking subjects that may be applied towards a professional certificate, who receive in each subject a mark of at least one grade above the minimum required for passing in such subject, will be exempt from the state examinations in these subjects. Those failing to get such mark in any subject must take the professional examination in that subject.

### EXERCISE AND RECREATION

A special feature of the Summer Session is the use of Northrop Athletic Field and the entire equipment of the university gymnasium, including the swimming pool, tennis courts, baseball field, outdoor and indoor running tracks, and basket-ball and hand-ball courts.

### FEEES

Each student pays a registration fee of five dollars and a tuition fee of five dollars for each course, with an extra charge of three dollars for

each laboratory course. Some courses require a special fee. See departmental statements. All students are required to pay a post-office box rental fee of ten cents.

### EXPENSES

The living expenses for students at the University are never very high, and this is true especially for the Summer Session. Good accommodations for room and board may be had at from four to seven dollars per week. A list of boarding places, stating location and prices, will be sent to any address on application to the Registrar. It will usually be found more satisfactory to engage accommodations after arrival than to reserve them in advance. Several good restaurants are to be found in the immediate vicinity of the University.

### UNIVERSITY DORMITORY

During the Summer Session, Sanford Hall, the university dormitory for women students, will offer rooms at \$1.50 a week for a single room and \$1.80 a week for a double room. Reservations should be made early, certainly not later than May 30. Apply to the Registrar.

### SHEVLIN HALL

The study, reception, and rest rooms of Shevlin Hall, the university club house for women students, will be open for the accommodation of young women attending the Summer Session of 1915.

Meals for both women and men will be served in Shevlin Hall.

### UNIVERSITY POST-OFFICE

The university Post-Office, through which mail addressed to the University is distributed, is in the Mechanic Arts Building. Students are assigned post-office boxes at the time of registration, and should leave forwarding addresses with the postmaster at the close of the session.

### SUMMER COURSES IN MEDICINE

The Medical School of the University of Minnesota announces summer courses in a special bulletin which may be secured by application to the Registrar.

### COLLEGE OF AGRICULTURE SUMMER SESSION

The College of Agriculture offers summer courses. Bulletins may be had by addressing the Registrar, University Farm, St. Paul, Minnesota.

SUMMER COURSES IN DENTISTRY

A Summer Course of two months is offered in the Departments of Anatomy, Dental Anatomy, Chemistry, Crown and Bridge Work, Operative Dentistry, Orthodontia, Physiology and Prosthetic Dentistry, by the College of Dentistry.

TEACHERS' SUMMER TRAINING SCHOOL

The work formerly conducted for graded and rural school teachers in the elementary section of the University Summer School is given now as a special state teachers' training school at the University Farm. For bulletin, address the Registrar, University Farm, St. Paul, Minnesota.

INFORMATION

Correspondence with reference to the Summer Session and requests for circulars and additional information may be addressed to the Registrar, University of Minnesota, Minneapolis, Minnesota.



## COURSES OF INSTRUCTION

### ANATOMY

MR. ALLEN, MR. CAMP, MR. ERDMANN, MR. HOSKINS, MR. JACKSON, MR. MYERS and MR. SCAMMON

Lectures and laboratory instruction in the Institute of Anatomy. Laboratories open from 8 a.m. to 5 p.m. (The fees charged are on the basis of \$5 for a three credit course.\* Laboratory fees are on the basis of \$3 for a three credit course.)

3-4s. Gross Human Anatomy MR. MYERS

Daily 8-12. 192 hours. Five credits.

Dissection, including osteology of head, neck and upper extremity; or thorax, abdomen and lower extremity. Extra fee for dissecting material, \$15; or \$7.50 each if two students work together. Prerequisite: General Zoology.

\*51s. Human Histology MR. HOSKINS and MR. CAMP

Daily 1-5. 160 hours. Five credits.

Microscopic study of the various tissues and organs. Laboratory work, lectures and recitations. Prerequisite: General Zoology, Animal Biology 7-8.

\*52s. Human Embryology MR. HOSKINS and MR. CAMP

Daily 2-4:30. 96 hours. Three credits.

A study of the development of the human body. Lectures and laboratory work.

\*55s. Human Neurology MR. ALLEN

Daily 2-4. 96 hours. Three credits.

A study of the central nervous system and sense organs. Lectures and laboratory work. Prerequisite: Courses 51 and 52.

11s. Anatomical Technique. MR. ALLEN

Daily 2-4:30. 96 hours. Three credits.

A study of the central nervous system and sense organs. Lectures and laboratory work. Prerequisite: Courses 51 and 52.

\*Except for medical students. See Bulletin of Medical School.

- 111s. Anatomical Technique MR. ALLEN  
 Daily 2-4:30. 96 hours. Three credits.  
 Microtechnique, general and special, reconstruction methods, etc.  
 Prerequisite: General Zoology.
- \*114s. Topographic Anatomy MR. ERDMANN  
 8-12, T., W., Th., F. 96 hours. Three credits.  
 A study of the position and relations of the various organs based  
 upon cross sections of the human body. Lectures and laboratory work.  
 Prerequisite: Course 3-4.
- 119-120s. Advanced Anatomy—Special Dissections MR. ERDMANN  
 8-12, T., W., Th., F. 96 hours. Three credits.  
 (Additional fee for dissecting material, \$5 to \$25, depending upon  
 the region selected.) Prerequisite: Course 3-4.
- 201-202s. Research in Anatomy MR. JACKSON and MR. SCAMMON  
 Hours and credits to be arranged.  
 Research work in anatomy, histology or embryology is offered to  
 properly qualified students, to be admitted only after consultation with  
 the instructors.

## ANIMAL BIOLOGY

MR. NACHTRIEB

- 1s. General Zoology MR. NACHTRIEB  
 Pillsbury Hall 201 and 204. 8-9:50 a.m. Laboratory hours arranged  
 with the instructor. Three credits.  
 This course will cover the first half of the university year course  
 and will meet the requirements of the State Professional Certificate for  
 Zoology.  
 The course is planned with special reference to teachers and will in-  
 clude simple methods of collecting and preparing material for demonstra-  
 tion and preservation.
- 143s. Genetics MR. NACHTRIEB  
 Pillsbury Hall, 201 and 204, 10-12 a.m. Three credits.  
 An advanced course covering a study of germ cells and the facts and  
 principal theories of heredity. Lectures and Laboratory.  
 This course carries credits for one semester of advanced work in  
 the Department of Animal Biology.
- 161s. Research Course MR. NACHTRIEB  
 Hours and credits to be arranged.  
 Graduate students and seniors with the necessary preparation may  
 undertake research in some selected field.

## ARCHITECTURE

MR. JONES

The following courses in Architecture are offered primarily for the benefit of those who plan to take up the study of architecture with advanced credits in other subjects, and who would otherwise be irregular in standing by reason of deficiencies in the earlier required architectural subjects.

Ordinarily, by reason of necessary sequence, the architectural studies cannot be condensed into shorter space of time than that regularly scheduled, even though a student may have time for extra work by reason of advanced credit in other required subjects.

Students who are deficient for any reason in the subjects offered may also avail themselves of this opportunity to make up their deficiencies.

Architectural draftsmen, who find themselves unable to register for the work of the regular school year, will find this an opportunity to condense the elementary work of the architectural course into the shortest possible space of time.

31s. or 32s. Elements of Architecture MR. JONES  
Main Engineering Building, 320, hours arranged. Three credits.

This course covers the same ground as Architecture 31 or 32 of the regular course, architectural drawing and lectures on the elements of architecture; eighteen hours drawing and three lecture periods each week. Fee \$7.50.

33s. or 34s. Architectural Design MR. JONES  
Main Engineering Building, 320, hours arranged. Four credits.

This course covers the same ground as Architecture 33 or 34 of the regular course, elementary problems in composition, drawing and rendering; twenty-four hours drawing each week. Fee \$10.

21s, 22s, 23s, or 24s. Freehand Drawing MR. JONES  
Main Engineering Building, 320, hours arranged. Two credits.

This course covers the same ground as Architecture 21, 22, 23 or 24, twelve hours drawing each week; students who are prepared may register for any one or more of these courses. Fee \$5.

The courses in Architecture will be offered if there are sufficient registrations.

## ASTRONOMY

MR. BEAL

11s. General Astronomy MR. BEAL  
Folwell Hall, 124, 10-11:50 a.m. Observatory work in the evening, as arranged. Three credits.

A course of lectures and recitations on the general principles of astronomy, illustrated by lantern slides and by the use of the telescope. Textbook: Moulton's *Introduction to Astronomy*.

This course carries university credit for Astronomy 11.

This course will be offered if there are sufficient registrations.

### GENERAL BACTERIOLOGY

MR. HENRICI and MISS WARWICK

Institute of Public Health and Pathology, daily 9-12 a.m. (The fees charged are on the basis of \$5 for a three credit course.\* Laboratory fees are on the basis of \$3 for a three credit course.)

58s. General Bacteriology MR. HENRICI or MISS WARWICK and Assistant  
90 hours. Three credits.

Lectures and demonstrations; laboratory work in the making of culture media; the study of bacteria in cultures and under the microscope; the technique of staining and other methods; observation of chemical and biological characteristics. The study of germicides and the use of bac- Particular attention is paid to the adaptations of plants for propagation be an important part of the course.

### BOTANY

MR. FOLSOM and MISS RIVET

121s. Teachers' Course MISS RIVET  
Greenhouse, 8-9:50 a.m. Occasional field trips in the afternoon or on Saturday morning. Three credits.

This is essentially the regular teachers' course without the practice teaching. Particular attention is given to methods of presenting the subject from the viewpoint of every-day life, and of training the student to become an independent observer and thinker. Especial emphasis is laid upon school garden and field methods by actual practice, and upon the outlining of a high school course. Since method and subject matter are inseparable, teachers are strongly urged to take General Botany 1 in connection with this course, in order that the two courses may be constantly correlated.

This course combined with the next will meet the requirements for Botany toward the State Professional Certificate. The course carries university credit for Botany 121.

1s. General Botany MR. FOLSOM and MISS RIVET  
Greenhouse, 10-11:50 a.m. Occasional field trips in the afternoon or on Saturday morning. Three credits.

\*Except for medical students. See Bulletin of Medical School.

Laboratory, garden and field study of the forms and behavior of the common flowering plants, including the forms and functions of stems, leaves, roots, flowers, fruits and seeds, with especial emphasis upon flower forms and family types. This course is closely correlated with the preceding, and teachers or those expecting to teach are strongly urged to register for both.

This course combined with the Teachers' Course will meet the requirements for Botany toward the State Professional Certificate. In special cases, it may be combined with the following course to meet the same requirement. This course carries university credit for Botany 1, and combined with the following course gives six credits for Botany 1-2.

2s. General Botany MR. FOLSOM and MISS RIVET  
Three afternoons a week, four hours each, Monday, Wednesday and Friday. Three credits.

Field and garden study of the classification and adaptations of flowering plants, with special training in the identification of the common plants of field, forest and garden, and in the recognition of family types. Particular attention is paid to the adaptations of plants for propagation and pollination, and to the concrete evidences of evolution.

In special cases, this course may be combined with courses 1 and 2 to meet the requirements in Botany toward the State Teachers' Certificate. It carries university credit for Botany 2, and combined with the preceding gives six credits for Botany 1-2.

## CHEMISTRY

MR. BAKER, MR. DIETRICHSON, MR. FRANKFORTER and MR. TEMPLE

1s. General Chemistry MR. BAKER  
Chemistry Building, first three weeks, 8-9:50 daily. Other hours to be arranged. Three credits.

This course is the equivalent of Course 1 as offered in the University during the first semester of the academic year, and is designed primarily for those who have had no preliminary training in chemistry. It will consist of experimental lectures, recitations and laboratory work. The fundamental laws and theories of chemistry will be developed, and special emphasis will be placed upon stoichiometry.

2s. General Chemistry MR. BAKER  
Chemistry Building, last three weeks, 8-9:50 daily. Other hours to be arranged. Three credits.

This course is the equivalent of Course 2 as offered in the University during the second semester of the academic year. Prerequisite: Course 1. It will consist of experimental lectures, recitations and laboratory work, and will cover in general the chemistry of the metals. Particular emphasis will be placed upon the industrial applications of chemistry.

Courses 1 and 2 combined will meet the requirements in chemistry for the State Professional Certificate.

## 3s. Advanced General Chemistry and Qualitative Analysis

MR. DIETRICHSON

Chemistry Building, first three weeks, 8-9:50 daily. Other hours to be arranged. Three credits.

This course is the equivalent of Course 3 as offered to students in the College of Science, Literature, and the Arts, and Agriculture, of Course 5 in the Schools of Chemistry and Mines, and of Course 25 in the College of Engineering, during the first semester. The course will consist of experimental lectures, recitations, and laboratory work. It will include a systematic study of the non-metals in connection with which the Periodic System will be largely made use of. The course will also include a thorough consideration of the fundamental laws and theories of chemistry, special emphasis being given to their applications in stoichiometrical calculations.

## 4s. Advanced General Chemistry and Qualitative Analysis

MR. DIETRICHSON

Chemistry Building, last three weeks, 8-9:50 daily. Other hours to be arranged. Three credits.

This course is the equivalent of Course 4 as offered to students in the College of Science, Literature, and the Arts, and Agriculture, of Course 6 in the Schools of Chemistry and Mines, and of Course 26 in the College of Engineering, during the second semester. The laboratory work will consist of the qualitative analysis of the metals and acid radicals. The lectures and recitations will include a discussion of the qualitative analysis procedures and also the descriptive chemistry of the metals. In connection with the latter the Periodic System will again be largely made use of.

## 5s. Organic Chemistry

MR. FRANKFORTER

Chemistry Building, Hours 8-9:50. Other hours to be arranged. Three credits.

An outline of the chemistry of carbon including both the aliphatic and aromatic series. In addition to a general discussion of the important organic theories and laws, special attention will be given to the subject as applied to every day life. The pedagogical side will also receive special attention. Recitations and lectures will be supplemented by laboratory work, including the preparation of the more important organic compounds. The course is equivalent to Courses 111-112 in the College of Science, Literature, and the Arts, and the School of Chemistry; also Courses 13-14 for the Medical School.

## 6s. Quantitative Chemistry

MR. FRANKFORTER

Chemistry Building, 10-10:50. Other hours to be arranged. Six credits.

A general presentation of the methods of quantitative analysis. The course will include a discussion of the chemical balance with special ref-

erences to the use and care of the balance. The various processes in gravimetric work as precipitation, filtration, washing, drying and ignition, will be discussed. In the volumetric work, the theory of solutions will be taken up in addition to normal and standard solutions, as used in volumetric analysis. This course is equivalent to Courses 11-12 in the College of Science, Literature, and the Arts, and also in the Schools of Chemistry and Mines.

20s. Teachers' Course in Chemistry MR. TEMPLE  
Chemistry Building, 10-10:50. Other hours to be arranged. Three credits.

This course includes a comparison of the standard texts in High School Chemistry, a study of the buying and installation of apparatus and equipment, simple exercises in the repairing of laboratory apparatus, lectures and recitations on the methods of presenting the main theories and various types of problems to elementary classes and of connecting as far as possible the study of chemistry with the common facts of every day life.

### ECONOMICS

MR. EBERSOLE, MR. GRAY and MR. PRESTON

1s. Elements of Economics MR. EBERSOLE  
Folwell Hall, 102, 10-11:50 a.m. Three credits.

Characteristics of the present economic system including a survey of land, labor, capital, and organization as essential factors in production; value, and prices as influenced by money and credit. Foreign trade and protective tariffs; distribution of wealth and income; social reform. Discussion of problems based on readings in Taussig's volume 1 and the Materials for Economics.

This course carries university credit for Economics 1a.

This course and Political Science 1, 8 and 3 prepare students for the State Professional Teachers' Examination in Political Science.

35s. Principles of Accounting MR. PRESTON  
Mechanic Arts Building, 109, 8-9:50 a.m. Three credits.

A fundamental course consisting of the principles underlying the science of accounting and the practical application of these principles. The aim of the course is to study accounting from the standpoint of first, the business statement, and second, the most economical method of recording the facts necessary for that statement. The point of view of the high school instructor in bookkeeping will be presented. As the business men of the smaller cities and towns are interested in retail merchandising, emphasis will be placed upon practical retail accounting. To illustrate the principles under discussion, use will be made of the system prepared by a committee on store accounting appointed at the first Merchants' Short Course held at the University.

Topics: The purpose of accounting; the main classification of accounts; single entry accounting and its limitations; the principles of double entry, and the application of these principles to the books of original entry; the trial balance; the balance sheet and profit and loss statement; the customers' ledger and its control in the general ledger; the special column cash book and purchase record; analysis of the trading accounts.

This course carries university credit for Economics 35.

This course will be offered if there are a sufficient number of registrations.

7s. Modern Industrial History MR. GRAY

Folwell Hall, 107, 8-9:50 a.m. Three credits.

Economic effects of inventions, wars, political changes, increased supply of precious metals, improved transportation and modifications of business organization in England since the industrial revolution.

This course carries university credit for Economics 7.

44s. Banking MR. EBERSOLE

Folwell Hall, 102, 8-9:50 a.m. Three credits.

Banking institutions, both national and state, their organization and operation, including reserves, note issues, clearing houses, domestic and foreign exchange, profits, and lending policy. Banking systems of foreign countries compared with the Federal Reserve System. Government guarantee of deposits and notes. The money market and discount rate. Current problems of banking reform, including agricultural credit and social control of banking institutions.

This course carries university credit for Economics 44.

\*186s. Socialism and Social Reform MR. GRAY

Folwell Hall, 107, 10-11:50 a.m. Three credits.

Economic Utopias from Plato to Proudhon. Special attention to the theory, history and practical significance of socialism. Historical causes of socialism and various schools of socialistic thought. Modern non-socialistic programs of social amelioration. This course may count towards a degree in either Economics or Sociology.

Properly prepared students may obtain graduate credit in this course by doing extra work in it.

\*257s. Research Problems in Economics MR. EBERSOLE

Hours and credits to be arranged.

Properly prepared students will be guided in their research.

\*259s. Research Problems in Economics MR. GRAY

Hours and credits to be arranged.

Properly prepared students will be guided in their research.



## EDUCATION

MR. BETTS, MR. CHALLMAN, MR. DAVIS, MR. GIDDINGS, MR. HOLT, MR. JAMES, MR. KENT, MR. MACLEAN, MR. SOUTHWORTH, and MR. SWIFT

## GUIDANCE IN SELECTION OF COURSES

*Graduate Students:* Students wishing to work upon problems immediately concerned with the writing of a graduate thesis are advised to consult with Mr. Swift, chairman of the sub-committee of the Graduate School for the Departments of Philosophy, Psychology, and Education.

*Undergraduates:* Beginning with September, 1915, the Department of Education will require that the fifteen credits required of all university students, candidates for the University State Teachers' Certificate, be distributed as follows: History of Education, three credits; Principles of School Practice, three credits; The High School as a Social Institution, Its Organization and Administration, three credits; Special Methods covering at least two subjects, three credits; Practice Teaching, three credits. Reference to the courses named below, supplemented by conference with the instructors will make clear how these requirements, with the exception of Practice Teaching, may be fulfilled during the summer session. An introductory course in Psychology will be required as a prerequisite for all courses in Education.

*Candidates for State Professional Certificate:* For guidance in the selection of courses relating to this certificate, consult statement on page—

*Superintendents and Graded School Principals:* It is probable that within a year the State High School Board will require that prospective superintendents and principals of graded schools who have not had at least two years' experience in a supervisory position in a school of at least two departments must, before entering upon their duties, have had courses in School Administration and School Supervision in some recognized normal school or college, totaling at least five semester credits. The following courses will be credited toward this requirement: 121s, 141s, 143s and 144s. 121s is a general introduction to all other courses in School Administration and is especially recommended to those beginning a study of this field.

## I. HISTORY OF EDUCATION

- 1s. History of Education to the Reformation MR. JAMES  
Education, 206, 8-9:50 a.m. Three credits

The purpose of the course is to arouse an interest in educational problems, to secure some perspective for use in current investigation, with some command of the facts of educational history and some ease in the methods of historical study. Education as a phase of civilization and the connection of schools with other social institutions.

This course carries university credits for Education 1 and may be counted toward the State Professional Teachers' Certificate.

3s. A Brief Course in the History of Education MR. SWIFT  
Education 205, 8:00-8:50 a.m. Three credits.

A study of current school problems and educational theories in the light of their history. The purpose of this course is to make intelligible the present school situation through an historical study of present educational standards, institutions, practices, and theories.

A term paper representing work equivalent to three additional hours per week will be required of every student. A period for consultation with reference to the term paper will be arranged.

Students will be required to purchase two texts: (1) Monroe, Paul, *Brief Course in the History of Education*, Macmillan, \$1.25; (2) Quick, R. H., *Educational Reformers*, D. Appleton & Co., \$1.30.

This course carries credit for the History of Education toward the State Professional Certificate and also university credit for Course 3 in Education.

132s. Selected Problems in Educational History MR. SWIFT  
Education 214, T., Th., 4:00-4:50 p.m. Two credits.

A seminar course for advanced students; devoted to the historical investigation of selected problems in education. Designed especially for those working for advanced degrees.

Prerequisite: A general course in the History of Education.

This course carries a university credit for Course 132 in Education. Open to seniors and graduates.

## II. PRINCIPLES OF EDUCATION

101s. Principles of Method. MR. BETTS  
Education 204, 8:00-9:50 a.m. Three credits.

The place of method in the science of education. Psychological versus logical method. Factors involved in method. The application of the principles of method to high school subjects; to elementary subjects. The method of the recitation.

Prerequisite: At least three credits in Psychology.

This course carries credit on General Pedagogy for the State Professional Certificate and also university credit for Course 101 in Education.

Open to juniors and seniors.

## III. EDUCATIONAL PSYCHOLOGY

14s. Educational Psychology MR. BETTS  
Folwell Hall 202, 10-10:50 a.m. Two credits.

For full description see statement under Department of Philosophy and Psychology.

## 110s. Problems in Educational Psychology

MR. BETTS

Folwell Hall, 202, 2:00-2:50 p.m. M., W., F.

An advanced course for seniors and graduate students. This course is designed primarily for students who wish to do work in problems of educational psychology counting toward a graduate degree. This course carries two university credits in Education or in Psychology for Course \*112. Advanced Educational Psychology.

## IV. SCHOOL ADMINISTRATION

## 121s. School Administration MR. CHALLMAN, MR. DAVIS, MR. MACLEAN

Education 115, M., T., W., Th., F., 11:00-11:50 a.m., and M., W., F., 2:00-2:50 p.m. Three credits

This course will consist of three parts to be handled respectively by the three instructors. This course is designed especially for Superintendents and Principals. The portion of the course dealing especially with the high school will be conducted by Mr. Davis; the portion dealing especially with the elementary school, by Mr. Challman; and a third portion dealing with certain significant problems drawn immediately from the field, by Mr. MacLean.

Reports of prescribed readings will be required weekly.

This course carries credit for (1) School Organization and Law on the State Professional Certificate, (2) School Administration and Supervision as required by the State Department of Education of all superintendents and principals of graded schools who have had less than two years' previous experience; and (3) university credit in the field of School Administration.

Open to seniors, graduates and other properly qualified students.

## 143s. The American Public School

MR. KENT

Education 113, 8:00-9:50 a.m. Three credits.

A survey of the present public schools of the United States with special reference to recent well defined changes and tendencies affecting the aim and content of the elementary and secondary school. The work will consist of lectures, assigned readings, discussion and reports.

Prerequisites: Open only to those having had Education 3, or an equivalent in the History of Education.

This course carries credit for (1) School Organization and Law on the State Professional Certificate, (2) School Administration and Supervision as required by the State Department of Education of all superintendents and principals who have had less than two years previous experience, (3) university credit in the field of School Administration.

## 144s. The High School as a Social Institution

MR. KENT

Education 113, 10:00-11:50 a.m. Three credits.

The High School as a community factor; its influence upon the community, the community's influence upon the High School; its present

peculiar relations and underlying reasons for the same; its functions in these relations; its opportunities in this field.

The work will consist of lectures, assigned readings, discussions and reports.

Prerequisite: Registration only by consent of the instructor.

This course carries credit for School Organization and Law on the State Professional Certificate and also university credit for Course 11 in Education.

#### V. COMPARATIVE STUDY OF SCHOOL SYSTEMS

124s. Comparative Study of School Systems MR. JAMES  
Education, 206, 10-11:50 a.m. Three credits.

The school systems of Germany, France, England, and the United States, with special reference to principles and methods of administration; elementary, secondary, and higher institutions.

This course carries university credit for Education 124.

#### VI. SCHOOL SANITATION AND HYGIENE

141s. School Sanitation MR. CHALLMAN  
Education 205, 10:00-11:50 a.m. Three credits.

Physical welfare of children as affected by conditions of lighting, acoustics, heating, ventilation, plumbing, nature of school tasks, seating, cleanliness, play-grounds, and personal care of body. Open air schools, medical supervision, provisions for exceptional children, laws and regulations relating to child welfare and school conditions.

This course carries credit for Course 141 in Education.

Open to seniors, graduates and other properly qualified students.

#### VII. VOCATIONAL GUIDANCE

145s. Vocational and Moral Guidance MR. DAVIS  
Education 115, 8:00-9:50 a.m. Three credits.

This course is designed for all who are interested in the problem of directing boys and girls toward their life work through education. It is also of special value to superintendents, principals, and teachers of English. Those who may aim to become vocational counselors or advisers of youth will obtain direct training in the work.

The following are among the most important topics to be included in the course:

Vocational guidance defined. The problem stated. Relation of vocational and moral guidance. Vocational direction through education. The vocationalized curriculum. Vocational surveys. Vocational analysis. Choosing a vocation. Vocations and avocations. Vocational counseling. The problem of placement. The vocation bureau. Application of vocational guidance principles.

The work of the course will consist in original investigations, reports on vocations, etc.

This course carries three university credits in Education.

Text (to be purchased by all students) Davis, *Vocational and Moral Guidance*.

Open to seniors, graduates and other properly qualified students.

#### VIII. METHODS

1. General Method—See above, Education 101s. Principles of Method.
2. Special Methods of Teaching High School Subjects.

A full description of each course appears elsewhere in this bulletin in connection with the work of the department concerned. Special attention is called to the recent ruling of the State Department of Education which requires courses in special methods of at least two different high school subjects and totaling at least three credits for all applicants for the State Professional Teachers' Certificate.

Department	Course No.	Credits	Instructor
Biology .....	1s	3	Nachtrieb
Botany .....	121s	3	Miss Rivet
Chemistry .....	20s	3	Temple
English .....	80s	3	Aydelotte
French .....	1s	3	Olmsted
Geography .....	30s	3	Posey
German .....	60s	3	Prokosch
History and Government.....	16s	2	Krey
Latin .....	53s	2	Pike
Latin .....	55s	1	Pike
Manual Training .....	2s	2	Southworth
Mathematics .....	54s	3	Jackson
Music .....	27s	3	Giddings
Physics .....	92s	2	Boomer
Physiology (Elementary) .....	3s	3	Lyon
Rhetoric .....	41s	3	Aydelotte
Vocal Expression .....	19bs	1½	Holt

#### IX. MANUAL TRAINING

##### as. Introductory Course

MR. SOUTHWORTH

A general course in Manual Training designed primarily for those who have had no preparation in this field. The character of the course will, however, be modified to meet the needs of individual students, and will be organized in such a way as to meet the needs of more advanced students should there be any considerable registration calling for this type of work.

This course will carry three credits in the College of Education toward preparation for teaching manual training.

Text-book, Wm. Noyes, *Handwork in Wood*. Price \$2.00. Manual Arts Press, Peoria, Illinois.

bs. Methods and Organization of Manual Training      MR. SOUTHWORTH  
11:00-11:50, M., T., W., Th., F. Two credits.

This course will deal with the aims and organization of a course of study in manual training as viewed from its place in the general school curriculum. It will endeavor to show how to organize a course of study for school systems in which manual training extends throughout the grade schools and the high school, and also for school systems in which manual training is confined to the high school only, or to a portion of the high school course. The educational significance of manual training, its correlation with other subjects in the curriculum, and a critical study of the most prominent methods of teaching manual training are among the most important topics to be treated in this course.

This course carries two credits in the College of Education toward the preparation of manual training teachers.

#### X. PUBLIC SCHOOL MUSIC

27s. Public School Music      MR. GIDDINGS  
Music Building. 10:00-11:50 a.m. Three credits.

This course is for supervisors of music, for students who wish to become supervisors, for teachers who wish to specialize in music. The work in each grade and in the high school will be taken up with reference to material used, methods of presentation and results to be required. The care, growth, and proper use of the child voice will receive careful attention. Testing of voices in the upper grades will be demonstrated. A comparative study of the different prevailing methods of school music teaching will be a part of the course.

This course carries university credit for Course 27 in Education.

#### XI. VOCAL EXPRESSION

19as. Vocal Expression: Reading      MR. HOLT  
Education 204, 10:00-10:50 T., W., Th., F. One and one-half credits.

(a) A general course in vocal expression for the average student who wants to improve his effectiveness as a speaker or teacher. Some time will be given to drill in correct breathing, elementary sounds, and a good standing position, but for the most part the work will consist of daily practice in reading before the class short selections from standard literature, prose, and poetry, to improve the student's expression. The course aims at simplicity, naturalness, and earnestness in expression, with great emphasis on correct and sympathetic interpretation.

One and one half university credits for Education 19a will be given to students who complete this course.

19bs. Methods of Teaching Vocal Expression MR. HOLT  
 Education 204, 11:00-11:50 a.m. T., W., Th., F. One and one-half credits.

An advanced course, open only to those who are taking section 19as or who have completed its equivalent. Designed especially for high school teachers of English and Rhetoric and for teachers of vocal expression.

The work consists in reading some of the classics used in high schools, including at least one Shakespearean play, the presentation of complete platform readings before the class, methods for coaching recitations and orations for high school and college contests, and methods for the selection and presentation of plays for high schools and colleges.

One and one half university credits for Education 19b will be given to students who complete this course.

## XII. EDUCATIONAL COURSES IN OTHER COLLEGES AND DEPARTMENTS

### *Agricultural Education*

All courses dealing with agricultural and rural education except the course in Rural Sociology named below will be offered at the Agricultural College. For complete description consult the Agricultural College Summer Session Bulletin which may be secured by writing to the Registrar, University Farm, St. Paul. For complete description of the course in Rural Sociology, see Department of Sociology, page 28, of this bulletin.

### *Home Economics*

The courses in Home Economics are offered at the Agricultural College. For complete description consult the Agricultural College Summer Session Bulletin.

### *Normal Training Departments in High Schools*

A course for training teachers to head Normal Training Departments in High Schools will be offered at the Agricultural College under the direction of Miss Mabel Carney. The satisfactory completion of this course will entitle those who have the preparatory work necessary to matriculate in the College of Education, to six university credits. For complete description of this course consult the Summer Bulletin of the State Teachers' Training School, copies of which may be had upon application to the Registrar, University Farm, St. Paul.

## ENGLISH

MR. AYDELOTTE, MR. BENHAM and MR. CRAIG

1-2s. General Survey of English Literature (from beginning to Robert Burns) MR. BENHAM

Folwell Hall, 305, 8:00-9:50 a.m. Three credits.

Lectures, recitations and assigned readings. Designed to cover the whole period in historical outline, and to prepare for a more minute study of special periods.

In combination with the following this course gives a direct preparation to candidates for the examinations on English and American Literature toward the State Professional Certificate.

This course carries university credit for English 1.

Open to sophomores, juniors and seniors.

1-2s. General Survey of English Literature (from Wordsworth to the present day) MR. BENHAM

Folwell Hall, 305, 10:00-11:50 a.m. Three credits.

This course is a continuation of the preceding and is conducted in the same manner. Attention will be centered on English and American literature in the 19th century.

In combination with the preceding, this course gives a direct preparation to candidates for the examinations on English and American Literature toward the State Professional Certificate.

This course carries university credits for English 2.

Open to sophomores, juniors and seniors.

\*55s. Shakespeare

MR. CRAIG

Folwell Hall, 205, 8:00-9:50 a.m. Three credits.

An introductory study of Shakespeare's development as a poet and dramatist, with reading of representative plays.

This course carries university credit for English 55.

Open to juniors and seniors.

80s. Teachers' Course

MR. AYDELOTTE

Folwell Hall, 204, 10:00-11:50 a.m. Three credits.

The teaching of English literature and composition: An analysis of some of the problems confronting the teacher of English with suggestions towards their solution. Among the questions considered will be: the study of literature versus the enjoyment of it; literature as training in thought; the treatment of literary history and biography; literature and science; liberal and utilitarian values in literary study; the relation of literature to composition; mechanical correctness versus thought; standards of usage; slang, colloquialisms, "business English"; interest in theme writing; the correlation of literature and composition.

Lectures, assigned reading and class discussion.

\*132s. Thomas Carlyle

MR. AYDELOTTE

Folwell Hall, 204, 8:00-9:50 a.m. Three credits.

A careful study of Carlyle's work with special reference to (a) his literary criticism, (b) his utterances on social and economic questions, and (c) his historical method and his doctrine of the Hero.

Lectures, assigned reading, papers, and class discussion.



This course carries university credit for English 132.  
Open to juniors, seniors and graduates.

- 68s. English Prose Fiction MR. CRAIG  
Folwell Hall, 205, 10:00-11:50 a.m. Three credits.  
The origin and development of the English novel with the study of modern examples. Written reports on selected novels.  
This course carries university credit for English 68.  
Open to juniors, seniors and graduates.

- 130s. Graduate Study in English MR. CRAIG  
The Department of English will undertake the direction of graduate students who are engaged in the study of approved topics in various fields. Students should consult the chairman of the department.

## FRENCH

MR. OLMSTED and MR. SEARLES

- 1s. Beginning Course MR. OLMSTED  
Folwell Hall, 201, 9:00-9:50 a.m., M., T., W., Th., F. and 2:00-2:50 p.m., M., W., F. Three credits.  
This course is intended for beginners in French and for teachers of the language who desire to follow the course for method. Particular attention will be given to the teaching of pronunciation by the aid of phonetic symbols, to a systematic presentation of grammar, to conversation and to reading. A modified direct method will be used throughout the course.  
The text-book employed will be Olmsted's *French Grammar*.  
This course carries university credit for French 1.

- 5s. Advanced Course MR. SEARLES  
Folwell Hall, 226, 9:00-9:50 a.m., M., T., W., Th., F. and 2:00-2:50 p.m., M., W., F. Three credits.  
A study of French literary development, beginning with the classic movement of the seventeenth century. This course is designed especially for teachers and for those who may wish to review and strengthen their acquaintance with modern French literature by a historical survey coupled with a critical study of some of the most important works. Facility in reading French is a prerequisite.  
This course carries university credit for French 5.

- 111s. Research in Romance Languages MR. OLMSTED and MR. SEARLES  
Hours and credits to be arranged.  
Graduate students with necessary preparation may undertake research in some selected field.

## GEOLOGY AND GEOGRAPHY

MR. LEHNERTS and MR. POSEY

## 30s. General Geography

MR. POSEY

Pillsbury Hall, 110, 8:00-9:50 a.m. Three credits.

A consideration of the principles of physiography together with a study of the different types of environment in their relation to life and human affairs. Topographic map work and field excursions.

This course is designed especially for teachers who give courses in high school geography. To this end material desirable for a high school course will be considered briefly.

## 29s. Physiography

MR. POSEY

Pillsbury Hall, 110, 10:00-11:50 a.m. Three credits.

Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology; laboratory conferences on interpretation of topographic maps; field excursions.

This course is adapted to teachers who wish a detailed study of the subject and to those who wish to pursue further courses in geology.

This course carries university credit for course 29.

## \*289s. Research Problems in Geography

MR. POSEY

Opportunity will be offered to those who are prepared to do semi-independent work in geography or in physiography to take up such work as seems desirable. Credits allowed will be according to the amount of work done.

## \*188s. Field Course in Geography

MR. LEHNERTS

A six weeks' course; four weeks in the field, observing and interpreting geographic and geologic phenomena, and two weeks at home, preparing a written report based on the field studies. Six credits for the full course, either tour "A" or tour "B", or three credits for the half course, tour "C." Open to sophomores, juniors, and seniors as a credit course, and open to all others as an educational tour without university credit.

Tour "A". June 19 to July 19. The Grand Canyon of Arizona; Southern California, Yosemite National Park, San Francisco and vicinity, returning via Nevada, Utah, and Colorado. Total cost, \$250.00.

Tour "B". July 23 to August 28. Pike's Peak, Cripple Creek, and the region around Colorado Springs and Denver; the Yellowstone National Park, and the Glacier National Park; the Columbia River valley, and Portland; San Francisco and vicinity; Puget Sound region, Victoria and Vancouver; the Fraser River canyon, and the Canadian Rockies. Total cost, \$285.00.

Tour "C". July 29 to August 15. The Yellowstone National Park and the Glacier National Park, two of Nature's greatest wonderlands. Total cost, \$150.00.

These tours are not on the all-expense plan. Each person pays his own way, and finds opportunities to reduce the cost somewhat below the estimates given above.

Members of tour "A" have the option of spending a month or more on the Coast or in any part of the West, joining tour "B" on its arrival and completing their field studies with the second section. Members, taking the tours for the educational value without university credit, are not required to return with either party, but may remain longer in the West and may return via any American or Canadian route over which their tickets are valid.

The University fees are \$15.00 for tour "A", \$15.00 for tour "B", and \$10.00 for tour "C". Early registration is recommended in order to insure satisfactory advance arrangements. Applications should be sent to The Registrar, University of Minnesota, Minneapolis.

### GERMAN

MR. GEISSENDOERFER, MR. MYERS and MR. PROKOSCH

1s. Elementary Course MR. PROKOSCH  
Folwell Hall, 212, 8-9:50 a.m. Three credits.

This course is designed for students who have little or no previous knowledge of German. It will be conducted in German and will include practice in speaking and reading, together with inductive instruction in the elements of German grammar.

This course carries university credit for German 1.

54s. Classic Period MR. MYERS  
Folwell Hall, 207, 8-9:50 a.m. Three credits.

A historical survey of German literature with the principal emphasis upon the period of Goethe and Schiller. Lectures, assigned readings, frequent quizzes and reports. This course will be offered if there are sufficient registrations.

This course carries university credit for German 54.

60s. Teachers' Course in German MR. PROKOSCH  
Folwell Hall, 212, 10-11:50 a.m. Three credits.

Introduction to German phonetics; elements of historical grammar, together with a survey of the more difficult points in grammar, from the teacher's point of view; discussion of methods of modern language teaching; practice lessons as far as possible in composition and reading. The course will be conducted in German.

21s. Scientific German MR. GEISSENDOERFER  
Folwell Hall, 8-9:50 a.m. Three credits.

The aim of this course is to give students a reading knowledge of German for use in scientific studies. One year of German is required as a

prerequisite. This course will be offered if there are sufficient registrations. Fee, \$10.00.

- \*125s. Research in German. MR. MYERS and MR. PROKOSCH  
 Hours and credits to be arranged.  
 Graduate students and seniors with the necessary preparation may undertake research in some selected field.

## HISTORY

MR. KELLAR, MR. KREY and MR. WHITE

- 2s. Modern Europe MR. KREY  
 Library Building, 216, 8-8:50 a.m., M., W., F. and 9-9:50 a.m., M., T.,  
 W., Th., F. Three credits.  
 Europe from the end of the Thirty Years' War to the present.
- 4s. Modern England from the Seventeenth to the Nineteenth Century MR. WHITE  
 Library Building, 112, 8-9:50 a.m. Three credits.  
 The social, political and institutional development of England since  
 1603. This course may be taken to remove failures in either semester of  
 History 3-4.
- 6s. American History MR. KELLAR  
 Library Building, 111, 8-8:50 a.m., T., Th., S. and 9-9:50 a.m., M., T.,  
 W., Th., F. Three credits.  
 American History from the end of Jackson's administration to the  
 present
- \*16s. Teachers' Course in History and Government MR. KREY  
 Library Building, 112. Hour to be arranged. Two credits.  
 Deals chiefly with the practical problems of teaching history and gov-  
 ernment in the secondary schools. Lectures, readings and round table dis-  
 cussions.  
 First meeting of the class to fix the schedule will be at 1 p.m., Monday,  
 June 14, in Library Building, 112.
- \*162s. English Constitutional History MR. WHITE  
 Library Building, 112, 10-10:50 a.m. Two credits.  
 An advanced course in selected phases of English constitutional his-  
 tory. Lectures, topics and readings. Open only to those who have at least  
 junior rating and have had a college course in English history.
- \*174s. The Renaissance MR. KREY  
 The Renaissance will constitute the field for individual investigation  
 with group conferences. The prerequisites are a college course in Euro-  
 pean history and junior standing.

- \*209s. Research in English Institutions MR. WHITE  
 Library Building, 112, hours to be arranged. Two credits.  
 Special investigation in the field of English institutions. Consent of  
 the instructor must be obtained before registering.

## LATIN

MR. PIKE

## LATIN COURSES FOR TEACHERS

The two courses in Latin are intended primarily for teachers who desire to handle the subject by the direct method or a modification of it. As the main difficulty of using even a modification of the method is caused by lack of confidence on the part of our teachers, these courses will not merely discuss the method academically, but show concretely how it may be handled.

- 53s. Presentation of Beginning Latin by the Direct Method MR. PIKE  
 Five times a week.  
 Folwell Hall, 110, 10-10:50 a.m. Two credits.  
 The course is intended for teachers and others who are interested in the method and have had at least four years of Latin in the high school.  
 Texts: *The Lingua Latina Series*.
- 55s. Presentation beyond the first year by the Direct Method MR. PIKE  
 Folwell Hall, 110, 11-11:50 a.m., three times a week. One credit.  
 The course is intended to show how any Latin beyond the first year may be presented by the direct method. Selections from Pliny's *Letters* and the *Lingua Latina Series* will form the basis of the work.  
 Courses 53s and 55s may be carried together if the student desires, giving three credits. These three credits may be applied to Course 101 when the prerequisites have been satisfied.  
 These courses will be given if there are sufficient registrations.

## MATHEMATICS

MR. ADKINS, MR. DALAKER, MR. JACKSON, MR. KIRCHNER and MR. SLOBIN

as. Solid Geometry MR. SLOBIN  
 Folwell Hall, 104, 10-11:50 a.m.

This course includes the subject matter of Books VI, VII, VIII and IX of the American texts in solid geometry and covers the study of points and lines in space, polyhedrons, cylinders and cones and the sphere.

This course is intended for those who are preparing for the examination in Solid Geometry towards the State Professional Certificate. It also meets the entrance requirements of the University.

1s. Higher Algebra, Part I Mr. JACKSON

Folwell Hall, 125, 8-9:50 a.m. Three credits.

The fundamental rules, factoring, highest common divisor, lowest common multiple, fractions, involution, evolution, surds, simple equations with one, two and several unknown quantities, inequalities, ratio and proportion, arithmetical and geometric progressions, quadratic equations and numerous problems requiring both simple and quadratic equations.

This course will be credited either for university entrance or for Mathematics 1, the first semester of the freshman year.

3s. Higher Algebra, Part II Mr. ADKINS

Folwell Hall, 105, 10-11:50 a.m. Three credits.

The first three days given to review of factoring, highest common divisor, least common multiple, fractions, surds and the theory of exponents.

The course proper will include the following topics: Quadratic equations, equations in quadratic form, graphical representations, graphical solution of quadratics, simultaneous quadratics with graphs, progressions, mathematical induction with the binomial theorem, permutations and combinations, simple determinants, theory of equations and the process of finding irrational roots by graphic methods. Text, Schultze's *Advanced Algebra*.

This course is the equivalent of Mathematics 3, usually taken in the first semester of the freshman year and in combination with the preceding offers a direct preparation to candidates for the examination in Higher Algebra toward the State Professional Certificate.

4s. Trigonometry Mr. SLOBIN

Folwell Hall, 104, 8-9:50 a.m. Three credits.

This course covers the ordinary work in logarithms and plane trigonometry and is the equivalent of Mathematics 4, ordinarily taken in the second semester of the freshman year.

7s. Plane Analytical Geometry Mr. ADKINS

Folwell Hall, 105, 8-9:50 a.m. Three credits.

Rectilinear and polar coördinates, producing equations of given loci, discussion of equations and construction of their loci, transformation of axes, properties of straight line, the conic sections and certain higher plane curves by means of their equations. Text, Ashton's *Analytical Geometry*.

This course carries university credit for Mathematics 7.

72s. Analytical Geometry and Calculus Mr. DALAKER

Main Engineering Building, 204, 8-9:50 a.m. Six credits.

Parametric equations of loci, intersections of curves, graphical solutions of equations, tangents and normals, construction of conics, equations and properties of conics, empirical equations; coördinates in space, locus of an equation in three variables, surfaces of revolution, plane and straight

line, quadric surfaces, differentiation and integration of simple forms with applications.

This course is the equivalent of the second semester of freshman mathematics in the College of Engineering.

74s. Differential and Integral Calculus MR. DALAKER  
Main Engineering Building, 204, 10-11:50 a.m. Four credits.

Differentiation and integration, geometrical applications, curve tracing, maxima and minima, relative rates, velocities, accelerations, definite integrals, integration as a process of summation, areas, lengths, volumes, center of gravity, moments of inertia, liquid pressure, approximate integrations, infinite series, expansion of functions by Maclaurin's and Taylor's series, indeterminate forms, partial derivatives, some simple differential equations with applications.

This course is the equivalent of the second semester of sophomore mathematics in the College of Engineering.

1-3s. Descriptive Geometry and Drawing MR. KIRCHNER  
Main Engineering Building, 205, 10-10:50 a.m. Three credits.

An introductory course covering systems of representation, methods, loci and constructive geometry. Recitations and drawing room exercises.

This course carries credit for the first semester of the required work of the freshman year in the Engineering course, Drawing 1 and Drawing 3.

2-4s. Descriptive Geometry and Drawing (continued) MR. KIRCHNER  
Main Engineering Building, 205, 11-11:50. Three credits.

This course includes central projections and special cases; principles and applications; representations of lines, planes and solids and of their relations; tangencies, intersections and developments. Recitations, lectures and the solution of problems.

This course carries credit for the second semester of the required work of the freshman year in the Engineering course, Drawing 2 and Drawing 4.

The courses in Descriptive Geometry and Drawing may be completed in three weeks by adding afternoon work. See the instructor before registering.

54s. Teachers' Course in Secondary Mathematics MR. JACKSON  
Folwell Hall, 125, 10-11:50 a.m. Three credits.

This course deals with the mathematical curriculum of the secondary schools and the methods of teaching the several subjects. The current high school courses will be examined in the light of modern educational aims and principles. Constructive criticism will be offered on these courses of study. Methods will be discussed in connection with the relevant subject-matter and sufficient practice will be given by way of exercises and problems fully to illustrate the methods recommended.

The student will be expected to do research readings and to take part in the daily discussion of assigned topics. A text-book will be recommended to serve as the permanent outline and to help in unifying the course.

The leading subjects, Algebra and Geometry, will be given special consideration under the following topics: Aims in the study of the subject; subject-matter—development and classification; methods of teaching—origin and application; relation to other mathematical subjects and to other studies, educational values belonging to the subject.

This course carries university credit for Mathematics 54.

### MACHINE WORK

MR. GRANT

3s. Machine Work MR. GRANT  
 Mechanical Engineering Building, morning and afternoon. Four credits.

This course consists of practice in machine and bench work and will be arranged to suit the requirements of either sophomore or junior students in the College of Engineering. Lectures must be taken during the regular school year. This course will be offered if there are sufficient registrations. Fee, \$10.

### PHILOSOPHY AND PSYCHOLOGY

MR. BETTS AND MR. LODGE

5as. Introductory Psychology MR. LODGE  
 Folwell Hall, 322, 8-9:50 a.m. Three credits.

The data and chief laws of conscious life, with applications to educational and other problems.

The purpose of this course is not only to acquaint the student with the general methods and result of contemporary psychology, but also to give practical training in psychological analysis. One half of the time will be spent in experimental work in the psychological laboratory. Text book, experimental work, discussions.

This course carries university credit for Philosophy 5a and meets the requirements for Psychology towards the State Professional Certificate and toward the University Teachers' Certificate.

20s. Introduction to Contemporary Philosophy MR. LODGE  
 Folwell Hall, 322, 10-11:50 a.m. Three credits.

The meaning, aims, and methods of contemporary philosophical inquiry: Idealism, Realism, Pragmatism, Bergsonism, etc.

