

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

The College of Education

Part II

Announcement of Program for the Year
1927 - 1928



Vol. XXX No. 63 July 27 1927

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

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

FRESHMAN WEEK

Every student entering any department of the University for the first time as a freshman in the fall of 1927 is required to be here throughout the week before the opening of classes. Every new freshman must present himself at the registrar's office either Friday, September 16, Saturday, September 17, or Monday, September 19, to begin the process of registration. Those coming later than 5:00 p.m. Monday, September 19, will be subject to the usual penalty for late registration. See Penalty Fees, page 47 of the bulletin of general information.

During the week September 20 to 24, in addition to carrying out their registration, freshmen will meet for lectures on such subjects as how to study, the use of the library, important university and college regulations, and will visit the library, the scientific laboratories, and other points of interest to them in connection with their choice of studies and of their future occupations.

During this week there will be the usual physical examinations and psychological tests and such other examinations as will enable the faculty to place the students in classes for which they are best fitted.

The general purpose of the Freshman Week is to help the student to make a good start on his work and to adjust himself to the new and perplexing conditions of university life.

NOTICE THAT ATTENDANCE THROUGHOUT FRESHMAN WEEK IS A REQUIREMENT

It is recommended that as many as possible present themselves for registration on Friday, September 16, in order to avoid the inconvenience and delay incident to the congestion on the last day.

1927							1928													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	..	1	2	3	4
7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25
28	29	30	31	..	..	..	26	27	28	29	..	..	..	26	27	28	29	30	31	..
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	3	..	..	..	..	..	..	1
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
..	..	..	..	..	1	2	1	2	3	4	5	6	7	..	1	2	3	4	5	6
2	3	4	5	6	7	8	8	9	10	11	12	13	14	7	8	9	10	11	12	13
9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20
16	17	18	19	20	21	22	22	23	24	25	26	27	28	21	22	23	24	25	26	27
23	24	25	26	27	28	29	29	30	..	..	..	..	..	28	29	30	31	..	..	..
30	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	..	1	2	3	4	5	..	..	..	..	1	2	3
6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
13	14	15	16	17	18	19	13	14	15	16	17	18	19	11	12	13	14	15	16	17
20	21	22	23	24	25	26	20	21	22	23	24	25	26	18	19	20	21	22	23	24
27	28	29	30	..	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	..	..	..	..	..	..	1	
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

UNIVERSITY CALENDAR

1927-28

Fall Quarter

1927			
September	15	Thursday	Payment of fees closes, except for new students
September	15-17		Entrance examinations (for removal of entrance deficiencies)
September	16-19		Registration of all new students entering the freshman class
September	19-23		Examinations for removal of conditions Physical examinations Registration period, ¹ colleges of Science, Literature, and the Arts, and Education
September	20-24		Freshman week
September	22-23		Registration days ¹ for all colleges not included above
September	23	Friday	Payment of fees for new students closes
September	26	Monday	Fall quarter classes begin, 8:30 ² a.m. Fall semester extension classes ² begin
October	20	Thursday	Senate meeting, 4:30 p.m.
October	22	Saturday	Homecoming Day
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	1	Thursday	State Day Convocation
December	14-17		Final examination period
December	15	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	17	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	21	Wednesday	Payment of fees closes for all students in residence fall quarter ⁴

Winter Quarter

December	27-29		Entrance examinations
1928			
January	2-3		Registration days for new students in the College of Science, Literature, and the Arts and Education

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 47, bulletin of general information.

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

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

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

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

January	3	Tuesday	Registration day for new students in all other colleges
January	4	Wednesday	Christmas vacation ends, winter quarter classes begin, 8:30 ² a.m.
January	28	Saturday	First semester extension classes close
January	30	Monday	Second semester extension classes begin
February	13	Monday	A holiday (February 12, Sunday, Lincoln's Birthday)
February	16	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	14-17		Final examination period
March	15	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ¹
March	17	Saturday	Winter quarter ends, spring vacation begins, 5:30 p.m.
<i>Spring Quarter</i>			
March	19-21		Entrance examinations
March	23-24		Registration days for new students in all colleges
March	26	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ² a.m.
April	6	Friday	Good Friday; a holiday
May	10	Thursday	Cap and Gown Day Convocation
May	17	Thursday	Senate meeting, 4:30 p.m.
May	26	Saturday	Second semester extension classes close
May	30	Wednesday	Memorial Day; a holiday
June	6-9		Final examination period
June	9	Saturday	Spring quarter closes, 5:20 p.m.
June	10	Sunday	Baccalaureate service
June	11	Monday	Fifty-sixth annual commencement
<i>Summer Quarter</i>			
June	15-16		Summer Session first term begins, registration and payment of fees
June	18	Monday	Classes begin, 8:00 a.m.
July	4	Wednesday	Independence Day; a holiday
July	28	Saturday	Registration and payment of fees for second term closes
July	30	Monday	Second term classes begin
September	1	Saturday	Second term Summer Session closes

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

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

CHANGES IN REGULATIONS

Below are listed the changes in regulations that have been made since the last printing of Part I of the College of Education Bulletin.

GENERAL REQUIREMENTS

CHANGE IN REGULATION FOR ADMISSION

The student entering at the beginning of his junior year must have an average of one honor point per credit hour in all subjects pursued prior to entrance to the College of Education.

MODIFICATION OF PRESCRIBED COURSE OF STUDY FOR THE UNIVERSITY TEACHER'S CERTIFICATE FOR GRADUATES OF STATE TEACHERS' COLLEGES OF GOOD STANDING

Students not completing a specialized curriculum described in Part I of the College of Education bulletin will be required to pursue the following prescribed professional courses in order to receive the Bachelor's degree and the university teacher's certificate in a secondary school subject.