The purpose of this course is not only to introduce the student to the general method and results of present day philosophy as pursued by



Royce, Eucken, Bergson, etc., but also to give individual training in the philosophical analysis of current problems, theoretical and practical.

Problems, reports, discussion.

This course carries university credit for Philosophy 20.

14s. Educational Psychology MR. BETTS

Folwell Hall, 202, 10-10:50 a.m. Two credits.

The principles of psychology applied to education. The psychology of study and learning. The psychological measurements and tests of educational progress. Individual differences and their educational implications.

\*112s. Advanced Educational Psychology MR. BETTS

Folwell Hall, 202, 2-2:50 p.m., M., W., F. Two credits.

For seniors and graduates.

For description, see Education, 110s. Consult instructor before registering.

## PHYSICS

MR. BOOMER, MR. KLOPSTEG and MR. MCKEEHAN

1s. General Physics MR. BOOMER and MR. KLOPSTEG

Experimental Lecture, Physics Building, 30, 8-8:50 a.m. Recitations, Physics Building, 17, 9-9:50 a.m., 2-2:50 p.m. Three credits.

Mechanics of Solids and Fluids, Heat, Sound.

The requirement for this course is a working knowledge of algebra. Familiarity with the common trigonometric functions is desirable, though not essential.

The treatment of the subject, which is experimental rather than mathematical, is designed to give the student general but accurate information about the fundamental laws and their applications.

This course is completed during the first three weeks of the session. It carries university credit for Physics 1 and, in combination with 2, meets the requirements for Physics toward the State Professional Certificate.

2s. General Physics (continued) MR. BOOMER and MR. KLOPSTEG

Daily program identical with that of Course 1. Three credits.

Electricity and Magnetism, Light.

A continuation of the preceding, embodying also a study of the essentials and recent discoveries in X-ray and radioactive phenomena with their applications to theories as to the most probable constitution of matter.

This course is completed during the second half of the session. Preceded by Physics 1 it meets the requirements for physics toward the State Professional Certificate.

## 3s. General Laboratory Practice

MR. McKEEHAN

Physics Building, 23, 10-11:50 a.m. One credit.

Physical measurements in the mechanics of solids and fluids and in heat, giving the student a knowledge of experimental methods and an acquaintance with the fundamental facts of the subject.

No charge is made for this course, except the usual laboratory fee, if taken in connection with Course 1.

This course is completed during the first three weeks of the session and carries university credit for Physics 3.

## 4s. General Laboratory Practice (continued)

MR. McKEEHAN

Program identical with that of 3s. One credit.

Physical measurements in electricity, magnetism and light, giving the student a knowledge of experimental methods and an acquaintance with the fundamental fact of the subject.

No charge is made for this course except the usual laboratory fee if taken in connection with course 2.

This course is completed during the second three weeks of the session and carries university credit for Physics 4.

## 92s. Teachers' Course in High School Physics

MR. BOOMER

Physics Building, 17, 10-11:40 a.m., M., W., F., 10-10:50, T., Th. Two credits.

This course includes a brief history of the teaching of Physics; its present status; function of class room work, of laboratory, and methods in each; criticism of high school texts and manuals; selection, purchase and care of apparatus; laboratory organization, reports and quizzes; foundation in nature study, influence of general science, correlation with other branches.

The course occupies the entire six weeks, and carries university credit for Physics 92.

## \*171s. Research

MR. McKEEHAN

Physics Building. Hours and credits to be arranged.

Students who satisfy the instructor in advance either by personal conference or by mail will be guided in their research.

## HUMAN PHYSIOLOGY

MR. BEARD, MR. LYON, MR. PETTIBONE and MR. SCOTT

The laboratories in Millard Hall will be open daily 8 a.m. to 5 p.m. except Saturday. On Saturday, 8 a.m. to 12 m. Students may work at any time during the above hours. (The fees charged are on the basis of \$5 for a three credit course.\* Laboratory fees are on the basis of \$3 for a three credit course.)

\*Except for Medical Students. See Bulletin of Medical School.

## 3s. Elementary Physiology

MR. BEARD, MR. LYON, or MR. SCOTT, and Assistant  
Millard Hall, 301, daily except Saturday, 1:30-4:30 p.m. Three credits. Adapted to teachers, home economics students and others who desire a general knowledge of the subject.

## 52s. Physiologic Chemistry

Mr. PETTIBONE  
Millard Hall, 310, daily except Saturday 1-5:30. The whole course, five credits; the didactic work alone, three credits.

The components, foods, secretions, digesta and excreta of the human body.

## \*53s. Physiology of Cells, Muscle and Nerve, Blood, Circulation

MR. LYON or MR. SCOTT, and Assistant  
Millard Hall, 301 and 315, daily except Saturday, 1-5:30. The whole course, 5 credits; the didactic work alone, 3 credits.

## \*54s. Physiology of Respiration, the Nervous System and Senses

MR. LYON or MR. SCOTT, and Assistant  
The physical and nervous aspects of secretion, digestion and absorption; internal secretion, metabolism.

Millard Hall, 301 and 315, daily except Saturday, 1-5:30. The whole course, five credits; the didactic work, three credits.

## 101-2s. Advanced Physiology or Physiologic Chemistry\*

Millard Hall, daily. Arrange hours and credits with instructors in residence.

## POLITICAL SCIENCE

MR. SABY AND MR. YOUNG

## 1s. American Government

MR. SABY

Mechanic Arts Building, 202, 8-9:50 a.m. Three credits.

A preparation for the advanced courses in Political Science, for teaching in secondary schools, and for good citizenship. Organization and actual workings of the National Government. Some attention will be given to the recent tariff act, the new financial and banking legislation and the Trades Commission Act. This course carries university credit for Political Science 1a. Courses 1s, 8s and 3s in Political Science and Course 1s in Economics prepare for the examination in Political Science toward the State Professional Certificate.

## 8s. State and Local Government

MR. YOUNG

Mechanic Arts Building, 102, 8-9:50 a.m. Three credits.

\*Only one of these courses will be given, choice to rest with the class.

A comparison of our state constitutions; relation of the states to the United States and to the local units of government; recent experiments such as the initiative and referendum, the recall, and primary systems of nominating. Special attention will be given to the government of Minnesota. This course carries university credit for Political Science 8.

- 3s. Comparative Government MR. SABY  
 Mechanic Arts Building, 202, 10-11:50 a.m. Three credits.  
 A study of the government and politics of the leading countries in modern Europe.  
 This course carries university credit for Political Science 3.

- \*201s. Research Problems in Political Science MR. YOUNG  
 Hours and credits to be arranged.  
 Graduate students and seniors with the necessary preparation may undertake research in some selected field.

## RHETORIC

MR. AYDELOTTE, MRS. PHELAN AND MR. SKINNER

- 1s. Composition and Rhetoric MRS. PHELAN  
 Folwell Hall, 306, 8-9:50 a.m. Three credits.  
 Practical training in the art of writing, study of the principles of structure, and analysis of specimens of good prose.  
 This course carries university credit for Rhetoric 1, first semester.

- 2s. Composition and Rhetoric MR. SKINNER  
 Folwell Hall, 305, 10-11:50 a.m. Three credits.  
 This course is a continuation of the preceding course.  
 It carries university credit for Rhetoric 1-2, second semester.

- 102s. Versification MR. SKINNER  
 Folwell Hall, 305, 8-9:50 a. m. Three credits.  
 The nature of poetry and a detailed analysis of English meters and of various English verse forms. The theory accompanied by criticism of current poetry and practice in writing verse. Open to juniors, seniors, and graduates.  
 This course carries university credit for Rhetoric 102.

- \*110s. Short Story writing MRS. PHELAN  
 Folwell Hall, 306, 10-11:50 a.m. Three credits.  
 The short story as an art-form; a study of its technique; constructive work in story writing; the reading of typical short stories. Individual aid given to the student in the working out of material and in the criticism of each piece of work.  
 This course carries university credit for Rhetoric 110.

- \*119s. Research and Special Work MRS. PHELAN  
 Primarily for graduates.  
 Hours and credits to be arranged.
- 41s. Teachers' Course.  
 For description see English 80s.

### SOCIOLOGY

MR. GRAY AND MR. HARRIS

- 3s. Principles of Sociology MR. HARRIS  
 Folwell Hall, 9, 8-9:50. Three credits.  
 This course aims to give a general knowledge of the field of modern sociology and to enable the student to see broadly the entire field of associational interests, activities and institutions. This knowledge is indispensable to one living in this time of rapidly developing and changing knowledge of society, whether in city or country life.  
 This course carries university credit for Sociology 3a.
- 8s. Rural Sociology MR. HARRIS  
 Folwell Hall, 9, 10-11:50 a.m. Three credits.  
 A descriptive, historical and critical analysis of the movement for the betterment of rural life. Social psychology of rural people as affected by occupation and relative isolation. Social aspects of coöperation. The social institutions of rural life and their partial dependence upon economic conditions. The Grange, its strength and weakness. Life and work of farm women. Rural recreation. The local unification of rural life interests as illustrated by the farmers' club movement in Minnesota. The rural social survey.
- \*104s. Socialism and Social Reform MR. GRAY  
 For statement of course and hours, see Economics \*168s.
- \*121s. Research Problems in Sociology MR. HARRIS  
 Hours and credits to be arranged.  
 Graduate students and seniors with the necessary preparation may undertake research in some selected field.

### SPANISH

MR. SIRICH

- 31s. Beginning Course MR. SIRICH  
 Folwell Hall, 226, 10-10:50 a.m., M., T., W., Th., F. and 3-3:50 p.m., M., W., F. Three credits.  
 This course is intended for beginners in Spanish. Especial attention will be given to pronunciation, thorough grammar drill and reading of

selected prose. A part of each hour will be taken up in the idiomatic use of Spanish.

The text-book used will be Olmsted and Gordon, *Abridged Spanish Grammar*.

### SWEDISH

Mr. STOMBERG

7s. Second-year Course

MR. STOMBERG

Folwell Hall, 206, 8-9:50 a.m. Three credits.

A course in reading of prose and poetry with exercises in composition and conversation. Review exercises in grammar. Texts: Vickner, *Swedish Grammar*, Selma Lagerlöf, *Nils Holderson*, Runeberg, *Fänrik Stals Sägner*

This course carries university credit for Scandinavian 7.

This course will be offered if there are sufficient registrations.

### LIBRARY TRAINING SCHOOL

MISS BALDWIN

Library Building, 218.

This school is under the direction of the Minnesota Library Commission, and the course is planned to meet the needs of the smaller public libraries. It includes instruction and practice work in classification, cataloging, and the technical details of library work, with lectures on the general organization and administration of a library.

The course is open only to those holding library positions, or under definite appointment to such positions, and to teachers in charge of school libraries. The lectures on children's books and reading will be open to any teachers who are interested in this work. A special course for librarians in charge of school libraries will be given under the direction of the Department of Education.

For further information regarding the outline of work, program, fees, etc., address Miss Clara F. Baldwin, Secretary, Public Library Commission, St. Paul, Minnesota.

21

# Bulletin of The University of Minnesota

THE MEDICAL SCHOOL

## SUMMER SESSION ANNOUNCEMENT OF PRACTITIONERS' COURSES IN MEDICINE

JULY 6 TO JULY 31  
1915



VOL. XVIII, NO. 25, MAY 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
MINNEAPOLIS, MINN.

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

The Bulletin comprises—

*Original Series.* Containing the reports of the President and of the Board of Regents, the Register, the Bulletin of General Information, the annual announcements of the individual colleges of the University, etc.

*General Series.* Containing announcements of departments of instruction, reports of University officers, etc.

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

The REGISTRAR,  
The University of Minnesota,  
Minneapolis, Minnesota.

*Research Publications.* Containing results of research work. Papers will be published as separate monographs numbered in several series.

*School of Mines Experiment Station Series.* Containing results of investigations conducted by the Station.

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

These bulletins are free to residents of the State. To others a small charge is made. They are offered for exchange with institutions publishing similar material. Address

THE LIBRARIAN,  
The University of Minnesota,  
Minneapolis, Minnesota.



# THE MEDICAL SCHOOL

## SUMMER SESSION

### COURSES FOR PRACTITIONERS OF MEDICINE

July 6 to July 31, 1915

The Medical School of the University of Minnesota announces its Summer Session, of four weeks' duration, for practitioners of medicine.\*

The courses of the Summer Session will be conducted at the University Hospitals, in the municipal hospitals and in the laboratories and lecture rooms of Millard Hall, the Institute of Anatomy, and the Institute of Public Health and Pathology.†

#### ADMISSION

Graduates who hold the degree of Doctor of Medicine, of any recognized institution, or are licensed to practice medicine in any state, may be admitted to the Summer Session of the School.

#### REGISTRATION

To register for the Summer Session: (1) Apply to the office of the Dean, Room 119, Millard Hall, for the arrangement of schedule of studies; (2) submit schedule to the Registrar, Library Building, for entry and certification of fees; (3) pay fees to the University Accountant; (4) present receipts to the Dean's office and to instructors in charge of classes entered. Registration day, July 5.

#### FEEES

A deposit of five dollars is required of those taking laboratory courses to cover breakage or loss of glassware, apparatus, etc. This is subject to refund, minus breakage and loss charges. Anatomical material and laboratory material required in physiology, pharmacology, and experimental surgery are supplied, subject to extra charge, as stated in announcements of these courses.

Tuition fees are indicated in schedule of courses. In lieu of separate fees for individual clinical courses, a general fee of fifty dollars may be paid. This fee will entitle the student to take any desired combination of the clinical courses offered, but does not cover laboratory courses or the expense of anatomical material or laboratory material in physiology, pharmacology, or experimental surgery.

\*Separate announcement of summer courses for undergraduates will be sent on request.

†Schedule of clinics at the Minneapolis City Hospital, see page 14.

## THE ADMINISTRATIVE BOARD

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614 Syndicate Bldg.  
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Seven Corners, St. Paul

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Department 324 Summit Ave., St. Paul
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323 6th Ave. S. E.
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820 Donaldson Bldg.
- SAMUEL E. SWEITZER, M.D., Assistant Professor of Dermatology  
625 Syndicate Bldg.
- FRANK C. TODD, M.D., Professor of Diseases of the Eye, Ear, Nose, and  
Throat 506 Donaldson Bldg.
- S. MARX WHITE, B.S., M.D., Associate Professor of Medicine  
910 Donaldson Bldg.

- FRANKLIN R. WRIGHT, M.D., Assistant Professor of Genito-urinary Diseases  
707 Donaldson Bldg.
- 
- FRANK S. BISSELL, M.D., Roentgenologist and Instructor in Roentgenology  
4412 Lake Harriet Blvd.
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820 Donaldson Bldg.
- JOHN E. HYNES, M.D., Instructor in Medicine  
3349 University Ave. S. E.
- HARRY G. IRVINE, M.D., Instructor in Dermatology 601 Syndicate Bldg.
- WILLIAM C. JOHNSON, B.A., M.D., Instructor in Pathology  
313 8th Ave. S. E.
- ANGUS W. MORRISON, B.A., M.D., Instructor in Nervous and Mental Diseases  
513 Pillsbury Bldg.
- HORACE NEWHART, B.A., M.D., Instructor in Diseases of the Eye, Ear,  
Nose, and Throat 910 Donaldson Bldg.
- OSCAR OWRE, M.D., C.M., Instructor in Genito-urinary Diseases.  
707 Masonic Temple
- HAROLD PEDERSON, B.A., M.D., Instructor in Medicine  
310 Pillsbury Bldg.
- C. J. V. PETTIBONE, Ph.D., Instructor in Physiology and Physiologic  
Chemistry 112 Church St. S. E.
- FREDERICK H. POPPE, B.A., M.D., Instructor in Surgery  
820 Donaldson Bldg.
- FRED J. PRATT, M.D., Instructor in Diseases of the Eye, Ear, Nose, and  
Throat 328 Central Ave.
- CHARLES A. REED, B.S., M.D., Instructor in Orthopedic Surgery  
420 Syndicate Bldg.
- ERNEST T. F. RICHARDS, M.D., C.M., Instructor in Medicine  
744 Lowry Bldg., St. Paul
- ARTHUR C. STRACHAUER, M.D., Instructor in Surgery 616 Syndicate Bldg.
- IVAR SIVERTSEN, M.D., Instructor in Gynecology 315 Syndicate Bldg.
- HENRY L. ULRICH, B.S., M.D., Instructor in Medicine 420 Syndicate Bldg.
- MARGARET WARWICK, B.S., M.D., Instructor in Pathology and Bacteriology  
1516 7th St. S. E.
-

## TEACHING ASSISTANTS

- ERNEST L. BAKER, M.D., Assistant in Medicine 503 Donaldson Bldg.  
 CLIFTON A. BOREEN, B.S., M.D., Assistant in Dermatology 416 Syndicate Bldg.
- PAUL F. BROWN, B.A., M.D., Assistant in Surgery 3733 Nicollet Ave.  
 HOWARD S. CLARK, B.S., M.D., Assistant in Diseases of Eye, Ear, Nose  
 and Throat 616 Syndicate Bldg.
- WALLACE COLE, M.D., Assistant in Orthopedics 925 Lowry Bldg., St. Paul
- L. J. CORIA, M.D., Assistant in Diseases of Eye, Ear, Nose and Throat  
 EDWIN L. GARDNER, B.S., M.D., Assistant in Medicine 1011 E. River Road
- JOSEPH A. HEDDING, M.D., Assistant in Pediatrics 1029 Andrus Bldg.  
 ALEXANDER JOSEWITCH, B.S., M.D., Assistant in Medicine 2505 Chicago Ave.
- STANLEY E. KERRICK, M.D., Assistant in Diseases of Eye, Ear, Nose and  
 Throat 802 Donaldson Bldg.
- WALTER J. KREMER, M.D., Assistant in Genito-urinary Diseases 523 Plymouth Ave. N.
- RAE THORNTON LA VAKE, B.A., M.D., Assistant in Anatomy 413 Pillsbury Bldg.
- FRANK J. LAWLER, M.D., Assistant in Internal Medicine 1525 E. Lake St.
- WILLIAM W. LEWIS, M.D., Assistant in Diseases of Eye, Ear, Nose and  
 Throat 826 Lowry Bldg., St. Paul
- HENRY A. LYSNE, B.S., M.D., Assistant in Pediatrics 700 20th Ave. N.  
 CLARENCE O. MALAND, B.A., M.D., Assistant in Obstetrics and Gynecology 300 Reid Corner
- GEORGE MANGHILL OLSON, M.D., Assistant in Medicine 636 Syndicate Bldg.
- THOMAS A. PEPPARD, B.S., M.D., Assistant in Medicine, 623 Syndicate Bldg.
- FREDERICK C. RODDA, M.D., Assistant in Pediatrics 134 E. 18th St.  
 CHARLES L. RODGERS, M.D., Assistant in Obstetrics 700 W. Lake St.  
 CARL A. SCHERER, M.D., Assistant in Pediatrics 3004 4th Ave. So.  
 JALMAR H. SIMONS, B.S., M.D., Assistant in Obstetrics and Gynecology 1020 Donaldson Bldg.
- MARGARET I. SMITH, M.D., Assistant in Diseases of the Eye, Ear, Nose,  
 and Throat 1940 Emerson Ave. So.
- HENRY C. STUHR, M.D., Assistant in Surgery 628 Syndicate Bldg.  
 GEORGE E. THOMAS, B.L., M.D., Assistant in Medicine 1 E. Lake St.  
 ANTON G. WETHALL, B.S., M.D., Assistant in Genito-urinary Diseases 325 Cedar Ave.
- HENRY W. WOLTMANN, B.S., M.D., Assistant in Nervous and Mental  
 Diseases and Pathologist to the Out-Patient Service Curtis Court

## COURSES OF INSTRUCTION

## DEPARTMENT OF SURGERY

## DIVISION OF GENERAL SURGERY

Course 1. Clinics in General Surgery, 30 hours Fee, \$15.00

The regular surgical staff will conduct diagnostic, operative, or dry clinics, daily, during the entire four weeks. Ample clinical material is available. Cases chosen with reference to their values both to recent graduates and to practitioners of experience. Clinics given by members of the staff who are selected for their special ability in each field.

St. Paul City and County Hospital, arrangements pending.

DRS. ROGERS, DENNIS AND COLVIN

University Hospital, Tuesdays, Wednesdays, Saturdays, 8:30 to 10:00 a.m.

DRS. MOORE, LAW, MACLAREN, RITCHIE, AND STRACHAUER

University Hospital, General Rounds, Fridays, 9:30 to 11:00 a. m.

DR. MOORE

Cystoscopic and Proctoscopic Clinic, University Hospital. Limited to four students. Fridays, 8:00 to 9:30 a.m. DR. STRACHAUER  
Minneapolis City Hospital Clinics, see page 13.

Course 2. Clinic Clerkship in Surgery, 48 hours Fee, \$25.00

This course provides for a personal study of cases at the University Hospital under the direction of members of the staff. Limited to six students. Daily, 10:00 a.m. to 12:00 m.

DR. STRACHAUER

Course 3. Minor Surgery, 18 hours Fee, \$7.50

Conducted at the University Dispensary. Abundant material is available. Limited to six students. Mondays, Wednesdays, Fridays, 1:00 to 2:30 p.m.

DRS. HARE AND STRACHAUER

Course 3a. Minor Surgery, 18 hours Fee, \$7.50

Same as Course 3, on Tuesdays, Thursdays, Saturdays, 1:00 to 2:30 p.m.

Note.—Students may elect Course 3 or Course 3a, or both.

Course 4. Experimental Surgery, 48 hours Fee, \$20.00

A laboratory course in animal surgery. Complete equipment and unusual facilities for instruction are available. Extra charge of \$5.00 for material. Limited to eight students for four weeks, beginning July 6. Tuesdays, Thursdays, Saturdays, 1:00 to 5:00 p.m.

DR. CORBETT

Course 5. Operative Surgery, 14 hours Fee, \$7.50

Course begins July 9. Operative work on cadaver. Cost of material extra. Mondays and Fridays. 8:00 to 10:00 a.m.

DR. CORBETT

Course 6. Clinical Surgery. 8 hours Fee, \$6.00  
 Conducted at Minneapolis City Hospital, Mondays and Thursdays,  
 10:00 a.m. to 12:00 m. DR. MANN

## DIVISION OF ORTHOPEDIA

Course 1. Clinic in Orthopedic Surgery, 12 hours Fee, \$6.00  
 At the State Hospital for the Crippled and Deformed, Phalen Park,  
 St. Paul, Thursdays, 8:30 to 11:30 a.m.

DRS. GILLETTE, CHATTERTON, AND COLE

Course 2. University Dispensary Clinic, 18 hours Fee, \$7.50  
 Demonstrations and individual study. Limited to six students. Mon-  
 days, Wednesdays, Fridays, 1:00 to 2:30 p.m. DR. GEIST

## DIVISION OF GENITO-URINARY SURGERY

Course 1. University Dispensary Clinic, 18 hours Fee, \$7.50  
 Clinical demonstrations of diagnostic measures (including cystoscopy),  
 and therapeutic procedure. Limited to four students. Mondays, Wed-  
 nesdays, Fridays, 1:00 to 2:30 p.m. DR. WRIGHT

Course 1a. Same as Course 1, 18 hours Fee, \$7.50  
 Tuesdays, Thursdays, Saturdays, 1:00 to 2:30 p.m. DR. OWRE

Note.—Students may register for Course 1 or Course 1a, or both.

## DIVISION OF DISEASES OF EYE, EAR, NOSE, AND THROAT

Course 1. Ophthalmoscopy, 18 hours Fee, \$10.00

Course opens with one or two introductory lectures, followed by in-  
 struction in technique and demonstration (a) of normal cases; (b) of  
 abnormal cases. The appearance of the fundus in nephritis, in optic  
 neuritis, and in mal-conditions characteristic of other types of diseases,  
 will be shown. The course is intended for physicians who desire to ac-  
 quire the technique of ophthalmoscopy as an aid to physical diagnosis.  
 Given to a limited number of students, at the University Hospital or the  
 University Dispensary and the City Hospital, thus offering a large amount  
 of material. Hours to be arranged upon registration.

DRS. BURCH, CLARK AND KERRICK

Course 2. Refraction, 30 hours Fee, \$15.00

Consists of lectures upon refraction and muscle errors; followed by  
 daily instruction in the fitting of glasses. Lessons given in the use of  
 the ophthalmometer, in retinoscopy and subjective methods. Graduate  
 students will have opportunity to do refractions upon patients under the  
 guidance of instructors. Given to a limited number of students. Uni-  
 versity Dispensary, Mondays, Wednesdays, Thursdays, and Saturdays,  
 3:00 to 5:00 p.m. DRS. BURCH AND McINTYRE

Course 3. Operative Clinics, 22 hours Fee, \$10.00

Operative procedures on the eye, ear, nose, and throat, demonstrating  
 the technique of operations of the largest benefit to general practitioners.

At University Hospital, Tuesdays and Fridays, 3:00 to 5:00 p.m.

DRS. TODD, BURCH, AND PRATT

At City Hospital, Saturday, 9:30 to 11:00 a.m.

DR. MURRAY

Course 4. Diagnosis and Treatment of Diseases of the Eye, 16 hours

Fee, \$7.50

University Dispensary. Limited to four students. Mondays and Thursdays, 1:00 to 3:00 p.m.

DRS. KERRICK AND CLARK

Course 5. Diagnosis and Treatment of Diseases of the Ear, 16 hours

Fee, \$7.50

Lectures and demonstrations, including methods of examining the labyrinth. University Dispensary, Tuesdays and Fridays, 1:00 to 3:00 p.m. Limited to four students.

DRS. NEWHART, SMITH, AND CORIA

Course 6. Diagnosis and Treatment of Diseases of the Nose and Throat, 16 hours

Fee, \$7.50

Limited to four students. University Dispensary, Wednesdays and Saturdays, 1:00 to 3:00 p.m.

DRS. PRATT AND MALONEY

Course 7. Operative Surgery of the Temporal Bone, 12 hours

Fee, \$6.00

Lectures and operations on the cadaver. Extra charge for material. Institute of Anatomy, Mondays and Thursdays, 8:30 to 10:00 a.m.

DR. NEWHART

Course 8. Operative Surgery of the Nose and Throat, 12 hours

Fee, \$6.00

Exercises on the cadaver. Institute of Anatomy, Tuesdays and Fridays, 8:30 to 10:00 a.m.

DR. MURRAY

Course 9. Operative Clinic in Eye, Ear, Nose, and Throat.

St. Paul City and County Hospital, 10:00 to 11:30 a.m. Days and fee to be arranged.

DR. LEWIS

#### DEPARTMENT OF MEDICINE

The courses in Medicine will consist of ward rounds, bedside demonstrations and special clinics in the diagnosis and treatment in the diseases of the lungs, heart, kidneys, stomach, blood, etc. Abundant clinical material is furnished and opportunity will be had for bedside work in the wards.

Course 1. Diseases of the Cardiovascular Apparatus, 16 hours

Fee, \$7.50

Clinic and bedside instruction in the wards with particular attention to graphic methods, such as polygraphic and electro-cardiographic tracings and comparison of physical data with Roentgenograms. University Hospital, Mondays and Wednesdays, 2:30 to 4:30 p.m.

DRS. GREENE AND WHITE

Course 2. General Medicine, 16 hours

Fee, \$7.50

Clinic and bedside instruction in wards of University Hospitals, Thursdays and Saturdays, 2:30 to 4:30 p.m.

DR. ULRICH



Course 3. General Medicine, 16 hours Fee, \$7.50  
 Clinic and bedside instruction in wards. University Hospital, Tuesdays and Fridays, 2:30 to 4:30 p.m. DR. RICHARDS

Course 4. Diseases of the Stomach, 8 hours Fee, \$4.00  
 The course will cover lectures and demonstrations with laboratory methods of diagnosis. (Given provided four students elect.) University Hospital, Thursdays and Saturdays, 4:30 to 5:30 p.m. DR. HEAD

\*Course 5. General Medicine, 18 hours Fee, \$7.50  
 Clinic in General Medicine at the Out-Patient Department, University Dispensary. Mondays, Wednesdays, and Fridays, 1:00 to 2:30 p.m. DR. HYNES and Associates

\*Course 5a. Same as Course 5, 18 hours Fee, \$7.50  
 Tuesdays, Thursdays, and Saturdays, 1:00 to 2:30 p.m. DR. HYNES and Associates

\*Note.—Students may elect Course 5 or 5a, or both.

Course 6. Lectures in Immunity and Vaccine Therapy, 8 hours Fee, \$4.00  
 University Hospital, Mondays and Wednesdays, 4:30 to 5:30 p.m. (Given if twelve men elect.) DR. ULRICH

Course 7. Roentgen Diagnosis, 8 hours Fee, \$4.00  
 Special demonstrations in Roentgen diagnosis of lesions of the thorax and abdomen. Mondays and Fridays, 9:00 to 10:00 a.m. DR. BISSELL

Course 8. General Medicine.

Clinics and bedside instruction. Minneapolis City Hospital. See page 13.

For course in Clinical Laboratory Methods, see Department of Pathology.

## DIVISION OF SKIN AND SYPHILIS

\*Course 1. University Dispensary, 18 hours Fee, \$7.50  
 Practical demonstrations, including diagnosis and treatment. Limited to four students. Mondays, Wednesdays, and Fridays, 1:00 to 2:30 p.m. DR. SWEITZER

\*Course 1a. University Dispensary, 18 hours Fee, \$7.50  
 Same as Course 1. Tuesdays, Thursdays, and Saturdays, 1:00 to 2:30 p.m. DR. BUTLER OR DR. IRVINE

\*Note.—Students may register for Course 1 or Course 1a, or both.

## DIVISION OF MENTAL AND NERVOUS DISEASES

Course 1. University Dispensary Clinic, 18 hours Fee, \$7.50  
 Practical demonstrations, including diagnosis and treatment. Mondays, Wednesdays, and Fridays, 1:00 to 2:30 p.m.

DRS. MORRISON AND LOBERG.

Course 2. Bedside Clinics with Laboratory Demonstrations, 24 hours  
 Fee, \$12.00  
 At the University Hospital or City Hospital, as may be arranged with  
 instructor. The work may be modified to suit the desires of the stu-  
 dents. Mondays, Wednesdays, and Fridays, 8:00 to 10:00 a.m.  
 DR. HAMILTON

Course 3. Bedside Clinics with Laboratory Demonstrations, 8 hours  
 Fee, \$4.00  
 City and County Hospital, St. Paul. The work will be arranged to  
 suit the desires of students. Thursdays, 8:00 to 10:00 a.m. DR. HAMMES

## DIVISION OF PEDIATRICS

Course 1. General Course in the Diseases of Children, 32 hours  
 Fee, \$15.00  
 Including diseases of the newborn, breast-feeding, ward work and  
 X-ray diagnoses with reading of plates. University Hospitals, Tuesdays  
 and Thursdays, 9:00 to 10:00 a.m.; Lymanhurst, Mondays, Wednesdays,  
 and Fridays, 9:00 to 10:30 a.m.; University Dispensary, Tuesdays and  
 Fridays, 1:00 to 2:30 p.m. DRs. SEDGWICK, RODDA, AND TAYLOR

Course 2. Diseases of Children, 8 hours  
 Fee, \$4.00  
 City and County Hospital, St. Paul, on any two days of the week, by  
 arrangement with instructor, 3:00 to 4:00 p.m. DR. RAMSEY

Course 3. Infant Feeding, 30 hours  
 Fee, \$15.00  
 Including theory and practice of infant feeding, food preparation, and  
 especially the acute and chronic diseases of the gastro-intestinal tract.  
 University Dispensary, Mondays and Thursdays, 1:00 to 2:30 p.m.; ward  
 work at Lymanhurst, Tuesdays, Thursdays, and Saturdays, 10:30 a.m. to  
 12:00 m. DR. SCHLUTZ

Course 4. Diagnosis of the Diseases of Infancy and Childhood, 12 hours  
 Fee, \$6.00  
 University Dispensary, Mondays and Thursdays, 1:00 to 2:30 p.m.  
 DR. SCHLUTZ

Course 5. Pediatric Clinic, 12 hours  
 Fee, \$6.00  
 University Dispensary, Wednesdays and Saturdays, 1:00 to 2:30 p.m.  
 DR. HUENEKENS

Course 6. Clinic in Infant Feeding, 12 hours  
 Fee, \$6.00  
 Pillsbury Settlement House, Mondays and Fridays, 10:00 to 11:30 a.m.  
 DR. HUENEKENS

Course 7. Syphilis of Children.  
 Tuesdays. Hours and fee to be arranged with the Dean and the in-  
 structor. DR. SCHERER

Course 8. Clinic in Contagious Diseases  
 Fee, \$7.50  
 Minneapolis City Hospital. See page 13.

## DEPARTMENT OF OBSTETRICS

- Course 1. Practical Obstetrics, 12 hours Fee, \$6.00  
 Antepartum examinations, manikin demonstrations, and parturition clinics. Limited to four students; not given to less than two students. University Hospital, Mondays, Wednesdays, Fridays, 9:00 to 10:00 a.m.  
DRS. LITZENBERG AND MOORE
- Course 2. Laboratory Studies in Obstetrics and Gynecologic Pathology, 24 hours Fee, \$12.00  
 Limited to six students; not given to less than three students. The Institute of Anatomy, Mondays, Wednesdays, Fridays, 10:00 to 12:00 a.m.  
DR. ADAIR
- Course 3. Gynecologic Diagnosis, 18 hours Fee, \$7.50  
 Pelvic examinations, methods of diagnosis and treatment. Limited to four students. University Dispensary, Mondays, Wednesdays, Fridays, 1:00 to 2:30 p.m.  
DRS. SIVERTSEN AND LA VAKE
- Course 3a. Gynecologic Diagnosis, 18 hours Fee, \$7.50  
 Same as Course 3. University Dispensary, Tuesdays, Thursdays, Saturdays, 1:00 to 2:30 p.m.  
DR. SIMONS
- Note.—Students may elect Course 3 or Course 3a, or both.
- Course 4. Clinic in Obstetrics and Gynecology DR. ADAIR  
 Limited to six. Minneapolis City Hospital. See page 13.

## DEPARTMENT OF ANATOMY

- Course 1. Special Dissections Fee to be arranged  
 Tuesdays, Wednesdays, Thursdays, and Fridays, 8:00 to 12:00 or hours arranged with the instructor. (An additional fee of from \$5 to \$25 is charged for dissecting material, according to the region selected).  
DR. ERDMANN

## DEPARTMENT OF PHARMACOLOGY

- Course 1. Experimental Pharmacology Fee to be arranged  
 Hours to be arranged with the instructors. DRS. BROWN AND HALL
- Course 2. Toxicology Fee to be arranged  
 Poisons; their detection and antidotes, embracing the detection of the more common poisons, along with the proper chemic and physiologic antidotes, symptoms, and treatment. Designed especially for clinicians. Hours arranged with the instructors. DRS. BROWN AND HALL

## DEPARTMENT OF PHYSIOLOGY

Advanced work suitable to the needs of graduates in medicine may be arranged with instructors in residence.

DEPARTMENT OF PATHOLOGY, BACTERIOLOGY, AND  
PUBLIC HEALTH

Course 1. Clinical Pathology, 48 hours Fee, \$24.00

Practical laboratory studies of the principles and methods involved in the examination of urine, blood, stomach contents, feces, exudates and transudates; together with the relation of these studies to the diagnosis of disease. This course, with Course 2, may give credit equivalent to the course in clinical pathology required of medical students. Institute of Public Health and Pathology, Mondays, Wednesdays, Fridays, 2:30 to 5:30 p.m. DR. POTTER

Course 2. Clinical Pathology

Practical work in the University Dispensary laboratory; daily, 1:00 to 2:30 p.m. This work will be free to students taking Course 1, or to students working in other dispensary courses. DR. WARWICK

Course 3. Immunity, 48 hours Fee, \$24.00

Lectures and laboratory work on the serum reactions including Wasserman test, agglutinin test and precipitin test and on the preparation of vaccines, etc. Institute of Public Health and Pathology, Mondays, Wednesdays, and Fridays, 8:00 to 11:00 a.m. DR. LARSON

CLINICS AT MINNEAPOLIS CITY HOSPITAL

These clinics are conducted by the staff of the hospital, but may be registered for in the regular way.

*Surgery.* Mondays and Thursdays, 10:00 a.m. to 12:00 m. Dr. Mann.  
Fee, \$6.00

Wednesdays and Saturdays, 10:00 a.m. to 12:00 m., Dr. Wilcox.  
Fee, \$6.00

*Medicine.* Mondays and Tuesdays, 8:30 to 10:00 a.m., Dr. Rees; Wednesdays and Thursdays, Dr. Cross.  
Fee, \$12.00

*Obstetrics and Gynecology.* Tuesdays and Tridays, 10:00 a.m. to 12:00 m., Drs. Adair and Sweetser.  
Fee, \$6.00

*Obstetrics and Gynecology Dispensary.* Tuesdays, Thursdays, and Saturdays, 1:00 to 2:00 p.m. Limited to two students. Dr. Sweetser.  
Fee, \$6.00

*Contagious Diseases.* Tuesdays, Thursdays, and Saturdays, 10:30 a.m. to 12:00 m., Dr. Huenekens; Tuesdays, 3:00 to 4:00 p.m., Dr. P. M. Hall.  
Fee, \$8.00

*Pediatrics.* Lymanhurst, Fridays, 3:00 to 4:00 p.m., Dr. P. M. Hall.  
See also Courses 1 and 3, Division of Pediatrics, University Clinics.

GENERAL LECTURES

A course of lectures upon topics of medical interest will be given on Mondays, Wednesdays and Fridays at 4:30 p.m., in the lecture room of

Millard Hall. These lectures will be free to students in the Summer School.

July 7, Wednesday. Shock. Dr. J. F. Corbett

July 9, Friday. Spasmophilia. Dr. J. P. Sedgwick

July 12, Monday. The Dropped Heart. Dr. Chas. Lyman Greene

July 14, Wednesday. Graphic Methods of Heart Study.  
Dr. S. Marx White

July 16, Friday. Mouth Infections as Related to Systemic Disease.

Dr. T. B. Hartzell

July 19, Monday. Growth. Dr. C. M. Jackson

July 21, Wednesday. The Treatment of Difficult and Unusual Herniae.

Dr. A. T. Mann

July 23, Friday. Obstetric Anesthesia and Analgesia. Dr. J. C. Litzenberg

July 26, Monday. Glaucoma. Dr. F. C. Todd

July 28, Wednesday. Hunger. Dr. E. P. Lyon

July 30, Friday. The Status of the Autograft. Dr. A. A. Law

# The University of Minnesota

DEPARTMENT OF AGRICULTURE

SUMMER SESSION

1915



BULLETIN OF THE UNIVERSITY OF MINNESOTA  
GENERAL SERIES NO. 26. MARCH 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minnesota

# THE UNIVERSITY OF MINNESOTA

## THE BOARD OF REGENTS

The Hon. FRED B. SNYDER, Minneapolis, President of the Board	-	1916
GEORGE EDGAR VINCENT, Minneapolis	- - - - -	<i>Ex Officio</i>
The President of the University		
The Hon. WINFIELD SCOTT HAMMOND, St. James	- -	<i>Ex Officio</i>
The Governor of the State		
The Hon. C. G. SCHULZ, St. Paul	- - - - -	<i>Ex Officio</i>
The Superintendent of Education		
The Hon. PIERCE BUTLER, St. Paul	- - - - -	1916
The Hon. B. F. NELSON, Minneapolis	- - - - -	1916
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The Hon. MILTON M. WILLIAMS, Little Falls	- - - - -	1919
The Hon. JOHN G. WILLIAMS, Duluth	- - - - -	1920
The Hon. GEORGE H. PARTRIDGE, Minneapolis	- - - - -	1920
The Hon. A. E. RICE, Willmar	- - - - -	1921
The Hon. CHARLES L. SOMMERS, St. Paul	- - - - -	1921

## THE AGRICULTURAL COMMITTEE

The Hon. A. E. RICE, Chairman	The Hon. C. G. SCHULZ
The Hon. MILTON M. WILLIAMS	The Hon. JOHN G. WILLIAMS
President GEORGE E. VINCENT	

## OFFICERS OF ADMINISTRATION

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ALBERT F. WOODS, D.Agr., Dean  
EDWARD M. FREEMAN, Ph.D., Assistant Dean  
ASHLEY V. STORM, M.A., Director  
JAMES M. DREW, Registrar  
LUCETTA BISSELL, Assistant Registrar in  
Charge of College Registration

## SUMMER SESSION

### PURPOSE

The work of the Land Grant Colleges of the United States is now finding expression in three great fields of educational activity, viz., Instruction, Experimentation, and Extension.

Two of these, Experimentation and Extension, are serving the people throughout the entire year, and the conviction is growing that the great plant, equipment, organization, and faculty of these institutions should likewise be utilized for instruction during more than the nine months of the college year.

In response to this demand the Summer Session is established in order that the field plots, live stock, libraries, laboratories, orchards, museums, shops, machinery, classrooms, instruction, and other facilities used by regular college students shall be available to those who for any reason find it more convenient to attend during the summer months.

The work offered seeks to meet the needs of graduates of arts colleges and normal schools, teachers of secondary schools, principals of schools (especially of consolidated schools), superintendents of schools, and others who desire courses in Agriculture or Home Economics, and who wish to obtain therefor college credit, as well as to meet the needs of students seeking to complete the undergraduate college work.

The work also furnishes an opportunity for graduates of other colleges of agriculture to improve their knowledge of Minnesota agriculture, preparatory to teaching in this State.

The Summer Training School and the Special Conference of Agricultural Instructors mentioned elsewhere add to the Session features of great value.

### COURSES AND CREDITS

The courses offered are selected from those offered during the regular college year in which the same amount of work will be done and for which the same credit will be given.

As the Summer Session (six weeks) is one third the length of a regular college semester (eighteen weeks), the number of recitations and amount of work will be *three times that shown in the descriptions of courses* found on another page. Eighteen hours per week constitutes standard work and gives six semester hour credits.



## FACULTY

The Summer Session Faculty will consist of members of the regular college faculty aided by specialists from other institutions who are of known efficiency in their fields of labor.

## COURSES OFFERED

Preparations have been made to offer such of the following courses as are applied for by a sufficient number of students, six regular students being the minimum.

Agronomy and Farm Management 1, Farm Crops 1  
 Agronomy and Farm Management 102, Farm Management 2  
 Agronomy and Farm Management 104, Grain and Corn Judging  
 Agricultural Chemistry 4, Chemistry of Plant and Animal Life.  
 Agricultural Education 131, Methods  
 Agricultural Education 141, Teaching  
 Agricultural Education 151, Organization and Management  
 Dairy and Animal Husbandry 1, Breeds and Types of Live Stock  
 Dairy and Animal Husbandry 7, Feeding and Management of Market Stock  
 Dairy and Animal Husbandry 11, Poultry  
 Dairy and Animal Husbandry 26, Farm Dairying  
 Dairy and Animal Husbandry 30, Incubating and Brooding  
 Entomology 3, Economic Entomology  
 Home Economics 1, Textiles  
 Home Economics 11, Garment Making  
 Home Economics 13, Dressmaking  
 Home Economics 21, Foods and Cookery  
 Home Economics 22, Food Economics  
 Home Economics 42S, Methods and Home Economics  
 Home Economics 51, Drawing and Design  
 Horticulture 71, Landscape Gardening  
 Horticulture 90, General Horticulture  
 Soils 3, Soil Physics and Management  
 Vegetable Pathology and Botany 1, Plant Pathology  
 Vegetable Pathology and Botany 3, Agricultural Botany  
 Veterinary Science 6, Veterinary Medicine

## FEES

The fees are five dollars (\$5.00) for registration and five dollars (\$5.00) for each three-hour credit course, with a maximum of fifteen dollars (\$15.00).

A deposit of five dollars (\$5.00) is also required to cover unusual breakage and safe return of apparatus and books. This deposit will be returned at the close of the Session less charges for breakage and losses. All fees are payable at the time of completing registration.

## ADMISSION

The courses of the Summer Session are open to all mature men and women who are considered qualified to pursue the chosen work to advantage, but college credit will be given only when college entrance requirements have been fulfilled.

If you have not registered at the College of Agriculture heretofore and wish to receive college credit for work done in the Summer Session, you should send to College Registrar, on a suitable blank a properly certified copy of your preparatory credits.

A blank for this purpose can be procured from the principal of your high school or will be furnished by the College Registrar, University Farm, St. Paul.

## REGISTRATION

Friday and Saturday, June 11, 12, are registration days. Students should complete registration on those days and be ready for class work Monday, June 14. After Monday, June 14 students are registered by special permission only.

## LOCATION

From St. Paul or Minneapolis, take a Como-Harriet or Como-Hopkins car to University Farm. One fare (5 cents) takes you to Doswell Avenue. A short walk to the northeast brings you to the Administration Building, where you register. If you wish to ride the entire distance, change at Eustis Avenue from the Como cars to the Intercampus cars, which take you, for an additional fare, into the University Farm grounds. Walk west to the Administration Building, the third on your left.

Although the school is located in the country and has all the advantages of the quiet and the fresh air of the country, yet it is close enough to the Twin Cities to get all the benefits of these large centers. No more beautiful spot between the two cities could have been selected for such a school. Situated on picturesque hills, overlooking the Midway and the two cities, the buildings are grouped conveniently about the undulating campus. Nature has done much to make this a beauty spot, and the landscape artist has added to the beauty in the arrangement of paths and the replacing of trees and shrubs with many varieties suited to the climate.

## ACCOMMODATIONS

Those taking regular work at the Summer Session may obtain rooms in the dormitories. Rooms will be assigned at the time of registration. The dormitories contain a very few single rooms; other rooms are intended to accommodate two or three persons. The rooms are furnished with necessary bedding. A change of linen is made twice each week, and

of towels every other day. Students residing in the Twin Cities will not be given dormitory rooms. Those who do not expect to remain at the school for the entire six weeks should obtain their rooms outside the dormitories. Good board and rooms may be obtained within a short distance from the school for five dollars (\$5.00) per week and upward. Dormitories and dining hall will be opened Saturday, June 12.

#### EXPENSES IN DORMITORIES

Fee for upkeep of dormitory rooms.....	\$1.00
Charge for postoffice box, room rent, use of bedding, and laundry of same .....	6.10
Regular board at dining hall, at \$3.50 per week.....	21.00
	<hr/>
Total .....	\$28.10

Entire amount to be paid in advance.

Students who for any cause leave the school before the end of the term, will have returned to them a proportional amount of the total paid for board or room unused. Students who leave the dining hall or dormitory but do not withdraw from the school will have three fourths of this amount returned. No rebate will be made for occasional absences.

A cafeteria with reasonable charges is maintained on the campus for those who prefer that form of service, or for those who are not prompt in attendance at regular meals.

#### BAGGAGE

Baggage will be carried between either city and University Farm by the service section for a uniform charge of fifty cents for each piece. Delivery will be made as promptly as the limited facilities of the section will permit. Those wishing special attention or quick delivery are advised to arrange with city express or transfer companies for delivery of their baggage and for the amount of charges for the same. Students wishing to have their baggage handled by the service section should hand the checks in at the general service office near the postoffice, promptly after arrival so as to avoid, as far as possible, charges for storage.

#### MAIL

Mail for students who room in dormitories or have no permanent address in the cities may be sent to University Farm, St. Paul. Postoffice boxes are assigned to all dormitory students and a charge of 10c made therefor.

#### LIBRARY

Good library facilities, including books, bulletins, reports, and papers on Agriculture and Home Economics, will be available to all students in the library of the College in the Administration Building.

## FIELD EXCURSIONS

The vicinity of the Twin Cities abounds in objects of geologic and physiographic interest, in rock formation, old river gorges and glacial moraines; while the cities themselves, with their parks, lakes, buildings, libraries, and art galleries, afford students every opportunity for profitable use of their leisure hours.

The campus, in connection with the Experiment Station farms, gives the best of opportunity to study agricultural problems and to study nature.

## THE ASSEMBLY HOUR

An assembly hour has been arranged for each day, from 9:30 to 10:00 a. m. At this time subjects of special interest will be considered. There will be a short opening exercise, followed by lectures and talks by specialists and prominent educators.

All students should be in attendance at chapel during this period.

## SPECIAL WEEK FOR AGRICULTURAL INSTRUCTORS

Many of the instructors in agriculture in Minnesota high schools are from other states and only partially familiar with Minnesota conditions. All instructors have found during the past year need for special study and conference. Some men will come into the State for their first work this fall. To help all of these men a special program has been prepared for the week of the Summer Session, July 19-24.

Definite, condensed instruction will be given by the principal members of the faculty on problems found to be most valuable to these teachers, and conferences will be held in which the experience and advice of each will be made available to all.

Fresh, pertinent suggestions are now being gathered from the men themselves to guide in arranging the program of work.

More details will be furnished later to those interested.

## CONSULTATION

Opportunity will be given for conference with the members of the Faculty on subjects of special interest to the individual students.

## STATE TEACHERS' TRAINING SCHOOL

Beginning and closing at the same time as the Summer Session of the College of Agriculture, there will be held at the same place (University Farm, St. Paul) the State Teachers' Training School, wherein courses will be offered in methods of teaching and school organization and management; also review and credit work in subjects required for common school

certificates and in non-college credit work in Agriculture, Manual Training, Home Economics, Drawing, and Music. For bulletin, address J. M. Drew, Registrar, University Farm, St. Paul.

*For Principals of Consolidated Schools.*—Special non-college credit courses in Agriculture and other industrial subjects will be offered to those who have served, or who will serve next year, as principals of consolidated schools under the Holmberg Act. The courses will be progressive in character and will afford special opportunities for study, not only to those who will be in attendance for the first time, but also to those who have taken the course in one or two previous summers. A junior course will be arranged for those who are taking the principals' course the first summer and a senior course for those who have taken the junior course. Advanced work in Agriculture and Manual Training will also be available for those who have completed the junior and senior years. Meetings and conferences of the consolidated school principals will be held from time to time dealing with problems peculiar to their work.

#### SPECIAL INFORMATION

Inquiry concerning courses, credits, and scope of the work in the Summer Session of the College of Agriculture, or in the State Teachers' Training School, should be addressed to A. V. Storm, Conductor, University Farm, St. Paul.

#### ADVANCED COURSES AT THE UNIVERSITY

Advanced courses in academic subjects, for college credit or for the State Professional Certificate, are given at the University Summer Session as heretofore. Courses are also given in the Colleges of Medicine and Dentistry. Those desiring information concerning such courses should send for bulletin to E. B. Pierce, Registrar, University of Minnesota, Minneapolis.

#### MEN WANTED

The demand for farm-reared men with agricultural college education, especially for those who have had teaching experience, is beyond the supply, at salaries ranging from \$1,200 to \$3,000.

Agricultural colleges need such men in departments of agricultural education or extension; colleges and normal schools need them to head their departments of agriculture; public and private secondary schools need instruction in many states to direct their departments of agriculture and their extension work; the government can use them in many kinds of work.

Graduates of the College of Agriculture who wish to teach are in demand in Minnesota high schools at salaries of \$1,200 and above, for those without teaching experience and at higher salaries for those who have taught successfully. Graduates of normal schools, and persons who

have had work in arts colleges, principals of schools, and others similarly prepared, who wish to take advantage of this situation should, if experienced in farm work, take summer work in an agricultural college and be ready for this opportunity. Teaching agriculture does not unfit a man for business but prepares him even better for running his own farm, managing a farm for someone else, or for entering the field of commercial agriculture such as is offered in farm machinery, drainage, farm management, irrigation, or development work with large corporations. The dead line of age retirement recedes a long distance when one's educational career touches elbows with the business world.

## FACULTY

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 EDWARD M. FREEMAN, Ph.D., Assistant Dean  
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 FREDERICK J. ALWAY, Ph.D., Soils  
 ALBERT C. ARNY, B.S. in Agr., Agriculture.  
 ROBERT C. ASHBY, B.S. in A., Animal Husbandry  
 BESSIE BEMIS, B.S., Foods and Cookery.  
 WILBUR H. BENDER, M.Di., Ph.B., Agricultural Education  
 ALVA H. BENTON, M.S., Agronomy and Farm Management  
 JOSEPHINE T. BERRY, M.A., Home Economics  
 WILLARD L. BOYD, D.V.S., Veterinary Science  
 WILFRID G. BRIERLEY, M.S., Horticulture  
 LEROY CADY, B.S. in Agr., Horticulture  
 GUSTAV W. GEHRAND, Ph.B., Dairy Husbandry  
 GRACE P. GILLET, B.A., Textiles and Clothing  
 PAUL HARMER, B.S., Soils  
 HORACE PRESTON HOSKINS, V.M.D., Veterinary Science  
 CHARLES W. HOWARD, B.A., M.S., Entomology  
 WILLIAM F. LUSK, Ph.B., Agricultural Education  
 DEXTER D. MAYNE, Agricultural Education  
 JOSEPH S. MONTGOMERY, B.S., in Agr., Animal Husbandry  
 WILLIAM MOORE, B.A., Entomology  
 PETER J. OLSON, M.S., Agriculture  
 WIELAND L. OSWALD, Agricultural Botany  
 CHARLES C. PALMER, D.V.M., Veterinary Science  
 THOMAS G. PATERSON, B.S. in Agr., Animal Husbandry  
 MYRON H. REYNOLDS, B.S.A., D.V.M., M.D., Ph.G., Veterinary Science  
 ARTHUR G. RUGGLES, M.A., Entomology  
 ARTHUR C. SMITH, B.S., Poultry  
 ELVIN C. STAKMAN, Ph.D., Plant Pathology  
 ROSCOE W. THATCHER, M.A., Agricultural Chemistry  
 FREDERIC L. WASHBURN, M.A., Entomology  
 ROBERT M. WASHBURN, M.S.A., Dairy Husbandry  
 MARION WELLER, B. S., Textiles and Clothing  
 RODNEY M. WEST, B.A., Agricultural Chemistry  
 GRACE I. WILLIAMS, B.S., Foods and Cookery  
 ARCHIE D. WILSON, B.S. in Agr., Extension

## DESCRIPTION OF COURSES

*Note.*—Since there are only one third as many weeks in the Summer Session as in a regular semester each course will require approximately three times as many hours per week as are shown in the following descriptions.

### AGRONOMY AND FARM MANAGEMENT

#### 1. Farm Crops 1

Three credits (four and one-half hours per week); first semester. Offered to freshmen in Agricultural Course.

An elementary study of the important field crops of the United States, with emphasis upon those of local importance; distribution, economic importance, agricultural classifications, cultural methods, and principles of improvement.

#### 102. Farm Management 2

Three credits (three hours per week); second semester. Offered to seniors in Agronomy and Farm Management. Prerequisite: Econ. 1a; Farm Crops 1.

A course in which the business side of farming is emphasized. Special attention is given to farm organization, equipment, and operation.

#### 104. Grain and Corn Judging

Three credits (six hours per week); second semester. Offered to seniors specializing in Agronomy and Farm Management. Prerequisites: Botany 1 and Farm Crops 1.

A study in detail of representative samples of the leading varieties of grains and corn and grass seeds, with score card practice in comparative judging of grain, corn, and grass seed.

### AGRICULTURAL CHEMISTRY

#### 4. The Chemistry of Plant and Animal Life.

Three credits (six hours per week); second semester. Offered to sophomores in Agricultural Course. Prerequisite: 1 year Chemistry.

The organic compounds commonly found in plant and animal tissues. The chemical changes during growth, harvesting, storage, and preparation for market. Factors affecting composition and changes therein. Utilization of farm by-products.

### AGRICULTURAL EDUCATION

#### 131. Methods

Three credits (three hours per week). Offered to juniors and seniors. Prerequisite, six hours in Agricultural Education, three of which must be course 1'a or 11b.

This course covers organization of agricultural subject matter, use of school plots, and extension work adapted to high-school conditions as found in Minnesota. A study is made of classroom and laboratory methods.



## 141. Teaching.

Three credits (three hours per week). Offered to seniors. Prerequisite, 11a or 11b and 131a or 131b.

Observation of regular classes; a study of class practices; preparation of lesson plans; actual teaching of classes under careful supervision in recitation, laboratory, and extension; criticism and discussion of plans, methods, results, examinations, and tests.

## 151. Organization and Management

Three credits (three hours per week). Offered to seniors.

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.

## DAIRY AND ANIMAL HUSBANDRY

## 1. Breeds and Types of Live Stock.

Three Credits (six hours per week); first semester. Offered to sophomores and juniors in Agricultural Course.

A study of the types and breeds of beef cattle, swine, sheep, and horses with special reference to the origin and leading characteristics of each of the important breeds.

## 7. Feeding and Management of Market Stock

Three credits (three hours per week); second semester. Offered to seniors in Dairy and Animal Husbandry Course. Prerequisite: 15 and 16.

Economical rations for growing and fattening all classes of market stock. Includes a discussion of shelter requirements, feed racks, and the details of management applicable to conditions on the average farm.

## 11. Poultry

Three credits; second semester. Offered to seniors.

A study of the most popular breeds of poultry and their feeding and management; house construction; incubation, brooding, dressing, and marketing. Practice in pen management is required.

## 26. Elements of Dairy Husbandry

Three credits (six hours per week); second semester. Offered to freshmen in Agricultural and Home Economics Courses.

Origin, characteristics, and adaptation of the dairy breeds of cows; particular attention is given to feeding followed by the study of the chemical and physical constituents of milk. Practice work in butter-making, and milk testing required.

## 30. Incubating and Brooding

Two credits (eight hours per week); nine weeks. Offered to seniors.

Includes instruction and practice in incubation and brooding, selection of breeding stock and eggs for hatching, and feeding young chicks. Of practical value to teachers of agriculture and poultry-raisers.

## ENTOMOLOGY

## 3. Economic Entomology

Three credits (three hours per week); first semester. Offered to

juniors in Agricultural Course. Prerequisite: Animal Biology 3 and 4.

A consideration of the most important insect pests; methods of control; insecticides and insecticidal apparatus; beneficial insects. All students entering this course make a collection of insects.

## HOME ECONOMICS

### 1. Textiles

Two credits (four hours per week). Offered to freshmen.

A study of the textile fibers and fabrics as to structure and properties, with application to the art and economic considerations involved in selection and purchase of fabrics for clothing and household furnishing.

### 11. Garment Making

Two credits (four hours laboratory per week). Offered to freshmen.

Instruction and laboratory practice in hand sewing; in the reading and adaptation of commercial patterns; in the construction and use of the sewing machine; in designing, cutting, and making simple outer garments from washable materials.

### 13. Dressmaking

Two credits (four hours laboratory per week). Offered to juniors. Prerequisite: 1 and 11.

Careful consideration of the factors of quality, suitability, cost in the selection of the dress fabrics employed; analysis and adaptation of simple dress designs; instruction and practice in cutting, fitting, draping, and methods of construction involved in tailored dresses.

### 21. Foods and Cookery

Two credits (four hours laboratory per week). Offered to sophomores. Prerequisites: Chemistry 2 or equivalent.

(a) Production, manufacture, chemical composition of typical foods; their classification into food principles; changes in digestion; function in nutrition. (b) Fundamental science principles from chemistry, physics, biology, bacteriology, and their application in typical cookery processes.

### 22. Food Economics

Two credits (four hours laboratory per week). Offered to sophomores. Prerequisite: Home Economics 21 or equivalent.

Cost and nutritive value of typical foods; the study of dietaries; preparation and serving of meals, the cost bearing a definite relation to the family budget.

### 42S. Methods in Home Economics

Two credits (one hour daily). Prerequisite or parallel: Home Economics 22 or 22s.

This course considers the high-school course of study; the relation of Home Economics to the course of study; correlation with biological and physical sciences; organization of the whole subject of Home Economics; outlines for high-school course in foods and in clothing; the preparation of lesson plans, including methods of presentation in the classroom; the planning of equipment for varying conditions and at different costs.

### 51. Drawing and Design

Two credits (four hours laboratory per week). Offered to freshmen.

Composition, perspective, color theory, and color harmonies applied to costume design and interiors; harmony, balance, rhythm, in line and area design.

## HORTICULTURE

## 71. Landscape Gardening

Three credits. Offered to sophomores, juniors and seniors.

A general course in the practice and principles of landscape gardening as applied to the home and community. Lectures and field trips to parks and private grounds.

## 90. General Horticulture

Three credits. Offered to freshmen, sophomores, juniors and seniors.

Prerequisite: 1 yr. Botany.

A general survey of horticulture with a consideration of the elementary principles of fruit-growing, vegetable gardening, floriculture, landscape gardening, plant breeding, plant forcing, and plant propagation.

## SOILS

## 3. Soil Physics and Management

Three credits (three hours per week); first semester. Offered to juniors in Agricultural Course. Prerequisite: 1 yr. Chemistry.

Origin, mechanical composition, classification, and physical properties of soils; tillage operations in relation to moisture supply, micro-organisms of the soil. Lecture, laboratory and field work.

## VEGETABLE PATHOLOGY AND BOTANY

## 1. Plant Pathology

Three credits (six hours per week); first semester. Offering to juniors in the Agricultural Course. Prerequisite: Botany 1.

Elementary study of plant diseases due to fungi bacteria and slime molds; life-histories and preventive methods. Lecture, laboratory, and reference.

## 3. Agricultural Botany

Three credits (six hours per week); second semester. Offered to sophomores, juniors and seniors. Prerequisite: Botany 1.

Elementary botanical and agricultural study of weeds and agricultural crop plants. Weed and crop seeds with special reference to identification. Seed testing and seed legislation.

## VETERINARY SCIENCE

## 6. Veterinary Medicine

Three credits. Offered to juniors.

Brief course in anatomy, animal physiology, veterinary pathology, including lameness and unsoundness, causes and prevention of diseases. Especial attention given to management of contagious and infectious diseases. Course for Agricultural students.

**Bulletin of**  
**The University of Minnesota**  
GENERAL EXTENSION DIVISION

**EVENING COURSES**

1915-1916



VOL. XVIII. NO. 20. AUGUST 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.

## CALENDAR

1915-1916

1915		
September	20-25	Registration Week
September	24	Friday, 8:00 p.m. Annual opening of St. Paul Institute and General Extension Courses, Mechanic Arts High School, St. Paul
September	25	Saturday, 8 p.m. Annual opening of General Extension Courses, Minneapolis
September	27	Monday. Regular class work begins
November	25	Thursday. Thanksgiving holiday
December	18	Saturday. Christmas recess to January 3, 1916
1916		
January	3	Monday. Class work resumed
January	24-29	Examination week, first semester
January	31	Second semester begins
May	15-20	Examination week, second semester

# GENERAL EXTENSION DIVISION

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 OTTO S. ZELNER, B.S., Assistant Professor of Surveying  
 HERMANN K. ZUPPINGER, Lecturer in Merchandising, General Extension Division

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DULUTH

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A. H. COMSTOCK	1320 E. Superior St.
B. C. WADE	Y. M. C. A.
R. B. KNOX	1314 E. Superior St.
J. J. MOE	2102 W. Superior St.
W. J. OLCOTT	2316 E. 1st St.
C. A. DUNCAN	1400 Alworth Bldg.
B. P. NEFF	2126 Jefferson St.
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L. A. BARNES	831 N. 57th Ave. W.
E. W. BOHANNON, President State Normal School	2323 E. 5th St.
R. E. DENFELD, Superintendent of Schools	18 Oxford
MRS. T. J. DAVIS	405 First Nat'l Bank Bldg
HON. W. E. MCEWEN	Manhattan Bldg.



## EXTENSION SERVICE

The Extension Service of the University of Minnesota is organized to include:

- A. Evening classes, in Minneapolis, St. Paul, Duluth and other cities.
  - 1. Courses leading to credit in the College of Science, Literature, and the Arts.
  - 2. Law courses.
  - 3. Courses in Business Administration, Accountancy, and Finance.
  - 4. Afternoon, evening, and Saturday classes in Education.
  - 5. Practical courses in Engineering.
- B. Correspondence courses.
- C. Extension lectures, singly or in groups, and lyceum lectures, concerts, and entertainments.
- D. Agricultural extension, including lectures, demonstrations, institutes, and short courses under the direction of the College of Agriculture.
- E. The Municipal Reference Bureau, which compiles and furnishes to city officials information pertaining to municipal government and administration.
- F. The Bureau of Visual Instruction, through which loan collections of lantern slides and films are furnished to schools and clubs.
- G. University cooperation with local educational effort as exemplified by the "University Weeks."
- H. The short course in Retail Merchandising.

# EVENING EXTENSION COURSES

## GENERAL INFORMATION

### ADMISSION TO COURSES

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 (usually twenty-one 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 of the business courses. The courses listed under Engineering do not carry credits. The statement in regard to credit for Law courses will be found on page 44. Such credits will be recorded upon matriculation in the University. Courses requiring one evening (two hours) a week for recitation normally carry two credits. Those requiring more time usually carry correspondingly more credit.

The statement concerning credit for the Certificates in Accountancy, in Finance, and in General Business will be found on pages 24, 25, and 26.

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 the appropriate credit.

4. Any person qualified to be admitted to the University shall receive a certificate upon satisfactorily completing an approved course. The certificates entitle the holder to the corresponding university credits whenever he has earned thirty credits in residence. The Registrar or the Administrative Board shall in all cases pass upon the qualifications of the student.

5. No credits shall be given to students not properly qualified to be admitted to the University as regular students.

6. The maximum credit towards a degree for work done in Extension courses shall not exceed one half the unit hours required for graduation. At least twelve credits in the major subject shall be completed in regular college classes and of these six must be from the starred courses.

7. 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.

#### *University Students and Correspondence and Extension Work*

1. No university student may enroll for a correspondence or extension course 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.

#### FEES

Collegiate courses meeting one evening a week require a fee of \$5.00 a semester of sixteen weeks. For Collegiate courses meeting two evenings a week, the fee is \$10.00 a semester.

For Business courses, except where otherwise noted, the fees are: For a single course, \$7.50 a semester; for two courses taken simultaneously, \$12.00 a semester; for three courses taken simultaneously, \$15.00 a semester; for four courses taken simultaneously, \$20.00 a semester.

For Engineering courses the fee is \$5.00, \$7.50 or \$10.00 a semester as indicated in the description of the several courses.

The fee does not include the cost of texts or material. The cost of these items varies from \$1.00 to \$3.00.

The requirements relative to the Law courses accompany the announcement of those courses in this bulletin. (See page 43.)

All fees are payable at the time of registration, and registration should

not be deferred longer than the second meeting of the class. Checks should be made payable to the University of Minnesota. No FEE WILL BE REFUNDED ON ACCOUNT OF WITHDRAWAL FROM ANY COURSE, unless application for refund be made within ten days after registration.

Special arrangements are made with organizations, clubs and individual 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.

#### PLACES FOR CONDUCTING CLASSES

The classes in Law will be held in the Law Building on the University campus. Most of the classes in Engineering will be held in the Main Engineering Building, Electrical Engineering Building, or the Mechanical 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 school houses. Definite locations for each class will be announced in a circular to be published about September 10.

In St. Paul the work will be carried on in coöperation with the St. Paul Institute of Arts and Sciences at the Mechanic Arts High School or in the City Normal School. Additional accommodations will be provided for in some cases.

#### NUMBER FOR WHOM CLASSES WILL BE ORGANIZED

Classes will not be organized for a smaller enrollment than twelve, and in some courses a larger registration will be required.

#### TIME OF MEETING

Classes ordinarily meet at 7:30 and dismiss at 9:30. The semester is sixteen weeks long.

#### ENROLLMENT

Registration takes place during the week preceding the organization of classes (September 20-25). Students may also register with the instructor at the class.

#### PROGRAM OF CLASSES

Folders will be issued about September 10, 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 announcements may be found in the special folders. Folders will be issued for the Collegiate courses, the Business courses, the Engineering courses, and the Law courses.

*LOCATION OF EXTENSION OFFICES*

After September 1, 1915, the offices of the General Extension Division may be found in their new location on the ground floor of the Main Engineering Building on Church Street, just north of Washington Avenue, South East. To telephone the office, call N. W. East 2760 or T. S. Spruce 257 and ask the University central for the General Extension Division.

## COURSES OF INSTRUCTION

The courses of instruction naturally group themselves into four 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 above college); (3) Engineering courses; and (4) Law courses. The descriptions 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 given 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 twelve. 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 will be sent to all requesting it.

### BOTANY

- 1 (1\*). BOTANY I. A university course in general botany, designed to meet the needs of students who have not the facilities of a regular laboratory. The course includes field study of autumn flowers, of weeds, trees, and shrubs, and of mushrooms and toadstools; the preparation of herbs and woody plants in garden and nature for winter; the migration of seeds and fruits; the gross structure of plants; the physiology of germination and growth. Four credits (two evenings a week). Fee, \$10.00 a semester. CLEMENTS.
- 2 (2). BOTANY II. A continuation of Course 1, taking up the study of the physiology of the adult plant, its methods of making and assimila-

\*The number in parentheses is that of the corresponding course in the regular University bulletins.

lating food, and its relations to water, light, temperature, etc.; the use of plants in every-day life; classification and relationships of flowering plants; principles of propagation and plant breeding; vegetation of North America. Four credits (two evenings a week.) Fee, \$10.00 a semester. CLEMENTS.

- 3 (119-120). INDUSTRIAL BOTANY. A study of plants as materials and agents in every-day life, with especial emphasis upon their uses in the home, in the industries, and in agriculture and forestry. Attention will be paid to the origin, distribution, and cultivation of useful plants, the nature and use of the products obtained from them, and the processes employed. Open to those who have had one year of high-school botany, or Botany 1 or 2. Eight credits (two evenings a week); both semesters. Fee, \$10.00 a semester. TILDEN.
4. SCHOOL GARDENS. A garden study of the common, useful, and ornamental plants with especial reference to the development of school and experimental gardens, as well as to methods of propagation and cultivation. Stress is laid upon the correlation of the garden work with the life of the school, and a general survey is made of the development of the school garden idea. Prerequisites the same as for Course 3. Four credits (two evenings a week); second semester. Fee, \$10.00 a semester. CLEMENTS

### CHEMISTRY

1. ELEMENTARY CHEMISTRY. A study of the common chemical elements and their compounds, with an introduction to the modern theories of chemistry. Special attention to be given to the practical applications of chemistry. Lectures, textbook, and laboratory work. Four credits (two evenings a week); both semesters. Fee, \$10.00 a semester. TEMPLE.

### EDUCATION

- 1 (3a\*). BRIEF HISTORY OF EDUCATION. The origin and development of schools, more particularly in the modern period, as a preparation for the understanding of the educational systems, theories, and practices of the present. Ranks as a junior and senior course in the University. Open to teachers and prospective teachers who have met the college entrance requirements. Four credits (two evenings a week); each semester. Fee, \$10.00 a semester. NORMAN.
- 2 (121a). SCHOOL SUPERVISION. A course in fundamental principles of school organization, administration, and supervision. It is designed for teachers, principals, superintendents, members of boards of education, parents, or others who are interested in discussions relating to

\*The number in parentheses is that of the corresponding course in the regular University bulletins.

- methods of administration and supervision of public school education. Open for credit to high-school graduates who are also graduates of normal schools, or who have had adequate experience in teaching. Other persons, not desiring credit, may register. Each prospective student must get permission from the instructor before registering for the course. Two credits (one evening a week); second semester. Fee, \$5.00 a semester. RANKIN.
- 3 (142). INDUSTRIAL EDUCATION. Open for credit to high-school graduates who are graduates of normal schools, or who have had adequate teaching experience, or who have had adequate experience as industrial workers. Other persons, not desiring credit, may register. Each person who wishes to take the course should see the instructor before registering. The course treats of the necessity for vocational training in the public schools. It aims to show the bearing of the facts of universal education and industrial evolution on the methods and material of a system of public schools. Four credits (one evening a week); both semesters; Wednesday. Fee, \$5.00 a semester. RANKIN.
- 4 (141). SCHOOL SANITATION. This course will be conducted by text, by lectures, and by investigation into the problems of school lighting, heating, and ventilation, and other questions of school architecture and management connected with the physical well-being of the pupils. Open for credit to teachers, prospective teachers, and school board members. Those desiring University credit must be eligible for enrollment in the University. Others may take the course without credit. Each student must see the instructor before enrolling. Two credits (one evening a week); first semester. Fee, \$5.00 a semester. RANKIN.
5. EDUCATIONAL STANDARDS IN A DEMOCRACY. The meaning of democracy, its origin and growth as a political and social ideal. The relation of the school to this ideal in America. School standards inherent in democracy as a political and social conception. The application of these standards to present conditions and practices. Two credits (one evening a week); first semester. Ranks as a junior and senior course in the University. Open to teachers and prospective teachers who have met the college entrance requirements. Fee, \$5.00 a semester. SWIFT.

## ENGLISH

- 1 (55). SHAKESPEARE: THE EARLIER PLAYS. A course of lectures on Shakespeare with reading of a considerable number of plays. Two credits (one evening a week); first semester. Fee, \$5.00 a semester. CRAIG.
- 2 (68). THE ENGLISH NOVEL. A course of lectures on the English novels and novelists and on the principles and methods of prose fiction with



- the reading of eight representative novels. Two credits (one evening a week); second semester. Fee, \$5.00 a semester. CRAIG.
3. THE SHORT STORY IN ENGLISH. A study of the principles and practice of the short story as evolved in modern literature. The work is aimed not only to teach technic of the form, but to train the student in the actual production of this sort of fiction. Two credits (one evening a week); first semester. Fee, \$5.00 a semester. NORTHROP.
  - 4 (56). SHAKESPEARE. A study of the later plays of Shakespeare showing the culmination of his development as a poet and dramatist. Two credits (one evening a week); second semester. Fee, \$5.00 a semester. NORTHROP.
  5. THE POETRY OF ROBERT BROWNING. A study of the inspirational value of Browning's message. Lectures and readings. The topics will include the dramas, lyrics, and *The Ring and the Book*. One evening a week; first semester. Fee, \$5.00 a semester. POWELL.

#### GEOLOGY AND GEOGRAPHY

- 1 (1). GENERAL GEOLOGY. Materials of the earth and geologic processes; physiographic, structural, and dynamic geology, with a brief introduction to historical geology. Lectures, laboratory work, field excursions, map study, and conferences. Two credits (one evening a week); first semester. Fee, \$5.00 a semester. LEHNERTS.
- 2 (4). GEOGRAPHY AND GEOLOGY OF MINNESOTA. The geological study of Minnesota; its rocks and soils; minerals and mines; building stones, clay beds, and glacial deposits; rivers, and lakes; scenic features; waterways and water powers; artesian well basins; prairies, forests, and agricultural lands; problems of state-wide interest, such as immigration, agriculture, drainage, reforestation, construction of state highways, utilization of natural resources, and development of old and new industries. Two credits (one evening a week); first semester. Fee, \$5.00 a semester. LEHNERTS.
- 3 (36). GEOGRAPHY OF NORTH AMERICA. A study of the United States, Canada, Mexico, and Central America; their surface, soil, climate, natural resources, industries, and peoples. Special study and scientific interpretation will be made of the most scenic regions of our continent, such as Yellowstone Park, Glacier Park, the Grand Canyon of the Colorado, the Yosemite Park, Lake Chelan and the Cascade Mountains, the Canadian Rockies, the Panama Canal, etc., etc. This course is planned (1) for those who can not travel but who wish to acquaint themselves with the peoples, resources, and conditions of our continent; (2) for those who have traveled, but desire further explanation of the conditions and phenomena; and (3) for those who intend to travel and wish to make adequate preparation. Two credits (one evening a week); second semester. Fee, \$5.00 a semester. LEHNERTS.

- 4 (31-32). PHYSICAL AND HUMAN GEOGRAPHY. First semester: Physical features of the earth and agencies effecting changes in them; effects of various land forms on activities of man; elements of climatology and oceanography; topographic map interpretation; field excursions. Second semester: economic and political development in relation to nature; geographic and economic interpretations of history; economic progress as a phase of adaptation to environment. Textbook, lectures, and reports. Constitutes a unit course for which no credit is given until both semesters are completed. May be counted toward a major or minor in the Department of Geology or in the Department of Economics. Four credits (one evening a week); both semesters. Fee, \$5.00 a semester. LEHNERTS.

## GERMAN

- 1 (1-2). 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. Fee, \$10.00 a semester. DAVIES.
- 2 (3-4). INTERMEDIATE GERMAN. First semester: selections from modern narrative and descriptive prose; selected lyrics and ballads. Second semester; a drama of Lessing, Goethe, or Schiller. Open to those who have completed Course 1 or its equivalent. Both semesters must be completed before credit is given for the first semester. Students who obtain credit for this course can not receive credit also for Course 3. Eight credits (two evenings a week); both semesters. Fee, \$10.00 a semester. GEISSENDOERFER.
- 3 (5-6). PROSE AND POETRY. Stern's *Aus deutschen Meisterwerken*; Goethe's *Gedichte*; Heine's *Buch der Lieder*. Geography, history, and legend. Review of German grammar throughout the year. Open to all with two years of German. Not open to those who have obtained credit in Course 2. Both semesters must be completed before credit is given for the first semester. Eight credits (two evenings a week); both semesters. Fee, \$10.00 a semester. BURKHARD.
- 4 (27-28). ELEMENTARY CONVERSATION AND COMPOSITION. Conversation on topics of every-day life, oral narrative; translation into German, short descriptive or narrative essays, and letter writing. Intended for those who have had at least one year of German. Four credits (one evening a week); both semesters. Fee, \$5.00 a semester. BURKHARD and MYERS.
- 5 (7-8). THE DRAMA. First semester: Classic drama; plays of Lessing, Goethe, or Schiller; study of dramatic structure; history of the German drama in the eighteenth century. Second semester: Modern drama; plays of Grillparzer, Kleist, Hauptmann or Sudermann;

study of the present-day drama in Germany; assigned readings and reports. Open to those who have taken Courses 1 and 2, or Course 3. Both semesters must be completed before credit is given for first semester. Eight credits (two evenings a week); both semesters. Fee, \$10.00 a semester. GEISSENDOERFER.

- 6 (29-30). INTERMEDIATE GERMAN CONVERSATION. This course follows the Elementary Course and is a conversational course only. Practice in speaking German, following the laboratory method. Some speaking knowledge of German is desirable. Should be preceded by Course 4. Two credits (one evening a week); both semesters. Fee, \$5.00 a semester. KOENIG.

### 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. Fee, \$5.00 a semester. SAVAGE.
2. THE GREEK DRAMA. No knowledge of Greek is required for this course. It consists in the reading and interpretation of representative Greek plays, together with lectures on the origin, growth, character and influence of the Greek drama. Lectures richly illustrated with the stereopticon, portraying Greek life and Greek dramatic art in its various aspects, will also be given. Two credits (one evening a week); second semester. Fee, \$5.00 a semester. SAVAGE.

### HISTORY

- 1 (1-2). MEDIEVAL AND MODERN HISTORY. The growth of France, Germany, and Italy from 800 A. D. to the French Revolution with reference also to social and economic conditions, and to the Medieval church. Open to all. Eight credits (two evenings a week); both semesters. Fee, \$10.00 a semester. DAVIS.
2. AMERICAN POLITICAL HISTORY, 1492-1912. Brief survey of the colonial and the most recent periods, with fuller treatment for the years 1789-1865. Special attention given to political parties, territorial expansion, slavery, and the Civil War. Eight credits (two evenings a week); both semesters. Fee, \$10.00 a semester. DAVIS.

## LATIN

- 1 (9). ROMAN LIFE AND ARCHITECTURE. Chief topics: Roman national characteristics; Rome and the Campagna; the orders of architecture; the Forum; its life and activities; the forums and palaces of the Caesars; the Roman house and furniture; the theaters and the presentation of plays; amphitheatres and gladiatorial combats; the circuses and chariot races; Pompeian baths and Roman *thermae*; triumphal and sepulchral monuments. Two credits (one evening a week); first semester. Fee, \$5.00 a semester. GRANRUD.
- 2 (10). ROMAN AND ITALIAN LIFE AND ART. Leading topics: the first principles of art; Roman historical reliefs and portrait sculpture from Sulla to Constantine; pictorial technique and wall decoration; mythological paintings; landscape, *genre*, and still life; Italian scenery; typical Italian cathedrals; *Roma immortalis*, past and present; select masterpieces of Raphael and Michael Angelo. Two credits (one evening a week); second semester. Fee, \$5.00 a semester. GRANRUD.

Each session of Courses 1 and 2 will consist of an introductory lecture, reports, and discussions. The lectures are illustrated with numerous black and colored lantern slides, and aim to portray the artistic side of the Romans and Italians, to describe the intimate and vital connection of their art and life, and to indicate the supreme importance of their artistic achievements.

## MATHEMATICS

- 1 (1). HIGHER ALGEBRA. PART I. The fundamental rules, factoring, highest common divisor, lowest common multiple, fractions, involution, evolution, surds, imaginaries, simple equations with one, two, and several unknown quantities, inequalities, ratio and proportion, arithmetical and geometrical progressions, quadratic equations, and numerous problems requiring both simple and quadratic equations. The examples and problems are more difficult than those under the same subjects in Elementary Algebra and demonstrations are an important part of the work. Four credits (two evenings a week); first semester. Fee, \$10.00 a semester. ADKINS.
- 2 (3). HIGHER ALGEBRA, PART II. First two evenings devoted to a review of factoring, H.C.D., L.C.M., fractions, surds, and theory of exponents. The following topics will be treated in detail: Quadratic equations, equations in quadratic form, simultaneous quadratic equations, progressions, the mathematical induction proof with the binomial formula, permutation, and combinations, determinants of second and third order in connection with simultaneous linear equations, the theory of equations with methods of obtaining real roots of numerical equations. Graphical representation and graphical solution of

equations will be given special attention all through the course. Open to those who have completed Course 1, or its equivalent. Four credits (two evenings a week); second semester. Fee, \$10.00 a semester. ADKINS.

- 3 (4). LOGARITHMS AND TRIGONOMETRY. Text, tables, and numerous problems. Open to those who have completed Course 2 (Higher Algebra, Part II.) Four credits (two evenings a week); first semester. Fee, \$10.00 a semester. SLOBIN.
- 4 (7). ANALYTICAL GEOMETRY. Rectilinear and polar coördinates, producing equations of loci whose law of development is known, constructing and discussing such equations, transformation of coördinates, properties of the straight line, the conic sections and higher plane curves by means of their equations. Open to those who have completed Course 2 or 4 (Advanced Algebra and Plane Trigonometry, or Logarithms and Trigonometry). Four credits (two evenings a week); second semester. Fee, \$10.00 a semester. SLOBIN.

#### PHILOSOPHY AND PSYCHOLOGY

- 1 (1). ELEMENTS OF PSYCHOLOGY. The aims and methods of psychology, the facts and laws of mental life, and the functions of the various mental processes in the adjustment of man and his environment. Open to sophomores, juniors, seniors, and teachers. This course is required for the Teachers' Certificate. Four credits (two evenings a week); each semester. Fee, \$10.00 a semester. WOODROW, EDWARDS.
- 2 (9a). LOGIC. The nature of knowledge, the laws of reasoning, and the principles and methods of scientific proof. The aim of this course is to produce accuracy of thought as well as to familiarize the student with the logical grounds of modern science. Textbook, lectures, and reports. Open to those who have had some college work, and to teachers. Four credits (two evenings a week); each semester. Fee, \$10.00 a semester.
3. PRESENT DAY PHILOSOPHY. A popular survey of the chief movements of contemporary thought in Philosophy and Sociology, including a discussion of modern Materialism, Idealism, Positivism, Utilitarianism, Pragmatism and Socialism. The course is meant for those who want to be awake to the main tendencies in the philosophic thought of the present and yet have not time to make an extensive study. Two credits (one evening a week); first semester. Fee, \$5.00 a semester.
4. HUMAN NATURE. A course in modern philosophy and psychology, as applied to the chief problems of practical life. The course will be untechnical, and will include a number of simple experiments designed to illustrate the subjects treated, and to serve as basis for the discussion. Among the subjects dealt with, the following will be included: the analysis of character into its elements; the significance of

laziness, fatigue and sleep; efficiency, and the chief factors in attaining it; the meaning of education; its various stages, and final goal; memory, and the laws of forgetfulness; thought transference, automatic writings, and kindred subjects. Two credits (one evening a week); second semester. Fee, \$5.00 a semester.

### POLITICAL SCIENCE

- 1 (5) MUNICIPAL ORGANIZATION. This is a course in the study of the modern city. The chief topics are: methods of framing and amending city charters, the initiative, referendum, recall, new methods of making nominations, preferential voting, municipal activities, finance and accounting, municipal inefficiency and corruption, and the proposed reforms. Two credits (one evening a week); second semester. Fee, \$5.00 a semester.

### RHETORIC AND PUBLIC SPEAKING

- 1 (1). ENGLISH 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. Fee, \$5.00 a semester. PATTISON.
- 2 (2) ENGLISH RHETORIC II. A combination of the preceding course, open to those who have had one half-year course in freshman Rhetoric, or its equivalent. Two credits (one evening a week); second semester. Fee, \$5.00 a semester. PATTISON.
- 3 (41-42). A GENERAL COURSE IN PUBLIC SPEAKING. The fundamentals of effective speaking; study and practice of the principles of breathing, voice-production, enunciation, and action; delivery of extracts from the works of well-known writers and speakers; the principles underlying the making of the speech applied in both oral and written compositions. Open to ministers, lawyers, teachers, and others who are able to carry the work successfully. Four credits (one evening a week); both semesters. Fee, \$5.00 a semester. RARIG, GISLASON.
- 4 (11-12). EXPOSITION, DESCRIPTION, AND NARRATION. In the first semester, the analysis of specimens of exposition; short themes and fortnightly essays, with emphasis on careful planning and amplification. In the second semester, the same general plan applied to description and narration. Open to those who have completed the equivalent of Course 1-2 in college Composition and Rhetoric. Eight credits (two evenings a week); both semesters. Fee, \$10.00 a semester.

### ROMANCE LANGUAGES

- 1 (1). 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. Fee, \$5.00 a semester.
- 2 (3). INTERMEDIATE FRENCH GRAMMAR AND COMPOSITION. French grammar review; readings from modern authors. Open to all who would 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. Fee, \$5.00 a semester.
- 3 (7-8) ELEMENTARY FRENCH CONVERSATION AND COMPOSITION. Four credits (one evening a week); both semesters. Prerequisite French 1. Fee, \$5.00 a semester.
- 4 (109-110) LECTURES IN FRENCH. Le mouvement général des lettres de 1870 jusqu'à nos jours. Supplementary reading, quizzes, and final examination. This course is particularly recommended to teachers of French and to members of the Alliance Française and kindred societies. Two credits (one evening a week); first semester. Fee, \$5.00 a semester. MULLER.
- 5 (31) BEGINNING SPANISH. Grammar, pronunciation, reading and practice in speaking. Four credits (one evening a week); both semesters. Fee, \$5.00 a semester.

## SCANDINAVIAN

- 1 (1-2) BEGINNING NORWEGIAN. Grammar, select reading in easy prose and poetry. Eight credits (two evenings a week); both semesters. Fee, \$10.00 a semester. BOTHNE.
- 2 (101-102) MODERN NORWEGIAN LITERATURE. History of Norwegian literature from 1814 to the present day. Open to advanced students who have completed Courses 1-2 and 3-4 (Elementary and Advanced Norwegian) and others having equivalent preparation. Both semesters must be completed before credit is given for the first semester. Eight credits (two evenings a week); both semesters. Fee, \$10.00 a semester. BOTHNE.
- 3 (5) BEGINNING SWEDISH. Grammar, conversation, composition, modern texts. Open to all who have had no Swedish. Both semesters must be completed before credit is given for the first semester. Second semester not given in 1915-1916. Four credits (two evenings a week); first semester. Fee, \$10.00 a semester. STOMBERG.
- 4 (107-108) SWEDISH LITERATURE. History of Swedish literature from 1719 to the present time. History of the literature and study of modern authors, including Selma Lagerlöf, Geijerstam, Strindberg. Open to advanced students who have completed Courses 5-6 and 7-8 (Elementary and Advanced Swedish) and others able to carry the work successfully. Both semesters must be completed before credit is given for the first semester. Eight credits (two evenings a week); both semesters. Fee, \$10.00 a semester. STOMBERG.

## SOCIAL ECONOMICS

Emphasizing human cost, human economy, human efficiency, and human justice, the following courses in Social Economy make an appeal to both the social worker and the business student. This is true particularly of the business student who desires to be a leader. A far-sighted view of business has always shown that a proper regard for the human factor may increase profits. Furthermore, society is already insisting that the heads of large business enterprises be socialized business chiefs.

Social workers, including teachers, charity workers, public officers, ministers, workers for civic improvement or for peaceable adjustment between labor and capital, will find these courses to be of vocational value.

*Certificate in Civic and Social Service*

The University now offers a Certificate in Civic and Social Service to those students who complete the following course of study. This certificate will be awarded upon the satisfactory completion of forty-eight credit hours of work as indicated below. The student may complete this course in three years of eight hours a week, but in many cases four years of six credit hours a week will be advisable.

## FIRST GROUP

(Twenty-four credits, all required)

*In Economics—*

Man and His Living (2)\*

Industrial History:

English (2)

American (2)

Labor and Life (2)

Labor and the Public (2)

Economic Conditions in American Cities (2)

*In Political Science—*

American Government (2)

Municipal Administration (2)

*In Sociology—*

Descriptive Sociology (2)

Elements of Sociology (2)

Social Pathology (2)

*In Psychology—*

Elements of Psychology (2)

\*Figures in parentheses indicate number of credits which correspond to the number of class hours a week.



## SECOND GROUP

(Subjects aggregating twenty-four credits to be selected)

*In Economics—*

- Labor and Immigration (2)
- Economic Functions of the State (2)
- Elements of Statistics (2)
- Economic Conditions in American Cities (2)

*In Political Science—*

- Modern Political Thought (2)
- Police Power (2)

*In Sociology—*

- The American People (2)
- Modern Social Institutions (2)

*In Psychology—*

- Mental Retardation (2)

*In Education—*

- Philosophy of Education (2)

*In English—*

- The Recent Movement in the Drama (2)

*In Rhetoric—*

- Rhetoric (2)
- Public Speaking (2)

The student may take subjects not here mentioned to the extent of six credits.

1. **MAN AND HIS LIVING.** A general course in the activities, relations, and phenomena that result from human effort to make a living and to live. How to weigh and study the economic facts of life; the aim and goal of economic progress; democracy of well-being; wages, rent, interest, profits, money, taxes, trusts, insurance, and other related topics. Designed to appeal to business and professional people, social workers, and others who desire to maintain a broad view of life and to be ripe for active citizenship; also to the teacher who aims to enliven and enforce his teaching by bringing it into relation with life outside the school. Two credits (one evening a week); one semester. Fee, \$5.00 a semester. PHELAN.
2. **ECONOMIC DEMOCRACY.** The beginning of American democracy; the modern teachings found in the Utopian reformers; the beginning of modern socialism; the progress of socialism; its relation to anarchism, syndicalism, and trade unionism. The problem of monopoly and its solution through (1) enforced competition, (2) socialism, or (3) public regulation. Of vital importance to every citizen and to students of human affairs. This course clears up many misconceptions, examines socialism carefully, and emphasizes economic reform through public regulation and education. Two credits (one evening a week); one semester. Fee, \$5.00 a semester. PHELAN.

- 3 (160). LABOR AND LIFE (LABOR PROBLEMS). The rise of the modern labor problem; woman labor, sweating, minimum wage; child labor, industrial education, vocational guidance, mothers' pensions; unemployment, industrial accidents, industrial disease, poverty. Teachers, employers, employees, social workers, and active citizens should find much of interest and profit in this course, and in the courses numbered 4 and 5. Two credits (one evening a week); one semester. Fee, \$5.00 a semester. PHELAN.
- 4 (161). LABOR AND THE PUBLIC (LABOR PROBLEMS). Strikes and their prevention, boycotts, injunctions; labor doctrines and theories; types of labor unions, of employers' associations; profit-sharing and co-operation; scientific management; housing and old-age pensions. Two credits (one evening a week); one semester. Fee, \$5.00 a semester. PHELAN.
5. IMMIGRATION AND LABOR. Who is an immigrant; the causes of immigration; the immigrant and the development of America; the effects of immigration on the native population; the effects on labor; the commercial, social, and civic effects on Europe; what shall be done about immigration. Two credits (one evening a week); one semester. Fee, \$5.00 a semester. PHELAN.
6. THE CITY. A general course on the city in relation to human progress and economic justice. The rise of cities; their peculiar problems; city government and human well-being; revenues and expenditures; the city as a laboratory of democracy. Two hours (one evening a week). Fee, \$5.00 a semester. PHELAN.

#### SOCIOLOGY AND ANTHROPOLOGY

1. (113) THE AMERICAN PEOPLE I. Dominant characteristics of the diverse foreign peoples now in the United States; their modification in America; the importance of these peoples to the American nation. Lectures, readings and essay. Two credits (one evening a week); first semester. Fee, \$5.00 a semester. JENKS.
- 2 (114) THE AMERICAN PEOPLE II. A continuation of Course 1. Essential and unique historical Americanisms, and their value and virility for the future; facts and forces of amalgamation and assimilation in America; America's ethnic problems. Lectures, readings, and essay. Two credits (one evening a week); second semester. Fee, \$5.00 a semester. JENKS.

#### 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

The following courses are arranged with a view to meet the needs of those who desire special training for the higher business positions. Business is rapidly becoming a profession, or rather the business field is opening up several professions, among which are Accountancy, Banking and Finance, Advertising, and Salesmanship. The University through its General Extension Division is attempting to afford a preparation for these professions, as it has long done for the professions of Law, Medicine, Engineering, and the like.

The time appears to be approaching when it will be just as necessary for one to secure special training for business positions as it is now to secure training for the learned professions. It is recognized, too, that the rewards for those trained for the business professions are fully as great both financially and in a social way as they are for those trained for the so-called learned professions. Moreover, experience is proving that the very people whom the General Extension Division are reaching can, while being actively employed during the day, best comprehend and appreciate the kind of instruction the evening classes afford.

The subjects of instruction are divided into three groups or courses of study, viz.: those aiding in the preparation for accountancy, those aiding in the 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. Each course can be completed by taking three subjects per week for two years, each class meeting one night per week. Each course may be completed in three years by taking but two subjects per week. Upon the completion of one of these courses a University Certificate to that effect will be granted.

### TWO-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. examination with a view of 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.

Upon the satisfactory completion of this course, the University Certificate in Accounting will be granted.

The course requires a total of twenty-four credits, each one-semester

subject counting for two credits. Each subject requires one class recitation per week for one semester of sixteen weeks. There are two semesters per year, hence the course may be completed in two years by taking three subjects per week. Or, if the student prefers, he may take but two subjects per week, thus requiring three years to complete the course.

The following subjects are required for the course:

- |  |   |
|--|---|
| 1. Principles of Accounting "A"          | 7. Accounting Problems or Cost Accounting |
| 2. Principles of Accounting "B"          | 8. Business Law "A"                       |
| 3. Accounting Practice and Procedure "A" | 9. Business Law "B"                       |
| 4. Accounting Practice and Procedure "B" | 10. Business Law "C"                      |
| 5. Auditing "A"                          | 11. Economics "A"                         |
| 6. Auditing "B"                          | 12. Business English                      |

#### ACCOUNTANCY PRIZE

In order to foster the study of accountancy the Commerce Club (composed of students of the Department of Business Instruction) offers a prize of \$15 to the best student in Principles of Accounting "A" and "B" in the year 1915-16.

#### FEEES

The fee for these courses is \$30 per year, payable \$15 each semester, when registering for three subjects; or \$24 per year, payable \$12 per semester, when registering for two subjects. The fee for a single subject is \$7.50 per semester. This does not include materials, these being furnished students at a nominal charge.

Special arrangements are made with organizations, clubs and individual 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.

#### THREE-YEAR 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.

This certificate will be granted to those who complete a total of twenty-four credits distributed as follows:

Principles of Economics (2)	Principles of Accounting B (2)
Banking Practice (2)	Business Law A (2)
Investments and Speculation (2)	Business Law B (2)
Corporation Finance (2)	Business Law C (2)
Business English (2)	Elective subjects (4)
Principles of Accounting A (2)	

#### *The American Institute of Banking*

The American Institute of Banking recognizes the evening courses of the General Extension Division at 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 examination 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), Finance (2 credits), and Business Law (4 credits).

The advanced courses in Finance coincide with the requirements of those who wish to receive the title of Associate from the Institute for postgraduate study.

### GENERAL BUSINESS COURSE

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.

#### *The University Certificate in General Business*

This certificate will be granted to those who successfully complete a total of twenty-four credits distributed as follows:

Business English (2)	Elective subjects (12)
Business Law A (2)	(These electives should be selected with a view to specializing in some particular field, as in Advertising and Selling, in Railroad Traffic, and the like.)
Business Law B (2)	
Economics A (2)	
Accounting A (2)	
Accounting B (2)	

### DESCRIPTION OF SUBJECTS

#### ACCOUNTING

1. INTRODUCTION TO ACCOUNTING. The purposes of accounting, the use of books of original entry, posting to the ledger, the trial balance, closing the ledger, preparation of simple statements. Two credits (one evening per week). PRESTON AND HARPER.