Ed. Psy. 55	Educational Psychology	.....3 credits
Ed. T. 15	Technique of High School Instruction	.....3 credits
Ed. Ad. 65	The High School	.....3 credits
	Special Methods and Practice Teaching	.....8 or 9 credits

In addition to the above courses, the student must select 8 credit hours from the following courses:

Ag. Ed. 11	Ed. 113
Ag. Ed. 21	Ed. 121
Ag. Ed. 75	Ed. 123
Ed. Psy. 134	Ed. 124
Ed. 110	Ed. 161b
Ed. 193	Ed. 167-168
	Ed. 169

MODIFICATIONS IN PRESCRIBED CURRICULA

Agricultural Education.—A one-hour course in parliamentary law is required of students in Agricultural Education.

Art Education.—Either Art Ed. 83: Problems in Art Education, or Art Ed. 89: Application of Esthetic Theories in Public Art Education is to be substituted for major in Art Education for the Teacher's Course in Art.

Journalism.—With the permission of his adviser, a student in the College of Education may select journalism as his minor subject.

Major Adviser: Mr. E. M. Johnson

The following courses constitute a minor in journalism:

13f	Introduction to Reporting
41w	Copy Reading and Make-up
69s	The Writing of Special Articles
82s	Supervision of School Publications

Physical Education for Men.—Majors in physical education must substitute Phys. Ed. A, B, C Elementary Physical Education for Phys. Ed. 1, 2, 3.

DESCRIPTION OF COURSES

The following courses have been added since the last printing of Part I of the College of Education bulletin.

GENERAL COURSES

Ed.50. Art Appreciation. The enjoyment of the visual arts. Illustration of governing principles by practical experience. No technical requirements.

ADMINISTRATION AND SUPERVISION

Ed.Ad.129. Educational Publicity Materials. Analysis of current and desirable practices in educational publicity. Planning in detail a publicity program and current publicity materials for a public school system. (See Summer Session bulletin.)

Ed.Ad.130. Educational Publicity Agencies. Relationship of superintendent to community agencies directly or indirectly interested in public education. Problems of personal contacts, public speaking, parent-teacher and similar organizations, board meetings as a publicity agency. (See Summer Session bulletin.)

Ed.Ad.184. Supervision of Practice Teaching. A course primarily for teachers engaged in the direction of practice teachers in secondary education.

AGRICULTURAL EDUCATION

Agr.Ed.144. Course Organization and Instruction for the Individual in Vocational Agriculture.

ART EDUCATION

Art.Ed.89. Application of Esthetic Theories in Public Art Education. A synthetic treatment of esthetic theories in the light of public school practice.

EDUCATIONAL PSYCHOLOGY

Ed.Psy.157. Ontogenetic Psychology. (Listed in Part I of the College of Education bulletin as Ed.Psy. 57. Now open to graduate students.)

Ed.Psy.158. Psychology of Personality. Theoretical basis. Survey of methods for the measurement and study of character and the emotions. Relation to school success and other factors in the school situation. Genetic development of personality traits in childhood and adolescence. Methods in education for social and emotional stability—preventive and remedial programs. Place of the teacher.

HOME ECONOMICS EDUCATION

H.E.Ed.143. Home Economics Curricula. A study of the objective of home economics in the junior and senior high schools; organization of curricula.

- H.E.Ed.145. Administration and Supervision of Home Economics. A study of the duties and problems of teacher trainers and local and state supervisors of home economics.
- H.E.Ed.149. Research Problems. Planned to familiarize students with research technique through work on specific problems of limited scope in the field of home economics; involving collection, treatment, and interpretation of data.
- H.E.Ed.160. Organization and Methods for Related Art Teaching. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes. (Formerly H.E.Ed.43.)

INDUSTRIAL EDUCATION

- Ind.10. Methods and General Shopwork. The selection and organization of content for multiple-activity courses. Teaching methods and devices, including the use of individual instruction sheets; consideration of shop plans and equipment.
- Ind.105. Industrial Education. For superintendents, principals, and teachers not specializing in the field named. General and vocational phases considered. Objectives, administration, and supervision; programs; courses and practices; laws, rulings, and standards for aid; significant literature.

PHYSICAL EDUCATION FOR MEN

- Phys.Ed.A,B,C. Elementary Physical Education. Elementary gymnastics, i.e. free exercises, marching tactics, apparatus work, gymnastic dancing, group games, physical efficiency tests. Majors in physical education must substitute this course for Phys. Ed. 1, 2, 3.

THEORY AND PRACTICE OF TEACHING

- T.143. Teaching of Reading in the Elementary School. An intensive study of the aims, content, and technique of reading instruction based upon best practices, scientific research, and the psychology of reading. Observation of reading classes and demonstration of techniques.
- T.201,202,203. The Teaching of History and Social Studies.

PROGRAM

GENERAL COURSES

No.	Title	Hour	Day	Bldg.	Instructor
Ed.50f,w.s	Art Appreciation				
	(3 cred.; jr., sr.)				
	Lect.	I	W	EngAud	Miss Raymond
	Sec. 1	I, II	S and ar	203F	
	2	II, VIII	W and ar	203F	
Ed.208f	Methods in Ed. Research	I, II	S	113Ed	Mr. Haggerty, Mr. Olson
	(2 cred.; grad.)				
Ed.228f-229w- 230s	Problems of College Education ..	7:30-9:30 p.m.	M	Ar	Mr. Haggerty
	(6 cred.; grad.)				