This course is arranged for those students who do not understand bookkeeping principles sufficiently well profitably to pursue Course 2. (Hereafter an examination will be required for entrance to Course 2.) The object of the course is not to teach bookkeeping and office routine. Those desiring such training are advised to enter the classes in the Public Schools, the Y. M. C. A., or the Business Colleges. The object is to give such preparation for those who desire to make a further study of the science of accounts, but who, through inexperience or lack of study, are unable to work beside those who have had that preparation. A study of the principles of the subject will be made from the start, only sufficient bookkeeping practice being given to illustrate the principles involved.

2. **PRINCIPLES OF ACCOUNTING "A"**. Single and double entry, statement of earnings by comparison of capital at the beginning and end of a period, statement of assets, liabilities, and capital, the merchandise account and its analysis, account nomenclature, accruals, deferred charges, classification of loss and gain accounts and of balance sheet accounts. The use of auxiliary ledgers and controlling accounts, exercises in closing the books and in arranging balance sheets and income statements, departmentization of accounts, imprest cash system, contingent liabilities. Designed for those who already have a knowledge of bookkeeping principles. Those not having such knowledge are expected to first take Course 1. Two credits (one evening a week); first semester. PRESTON, ROTZEL.

A fundamental general course treated from the standpoint, first, of the purposes which the science and practice of accounting seek to accomplish; second, of the methods and means by which this object is gained. Under the first heading, a general inquiry is made into the information necessary for an intelligent conception of a business to various parties in interest. Under the second heading, principles are developed which underlie the most efficient methods used to secure and set forth such information and place it upon record.

The method of instruction affords the student the greatest amount of practical work. A model proposition is demonstrated by the instructor and the student is asked to work out a similar proposition according to the principles brought out in the demonstration. The propositions as well as their solutions are taken from actual practice.

3. **PRINCIPLES OF ACCOUNTING "B"**. Further exercises in the preparation of statements, the manufacturing, trading, and profit and loss accounts, good will, depreciation, the accountant's working sheet, accounts peculiar to a corporation, surplus, sinking funds and reserves, condensed balance sheet and income statement. For those who have completed Course 2 or its equivalent. Two credits (one evening a week); second semester. PRESTON, ROTZEL.
4. **ACCOUNTING PRACTICE AND PROCEDURE "A"**. 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) the study of a complete illustrative accounting installation for a manufacturing and selling enterprise; (b) 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 made possible by the use of an installation such as the one studied; (c) a study of the accounting problems peculiar to representative business other than manufacturing and selling. 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. ROTZEL.

An advanced course for the accounting student following the study of *Accounting Principles*. The object of the subject is twofold: 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.

5. ACCOUNTING PRACTICE AND PROCEDURE "B". A continuation of Course 4. Two credits (one evening a week); second semester. ROTZEL.
6. COST ACCOUNTING. The elements of cost, i.e., prime cost and indirect expense or 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. Pre-determined standard costs, and their relation to "scientific management." The cost ledger and its relation to the general ledger. Two credits (one evening a week); first semester. PRESTON.

Modern industry demands that each plant to 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.

7. 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 their 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. ROTZEL.

8. **AUDITING (B).** A continuation of Course 7. Two credits (one evening a week); second semester. ROTZEL.
9. **APPLIED ACCOUNTING (A).** A similar course designed for those who have two years of work in Accounting. The purpose of the course is to apply the principles and the practice of accounts as studied in the previous years to a business most primitive to the student. Each student will work up in report form the details of an accounting installation which will be of such a character that it will meet in a scientific way all the contingencies which would be likely to arise in a series of years. Two credits (one evening a week); first semester.
10. **APPLIED ACCOUNTING (B).** Continuation of Course 9. Two credits (one evening a week); second semester. ROTZEL.
11. **ACCOUNTING SYSTEMS.** The type of business to be dealt with will consist of: financial—the commercial bank, savings bank, and insurance company; mercantile—the department store and lumber yard; manufacturing—the flour mill and brewery; municipal utilities—the gas and electric railway companies; public service—the steam railroad and telegraph companies; governmental—accounting systems of municipalities; legal—the accounts and books of executors and receivers. The subject matter will be illustrated by means of the uniform systems of accounts prescribed by governmental and other commissions, by the published report of corporations, and selected C. P. A. problems. Four credits (one evening a week); both semesters. MITCHELL.

The aim of this course is to apply the principles of account classification to the accounts of a representative of each type of business, showing how its expense and revenue accounts should be classified, its special accounting problems, and the system of accounts and books which will best accomplish the purpose.

#### BANKING AND FINANCE

21. **BANKING PRACTICE.** 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 officers 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; examinations, supervision, and reports; and bank policy from the analysis of local bank reports. Two credits (one evening a week); second semester. EBERSOLE.

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.

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 bimetalism and the gold exchange standard; discount rates, the problem of securing an elastic currency, and the distribution of the world's gold between the nations; the problem of securing an ideal money. Text-book and money-market articles in current newspapers will furnish material for discussion. Two credits (one evening a week); first semester. **EBERSOLE.**

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.

- 23 (145). **THE 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, consolidation, and reorganization; trust and holding companies; the taxing of corporations; corporation statistics; the preparation and analysis of corporation reports; the corporation before the law. Two credits (one evening a week); second semester. **SINCLAIR.**

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.

- 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. EBERSOLE.

## BUSINESS LAW

*General Explanation.* In teaching business law, the Extension Division of the University has deviated widely from the general course and method of handling the subject. The policy of the department is to give the student *all* the principles which he can, as a layman, use and apply in actual business. Many courses have included only what the instructor thought of greatest importance without regard to usefulness. Usefulness is the sole test applied by the department.

The instruction is by means of lectures, quizzes, textbook, cases, and free and open class discussions and wide range and liberty of question by students.

The instructor, where the class will benefit thereby, will explain, discuss and pass upon contracts and contract forms, and methods of conducting business employed by the student or his employer in any case wherein the student may desire such consideration.

The illustrations and lectures emphasize the practical phases of the several subjects and are designed to assist the student to become thoroly businesslike and save him the expense arising from the most common and frequent legal errors.

Every business man needs, and is not fully equipped until he has covered the subjects of Business Law A, B, C and D. The other business law subjects are planned more particularly for certain students only.

### 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, of 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 agency; the rights and obligations of principals, agents, and third parties. Text, lectures, and cases. Two credits (one evening a week); first semester. HOUCK, SINCLAIR, SMILEY.

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 instrument law; form: (a) what a negotiable instrument must and must not contain, (b) non-essentials, (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 cases. HOUCK, SINCLAIR, AND SMILEY.

Two credits (one evening a week); second semester. For those who have completed Course 31.

33. BUSINESS LAW "C"—PARTNERSHIPS AND CORPORATIONS.

**Partnerships:** Formation of partnerships; articles of copartnership; methods of terminating partnerships; rights and obligations of partner (a) toward his copartners, (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; terminations 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; liabilities 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. Text, lectures, case assignments, and class discussions.

For those who have completed Course 31. Two credits (one evening a week); first semester. HOUCK.

## 34. BUSINESS LAW "D"—REAL PROPERTY, MORTGAGES, BANKRUPTCY

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.

Insolvency and Bankruptcy.

Two credits (one evening a week); second semester. HOUCK.

## 35. BUSINESS LAW "E"—COMMON CARRIERS, AND LAW OF RAILWAY TRAFFIC AND RATES. Among the items considered are: Who are common carriers; duties, privileges, rights and liabilities in general; duty to furnish equipment; demurrage; when liability of carrier begins; when liability ends; bills of lading and contracts limiting liability; carrier's liability for goods in storage awaiting shipment or delivery; liability on goods lost, damaged or delayed, etc., etc. The difference between private and public utility businesses for purposes of regulation; the fundamental principles of regulation; legal considerations and elements making up lawful rates; what are reasonable rates, discriminatory rates; how each is determined and protected against competition, long and short haul, construction of tariffs; routing and misrouting; reconsignment and diversion of cars; time and manner of preventing claims; state and federal regulation and regulatory bodies; right to have rates quoted; penalty for erroneous quotation; how to present and handle claims before the State and Interstate Commerce Commission.

Particular attention is paid to state and federal regulatory acts and tribunals. The Interstate Commerce Act (1887) and the Elkins Amendment (1903), the Hepburn Act (1906), the Mann Act (1910), and the Cummins Act (1915) are all thoroly covered.

The widest latitude of discussion and questioning will be allowed. Students will be allowed and invited to present actual pending disputes for discussion and advice as to proper procedure to be followed.

Two credits (one evening a week); first semester. HOUCK.

*Note.*—Railway Traffic and Rates (Railway Problems), Course 71, shown on page 35, should be taken simultaneously with this course and as an integral part of the instruction in this subject. The purpose of this course is to enable the layman to handle intelligently the numerous problems continually arising between shipper and receiver of goods and the carriers. The student will be given a working knowledge of the many principles the application of which will save much money and endless annoyance in the daily application of the principles.

## ECONOMICS AND COMMERCE

41. (1a). ELEMENTS OF ECONOMICS: Utility and valuation; price and the laws of price as applied to competitive and monopolistic conditions;

price and the cost of production; the factors of production; the law of diminishing returns; division of labor and its relation to the development of industry; the forces and factors involved in the concentration of industry, including the difference between the agricultural and the mechanical industries; wages, rent, interest, capitalization, enterprise, and business profits; finally, some attention is given to money, credit, banking, and international trade. Two credits (one evening a week); first semester. Fee, \$5.00 a semester. GESELL.

This course aims to ground the student in principles that are basic in all economic discussions. The study naturally centers in value and the laws of valuation under the various applications.

- 42 (3a). PRACTICAL ECONOMIC PROBLEMS (ADVANCED ECONOMICS). Taxation—the tariff, general property tax, corporation taxes, income taxes; labor problems—unionism, trade agreements, strikes and lock-outs, law in reference to labor unions, injunctions, employers' liability, workmen's compensation; railway problems—theory of rate-making, state and federal control; monopoly problems—economics of big business, intensive study of U. S. Steel Corporation, Sherman Anti-Trust Act, and important legal decisions relating to restraint of trade. Two credits (one evening a week); second semester. GESELL.

The aim of this course is to study economic principles in their relation to some of the leading questions of today.

43. BUSINESS ORGANIZATION. A study of the organization of industry as a whole, and the relationship of different types of business. The organization of typical business units, with reference to, first, the organization of the ownership (with special reference to the corporation), the promotion of corporations, the corporation charter, financing the corporation, the function of the underwriters, a classification of stocks and bonds, the comparison of a few typical state corporation laws; second, the internal organization of typical concerns with reference to a division of authority and responsibility; sales organization, sales planning, sales management, the organization of the advertising department, credits and collections, the organization of the production department, Taylor's system of scientific management. Emerson's efficiency system, wage systems and their relation to efficiency. Two credits (one evening a week); second semester. PRESTON and special lecturers.

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. One evening a week; first semester. MARTIN.

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.

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 analyses the product from the standpoint of its advertisability. He considers the planning of a trademark, the organization of the sales forces, the selling points, the prices and the profits. He then thoroly analyzes the market, chooses the advertising mediums 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 300 of the leading advertising men of this country will be available to the student. Two credits (one evening a week); second semester. MARTIN.

53. **RETAIL ADVERTISING.** In this course the student conducts an advertising campaign for a retailer under the same general plan as in Course 52 for a manufacturer. The student is shown the relation of advertising to the different departments of a great department store. He is also shown how some of these same principles may be adopted for the smallest of specialty stores. He is shown where the advertising manager gets his ideas and how they are developed into the finished advertisement—what pays and what does not pay. One evening a week; second semester. LEE.

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. One evening a week; each semester. CORBETT, SCHONEK.

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.

- 71 (73). **RAILWAY TRAFFIC AND RATES.** Theory of railroad rates; freight classifications; "make-up" of tariffs, both local and joint; authorities under which joint tariffs are published; rail and water versus all-rail rates; basis for principal present-day rates; car service and efficiency; fast freight lines, tariffs and guide of billing books; privileges, "transit and storage"; principal commodity rates—lumber, live stock, grain products, etc.; conditions governing proper issuance of bills of lad-

ing; tracing of freight; methods of compiling and presenting claims; conditions imposed by federal and state laws on the acceptance of freight; study of conference rulings of the I. C. C.; federal control—Interstate Commerce Act. The course is built on practical lines and is intended to assist the railroad or commercial traffic man to become familiar with the technicalities and the problems connected with an important branch of business service. Four credits (one evening a week); both semesters. KUEMPEL.

72. RAILWAY TRAFFIC AND RATES (2). (LEGAL PHASES). For description see Course 35, Business Law "E." Two credits (one evening a week); first semester. HOUCK.

### ENGLISH AND SPANISH

81. BUSINESS ENGLISH. Not a lecture course nor a dry, prosy study of technical English grammar and composition but a new, interesting and practical application of the custom of our speech to every-day conversation and writing. The letter will be used as the basis of all written work because it is the form most common in business and is so intimate and personal that fundamental principles are more quickly discovered and definite results more easily obtained. Special attention will be given to letters of application, complaint, collections and credit, and other forms of commercial correspondence that do not deal directly or indirectly with sales. Students will be expected to write letters and take their part in the weekly discussion. Some knowledge of English grammar and composition is a prerequisite to this course. One evening a week; first semester.
82. SALES CORRESPONDENCE. Studying to put "pull" into sales letters is the purpose of this course. The work is not based on theories, but upon the practical application of fundamental principles. A careful analysis is made of letters that have been big winners and a knowledge of the psychology of sales correspondence is secured and then practically applied. Letters written by students and actually used in sales campaigns or in their daily office work are studied, criticized, and tested. The work is made intensely practical and is vitally interesting because it deals with the daily difficulties and problems of the student. Every phase of sales correspondence is carefully investigated, studied, and worked out in letters so that every effort is put forth to make the course broad, suggestive, practical. A course in Business English or its equivalent is a prerequisite to this work. One evening a week; second semester.
83. PUBLIC SPEAKING. For description see Department of Collegiate Instruction. One evening a week; both semesters. RARIG, GISLASON.
90. COMMERCIAL SPANISH. For description see Department of Collegiate Instruction. One evening a week; both semesters.

## DEPARTMENT OF ENGINEERING INSTRUCTION

The increase in the number of students in the extension engineering classes last year indicates the importance of this work. 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.

In the past, the General Extension Division has offered various subjects covering the engineering field. While each of these subjects is important, it was found that many persons registered who could not take the work with any great profit to themselves because of inadequate preparation.

This fact has now led the General Extension Division to offer groups of courses in Architecture, Civil Engineering, Electrical Engineering and Mechanical Engineering. These course groups are arranged to be completed in either two- or three-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 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 the student completes any one of these consecutive courses, a certificate to that effect from the University of Minnesota will be given.

Unless otherwise stated herein the fee for a single course meeting one night a week is \$7.50 a semester; for two courses, \$12.00 a semester; for three courses, \$15.00 a semester.

The following courses, arranged to be completed in three years of two evenings a week, may also be finished in two years of three evenings a week. The work is divided into two semesters per year. Each semester of the Engineering Extension classes is twelve weeks long; but the classes in Shop Mathematics and Elementary Electricity continue for sixteen weeks.



## ARCHITECTURE

## FIRST YEAR

*First Semester*  
Elementary Architectural Design  
Freehand Drawing

*Second Semester*  
Elementary Architectural Design  
Architectural History

## SECOND YEAR

*First Semester*  
Intermediate Architectural Design  
Shop Mathematics

*Second Semester*  
Intermediate Architectural Design  
Mechanics, Strength of Materials

## THIRD YEAR

*First Semester*  
Advanced Architectural Design  
Structural Design

*Second Semester*  
Advanced Architectural Design  
Reinforced Concrete

## CIVIL ENGINEERING (For Office Men)

## FIRST YEAR

*First Semester*  
Shop Mathematics  
Drawing: Working Drawings

*Second Semester*  
Shop Mathematics—Advanced  
Structural Drafting

## SECOND YEAR

*First Semester*  
Applied Mechanics  
Elements of Structural Design

*Second Semester*  
Strength of Materials  
Structural Design

## THIRD YEAR

*First Semester*  
Reinforced Concrete  
Roof Trussed Bridges—Design

*Second Semester*  
Reinforced Concrete Design  
Bridge and Building Design

## CIVIL ENGINEERING (For Field Men)

## FIRST YEAR

*First Semester*  
Shop Mathematics  
Lettering and Sketching

*Second Semester*  
Plane Geometry and Trigonometry  
Mapping

## SECOND YEAR

*First Semester*  
Plotting and Calculation  
Plane Surveying

*Second Semester*  
Stadia and Topographical Surveys  
Curves and Earthwork

## THIRD YEAR

*First Semester*  
Highways  
Municipal Engineering

*Second Semester*  
Railways  
Municipal Engineering

## ELECTRICAL ENGINEERING

## FIRST YEAR

Shop Mathematics

*First and Second Semesters*

Elementary Electricity

SECOND YEAR

<i>First Semester</i>	<i>Second Semester</i>
Alternating Currents	Alternating Currents
Mechanical Drawing	Mechanical Drawing
or	or
Applied Mechanics	Strength of Materials

THIRD YEAR

<i>First Semester</i>	<i>Second Semester</i>
Direct and Alternating Current Machinery	Central Power Stations
or	or
Telephony	Telephony
Steam Boilers and Engines	Engine Testing
or	or
Electrical Measurements	Electrical Measurements

Alternates in the third year will be given only every other year.

MECHANICAL ENGINEERING

FIRST YEAR

<i>First Semester</i>	<i>Second Semester</i>
Shop Mathematics	Shop Mathematics—Advanced
Mechanical Drawing	Shop Drawing

SECOND YEAR

<i>First Semester</i>	<i>Second Semester</i>
Applied Mechanics	Strength of Materials
Advanced Shop Work	Gas Engines
or	or
Elementary Electricity	Plumbing

THIRD YEAR

<i>First Semester</i>	<i>Second Semester</i>
Shop Management and Pattern Construction	Steam Boilers
or	or
Steam Engines and Engine Testing	Central Stations
Heating and Ventilation	Alternating Currents
or	or
Mechanical Equipment of Buildings	Elementary Machine Design

1. ARCHITECTURAL HISTORY. Twelve lectures illustrated with lantern slides, covering the ancient and Renaissance periods. One evening a week; second semester. Fee, \$5.00 a semester. MANN.
2. ELEMENTARY ARCHITECTURAL DESIGN. Shades and shadows and wash rendering. Architectural elements such as doors, windows, moldings, and the architectural orders; lectures and drawing. Open only to high-school students who have had mechanical drawing, or to those who have had one year or more in an architect's office, or who have had equivalent experience. Two evenings a week; both semesters. Monday and Thursday evenings, 7:30-9:30. Fee, \$7.50 a semester. FORSYTHE.

3. INTERMEDIATE ARCHITECTURAL DESIGN. Regular Class B "Analytique" or Order Problems of the Society of Beaux Arts Architects. Open only to those who have completed Course 1, or who have had two years or more in an architect's office, or who have had equivalent preparation in an architectural school. Two evenings a week; both semesters. Monday and Thursday evenings, 7:30-10:00. Fee, \$5.00 a problem, or \$10.00 a semester. JONES.
4. ADVANCED ARCHITECTURAL DESIGN. Class B, Plan Problems, and Class A, Problems of the Society of Beaux Arts Architects. 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 an architectural school. Two evenings a week; both semesters. Monday and Thursday evenings, 7:30-10:00. \$5.00 a problem or \$10.00 a semester. MANN.  
*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. MAP DRAWING. (a) Farm and city plats. (b) Real estate display maps. (c) Landscape architects' maps. (d) Topographic and hydrographic symbols. One evening a week; second semester. Fee for course, \$7.50 a semester. ZELNER.
6. LETTERING AND TITLES FOR ENGINEERS. Principally freehand Reinhardt lettering. Title lay-outs and lettering. One evening a week; first semester. Fee for course, \$7.50 a semester. ZELNER.
7. PLANE SURVEYING. Elements of plane surveying relating to methods of chain, compass, transit, and stadia surveys; methods of keeping field notes; determination of area of irregular plots; care, use, and adjustment of instruments; methods of subdivision of the United States public lands. One evening a week; first semester. Fee, \$7.50 a semester. CUTLER.
8. 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. Fee, \$7.50 a semester. McMILLAN.
9. 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. Fee, \$7.50 a semester.

10. 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. Fee, \$7.50 a semester.
11. 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. Experiments will be made throughout the course. One evening a week; both semesters. Fee, \$5.00 a semester. EDWARDS.
12. ELEMENTS OF ALTERNATING CURRENTS. An experimental study of alternating currents, including the modifications of Ohm's law to include effects of inductance and capacity, the fundamental principles of the impedance coil, transformer, generator, motor, telephone transmitter and receiver, and the like. The treatment will lead up gradually from simple explanations, and the necessary mathematics will be developed as required. One evening a week; both semesters. Fee, \$7.50 a semester. TURNER.
13. DIRECT AND ALTERNATING CURRENT MACHINERY. The operation and maintenance of direct and alternating current generators, motors and electrical measuring instruments. A textbook by J. H. Morecroft will be used. One chapter will be taken each week, and a number of experiments will be made throughout the course. One evening a week; first semester. Fee, \$7.50 a semester. RYAN.
14. POWER STATION ELECTRICAL APPARATUS. A study of the problems involved in the operation and maintenance of direct and alternating current generators and motors, switchboards, electrical measuring instruments, and storage batteries. This course is designed for men connected with central stations and isolated plants. One evening a week; second semester. Fee, \$7.50 a semester. RYAN.
15. ELEMENTS OF TELEPHONY. Nature of voice sounds, construction and operation of receivers and transmitters, reading blue-prints 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 practicable. One evening a week; second semester. Fee, \$7.50 a semester. SHEPARDSON.
16. SHOP MATHEMATICS. 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; both semesters. Fee, \$5.00 a semester. EDWARDS.
17. 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; both semesters. Fee, \$5.00 a semester. EDWARDS.
18. 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 calculation, simple graphical calculations, forces, simple machines, work, power, energy, strength of materials, elementary hydraulics and pumps. One evening a week; first semester. Fee, \$5.00 a semester. BROOKE.
19. 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, moment of inertia, simples stresses, shear, riveted joints, the general elementary theory of beams, columns, and shafts. One evening a week; second semester. Fee, \$7.50 a semester. BROOKE.
20. 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 instruction 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. Fee, \$7.50 a semester. SHOOP.
21. STEAM BOILERS AND ENGINES. Theory and practice of steam boiler operation; settings and accessories; type of boilers, chimneys, smoke prevention, mechanical stokers and economizers. Mechanism of the steam engine, work in the cylinder, steam distribution, effect of reciprocating parts. Indicator and indicator cards. Horsepower from cards; valve diagrams and valve setting. Exercises and problems. One evening a week; second semester. Fee, \$7.50 a semester. MARTIN.
22. PATTERN MAKING. A series of lessons on the theory and practice of pattern making. Open to mechanics and apprentices who are able to

take the work with profit to themselves. A further course is offered to teachers who are now teaching manual training and desire to take up a more advanced branch of the work. This course can also be taken advantageously by those of mature years who wish to become teachers of manual training. One evening a week; first semester. Fee, \$7.50 a semester. RICHARDS.

23. **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. Fee, \$7.50 a semester. MARTENIS.
24. **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. Fee, \$7.50 a semester. MARTENIS.
25. **GAS ENGINES AND PRODUCERS.** Principles of operation of two-cycle and four-cycle engines; cylinder construction and arrangement, system of speed control, ignition, and cooling. Application of the indicator and consideration of indicator diagrams. A study of the power gas producer, including suction and pressure types for various fuels; construction and operation of the generator and accessory apparatus. Application to various industrial purposes. One evening a week; first semester. Fee, \$7.50 a semester. MARTIN.
26. **MECHANICAL DRAWING.** How to make drawings and how to read them. This course will be given to meet the needs of the individual. It includes the making of drawings or reading from blue prints or both. The work is intended for beginners. One evening a week; both semesters. Fee, \$7.50 a semester. FRENCH.
27. **MECHANICAL EQUIPMENT OF BUILDINGS.** This course covers the necessary calculations for, and the layout on, the plans of the complete mechanical equipment of the various types of buildings with proper specifications. The various heating and ventilating systems together with the proper plumbing fixtures will be taken up in detail. Specifications covering the equipment laid out will be written. One evening a week; first semester. ROWLEY.

## COURSES IN LAW

### SCOPE OF COURSE

University Extension courses in substantive law are given under the immediate direction of the Faculty of the Law School. They are designed primarily for the benefit of those persons who desire legal instruction for the purpose of better qualifying themselves for business careers. They do not lead to a degree.

### TIME AND PLACE OF INSTRUCTION, AND TEXTBOOKS

All instruction in Law will be given at the Law Building of the University of Minnesota, Minneapolis. Class exercises will be held on the evening of each week day, excepting Saturday, during the session, beginning at 7:30 and extending not later than 9:30.

For the present, at least, textbooks used by students in pursuing the courses will be loaned by the University free of charge, upon payment of a deposit fee of \$5.00. This deposit will be repaid upon the student's returning in good condition all of the books loaned to him during the year.

### REQUIREMENTS FOR ADMISSION

The requirements for admission to the Extension courses in Law are in general the same as for the day courses in the College of Science, Literature, and the Arts; namely, either (1) passing special entrance examinations, (2) graduation from an accredited high school, or (3) evidence by certificate, of equivalent scholastic preparation.

By special arrangement, persons who are at least twenty-one years of age, and who do not comply with the general requirements as above outlined, may enter the evening courses in Law. In such cases, it will be necessary for applicants to satisfy the department that they are adequately fitted to carry the proposed work.

### UNIVERSITY CREDIT FOR EXTENSION WORK IN LAW

Students who show special aptitude may receive credit in Extension courses towards a degree in Law. Any student who has completed with marked success any Extension course will be admitted to the regular Law School examination in that subject, and, if successful, will be given full credit. After securing credit for all the subjects taught in the Extension course in Law, and thereupon completing at the Law School of the University of Minnesota the various procedural courses required for a degree, a student will be entitled to graduation, provided that previous to taking these examinations he could have qualified as a regular student in the Law School by having completed two years of academic work in an institution of collegiate rank. It is possible also for a student who successfully completes the Extension courses in Law to qualify for passing the bar examination for admission to practice, by taking the regular practice work in the Law School during an additional year.

## EXAMINATIONS AND CERTIFICATES

Upon completion of each of the courses above described an examination will be held. Students who successfully pass all examinations given during the three year's course will receive a certificate showing that they have completed the University Extension Course in Law.

## FEES

The tuition fee for the regular Extension Course in Law is \$50.00 a year, payable one half at the beginning of the first semester and one half at the beginning of the second semester. Students taking less than the whole course will be required to pay at the rate of \$5.00 for each recitation a week for each semester. No other charge of any kind will be made excepting the deposit required for the safe return of textbooks loaned, as indicated above.

## REGISTRATION

From September 20 to October 8 the office of the Dean in the Law Building will be open for the purpose of giving information and registering students for the Extension Law courses every evening, except Saturday and Sunday, from 7:30 to 9:30. At other times, and for further particulars apply to Director of the General Extension Division, University of Minnesota, Minneapolis.

## COURSES GIVEN IN 1915-16

The complete Extension curriculum in Law will extend through three years, with six lecture periods a week each year. The courses given are described in outline below.

*First Year*

1. **PERSONAL PROPERTY.** This course includes a consideration of the distinction between real and personal property; the acquisition of title to personal property other than by sale; accession, confusion; gifts; finding; property rights of bailor and bailee; possessory liens and pledges. One hour; first semester. FLETCHER.
2. **CONTRACTS.** This course deals with the general principles of the Law of Contracts. The student considers fully the rules governing the making of contracts, their operation and discharge, and the legal consequences of a breach of contract. The general purpose of the course is to afford a foundation for the later study of the important kinds of specific contracts, such as those of agency, bailments, partnership, commercial paper and sales, which are considered in separate courses. Two hours throughout the year. CHERRY.
3. **DOMESTIC RELATIONS.** This course treats of marriage and divorce; parent and child; guardian and ward; property law peculiar to the marriage relation; rights and liabilities of persons under the disabilities of coverture, infancy, insanity, etc. One hour; first semester. PAIGE.



4. **CRIMINAL LAW.** This course deals with the common and statutory law of crimes, its historical development and practical application. Two hours; first semester. PAIGE.
5. **AGENCY.** In this course are treated the creation of the relation of principal and agent, capacity of parties, reciprocal duties of principal and agent, respective rights and liabilities of principal and agent to third parties, including the doctrine of undisclosed principal, requisites and effect of ratification, and termination of the relation. Two hours; second semester. THURSTON.
6. **SALES.** This course includes a consideration of sales of specified goods; sales of goods not specified; reservation of title by bill of lading; effect of fraud upon the contract of sale; condition and warranties; vendor's lien; stoppage in transitu, and the Statute of Frauds. Two hours; second semester.

*Second Year*

7. **REAL PROPERTY.** This is a continuation of the course begun in the first year, and treats primarily of title to real estate and the principles and practice of conveyancing. Two hours; first semester.
8. **MORTGAGES.** In this course are considered the essential elements of legal and equitable mortgages, both of realty and chattels; rights of mortgagor and mortgagee at law and in equity; title, possession, dower, curtesy, waste, priorities, collateral agreements, foreclosure, redemption; extension, assignment, and discharge of mortgages. One hour; first semester. FLETCHER.
9. **CONSTITUTIONAL LAW.** This course deals with the nature of the American constitutional system, including the relation of the states to the federal government; the legislative, executive, and judicial departments, with express and implied powers of each; interstate commerce; constitutional limitations; police power; due process of law; taxation; eminent domain, etc. Two hours; second semester. FLETCHER.
10. **DOMESTIC RELATIONS.** This course is identical with that given to the first-year class as above described. One hour; first semester. PAIGE.
11. **CRIMINAL LAW.** This course is identical with that given to the first-year class as above described. Two hours; first semester. PAIGE.
12. **AGENCY.** This course is identical with that given to the first-year class as above described. Two hours; second semester. THURSTON.
13. **SALES.** This course is identical with that given to the first-year class as above described. Two hours; second semester.

*Third Year*

14. **REAL PROPERTY.** This course is identical with that given to the second-year class as described above. Two hours; first semester. FLETCHER.

15. MORTGAGES. This course is identical with that given to the second-year class as described above. One hour; first semester. FLETCHER.
16. CONSTITUTIONAL LAW. This course is identical with that given to the second-year class as described above. Two hours; second semester. FLETCHER.
17. PRIVATE CORPORATIONS. This course deals with the nature, creation, and citizenship of corporations, *ultra vires* contracts and acts, stock issues, rights and liabilities of stockholders, officers and agents of corporations, and rights of creditors. Two hours; first semester. ABBOTT.
18. INSURANCE. In this course are considered the nature and history of the insurance contract; the doctrines of insurable interest, warranties and representations; waiver and estoppel; rights of parties to the contract; and construction of the standard policy. One hour; first semester. VANCE.
19. PARTNERSHIP. This course deals with the nature and formation of the partnership relation, and the rights and liabilities of the partners, both *inter se* and as to third parties. One hour; second semester. PAIGE.
20. NEGOTIABLE INSTRUMENTS. This course considers 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. Two hours; second semester. PAIGE.
21. BANKRUPTCY. This course treats of the 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. One hour; second semester. FLETCHER.

## AGRICULTURAL EXTENSION DIVISION

For details relative to Extension Courses offered by the College of Agriculture, address the Agricultural Extension Division, University Farm, St. Paul.

### OTHER BULLETINS

In addition to the present publication, the General Extension Division also issues the following:

Bulletin of Correspondence Courses

Bulletin of Extension Lectures

They will be sent free to any interested person upon request. All inquiries should be addressed to the

General Extension Division,  
The University of Minnesota,  
Minneapolis

## REGISTRATION 1914-1915

### DEPARTMENT OF COLLEGIATE INSTRUCTION

#### MINNEAPOLIS

Abrahamson, H., 321 19th Ave. S.E.  
Abt, Emma W., 1618 Girard Ave. W.  
Adams, Cynthia E., Central High School  
Adams, K. H., 110 Willow St.  
Adams, Ruth, Lafayette School  
Adie, David C., Civic and Commerce Association.  
Ainsworth, Ida, 2948 Fremont Ave. No.  
Akins, Ethel M., 605 Delaware St. S.E.  
Akre, Belle C., 1428 Spruce Place  
Albertson, Grace, Franklin School  
Alrick, B. G., Jewelers' & Exchange Bldg.  
Almquist, Herman E., 1401 No. Fremont Ave.  
Alsworth, Ida, 2948 Fremont Ave. No.  
Amonson, Maude, Monroe School  
Amonson, Nettie, Adams School  
Anderson, H., 1005 E. 19th St.  
Anderson, Deborah Marie, West High School  
Andrews, Rev. Mary G., 2006 Park Ave.  
Andrews, Bernice, Longfellow School  
Ankeny, Sarah T., Clinton School  
Apfeld, Josephine, 3032 Irving Ave. S.  
Ashton, Jennie, Bryant School  
Babcock, M. Vinette, Bryant School  
Babcock, Ruth E., 1703 4th St. S.E.  
Bacon, Eleanor, Simmons School  
Baldwyn, Louise V., Simmons School  
Banker, Mary L., 3314 Elliott Ave.  
Barber, Mrs. Anabel R., 319 19th Ave. S.E.  
Barber, Laura, Clinton School  
Barker, Nellie I., 710 10th St. So.  
Barnes, Walter G., 535 Plymouth Bldg.  
Barney, Edith M., 2118 Cedar Ave.  
Barquist, Elsie M., South High School  
Barry, Florence, 1015 E. 28th St.  
Baston, C. B., Curtis Court  
Bartlett, Elizabeth, 1308 Harmon Place  
Bartlett, Mae L., Prescott School  
Bauman, Helen L., Irving School  
Bell, Mabel, Grant School  
Bell, Jane E., Longfellow School  
Bemis, Katherine I., Logan School  
Bemis, Luella May, Blaine School  
Benjamin, Arthur E., 1020 Donaldson Bldg.  
Benjamin, W. G., 1020 Donaldson Bldg.  
Benjamin, Mrs. W. G., 3115 Calhoun Ave.  
Benjanus, Axel A., Second Warehouse Co.  
Berkheimer, Effie B., Longfellow School  
Bezanson, Edith E., 3432 Chicago Ave.  
Bjirhus, Knute, 3817 Nicollet Ave.  
Bjirhus, Mrs. Margaret, 3817 Nicollet Ave.  
Blair, Virginia, Whittier School  
Blythe, Mrs. Virginia B., 554 Security Bank Building  
Boe, H. Margaret, Lake Park, Minn.  
Bomberger, Edna, University of Minnesota Administration Board  
Roos, Monte, 1625 University  
Boquist, Adele E., Bremer School  
Boquist, Linda, 2210 Polk St. N.E.  
Borovsky, Jacob, 112 5th St. N.  
Botzenhardt, Eugene W., 12-14 E. Grant St.  
Boudry, Igile M., Chamber of Commerce Association  
Powers, Ruth A., Gimbel-Zimmer Co.  
Briggs, Mrs. Edith Drake, 611 E. 25th St.  
Brockway, Clara E., Tri-State Tel. & Tel. Co.  
Broderick, F. M., University of Minnesota Department of Geology  
Brooks, Leslie C., Chemical Bldg.  
Brown, D. Grace., 1904 5th Ave. So.  
Browne, Marie W., 3505 Fremont So.  
Bruce, Helen, 2308 Bryant So.  
Bruce, Rena, Prescott School  
Bryant, Lora S., Johnson School  
Buchanan, Anabel, Emerson School  
Buck, Myrtle, Civic and Commerce Association  
Bunge, Amanda, 610 E. 16th St.  
Burbank, Eliz. W., Madison School  
Burns, Mrs. Louise, Simmons School

- Busian, Zula, 2544 Pillsbury School  
 Butler, Gladys Helena, Bremer School  
 Butterfield, Truman L., Newport, Minn.  
 Byrne, Anna M., Franklin School  
 Cameron, Mrs. A. H., 615 University Ave. S.E.  
 Cameron, Elizabeth, Lowell School  
 Camfield, Mrs. H. E., 2515 Blaisdell Ave.  
 Campbell, Olga W., 908 5th Ave. So.  
 Campbell, Sarah, Margaret Fuller School  
 Cantwell, Lucille M., Longfellow School  
 Caranor, Hazel C., 205 James Ave. No.  
 Carey, Agnes F., Lowell School  
 Carlson, Ida C., 1409 Stevens Ave. So.  
 Carpenter, Martha, Lyndale School  
 Casserday, Mabel C., Sheridan School  
 Challman, Esther R., Monroe School  
 Channon, Julia H., Holmes School  
 Chapel, Winnie M., Hawthorne School  
 Chapman, Madge, Adams School  
 Chase, Florence, 1647 W. 26th St.  
 Chase, Ruth, 1647 W. 26th St.  
 Chisholm, Tryphena, Calhoun School  
 Christensen, Emma D., Bremer School  
 Christensen, Emma Louise, 2757 Bryant Ave. So.  
 Christensen, May J., Garfield School  
 Christie, Blanche, Bremer School  
 Clyde, Mrs. Mary C., College of Dentistry, University of Minnesota  
 Collins, Margaret E., Robert Fulton School  
 Collohan, M. Ida, McKinley School  
 Confield, Jeanette, Lincoln School  
 Confield, H.E., 2515 Blaisdell Ave.  
 Conn, Bertha, Everett School  
 Conroy, Mary H., 710 15th Ave. So.  
 Cook, Ellen E., 4036 Queen Ave. So.  
 Corrigan, Edna, Drew School  
 Cort, Maude O., 4312 Linden Hills Blvd., Dakotah Apts., Apt. 1  
 Cory, Russell L., Franklin School  
 Coulter, M. Etta, Franklin School  
 Councilman, Mrs. Alice, Sidney Pratt School  
 Covell, Susan A., Washington School  
 Coveny, Mary J., 1522 N. Emerson Ave.  
 Cox, Ethel J., 1117 8th St. S.E.  
 Crane, Laura A., Sidney Pratt School  
 Crawford, Mary E., Sheridan School  
 Crawford, Blanche L., Sidney Pratt School  
 Croasdale, Inez S., Corcoran School  
 Crockett, Clara S., Bryant School  
 Crouse, T. Frances, Kenwood School  
 Cunningham, Harriet A., 412 16 Flour Exchange  
 Curran, Arthur A., 811 14th Ave. No.  
 Dahl, Catherine, 2525 No. 40th St.  
 Dale, John J., 913 5th Ave. So.  
 Deahofe, A.B., G.N. Ry., St. Paul  
 DeCamp, Lee, Horace Mann School  
 DeCamp, Melvina, Pillsbury School  
 Dells, May H., Central High School  
 Des Marais, Hubert H., 610 4th St. N.E.  
 Densmore, Lydia M., 601 W. Franklin  
 Devaney, Mary R., 624 15th Ave. S.E.  
 De Vinny, H. B., 1920 Laurel Avenue  
 Dicken, Anna M., Lafayette School  
 Dickinson, Mrs. W. H., 2213 Aldrich Ave. S.  
 Dill, John, 109 University Ave.  
 Doires, Phoebe M., East Sanford Hall  
 Dona, Jessie, 419 6th St. S.E.  
 Dorensen, Niels, Y.M.C.A.  
 Doswinkel, Eleanor, Bremer School  
 Dounn, August A., Madison School  
 Dougherty, Sada, Adams School  
 Downing, Theo. C., 175 Rondo St., St. Paul  
 Drake, Mary J., Adams School  
 Draper, Annie M., McKinley School  
 Duesler, Grace, Hamilton School  
 Dunbar, Louise E., West High School  
 Dunbar, Emma L., Longfellow School  
 Dunkley, Doris, Lindsay Bros.  
 Dunlap, Alta, 2216 Bryant Ave. So.  
 Dunn, Cordelia, Douglas School  
 Dunn, Alla May, Calhoun School  
 Dunn, Jeanette W., State Capitol, St. Paul  
 Durgin, Mrs. F. M., 2618 Bryant Ave. So.  
 Durham, F. H., 436 McKnight Bldg.  
 Dusschee, Hilda E., Bremer School  
 Dwyer, Elizabeth, Holland School  
 Eastwold, Clara M., St. Louis Park Schools  
 Eaton, Nellie R., 1019 26th Ave. N.E.  
 Edgerton, Bessie E., Franklin School  
 Edwards, Mary L., 723 10th Ave. S.E.  
 Elder, Henry K., 25 Old Chamber of Commerce  
 Elvidge, George, 1317 7th St. S.E.  
 Emmett, Edna E., Bremer School  
 English, Mrs. C. E., 2091 Lake of Isles Blvd.  
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 Erickson, Cornelia, J. A. Johnson School

- Echel, Allen, 1112 8th St. S.E.  
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 Evans, Carrie M., Lincoln School  
 Everard, John C., Bremer School  
 Everhard, Mabel, Hamilton School  
 Fairfield, Elizabeth, 1313 40th Ave. So.  
 Falconer, Gertrude M., Wm. Penn School  
 Falk, Martin F., Martin F. Falk Paper Co.  
 Featherstone, Harriet, Bryant School  
 Ferguson, Ida May, Public Library  
 Finigan, Josephine A., 1930 Clinton Ave.  
 Finn, Delia A., Grant School  
 Fish, Florence, Central High School  
 Fisher, Dora M., Bremer School  
 Fitzgerald, Teresa G., 1301 5th St. S.E.  
 Fitzpatrick, Lucy, Hastings Hotel  
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 Flahavan, Teresa L., Adams School  
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 Folsom, Louise M., Longfellow School  
 Ford, Mary F., Emerson School  
 Forester, Fannie M., Central High School  
 Foster, W. K., University of Minnesota Armory  
 Foster, Ada L., Washington School  
 Foster, Maude, Drew School  
 Foster, Mrs. Anna, 652 Erie St.  
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 Fowler, Alice J., Lake Harriet School  
 Foxler, Fred L., 4147 Vincent Ave. So.  
 Fraser, Ella, 2318 Dupont Ave. No.  
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 Frederickson, Margaret, Marcey School  
 Freeman, Eva I., Washington School  
 Freeman, Lily J., St. Louis Park  
 Fridley, Edith G., 707 E. 14th St.  
 Fridley, John P., 707 E. 14th St.  
 Frisch, S. Bernice, Emerson School  
 Gabrielson, Giedrum, Lindsay Bros.  
 Garvey, Florence M., Bremer School  
 Gaus, Otilie J., Jackson School  
 Gee, Florence L., Margaret Fuller School  
 Giddings, Guida, Bremer School  
 Gish, Bessie K., West High School  
 Godley, Margaret H., Lyndale School  
 Gordon, Pearl M., 2101 Irving So.  
 Gordon, Sadie, Rosedale School  
 Grandy, Eleanor E., Blaine School  
 Granrud, Amalie, 605 Delaware St.  
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 Grenager, Gudrum, 1409 Stevens Ave.  
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 Grobel, Olive A., Adams School  
 Groesbeck, Mrs. Agnes M., Lowell School  
 Grothan, Jane F., Seward School  
 Grozinger, Emma, Wm. Penn School  
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 Hardaker, Ernest J., Franklin-Blaine Schools  
 Harrington, Julia G., Everett School  
 Harrington, Mary M., Pierce School  
 Harris, Agnes, Girls' Vocational High School  
 Hart, Mabel R., Harrison School  
 Haseltine, Julia M., Grant School  
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 Hatz, Rose, 128 E. 18th St.  
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 Hayes, Effie M., Lake Harriet School  
 Hayes, Annie M., 1701 University Ave. S.E.  
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 Hays, Ada S., Bryant School  
 Hazelton, Lydia L., Whittier School  
 Hegel, Edith, Simmons School  
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 Helen, W. C., 1720 Humboldt Ave. So.  
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Hewitt, Helen, Monroe School  
Higbie, Margaret, Holmes School  
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Hilder, Fannie E., Corcoran School  
Hilliard, Ruth, Bremer School  
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Holt, Matilda E., Logan School  
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Homstreet, W. E., Madison School  
Hood, Leone, Blaine School  
Houer, Marie E., Lyndale School  
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Hughes, Theresa, Globe Bldg.  
Hughes, Harriet J., Monroe School  
Hughes, Hugh E., 713 Chamber of Commerce  
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Hurlburt, Frances, Lyndale School  
Hurlburt, Harold F., International Stock Food Co.  
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Jacobson, Elizabeth, William Penn School  
Jameson, May, Seward School  
Jarvis, Calvin W., Longfellow School  
Johnson, Milda, Lyndale School  
Johnson, Frederick O., 2217 Commonwealth Ave., St. Paul  
John, Dora U., Irving School  
Johnson, Lillian, Margaret Fuller School  
Johnson, Delia, Franklin School  
Johnson, Harriet C., 4626 Fremont Ave. So.  
Johnston, Alice M., 4626 Fremont Ave. So.  
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Jones, Pearl B., Franklin & 16th Ave.  
Jones, Elizabeth, Franklin School  
Jones, Ruth, Schiller School  
Jordan, Helen, Corcoran School  
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Keith, Effie A., University of Minnesota Library  
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Kelly, Katherine, North High School  
Kelly, Evie F., Everett School  
Kenig, Grace E., Corcoran School  
Kennedy, Marion, Grant School  
Kennedy, Agnes M., Seward School  
Kennedy, Mrs. Mabel A., 1517 3rd Ave. So.  
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Kerr, Maude Mary, Monroe School  
Kerr, Mary, 1708 Portland Ave.  
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- Kuenbuhl, Emily R., Motley School  
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 Libby, Wm. A., 325 Broadway N.E.  
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 Lillegran, Damaris, Harrison School  
 Lilley, Elizabeth, Bremer School  
 Little, Dorothy A., Irving School  
 Loate, Gurid, College of Agriculture  
 Loemans, Emma, Motley School  
 Lovell, Lela E., Calhoun School  
 Lundsten, Donald B., Hutchinson, Minn.  
 Lymann, Florence A., Lake Harriet School  
 Lynn, J. W., Soo Line Bldg.  
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 McAuliffe, Agnes, Bremer School  
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 McGregor, Effie, Longfellow School  
 McGregor, Lulu M., 502 W. Franklin  
 McGuire, Sadie, Rosedale School  
 McGuire, Mrs. A. J., St. Anthony Park  
 McIntyre, Lois, Lafayette School  
 McKillop, Nellie, Blaine School  
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 Magnussen, Jennie M., Sheridan School  
 Maguire, Gertrude E., 616 Security Bldg.  
 Mahlquist, Myrtle S., 1806 Park Ave.  
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 Mandeville, Clara L., 4833 Dupont Ave. So.  
 Marsh, Gertrude, Lowell School  
 Martin, Mary L., Pierce School  
 Martin, Maude E., Harrison School  
 Martin, Arabel, 2016 Bryant Ave. So.  
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 Mead, Ella D., Blaine School  
 Meier, A. G., Central High School  
 Merkert, Irene D., Irving School  
 Meyer, Miss Carla, Hampshire Arms  
 Miller, Bessie, 2314 Girard Ave. So.  
 Miller, Mrs. H. E., 2413 Girard Ave. So.  
 Miller, O. H., Bremer School  
 Minsky, Nathan, 427 Lyndale Ave. No.  
 Mirick, Edw. H., 1945 Fremont Ave. So.  
 Mo, Helen George, 701 15th Ave. S.E.  
 Mohlstad, Amy E., Longfellow School  
 Monasch, Stanley B., 1819 Lyndale Ave. So.  
 Monn, Ella C., William Penn School  
 Morgan, Elizabeth H., 1715 Portland Ave.  
 Morse, Mrs. Eva W., Excelsior, Minn.  
 Morse, Margaret, George Bancroft School  
 Morse, Anna E., Longfellow School  
 Morton, Catherine, William Penn School  
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 Munson, Harriet, 2412 1st Ave. So.