ADMINISTRATION AND SUPERVISION

Major Advisers: L. J. Brueckner, Fred Engelhardt, L. V. Koos

No.	Title	Hour	Day	Bldg.	Instructor
Ed.Ad.65as	The High School	VIII	TThS	210OL	Mr. Kefauver
	(3 cred.; jr., sr.; prereq., Ed. 55) (Limited to students in special curricula for superintendents and high school principals)				
Ed.Ad.65f	The High School	III	TThS	210OL	Mr. Koos
	(3 cred.; jr., sr.; prereq., Ed. 55)				
Ed.Ad.65w	The High School	II	TThS		Mr. Kefauver
	(3 cred.; jr., sr.; prereq., Ed. 55)				
Ed.Ad.65s	The High School	III	TThS	210OL	Mr. Kefauver
	(3 cred.; jr., sr.; prereq., Ed. 55)				
Ed.Ad.113w	High School Curriculum	X	MWF	112Ed	Mr. Kefauver
	(3 cred.; sr., grad.; prereq., 10 hrs. in education including Ed. 55)				
Ed.Ad.115af- 115bw-115cs	Practice Supervision	Ar*	Ar	Ar	Mr. Brueckner, Mr. Peik
	(9 cred.; sr., grad.)				
Ed.Ad.119f	Elementary School Curriculum ..	I	MWF	ArEd	Mr. Peik
	(3 cred.; sr., grad.; prereq., 1, 3)				
Ed. Ad.119Tw- 120Ts	Elementary School Curriculum ..	I, II	S	113Ed	Mr. Peik
	(4 cred.; sr., grad.; prereq., 1, 3)				
Ed.Ad.121w	Educational Advising of Women and Girls	Ar	Ar	Ar	Miss Blitz
	(3 cred.; jr., sr., grad.; prereq., 15 qtrs. cred. in ed. and psy.)				
Ed.Ad.123s	Supervision of High School In- struction	I	TThS	ArEd	Mr. Koos
	(3 cred.; sr., grad.; prereq., 10 hrs. in education)				

* Consult instructors regarding time schedule before registering.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
Ed.Ad.124f	Educational Administration (3 cred.; sr., grad.; prereq., 10 hrs. in education)	IX	MWF	210OL	Mr. Engelhardt
Ed. Ad.125w	City School Administration .. (3 cred.; sr., grad.; prereq., Ed. 124)	IX	MWF	210OL	Mr. Engelhardt
Ed.Ad.126s	City School Administration (3 cred.; sr., grad.; prereq., Ed. 124, 125)	X	MWF	210OL	Mr. Engelhardt
Ed.Ad.128f,w,s	Special Problems in Educational Administration (1 or 2 cred.; prereq., Ed. 124-125-126)	Ar	Ar	Ar	Mr. Engelhardt
Ed.Ad.133aw-133bs	Guidance in Secondary Schools (4 cred.; prereq., 10 hrs. in education including Ed.Psy. 55)	IX, X	T	Ar	Mr. Kefauver
Ed.Ad.160f	Principles of Supervision (2 cred.; sr., grad.; prereq., 15 or equiv.)	III, IV	S	ArEd	Mr.Brueckner
Ed.Ad.161aw	Supervision: Uses of Educational Tests in Improving Instruction (2 cred.; sr., grad.; prereq., 15 or equiv.)	I, II	S	ArEd	Mr. Melby
Ed.Ad.161bs	Supervision: Adjustment of Schools to Individual Differences (2 cred.; sr., grad.; prereq., 15 or equiv.)	IX, X	W	ArEd	Mr. Peik
Ed.Ad.162bw,162as	Elementary School Supervision .. (2 or 4 cred.; sr., grad.; prereq., 15 or equiv.)	III, IV	S	ArEd	Mr.Brueckner
Ed.Ad.164w	High School Administration (3 cred.; sr., grad.; prereq., 10 hrs. in education including Ed. 55)	I	TThS	ArEd	Mr. Koos
Ed.Ad.167f	Junior High School (3 cred.; sr., grad.; prereq., 10 hrs. in education including Ed. 55)	I	TThS	Ar	Mr. Koos
Ed.Ad.167w-168s	Junior High School (4 cred.; sr., grad.; prereq., 10 hrs. in education including Ed. 55)	III, IV	S	Ar	Mr. Koos
Ed.Ad.169f	Extra-Curricular Activities (2 cred.; prereq., 10 hrs. in education including Ed. Psy. 55)	IX, X	T	Ar	Mr. Kefauver
Ed.Ad.170f,w,s	Special Problems in Secondary Education (2 cred.; prereq., 10 hrs. in education including Ed. Psy. 55)	Ar	Ar	Ar	Mr. Koos
Ed.Ad.175s	City School Finance (3 cred.; sr., grad.; prereq., 124, 125)	IX	MWF	210OL	Mr. Engelhardt

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
Ed.Ad.178f	School Surveys (3 cred.; sr., grad.)	X	MWF	202OL	Mr. Engelhardt, Mr. Melby
Ed.Ad.179w	School Surveys (3 cred.; sr., grad.)	VIII	MWF	202OL	Mr. Engelhardt, Mr. Melby
Ed.Ad.184f	Supervision of Practice Teaching (2 cred.; sr., grad.)	9-11 a.m.	S	Ed	Mr. Boardman
Ed.Ad.205f- 206w-207s	Seminar in Ed. Admin.	IX, X	Th	202OL	Mr. Engelhardt
Ed.Ad.218f- 219w-220s	Seminar in Secondary School Problems	IX, X	Th	111Ed	Mr. Koos
Ed.Ad.225f- 226w-227s	Seminar in Elementary School Problems	IX, X	Th	Ar	Mr. Brueckner

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

Major Adviser: A. V. Storm

No.	Title	Hour	Day	Bldg.	Instructor
Ag.Ed.11f	Principles of Vocational Educa- tion (3 cred.; jr., sr.; † no prereq.)	III	MWF	202Ad	
Ag.Ed.11w,s	Principles of Vocational Educa- tion (Same as 11f)	II	TThS	202Ad	
Ag.Ed.21f	Vocational Education (3 cred.; jr., sr.; no prereq.)	III	TThS	202Ad	Mr. Mayne
Ag.Ed.41f,w,s	Apprentice Teaching (2 cred.; jr., sr.;* prereq., 11)	Ar	Ar	Ar	Mr. Field, Mr. Lathrop, Mr. Nylin
Ag.Ed.42f,w,s	Teaching (3 cred.; jr., sr.;* prereq., 131, and a final mark not lower than C in 41)	Ar	Ar	Ar	Mr. Field, Mr. Lathrop, Mr. Nylin
Ag.Ed.75w,s	Visual Presentation (3 cred.; jr., sr.; prereq., 11)	Lect. VI Lab. VI, VII	M WF	202Ad 202Ad	Mr. Field
Ag.Ed.81s	Extension Work (3 cred.; jr., sr.; prereq., 6 cred. in farm mgt., 6 cred. in farm crops, 15 cred. in an. ind., 6 cred. in agr. ed.)	VI	MWF	24Ad	Mr. Storm, Mr. Peck
Ag.Ed.82f,w,s	Agricultural Extension Field Course (3 to 10 cred.; jr., sr.; ‡ prereq., 81)	Ar	Ar	Ar	Mr. Storm, Mr. Peck

* Only students pursuing the Agricultural Education curriculum are eligible to register for this course. Registration limited. Written approval of head of Department of Agricultural Education must be obtained before registration. Students entering this course will be expected to have completed the Agricultural Education curriculum of the preceding quarters.