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 School  
 Naper, Martha E., Peabody School  
 Nason, Effie L., Grant School  
 Needham, Maud, The Associated Char-  
 ities  
 Nessel, Martha E., Clay School  
 Newell, Margaret M., Seward School  
 Nickerson, Edward, 600 Essex St. S.E.  
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 S.E.  
 Northfield, Mrs. S. M., 1415 19th Ave.  
 N.  
 Oakes, Caroline L., Johnson School  
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 O'Brien, Mrs. J. D., Lake Harriet  
 School  
 Ohr, Frances, G. N. Ry. Engr. Dept.,  
 St. Paul  
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 School  
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 Olson, Elmer, G.N. Ry., Engr. Dept.,  
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 Opper, Albert B., West High School  
 Osman, Norma B., Whittier School  
 Oswald, Mae B., Monroe School  
 Painter, David H., Seward School  
 Palmer, Alice H., 2102 2nd Ave. S.  
 Parkinson, L. D., Central High School  
 Patch, Alice S., Emerson School  
 Paterson, Minnie F., 25 Old Cham-  
 ber of Commerce  
 Pathson, Edith S., William Penn School  
 Pattison, Edith S., William Penn  
 School  
 Pearson, A. Isabel, Bremer School  
 Pearson, Belle S., Curtis Court  
 Pearson, Edw., 2420 28th Ave. S.  
 Pearson, Emelia C., The Tenny Co.  
 Pearson, F. E., Monroe School  
 Pearson, F. R., 509 Washington Ave.  
 S.E.  
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 Pepper, Herbert K., Washburn Crosby  
 Co.  
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 Petran, Miriam V., 1700 Kenwood  
 Parkway  
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 Phillips, Parry, 2036 Upton Ave. So.  
 Phillips, Philip P., 2036 Upton Ave. So.  
 Pierce, Elizabeth, University Hospital  
 Piggott, Lucy, Adams School  
 Plithe, Dora, Monroe School  
 Pomeroy, Lillian C., Whittier School  
 Pond, Harold, T. S. Tel. Co.  
 Porter, Mary L., Longfellow School  
 Posey, Mrs. C. J., 1627 Melbourne  
 Ave. S.E.  
 Powell, Mrs. R. J., 307 Oak Grove St.  
 Pratt, Mrs. Agnes A., Nicollet Ave.  
 and 50th St. W.  
 Priesman, Samuel, 212 5th St. No.  
 Price, Maud L., Hamilton School  
 Probst, Ella M., Lake Harriet School  
 Quayle, Mrs. Anna, 116 11th St. No.  
 Radebough, Mrs. C., 2426 32nd Ave.  
 So.  
 Radusch, Frieda J., 1039 18th Ave. S.E.  
 Raines, M. E., West High School  
 Randall, Ada, 3027 Stevens Ave. So.  
 Randall, Grace, 1308 Harmon Place  
 Rankin, Eva L., 2417 Lyndale Ave. So.  
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 Reid, Katherine, St. Barnabas Hos-  
 pital  
 Rheburg, Rachel, Minnehaha School  
 Rice, Mathilde E., Hamilton School  
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 Richards, Mary B., Tuttle School  
 Richards, Mary L., Monroe School  
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 St.  
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 School  
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 Ritze, Bertha L., Corcoran School  
 Roberts, Charlotte, St. Barnabas Hos-  
 pital  
 Roberts, May K., Lowell School  
 Robinson, Grace E., William Penn  
 School  
 Robinson, Harriet M., Seward School  
 Robinson, Mary R., 715 University  
 Ave.  
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 Rogers, Lena H., Logan School  
 Rood, Mary B., 116 Oak Grove St.  
 Roomer, Isabel, Grant School

- Roundy, A. L., Washburn Crosby Co.  
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 Rowell, K. M., Jackson School  
 Rowell, Ora M., Hamilton School  
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 Rutledge, Elizabeth, Garfield School  
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 Savage, Clara B., 825 5th St. S.E.  
 Scales, Kate M., Lyndale School  
 Schibursky, Clara Z., Horace Mann School  
 Schilling, Frances G., Franklin School  
 Schoepel, Edith, Bremer School  
 Schroeder, William F., Minneapolis Drug Co.  
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 Sessions, Marilla, Pierce School  
 Shaw, Gertrude J., Pillsbury School  
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 Smith, Irene, 301 Court House  
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 Smith, Harriet E., 126 W. Grant St.  
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 Sprague, Louetta, Bremer School  
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 Stephens, Jean P., Johnson School  
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 Stone, Genevieve L., Greeley School  
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 Strate, Nettie M., Adams School  
 Strauck, Hilda, Central High School  
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 Taylor, Susan, Hotel Maryland  
 Taylor, Jessie E., Whittier School  
 Telfair, Nellie M., Monroe School  
 Terry, Stephen N., 3rd Ave. and 7th  
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 Thomas, Katherine, Blaine School  
 Thomas, Lucy A., Whittier School  
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 Ulbricht, Clara M., Broadway and Fillmore  
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 Welty, B., 1711 University Ave. S.E.

Wendell, Mrs. Leona, Minnehaha School  
 Wentz, Edith M., Grant School  
 Wertz, Edith A., 1522 Fremont Ave.  
 West, Martha Belle, West High School  
 Westlund, Mary E., 4351 Garfield Ave.  
 Wildes, Marjorie, Engineering Library, University of Minnesota.  
 Wilson, Hazel, 1228 4th St. S.E.  
 Wilson, Margaret M., 723 2nd St. N.E.  
 Wheeler, Eva, South High School  
 White, Carrie A., Corcoran School  
 Wilkie, David B., Wm. McMurray & Co.  
 Wilkinson, Sarah H., Sumner School  
 Willard, Clara E., St. Louis Park High School  
 Williams, E., 32nd and Emerson Ave. No.  
 Williams, Maud, Willard School  
 Williams, R. D., 3907 Stevens Ave. S.E.  
 Wischkoemper, Olive, 979 14th Ave. S.E.  
 Wolf, Edward, 520 Nicollet Ave.  
 Wolfberg, May E., Kenwood School  
 Wollin, Lottie E., 710 Essex St. S.E.  
 Wood, Adelia, Bryant School  
 Wood, Harriet, Franklin School  
 Woodward, Chas. E., 400 No. 1st St.  
 Woodruff, Pearl E., Sheridan School  
 Wright, William W., 1210 McKnight Bldg.  
 Yahr, Cora, 2427 Cedar Ave. So.  
 Yang, Dorothy A., 25 Old Chamber of Commerce  
 Yeaton, Clyde E., Pierce School  
 Young, Katherine G., Marcy School  
 Young, Marie L., Greeley School  
 Youngberg, Berner, 3240 Aldrich Ave. So.  
 Youngberg, Paul, 3240 Aldrich Ave. So.  
 Zickwick, Theodore, Longfellow School

## ST. PAUL

Ames, Reginald H., White Enamel Refrig. Co.  
 Bacon, Alice K., 737 Fairmont Ave.  
 Bezanson, Edith E., Horace Mann School  
 Bigelow, Mrs. Alice F., 493 Portland Ave.  
 Bigelow, Allison, M., 415 Laurel Ave.  
 Birnberg, Margaret, Hendricks School  
 Blacklock, Leslie, Pioneer Press Bldg.  
 Bohon, Paul R., Emporium  
 Borup, Sophis C., Whittier School  
 Brennan, Mary F., 760 Carroll Ave.

Brennan, Rose Jane, Visitation Convent  
 Bright, M. Louise, Ramsey School  
 Buckley, Margaret, Baker School  
 Buell, Caroline, Monroe School  
 Burch, Katherine J. (Mrs. F. E.) 754 Linwood Place  
 Burns, Elizabeth, Gorman School  
 Burns, Maria, Hendricks School  
 Byerlyn, H. W., Ass't Gen. Immigration Agent  
 Caulfield, Mary G., J. J. Hill School  
 Chase, Walter W., 301 Sturgis St.

- Christenson, Margaret, 839 Fairmont Ave.
- Clark, Martha, 1470 Wesley Ave.
- Clark, R. W., 1012 Portland
- Colvin, Mrs. A. R., Davern Avenue
- Daly, Elizabeth B., Harrison School
- Daly, M. E., Harrison School
- Davenport, Florence, Whittier School
- Day, Mary E., Hendricks School
- Deahofe, A. B., G. N. Ry.
- Dimond, Winnifred, Drew School
- Dion, Anna C., Crowley School
- Dion, Philomene, Harrison School
- Dittenbrech, H. O., 1466 Capitol Ave.
- Dore, Johnanna F., Hancock School
- Dosdall, Bertha, Irving School
- Easton, Lucia B., White Bear Lake
- Eaton, Benj., Hendricks School
- Fayerweather, Mary, Harrison School
- Firestone, Allan F., Corning Adv. Agency
- Flynn, Blanche, The Angus
- Ford, Antoinette E., Irving School
- Furlong, Bridget, 128½ Eaton St.
- Gaughan, Katherine, Sibley School
- Gaughan, Sarah, Smith School
- Geroghty, Bridget, Gorman School
- Ginsberg, Annie, McKinley School
- Gorman, Alice, Van Buren School
- Gorman, Mary, Philip Crowley School
- Grant, Mary, Crowley School
- Gruber, Miss C. C., State Capitol
- Gruber, Minnie H., Van Buren School
- Hinners, Clara, Davis, Kellogg & Severance
- Hinners, Gertrude, 1850 Summit Ave.
- Hosmer, Alice M., Central High School
- How, Mary W., Whittier School
- Hurley, Anne, 117 E. Isabel St.
- Johnson, Sophie J., Rice School
- Johnson, Otto A., American Express Co.
- Kamman, Ira, Western Letter Co.
- Kaplan, A. H., City and County Hospital
- Kelly, Raymond, American Express Co.
- Kennedy, Ella F., Jackson School
- King, Margaret, Whittier School
- Kirby, Julian N., Aberdeen Hotel
- Knapp, Edward A., Germania Life Bldg.
- Krogstad, Marie C., Lyndae School
- Loveland, M. W., 78 Plate
- Lundey, Chas. M., Hudson, Wis.
- McCloud, Agatha, 135 N. Lexington
- Mahan, Sarah, McClellan School
- Maxwell, Mrs. E. H., 558 Arundel St.
- Murray, R. F., N. P. Ry.
- Noyes, Dorothy G., 1 Heather Place
- Noyes, Emily, Virginia Ave.
- O'Brien, Ella C., Franklin School
- O'Connor, M. A., Visitation Convent
- O'Donnell, M. E., Jr., Swift & Co.
- O'Keefe, Nellie M., Jefferson School
- Ostergren, Mabel C., 959 Burr St.
- Parker, Frances P., St. Paul Normal School
- Patterson, Mrs. Georgie L., 745 Fairmont Ave.
- Peck, Helene D., Minneapolis Public Library
- Peterson, Lenore, Purity Baking Co.
- Pickard, Anna C., 492 W. Central Ave.
- Ramsey, Ruth T., 214 S. Grotto
- Regan, M. Maud, Lincoln School
- Rickmire, Ora P., 58 W. 7th
- Riordan, Ethel, Visitation Convent
- Rittle, Katherine I., 409 Marshall Ave.
- Rood, Marjorie, Webster-Ramsey School
- Routh, Margaret, 537 Holly Ave.
- Ryan, Anna G., Humboldt High School
- Schulz, Elsie, Cleveland School
- Schulz, Erna, Cleveland School
- Shepherd, Mary C., Visitation Convent
- Sinclair, Gertrude, Neill School
- Slavin, Mary, Hendricks School
- Sliney, Elizabeth J., Davis School
- Sliney, Ellan, Maxfield School
- Sliney, Katherine, Neill School
- Smith, Mr. Esteele, Van Buren School
- Spates, Mrs. Anna E., 800 Hague Ave.
- Spetzman, Elizabeth H., Phalen Park School
- Swanson, Law, 197 Maria
- Sister Jane M. Cullinan, Visitation Convent
- Sister Mary Teresa Daugherty, Visitation Convent
- Sister Mary Clare Gabisch, Visitation Convent
- Sister Francis de Sales Larpenteur, Visitation Convent
- Sister Agnes Marie Mahoney, Visitation Convent
- Sister M. Marcellina, Visitation Convent
- Sister M. Antonia Naughton, Visitation Convent
- Sister Mary Vincentes O'Brien, Visitation Convent
- Sister Mary Frances Whaley, Visitation Convent
- Talbot, Georgiana, 293 Selby Ave.
- Taylor, Ethelberta G., 748 Linwood Place
- Thompson, Ruth R., 1680 Capitol Ave.
- Thygeson, Mrs. L. G., 894 Laurel Ave.
- Tousley, Elizabeth, 659 So. Robert St.

## ST. CLOUD

Bernis, Clifford, St. Cloud Normal  
 Brock, Grace M., 314 3d Ave. So.  
 Clark, Elizabeth, St. Cloud High  
 Clark, H. Addie, 315 4th Ave. So.  
 Clarke, Marianne, 356 3d Ave. So.  
 Clarke, Charlotte E., 356 3d Ave. S.  
 Douglas, Beulah, St. Cloud, Normal  
 Hilbert, Elise (Mrs.), 425 6th Ave. So.  
 Hill, Helen, St. Cloud High  
 Holmberg, Anna, 627 6th Ave. So.  
 Jodoin, Fannie M., Lincoln School  
 Knudson, Charlotte M., 810 5th Ave.  
 So.  
 Ladner, Vera, 713 7th Ave. No.  
 Magnusson, Dr. P. M., 800 1st Ave.  
 So.  
 Mitchell, Eleanor, 508 1st Ave. So.

Mitchell, Ruth H., 508 1st Ave. So.  
 Muckley, Rose M., 1916 Laurel Ave.,  
 St. Paul  
 Oliver, Myrtle T., St. Cloud Normal  
 Pribble, Evalin, St. Cloud Normal  
 Root, Stella R., St. Cloud Normal  
 Schoenfeldt, Arthur, Box B  
 Smith, Mrs. Walter A., 814 6th Ave.  
 So.  
 Smith, Rev. Walter A., 814 6th Ave.  
 So.  
 Smith, Stella, Box B  
 Tschumperlin, Mrs. Elizabeth, 526 4th  
 Ave. So.  
 Weir, Margaret, 828 5th Ave.  
 Wicklund, Effie M., 519 5th Ave. So.  
 Wilson, Claire L., 627 6th Ave. So.

## DEPARTMENT OF BUSINESS INSTRUCTION

*Third Year Students*

(i. e., those having completed two years' work in the course in Accountancy, in Banking and Finance, or in General Business.)

Harry E. Berry  
 George A. J. Carr  
 Arthur J. Draeger

Earl R. Jones  
 Fergus H. MacGregor  
 Clarence E. Nickerson

*Second Year Students*

(i. e., those having completed one year's work in the course in Accountancy, in Banking and Finance, or in General Business.)

Charles B. Brombach  
 Ernest H. Brown  
 Arthur C. Brude  
 Gustav O. Flink  
 Jeffrey Gruber  
 Arthur E. Haslund  
 Arthur W. Hauge  
 Paul G. Heinze

George L. Hudson  
 David L. Johnson  
 Evan M. Johnson  
 Samuel Leist  
 Walter M. Loberg  
 John G. Martner  
 Arthur V. Smith

## MINNEAPOLIS

Adams, J. W., Jr., 244 Plymouth Bldg.  
 Ahlness, Clair N., First National Bank  
 Aiken, E. C., Central State Bank  
 Akervold, Jenette, G., First National  
 Bank  
 Aude, H. F., 1725 E. Lake St.  
 Anderson, Alfred F., 335 9th St. S.E.  
 Anderson, Anton M., Aermotor Co.  
 Anderson, Arthur E.  
 Anderson, Fred A., C. St. P. M. & O.  
 Ry.  
 Anderson, Harry V., Grimsrud Shoe  
 Co.  
 Anderson, P. R., St. Anthony Falls  
 Bank

Anderson, Milton, 335 9th St. S.E.  
 Anderson, Robert A., 232 7th St. N.  
 Anderson, Walter, 335 9th St. S.E.  
 Anderson, William Curtis, American  
 National Bank  
 Armstrong, Mrs. C. E., County Treas-  
 urer's Office  
 Arneson, George R., Osborn & Clark  
 Attwood, Wm., Foreman Ford & Co.  
 Auel, Jos. F., J. N. Johnson Co.  
 Banks, Lester F., N. W. National  
 Bank  
 Barnard, Jas., M. W. Barnard  
 Barry, D. E., Wm. P. Johnson Elec.  
 Co.

- Barry, John P., N. W. Knitting Co.  
 Barry, Walter R., First National Bank  
 Barthel, Herman, Heywood Mfg. Co.  
 Bartholomew, Fred, 412 Washington Ave. No.  
 Bartlett, Robert, Security National Bank  
 Bauman, Jacob, Superior Elec. Mfg. Co.  
 Bayley, Chas., John Leslie Paper Co.  
 Bell, P. M., Gold Stabeck Loan & Trust Co.  
 Bengsreet, J. A., 2834 Minnehaha Ave.  
 Berg, Einor, University of Minnesota  
 Berner, T. E., T. C. Cut Glass Co.  
 Bernhagen, D. O., Filtration Plant  
 Berry, Harry E., Winston Harper Fisher Co.  
 Bishop, Alexander, Minneapolis Drug Co.  
 Blackman, H. E., Deere & Webber Co.  
 Blair, H. A., 18 University Ave. N.E.  
 Blair, Raymond E., Northwestern National Bank  
 Bloomquist, H. E., Scandinavian American National Bank  
 Blythe, Floyd M., John F. McDonald Lumber Co.  
 Bohn, Mark D., 2nd Ave. S. and 3d St.  
 Boland, Richard, 115 5th St. N.E.  
 Boran, Jos. A., Janney, Semple, Hill Co.  
 Borgeson, Bernard R., 424 Security Bank  
 Bostrom, Nathan A., 734 Security Bank  
 Bousquet, J. A., National Steel & Machinery Co.  
 Bowers, R. J., McDonald Bros. Co.  
 Bowers, R. W., Van Tilburg Oil Co.  
 Bronson, R. G., Hydraulic Press Brick Co.  
 Brown, Clifford, 336 E. 22d St.  
 Brown, Donald H., Wells & Dickey Co.  
 Brown, Ernest H., Northwestern National Bank  
 Browne, Jack W., Minnesota Loan & Trust Co.  
 Bruer, Leo, 2621 Garfield Ave.  
 Brugger, Hiram, Fred L. Gray Co.  
 Brunzell, A. C., Green DeLaittre Co.  
 Burton, F. W., 41 Chamber of Commerce  
 Butler, Richard M., Washburn Crosby Co.  
 Calhoun, Samuel, Sterling Elec. Co.  
 Calm, Robt., 1316 S. 6th St.  
 Cannon, Frank E., Butler Bros.  
 Carlson, Alfred M., 20-22 N. 4th St.  
 Carlson, C. W., C. M. & St. P. Ry. Co.  
 Carlson, George H., Northwestern National Bank  
 Carlson, Henry, Janney, Semple, Hill Co.  
 Cassidy, Tracy G., Northwestern National Bank  
 Celestine, F., National Hotel  
 Chamberlain, V. P., 46 S. 3d St.  
 Chapman, Cecil B., Chapman & Magney  
 Chapman, Stella L., Chapman Shop  
 Chilstrom, John A., St. Anthony Falls Bank  
 Curran, Clara, 124 S. 4th St.  
 Close, S. C., J. Neils Lumber Co.  
 Cloutier, Sara, M. W. Savage Factory, Inc.  
 Coaler, Howard A., 417 Essex Bldg.  
 Cohn, Robert R., 1303 Yale Place, Flat 3  
 Coil, F. B., N. P. Ry.  
 Cole, H. G., 114 3d St. N.  
 Commer, Edward B., Rural Weekly, St. Paul  
 Covell, Gladys M., Board of Park Commissioners.  
 Cowles, Raymond C., Brookside Grocery Co.  
 Cress, George, Samuels Bros.  
 Cummings, H. M., Baker Vawter Co.  
 Cunningham, Sylvester, Northwestern National Bank  
 Curran, Clara, Oliver Typewriter Co.  
 Dahl, Clarence J., St. Anthony & Dakota Elevator Co.  
 Davis, Charles A., J. P. Snyder Co.  
 Dahl, S. N., 1518 Hennepin Ave.  
 DeLapp, Leslie, Security National Bank  
 Dennis, D. W., Ogden Apartments  
 Denny, Charles M., Denny Land Co.  
 Dentz, Charles J., 709 Plymouth Bldg.  
 Dessert, P. B., The Albert Dickinson Co.  
 Devereux, Miss Margaret, 815 Nicollet Ave.  
 Dobbs, C. L., Menominee Truck Co.  
 Dodgson, J. B., C. D. Robinson Co., St. Paul  
 Doollittle, C. W., Russell Miller Milling Co.  
 Dunnigan, Thomas J., John Leslie Paper Co.  
 Duntley, Grace, 1706 Elliot Ave.  
 Dwyer, Thomas L., Johnson Elec. Co.

- Early, Mary J., The Dayton Co.  
 Eastburg, Fred C., 384 1st Ave. S.  
 Edsall, James K., Metropolitan National Bank  
 Edwards, Richard, Edwards Bros.  
 Eickenberg, Philip, Sup. Elec. Mfg. Co.  
 Eide, Einer, 836 Security Bank Bldg.  
 Ellithorpe, E. W., Regan Bros.  
 Elling, Hadar E., McDonald Bros.  
 Englund, E. F., University of Minnesota  
 Enright, John E., J. P. Fanechon Co.  
 Erickson, C. L., Northwestern National Bank  
 Erickson, John, 503 Plymouth Bldg.  
 Erickson, Sigurd, New York Life Bldg.  
 Esch, Otto N., 974 East Minnehaha St., St. Paul  
 Evans, Kenneth, D. H. Evans  
 Farnham, S. W., Twin City Lines  
 Fett, J. T., 402 Central Ave.  
 Finstrom, Carrie, 2113 Washington Ave. S.  
 Fiske, Torrance, Wells & Dickey Co.  
 Fitzgerald, Edward, Metropolitan Life Bldg.  
 Flagg, Mrs. M. I., 2101 Blaisdell Ave.  
 Flaherty, L. C., Great Falls Paper Co., Great Falls, Mont.  
 Flood, Peter, First National Bank  
 Foley, Katherine, 726 Security Bank Bldg.  
 Ford, E. L., 121 S. 10th St.  
 Forsythe, E. L., Central State Bank  
 Foster, Harry, 15 S. 5th St.  
 Fredericks, Walter, Nickels & Smith  
 Frederickson, Arthur C., N. W. Telephone Exchange  
 Friedlund, Edwin, G. N. Ry. Co.  
 Friedman, William F., Johnson, Jackson & Corning Co.  
 Fuchs, Oswin B., 214 S. 7th St.  
 Galvin, Eugene F., Minnesota Loan & Trust Co.  
 Ganzer, John H., 631 Jackson St. N.E., Flat 3  
 Gearty, Harold J., 503 Plymouth Bldg.  
 Gibbs, Nina A., Gould Grain Co.  
 Giblos, Fred C., Ives Ice Cream Co.  
 Gilbert, Carl G., 1105 E. Lake St.  
 Gillaspy, Harold F., Wyman Partridge Co.  
 Gleason, Frank, 405 Marquette Ave. S.  
 Glend, Jay C., Naas Bros.  
 Goetzman, Arthur, 2401 Central Ave.  
 Goetzman, C. A., Central State Bank  
 Goetzman, Leon M., 520 Flour Exchange  
 Gorman, H. J., N. W. National Bank  
 Graham, J. Leland, Loose-Wiles Biscuit Co.  
 Granning, Carl, Met. National Bank  
 Graus, Wendell, 315 10th Ave. S.E.  
 Gruenberg, David, Wells Dickey Co.  
 Gruenberg, Jas. J., Minneapolis Paper Co.  
 Gruetzmacher, R. P., 3046 Oakland Ave. S.  
 Gurney, E. A., M. A. Gedney Co.  
 Gustafson, Victoria E., Loose Wiles Biscuit Co.  
 Haas, Theodore J., Met. National Bank  
 Hagensen, Elmer A., 626 Jackson St.  
 Hale, Alvin L.  
 Hale, Howard, 132 Corn Exchange  
 Hall, Wm. F., McDonald Bros. Co.  
 Hannah, Fred J., Market State Bank  
 Hare, Leah A., Anti-Saloon League of Minnesota.  
 Harnisch, H. O., Jones-Harrison Home  
 Haslund, Arthur E., 906 Chamber of Commerce  
 Hastey, W. P., N. W. National Bank  
 Hauge, Arthur W., Security National Bank  
 Hawkins, John R., C. B. Lyon & Bro.  
 Hecker, Walter H., Russell Miller Milling Co.  
 Hallan, Arild, N. W. Fire & Marine Ins. Co.  
 Hellickson, Spencer H., Met. National Bank  
 Henry, Carson C., McCullough Mfg. Co.  
 Henry, Louis F., Langworthy Lumber Co.  
 Hentschell, P. J., Minneapoli Tribune  
 Herr, Anna, Civic and Commerce Association  
 Herrick, E. F., Gas Traction Foundry Co.  
 Heule, Everett W., 517 Lumber Exchange  
 Hickok, Jessie E., 75 Dell Place  
 Hill, C. F., N. W. National Bank  
 Hogan, Arthur, 1026 Lumber Exchange  
 Hogen, Ralph, Buzza Co.  
 Hoiby, Anna L., S. R. Sikes Co.  
 Holm, Florence, 814 Washington Ave. S.E.  
 Holm, H. S., 2854 Minnehaha Ave.  
 Holmes, Harry L., Omaha Ry.  
 Holmberg, C. A., 2650 Chicago Ave.  
 Holmgren, W. H., University of Minnesota

- Hoslund, Arthur E., 906 Chamber of Commerce.
- Hosp, Sam., 418 Guaranty Bldg.
- Houston, G. Sidney, Jr., Waterman-Waterbury Co.
- Huch, A. J., Central Supply Co.
- Huelskamp, Herbert J., 200 4th St. S.
- Hughes, Ellis J., 2937 Bloomington Ave.
- Hughes, C. F., First National Bank
- Hurlbut, Harold F., M. W. Savage Factories
- Hutson, Erwin, First National Bank
- Jacobsen, Harry, 14 S. 8th St.
- Jacobson, M. C., N. W. Cons. Milling Co.
- Janzen, Gerhard, McDonald Bros. Co.
- Jensen, Ernest W., Jensen Lumber Co.
- Jensen, Guy F., 301 Central Ave.
- Johannsen, A. H., N. W. National Bank
- Johnson, Arthur E., Russell Miller Milling Co.
- Johnson, C. M., 4th St. and 2d Ave. N.
- Johnson, David, Hennepin County Savings Bank
- Johnson, Evan M., Security National Bank
- Johnson, F. O., Y. M. C. A.
- Johnson, Frederick B., C. M. & St. P. Ry.
- Johnson, Guy P., West. Steel Const. Co.
- Johnson, Guy C., 2325 Fremont Ave. S.
- Johnson, L. H., M. A. Gedney Pkl. Co.
- Johnson, Martin J., N. P. Ry. Co.
- Johnson, Merle C., Winston, Harper, Fisher Co.
- Johnson, O. S., Student, University of Minnesota
- Johnston, F. E., Soo Line
- Jones, David, Mellis Perie & Co.
- Jones, E. H., Deere & Webber Co.
- Jones, George W.
- Jordan, L. E., Vulcan Process Co.
- Justad, Jos., Wyman Partridge Co.
- Juster, Adolph, William Weisman Co.
- Kahlert, W. G., 468 State St.
- Kanitar, Morris, 117 N. 6th St.
- Kaser, Olga A., Van Derlip & Lum
- Keefe, C. F., 814 20th Ave. N.
- Keegan, E. T., Carr-Cullen Co.
- Keith, Kenyon A., Washburn-Crosby
- Kellberg, E. J., Security National Bank
- Kennedy, L. L., Washburn-Crosby Co.
- Kennedy, W. H., Student, University of Minnesota
- Kesler, Miss C. R., Twin City Mission Furniture Co.
- Keyes, Helen, 405 Marquette Ave.
- Kilbourne, Fannie M., Journal
- King, Z. P., Minneapolis City Hospital
- Kleppa, H., 716 Lumber Exchange
- Knight, D., Minneapolis Steel & Machinery Co.
- Knudson, C. A., Security National Bank
- Koch, Arthur J., Central Supply Co.
- Kopper, Edward, Jr., Gray Tractor Mfg. Co.
- Kraft, Louise, Butler Bros.
- Krueger, E. W., St. Anthony Falls Bank
- Kurtz, A. J., 49 Western Ave.
- LaBissoniere, George, Minneapolis Dry Goods Co.
- Ladd, S. C., Wyman Partridge Co.
- Laliberte, W. J., Freeman Patterson Co.
- Lampher, G. H., N. W. National Bank
- Landquist, H. J., Security National Bank
- Laring, D. B., Deere & Webber Co.
- Larson, Arthur, Great Western Grain Co.
- Lawton, Charles E., Washburn-Crosby Co.
- Lebeck, Roy C., H. S. Johnson Co.
- Lenz, Paul H., Hydraulic Press Brick Co.
- Lestrolus, J. M., Northrup, King & LeVahn, Carl H., 536-38 Plymouth Bldg.
- Levi, Arthur, 1930 Laurel Ave.
- Levy, Abe, Harris Bros.
- Lilligren, Austin T., Baker Valve Co.
- Lilligren, M., Warner Hdw. Co.
- Lindblom, Oscar M., N. W. National Bank
- Lindquist, H. C., Security National Bank
- Lindskog, John O., Minneapolis State Bank
- Lineburg, George F., Security National Bank
- Linnell, Jos. G., Max Blumenkranz
- Littlefield, Miss B. H., 405 Marquette Ave.
- Livingston, Grace, Farmers & Mechanics Savings Bank
- Loberg, James M., Emerson-Brantingham Co.
- Loberg, Walter M., Security National Bank



- Long, James M., John F. Wilcox Co.  
 Luidberg, Helen A., Butler Bros.  
 Lundin, H. W., Security National Bank  
 Lyman, Frederick C., 700 Oneida Bldg.  
 Lyman, H. D., Freeman Patterson  
 Shoe Co.  
 McCartin, Aaron M., Minnesota Loan  
 & Trust Co.  
 McClellan, L. A., 500 1st Ave. N.  
 McCluskey, A. R., Curtis Yale Howard  
 Co.  
 McDaniel, P. M., Soo Line Bldg.  
 McDermott, Mrs. Emma P., 910 2d  
 Ave. S.  
 McDonald, Millard H., McDonald Bros.  
 Co.  
 McDonald, S. L., McDonald Bros. Co.  
 McGilvra, W. G., Glenwood Inglewood  
 Co.  
 McGowan, Thomas J., 225 Temple  
 Court  
 McHenry, R. D., Minneapolis Sash &  
 Door Co.  
 McKenzie, Chas. A., 1236 James Ave.  
 N.  
 McMillan, William James, Russell Mil-  
 ler Milling Co.  
 Mairs, Thomas N., Minneapolis Steel  
 & Machinery Co.  
 Marrick, Edwin, First National Bank,  
 St. Paul  
 Marriott, Edward, First National Bank,  
 St. Paul  
 Martin, H. W., First National Bank  
 Martinson, Arnold B., Washburn Crow-  
 by Co.  
 Mattick, Florence A., 2118 Pleasant  
 Ave.  
 Mellen, George H., 201 Met. Bldg.  
 Meshan, Grace, Parke Davis & Co.  
 Miller, Jos. R., N. W. Knitting Co.  
 Miller, L. F., 400 E. Lake St.  
 Miller, Robert A., H. G. Foote Co.  
 Mittlstaedt, A., McDonald Bros.  
 Moeller, Walter L., Minneapolis Steel  
 & Machinery Co.  
 Monasch, Jerome, Wm. Monasch  
 Monasch, Stanley B., Tri-State Tel. Co.  
 Money, W. A., 1809 Minnehaha Ave.  
 Morey, Carlyle, 1904 Washington Ave.  
 N.  
 Morrissey, Ethel L., 1211 Plymouth  
 Bldg.  
 Morton, Edward W., Monarch Elev.  
 Moulton, M. M., Minneapolis Thresh-  
 ing Machine Co.  
 Mulcahy, Frank J., Minnesota Loan &  
 Trust Co.
- Mulheran, J. F., T. W. Stevenson Co.  
 Mullahy, Michael J., Gamble Robinson  
 Co.  
 Myers, Lloyd D., 114 S. 7th St.  
 Nelson, Carl, 836 Security Bank Bldg.  
 Nelson, Emil, 1813 Washington Ave. S.  
 Nelson, John G., H. E. Wilcox Motor  
 Co.  
 Nelson, Robert A., 1024 Security Bank  
 Bldg.  
 Nelson, Roy B., Student  
 Nesler, E., Scand. Amer. Nat. Bank  
 Newcomb, Glenn F., Athletic and Boat  
 Club  
 Neudeck, E., St. Anthony Falls Bank  
 Nightingale, Florence, Board of Trade  
 Commission  
 Nickel, Walter, Security National Bank  
 Nickerson, C. E., Interior Lumber Co.  
 Nilson, Edw. C., N. W. Cons. Milling  
 Co.  
 Nolan, John, First National Bank  
 Nordstrom, Leonard, Northern Bag Co.  
 Normond, Leon  
 Norby, F. S., 924 Flour Exchange  
 Northaft, Fred W., Wm. A. French  
 Co.  
 Nygard, O. E., Minneapolis Athletic  
 Club  
 O'Connell, John F., 906 4th St. N.E.  
 O'Connor, James E., 200 Wash. Ave. N.  
 O'Dell, O. W.  
 O'Hara, Chester L., First National  
 Bank  
 Oberg, Ezra N., 236 Cedar Ave.  
 Olson, Anna, Grimsrud Shoe Co.  
 Olson, Edward A., 3205 Bloomington  
 Ave. S.  
 Olson, John W., Security National  
 Bank  
 Onstad, Olaf, 3303 10th Ave. S.  
 Orness, Chester A., 3307 Holmes Ave.  
 S.  
 Ortle, Arthur R., R. C. Hull & Co.  
 Ostrum, W. A., Security National  
 Bank  
 Overlock, R. F., Andrews Tractor Co.  
 Owens, John L., 13 Barton Ave.  
 Paavola, George P., Hydraulic Press  
 Brick Co.  
 Parker, R. B., 915 10th St.  
 Palmer, Roy P., 2007 Aldrich Ave. S.  
 Parodis, R. T., Wm. A. French & Co.  
 Patterson, A. C., 417 S. 4th St.  
 Paulsen, Thorwald, Ives Ice Cream Co.  
 Pearce, James B., Peaces  
 Pearllove, Edward, Radisson Hotel  
 Pepper, F. W., 844 Pillsbury Bldg.  
 Perry, H. M., Standard Oil Co.

- Persall, A. H., Donaldson's  
 Peterson, Ernest G., First National Bank  
 Peterson, R. T., Northland Pine Co.  
 Piper, Harold G., 416 17th Ave. S.E.  
 Pohlson, Julius H., Inter-State Co.  
 Porter, C. A., Diamond Iron Works  
 Poucher, Fred W., Power Elec. Co.  
 Pray, J. W., First National Bank  
 Prisch, H. W., Security National Bank  
 Quaid, J. P., Deere & Webber Co.  
 Quaid, M. J., Butler Bros.  
 Réed, Alice M., Colwell Press  
 Reed, Margaret, Mpls Dry Goods Co.  
 Reed, Sadie, Twin City Paint Co.  
 Reedy, H. A., 2623 Grand Ave. S.  
 Rickel, Cyrus K., Firestone Tire Co.  
 Riedl, John P., Roscoe Knutson Co.  
 Riekki, August, Twin City Lines  
 Riley, Joseph T., Inter-State Co.  
 Rittenhouse, T. H., First National Bank  
 Ritter, H. L., 915 University Ave. S.E.  
 Roberts, Thomas C., Washburn Crosby Co.  
 Robertson, F. M., Butler Mfg. Co.  
 Rodine, Elmer, Boutell Bros.  
 Roholt, Lois, 2210 Riverside Ave.  
 Ronk, Albert P., 200 3rd Ave. S.  
 Ronolt, A., Nagell & Diskerud  
 Rose, Carrol H., N. W. National Bank  
 Rose, L. V., N. W. National Bank  
 Rydell, Edmund T., North Side Sash & Door Co.  
 Sabom, F. W., 2231 4th St. N.  
 Sabom, Oscar, 2231 4th St. N.  
 Sampsell, Chauncey W., First National Bank  
 Sandhoff, Herbert, 414 Met. Life Bldg.  
 Sandquist, Paul V., Scand. Amer. National Bank  
 Sanford, L. W., 527 Marquette Ave.  
 Sargent, W. R., Security National Bank  
 Sargeant, Chas. F., Butler Bros.  
 Sawyer, Fred W., N. W. Cons. Mfg. Co.  
 Schellenberger, E. J., Russell-Miller Milling Co.  
 Schlammpp, Edward A., Aermotor Co.  
 Schmall, George P., Swift Co.  
 Schmidt, Robert A., 729 Nicollet Ave.  
 Schultz, A. W., Janney Semple Hill & Co.  
 Schwartz, A. B., N. W. National Bank  
 Schwartz, S., 1205 Plymouth Bldg.  
 Schwarz, C. S., 124 W. 27th St.  
 Scott, Donald A., G. N. Ry. Co.  
 Searle, C. E., Farmers & Mech. Savings Bank  
 Seidle, M. W., Moore Bros. Brace & Co.  
 Seidle, Walter T., W. S. Nott Co.  
 Sellars, Ernest, 620 Bryant Ave. N.  
 Seybold, Joseph L., Wells & Dickey Co.  
 Shattuck, I. E., Security National Bank  
 Sheppard, Earl, First National Bank  
 Sherlock, Alfred, 516 S. 8th St.  
 Simmons, M., U. of M.  
 Sinclair, L. D., E. E. Atkinson Co.  
 Smith, A. V., Security National Bank  
 Smith, E. C., Security National Bank  
 Smith, John W., N. Welding Co.  
 Smith, W. H., 704 S. 5th St.  
 Sondberg, V. E., University of Minnesota  
 Souba, Emil G., L. S. Donaldson Co.  
 Stacy, Harlem G., E. P. Stacy & Sons  
 Staffelbach, Earl T., Davenport, Iowa  
 Stasel, A. G., U. of M.  
 Stephens, Ralph B., F. M. Morgan & Co.  
 Steller, A. W., 503 S. 6th St.  
 Stock, E. G., 1224 Nicollet Ave.  
 Stocking, R. E., Mpls. Steel & Mach. Co.  
 Stowe, V. A., 323 Union St. S.E.  
 Strate, Arthur J., Wm. J. Moulton Co.  
 Stratton, Margaret, 3320 4th Ave. S.  
 Striegl, Sylvester A., St. Anthony Falls Bank  
 Strong, Arthur D., Pillsbury Flour Milling Co.  
 Sugarman, A. L., Kasota News Bldg.  
 Sussmilch, Delbert, N. W. National Bank  
 Swanson, Edwin, 304 Flour Exchange  
 Swanson, E. G., S. H. Holstad & Co.  
 Swanson, G. O., 954 Sec. Bank Bldg.  
 Swanson, N. E., International Harvester Co.  
 Sweet, Lee Roy, 3220 Clinton Ave.  
 Swenson, Hugo, 809 Chamber of Commerce  
 Taylor, Charles P., First National Bank  
 Taylor, Harold G., 1042 McKnight Bldg.  
 Teiger, Iver, N. W. National Bank  
 Thorshaug, P., First National Bank  
 Thayer, R. O., N. W. National Bank  
 Theis, Cora O., 2610 W. 42nd St.  
 Theis, Roy A., N. W. National Bank  
 Thompson, Harvey E., 210 Andrus Bldg.  
 Thompson, Roy C., Minnehaha & 29th  
 Thoroup, Robert B., 401 5th St. S.E.  
 Thrall, R. A., Security National Bank  
 Thuros, Harold C., Deere & Webber Co.

Thurston, F. A., Independent Silo Co.  
 Tillotson, H. B., Jr., Mpls Journal  
 Tingeon, W. E., Colonial Warehouse  
 Toman, S. J., First National Bank  
 Tompkins, J. F., N. W. National Bank  
 Towle, Robert E., Federal Res. Bank  
 Turpin, L. L., Security National Bank  
 Tusler, F. E., Hershel Roth Mfg. Co.  
 Twichell, B. H., N. W. Cons. Milling  
 Co.  
 Vandoren, P. W., Russell-Miller Mill-  
 ing Co.  
 Velett, Roland A., Sterling Elec. Co.  
 Vikre, Henry O., Mpls. Fire & Marine  
 Co.  
 Vorweck, Fred W., E. P. Stacey Co.  
 Voith, Albert J., McLaughlin-Gormley  
 King Co.  
 Wagner, Archibald F., 1613 Pioneer  
 Bldg., St. Paul  
 Wasley, L. H., Monasch Litho. Co.  
 Weber, Anthony O., Oscar Weber Groc.  
 Weisman, J. C., 302 Met. Life Bldg.  
 Weisenberger, Albert C., N. W. Na-  
 tional Bank  
 Westerdahl, W. P., 301 Central Ave.  
 White, John R., Jr., Campus Club  
 White, May E. L., 715 Delaware St.  
 S. E.

Wielklund, H. M., Loose-Wiles Biscuit  
 Co.  
 Wilcox, A. S., Mpls. Office & School  
 Furn. Co.  
 Wilk, Ralph, 1614 4th St. S. E.  
 Wilkinson, C. P., 915 N. Y. Life  
 Bldg.  
 Will, Fred I., N. W. National Bank  
 Williams, James E., N. W. National  
 Bank  
 Wilson, Alfred, Security National  
 Bank  
 Wilson, James G., N. W. National  
 Bank  
 Wold, Oscar, Pillsbury Flour Milling  
 Co.  
 Woller, Alvina H., 416½ 10th Ave. N.  
 Wood, George B., City Comptroller's  
 Office  
 Woodruff, P. A., 3145 Clinton Ave.  
 Young, C. L., 5th & 2nd Ave. N.  
 Young, Katherine G., 2420 Elliott Ave.  
 Young, Marie L., 2420 Elliott Ave.  
 Youngerman, W. W., P & O Plow Co.  
 Zesbaugh, Paul L., Pillsbury Flour  
 Mills Co.  
 Zickert, L. R., Lathrop-Kemps Ice  
 Cream Co.  
 Zimmerman, John P., Security Na-  
 tional Bank

## ST. PAUL

Angell, Frank M., G. N. Office  
 Armbruster, Edward J., D. D. Blood  
 & Co.  
 Arth, F. J., Noyes Bros. & Cutler  
 Babcock, Roy, Nichols Dean & Gregg  
 Baer, F. B., Golden Rule  
 Baker, O., O'Donnell Shoe Co.  
 Baldwin, Douglas K., Minn. State  
 Fair  
 Berg, Urban, 755 Payne Ave.  
 Berglund, Ragnar, 805 Pusey Ave.  
 Bohrer, Jessie O., G. N. Ry. Co., Legal  
 Dept.  
 Bosshardt, Arthur H., National Bank  
 of Commerce  
 Bovard, James W., Finch VanSlyck &  
 McConville  
 Brandhorst, Foster, 478 Wabasha St.  
 Bratter, H. D., Daily News  
 Briggs, Allan, 793 Fairmont Ave.  
 Bronstein, Charles W., U. S. Bedding  
 Co.  
 Bucklee, J. P., P. W. Jackson Co.  
 Burns, Elizabeth, Gorman School  
 Carlson, Irwin, H. G. Foote Lumber  
 Co.

Carlson, Oscar E., Floan & Leveroos  
 Carlson, William, Central Warehouse  
 Co.  
 Coil, F. B., N. P. Ry. Co.  
 Coburn, Thomas, Minn. Transfer, Car  
 Dept.  
 Cochran, M. M., Cochran-Sargent  
 Cool, Jules V., Nichols Dean & Gregg  
 Cook, Mary, E. M. Lohmann Co.  
 Cottor, Emil F., R. L. Polk & Co.  
 Cullen, Patrick, Elite Laundry Co.  
 Danielson, Andrew W., G. N. Ry. Co.  
 Darwitz, William A., N. P. Gen. Office  
 Dittbenner, H. O., 1466 Capital Ave.  
 Draper, Horace S., Minn. Typographic  
 Co.  
 Driscoll, Charles B., St. Paul Daily  
 News  
 Durenberger, Arthur, Omaha Railway  
 Eichhorn, C. H., National Bank of  
 Commerce  
 Ekstrom, Charles E., Manhattan Oil &  
 Linseed Co.  
 Eldredge, Asa, Towle Maple Prod. Co.  
 Eldredge, E. T., Towle Maple Prod.  
 Co.

- Ellis, H., 674 St. Peter St.  
 Elmquist, Nau C., The Adlerika Co.  
 Engstrom, Theo. A., Aetna Life Co.  
 Esch, Otto N., Nichols, Dean & Gregg Co.  
 Farrell, V. F., N. W. Fuel Co.  
 Flesher, Benjamin H., 220 G. N. Ry. Building  
 Gadacz, Stanley, Crescent Cream. Co.  
 Garrison, Oliver E., 1657 Taylor Ave.  
 Geisenheyner, A. L., N. W. Fuel Co.  
 George, Charles W., Citizens Ice & Fuel Co.  
 Goodson, Curtis C., N. W. Fuel Co.  
 Grove, Henry A., N. Insulating Co.  
 Gruber, Jeffrey, G. N. Iron Ore Prop.  
 Gullickson, O. S., Consumers Lumber Co.  
 Haselbeck, H., Finch, Van Slyck & McConville  
 Hildebrandt, Carl L., Hotel Ryan  
 Hodgins, R. O., J. T. McMillan Co.  
 Holmstine, G. E., Singer Sewing Machine Co.  
 Hellriegel, A. H., Cable Piano Co.  
 Hun, Alys L., The Broderick Co.  
 Ivey, Henry W., W. H. Ivey & Co.  
 Ivey, Thomas, Ogden Merrill & Greer  
 Johnson, George A., Klinkerfues Bros.  
 Johnson, Kester, Klinkerfues Bros.  
 Johnson, Otto A., American Express Co.  
 Kalbus, F. G. A., G. Sommers & Co.  
 Kaplan, A. H., City and County Hospital  
 Kelly, Raymond C., Philip Ruxton, Inc.  
 Kelley, Vincent, G. N. Freight Dept.  
 Kennedy, W. Hubert, Student  
 Keppers, William M., Brown & Bigelow  
 Kerker, Thomas, Theo. Hamm Brew. Co.  
 Klinkerfues, R. E., Klinkerfues Bros.  
 Kopp, George M., Theo. Hamm Brew. Co.  
 Koppy, Frank J., Jacobs Furn. Co.  
 Kranhold, Gertrude A., Roe-James Glass Co., Inc.  
 Kranhold, H. E., Brown & Bigelow  
 Kraus, Carl B., W. J. Hoy Co.  
 Kuehne, Minnie L., 205 Commercial Bldg.  
 Lampland, Arthur, Capital City Lumber Co.  
 Lampland, Oscar, Capital City Lumber Co.  
 Lang, F. W., First National Bank  
 LaVelle, Geo. F., Daily News  
 Lawrence, C. D., First National Bank  
 Lemke, Frank J., Theo. Hamm Brew. Co.  
 Leyh, Grover C., Kempien Burk & Co.  
 Linnell, E. T., P. J. Bowlin & Son  
 Lufkin, H. M., St. Paul Foundry Co.  
 McCormick, Philip C., B. & O. Ry. Office  
 McNaughton, Wm. T., P. O. Dept.  
 Malstrom, Rudolph, Milton Dairy Co.  
 Meyer, Edwin A., Geo. Benz & Sons  
 Mickman, John E., 1349 Nicollet Ave.  
 Micko, M. E., W. S. Conrad Co.  
 Miller, Herbert, West Pub. Co.  
 Miller, Lydia P., Dept. of Education  
 Milton, Clarence, Van Sant Co.  
 Moller, L. B., Thoen Bros.  
 Monick, F. R., Cochran Sargent Co.  
 Morice, Zalia I., Minn. Tax Commis.  
 Murty, R. S., Capital City Lumber Co.  
 Nelson, Henry J., Riverside Builders Supply Co.  
 Nelson, Victor, E. Albrecht & Son  
 O'Brien, C. Roy, Minn. Mutual Life  
 O'Dell, Thomas E., G. N. Gen. Offices  
 O'Donnell, Wm. B., Golden Rule  
 Ogilvie, R. T., St. Paul Dairy Reporter  
 Olson, Leonard H., L. C. Smith Type-writer Co.  
 Olson, Orde C., N. Insulating Co.  
 Pampusch, Joseph R., Snelling State Bank  
 Pantel, Ralph W., 50 E. 4th St.  
 Parsons, C. C., Gordon & Ferguson  
 Paulsen, Rene L., F. J. Munn Co.  
 Pavlicek, Joseph, Theo. Hamm Brewing Co.  
 Peck, Ella L., Swift & Co.  
 Peterson, Axel M., Sauer Bros.  
 Peterson, George C., G. N. Gen. Offices  
 Peterson, Ragnar T., N. W. Tel. Exchange Co.  
 Pieper, R. A., Brown & Bigelow  
 Power, Fred S., St. Paul Foundry Co.  
 Price, Edward, C. St. P. M. & O. Offices  
 Queiszer, Charles, Webb Publishing Co.  
 Reade, George W., Twin City Motor Car Co.  
 Reimers, William J., Lewis Finkelstein  
 Rodlun, T. M., Hamline U.  
 Rolph, Roy D., L. C. Smith Type-writer Co.  
 Rowland, James D., Capital City Lumber Co.  
 Sausen, George M., C. St. P. M. & O.  
 Schaffelke, Henry A., Amer. National Bank

- Schneider, P. J., 161 Ann St.  
 Scholtz, Henry C., St. Paul Gas Light Co.  
 Sedletsky, J., Bannon Bros. Co.  
 Shannon, Thomas J., E. J. Bishop, C. P. A.  
 Shepard, A. K., 1963 Ashland  
 Sladek, Jerome C., G. N. Ry. Offices  
 Smith, Harold R., Paul J. Kalman Co.  
 Smith, Thomas G., Minn. Mutual Life Ins. Co.  
 Soaboda, S. V., 105 Gt. Northern Bldg.  
 Spaeth, W. W., 1563 Ashland Ave.  
 Stanton, Joseph R., Stanton, DeLong Lumber Co.  
 Strong, Gust, Amer. Hoist & Derrick Co.  
 Studeman, M. E., Student  
 Sundberg, William, Drury & Co.
- Sussmilch, Adelbert, N. W. National Bank  
 Swanson, Al., Lindeke Roller Mill Co.  
 Swanstrom, Roy E., Golden Rule  
 Sweeney, George P., N. W. Fuel Co.  
 Temple, H. M., Hackett Gates Hurty Co.  
 Thorson, Oscar M., Webb Pub. Co.  
 Turner, J. W., Union Pacific Tea Co.  
 Turnquist, E. C., St. Paul State Bank  
 Welck, Carl A., Patterson Sargent Co.  
 Wheeler, John, Pittsburgh Plate Glass Co.  
 Whitmore, I. W., Brown & Bigelow  
 Williams, G. E., J. T. McMillan Co.  
 Wolf, Julius R., Paris Ladies Hat Mfg. Co.  
 Wolkerstorfer, John J., W. L. Perkins & Co.

## DULUTH

- Anderson, Aldor G., 12 20th Ave. W.  
 Arneson, A. E., D. M. & N. Ry.  
 Bartholdi, Walter J., Ames-Brooks Co.  
 Batley, Ray E., Island Creek Coal Dock Co.  
 Beck, Arthur, Oliver Mining Co.  
 Bergeron, Rene L., 732 Garfield Ave.  
 Bescheubossel, C. C., Oliver Mining Co.  
 Bethune, A. J., 481 Mesaba Ave.  
 Bodin, August, J. Freimuth  
 Bodin, J. O., Enger & Olson  
 Brown, Colin F., French & Bassett Co.  
 Cahill, J. L., D. M. & N. Ry.  
 Currie, L. F., National Candy Co.  
 Daugherty, Frank C., Northern National Bank  
 Durham, Kenneth W., Water & Light Dept.  
 Evans, Charles G., D. G. Cutler Co.  
 Fisher, S. S., Mutual Transit Co., 325 E. 5th St.  
 Freimuth, Hugo, I. Freimuth  
 Goss, Harry, Hunters Park  
 Goss, Leander M., Duluth Street Ry. Co.  
 Glyne, G. A., Central High School  
 Gross, George L., Water & Light Department  
 Haig, William F., Water & Light Dept.  
 Hanson, Jarl W., Duluth St. Ry. Co.  
 Harrom, Olaf J., 2020 W. 2nd St.  
 Harried, F. N., Marshall Wells Hdw. Co.  
 Holmbae, R., 221 E. 7th St.  
 Hon, C. F., Northern Shoe Co.  
 Honigmann, Carl, N. P. Freight Office
- Johnson, Albin E., I. Freimuth  
 Johnson, Peter A., 2211 W. 4th St.  
 Kramer, C. E., Duluth Edison Electric Co.  
 Larson, Roy, Oliver Mining Co.  
 Laskowsky, Frank L., Duluth Iron Metal Co.  
 Lee, Thomas G., 416 E. Superior  
 Lee, Thomas G., Jr., 416 E. Superior  
 Lundgren, G. F., 712 Lake Ave. S.  
 Mineau, Raymond A., Marshall Wells Hdw. Co.  
 Moeller, John, Northern Shoe Co.  
 Moore, R. R., D. M. & N. Ry.  
 Mostue, E., Cargill Com. Co.  
 Muir, J. S., Roman Meal Co.  
 Nelson, William A., 101 S. 19th Ave. E.  
 Nivela, William, 328 63rd Ave. W.  
 Pattinson, C. R., Water & Light Dept.  
 Peterson, Arthur C., Duluth Street Ry. Co.  
 Phelan, John, Pittsburgh Coal Co.  
 Powers, J. Fred, Peyton Paper Co.  
 Pyfer, G. A., Oliver Mining Co.  
 Roper, Cyril J., Marshall-Wells Hdw. Co.  
 Schneider, E. G., Water & Light Dept.  
 Schneider, W. M., Oliver Iron Co.  
 Scheerer, James A., Soo Line Ticket Office  
 Strain, Sylvester T., American Exchange National Bank  
 Tengblad, C. A., Oliver Iron Mining Co.  
 Walstad, Justin A., 6415 Green St.  
 Wisner, Ina C., 2100 Bryant Ave. So., Minneapolis  
 Zirn, T. H., Union Match Co.

## ALBERT LEA

- Anderson, William, Jewel Hardware Co.  
 Ayars, Harold, 418 Grove St.  
 Black, Robert H., 512 Water St.  
 Briggs, Rollin P.  
 Brown, E. H., State Highway Comm.  
 Berglund, A. J., Lake Drive  
 Christensen, Esther, Lembke Dry Goods Co.  
 Donahue, Ray, Albert Lea Hdw. Co.  
 Fosse, Otto, Thompson & Heddemark  
 Gulbrandson, Einar M., Gulbrandson Hardware Co.  
 Hanson, H. C., Citizens National Bank  
 Haugen, Bertine, Lembke Dry Goods  
 Hayden, Clyde, O. C. Hayden & Co.  
 Hillestad, Mary, Lembke Dry Goods Co.  
 Ingbritsen, Irving S., Freeborn Co. Abstract Co.  
 Jensen, R. C., Lembke Dry Goods Co.  
 Johnson, Anna B., Lembke Dry Goods Co.  
 Johnson, L. W., First National Bank  
 Jorgensen, E. C., American Gas Mach. Co.  
 Kleinke, Emma L., Lembke Dry Goods Co.  
 Knatvold, Burt, Northern Cream Supply House  
 Larson, Arthur M., 211 W. Main  
 Leusman, C. J., First National Bank  
 Lembke, C. G., Lembke Bros.  
 Machacek, E. C., American Gas Mach. Co.  
 Morin, William G., W. A. Morin  
 Narveson, Amanda, Lembke Dry Goods Co.  
 Nelson, Clifford, C. E. Nelson Dry Goods Co.  
 Nelson, Frank L., P. A. Nelson & Son  
 Nelson, Hans Z., American Gas Mach. Co.  
 Ness, M. C., American Gas Mach. Co.  
 Olson, Oscar C., Citizens National Bank  
 Olson, O. T., Jewel Hardware Co.  
 Pankhurst, Max, 131 2nd Ave.  
 Pedersen, P., Jewel Hardware Co.  
 Peterson, Ida  
 Pilgrim, Roy, Nelsons  
 Rodli, O. E., Physician  
 Scott, George R., Albert Lea Hdw. Co.  
 Shea, William R., Model Clothing Co.  
 Slodheim, Louis, Model Clothing Co.  
 Swenson, Horace A., Citizens National Bank  
 Thompson, R. B., Thompson-Hedemark  
 Thorpe, Evangeline, Lembke Dry Goods Co.  
 Vollum, Ida, Lembke Dry Goods Co.  
 Westrum, E. F.  
 Westrum, L. O., Citizens National Bank  
 Westerhouse, Aaron, Albert Lea Hdw. Co.  
 Wiele, Augusta, Lembke Dry Goods Co.

## AUSTIN

- Albertson, Oscar S.  
 Anderson, Osper  
 Alderson, Rollin C.  
 Banfield, H. L.  
 Barrett, H. L.  
 Beaulieu, P. D.  
 Bennett, William P.  
 Carter, Clarence L.  
 Christenson, A. C.  
 Dalager, Alvin B.  
 Dalager, Clarence  
 Dicker, Leonard R.  
 Drost, H. J.  
 Dugan, M. F.  
 Edson, Fred H.  
 Edson, L. E.  
 Enochson, Thomas L.  
 Fox, Irvin D.  
 Furtenev, Roy L.  
 Hall, John C.  
 Hardy, M. J.  
 Harpman, Arthur O.  
 Hayes, A. C.  
 Johnson, Carl  
 Knopf, Paul C.  
 Nelson, Alex E.  
 Plzak, William P.  
 Russell, Lloyd M.  
 Taylor, J. N.  
 Wilbourn, Frank C.  
 Woodle, Loren H.

## NORTHFIELD

- Ackerman, L. J.  
 Arneson, George J.  
 Bertrand, George D.  
 Bolang, Thomas  
 Burr, Charlotte  
 Ebel, William, Jr.

Ellingboe, J. M.  
 Ellingboe, Thomas  
 Elting, John  
 Grove, Minnie  
 Haugen, Rogna  
 Hickey, Margaret  
 Jensen, Thomas  
 Johnson, W. E.  
 Johnson, Emil  
 Kelley, James W.

Lystad, C.  
 Mackay, A. J., Jr.  
 Mascow, Mildred  
 Mohn, George W.  
 Moshin, Edna S.  
 Oie, Georgie  
 Proud, Mrs. A. C.  
 Revere, William E.  
 Skreen, Clare

## ST. CLOUD

Barden, C. H.  
 Becker, Matt, Jr., 426 8th Ave. N.  
 Doerner, Carl, 109 15th Ave. S.  
 Edelbroch, Felix W.  
 Fandel, Sylvester W.  
 Fisher, I. B.  
 Gambrino, Leo B.  
 Guthmann, Milton E.  
 Hanlon, Thomas, St. Cloud Shoe Co.  
 Hemstiger, Frank J., 28 13th Ave. S.  
 Hilbe, Joseph J., 612 Main St.  
 Hostler, Leslie M., 225 7th Ave. N.  
 Magnuson, C. O., 110 1st St. S.E.  
 Magnuson, John E., 107 1st St. S.E.  
 Magee, Thomas G., 611 St. Germain St.  
 Nathe, Julius M., 314 13th Ave. N.  
 Rau, William J., 712 9th Ave. S.

Ruettell, G. F., 612 3rd Ave. S.  
 Sauer, Charles S., 315 7th Ave. N.  
 Schumacher, Andrew J., 611 St. Germain  
 Stafford, Bert, 1529 1st St. N.  
 Stafford, Francis, 1529 1st St. N.  
 Strobel, Alphonse, 114 St. Germain St.  
 Thelen, M. L., 126 15th Ave. S.  
 Tschumperlin, Al J., 613 St. Germain St.  
 Tueschel, Ernest B., 124 14th Ave. S.  
 Wastrom, Charles H., St. Cloud Shoe Store  
 Weber, John P., 802 4th Ave. S.  
 Weber, William S., 802 4th Ave. S.  
 Wilson, S. S., Wilson & Co.

## DEPARTMENT OF ENGINEERING INSTRUCTION

## MINNEAPOLIS

Ainsworth, Erle R., 1112 Dartmouth Ave. S.E.  
 Allbright, Daniel B., 538 Dayton Ave., St. Paul  
 Anderson, Axel G., Sprague Mfg. & Sales Co.  
 Anderson, Gerald, 601 Endicott Bldg.  
 Attridge, Albert, Western Electric Co.  
 Aulin, Emil, 406 Snelling Ave., St. Paul  
 Babb, Charles G., 3404 Pleasant Ave. S.  
 Baptiste, Noel, 2627 Chicago Ave.  
 Barber, Owen E., Belden Porter Gray Co.  
 Barlow, Harry E., C. St. P. M. & O. Ry., Gen. Office  
 Benoit, J. H., Minn. Athletic Club  
 Berg, Peter A., 623 Washington Ave. S. E.  
 Bildsten, P. D., 711 East 17th St.  
 Blake, Robert, Puffer-Hubbard Mfg. Co.  
 Bowden, Sumner B., Archer Daniels Linseed Co.  
 Bowler, Robert, 962 Endicott Bldg., St. Paul

Brondson, F. E., Mpls. Gen. Electric Co.  
 Prown, Anna A., 1425 Vine Place  
 Brown, John F., 2412 Garfield Ave. S.  
 Brown, Lynn, 321 Capital Bank Bldg., St. Paul  
 Brown, Milton, Baker Valve Co.  
 Burns, William, 3008 James Ave. S.  
 Burns, William A., 2631 16th Ave. S.  
 Bury, Henry C., 805 Russell Ave. N.  
 Bushy, Albert F., Mehring & Hanson Co.  
 Capp, Frank W., G. N. Ry. Co., St. Paul  
 Carlblom, T., Crown Iron Works  
 Chadbourne, Herbert N., Jr., Emerson-Brantingham Co.  
 Christianson, H. T., 2721 University Ave. S.E.  
 Christianson, Harley, 337 E. 16th St.  
 Christianson, Sigurd, Milwaukee Ry.  
 Clark, Frank E., 962 22nd Ave. N.E.  
 Clark, W. W., 616 S. 3rd St.  
 Cole, Fred M., Emerson-Brantingham Co.

- Cole, Sam, Mpls. Steel and Machinery Co.
- Collins, Arthur, 229 5th St. S.
- Collins, Evar, 807 Lowry Ave. N. E.
- Cosler, Howard A., 417 Essex Bldg.
- Corwins, J. R., 298 Studio Bldg.
- Dahl, Harry J., Mpls. General Electric Co.
- Danielson, E. A., 2539 Territorial Rd.
- Dasset, Myron R., 3128 Hennepin Ave.
- Deane, G. Brooks, University of Minnesota Armory
- Dempsey, F. B., 2924 Columbus Ave.
- Dickman, L. J., H. J. Allen & Co., St. Paul
- Dobbs, Loyle D., Electric Mach. Co.
- Doble, E., Agriculture School
- Donaldson, R. H., R. H. Donaldson
- Dyste, N. M., 88 Spruce Place
- Elmer, C. K., Consumers Power Co.
- Engelstad, Ben, H. R. Robbins
- Enzler, Carl, Enterprise Mach. Co.
- Erastoff, S., 413 S. 5th Ave.
- Erickson, Hilmer A., 113 N. 7th St.
- Fargo, C. L., 700 Flour Exchange
- Flannigan, Charles A., Emerson-Brantingham Co.
- Fleischbein, Allan C., 66 Gilfillan Block, St. Paul
- Fletcher, Fred F., 1217 Dupont Ave. N.
- Flower, D. Z., M. & St. L. Ry. Office
- Forbes, C. J., Student
- Forsman, Clarence, Olin H. Round, Architect
- Forsman, Herman, Crown Iron Works
- Fox, Eugene H., Belden Porter Gray Co.
- Fredericksen, J. A., 724 E. 16th St.
- Freeman, Edith, 302 S. 11th St.
- Frensett, Harlow G., Central High
- Gardner, LeRoy, 601 Phoenix Bldg.
- Garmoe, Harold, Baker Valve Co.
- Garry, Will J., 2113 22nd St. E.
- Gerth, H. A., Teacher, Mpls Schools
- Getchell, O. W., 700 Flour Exchange
- Giles, John, City & County Hospital, St. Paul
- Glasow, O. A., 15 S. 5th St.
- Grabner, Walter, 2410 Polk St. N.E.
- Graff, V. B., Amer. Hoist & Derrick Co.
- Green, W. M., Pillsbury A.
- Gudenan, M. L., 1920 Hamline Ave. S.E.
- Guthrie, Marguerite, Washburn-Crosby Co.
- Gwiazdon, Walter J., 1324 3rd St. N.E.
- Hanson, Arthur, G. N. Ry.
- Hartesell, Sydney, 2404 Jackson St. N.E.
- Headley, Holland C., 225 N. Lexington Parkway, St. Paul
- Hepp, M. H., Adams School
- Herreid, Knudt, Andrews Heating Co.
- Hilstrom, Edward, 870 Westminster St.
- Hobley, Roland, Mpls. Drug Co.
- Horsley, Clyde, Emil E. Erickson
- Jensen, George, C. M. & St. P. Ry.
- Johnson, A. W., 906 N. Y. Life Bldg.
- Johnson, Arthur J., 709 5th St. S.
- Johnson, Alfred, 1129 Fillmore St. N. E.
- Johnson, Cyrus, 626 Bryant Ave. N.
- Johnson, Dellma, 1410 Madison St. N.
- Johnson, Edward J., Emerson-Brantingham Co.
- Johnson, F. L., Roustead Elev. Mfg. Co.
- Johnson, F. S., M. & St. L. Shops
- Johnson, H. J. M., 816 Hennepin Ave.
- Johnson, Louis H., Robert Simpson & Co.
- Johnson, O. H., Tri-State Tel. Co.
- Johnson, R. B., 2718 S. 9th St.
- Johnston, George H., Emerson-Brantingham Co.
- Jones, David, Belden Porter Gray Co.
- Jones, Harry E., Hughes Heating & Plumbing Co.
- Jones, Trevor V., 829 17th Ave. S.
- Keller, W. F., 2606 Humboldt Ave. S.
- Kenkel, John, Emerson Brantingham Co.
- Kennison, H. A., 923 Lumber Exchange
- Kimm, Frank H., Room A, Metropolitan Bldg.
- Klanster, F. C., 38 Minnehaha Flats, St. Paul
- Kirgensmith, Frank, 2000 Pleasant Ave.
- Knudson, Morgan, 509 Essex Bldg.
- Knudtson, C. M.
- Kocourek, John F., 508 Plymouth Bldg.
- Kohanik, J. G., cor. of 14th & Henn.
- Lander, Guy R., West High School
- Larsen, Alfred M., 751 Plymouth Bldg.
- Larson, E. O., N. P. Ry.
- Larson, Nathan, 320 Auditorium
- Linden, Christian J., Central High
- Linman, George E., Mehring & Hanson
- Livermore, H. J., N. W. Tel. Exchange
- Losie, Fred A., W. S. Milnor Co.
- Lund, Lawrence, 2529 University Ave. S.E.
- McCafee, Allan L., 704 5th St. S.
- McCartney, Floyd A., Swift & Co., St. Paul



- McCumber, Frank, Ford Motor Co.  
 McDougall, Harold, 2910 Lyndale Ave. N.  
 McEnary, Dale R., 321 Capital Bank Bldg., St. Paul  
 McGrath, Harry F., Room 50, Court House, St. Paul  
 McKenzie, Charles A., Plumbing & Heating Co.  
 McMillan, James F., N. W. Consolidated Mfg. Co.  
 McQueen, F. R., Barnett & Record Co.  
 Macpherson, A. B., Crown Iron Works  
 Madson, Edward W., Soo Line Shops  
 Magnuson, Carl, W. O. Hartig Elec. Co.  
 Mample, A. Z., 3rd & Hennepin  
 Marron, C. M., Russell-Miller Milling Co.  
 Mattemore, J. W., Consumers Power Co.  
 Mester, Louis D., N. W. Knitting Co.  
 Miller, A. J., Studebaker Co.  
 Miller, John M., 740 Dayton Ave., St. Paul  
 Minter, Maurice J., West. Elec. Co.  
 Moher, E. W., 400 Sykes Block  
 Molmen, P. O., 155 5th St.  
 Mosher, A. E., Emerson-Brantingham Co.  
 Muggley, J. M., Colwell Printing Co.  
 Muldner, Leroy V., 223 S. 5th St.  
 Murray, William, 17 W. 9th St.  
 Nelson, Robert, 2000 Plymouth Ave. N.  
 Newstrom, Oscar N., Haugen & Newstrom Co.  
 Newstrom, Paul J., 314 Nicollet Ave.  
 Nolan, Harry A., 44th Ave. N. & Colfax  
 Nordstrom, Carl T., 2854 Minnehaha Ave.  
 Oakley, Fayette F., N. W. Marble & Tile Co.  
 Ogden, S. S., Nott Fire Engine Co.  
 Olive, Fred E., 307 4th St. S.E.  
 Olsen, Herman E., 509 Essex Bldg.  
 Olson, Gardner M., Student, U. of M.  
 Opsahl, Harry L., 1808 E. 22nd St.  
 Osgard, Arthur, 2307 S. 8th St.  
 Paulson, Arthur, 2520 29th Ave. So.  
 Pederson, Oscar, Big 4 Tractor Co.  
 Peterson, Roy K., 409 Franklin St., St. Paul  
 Pitman, W., 2718 University Ave.  
 Prydz, John, 5 Barton Ave.  
 Putman, George W., H. Kelly Co.  
 Rabinowitz, Julius G., 1001 Humboldt Ave. N.  
 Rose, Samuel C., Harris Machinery Co.  
 Rosenthal, B. J., Joerus Motor Mfg. Co.  
 Rossiter, Leslie A., 2800 Fremont Ave. S.  
 Sanaker, O. H., Mpls. General Electric  
 Sanborn, G. W., Ford Motor Co.  
 Sandberg, David H., 1131 6th St. N.E.  
 Sather, Theo., Pence Auto Co.  
 Scarrott, A. W., Mpls. Steel & Mach. Co.  
 Scharpf, E. L., 824 Plymouth Bldg.  
 Schiefelbein, W. S., 114 N. 3rd St.  
 Schnitzler, T. E., 700 Flour Exchange  
 Schultz, Wallace, 2845 27th Ave. S.  
 Secor, F. L., 221 3rd St. N.  
 Seese, Paul, 2635 Dupont Ave. N.  
 Shepardson, H. R., Hotel Maryland  
 Sheridan, George C., C. M. & St. P. Ry  
 Sherin, F. M., 2536 Chicago Ave.  
 Silverman, H. C., 114 N. 3rd St.  
 Skarnes, Reuben, Pillsbury Co.  
 Skinkle, Elmer C., 3145 Stevens Ave. S.  
 Smith, James R., Mpls. Gen. Elec. Co.  
 Sorensen, Joseph, Mpls. Steel Mfg. Co.  
 Stewart, G. A., Keefe & Erickson  
 Stock, E. G., Kinnard-Hainer Co.  
 Sundbeck, Elmer J., M. Jacobson  
 Swanson, H. E., 369 Cleveland Ave., St. Paul  
 Swanson, Lyel, Andrews Heating Co.  
 Sweger, Martin A., 17 W. 9th St.  
 Talcott, Marion K., Emerson Brantingham Co.  
 Taylor, Harold G., 1042 McKnight Bldg.  
 Thompson, Donald, 302 S.E. 6th.  
 Titze, Philip E., 4053 Lyndale Ave. S.  
 Trask, D. M., M. St. P. & S. St. M.  
 Turner, Howard A., A. A. Van Dyke  
 Vilett, Roland A., Sterling Electric Co.  
 Waldron, R. E., 319 14th Ave. S.E.  
 Walton, Alice, Arch. Dept. U. of M.  
 Wheeler, Beech H., Mpls. Steel & Mach. Co.  
 Wikdahl, Victor, 2003 2nd St. S.  
 Wilber, Harold L., 417 2nd Ave. S.E.  
 Wilkins, Walker, Emerson Brantingham Co.  
 Williams, Milo, 688 Carroll Ave., St. Paul  
 Wilson, Walter, 3328 4th Ave. S.  
 Withers, C. D., Emerson Brantingham Co.  
 Woebler, Charles G., 945 McKnight Bldg.  
 Woell, Fred P., 501 Minnesota St., St. Paul  
 Wolff, Fred P., 501 Minnesota St., St. Paul  
 Youngberg, Henry G., Pierson-Wilcox Elec. Co.

## ST. PAUL

Bartel, E., Joy Bros. Auto Co.  
Churchill, Geo., G. N. Ry., Dale St.  
Flad, George W., Joy Bros. Auto Co.  
Kueppers, Max H., 156 Edmund St.  
Larson, Gus, G. N. Shops  
Minea, Louis A., 131 West Robie

Mueller, Karl H., Joy Bros. Auto Co.  
Olander, F. A., E. Schmelz & Son  
Ranelius, S. J., 723 Orange St.  
Treacy, John G., G. N. Ry., Dale St.  
Shops  
Trierweiler, D. G., 406 Maple St.

## DULUTH

Bergstrom, Harry E., Rex Hotel  
Hise, George L., Minn. Steel Co.  
Huston, R. A., City Engineer's Office  
(Sewer Dept.)  
Lufholm, Henry Lawrence, Minn. Steel  
Co.  
Nelson, George M., W. F. Hurst  
Norman, George, 5308 Main St. West  
Olson, Robert, 706 S. 63rd Ave. W.  
Olson, Goodwin, Minn. Steel Co.  
Pehlinski, John, Duluth Brass Works

Pollock, Charles A., Duluth Steel Ry.  
Co.  
Robbins, F. E., 202 Osakis St.  
Rollin, J. V., 108 S. 61st Ave. W.  
Scots, F. G., Duluth Diamond Drilling  
Co.  
Sinn, Hans, Zenith Furnace Co.  
Wenstad, W. B., Citizens State Bank  
Wolebern, H. V., Marshall-Wells Hdw.  
Co.

# Bulletin of The University of Minnesota

GENERAL EXTENSION DIVISION

## CORRESPONDENCE COURSES

1915-1916



VOL. XVIII, NO. 21. FEBRUARY 1916

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.

## CORRESPONDENCE COURSES

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RICHARD R. PRICE, M.A., Director of University Extension

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JEREMIAH S. YOUNG, Ph.D., Professor of Political Science  
OTTO S. ZELNER, B.S., Assistant Professor of Surveying

## GENERAL INFORMATION

The developments of the last few years have clearly demonstrated the effectiveness of, and the necessity for, university teaching by correspondence. The foremost American universities have recently recognized this opportunity for specific service by extending their work beyond the lecture room and the campus, in order to reach students who are unable to comply with the traditional limitations of university and college study.

In thus extending its functions the University offers a plan of practical instruction whereby collegiate training is made available in every section of the state and to those who of necessity must devote a part of their time to other duties. Altho such instruction can not compensate for the lack of a complete cultural or professional course taken in residence, it makes available to persons unable to attend the University an opportunity to study along lines best adapted to their respective needs and interests.

By a careful economy of time it is possible to contribute largely to the requirements for a Bachelor of Arts degree by combining work in residence at the University Summer Session with correspondence study under the General Extension Division.

## CORRESPONDENCE STUDENTS

Correspondence teaching is of significance to several kinds of students; to the teacher, whom experience has taught the need of further study for individual satisfaction and professional efficiency; to the college graduate, who desires to take up some study which he did not pursue in his resident work; to the man or woman who left school early and who now feels the value of broader training to make either life more interesting or work more productive; and to the young high school graduate who desires to begin his college course. When correspondence teaching is fully developed, it can offer something to every one in the community, whatever his age, training, occupation, or interests. Even at the present stage it meets the needs of very considerable numbers and many different classes.

## SCOPE OF THE WORK

The subjects offered cover a wide range and give sufficient material for the needs of numbers of men and women intent on further study. Mathematics and certain lines of natural science, language and literature, history, politics, economics, and the elements of philosophical and other social sciences, afford a considerable breadth of selection.

## THE INSTRUCTION

Upon receipt of application and fee the first lesson will be sent, with instructions for study and methods of preparation, and directions for returning lesson sheets and reports. Each lesson will be returned to the student with such corrections, explanations, and suggestions as may be needed. Lists of books, assignments for reading, and all necessary assistance will be furnished throughout the course, so that no student will be left without adequate aid and guidance. Questions on the subject in hand are at all times encouraged.

Each assignment contains questions to test the student's methods of work as well as his understanding of the ground covered. After preparing for recitation the student writes his answers to the questions and returns them, together with a statement of any difficulties which may have arisen during his study. The student is expected to complete any course within one year from the date of enrollment.

## INSTRUCTORS

The correspondence teaching is done by instructors from the various faculties in the University, who are in continuous charge of similar courses and who are familiar with the needs of non-resident students. The courses outlined are not mere duplicates of university work, but have been outlined and will be administered in such a way as to take advantage of the broader experience of the mature non-resident student and to make this experience serve as far as possible instead of the more intensive reading of the college student.

## THE UNIT COURSE

The unit course is divided, where practicable, into forty assignments, representing a five-credit course in residence. Such a course represents at least an amount of work equal to that done in residence at the University in a study of five full recitation-hours per week for one semester or half year. It is assumed that this work may be done by the average student in forty weeks with a minimum leisure for study of one hour per day, six days in the week. It is, however, the student's privilege to pursue his studies as rapidly as he is able. Shorter courses are ordinarily divided into fifths of the unit course of forty assignments, corresponding to three-credit, two-credit, or one-credit courses in resident work at the University. A three-credit course in residence, then, would be covered by correspondence teaching in twenty-four assignments, and shorter courses in proportion. Two assignments in correspondence approximately cover the ground in quantity of a week's work in residence.

## CLASS WORK

The work here offered is primarily for individual students. When a group of twelve or more is pursuing the same course, however, in any community, the University offers to send an instructor at a nominal charge of five dollars for each visit, in order to direct personally either in the beginning of the term or occasionally at intervals the studies of the group.

## BOOKS AND OUTFIT

All necessary textbooks, drawing outfits, apparatus, dissecting material, chemicals, etc., are extra and *must be procured by the student*. The student also pays postage on lessons one way.

Reference books may be borrowed from the University Library. This privilege does not apply to the necessary textbooks. The period of loan is one month. The student is expected to pay express or postage both ways. Requests for such reference books should be addressed to The Librarian, University of Minnesota, Minneapolis, and the student should state explicitly what books are desired, naming the course taken by correspondence and giving full instructions for mailing.

No list of textbooks is published by the Division.

## PROCEDURE

The student who wishes to undertake correspondence study should first select such course or courses as he may desire to take and send for an application blank. He should fill out the blank with all the information called for and return it with the required fee to the office of the General Extension Division.

## HOW TO SEND MONEY

By post-office or express money order, personal check, or draft. *Make all checks and orders payable to the University of Minnesota.* Always address the General Extension Division, University of Minnesota, Minneapolis.



## REGULATIONS

### ADMISSION

All men and women who seem qualified to pursue successfully the courses offered will be admitted to registration without formal examination. The student is required to fill out an application blank giving such information as may be helpful in adapting the instruction to the personal needs of each student. It is desired that the student state fully the purpose he has in view in taking the work and also in detail such educational advantages, training, or experience as he may have had. The Division endeavors to meet the needs of the individual student by advice and suggestions, as well as by formal instruction, but whenever it finds that the course elected is not for the best interests of the student, it reserves the right to reject the application or to advise change or discontinuance.

### TIME

Students may begin a correspondence course at any time during the year and will be expected to complete the course within twelve months from the time of enrollment, but the Division *can not guarantee that all courses will be given during the summer months*. During an instructor's vacation, a substitute will be provided to carry on such course or courses, if possible, or the time for completing the courses will be extended.

### NUMBER OF COURSES CARRIED

Not more than two courses may be carried through correspondence at one time.

### FEES

All fees are payable at the time the student files his application for registration. If a student enrolls for more than one course at a time he may pay \$12.00 at the time of application and the remaining amount any time within sixty days thereafter.

Three-credit course—24 lesson assignments.....	\$12.00
Five-credit course—40 lesson assignments.....	20.00
For two three-credit courses of 24 lesson assignments each, carried simultaneously .....	20.00
For two five-credit courses of 40 lesson assignments each, carried simultaneously .....	35.00
For one five-credit course plus a three-credit course, carried simultaneously .....	30.00

The reduction in fees is made for the benefit of those who register for and carry two courses at the same time and not for those who carry two courses consecutively.

*No fee is refunded because of a student's inability to enter upon or pursue a course for which he has once registered.* If an application for instruction is rejected, the fee is returned.

#### REINSTATEMENT

Any student whose registration has expired, or who has failed to complete a course within the prescribed time through causes not within the control of the University, may be reinstated with the consent of the Director on payment of one dollar.

#### CREDIT

Students who undertake correspondence study work for university credit must state this fact in advance and comply with all requirements of the University. University credits allowed in this connection will be recorded separately until the student matriculates at the University, when they will be recorded permanently as university credits. Registrations for credit will not be accepted until university entrance requirements have been met.

Those seeking a university degree must conform to all the requirements exacted by the college or school in which such degree is sought.

A maximum of one half the required credits for the B.A. degree may be accumulated through correspondence. The work of the earlier part of the course is more likely to be available for correspondence study.

No credits may be earned by correspondence study to apply on the Master's Degree, or any other graduate degree.

#### PROFESSIONAL STATE TEACHERS' CERTIFICATE

Credit toward the Professional State Teachers' Certificate will be allowed only to such students as are now admitted to examination by the committee acting for the State Department of Public Instruction. Credit may be earned by correspondence in General Pedagogy, History of Education, Psychology, and School Organization and Law. Similar credit may also be earned in certain collegiate subjects, which are indicated in each instance under the description of the course. Upon the satisfactory completion of a course a certificate is issued by the University and this may be presented to the State Department of Public Instruction with a request for credit on the State Certificate.

#### RESIDENT STUDENTS

No university student may enroll for a correspondence course if

this would increase his credit hours beyond the maximum number of hours allowed him.

No university student may enroll for a correspondence course for the purpose of removing a condition or a failure.

#### EXAMINATIONS

All students who desire credit in any course will submit to an examination either at the University or, by arrangement, in their home town under the supervision of an accredited representative of the University. This representative may often be the local superintendent of schools.

## COURSES OF INSTRUCTION

### ASTRONOMY

1. **ASTRONOMY.** A descriptive course designed to give accurate general information regarding the solar system and the stellar universe. Students will be expected to construct some simple inexpensive apparatus for themselves to aid in the comprehension of the subject. Although not necessary, the student will find that a small telescope, or even an opera glass, will add greatly to the interest in the subject.  
Twenty-four lessons (three university credits). BEAL.

### BOTANY

1. **GENERAL BOTANY.** A university course in General Botany, designed to meet the needs of students who have not the facilities of a regular laboratory. The course includes field study of autumn flowers, of weeds, trees, and shrubs, and of mushrooms and toadstools; the preparation of herbs and woody plants in garden and nature for winter; the migration of seeds and fruits; the gross structure of plants; the physiology of germination and growth.  
Twenty-four lessons (three university credits). One-half credit toward Botany on the State Professional Teachers' Certificate. BERGMAN.  
Registrations for this course will be accepted only between September 1 and October 15, and in April of each year.
2. **GENERAL BOTANY.** Field and garden study of the classification and adaptations of flowering plants with special training in the identification of the common plants of field, forest, and garden, and in the recognition of family types. Particular attention is paid to the adaptations of plants for propagation and pollination, and to the concrete evidences of evolution.  
Twenty-four lessons (three university credits). BERGMAN.  
Registrations for this course will be accepted only between January 15 and March 1, of each year.
3. **INDUSTRIAL BOTANY A.** A study of the origin, distribution, and cultivation of plants yielding products of economic value; the processes by which these products are obtained from the plant, and their nature and uses; special laboratory and topic work on cereals, starches, fibers, and timbers.  
Twenty-four lessons (three university credits). Open to those who have completed the equivalent of Course 1, General Botany, or Correspondence Courses 1 and 2. TILDEN.

4. **INDUSTRIAL BOTANY B.** A continuation of Course 3. Special laboratory and topic work on vegetables, legumes, fruits, seeds, nuts, dyes, gums, beverages, spices, and condiments.

Twenty-four lessons (three university credits). Open to those who have completed Course 3. TILDEN.

### BUSINESS COURSES

1. **RETAIL STORE ACCOUNTING.** The records essential to the successful management of a retail store; a classification of accounts necessary to show results; the use of sales slips and credit slips; the short account system; its advantages and deficiencies; advantages of providing checks upon records; the double entry system; the use of the daily "re-cap" sheet; the special column cash book; the cost of doing business; and the daily and monthly expense record; the records of sales and purchases by departments; the monthly statement of business; the advantage of uniformity in the monthly statement for purposes of comparison.

A course designed with special reference to a retail general merchandise business. A part of this course will consist of the presentation of the system of accounts as prepared by the Committee on Accounting, appointed at the first Short Course in Merchandising held at the University.

Twelve lessons (no university credit.) Fee, \$6.00. PRESTON.

2. **PRINCIPLES OF ACCOUNTING.** The purposes of accounting; the main classification of accounts; single entry accounting; the principles of double entry; the application of those principles to the cash book, journal, sales book and purchase book; the trial balance; adjustments and accruals before closing; the balance sheet and income sheet; the working sheet as an aid to statement making; columnar books of original entry; subsidiary ledgers and controlling accounts in the general ledger; contingent liabilities; imprest cash; manufacturing accounts and the manufacturing statement; depreciation; voucher systems.

A fundamental general course treating of the principles underlying the science of accounts and the practical application of those principles. The principal aim of the course is to study accounts from the standpoint of the business statements—the balance sheet, and profit and loss statement. The first series of eight lessons is aimed to give the student an understanding of the principles of double-entry bookkeeping. The remaining sixteen lessons apply to the principles and practice of accounts not ordinarily understood by the average bookkeeper.

Twenty-four lessons (three university credits). PRESTON.

3. **BUSINESS ENGLISH.** Mastery of materials, letters in general, complaint answers, reminder letters, recommendation letters, application letters,

credit-adjustment letters, "ginger" letters, form letters, follow-up letters, general sales letters.

Twenty-four lessons (no university credit). VIETS.

#### 4. BUSINESS LAW A—CONTRACTS, AGENCY AND SALES.

The general rules of contracts being fundamental to all work in business law, this course should precede the others.

Contracts: Formation of contracts, offer and acceptance, consideration, capacity of parties, minors, married women, misrepresentation, fraud, legality of object, the operation of contracts, interpretation of contracts, methods of discharging contracts.

Agency: Methods of forming the relation of agency, who may act as agent, who may act as principal, liabilities of principal to third parties, liabilities of agents, termination of agency.

Sixteen lessons (two university credits). Fee, \$8.00. SMILEY.

#### 5. BUSINESS LAW B—NEGOTIABLE INSTRUMENTS, PERSONAL PROPERTY, BAILMENTS, SALES.

Negotiable instruments, nature and characteristics: (a) definition; (b) the uniform negotiable instruments law, essentials, non-essentials, negotiations, indorsements and delivery, holder in due course and his rights, notice of dishonor, protest, checks.

Personal Property—Bailments: definitions, distinction between real and personal property, nature of bailment, rights of bailor, rights of bailee.

Sales of personal property. Definition of a sale; when the title passes to the buyer; rights of the seller (a) to set the contract aside on the ground of fraud, (b) the seller's lien for the purchase money, (c) right of stoppage in transit; rights of the purchaser, (a) to demand goods of a certain quality, (b) warranty of the purchaser's title.

Sixteen lessons (two university credits). Fee, \$8.00. SMILEY.

Note: See also Course 9 under "Economics."

## ECONOMICS

1. ELEMENTS OF ECONOMICS. Price under competition and under monopoly; the factors of production and the principles determining the reward that the factors get in the shape of wages, rent, interest, and profit; principles of trade, including consideration of relative merits of free trade and protection; money; banks and banking; immigration; trade unions; stock exchange; concentration of industry; insurance; the economic functions of the state.

This course is designed to give a general understanding of our economic order. Special attention is given to a consideration of basic principles and to descriptive accounts of economic institutions.

Twenty-four lessons (three university credits). HAYES.

2. LABOR PROBLEMS, PART I. Modern labor problems; woman and child

labor, industrial education, unemployment, poverty, industrial hygiene, welfare work. Lectures, textbooks, assigned readings.

Twenty-four lessons (three university credits). PHELAN.

LABOR PROBLEMS, PART II. Profit sharing, coöperation, labor unions, strikes, boycotts, conciliation and arbitration; immigration; causes, effects, remedies. Lectures, textbooks, assigned readings.

Both courses must be completed before credit is given for either.

Twenty-four lessons (three university credits). PHELAN.

3. ECONOMIC DEMOCRACY. Aristocracy versus democracy in economics; competition, socialism, and state regulation plus education as means of achieving economic justice; special attention to socialism as a philosophy of industrial evolution and a program of economic reform, and to the alternative of adequate, reasonable, and efficient public regulation of private economics: Lectures and assigned readings.

Twenty-four lessons (three university credits). PHELAN.

4. MAN AND HIS LIVING. A general course in the activities, relations, and phenomena that result from human effort to make a living and to live. How to weigh and study the facts of life; the aim and goal of economic progress; economic change; economic development in the United States; the language of economics; the factors of production; business organization; value and price; monopoly; money and banking; foreign economic relations; sharing the product; rent, wages, interest, profits; transportation; insurance; city and country; the state and our money.

Designed to appeal to all who desire to maintain a broad view of life and to be ripe for active citizenship; also to the teacher who means to enliven and enforce his or her teaching by bringing it into relation with life outside of the school.

Twenty-four lessons (three university credits.) PHELAN.

5. ECONOMIC DEMOCRACY. The beginning of American Democracy; modern ideas in the utopian philosophers; the beginnings of modern socialism; the People's Great Britain; social democracy in France; German social democracy; the social movement in Belgium, Austria, Italy, Switzerland, Russia; the general strike; anarchism; communism and socialism in the United States; the single tax; public regulation of business; criticisms of socialism, an alternative. Emphasizes reform through public regulation and education.

A course on constructive citizenship.

Twenty-four lessons (three university credits). PHELAN.

6. (160) LABOR AND LIFE (LABOR PROBLEMS). The rise of the modern labor problem; woman labor; the minimum wage; child labor; vocational guidance; mothers' pensions; unemployment; industrial accidents; occupational disease; poverty.

Twenty-four lessons (three university credits). PHELAN.

Teachers, employers, employees, social workers, and active citi-

zens should find much of interest and profit in this and the two following courses.

7. (161) LABOR AND THE PUBLIC (LABOR PROBLEMS). Strikes and their prevention; boycotts; injunctions; labor doctrines and theories; types of labor unions; of employers' associations; profit-sharing and coöperation; scientific management; old age pensions.  
Twenty-four lessons (three university credits). PHELAN.
8. IMMIGRATION. The making of America; causes of immigration; effects of immigration on native population; effects of American institutions; effects on labor; the effects on Europe; immigration administration; what shall be done about immigration?  
Twenty-four lessons (three university credits). PHELAN.
9. BANKING. The subject-matter of this course constitutes the necessary basis of a thoro understanding of the principles of currency, banking, and finance. The lessons will survey all the practical operations of modern banks with chief emphasis upon commercial banking and with some attention to the legal problems to be met with in dealings between banks and their customers. Beginning with a description of the development of commercial banking, of savings banks and trust companies, the course will be developed under the following topics: how to organize a commercial bank; shareholders, directors and officers, their duties, powers, and liabilities; deposits, depositors and the receiving teller; the paying teller and checks; the bank reserve; national bank notes; clearing houses; collections and domestic exchange; foreign exchange; loans and discounting, credit departments and how they judge credit; collateral loans; statements of condition; bank policy; supervision and examinations; analyzing depositors' accounts, central banks of England, France and Germany, the Federal Reserve System of the United States, and rural credits.  
Twenty-four lessons (three university credits). EBERSOLE.

## EDUCATION

1. INTRODUCTORY PSYCHOLOGY  
See Course 1 under Philosophy and Psychology.
2. EDUCATIONAL PSYCHOLOGY  
See Course 2 under Philosophy and Psychology.
3. HISTORY OF ANCIENT AND MEDIEVAL EDUCATION. An introductory study in the history of education, with special attention to the education of Greece, Rome, and the early Christian centuries, to the development of different types of schools in medieval times, and to the rise of the universities and of the humanistic schools of the Renaissance. The course is designed to arouse an interest in educational problems, to secure some perspective for use in current investigation, and to give some command of the facts of educational history and some



facility in the methods of historical investigation. An attempt is made to bring out education as one phase of civilization and to show the connection of schools with other social institutions.

Twenty-four lessons (three university credits). SWIFT.

4. HISTORY OF MODERN EDUCATION. A somewhat intensive study of the periods in the history of modern education, with special reference to the development of the various national systems of public instruction. Different types of educational theory are considered in connection with a study of the men who first advanced them and of the schools in which they were first put into effect. This course is a direct preparation for an understanding of the educational systems, theories, and practices of the present.

Twenty-four lessons (three university credits). One credit toward History of Education on the State Professional Teachers' Certificate. SWIFT.

5. RURAL EDUCATION. This course is intended to give the student a comprehensive understanding of rural life in its economic and social aspects so that he may, with better intelligence, organize the rural school and make it a power in the community for coöperation with all other constructive forces, and a factor in the promotion of leadership among the country people themselves. It is not a narrow academic course, but a broad, popularly arranged course that any intelligent person can pursue with satisfaction and profit.

Gillette's *Constructive Rural Sociology*, Carver's *Principles of Rural Economics*, supplemented by a number of rural surveys and pamphlets on various special topics, are the required texts in the course.

Twenty-four lessons (three university credits). RANKIN.

6. THE MODERN HIGH SCHOOL. A brief review of its evolution to date will be followed by a thoro consideration of its place and function, especially its increasing usefulness in a democracy; its curriculum, particularly with reference to needed reconstruction of courses; the better organization of the high school to meet the demands of adolescence; relation of the high school to other parts of the system; the larger problems of organization and management, especially as these things affect the work of the regular teacher. In a word, this course is intended to give those who work in high schools the point of view that will insure the best results.

Much of the material of the course is drawn from practical observation and actual surveys. Johnston's *The Modern High School* is used as the fundamental text.

Twenty-four lessons (three university credits). NORMAN.

7. INDUSTRIAL EDUCATION. The principles fundamental to vocational training in the public school system as affecting the arrangement of school years, the course of study, and the methods of teaching.

Twenty-four lessons (three university credits). RANKIN.

8. **PHILOSOPHY OF EDUCATION.** An endeavor to correlate the various educational ideals drawn from biological and psychological studies, with special consideration of recent social phases of education. An attempt to answer the question, "What does education mean today?"

Twenty-four lessons (three university credits). One-half credit toward General Pedagogy on the State Professional Teachers' Certificate. **NORMAN.**

9. **THEORY OF TEACHING.** An introductory course in educational theory, including a somewhat detailed study of the principles on which is based the present practice in teaching, with an interpretation of the fundamental facts of psychology as applied to the problems of education.

Twenty-four lessons (three university credits). One-half credit toward General Pedagogy on the State Professional Teachers' Certificate. **NORMAN.**

10. **SCHOOL ORGANIZATION AND LAW.** A comprehensive course in the organization and management of schools in American communities, with special reference to the duties of school boards and school superintendents, principals, and teachers, to the methods and equipment proper to schools of various grades, and to the main facts in the school law of Minnesota.

Twenty-four lessons (three university credits). Credit for School Organization and Law on the State Professional Teachers' Certificate. **RANKIN.**

11. **SCHOOL SANITATION.** This course is designed for those who are concerned with schools of any and all grades. It deals with conditions affecting the health of school children of all ages. School architecture, courses of study, and the discipline of the school will be considered as well as all other questions affecting the well-being of pupils.

Twenty-four lessons (three university credits). **RANKIN.**

## ENGINEERING

1. **SHOP MATHEMATICS, PART I.** This course will include mathematics from the elements through proportion, and will also include certain problems in areas, volumes, weights of materials, etc., and the fundamental elements of machines, such as levers, pulleys, inclined plane, etc.

Twenty-four lessons (no university credit). **EDWARDS.**

2. **SHOP MATHEMATICS, PART II.** This work will be in advance of Part I and will take up algebra, geometry, and trigonometry from a practical shop standpoint. A thoro working knowledge of formulae will be given. Each lesson in both Parts I and II will have numerous practical problems to be worked by the student.