† Offered only to those preparing to teach.

‡ Broad curriculum approved by the Agricultural Education Division and a position approved by the Agricultural Extension Division are also prerequisites in this course.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
Ag.Ed.121	Teachers' Course, Home and School Gardening	Not offered in 1927-28			
	(2 cred.; prereq., division approval)				
Ag.Ed.131w,s	Methods in Teaching High School Agriculture	III	MTWThF	202Ad	Mr. Field
	(5 cred.; jr.,¶ sr.)* prereq., a final mark not lower than C in 41)				
Ag.Ed.135	The Curriculum in Vocational Agriculture	Not offered in 1927-28			
Ag.Ed.141w,s	Supervised Practice in Vocational Agriculture	Ar		Ar Ar	Mr. Field
	(3 cred.; sr.;† prereq., 11)				
Ag.Ed.144f	Course Organization and Instruction for the Individual in Vocational Agriculture	Ar		Ar 202Ad	Mr. Lathrop
	(2 cred.; sr.)* prereq., 131)				
Ag.Ed.151w,s	Organization and Management . .	IV	MTWFS	202Ad	Mr. Storm, Mr. Lathrop
	(5 cred.; sr.;† prereq., 11, 21)				
Ag.Ed.153	Consolidated Rural Schools . . .	Not offered in 1927-28			
	(3 cred.; jr., sr.;† prereq., 11)				
Ag.Ed.154	Rural Education and Community Life	Not offered in 1927-28			
	(3 cred.; jr., sr.; prereq., 11)				
Ag.Ed.155	Consolidated Rural School Problems	Not offered in 1927-28			
	(3 cred.; jr., sr.;† prereq., 11, 153, or equiv.)				
Ag.Ed.161	Vocational Education in Agriculture	Not offered in 1927-28			
Ag.Ed.162	The Basis of Vocational Teaching Technique	Not offered in 1927-28			
Ag.Ed.164	Fundamentals of Agriculture . .	Not offered in 1927-28			
Ag.Ed.171w,s	Problems in Procedure	Ar		Ar Ar	Mr. Lathrop
	(3 cred.; sr.;† prereq., 42, 131, or equiv.)				
Ag.Ed.176s	Problems in Visual Presentation	Ar		Ar Ar	Mr. Field
	(3 cred.; jr., sr.; prereq., 75)				
Ag.Ed.191f-192w-193s	Seminar in Agricultural Education	Ar		Ar Ar	Mr. Storm, Mr. Lathrop, Mr. Field
	(6 cred.; sr.;† prereq., 11 cred.)				

ART EDUCATION

Major Adviser: Ruth Raymond

DESIGN

No.	Title	Hour	Day	Bldg.	Instructor
ArtEd.1f-2w-3s	Fundamental Principles of Design				
	(9 cred.; no prereq.)				
		Sec. 1	II (III)	TThS 401F	Miss Clousing
		2	III, IV	TThS 404F	Mrs. Hanley

¶ Open to juniors on the approval of the chief of the division.

* Only students pursuing the Agricultural Education curriculum are eligible to register for this course. Registration limited. Written approval of head of Department of Agricultural Education must be obtained before registration. Students entering this course will be expected to have completed the Agricultural Education curriculum of the preceding quarters.

† Offered only to those preparing to teach.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
ArtEd.1Tf-2Tw-3Ts	Fundamental Principles of Design (6 cred.)	(III) IV	S	404F	Miss Clousing
ArtEd.20f-21w-22s	Principles of Harmony in Form and Color (9 cred.; soph., jr., sr.; prereq., 2, 3)	Sec. 1 (I) II 2 (III) IV	TThS	406F	Mr. Hilpert
ArtEd.50w	Commercial and Industrial Design (3 cred.; jr., sr.; prereq., 1, 2, 3, 4, 5, 7, 8, or ar.)	VI (VII)	MWF	401F	Mr. Hilpert
ArtEd.51	Commercial and Industrial Design				Not offered in 1927-28
ArtEd.53-54	Design for the Consumer (3 cred.; jr., sr.; prereq., 1, 2, 3, 7, 8, 9, and 20, 21, 22, or 50, 51)				Not offered in 1927-28
ArtEd.55,56,57	Fundamental Art Principles (1 cred.; all; no prereq.)				Not offered in 1927-28