Twenty-four lessons (no university credit). **EDWARDS.**

3. **MECHANICAL DRAWING, PART I.** The course includes the use of instruments, lettering, simple projections with sections and developments, working drawings of details of tools, machines, and structures. Geometrical problems and exercises will be studied in connection with their application. An elementary course designed to meet the needs of beginners.  
Twenty-four lessons (no university credit). KIRCHNER and assistants.
4. **MECHANICAL DRAWING, PART II.** A continuation of Part I. (A complete outfit for these courses can be purchased for as little as six dollars. Set No. 1, \$6.00; Set No. 2, \$8.00; Set No. 3, \$10.00.)  
Twenty-four lessons (no university credit). KIRCHNER and assistants.
5. **FREEHAND LETTERING.** This course is especially adapted for the use of teachers of drawing in high schools, manual training instructors, rural teachers, draftsmen, highway and county engineers. Capitals, lower case, numerals, and other symbols will be thoroly treated. Explanatory notes, dimensions, and title layouts will be illustrated.  
Sixteen lessons (no university credit). Fee, \$8.00. ZELNER.
6. **ELECTRICITY AND MAGNETISM.** An elementary study of magnetism and electricity. Simple laws of magnetism, and the relation of magnetism to direct current electricity will be developed. Series and parallel circuits, combinations of both, simple wiring and armature winding will be taken up. A knowledge of arithmetic and algebra would be helpful, but is not required.  
Twenty-four lessons (no university credit). EDWARDS.
7. **HEATING AND VENTILATION.** The course is intended to meet the needs of those who wish to know about the principles and installation of heating and ventilating apparatus. The work will include an introduction and study of heat, heat losses, loss of ventilation, ventilating practice, air conditioning, heating systems—steam and hot-water, direct and indirect, use of exhaust steant, thumb rules, warm-air systems, fan systems—plenum and exhaust systems, vacuum systems, piping systems, central-station heating and heating accessories.  
Twenty-four lessons (no university credit). MARTENIS.
8. **STRENGTH OF MATERIALS.** An elementary course on the strength of materials in common use. Properties of materials, stress and strain, elastic limit, ultimate strength, deformation, deflection, principle of moments, moment of inertia, and the general elementary theory of beams, columns, and shafts will be taken up. The student should have the equivalent of Shop Mathematics, Parts I and II.  
Twenty-four lessons (no university credit). EDWARDS.
9. **ELEMENTARY MECHANICS.** A short, practical course in elementary mechanics designed to meet the needs of students who have had a limited

training in mathematics. Numerical calculation, simple graphical calculations, forces, simple machines, velocity, acceleration, impulse, momentum, work, power, and energy.

Twenty-four lessons (no university credit). BROOKE.

10. LUMBER AND ITS USES. Structural and physical properties of wood, standard grades and sizes, structural timbers, seasoning and preservation, paints and stains, lumber prices, cost of wood construction, specific uses of woods and selection of materials.

Ten lessons (no university credit). Fee, \$5.00. CHEYNEY.

## ENGLISH

1. THE ENGLISH NOVEL. An elementary course in the principles of fiction with the careful study of seven novels, selected to represent various aspects of the history of English prose fiction; also the study of a contemporaneous novel with an attempt to ascertain its literary value and its relationship to the masterpieces of the past. The consecutive study of the novels will be accompanied by selected assignments from Bliss Perry, *Study of Prose Fiction* and W. L. Cross, *The Development of the English Novel*.

Twenty-four lessons (three university credits). CRAIG.

2. AMERICAN LITERATURE—GENERAL SURVEY. A study of American literary development, with particular attention to the influence of English literature and the effect of our own national history upon the progress of thought and expression in the United States. The student must read extensively from American authors and answer questions which will call for constructive criticism and independent estimates. Textbook comments will not be accepted.

Twenty-four lessons (three university credits). Credit for American Literature on the State Professional Teachers' Certificate. NORTHROP.

3. HISTORY OF ENGLISH LITERATURE I. A general survey of English literature from the earliest times to 1700, with a good deal of emphasis upon the historical setting. Extensive readings from volumes of examples of the most famous poetry and prose. When feasible, the special study of the work of one of the major authors is recommended to be done at the same time as an intensive offset to so much rather sporadic reading.

Twenty-four lessons (three university credits). Credit for English Literature on the State Professional Teachers' Certificate. NORTHROP.

4. HISTORY OF ENGLISH LITERATURE II. A general survey of English literature from 1700 to the present time.

Twenty-four lessons (three university credits). Credit for English Literature on the State Professional Teachers' Certificate. NORTHROP.

## GEOLOGY

1. GENERAL GEOLOGY. A general course, including a study of natural forces and phenomena, plants and animals as geologic agents, structural geology, physiographic geology, and an outline of historical geology.

Twenty-four lessons (three university credits). One-half credit toward Geology and Physiography on the State Professional Teachers' Certificate. LEHNERTS.

2. PHYSICAL GEOGRAPHY. A college course in the essentials of Physical Geography and Physiography, with special application of the conditions of surface and climate to human occupation and national development.

Twenty-four lessons (three university credits). One half credit toward Geology and Physiography on the State Professional Teachers' Certificate. LEHNERTS.

## GERMAN

1. BEGINNING GERMAN A. Grammar and easy composition.

Forty lessons (five university credits). Open to all who have had no German. BURKHARD.

2. BEGINNING GERMAN B. Grammar and composition continued; selected readings in easy prose and verse.

Forty lessons (five university credits). Both A and B must be completed before credit is given for A. BURKHARD.

3. INTERMEDIATE GERMAN A. Selections from modern narrative and descriptive prose, selected lyrics and ballads. Review of the morphology of grammar.

Twenty-four lessons (three university credits). Open to those who have completed Courses 1 and 2 or their equivalent. GEISSENDOERFER.

4. INTERMEDIATE GERMAN B. A drama of Lessing, Goethe, or Schiller.

Twenty-four lessons (three university credits). Both A and B must be completed before credit is given for A. Students who obtain credit for these courses can not receive credit also for Courses 5 and 6. GEISSENDOERFER.

5. PROSE AND POETRY A. Spanhoffd's *Aus Vergangener Zeit*; selected lyrics and ballads. Geography, history, legend. Review of the morphology of grammar.

Twenty-four lessons (three university credits). Open to freshmen and sophomores who enter the University with two years of preparatory German. SCHROEDEL.

6. PROSE AND POETRY B. Lyrics and ballads continued. Goethe's *Hermann und Dorothea*. Review of syntax.

Twenty-four lessons (three university credits). These courses not

open to those who have obtained credit in Courses 3 and 4. Both A and B must be completed before credit is given for A. SCHROEDEL.

7. **ELEMENTARY COMPOSITION A.** Translation of short English selections. Paraphrasing of simple poems. Free narration. Exercises based on topical grammar review.  
Sixteen lessons (two university credits). Open to those who are taking or have taken Courses 3 and 4 or 5 and 6. Fee \$8.00. MYERS.
8. **ELEMENTARY COMPOSITION B.** Translation and grammar review continued. Simple description. Letter writing.  
Sixteen lessons (two university credits). Both A and B must be completed before credit is given for A. Fee \$8.00. MYERS.
9. **DRAMA A.** Study of the present-day drama in Germany. Selected plays of Hebbel, Hauptmann, or Sudermann, with assigned readings and reports.  
Twenty-four lessons (three university credits). Open to those who have completed Courses 1 and 2 and 3 and 4, or 5 and 6. DAVIES.
10. **DRAMA B.** Study of the German drama of the eighteenth century and through the classic period. Selected plays of Lessing, Goethe, or Schiller, with assigned readings.  
Twenty-four lessons (three university credits). DAVIES.

### GREEK

1. **BEGINNING GREEK A.** The declensions and conjugations and the simpler rules of syntax, together with sentences based on the vocabulary of the *Anabasis*, and translation into Greek of idiomatic English sentences based upon the same text.  
Forty lessons (five university credits). Open to those qualified, who have had no Greek. Both A and B must be completed before credit is given for Course A. SAVAGE.
2. **BEGINNING GREEK B.** The *Anabasis* itself, an amount equivalent to about a book; Hadley's *Greek Grammar*; etymology reviewed and syntax studied sufficiently to enable the student to proceed confidently in the translation of the text; translation from English into Greek continued.  
Forty lessons (five university credits). SAVAGE.
3. **ESSENTIALS OF NEW TESTAMENT GREEK.** An elementary course in beginning Greek based on the New Testament. Open to those who desire to be able to use the New Testament in the original. No previous knowledge of Greek is required.  
Twenty-four lessons (three university credits). HUTCHINSON.
4. **ELEMENTARY COURSE IN HOMER**  
Open to those who have read in Greek prose the equivalent of at least three books of the *Anabasis*. Twenty-four lessons (three university credits). HUTCHINSON.

## 5. ELEMENTARY COURSE IN THE DRAMA

Open to those who have read at least two books of Homer in addition to the prose equivalent of at least three books of the *Anabasis*. Twenty-four lessons (three university credits). SAVAGE.

## HISTORY

1. ANCIENT HISTORY, PART I—GREEK. This course includes a brief preliminary survey of Egypt and Babylonia, showing their influence on later civilizations, followed by a study of Greek history, with special stress on the development of Sparta and Athens, the Persian Wars, the Age of Pericles, the inter-relation of politics with the artistic and literary development and finally the conquests of Alexander and the diffusion of Greek civilization over the East.

Twenty-four lessons (three university credits). One-half credit toward Ancient History on the State Professional Teachers' Certificate. DAVIS.

2. ANCIENT HISTORY, PART II—ROMAN. A course in Roman history, including the rise of Rome from a petty city to the position of mistress of the ancient world, the great struggle with Carthage, the causes that led to the fall of the Republic, the transition to the Empire, and its decline and fall, with special emphasis on the effect of imperial institutions on modern civilization.

Twenty-four lessons (three university credits). One-half credit toward Ancient History on the State Professional Teachers' Certificate. DAVIS.

3. MODERN HISTORY, PART I. A study of European history from the time of Charlemagne to the close of the Thirty Years War (800-1648 A. D.).

Twenty-four lessons (three university credits). One-half credit toward Modern History on the State Professional Teachers' Certificate. KREY.

4. MODERN HISTORY, PART II. A study of European history from the close of the Thirty Years War to the present (1648-1914).

Twenty-four lessons (three university credits). One-half credit toward Modern History on the State Professional Teachers' Certificate. KREY.

5. UNITED STATES HISTORY, PART I. This is the first half of a comprehensive course in American history. About two thirds of Part I is devoted to the colonial period, the remainder to the Revolution and the closing years of the eighteenth century. The work consists of a study of the text, supplemented by a considerable amount of source study and collateral reading. The student is required to prepare written answers to questions based on the text and on the supplementary readings.

Twenty-four lessons (three university credits). One-half credit toward United States History on the State Professional Teachers' Certificate. BUCK.

6. UNITED STATES HISTORY, PART II. A continuation of Part I, devoted mainly to a study of the period from the beginning of the nineteenth century down to 1861, with a brief survey in conclusion of the principal events from that time to the present.

Twenty-four lessons (three university credits). One-half credit toward United States History on the State Professional Teachers' Certificate. BUCK.

### LATIN

1. ORATIONS OF CICERO A. Two orations, study of the life of Cicero and Latin composition.

Twenty-four lessons (three university credits). Open to those who have completed two years of preparatory Latin. GRANRUD.

2. ORATIONS OF CICERO B. Four orations, study of the times of Cicero and Latin composition.

Twenty-four lessons (three university credits). Open to those who have completed Course 1. GRANRUD.

3. VIRGIL'S AENEID A. The course will cover the first two books of the *Aeneid* and include the study of the life and times of Virgil, the principles of Latin prosody, the literary style of the *Aeneid*, and, to a limited extent, Roman mythology.

Twenty-four lessons (three university credits). Open to those who have completed three years of preparatory Latin. PIKE.

4. VIRGIL'S AENEID B. Books 3, 4, 5, 6 of the *Aeneid*. Textbooks: *Virgil's Aeneid* by Charles Knapp, Bennett's *Latin Grammar*. The student will, besides, be expected to read and report on Sellar's *Virgil*.

Twenty-four lessons (three university credits). Open to those who have completed Virgil's Aeneid A. PIKE.

5. LIVY, BOOK I. The work will comprise the study of the text, the life, times, and literary style of Livy, and, in some measure, early Roman institutions, and, lastly, Latin composition. Textbooks: Westcott's *Livy*, Book I, Bennett's *Latin Grammar*, and White's *Latin-English Lexicon*. The student will also read and report on Ihne's *Early Rome*.

Twenty-four lessons (three university credits). Open to those who have completed four years of preparatory Latin. PIKE.

6. PLAUTUS AND TERENCE: SELECTIONS. The course will consist of a study of the texts, the literary styles of Plautus and Terence, and an outline of the history and technique of the Roman drama. Textbooks: *Plautus' Menaechmi* by Fowler, *Terence's Phormio* by Elmer, and



*White's Latin-English Lexicon*. The student will also be required to read and report upon Sellar's "Plautus and Terence" in *The Roman Poets of the Republic*.

Twenty-four lessons (three university credits). Open to those who have completed Course 5. PIKE.

### MATHEMATICS

1. **ELEMENTARY ALGEBRA I.** This course covers the ground given in the average high school in the first half year of algebra.  
Twenty lessons (no university credit). Fee, \$10.00. MIKESH.
2. **ELEMENTARY ALGEBRA II.** This course covers the ground given in the average high school in the second half year of algebra up to and including quadratics.  
Twenty lessons (no university credit). Fee, \$10.00. MIKESH.
3. **PLANE GEOMETRY I.** This course covers the ground of the average high-school course as given in first half year of plane geometry.  
Twenty lessons (no university credit). Fee, \$10.00. KIRCHNER.
4. **PLANE GEOMETRY II.** This course covers the ground of the average high-school course as given in the second half year of plane geometry.  
Twenty lessons (no university credit). Fee, \$10.00. KIRCHNER.
5. **SOLID GEOMETRY.** This course is designed not only to give a knowledge of the standard theorems and exercises of the text, but to develop the student's own imagination and initiative and give a well-rounded view of the subject by practice in special proofs and original exercises.  
Twenty-four lessons (no university credit). Credit for Solid Geometry on the State Professional Teachers' Certificate. KIRCHNER.
6. **HIGHER ALGEBRA, PART I.** A comprehensive study of the elements of the subject, with more difficult problems and demonstrations than in the elementary course, covering the fundamental rules, factoring, highest common divisor, lowest common multiple, fractions, involution, evolution, surds, imaginaries, simple equations with one, two, or more unknown quantities, ratio, proportion, variation, and progressions.  
Forty lessons (five university credits). One-half credit toward Higher Algebra on the State Professional Teachers' Certificate. MIKESH.
7. **HIGHER ALGEBRA, PART II.** A continuation of Part I, including a study of variation, quadratic equations, special higher equations, simultaneous equations of the second degree, maxima and minima of functions, logarithms, theory of equations, and solution of numerical higher equations.  
Twenty-four lessons (three university credits). One-half credit

toward Higher Algebra on the State Professional Teachers' Certificate. **MIKESH.**

8. **TRIGONOMETRY.** A course in plane and spherical trigonometry, designed to meet the needs of beginners and to include the subject usually considered in the ordinary college course. The solution of triangles is treated quite fully, but not to the exclusion of analytical trigonometry.

Twenty-four lessons (three university credits). Credit for Trigonometry on the State Professional Teachers' Certificate. **BROOKE.**

NOTE: See also Courses 1 and 2 under "Engineering."

### MUSIC

1. **HARMONY.** Will begin with scales, major and minor; intervals; formation of triads, their inversions; the dominant seventh chord, its inversions; modulation; suspension; organ-point, etc.

Twenty-four lessons (three university credits). **SCOTT.**

2. **HISTORY OF MUSIC.** A general survey of the development of music, from the earliest times to the present; primitive scale-forms, Greek theory, changes due to Christian practices, the development of polyphony, the monodic revolution and the growth of opera, the rise of instrumental music and instrumental forms, leading to a historical view of present-day music and musical tendencies. Considerable attention will be given to parallel movements and conditions in literature and history, the aim of the course being to present music as a literature.

Twenty-four lessons (three university credits). **FERGUSON.**

### PHILOSOPHY AND PSYCHOLOGY

1. **GENERAL PSYCHOLOGY I.** The purpose of this course is to acquaint the student with the general characteristics and laws of mental life and with the aims and methods of modern psychology.

Twenty-four lessons (three university credits). One-half credit toward Psychology on the State Professional Teachers' Certificate. **KANTOR.**

2. **GENERAL PSYCHOLOGY II.** The study of mental development in its relation to heredity and training, with an investigation of the facts and theories of childhood and adolescence with special reference to their bearing on education.

Twenty-four lessons (three university credits). One-half credit toward Psychology on the State Professional Teachers' Certificate. **DASHIELL.**

3. **LOGIC.** A study first of the nature and place of thinking in human life, followed by some notice of points in logical theory. Main emphasis

then to be laid upon the methods that naturally arise in human thinking, studying their technical developments with the Greeks, the Schoolmen, and the modern scientists.

Twenty-four lessons (three university credits). DASHIELL.

4. ETHICS. A study mainly of morality as a phase of the developing life of peoples. Some attention to individual morality, but especially to contemporary social problems.

Twenty-four lessons (three university credits). DASHIELL.

5. ANCIENT AND MEDIEVAL PHILOSOPHY. A general survey of the philosophical problems that arose in the Greek period, and their development through the Middle Ages. The philosophical problems will be considered as representing the fundamental attitudes of the particular periods toward experience. These fundamental attitudes will be studied in the formulations of the individual philosophers. The work of Plato and Aristotle will be particularly stressed.

This course will give credit only to those having six credits or their equivalent in the Department of Philosophy. Text: Rogers' *Students' History of Philosophy*, and readings in Plato and Aristotle.

Twenty-four lessons (three university credits). KANTOR.

6. MODERN PHILOSOPHY. A continuation of the previous course. This course is intended to cover the reconstruction of the problems of human experience, and their intended solution. The traditions of Rationalism and Empiricism will be traced down to the Kantian Philosophy. As in the previous course, the special authors will be studied. Rogers' *Students' History of Philosophy*, with special readings, will be used.

Twenty-four lessons (three university credits). KANTOR.

## PHYSICS

1. GENERAL PHYSICS. Mechanics of solids and fluids, sound, and heat. An elementary university course in the fundamental principles of the subject.

Twenty-four lessons (three university credits). DIETERICH.

2. GENERAL PHYSICS. Electricity, magnetism, and light. A continuation of General Physics 1.

Twenty-four lessons (three university credits). DIETERICH.

## POLITICAL SCIENCE

1. AMERICAN GOVERNMENT. An elementary course in American Government and Politics intended as a preparation for teaching in secondary schools and for good citizenship. The course deals with the national government, treating its nature and origin. Special attention will be given to the organization of the executive, legislative, and judicial

branches of the government, together with the various powers and duties of each department; to the conduct of foreign affairs; and the Federal Trade Commission. The textbooks are *American Government and Politics*, by C. A. Beard, and *The New American Government* by J. T. Young.

Twenty-four lessons (three university credits). VIESSELMAN.

2. STATE AND LOCAL GOVERNMENT. The constitutional basis of state government; relation of the states to the United States and to the local units of government; recent experiments, such as the initiative and referendum, the recall, and primary systems in nominating. Three text-books are required: *American Government and Politics*, by Charles A. Beard; *The New American Government and Its Work*, by J. T. Young; and *Government of Minnesota*, by J. S. Young.

Twenty-four lessons (three University credits). YOUNG.

### RHETORIC

1. RHETORIC, PART I. This course is designed to give practical training in composition as well as a knowledge of rhetorical principles. Aside from the study of the text it includes practice in the analysis of the best specimens of English prose, and the writing of papers, mainly expository in character.

Twenty-four lessons (three university credits). One-half credit toward Rhetoric on the State Professional Teachers' Certificate. VIETS.

2. RHETORIC, PART II. A continuation of Part I, with more advanced work in analysis, and practice in writing narration, description, and informal argument.

Twenty-four lessons (three university credits). One-half credit toward Rhetoric on the State Professional Teachers' Certificate. VIETS.

3. BUSINESS ENGLISH. See Course 3 under Business Courses. VIETS.

### ROMANCE LANGUAGES

#### FRENCH

1. BEGINNING FRENCH A

Forty lessons (five university credits). SIRICH.

2. BEGINNING FRENCH B. French grammar and reader; modern texts.

Open to all who have had no French. Juniors and seniors receive only half credit. Both courses must be completed before credit is given for the first course. Forty lessons (five university credits). SIRICH.

3. INTERMEDIATE FRENCH A

Twenty-four lessons (three university credits). FRELIN.

4. INTERMEDIATE FRENCH B. Prose composition; modern texts, including some of the works of Coppée, Daudet, Scribe, *et al.*  
Twenty-four lessons (three university credits). Open to those who have completed Courses 1 and 2 or their equivalent. Both courses must be completed before credit is given for the first course. FRELIN.

## SPANISH

1. BEGINNING SPANISH A  
Twenty-four lessons (three university credits). BARRETT.
2. BEGINNING SPANISH B. Spanish grammar and reader; modern texts.  
Twenty-four lessons (three university credits). Open to all who have had no Spanish. Both courses must be completed before credit is given for Course 1. BARRETT.
3. INTERMEDIATE SPANISH A  
Twenty-four lessons (three university credits). BARRETT.
4. INTERMEDIATE SPANISH B. Reading of modern Spanish texts.  
Open to those who have completed Courses 1 and 2. Both courses must be completed before credit is given for the first course. Twenty-four lessons (three university credits). BARRETT.

## SCANDINAVIAN LANGUAGES AND LITERATURES

## NORWEGIAN

1. ELEMENTARY NORWEGIAN A  
Forty lessons (five university credits). HJELMSTAD.
2. ELEMENTARY NORWEGIAN B. Elementary study of the language, grammar, composition, select readings in easy prose and poetry.  
Forty lessons (five university credits). Open to all who are qualified to take the course. Both courses must be completed before credit is given for the first course. HJELMSTAD.
3. MODERN NORWEGIAN LITERATURE A  
Twenty-four lessons (three university credits). BOTHNE.
4. MODERN NORWEGIAN LITERATURE B. History of Norwegian literature from 1814 to the present day.  
Twenty-four lessons (three university credits). Open to advanced students. Both courses must be completed before credit is given for the first course. BOTHNE.

## SWEDISH

1. ELEMENTARY SWEDISH A  
Forty lessons (five university credits). STOMBERG.
2. ELEMENTARY SWEDISH B. Grammar and composition; select readings in easy prose and verse.

Forty lessons (five university credits). Open to all who are qualified to take the course. Both courses must be completed before credit is given for the first course. STOMBERG.

3. INTERMEDIATE SWEDISH A

Twenty-four lessons (three university credits). STOMBERG.

4. INTERMEDIATE SWEDISH B. Prose composition; modern texts, including Grimberg's *Sveriges Historia*, Tegner's *Frithiofs Saga*, Runeberg's *Fänrik Ståls Sägner*.

Twenty-four lessons (three university credits). Open to those who have completed Courses 1 and 2 or their equivalent. \* Both courses must be completed before credit is given for the first course. STOMBERG.

5. SWEDISH LITERATURE A

Twenty-four lessons (three university credits). STOMBERG.

6. SWEDISH LITERATURE B. History of Swedish literature from 1710 to the present time. History of the literature and study of modern authors, including Selma Lagerlöf, Gejerstam, Strindberg.

Twenty-four lessons (three university credits). Open to advanced students. Both courses must be completed before credit is given for the first course. STOMBERG.

### SOCIOLOGY

1. RURAL SOCIOLOGY. A study of the conditions and problems of country life. Analysis of environmental, human, and general social conditions; how soil, climate, etc., the quantity and quality of the rural population, the interaction of city and country, determine the type of rural communities. Problems of sanitation, coöperation, education, religion, recreation, crime, and dependency, growing out of these conditions. Not available before September, 1916.

Twenty-four lessons (three university credits). NEERGAARD.

## OTHER EXTENSION ACTIVITIES

### UNIVERSITY WEEKS

For three consecutive seasons University influence and a part, at least, of the University atmosphere have been carried to the people of the state through the somewhat unique form of service called University Weeks. The University Week is a six-day program conducted in each of many towns throughout the state. In the summer of 1915 twenty-four towns participated in the circuit. During these six days the effort was to present in epitome as many as possible of the widespread activities of the University. Members of the faculty lectured on a great variety of subjects, the Glee Club gave concerts, the debating societies held debates, the Dramatic Club gave performances of one or two plays, various musical organizations gave concerts, there were talks to business men at noon-day lunches, and talks to Women's Clubs in the afternoons. The ultimate purpose is to stimulate the constructive forces for each community and to produce permanent effects. It is a singularly successful way of making the people of Minnesota well acquainted with their University. It is proposed in the summer of 1916 to extend these Weeks to still other towns. If any community of the state wishes to be put on one of these circuits, it should make arrangements with the General Extension Division as early as February, 1916.

### DEBATING

One of the best means of encouraging the earnest and open-minded study of public questions is the formation of debating societies. For that reason no village, town, or city should be without such an organization. High schools in particular should make debating a well-recognized part of school activity. Moreover, debating in the school tends to offset in some measure the tendency to over-enthusiasm in athletics. The intellectual as well as the physical should have a well-recognized position in the circle of school activities. It is not well that the football player and the track athlete should occupy the sole position of preëminence as school heroes. The High School Debating League, already organized in this State, promotes interest in debating among the schools of its membership. One of the functions of the General Extension Division is to foster this organization as well as independent debating societies by furnishing debating helps, such as lists of references, bibliographies, schemes of organization for debating societies, etc. Debating squads of well-trained students are also sent about the state to hold public debates in towns that desire this form of service.

### LANTERN SLIDES

A new departure for the General Extension Division is the organization of a free lantern-slide bureau. Collections of lantern slides on subjects of interest to schools, and more especially to high schools, are procured and sent out as loans to the schools which are provided with lanterns. No charge is made for this service, the borrowing school being expected to pay only transportation charges and the cost of replacing any broken slides. The slides are sent out in collections of fifty or sixty on each subject, accompanied by a syllabus or running commentary on the slides. With some collections a complete typewritten lecture is included. Among the subjects are Caesar's Helvetian Campaign, Rome, the World Center of Olden Times, The Conquest of Tuberculosis, The Passion Play of Oberammergau, Following Great Men Through Greece, Birds of Minnesota, Insect Pests of Minnesota, Private Life of the Romans, Roman Architecture and Sculpture, Wild Flowers of Minnesota, Philippine Islands, India, Switzerland. From time to time additions to these collections will be made and offered, as the demand arises. Correspondence is solicited from any interested school.

### COMMUNITY CENTERS

There is a movement now running through the country in the interest of a wider community use of the school plant and of other public buildings. It is realized that these buildings, in which the public has a large investment, are open for the use of the people for only a fraction of the available time. There is need for a civic forum or community club house, where citizens may gather for discussion of public questions and for the expression of neighborhood civic and social life. One of the great purposes of the present movement is the realization by the people of the latent possibilities in every schoolhouse for what has been called "concentrated, coöperative, constructive citizenship." It is hoped that the people of every community in the State will organize for the purpose of using their public buildings for social and recreational purposes as well as for the wider education of the grown portion of the community through lecture courses and similar means. The General Extension Division proposes to further this movement by offering guidance and coöperation, more particularly in the way of providing plans for organization, with a list of things that may be done. It will also offer programs and lectures, musical entertainments and dramatics for such local centers as have effected a proper organization. Correspondence is invited from any citizen or organization of citizens interested in this subject.

### LYCEUM COURSES

In addition to the more strictly educational lectures offered by members of the University faculty, there are offered also lyceum courses of popular lectures, entertainments, concerts, and dramatics. The General Extension Division is in a position to obtain the services of the



best lecturers as well as of the lyceum companies presenting entertainments, readings, and concerts, at a much lower rate than is possible for the average community. It is proposed to offer these courses at cost, thereby eliminating the profits of the agent and of the middleman. In this way the lecturer will get just as much for his services while the community will obtain the same entertainment for much less money, or, better still, will obtain a very much higher order of entertainment for the same money. No course of lectures or of entertainments will be sent out by the General Extension Division except those of marked merit, so that every community may depend upon what it is getting. Moreover, an opportunity will be given to towns to see meritorious dramatic entertainments. There are many good modern, as well as classical, plays which can be worthily presented by talent now available. It is hoped that this opportunity will be the occasion of the renewal of interest in the drama. A list of the lyceum attractions available for the season 1916-1917 may be obtained on request.

#### SHORT COURSES

The Agricultural Extension Division has been very useful to the people of the State through its system of short courses of one week offered in agriculture, home economics, and similar subjects. The General Extension Division now reaches another class of people in a similar way by offering one-week courses in such subjects as merchandising, retail selling, etc. These courses are of very great benefit to country merchants especially. The third of these short courses was offered during the last week in January, 1916, at the University. Merchants and their clerks from all over the state attended this practical school for one week. Experts from the best talent in the country were brought in to expound the various phases of the subject and to outline fundamental principles. One hundred and twenty-two persons availed themselves of this opportunity. At the close of the one-week course a three-weeks course was offered for the benefit of those who wanted to give the several subjects more intensive study. It is believed that the longer course will become increasingly popular. Persons interested in this subject are invited to address the General Extension Division.

#### MUNICIPAL REFERENCE BUREAU

The Municipal Reference Bureau is designed to provide the municipal officers of the State with a central clearing house for the dissemination of intelligent information on matters of municipal importance. To render this service the Bureau has collected charters, ordinances, and other municipal documents. This information is drawn upon in the answering of specific inquiries referred to the Bureau by municipal officers of the State and in the preparation of reports of general interest to the villages and cities of Minnesota. Municipalities desiring information, public reports, statistics, and advice upon administrative matters are invited to communicate with the Bureau.

## EXTENSION LECTURES

Lectures, either single or in series, delivered by members of the University faculty, may be obtained by the people of the various communities of the state on very reasonable terms. These lectures attempt to present in popular form present knowledge of the various fields of research and investigation covered by the numerous departments of the University. Some of these lectures are primarily informational, others cultural, and all, it is hoped, inspirational. These lectures afford a good opportunity for any community to keep abreast of present thought and new ideas in the various fields of the world's activity. Some of the courses of lectures given will closely parallel similar courses given each year in the classrooms of the University. In order that courses of lectures may be inaugurated and successfully prosecuted in any town, it is necessary usually that an organization be effected. This may be called the Extension Committee, and through its means business details, advertising, etc., may be attended to systematically and well.

## INFORMATION

The General Extension Division has as one of its functions the business of obtaining and furnishing to inquirers information on the various subjects which from time to time may be called for. This information is obtained by research and by application to the proper university source, and thereby the department acts as a clearing-house of the information which is gathered and stored up through the facilities of a great university. Inquiries for information are therefore invited and so far as the means at hand will permit, the information will be found and supplied.

The various subjects mentioned in the preceding pages lie within the province of the General Extension Division and inquiries on all of them should be addressed to The General Extension Division, University of Minnesota, Minneapolis.

## AGRICULTURAL EXTENSION

Agricultural extension including lectures, demonstrations, institutes, and short courses will be carried on as usual under the direction of the Agricultural Extension Division of the College of Agriculture. Address all inquiries regarding such work to the Agricultural Extension Division, University Farm, St. Paul, Minnesota.

## INDEX

	Page		Page
Admission .....	8	Lantern Slides .....	31
Agricultural Extension .....	33	Latin .....	23
Astronomy .....	11	Lyceum Courses .....	31
Books and Outfit.....	7	Mathematics .....	24
Botany .....	11	Municipal Reference Bureau.....	32
Business Courses .....	12	Music .....	25
Class Work .....	7	Number of Courses Carried.....	8
Community Centers .....	31	 	
Correspondence Students .....	5	Other Extension Activities.....	30
Courses of Instruction.....	11-29	 	
Credit .....	9	Philosophy and Psychology.....	25
 		Physics .....	26
Debating .....	30	Political Science .....	26
 		Procedure .....	7
Economics .....	13	Professional State Teachers' Certifi- cate .....	9
Education .....	15	 	
Engineering .....	17	Regulations .....	8
English .....	19	Reinstatement .....	9
Examinations .....	10	Resident Students .....	9
Extension Lectures .....	33	Rhetoric .....	27
 		Romance Languages .....	27
Faculty .....	3	 	
Fees .....	8	Scandinavian Languages and Liter- atures .....	28
 		Scope of Work.....	5
General Information .....	5	Short Courses .....	32
Geology .....	20	Sociology .....	29
German .....	20	 	
Greek .....	21	Time .....	8
History .....	22	Unit Course .....	6
How to Send Money.....	7	University Weeks .....	30
Information .....	33		
Instruction .....	6		
Instructors .....	6		

25

# Bulletin of The University of Minnesota

GENERAL EXTENSION DIVISION

UNIVERSITY EXTENSION LECTURES  
AND  
THE UNIVERSITY LYCEUM  
1915 - 1916

WITH ANNOUNCEMENTS FOR 1916-1917



VOL. XVIII, NO. 23. DECEMBER 1915

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minnesota

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# UNIVERSITY EXTENSION LECTURES

## GENERAL INFORMATION

The University of Minnesota through its General Extension Division makes the following announcement of lectures that are available to the communities throughout the State.

The lectures here listed have a bearing on the vital social, economic, and scientific problems of life. They may be given in courses of several lectures upon the same general theme, or as single lectures.

### FEEES

There is no appropriation to cover the expense of these lectures. With only a few exceptions they are to be given by members of the faculty who have their full share of heavy work in the University and who volunteer to go out on this service simply to meet the increasing demand for this kind of educational effort.

In order that no community may be penalized because of its distance from the seat of the University, it has been determined to make a flat rate, uniform in all parts of the State, for most of the extension lectures. In pursuing the general policy to make the cost to the community as low as possible, the fee has been fixed at \$15 plus the local entertainment of the lecturer. This amount includes the lecturer's fee and traveling expenses. A few members of the faculty who are in demand on the lecture platform, and who for that reason have an established fee at a higher rate, are not included in the list of those who may be obtained at the \$15 rate. Their terms may be learned on application to this department. But generally speaking, the \$15 rate applies to the University lecturers listed in this bulletin.

### HOW TO SECURE THE LECTURERS

1. Apply to the General Extension Division, University of Minnesota, Minneapolis, for the lecture or lecturers desired.
2. Duplicate contracts covering conditions and fee will be sent you.
3. If you can meet the conditions, sign and return one copy of the contract.
4. When the lecture is delivered, you will immediately forward the fee to the Director of the General Extension Division, who will pay the money to the Comptroller and forward the receipt to you.

### HOW TO SEND MONEY

By post-office or express money order, personal check, or draft.

Make all checks, orders, and drafts payable to the University of Minnesota.

Always address the Director of the General Extension Division at the University of Minnesota, Minneapolis.



## COURSES OF LECTURES

### ANIMAL BIOLOGY

MR. SIGERFOOS

*Series of Three Each*

1. The Evolution Theory
2. The Nutrition of Animals

*Single Lectures*

1. The Evolution Theory
2. The Nutrition of Animals
3. Heredity and Environment in Animal Life
4. The Life and Work of Louis Pasteur and Human Welfare
5. The Method, Spirit, and Results of Scientific Work

### HEREDITY AND EUGENICS

MR. NACHTRIEB

One or Three Lectures

*Single Lecture*

A brief account of the problems and aims of the breeder; some facts and Mendelism; the physical carriers of inheritances and their relation to the theory of Mendel; the application of the laws to man and human society.

*Series of Three Lectures*

1. A brief historical review of the facts and theories of heredity; an account of our present knowledge of the mechanism by which characters are transmitted from one generation to another.
2. Modern experiments in breeding animals and the theory of Mendel and its modifications.
3. The influence of environment; the determination of sex; eugenics and the application of the general laws governing natural inheritances to man in the present state of human society.

### ARCHITECTURE

MR. MANN

1. Ancient Egypt
2. Ancient Greece

3. Ancient Rome
4. Gothic Architecture: The Great Cathedral Churches
5. The Renaissance in Italy

### ASTRONOMY

MR. LEAVENWORTH

1. Bird's-eye View of the Universe
2. A Trip to the Moon
3. The Sun
4. Eclipses of the Sun
5. Are Other Worlds Inhabited?
6. Comets and Meteors

All are illustrated with lantern slides.

MR. BEAL

1. The Stars
2. The Planets
3. Evolution of the Solar System
4. Stars and Nebulæ

All are illustrated with lantern slides.

### ECONOMICS

#### DEMOCRACY AND INDUSTRY

MR. GRAY

It will be the lecturer's aim to show how the world, under the influence of invention and discovery, has passed from an era of stagnation, local industry, and hand labor, through a period of competition, to a condition of large business units, vast accumulation of capital, machine production, world markets, and powerful labor unions. Some of the effects of this change on individuals, classes, and governments will be discussed. An attempt will then be made to point out how man's increased power of producing commodities can be made to minister more universally and effectively to human welfare.

1. The Industrial Revolution, 1775

The great textile and other inventions; England wins industrial and commercial supremacy; but gains the labor problem, the slums, social unrest, and national decadence. The relation of these changes to the present British Budget and political movements.

2. The Factory System and Its Problems

The occasion for, and the legal, economic, and normal basis of, factory

legislation and other governmental interference with freedom of contract; factory legislation and the labor union.

### 3. Regulation of Monopoly

The final test of democracy is its ability to control monopoly, especially public utilities; history and tendency of regulation; regulation of public ownership.

### 4. The Trust Problem

The advantages and dangers of the concentration of wealth; the methods previously tried for dealing with these questions; a changed point of view; the failure and folly of "trust busting."

### 5. Wealth and the Public Welfare

The obligations of wealth to the State, to employees, to coming generations; relation of individual initiative to large fortunes; the existing and future generations. This is a question of individual efficiency, which in its turn is a question of democracy, freedom to vote, and economic freedom.

### 6. Education and Social and Economic Progress

Relation of industrial and social changes to education; past and present: the church and education; the family and education; the school, college, and technical school as instruments of education; education in citizenship and for industry.

### 7. Coöperation

The achievements of coöperation in Great Britain, France, India, and Denmark; the significance of the movement and its relation to economic and social conditions at home.

## MR. MITCHELL

### 1. Efficient Business Management

A discussion of the defects of the ordinary type of management; of the requisites of good management; of the main features of the functional type ("scientific management") and its success.

### 2. Wage Systems that Make Workmen Efficient: the Premium System

A description of the various premium systems of compensating workmen, with illustrations from practice showing their great success.

### 3. Wage Systems that Make Workmen Efficient: Task Systems

A description of the Task System and its off-shoots, the Gantt Task and Bonus System, the Taylor Differential Piece-Rate System, and the Emerson Efficiency Premium System, showing the principles upon which they are based, the conditions to which they are adapted, and their great success.

## MR. EBERSOLE

### 1. How Prices Control Business

The prosperity and happiness of nations and of peoples is the basis

of business and the problem of political economy. Coöperation through division of labor and exchange of products is the essence of modern business. Consumers and producers as buyers and sellers determine prices, and prices determine the course of business development. Systematic control of business by consumers.

## 2. The Conservation of Human Resources

Typical wastes of human energy. Important movements: (a) to lengthen human life, (b) to discourage idleness, (c) to develop and to utilize properly all individual talents, and (d) to eliminate war and military establishments.

## 3. Principles of Sound Investment

How to save and how to invest. Investments now offered to the public; examples exhibiting violations of each principle of sound investment; rules for the investor who desires both security and maximum return.

## 4. Life Insurance

The scientific basis of insurance rates explained; the different kinds of policies contrasted; and the problem of the individual purchaser of insurance with reference to the forms of insurance best suited to different risks.

## 5. The Responsibilities of Citizenship

How leaders are chosen in business and political life. What theory of success should the individual adopt? How public opinion is formed and how it controls those who are active in public life. Individual responsibilities, and a practical program for every citizen. (Designed for commencement program.)

### CURRENT BUSINESS TOPICS

MR. EBERSOLE

#### 1. Prices and the Cost of Living

The difference between high prices and high cost of living; the facts regarding recent price changes and how they have affected various classes of citizens; the forces determining prices; and the immediate future outlook as to prices and cost of living.

#### 2. Our Present Monetary and Banking System

The story of how barter developed into the gold standard; the new Federal Reserve Banks and the probable effects upon industry, trade, agriculture, and general prosperity.

#### 3. Rural Credits or Financing the Farmer

The problem of providing proper credit facilities for American agriculture, including a review of European experience with farmers' banks and a summary of bills now before Congress with conclusions regarding the practical workings of these plans.

4. The European War and Its Economic Effects upon the United States  
Banking and borrowing methods in England, France, and Germany. The effects of the war upon American economic life with reference to such problems as ocean shipping, domestic trade, finance, labor and wages, general prices, and prosperity. (Not offered before February 5, 1916.)

MR. JAMES

1. The Retail Merchant versus the Mail Order House
2. Some Methods by which Retail Merchants Have Increased Their Business
3. What it Costs the Retail Merchant to do Business
4. Opportunities for Young Men in Their Home Town in Retail Business
5. Coöperation between Manufacturer, Retailer, and Consumer to Reduce the Present Cost of Living

MR. PRESTON

1. The Problem of Retail Marketing  
A discussion of the subject from the consumer's point of view; the great waste in the present methods of distribution, and evidence showing an evolution in progress as to methods of retailing; the Mail Order House, the Department Store, and the Chain Stores; coöperation of consumers and its bearing on the problem.

MR. HAYES

1. Common Economic Fallacies  
The common fallacies regarding money, employment, the tariff, foreign trade, "favorable" and "unfavorable balances of trade," local buying, and speculation.
2. The Special Taxation of Land  
An historical survey of the proposals to apply special taxes to land,—the Single Tax, unearned increment taxes,—results of special taxes on land in England and Germany, the movement in the United States.
3. The Economics of Feminism  
Woman's changing economic position,—the increasing economic independence of the unmarried woman and the increasing economic dependence of the married woman. The relation of these changing conditions to feminism.
4. The Economics of War  
The economic interests making for war; the futility of war as a source of national gain; the economic waste, and the economic burden of war.
5. Full Measure  
The obligation to give an equivalent for that which is received; parasitism, predatory production, unearned increments, inheritance of

wealth. Does our present economic order exact measures of service in proportion to goods received?

## EDUCATION

### STANDARDS IN EDUCATION

MR. SWIFT

A series of six lectures designed especially for the needs of educational clubs and associations. Given during the year 1915-16 before the Froebel Society at the Woman's Club, Minneapolis.

1. Introductory. Standards of Education. Meaning and Importance of Standards
2. Culture as a Standard in a Democracy
3. Utility as a Standard
4. Religion and Morality
5. Child Life as a Standard
6. Social Standards

### GENERAL LECTURES

MR. SWIFT

1. The Montessori System and Early Education
2. Present Conditions in European Schools; The Schools of England; The Schools of France; The Schools of Germany
3. The Story as a Factor in Moral Education, illustrated by readings from "The Most Beautiful Thing in the World"
4. Education our Birthright
- 5-9. Makers of Modern Education (given in series or separately): Rousseau, Herbart, Pestalozzi, Froebel, Dewey
10. Education and Social Betterment
11. Teachers of the East Buddha, Socrates, Christ
12. Dramatization as a Method in Teaching
13. The Meaning of Play and Its Place in Education

### LANTERN TALKS

MR. SWIFT

1. Rome
2. Monasteries
3. Schools in Other Lands and Other Days
4. American Universities

## ENGINEERING

## ELECTRICAL ENGINEERING

MR. SHEPARDSON

## 1. The Electrical Transmission of Intelligence

Indicating how modern life is dependent on electrical transmission of intelligence, showing how the various senses are used for receiving information, and explaining the operation of the bell, fire alarm, telegraph, telephone, and "wireless." The lecture will be illustrated by lantern slides and experimental demonstrations.

## 2. The Use and Abuse of Light

Showing the various sources of light, how they affect the eye, how they should be placed and used for safe and comfortable results, how some common errors may be avoided and how eyes are being spoiled. The lecture will be illustrated by lantern slides and by experimental demonstrations.

## 3. Electricity in the Home

Showing how electricity is used for bells, for thermostats to regulate fires, for telephones, for cooking, for the toilet, for lighting, for the laundry, for cleaning, for ventilation, and for various power purposes. The lecture will be illustrated by lantern slides and by apparatus.

## MECHANICAL DRAWING

MR. KIRCHNER

## 1. Significant Marks (Graphic, Theoretical, and Practical), Representation and Interpretation

A survey of the development of the systems of delineation, with illustrations.

## 2. The Science of Extension and Position (Geometry, Qualitative), Concepts of Space, and Spatial relations

## 3. The World on Paper (Drawing, Mathematics, and Geography), Maps and Map Making

## 4. Lettering and Composition (Drawing and Design), the Alphabet: Origin, development, and application.

## 5-6-7. Design and Ornament (Fine Arts and the Industries)

a. Design and Composition

b. Ornament, Symbolic and Aesthetic

c. Applied Design

## MECHANICAL ENGINEERING

MR. KAVANAUGH

## 1. Development of the Locomotive

MR. MARTENIS

1. The Heating and Ventilation of Homes and Buildings

MR. SHIPLEY

1. The Automobile

ENGLISH

MR. BURTON

*Single Lectures*

1. English Idiom: Its Uses and Abuses
2. The Theater and the People
3. The Short Story: A Modern Form of Art
4. The Return to Dickens

*Lecture Courses*

1. Ibsen: The Revolutionary of Modern Drama
2. Robert Browning: A Typical Modern Poet
3. The Short Story: A Modern Form of Art
4. Representative Modern Drama

MR. CRAIG

*A Course of Six Lectures on American Literature*

1. The Romantic Movement in American Literature  
Cooper, Longfellow, and other writers, together with an inquiry into the vitality of Romanticism in American literature at the present time.
2. Emerson and the New England Renaissance  
Naturalism in America from Thoreau to Burroughs.
3. The Old South and the New
4. The Literature of the West with Special Attention to Mark Twain
5. The American Novel  
A study mainly devoted to the realistic elements of American fiction.
6. American Drama  
A historical consideration of the subject with an attempt to gauge the present trend.

*Single Lectures*

1. Culture and Strenuousness
2. The South and the Nation
3. Self-Cultivation in English
4. Sohrab and Rustum
5. The Art of Reading Periodical Literature
6. Scottish Literature, mainly Burns
7. Joel Chandler Harris's "Nights with Uncle Remus"



## MR. BEACH

1. The New Tendencies in English and American Poetry
2. The Technique of Henry James's Novels
3. George Meredith
4. The Nature and Function of Humor

## MR. NORTHROP

*Lecture Courses*

A course of three or six lectures on Modern Dramatics

A course of three or six lectures on Shakespeare

*Single Lectures*

1. Oxford and her Sons
2. The Irish Theater and the Work of J. M. Synge, W. B. Yeats, and Lady Gregory
3. A Comparison of the Problems of the Novelist and the Playwright
4. The Greatest English Diary
5. The Vocation and the Avocation

## MRS. PHELAN

1. Social Forces in the Drama

A brief consideration of some of the social problems which are being discussed by leading modern dramatists, supplemented by illustrative material from a few of the best-known of the dramas of to-day.

2. William Morris

The lecture emphasizes William Morris as a social thinker; the relation of his art-doctrine to his democratic ideals; and his significance as a reformer.

## ECONOMIC ENTOMOLOGY

## MR. WASHBURN

1. The House-Fly; What It Does; and How Best to Combat It in Towns and Cities (Illustrated by lantern slides)
2. Protective Coloration and Mimicry in Insects (Illustrated by lantern slides)
3. Mill and Elevator Insects and Their Control
4. The Present Status of Economic Entomology in the United States
5. Four-footed Pests of the Farm, and Birds in Their Relation to the Farmer and Orchardist (Illustrated by lantern slides)

## MR. RUGGLES

1. Shade Tree Insects (Illustrated by lantern slides)
2. Fundamentals of Spraying (Illustrated by lantern slides)

## MR. HOWARD

1. Insects and Public Hygiene (Illustrated by lantern slides)
2. Fighting Insects with Insects (Illustrated by lantern slides)

## MR. MOORE

1. Garden Insects (Illustrated by lantern slides)
2. Snakes and Their Poisons

## FORESTRY

## MR. CHEYNEY

1. Winter Logging in North Woods (Slides)
2. Steam Logging in South and Pacific Coast (Slides)
3. History of the Forests in the United States
4. Our National Forests (Slides)
5. The Southern Appalachians and Their Forests

## GEOLOGY AND GEOGRAPHY

## MR. EMMONS

1. The Mineral Resources of Minnesota

## MR. GROUT

1. The Origin of Coal and Its Uses, with Special Reference to House Heating
2. The Building Materials of Minnesota

## MR. LEHNERTS

1. The Making of Minnesota

The Story of the State from its earliest beginnings. The coming of the missionaries, explorers, and settlers. The builders and their work. Man and Nature in the making of Minnesota. Present realization and future promise.