DRAWING

ArtEd.4,5,6f,w,s	Still Life Drawing (3 cred.; all; no prereq.) (Limited to 20)	Sec. 1 I, II 2 III, IV 3 II, III 4 I, II	M	404F	Mrs. Hanley
ArtEd.7,8,9f,w,s	Sketch, Course I (3 cred.; all; no prereq.) (Limited to 20)	Sec. 1 I, II 2 III, IV 3 I, II 4 III, IV	M	404F	Mrs. Hanley
ArtEd.7,8,9f,w,s	Sketch, Course I (3 cred.; all; no prereq.) (Limited to 20)	Sec. 1 I, II 2 III, IV 3 I, II 4 III, IV	F	406F	Mrs. Hanley
ArtEd.7,8,9f,w,s	Sketch, Course I (3 cred.; all; no prereq.) (Limited to 20)	Sec. 1 I, II 2 III, IV 3 I, II 4 III, IV	W	406F	Miss Clousing
ArtEd.7,8,9f,w,s	Sketch, Course I (3 cred.; all; no prereq.) (Limited to 20)	Sec. 1 I, II 2 III, IV 3 I, II 4 III, IV	W	402F	Miss Clousing
ArtEd.7,8,9f,w,s	Sketch, Course I (3 cred.; all; no prereq.) (Limited to 20)	Sec. 1 I, II 2 III, IV 3 I, II 4 III, IV	W	402F	Miss Clousing
ArtEd.10f-11w-12s	Graphic Composition (3 cred.; all; no prereq.)	Sec. 1 II, III 2 III, IV	M	402F	Miss Raymond
ArtEd.23,24,25f,w,s	Water Color (3 cred.; soph., jr., sr.; prereq., 4, 5, 6)	Sec. 1 (II) (III) IV 2 II, III	M	406F	Mr. Hilpert
ArtEd.26,27,28f,w,s	Charcoal, Pencil, and Pen Techniques (3 cred.; soph., jr., sr.; prereq., 4, 5, 6)	Ar	Ar	Ar	Miss Clousing

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
ArtEd.29,30, 31f,w,s	Sketch, Course II (3 cred.; soph., jr., sr.; prereq., 7, 8, 9)	Sec. 1 I, II 2 II, III 3 III, IV		F 401F F 402F F 401F	Miss Raymond
ArtEd.60,61, 62f,w,s	Advanced Water Color (See 23, 24, 25) (3 cred.; soph., jr., sr.; prereq., 25)	Ar	Ar	F	Mr. Hilpert
ArtEd.63,64, 65	<i>Advanced Techniques</i> (See 26, 27, 28) (3 cred.; soph., jr., sr.; prereq., 28)	<i>Not offered in 1927-28</i>			
ArtEd.66,67, 68f,w,s	Advanced Sketch (See 29, 30, 31) (3 cred.; soph., jr., sr.; prereq., 31)	Ar	Ar	Ar	Miss Raymond
HANDICRAFTS					
ArtEd.32w	Cardboard and Paper Construc- tion (1 cred.; all; no prereq.) (Limited to 20)	Sec. 1 V (VI) (VII) 2 VII (VIII) (IX)		W 406F W 406F	Miss Ross Miss Ross
ArtEd.33w	Bookbinding (2 cred.; all; no prereq.) (Limited to 20)	Sec. 1 V (VI) (VII) 2 (VI) VII (VIII)	TTh	406F 406F	Miss Ross Miss Ross
ArtEd.35 ArtEd.37f	<i>Clay Modeling</i> Basketry (2 cred.; all; no prereq.)	<i>Not offered in 1927-28</i>			
		Sec. 1 V (VI) (VII) 2 (VI) VII (VIII)	TTh	406F 404F	Miss Ross Miss Ross
ArtEd.38f	Elementary Weaving and Allied Crafts (1 cred.; all) (Limited to 15)	Sec. 1 V (VI) (VII) 2 (VI) VII (VIII)		W 406F W 404F	Miss Ross Miss Ross
ArtEd.39 ArtEd.40	<i>Advanced Basketry</i> <i>Advanced Weaving</i>	<i>Not offered in 1927-28</i> <i>Not offered in 1927-28</i>			

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
ArtEd.41f	Elementary Pottery (2 cred.; all; no prereq.)				
	Sec. 1	V (VI) (VII)	MF	411F	Miss Clousing
	2	(VI) VII (VIII)	MF	406F	Miss Ross
ArtEd.42s	Advanced Pottery (2 cred.; all; prereq., 41) (Limited to 10)	V (VI) (VII)	MF	411F	Miss Ross
ArtEd.43	Advanced Pottery—Continued ..	<i>Not offered in 1927-28</i>			
ArtEd.44s	Application of Design to Fabrics (2 cred.; all; prereq., 1, 2)				
	Sec. 1	V (VI) (VII)	TTh	406F	Miss Ross, Miss Clousing
	2	(VI) VII (VIII)	TTh	404F	Miss Ross
ArtEd.45s	Application of Design in Needle- craft (2 cred.; soph., jr., sr.; prereq., 1, 2, 3)	VI (VII)	W	411F	Miss Ross
ArtEd.46w	Metal Work (2 cred.; jr., sr.; prereq., four terms of design) (Limited to 10)	(VII) VIII (IX)	MF	411F	Miss Ross

ART HISTORY AND APPRECIATION

See Part I of the Bulletin of the College of Education

ArtEd.70 *Art of the Italian Renaissance .. Not offered in 1927-28*

TEACHER TRAINING

ArtEd.8of-81w- 82s	Types of Art Instruction (3 cred.; jr., sr.; prereq., 9 cred. in design, 9 cred. in drawing, 6 cred. in handi- crafts)	IV	F and Ar	406F	Mrs. Hanley
ArtEd.83s	Problems in Art Education (3 cred.; sr.; prereq., 12 cred. in design, 12 cred. in draw- ing, 6 cred. in handicrafts)	4:00-4:50	M(W)F	401F	Miss Raymond
ArtEd.86,87, 88f,w,s	Practice Teaching in Art (6 cred.; sr.; prereq., 9 cred. in design, 9 cred. in draw- ing, 6 cred. in handicrafts)	VI, VII	TTh	Public Schools	Miss Raymond
ArtEd89f	Application of Esthetic Theories in Public Art Education (3 cred.; sr., grad.; prereq., 9 cred. in design, 9 cred. in drawing, 6 cred. in handi- crafts)	4:00-4:50	M(W)F	401F	Miss Raymond

NOTE.—Hours in parentheses are laboratory hours and may be adjusted in individual cases.

NOTE.—Courses for public school teachers.—Courses equivalent to parts of those listed above in design, drawing, and handicrafts will be offered on Saturday mornings if there is sufficient demand. Those interested should consult with the Art Education faculty.

COLLEGE OF EDUCATION

EDUCATIONAL PSYCHOLOGY

Major Advisers: M. F. Haggerty, W. S. Miller

No.	Title	Hour	Day	Bldg.	Instructor
Ed.Psy.55f,w	Educational Psychology (3 cred.; jr., sr.; prereq., 6 cred. in psy.)	Sec. 1	I	MWF Psy	Mr. Miller
		2	III	MWF 210OL	Mr. Eurich
		3	VII	MWF Ed	Mr. Olson
Ed.Psy.55s	Educational Psychology (See 55f)	Sec. 1	I	MWF Psy	Mr. Miller
		2	III	MWF Ed	Mr. Eurich
Ed.Psy.55Tf- 56Tw	Educational Psychology (for teachers) (4 cred.; jr., sr.; prereq., 6 cred. in psy.)	III, IV	S	Psy	Mr. Van Wagenen
Ed.Psy.106f- 107w-108s	Advanced Educational Psychology (9 cred.; jr., sr., grad.; prereq., 55 or equiv.)	III	MWF	301Psy	Mr. Miller
Ed.Psy.111s	Educational Diagnosis (3 cred.; jr., sr., grad.; prereq., 55 or equiv.)	II	MWF	Psy	Mr. Van Wagenen
Ed.Psy.111Tf- 112Tw	Ed. Diagnosis (for teachers) .. (4 cred.; jr., sr., grad.; prereq., 55 or equiv.)	I, II	S	Psy	Mr. Van Wagenen
Ed.Psy.113f- 114w-115s	Psychology of Elementary School Subjects (2 cred. per qtr.; jr., sr., grad.; prereq., 10 cred. in psy. and ed.)	IX,X	W	Ar	Mr. Van Wagenen
Ed.Psy.116af,w	Elementary Statistical Methods .. (2 cred.; jr., sr., grad.)	I	MW	Psy	Mr. Olson
Ed.Psy.116s	Elementary Statistical Methods .. (See 116f)	I, II	S	Ar	Mr. Olson
Ed.Psy.116bf	Elementary Statistical Methods .. (This section is for those who plan to take 117w and 118s)	IX, X	T	Psy	Mr. Van Wagenen
Ed.Psy.117w- 118s	Advanced Statistical Methods in Education (4 cred.; sr., grad.; prereq., 126)	IX, X	T	Psy	Mr. Van Wagenen
Ed.Psy.130s	Vocational Psychology (2 cred.; jr., sr., grad.; prereq., Psy. 1, 2, and 4 additional cred. in econ., ed., or psy.)	IX, X	F	301F	Mr. Paterson
Ed.Psy.134f- 135w-136s*	Mental Tests and Mental Diag- nosis (6 cred.; sr.; grad.; prereq., 55 or equiv.)	VII, VIII	MW	Psy	Mr. Miller

* No individual examination will be given in this course. Those desiring training in individual mental testing should register for 143f-144w-145s.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
Ed.Psy.138f- 139wf-140s	Experimental Educational Psychology (4 cred.; sr., grad.; prereq., 55 or equiv.)	IX, X	TTh	Psy	Mr. Rockwell
Ed.Psy.143f- 144wf-145s	Individual Mental Examination (6 cred.; sr., grad.; prereq., 55 and 111 or 134. Permission of instructor)	VIII, IX	WF	Psy	Mr. Rockwell
Ed.Psy.149f- 150wf-151s	Psycho-Educational Clinic (2 to 6 cred.; sr., grad.; permission of instructor; prereq., Ed. 134-135-136, 144-145 or 184, and 111)	Ar	Ar	Ar	Mr. Olson
Ed.Psy.153f- 154w-155s	Research Problems (Ar.; sr., grad.; prereq., consult instructor)	Ar	Ar	Ar	Mr. Haggerty; Mr. Miller, Mr. Olson, Mr. Rockwell, Mr. Van Wag- enen
Ed.Psy.157f,w	Ontogenetic Psychology (4 cred.; jr., sr.; prereq., 6 cred. in psy.)	I, II	S	Psy	Mr. Rockwell
Ed.Psy.158s	Psychology of Personality (2 cred.; sr.; grad.; prereq., Ed. 55 and 116 or 134)	III	TTh	Ed	Mr. Olson
Ed.Psy.184s	Mental Deficiency (2 cred.; jr., sr., grad.; prereq., 55 or equiv.)	III, IV	S	Psy	Mr. Rockwell
Ed.Psy.191w	Systematic Ed. Psychology (4 cred.; sr., grad.; prereq., 12 credits in psy. and ed. psy.) (Not open to students receiving credit for Ed. Psy. 106-107-108)	III	MTThF	Ar	Mr. Rockwell
Ed.Psy.192w- 193s	The Psychology of Behavior Problems in Children (4 cred.; jr., sr., grad.; prereq., 15 cred. in psy. and ed.)	III, IV	S	Psy	
Ed.Psy.197,198, 199	Seminar: Problems in Sub-normality (6 cred.; jr., sr., grad.)	<i>Not offered in 1927-28</i>			
Ed.Psy.201f- 202w-203s	Seminar in Ed. Psychology (No cred.; grad.)	IX, X	M	208OL	Mr. Haggerty, Mr. Miller, Mr. Olson, Mr. Rockwell, Mr. Van Wag- enen