2. Minnesota: The Heart of Our Continent (Stereopticon Illustrations)

A lecture on the great wealth and varied resources of Minnesota and the wonderful opportunities she offers to her citizens. This lecture is illustrated with 150 excellent views of Minnesota's beautiful lakes, streams and waterfalls, productive soils, golden harvests, extensive forests, and unrivaled iron mines.

3. The Geology and Geography of Minnesota

Sixteen lectures, offered singly or in series, with or without stereopticon illustrations, on the geology and geography of our State, her vast natural resources and their utilization and conservation.

- (1) The Geological Story of Minnesota. (2) The Climate and

Weather of Minnesota. (3) The Soils of Minnesota. (4) The Crops of Minnesota. (5) Livestock and Dairying in Minnesota. (6) Minnesota Swamp Lands and Peat Beds and Their Utilization. (7) Forests, Lumbering, and Reforestation in Minnesota. (8) Minnesota Plant and Animal Life. (9) The Building Stones and Clays of Minnesota. (10) The Iron Mines of Minnesota. (11) The Waterpowers of Minnesota: Developed and Undeveloped. (12) The Manufacturing Industries of Minnesota. (13) Transportation, Commerce, and Commercial Centers in Minnesota. (14) The People of Minnesota. (15) Immigration: Opportunities for the Immigrant and for the State. (16) Minnesota's Place in the Sisterhood of States.

#### 4. Wonderlands of America

Fourteen lectures, offered singly or in any desired combination. Well illustrated with colored views and moving pictures. A very striking and realistic representation as well as a popular scientific explanation of Nature's greatest wonderlands.

(1) The Glacier National Park. (2) The Yellowstone National Park. (3) Cripple Creek, Pike's Peak and Vicinity. (4) The Grand Canyon of Arizona. (5) The Yosemite National Park. (6) Mt. Rainier National Park. (7) Crater Lake National Park. (8) Alaska. (9) The Canadian Rockies. (10) Northeastern Minnesota and Isle Royal. (11) North Central Minnesota and the Lake of the Woods. (12) Along the Upper Mississippi and Its Tributaries. (13) The Great Lakes. (14) The Scenic St. Lawrence and Hudson River Regions.

#### MR. POSEY

##### 1. Physical Environment as Affecting a People (Illustrated)

A portrayal of the mountain people of eastern Kentucky and eastern Tennessee whose advance in civilization, because of the influence of physical environment, has been greatly retarded.

#### GERMAN

#### MR. SCHLENKER

##### 1. Germany and the Germans

Racial traits and character-moulding influences that have made the Germans what they are.

##### 2. Social Questions in German Literature

(1) Literature as a mirror of social conditions.

(2) Literature as a guide and a force in the reform of social wrongs.

##### 3. The Power of an Ideal (Commencement address)

#### MR. BURKHARD

##### 1. Schiller: The Poet of Liberty

##### 2. Goethe's Faust (Illustrated)

##### 3. The Nibelungenlied (Illustrated)

## MR. SCHROEDEL

1. The Nibelungenlied and Wagner's Ring des Nibelungen
2. Wolfram von Eschenbach's Parzifal and Wagner's Dramatization

## MR. WISCHKAEMPER

1. Goethe as Scientist
2. Goethe's Mission in German Literature and Culture

## MR. KOENIG

1. Theodor Storm (In German)
2. Rheinburgen und Legenden (In German or English, Illustrated)

## MR. DAVIES

1. The Lyrics of Goethe and Heine in Musical Setting
2. German Educational Ideals

## MR. GEISSENDOERFER

1. Grillparzer: His Life and His Works

## GREEK

## DIVISION I. FAMOUS SITES IN GREEK LANDS AND THEIR STORY

## MR. HUTCHINSON

1. Athens, Old and New
2. The Shrines of Greece: Delphi
3. The Shrines of Greece: Eleusis and Epidaurus
4. The Shrines of Greece: Olympia and Bassae
5. Mycenae and Tiryns
6. Cnossus and Its Palaces
7. The Acropolis of Athens and Its Buildings
8. The Parthenon

These lectures are amply illustrated by means of lantern slides. Any one of the lectures may be given separately.

## DIVISION II. LECTURES ON GREEK CULTURE

## MR. SAVAGE

1. Greek Literature and Its Influence

Some of the leading characteristics of the literature of the Greeks will be presented, and the influence of Greek thought, especially in literature and philosophy, will be briefly discussed.

2. Homer and the Homeric Age

Selections from the Iliad will be read, the more important characteristics of the Homeric poems will be pointed out, and the influence of Homer

will be briefly discussed. Stereopticon views will be given, illustrating Homeric life and art, and discoveries at Troy and elsewhere.

### 3. Sappho and the Greek Lyric

A brief characterization of Greek lyric and elegiac poetry, with a few illustrative readings; a discussion of the personality, career, literary work, and influence of Sappho, with numerous illustrations from the surviving fragments of her writings.

### 4. Greek Plays and the Greek Theater

The leading characteristics of the Greek drama will be set forth. The Greek theater will be described, and views of many theaters will be shown, and one or two representative Greek plays will be presented by means of the stereopticon.

### 5. Demosthenes and Greek Oratory

The development, characteristics, and influence of Greek oratory will be discussed. The personality, career, and literary work of Demosthenes will be touched upon, and a few illustrative readings from his great speeches will be given.

### 6. Mythology in Greek Art

Certain of the leading aspects of Greek mythology will be presented. The personalities and chief attributes of the more important deities of Greece will be discussed, and many views of Greek statues, illustrating the Greek artists' conception of their gods and heroes, will be given with the stereopticon.

### 7. The Women of Greece

The life and environment of Homeric women will be briefly set forth, and reference will be made to the personalities of several of Homer's most famous heroines; and the position of Athenian women during the Age of Pericles will receive full treatment. Among other topics relating to the latter period, the lecture will deal with the secluded lives of Athenian girls and women, the relations existing between father and daughter, between husband and wife, between mother and child, the dependence of husband and wife upon the operation of the inheritance laws, and the marriage customs and ideals of the period.

## HISTORY

MR. DAVIS

### 1. Sicily: Its Past and Present

### 2. The First Crusade: Its Misery and Its Triumph

A series of five talks on Martin Luther considered as a man and as the hero of Protestant Germany.

MR. WHITE

### 1. Ireland and the Beginnings of Modern Civilization

## HYGIENE

DR. BEARD

## DIVISION I

1. The Sanitary Conditions of the Dwelling
2. The Disposal of Refuse
3. The Sanitation of School Buildings
4. Medical Inspection in the Schools
5. The Hygiene of the Street and of Public Conveyances
6. The Water Supply

## DIVISION II

1. The Values of Food Stuffs
2. The Uses of Water
3. The Feeding of School Children
4. The Hygiene of the Skin
5. The Uses of Clothing
6. The Ventilation of the Home

## DIVISION III. PERSONAL HYGIENE

1. The Hygiene of the Human Skin
2. Pure Air in the Home
3. The Uses and Purity of Water
4. Food Values
5. The Symmetrical Development of the Human Being

## DIVISION IV. THE HEALTH OF THE COMMUNITY

1. Health Inspection in the Schools
2. The Sanitation of School Buildings
3. The Disposal of Refuse
4. The Hygiene of the Street
5. The Public Water Supply
6. The Hygiene of the Public Conveyance

## LATIN

## DIVISION I. LECTURES ON ROMAN LIFE AND LITERATURE

MR. PIKE

1. The Latin Language

The purpose of this lecture is to bring out the salient characteristics of the Latin language and to show that these are but the expression of the characteristics of the Roman people.

## 2. Roman Life in the Time of Pliny the Younger

The purpose of this lecture is to give a glimpse of the brighter side of Roman life as pictured in the interesting correspondence of Pliny the Younger.

## 3. Apuleius and the Ancient Short Story

## 4. Catullus, an appreciation

DIVISION II. LECTURES ON ROMAN AND ITALIAN ARCHITECTURE,  
SCULPTURE, AND PAINTING

## MR. GRANRUD

## 1. Roman National Characteristics

## 2. The Forum, Its Life and Activities

## 3. Roman Amusements: Theaters, Amphitheaters, and Circuses

## 4. The Roman House and Its Furniture

## 5. Roman Portrait Sculpture

## 6. Characteristics of Roman Architecture

## 7. Representative Cathedrals of Italy

## 8. Select Masterpieces of Raphael and Michael Angelo

## 9. Roma Immortalis: Ancient, Mediaeval, and Modern

## COMPARATIVE PHILOLOGY

## MR. KLAEBER

## 1. The Life of Language

## 2. The Languages of Europe—a geographical and historical survey

## 3. The Idea of an International Language

## 4. Spelling and Spelling Reform

## 5. Jacob Grimm, The Typical German Scholar (Lecture in German)

## PHILOSOPHY AND PSYCHOLOGY

## MR. DASHIELL

## 1. The Psychology of Fashion

Its explanation in terms of social classes and rivalry; its explanation in terms of individual interests and appeals. Some practical suggestions.

## 2. The Psychology of the Crowd

Some of the individual's tendencies are intensified when in a crowd, while others are inhibited. Application of these principles to various good and bad crowd-actions, such as lynchings, fire panics, stump speeches, religious revivals, etc.

## 3. The Subconscious (One or two lectures)

The true meaning of "subconscious mind"; how it is involved in

normal life and thought; how it helps to explain telepathy, automatic writing, hypnotism, etc.

4. The Place of Mind in Evolution (One or two lectures)

The false and true meanings of evolution; evolution in general; and especially, evolution in the realm of living things; consequences for our interpretation of mind, its true nature and its development.

5. Principles of Science (One or two lectures)

How scientific interests and the methods for following out those interests have developed from every-day life; some of the highly perfected methods used to-day.

6. Philosophy: Its Nature and Its Practical Value

Everybody is a philosopher in some sense and uses philosophy in all his daily thinking. The practical importance of getting the most helpful sort of philosophy.

7. The Great Problems (One lecture or series of any length)

Problems of life and thought, as arising in certain types of social and historical situations. Attempted solutions by great thinkers—Democritus, Plato, the Schoolmen, Kant, James, etc. Applications to problems of our own time.

8. The Nature of Morality (One or two lectures)

Development of moral codes in the human race; development of moral ideas in the individual person. The light thrown by these facts upon the question of the meaning of morality for twentieth century adults.

9. The Philosophy of Bergson

The central conceptions: evolution, duration, intuition; expounded from Bergson's point of view and considered critically.

10. The Philosophy of Feminism

Position of women in savagery and in civilization. The different forms of the contemporary "woman's movement." Its aims and its logic.

11. The Philosophy of the Present War

Certain philosophical conceptions involved in the attitude and aims of the different belligerents. What the war as a whole appears to teach us.

MR. PETERSON

1. The Walls of the Prison House

2. Human Nature and War

3. The Dangers of Group Attitudes

4. The Determination of Fitness for the Vocations

5. The Psychology of Musical Harmony

6. Incentives in Advertising



7. The Intelligence of Higher Animals
8. Changing Conceptions of Mind and Personality

MR. EDWARDS

*I. General*

1. Modern Psychology: What it is
2. Some Applications of Psychology
3. The Psychology of Suggestion

*II. Special*

1. How to Study (One or two lectures)
2. Testing Mental Development (Intelligence tests)
3. Suggestion in Education
4. The Psychology of Discipline
5. Suggestion in Business
6. The Psychology of a Sale
7. Development and Control of the Will
8. Choosing a Vocation
9. Psychology and Human Nature

*III. Course in Learning and Study*

A course of six to fifteen lectures on the problems and some results of experimental psychology and experimental pedagogy in learning and study.

POLITICAL SCIENCE

SOME MUNICIPAL PROBLEMS

MR. SCHAPER

1. What We Can Learn from the German Cities  
The remarkable recent growth of the German cities, how they are governed, and what they have accomplished.
2. City Government in England and in France  
How the English and the French cities are governed.
3. Some New Experiments in American City Government  
Commission government and other new plans, why these radical changes are being introduced, and what results may be expected.
4. The Charter Situation in Minnesota  
The various methods of framing and amending city charters, recent charter changes, some mistakes to be avoided, results obtained and new legislation needed.

## 5. The Need of a Constitutional Convention in Minnesota

The circumstances under which the present constitution was framed, the history of the amendments made to date, change in the method of making amendments in 1898, and the disastrous effect of this new rule regarding the counting of the votes on amendments, and the way out of our constitutional difficulties.

## STUDIES IN DEMOCRACY

MR. ALLIN

The following three lectures discuss problems of democracy in Australasia, Switzerland, and England.

## 1. Australasian Experiments in Democracy

This lecture will discuss some of the characteristic features of the social, economic, and political legislation of New Zealand and of the Australian colonies.

## 2. Democracy in Switzerland

The rise of democracy in Switzerland will be outlined and discussed together with the more important legislation of recent years.

## 3. Democracy in England.

This lecture will lead up to and discuss the social and constitutional question at issue in Great Britain at the present time.

## 4. Colonial Aspects of the War

MR. YOUNG

## 1. The Commission Plan of City Government

The city state; phenomenal growth of cities during recent years; the city as the "plague spot" of American politics; the Galveston and Des Moines plans for the redemption of city government with centralization in the hands of a small commission of non-partisan officials; the initiative and referendum; the recall; the city-manager plan as an evolution from the commission plan; the success of the new forms as far as tried.

## 2. State Education for Industrial and Civic Efficiency

Modern state education as a result of increased wealth; changing viewpoint in culture and usefulness as antithetical terms; knowing and doing; manual training and domestic science; business subjects in the curriculum; agriculture and forestry; physical education; education for vocational; social obligations of the school as a training for civic life; study of economics and political science as a preparation for the performance of industrial and political duties.

Social Function of the Church (suitable for a Sunday church service)

Interpretation of the social content of the gospel parables; the socialism; a constructive program for an institutional church.

## 4. Community Team Play

Individualism in this country during the past century; the world a neighborhood at present; next step is the world a brotherhood by instituting a system of local, national, and international coöperation, or social solidarity; ways and means of effecting this ideal.

## 5. The Moroccan Crisis

The latent, fundamental cause of the present European war; the partition of Africa and the consequent friction among the European Powers; the Triple Alliance and the Triple Entente; the crisis of 1911; why war did not result three years ago; triumph of the new internationalism.

## 6. The United States of the World

Weakness of independent states; forces working for interdependence, such as commerce, science, education, international credit, postal union, inter-parliamentary union, metric union, treaties, international law, the Hague Court, etc.; nationalism and internationalism; federalism as the model for a world political organization.

## 7. Reorganization of Our State Governments

Position and importance of the states in our federal systems. Plans for the reorganization of state governments as now proposed in several states, especially the reorganization of the executive department in Minnesota.

MR. GESELL

## 1. The Recall of Judges

History of the movement for the recall; comparison of various recall statutes; conceptions of the judiciary; remedies proposed for evils complained of in our judicial system, amendment of the constitution, restriction of annulling powers, unanimous decisions, obiter opinions, appeals, recall of decisions.

## ROMANCE LANGUAGES

MR. MORAUD

## 1. Some Representatives of French Modern Thought

- (1) Rene Barzin
- (2) Anatole France
- (3) Maurice Barres

## 2. Democratic Tendencies in the French Literature of the Nineteenth Century

- (1) The Romantic Movement
- (2) Michelet and French Democracy
- (3) Victor Hugo and the Social Novel in 1862

## 3. Ideals of Modern France

- (1) The Tendencies of Modern Instruction in France
- (2) Some Salient Features of Intellectual Life in Paris
- (3) Some Salient Features of Intellectual Life in the Provinces

The above lectures will be given in French preferably, but may be given in English if requested.

MR. BARTON

1. Blasco Ibanez

Deals with social problems in Spain; relation of church and state; education; relation of employer and employee. This lecture is based on personal experience and observation.

MR. PLUMMER

1. Spain and the Spaniards

In this lecture will be discussed the history of Spain, the racial characteristics and customs of her peoples and the present economic condition of the country.

SCANDINAVIAN

MODERN NORWEGIAN LITERATURE FROM WERGELAND TO THE  
PRESENT TIME

MR. BOTHNE

(In English or in Norwegian)

1. Ja, vi elsker dette landet (Norwegian)
2. Norway since 1814
3. Henrik Wergeland
4. Kings of Norway
5. Asbjørnsen and Moe
6. Bjørnson
7. Ibsen
8. Grundtvig and Denmark

MR. STOMBERG

1. Frithiof, the Viking
2. Democracy in Sweden in the Middle Ages
3. Educational Ideals in Sweden
4. Three Swedish Woman's Rights Advocates: Fredrika Bremer, Ellen Key, Selma Lagerlöf
5. August Strindberg, the Iconoclast
6. Selma Lagerlöf's Optimism
7. Viktor Rydberg
8. Alfred Hedenstierna
9. Sweden and Finland
10. The Land of the Midnight Sun (Illustrated)

## SOCIAL ECONOMICS

MR. PHELAN

## CIVIC REFORM

## 1. The New Democracy

Our national birth certificate; the conditions and beliefs that shaped the Declaration of Independence and the Constitution; our natural resources and American ideals; the new democracy.

## 2. The Community Center and the Better Town

Fuller use of schools, churches, and other buildings, public and semi-public for the promotion of child well-being, public health, community intelligence, clean politics, economic justice, town improvements, more business, closer relations between town and country.

## LIFE AND LIVING

## 3. The Shrinking Dollar

Prices and American History. Twelve explanations of the high cost of living; the desirability of rising standards of living; remedies for high prices.

## 4. Population and Progress

Theories of population; the real race suicide; the relation of eugenics to progress; freedom for women and a better race.

## 5. Our New Neighbors

Who is an immigrant? causes of immigration; the effects of immigration in America, and in Europe; the immigrant's American environments and its evils; what shall be done about immigration?

## THE CHILD

## 6. Vocational Education and American Fair Play

The demand for industrial education; its relation to economic democracy; three-fold education: for work, for living, for citizenship; vocational guidance.

## 7. The Child at Work

The general question of the child; child labor an old problem; its relation to adult efficiency, human justice, morality, human welfare; child workers and family poverty; scholarships and widows' pensions; legal protection for the child.

## 8. Child Welfare

The community and the child. Play, pageants, health, moral safety.

## WOMAN

## 9. The Changing Woman

Woman at different times in human history; woman's work in the

home, world, and state; man's attitude and woman's opportunity; the free woman and the better race.

10. The Woman with an Occupation

Woman's work: its relation to her and to the home, her wages, her morality; labor unionism, politics, and law in relation to woman labor.

11. The Minimum Wage

The philosophy of the minimum wage; its application and effects; the value of minimum wage laws to worker, employer, and nation.

#### LABOR

12. The Labor Union

Creation of a wage-earning class; early opposition to trade unions; changing principles of trade unionism; the reasons for labor unions; the labor union for better work, better citizenship, and better conditions of work; a new labor union duty and its reward.

13. Industrial Peace

The strike an instrument of warfare; methods of maintaining labor peace on just terms, in Europe, Australia, Canada, and the United States; the importance of publicity and the force of public opinion; the seller of labor; who shall he be?

14. The Worker Out of Work

Classes of the unemployed; remedies in Europe and the United States.

15. Prison Labor

Aims of prison labor and the different systems of prison labor with special reference to the welfare of the prisoner and of his dependents.

16. The Soldier of Industry

Sick, accident, occupational disease, invalidity, and old age insurance for workers.

#### HEALTH

17. Disease and Occupation

The poisons, infirmities, and disabilities that lurk in the different occupations; value of the movement in business that means health for the worker, gain for his employer, and wealth for the nation.

#### BUSINESS AND JUSTICE

18. Human Dividends

Human conservation in business. The new employment policy. Psychology in relation to business success and human justice.

19. Credit for the Farmer

The credit factor in agriculture; the agricultural credit of the Old World and the question of its adoption in this country.

20. City and Country. The reciprocal interests of city and country.  
Profit sharing and coöperation. The advantages and limitations of profit sharing and coöperation.
21. The Single Tax as a Measure of Reform  
A tax only on the rent of land; its claim for justice; its application.
22. Your Money and the State. Taxation with special reference to Minnesota.

ECONOMIC REFORM

23. Catching Up. Modern morality as taught by Lycurgus, Plato, More, Campanello, Bacon, and Morelly
24. The Teaching Called Socialism  
The claims, aims, conflicts, mistakes, and the services of Socialism to human progress.
25. Socialism in the United States  
Socialism past and present in this country.
26. Syndicalism and the United Workers of the World  
The philosophy, aims, methods, and history of syndicalism.
27. A Message for Humanity  
Tolstoi's idea of God; his five commandments; his formula for happiness through communion with nature and service to humankind.
28. Fact and Fallacy  
Fallacious ideas that warp human thinking and sometimes block progress.

COMMENCEMENT ADDRESSES

1. A Star of Civilization; 2. The Passerby; 3. Human Types.

SOCIOLOGY

MR. TODD

1. Sociology and Conservation
2. Art for Man's Sake
3. Human Parasites
4. The Philosophy of Social Reform
5. The Twentieth Century Family

MR. GILBERTSON

1. The American Indian and His Contribution to Modern Civilization
2. Prehistoric Man and Civilization of Europe (If desired, the lecturer will give special attention to Scandinavia)

3. The Position and Work of Woman in Primitive Culture
4. The Mind of Primitive Man
5. The Oberammergau Passion Play (Illustrated)

The play and players of 1910, and a consideration of the relation between religion and drama in primitive, classic, and medieval times.

#### MISCELLANEOUS LECTURES

MR. ERIKSON

1. Liquid Air

Illustrated with apparatus and experiments.

MR. GLICK

1. Slaves of Tradition

A popular lecture full of vivid pictures and other interesting illustrative material, attacking prejudice and intolerance.

#### *Commencement Address*

2. What Thomas Saw

A discussion of the high-school senior and his ideals with particular reference to entrance into higher institutions of learning.

MR. HERRICK

1. Back Through Bookdom

A talk adapted to a general audience. A glance at the books of our ancestors since 1500. Herewith are shown copies of many quaint, scarce, and otherwise curious and interesting first and early editions from my private library. Ancient book-publishing, older notions of reformed spelling, and numerous other matters of general literary curiosity are discussed in popular fashion.

2. Forgotten Writers

This talk is not as dead as it sounds. Authors influential in their own day, but forgotten because of their archaism, are sympathetically considered: e. g. Allan Ramsay (the forerunner of Burns), John Flavel, John Bunyan the Poet, etc. Adapted to an audience of average high-school or college acquaintance with literary history.

3. The First Best Sellers in America

A talk wherein we find sociology unexpectedly married to literature.

4. The Family Trail through American History

A talk of especial interest to members of the Daughters of the American Revolution and those studying the Chautauqua courses for 1915-16. It is shown how the study of one's own ancestry leads us out into a general comprehension of the history of this country. Might be entitled "Through Genealogy to History." Following our great grand-



fathers in their migrations, we watch American history in the making. A somewhat unusual treatment of a fascinating topic.

5. Italian Influences in English Literature

This lecture is intended more especially, but not exclusively, for those interested in comparative literature and in literary types.

MR. HOWARD

1. Victoria Falls, South Africa

MR. NEWKIRK

1. The Gyroscope

A popular presentation with apparatus.

MISS NORRIS

1. Things Women Ought to Know

A treatment of the need of education in matters relating to sex and reproduction, information regarding these subjects, and suggestions as to the best way to take them up with the young. For mothers and daughters.

MR. PRICE

1. Personal Efficiency
2. The Need of Business Education
3. Some Educational Ideals (an address for teachers)
4. A Plan of Life (commencement address)
5. The Easiest Way (commencement address)

MISS SANFORD

*History of Art*

Illustrated by very fine sets of lantern slides. Each lecture is complete in itself.

1. The Buried Cities of the East
2. Egypt and its Mighty Ruins
3. Greek Art
4. Rome, Pagan, and Christian
5. Florence and the Florentine Galleries
6. Venice and the Venetian Painters
7. Raphael and Michael Angelo
8. Paris and the Louvre

*Literary Lectures*

The Character and Works of Burns, Browning, Tennyson, Dickens, Kipling, Lowell, Longfellow, Whittier, Emerson, Mark Twain.

1. The Love Letters and Poems of Robert and Elizabeth Barrett Browning

2. The Beauty of the Bible
3. A Popular and Humorous Lecture: "How to Make Home Happy"
4. Literature for Everybody—with some humorous selections

*Readings from Shakespeare*

Macbeth, King Lear, Othello, Hamlet, Merchant of Venice

The principal scenes in a play are read, the story told, the characters and striking passages commented upon.

*Addresses for Teachers' Institutes*

1. The Cultivation of the Voice
2. Teaching Literature, Reading, English Composition, History
3. Growth, the Teacher's Duty
4. Moral Power in the School-Room

*For Mothers' Meetings*

1. The Training of Children
2. Teaching Sex Hygiene
3. The Influence of Good Art and Good Literature upon Character

MR. SCHROEDEL

1. The Charm of the Holy Land; the Strange Experiences Encountered by the Traveler in Palestine

An account of some interesting phases of the present-day conditions of the land and the people of Palestine as they were met with by the lecturer while a member of the American School of Archaeology in Jerusalem in 1908 and 1909. After a brief reference to the universal interest that Palestine arouses on account of its history, its geographical contrasts, and the heterogeneity of its people, the conditions of the country during the rainy and dry seasons, the mode of living of the natives in the villages and of the Bedouins on the borderlands, striking characteristics and customs, and Christian and Mohammedan festivals will be discussed.

MR. SKINNER

1. Two English Counties: Warwickshire and Devonshire
2. The English Lakes
3. The Country of Burns and Scott
4. Gothic Cathedrals

Lantern slides are available for all of these lectures.

MR. WASHBURN

1. Spain and the Spaniards from the Viewpoint of the Young Tourist

## THE UNIVERSITY LYCEUM

The General Extension Division of the University of Minnesota, in coöperation with the Extension Divisions of the Universities of North Dakota, Wisconsin, and Indiana, has undertaken the service of supplying any community in the State with lectures, readings, recitals, and concerts suitable for lyceum courses. These entertainments are given by professionals, and are in addition to the more strictly educational lectures offered by members of the University faculty. There is in every community a demand and need for such attractions, and in furnishing them at a minimum of expense the University feels that it is rendering an educational service. The effort is made to secure attractions of merit at prices within the reach of the various communities. While avoiding the trashy and the meretricious, the aim is to offer wholesome and uplifting entertainment that shall establish standards of good taste and judgment in art, music, literature, and all other matters that affect human life. The University Lyceum is well adapted to bringing about in any community social consciousness and an effort toward solidarity and coöperation. To make a lyceum course successful, there must be a small organization of public-spirited citizens who will devote time to the work. After a course is selected, a thoro canvass should be made for the advance sale of season tickets, so that the cost of the course may be assured in advance. On request a representative of the General Extension Division will assist any community in selecting a course.

Following is a list of the attractions available for the season 1916-17. The season runs from about October 1 to April 1. The fees for the programs will vary with the selections made, but in all cases the plan is to furnish the attractions at cost. For information regarding programs and expenses address the General Extension Division.

### ATTRACTIONS FOR 1916-17

#### MUSICAL ATTRACTIONS

##### APOLLO MALE QUARTET

A quartet giving popular programs of songs and entertainment numbers. Available October, 1916, and February, 1917.

##### CHICAGO MALE QUARTET

A quartet composed of singers with long experience in male quartet work. The members are all well-known concert artists and church soloists in Chicago. Available October, 1916, and January, 1917.

## CHICAGO MUSICAL CLUB

An orchestral company of six people—four women and two men. Vocal and instrumental solos and ensemble numbers. Available October, 1916.

## CHICAGO OPERATIC COMPANY

An operatic company composed of seven members of the Chicago Opera Company, including John B. Miller. Grand opera programs given in costume. Available December, 1916.

## FAUST OPERA SINGERS

A company of five artists offering concert programs and selections in costume from the popular opera *Faust*. Available February, 1917.

## THE JOHN HOWARD QUINTET

The instrumentation of this quintet,—first violin, second violin, flute, cello, and piano—makes possible the rendition of many delightful numbers. The quintet will also carry a harmonium, a type of reed organ, and when this is used in place of the piano the effect of a wood-wind section is obtained. The soloists are very capable and add delightfully to the program. Available December, 1916.

## INTERNATIONAL OPERATIC COMPANY

A company of five artists rendering selections from the best of the modern popular operas, and songs from a grand opera in costume. Available December, 1916, and the first half of January, 1917.

## KAFFIR BOYS' CHOIR

See J. H. Balmer.

## MACPHAIL STRING QUARTET

An orchestral combination under the leadership of a well-known and accomplished violinist. This company may also be obtained with the addition of a soprano soloist or a reader. Available throughout the season.

## MACPHAIL TRIO

A combination of the violin, piano, and a soprano soloist. Each member of the trio is an artist. Available throughout the season.

## METROPOLITAN MALE TRIO

A company of three men presenting a musical and dramatic entertainment. Available March, 1917.

## OTTO MEYER

Violin virtuoso assisted by Marie Meyer-TenBroeck, pianist. Available throughout the season.

## PHILHARMONIC ORCHESTRAL CLUB

A company composed of fourteen instrumental artists, most of whom are players in the Minneapolis Symphony Orchestra. The conductor is Karl Scheurer, who was second concert master of that organization. The company also has a soprano soloist. A very high-grade company, each member of which is an artist. Available the first half of October, 1916.

## POTTER-DEFEW COMPANY

A trio offering a program of violin and cello solos, readings, and sketches. Available January, 1917.

## REEVES-CHADBOURNE COMPANY

A first-class soprano soloist and a gifted pianist. They give a recital program that will be appreciated by music lovers. Available throughout the season.

## SCHEURER TRIO

A company composed of violinist, piano accompanist, and soprano soloist. A combination of high artistic merit under the leadership of a well-known violinist of the Minneapolis Symphony Orchestra. Available throughout the season.

## TREBLE CLEF CLUB

A quartet composed of four talented young women offering vocal and entertainment numbers. Available November, 1916.

## UNIVERSITY GLEE CLUB

A Girls' Glee Club and a Men's Glee Club are offered. Each is composed of fifteen members, and an additional soloist is usually carried. Available week-ends after November 15, 1916.

## LECTURERS AND ENTERTAINERS

## ALLEN D. ALBERT

A well-known journalist and orator. President of the International Rotary Clubs. Available throughout the season.

*Lectures*

1. The New Citizenship
2. Forces that Make Cities
3. The Meaning of the World War

## IRVING BACHELLER

Well-known and popular author of *Eben Holden* and other books. Available November, 1916.

## J. H. BALMER, F.R.G.S.

Explorer and traveler giving lecture recitals, assisted by Miss Elsie Clark and five Kaffir Singing Boys. An attraction of international reputation. Available November, 1916.

## ARTHUR E. BESTOR

Well-known director and president of the Chautauqua Institution. Available December, 1916.

*Lecture*

1. Dominant Personalities in the Great War

## HON. HERBERT S. BIGELOW

Member of the Ohio Legislature from Cincinnati. Pastor of Vine Street Congregational, now The People's Church, of Cincinnati, for nineteen years. President Ohio State Constitutional Convention. Available January, 1917.

*Lectures*

1. The Religion of Inspired Politics
2. The Sermon on the Mount of Fiction

## CLARENCE BURGDERFER

Entertainer and impersonator, using wigs, grease paint, and costumes. Available March, 1917.

## HAZEL CLUFF

A popular dramatic reader and entertainer giving programs of miscellaneous readings. Available throughout the season.

## JAMES DAVIES

Member of the Department of German, University of Minnesota. Lecturer and tenor singer. Available throughout the season. May also be booked for commencement addresses.

*Lecture-recitals*

1. Rudyard Kipling
2. In and Out of Tune
3. Lieder and Literature
4. The Folk-Song
5. Robert Burns

## MONTAVILLE FLOWERS

A popular lyceum lecturer, twice elected president of the International Lyceum Association. Life lectures with illustrative singing, and original lectures on great world themes. Available November, 1917.

Life lectures combine lecturing, reading and acting.

*Life Lectures*

1. The Drama of Gold: Christmas Carol
2. The Drama of Revenge: Merchant of Venice
3. The Drama of Chastity: Hamlet
4. The Drama of Divinity: Ben Hur
5. The Drama of Life and Religion: Little Minister
6. The Drama of Conscience: Les Miserables
7. The Drama of Human Ambition: The Battle of Waterloo

*Original Lectures*

1. The Color Guard and the Picket Line: The Japanese Question
2. The Drama of Human Capabilities: Personality

## JOHN ARCHER GRAY

Lecturer. Formerly pastor of the Workingman's Church, New York City, and social welfare worker. Available April, 1917.

*Lectures*

1. Out of Work
2. A God in Ruins
3. The Man of the Hour
4. Savonarola
5. The Master and the Masterpiece
6. The Voice and the Vision

## GEORGE G. GLICK

Member of faculty at University Farm School, St. Paul. Popular lyceum and chautauqua lecturer and dramatic interpreter. Available throughout the season.

*Lectures*

1. Slaves of Tradition
2. What Thomas Saw (commencement address)

*Lecture Recitals and Dramatic Interpretations*

1. Sevenoaks
2. The Fortune Hunter
3. The Melting Pot
4. The Right of Way
5. Miscellaneous readings

## HARRIET HETLAND

A clever and talented dramatic reader and impersonator. Her work is particularly suited for club, church, and school entertainments, and chautauquas. She gives complete dramas and miscellaneous programs. Available throughout the season.

*Programs*

1. The Dawn of a Tomorrow
2. The Pigeon
3. Polly of the Circus

*Miscellaneous Programs*

Standard, Humorous, and Serious.

## BLANCHE HUTCHINSON

Interpreter of dramatic literature. Reads complete plays; also gives programs of miscellaneous readings. Popular style of delivery. Available throughout the year.

## ALBERT H. JOHNSTONE

A dramatic reader and also a popular lecturer. Head of the Department of Public Speaking at Hamline University. Available throughout the year. May be obtained for commencement addresses.

*Popular Lectures*

1. Departures
2. The Boy and His Quest

*Comedy Recitals*

1. A Poor Relation
2. Far from the Maddening Girls
3. Modern Humor. Four different programs

## EDWIN W. LANHAM

Inspiring lecturer of the popular lyceum type. Available January, 1917.

*Lectures*

1. The World's Battleground
2. The Supreme Christ
3. The Land of Possibilities
4. The Birthright Sold
5. Does It Pay?

## FLORENCE LILLIE

Illustrated lectures on nature and nature study. Well adapted to interest women's clubs and teachers' institutes. Available throughout the season.

*Lectures*

1. In Nature's By-Ways
2. An Evening with the Butterflies

## BURT L. NEWKIRK

Member of the Department of Engineering, University of Minnesota. Demonstrates the Gyroscope and its applications. A scientific lecture given in a popular and understandable manner.

## CHARLES A. PAYNE

"The World Traveler with a Genius for Friendship"  
Gives illustrated travelogues. Available January, 1917.



*Illustrated Lectures*

1. The Panama Canal
2. Famous Cities of Italy
3. Beautiful, Fascinating Hawaii
4. Nature's Story of World Building
5. Life among the Mohammedans

DR. JNO. W. POWELL

*A Course of Six Lectures on Robert Browning*

1. Browning's Italy
2. The Man and the Artist
3. The Interpretation of Life
4. Men and Women
5. Love and Life
6. The Art of Optimism

*Single Lectures*

1. Kipling and the God of Things as They Are  
(One or two lectures)
2. Literature and Life
3. Bread and Lilies
4. Tennyson and Browning
5. Les Miserables
6. The Drama as a Social Force
7. The English Bible

DR. WILLIAM S. SADLER

Popular Health Talks. Available December, 1916.

*Lectures*

1. The Cause and Cure of Worry, or How to Banish the Blues
2. The Physiology of Faith and Fear, or the Mind in Health and Disease
3. The Science of Living, or The Art of Keeping Well
4. When Doctors Disagree, or What Shall the Layman Do?

## THE UNIVERSITY LYCEUM PLAYERS

A company of four actors presenting a repertoire of standard and classic drama in the form of one-act plays. Available November and December, 1916.

ALBERT EDWARD WIGGAM

Known as "The Apostle of Efficiency." Available December, 1916.

*Lectures*

1. Dollars and Sense: The Health and Wealth of the Nation
2. Forty Kinds of Fools: A Plea for Wiser Motherhood
3. Changing the Leopard's Spots: The New Hope of the Unborn
4. Marketing the Margin: Human Equipment

## SARAH MILDRED WILLMER

A well-known popular lyceum reader and interpreter of the drama. Reads complete plays such as "The Sign of the Cross." Available November, 1916.

## J. LORENZO ZWICKEY

Landscape artist, Detroit, Michigan. Author of the popular Ode to the Seasons, The Mariner, Good Night, etc. Transforms the stage into an art studio. Draws pictures and gives entertaining and instructive lectures. Available February, 1917.

*Illustrated Entertainments*

1. The Philosophy of the Beautiful
2. The Legend of Peaceful Valley: The Ideal Community
3. Exterior and Interior Decorating
4. Art, a Factor of Life
5. For School—The World's Demands

## OTHER EXTENSION ACTIVITIES

### UNIVERSITY WEEKS

For three consecutive seasons University influence and a part, at least, of the University atmosphere have been carried to the people of the State through the somewhat unique form of service called University Weeks. The University Week is a six-day program conducted in each of many towns throughout the State. In the summer of 1914 twenty-four towns participated in the circuit. During these six days the effort was to present in epitome as many as possible of the widespread activities of the University. Members of the faculty lectured on a great variety of subjects, the Glee Club gave concerts, the debating societies held debates, the Dramatic Club gave performances of one or two plays, various musical organizations gave concerts, there were talks to business men at noon-day lunches, and talks to Women's Clubs in the afternoons. The ultimate purpose is to stimulate the constructive forces for each community and to produce permanent effects. It is a singularly successful way of making the people of Minnesota well acquainted with their University. In the summer of 1915 these Weeks were extended to still other towns. If any community of the State wishes to be put on one of these circuits for 1916, it should make arrangements with the General Extension Division as early as February, 1916.

### LANTERN SLIDES

A new departure for the General Extension Division is the organization of a free lantern-slide bureau. Collections of lantern slides on subjects of interest to schools, and more especially to high schools, are procured and sent out as loans to the schools which are provided with lanterns. No charge is made for this service, the borrowing school being expected to pay only transportation charges and the cost of replacing any broken slides. The slides are sent out in collections of fifty or sixty on each subject, accompanied by a syllabus or running commentary on the slides and from one to three books of reference. With some collections a complete typewritten lecture is included. Among the subjects are Caesar's Helvetian Campaign, Rome, the World Center of Olden Times, The Conquest of Tuberculosis, The Passion Play of Oberammergau, Following Great Men through Greece, Birds of Minnesota, Insect Pests of Minnesota, Private Life of the Romans, Roman Architecture and Sculpture. A few moving picture films may be available during the year 1916-17 to be sent out as loans to places which have the proper projecting equipment. From time to time additions to these collections will be made and offered, as the demand arises. Correspondence is solicited from any interested school.

## CORRESPONDENCE COURSES

For those who live away from the great centers of population and also for those who are interested in courses which are not offered in night classes, correspondence work is recommended. The lessons in these correspondence courses are prepared and taught by regular members of the University faculty and the courses offered embrace collegiate as well as professional and vocational branches. Each lesson assignment gives an outline of work, references to text-books and collateral reading, topics for study, and a list of questions, the answers to which are to be sent in. This constitutes the student's recitation. The answers thus sent in are read, corrected, and graded by the instructor with the addition of marginal notations, suggestions, advice, and explanation. The lesson sheets thus annotated are then returned to the student. Persons who have the qualities of courage, energy, and persistence can do meritorious work by this plan. It is not contended that correspondence instruction is as good as residence instruction. Nothing can take the place of the living presence of the instructor in the classroom, and the stimulus of classmates. However, where residence instruction is for any reason impossible to obtain, correspondence instruction offers a fair substitute. This applies especially to persons of initiative, and to those persons able to cultivate the spirit of self-reliance, who will often thus obtain more from the course than will the more easy-going student in residence. Many of the courses command University credit when taken by properly qualified students, and all are of University grade.

For further particulars as to fees and courses now offered through correspondence, address the General Extension Division, Minneapolis.

## SHORT COURSES

The Agricultural Extension Division has been very useful to the people of the State through its system of short courses of one week offered in agriculture, home economics, and similar subjects. The General Extension Division now proposes to reach another class of people in a similar way by offering one-week courses in such subjects as merchandising, retail selling, etc. These courses are of very great benefit to country merchants especially. The second of these short courses was offered during the second week in February, 1915, at the University. Merchants and their clerks from all over the State attended this practical school for one week. Experts from the best talent in the country were brought in to expound the various phases of the subject and to outline fundamental principles. Two hundred and twenty-two persons availed themselves of this opportunity. It is believed that much valuable information will be obtained by any person who spends a week in this way. Persons interested in this subject are invited to address the General Extension Division.

## MUNICIPAL REFERENCE BUREAU

The Municipal Reference Bureau is designed to provide the municipal officials of the State with a central clearing house for the dissemination of intelligent information on matters of municipal importance. To render this service the Bureau has collected charters, ordinances, and other municipal documents. This information is drawn upon in the answering of specific inquiries referred to the Bureau by municipal officials of the State and in the preparation of reports of general interest to the villages and cities of Minnesota. Municipalities desiring information, public reports, statistics, and advice upon administrative matters are urged to communicate with the Bureau.

## COMMUNITY CENTERS

There is a movement now running through the country in the interest of a wider community use of the school plant and of other public buildings. It is realized that these buildings, in which the public has a large investment, are open for the use of the people for only a fraction of the available time. There is need for a civic forum or community club house, where citizens may gather for discussion of public questions and for the expression of neighborhood civic and social life. One of the great purposes of the present movement is the realization by the people of the latent possibilities in every schoolhouse for what has been called "concentrated, coöperative, constructive citizenship." It is hoped that the people of every community in the State will organize for the purpose of using their public buildings for social and recreational purposes as well as for the wider education of the grown portion of the community through lecture courses and similar means. The General Extension Division proposes to further this movement by offering guidance and coöperation, more particularly in the way of providing plans for organization, with a list of things that may be done. It will also offer programs and lectures, musical entertainments and dramatics for such local centers as have effected a proper organization. Correspondence is invited from any citizen or organization of citizens interested in this subject.

## DEBATING

One of the best means of encouraging the earnest and open-minded study of public questions is the formation of debating societies. For that reason no village, town, or city should be without such an organization. High schools in particular should make debating a well-recognized part of school activity. Moreover, debating in the school tends to offset in some measure the tendency to over-enthusiasm in athletics. The intellectual as well as the physical should have a well-recognized position in the circle of school activities. It is not well that the football player and the track athlete should occupy the sole position of preëminence as school heroes.

The High School Debating League, already organized in this State, promotes interest in debating among the schools of its membership. One of the functions of the General Extension Division is to foster this organization as well as independent debating societies by furnishing debating helps, such as lists of references, bibliographies, schemes of organization for debating societies, etc. Debating squads of well-trained students are also sent about the state to hold public debates in towns that desire this form of service.

#### INFORMATION

It often happens that citizens of a state are in need of information on some specific subject not to be found in the ordinary books of reference, and in such cases the average person is at a loss where to turn. The General Extension Division has as one of its functions the business of obtaining and furnishing to inquirers information on the various subjects which from time to time may be called for. This information is obtained by research and by application to the proper university source, and thereby the department acts as a clearing-house of the information which is gathered and stored up through the facilities of a great university. Inquiries for information are therefore invited and so far as the means at hand will permit, the information will be found and supplied.

The various subjects mentioned in the preceding pages lie within the province of the General Extension Division and inquiries on all of them should be addressed to The General Extension Division, University of Minnesota, Minneapolis.

#### AGRICULTURAL EXTENSION

Agricultural extension including lectures, demonstrations, institutes, and short courses will be carried on as usual under the direction of the Agricultural Extension Division of the College of Agriculture. Address all inquiries regarding such work to the Agricultural Extension Division, University Farm, St. Paul, Minnesota.

## INDEX

	Pages		Pages
Agricultural Extension .....	44	Geissendoerfer, J. T.....	18
Albert, Allen D.....	35	General Information .....	6
Allin, C. D.....	24	Geology and Geography.....	16
Animal Biology .....	7	German .....	17
Apollo Male Quartet.....	33	Gesell, G. A.....	25
Architecture .....	7	Gilbertson, A. N.....	29
Astronomy .....	8	Glick, George G.....	30, 37
Attractions for 1916-1917.....	33	Granrud, J. E.....	21
		Gray, John A.....	37
Bachelor, Irving .....	35	Gray, John H.....	8
Balmer, J. H.....	36	Greek .....	18
Barton, F. B.....	26	Greek Culture .....	18
Beach, J. W.....	15	Grout, F. F.....	16
Beal, W. O.....	8		
Beard, R. O.....	20	Hayes, H. G.....	11
Bestor, Arthur E.....	36	Heredity .....	7
Bigelow, Herbert S.....	36	Herrick, C. A.....	30
Bothne, G.....	26	Hetland, Harriet.....	37
Burgderfer, Clarence.....	36	History .....	19
Burkhard, O. C.....	17	Howard, C. W.....	16, 31
Burton, R.....	14	Howard Quintet .....	34
		Hutchinson, Blanche .....	38
Cheyney, E. G.....	16	Hutchinson, J. C.....	18
Chicago Male Quartette.....	33	Hygiene .....	20
Chicago Musical Club.....	34		
Chicago Operatic Company.....	34	Information .....	44
Cluff, Hazel .....	36	International Operatic Company.....	34
Community Centers .....	43		
Comparative Philology .....	21	James, Albert C.....	11
Correspondence Courses .....	42	Johnstone, A. H.....	38
Craig, H.....	14		
Current Business Topics.....	10	Kaffir Boys Choir.....	34
		Kavanaugh, W. H.....	13
Dashiell, J. F.....	21	Kirchner, W. H.....	13
Davies, James .....	18, 36	Klaeber, F.....	21
Davis, W. S.....	19	Koenig, A. E.....	18
Debating .....	43		
		Lanham, Edwin W.....	38
Ebersole, J. F.....	10	Lantern Slides .....	41
Economics .....	8	Latin .....	20
Economic Entomology .....	15	Leavenworth, F. P.....	8
Education .....	12	Lecturers and Entertainers.....	35
Edwards, A. S.....	23	Lehnerts, E. M.....	16
Emmons, W. H.....	16	Lillie, Florence .....	38
Engineering .....	13	Lyceum Courses .....	33
English .....	14		
Erikson, H. A.....	30	MacPhail String Quartette .....	34
		MacPhail Trio .....	34
Faust Operatic Company.....	34	Mann, F. M.....	7
Fees .....	6	Martenis, J. V.....	14
Flowers, Montaville .....	36	Metropolitan Male Trio .....	34
Forestry .....	16	Meyer, Otto .....	34
		Miscellaneous Lectures .....	30

	Pages		Pages
Mitchell, T. W.....	9	Sanford, M. L.....	31
Moore, W. ....	16	Savage, C. A.....	18
Moraud, M.....	25	Scandinavian .....	26
Municipal Reference Bureau....	43	Schaper, W. A.....	23
Musical Attractions .....	33	Scheurer Trio .....	35
Nachtrieb, H. F.....	7	Schlenker, C.....	17
Newkirk, B. L.....	31, 38	Schroedel, T. H.....	18, 32
Norris, J. A.....	31	Shepardson, G. D.....	13
Northrop, G. N.....	15	Shipley, C. G.....	14
Other Extension Activities.....	41	Short Courses .....	42
Payne, Charles A.....	38	Sigerfoos, C. P.....	7
Peterson, Joseph .....	22	Skinner, C. E.....	32
Phelan, Anna H.....	15	Social Economics .....	27
Phelan, R. V.....	27	Sociology and Anthropology....	29
Philharmonic Orchestral Club...	35	Stomberg, A. A.....	26
Philosophy and Psychology.....	21	Swift, F. H.....	12
Pike, J. B.....	20	Todd, Arthur J.....	29
Plummer, Willis J.....	26	Treble Clef Club.....	35
Political Science .....	23	University Glee Club.....	35
Posey, C. J.....	17	University Lyceum, The.....	33
Powell, J. W.....	39	University Lyceum Players.....	39
Potter-Depew Company.....	35	University Weeks .....	41
Preston, C. H.....	11	Washburn, F. L.....	15, 32
Price, R. R.....	31	White, A. B.....	19
Psychology .....	21	Wiggam, Albert E.....	39
Reeves-Chadbourne Company....	35	Willmer, Sarah M.....	40
Romance Languages .....	25	Wisckemper, R. ....	18
Ruggles, A. G.....	15	Young, J. S.....	24
Sadler, William S.....	39	Zwickey, J. Lorenzo S.....	40