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

HISTORY AND PHILOSOPHY OF EDUCATION

Major Advisers: A. C. Krey, F. S. Chapin, Jean Alexander

No.	Title	Hour	Day	Bldg.	Instructor
H.Ed.1f	Brief Course in History of Education (5 cred.; jr., sr.; prereq., 6 cred. in psy.)	Sec. 1 II 2 IV	MTWThF MTWFS	210OL 204Ed	Miss Alexander
H.Ed.1w,s	Brief Course in History of Education (See 1f)	II	MTWThF	210OL	Miss Alexander
H.Ed.3f	Educational Sociology (3 cred.; jr., sr.; prereq., 6 cred. in psy.)	Sec. 1 I 2 III	MWF	210OL 204Ed	Mr. Hammer Mr. Finney
H.Ed.3w,s	Educational Sociology (See 3f)	III	MWF	204Ed	Mr. Finney
H.Ed.5s	Public Education in the U. S. . . (Offered at U. Farm) (3 cred.; jr., sr.; prereq., 6 cred. in psy.)	VIII	MWF	ArHE	Miss Alexander
H.Ed.101f	Foundation of Modern Education (3 cred.; jr., sr., grad.; prereq., 6 cred. in psy. and 6 cred. in hist.)	VI	MWF	210OL	Miss Alexander
H.Ed.102w	History of Modern Secondary and Higher Education (3 cred.; jr., sr., grad.; prereq., 6 cred. in psy. and 6 cred. in hist.)	VI	MWF	210OL	Miss Alexander
H.Ed.103s	History of Modern Elementary Education (3 cred.; jr., sr., grad.; prereq., 6 cred. in psy. and 6 cred. in hist.)	VI	MWF	210OL	Miss Alexander
H.Ed.114	<i>Philosophy of Education</i>	<i>Not offered in 1927-28</i>			
H.Ed.129-130	<i>Educational Classics</i>	<i>Not offered in 1927-28</i>			
H.Ed.131-132	<i>Comparative School Systems</i> . .	<i>Not offered in 1927-28</i>			
H.Ed.140w-141s	Topics in the History of Education (6 cred.; sr., grad.; prereq., permission of instructor)	VI, VII VI	W F	ArOL	Mr. Krey

HOME ECONOMICS EDUCATION

Major Adviser: Wylle B. McNeal

No.	Title	Hour	Day	Bldg.	Instructor
H.E.Ed.40f,w,*s	Child Training (3 cred.; jr., sr.; prereq., Psy. 1-2)	IV	MWF	213HE	Mr. Anderson and others
H.E.Ed.42f.s	Special Methods of Teaching Home Economics (5 cred.; jr., sr.; prereq., H.E. 13, 22, Psy. 1-2, Agr.Ed. 11 or Ed. Psy. 55)	VIII	MTWThF	213HE	Miss Brown, Miss Rose

* Offered on Minneapolis campus.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
H.E.Ed.46f,w	Observation and Teaching: Related Art (8 cred.; sr.; prereq.,† 42, 160 or parallel H.E. 13 and 53)	Lect. IX Teaching Ar	TTh Ar	213HE Ar	
H.E.Ed.47f,w,s	Observation and Teaching: Foods and Home Management (8 cred.; sr.; prereq.,† H.E. 34, 35, 42)	Lect. IX Teaching Ar	TTh Ar	213HE Ar	Miss Rose
H.E.Ed.48f,w,s	Observation and Teaching: Textiles and Clothing (8 cred.; sr.; prer.q.,† H.E. 42 and 53)	Lect. IX Teaching Ar	TTh Ar	213HE Ar	Miss Keever Miss Sell, Miss Landis
H.E.Ed.49f,w,s	Observation and Teaching: General Home Economics (8 cred.; sr.; prereq.,† H.E. 42)	Lect. IX Teaching Ar	TTh Ar	213HE Ar	Miss Rose
H.E.Ed.141f	Problems in Vocational Education in Home Economics (2 cred.; sr.; prereq., H.E.Ed. 42)	Ar	Ar	Ar	Miss McNeal, Miss Brown
H.E.Ed.142s	Educational Measurements in Home Economics (2 cred.; sr.; prereq., Ed. Psy. 55, H.E.Ed. 42)	Ar	Ar	Ar	Miss Brown
H.E.Ed.143f,s,su	Home Economics Curricula (2 cred.; sr.; grad.; prereq., H.E. 42 or parallel)	VIII	TTh	HE	Miss Brown
H.E.Ed.145w,s	Administration and Supervision of Home Economics (3 cred.; grad., prereq., H.E. 42, 49, 143)	Ar	Ar	Ar	Miss McNeal, Miss Brown
H.E.Ed.149f,w,s	Research Problems (Cred. ar., sr., grad.; by permission of instructor)	Ar	Ar	Ar	Miss Brown
H.E.Ed.160w	Organization and Methods for Related Art Teaching (3 cred.; jr., sr.; prereq., H.E. 42 or parallel 53, 131 or parallel)	III	TThS	402HE	Miss H. Goldstein
H.E.Ed.242f,w,s	Home Economics Education Seminar (1-5 cred.; grad.)	Ar	Ar	Ar	Miss McNeal, Miss Brown

† In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H.E. 3, 11, 13, 21 or 26, 22, 50, 51, and 53.

COLLEGE OF EDUCATION

INDUSTRIAL EDUCATION*

Major Adviser: Homer J. Smith

No.	Title	Hour	Day	Bldg.	Instructor
Ind.10f	Methods in General Shopwork .. (2 cred.; all; prereq., 10 cred. in either shopwork or drawing or both)	IX-X	Th	24Ed	Mr. McGee
Ind.11w	Special Class Woodwork (2 cred.; group to be limited to students of art education, teachers of subnormal classes, and elementary school teach- ers; no prereq.)	VIII-IX	MF	24Ed	Mr. McGee
Ind.12	<i>Methods, Elementary Electric Wiring</i>	<i>Not offered in 1927-28</i>			
Ind.14s	Methods in Mechanical Drawing (2 cred.; all; prereq., 10 cred. in drawing or consent of in- structor)	IX-X	W	115Ed	Mr. McGee
Ind.20s	Industrial History (2 cred.; all; no prereq.)	IX-X	F	222OL	Mr. McGee
Ind.25f	Literature of Industrial Educa- tion	III-IV	S	222OL	Mr. Smith
Ind.30w	Graphic Presentation (2 cred.; all; no prereq.)	III-IV	S	222OL	Mr. Smith
Ind.40f	Analysis (2 cred.; all; no prereq.)	IX-X	W	222OL	Mr. McGee
Ind.42s	Course Organization† (2 cred.; all; prereq., Ind. 40)	IX-X	Th	222OL	Mr. Smith
Ind.50f,51w,52s	Practice Teaching (6 cred.; jr., sr.; prereq., Ed. 15, Ind. 80, and any one of Ind. 10, 14, 66, 70, plus consent of instructor)	Ar	Ar	Ar	Mr. Smith
Ind.60f	Social Agencies in Education .. (2 cred.; jr., sr.; no prereq.)	IX-X	M	222OL	Mr. Prosser
Ind.61w	Social Significance of Vocational Education	IX-X	M	222OL	Mr. Prosser
Ind.65	<i>Methods in Non-Vocational Sub- jects</i>	<i>Not offered in 1927-28</i>			
Ind.66s	Methods in Related Subjects .. (2 cred.; jr., sr.; prereq., Ind. 40)	IX-X	T	222OL	Mr. Smith
Ind.70f	Methods in Shop Subjects (2 cred.; jr., sr.; prereq., Ind. 40)	IX-X	T	222OL	Mr. Smith

* See Education bulletin, Part I, for special four-year curriculum in industrial education and for course descriptions.

† Course formerly called "Selection and Organization of Related Material."

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
Ind.8ow	General Industrial Training ... (2 cred.; all; no prereq.)	IX-X	T	222OL	Mr. Smith
Ind.105w	Industrial Education (3 cred.; sr. and grad. in educ.; not open to those pursuing the special curriculum in indus- trial education)	II	MWF	222OL	Mr. Smith
Ind.110s	Guidance in the Schools (2 cred.; jr., sr., grad.; pre- requisite Ed. Psy. 134)	III-IV	S	222OL	Mr. Smith
Ind.150f,151w, 152s	Problems in Vocational Education (6 cred.; for students in all branches of vocational educa- tion; consent of instructor)	7:30-9:10 p.m.	M	222OL	Mr. Prosser
Ind.170f	Administration of Vocational Education (Day Schools) (2 cred.; jr., sr., grad.; no prereq.)	IX-X	F	222OL	Mr. Craig
Ind.171w	Administration of Vocational Education (Evening Schools) (2 cred.; jr., sr., grad.; prereq., Ind. 170)	IX-X	Th	222OL	Mr. Bass
Ind.172s	Administration of Vocational Education (Part time classes) (2 cred.; jr., sr., grad.; prereq., Ind. 170, 171)	IX-X	M	222OL	Mr. Prosser

Shopwork and drawing courses of wide variety are available in the College of Engineering. Students may also elect to pursue courses, day or evening, at the William Hood Dunwoody Industrial Institute. Conference with the adviser and consequent assignment to Dunwoody assures that the enrolment fee paid to the University covers the cost of instruction.

LIBRARY METHODS

No.	Title	Hour	Day	Bldg.	Instructor
Lib.Ed.7f	School Library Administration .. (2 cred.; jr., sr.) (30 practice hrs. to be arranged)	VII	T	117Ed	Miss Penrose
Lib.Ed.8w	School Library Organization, A (2 cred.; jr., sr.) (30 practice hrs. to be arranged)	VII	T	117Ed	Miss Penrose
Lib.Ed.9s	School Library Organization, B (2 cred.; jr., sr.) (30 practice hrs. to be arranged)	VII	T	117Ed	Miss Penrose
Lib.Ed.10f	Book Selection (1 cred.; jr., sr.)	VII	Th	117Ed	Miss Penrose
Lib.Ed.11w	Book Selection (1 cred.; jr., sr.)	VII	Th	117Ed	Miss Penrose
Lib.Ed.12s	Book Selection (1 cred.; jr., sr.)	VII	Th	117Ed	Miss Penrose

COLLEGE OF EDUCATION

PHYSICAL EDUCATION FOR MEN

Major Advisers: L. F. Keller, Fred Luehring

No.	Title	Hour	Day	Bldg.	Instructor		
Phys.Ed.1f,2w,3s	Freshman Physical Education .. (No cred.; fr.; no prereq.)	Sec. 1	II	TTh	A	Mr. Keller, Mr. MacMil- lan and others	
		2	III	TTh	A		
		3	VI	TTh(f,w)	A		
				MTh(s)			
		4	VII	TTh(f,w)	A		
Phys.Ed.3s	Freshman Physical Education .. (See 1f-2w)	Sec. 1	II	TTh	A		
		2	III	TTh	A		
		3	VI	MTh	A		
		4	VII	MTh	A		
		5	VIII	TTh(f,w)	A		
		MTh(s)					
Phys.Ed.Af,Bw, Cs	Elementary Physical Education (3 cred.; fr. majors)	VI	MWF		Mr. Keller		
Phys.Ed.4f	Freshman Hygiene	Sec. 1	II	T	301F	Dr. Cooke and others	
			2	IV	T		300F
			3	II	F		301F
Phys.Ed.4w	Freshman Hygiene	Sec. 1	IV	T	301F	Dr. Cooke and others	
			2	II	F		300F
			3	IV	S		301F
Phys.Ed.4s	Freshman Hygiene	Sec. 1	III	M	301F	Dr. Cooke and others	
			2	IV	T		300F
			3	II	F		301F
Phys.Ed.7f-8w-9s	Advanced Leaders	Sec. 1	IV	T	A	Mr. Keller	
			II	TTh	A		
			2	IV	T		A
			III	TTh	A		
			3	IV	T		A
			VI	TTh	A		
			4	IV	T		A
			VII	TTh	A		
5	IV	T	A				
VIII	TTh	A					
6	II	MWF	A				
7	III	MWF	A				
8	IV	MWF	A				

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
Phys.Ed.10f- 11w-12s	Minor Sports (6 cred.; soph., jr., sr.; prereq., 1-2-3)	Lect. IV Lab. IV	S MWF	A	Mr. Keller
Phys.Ed.13f- 14w-15s	Corrective Work (No cred.; by petition only)	Sec. 1 II 2 III 3 IV	TTh TTh TS	S	Mr. Iverson
Phys.Ed.16f- 17w-18s	Drill Substitution (No cred.; by petition only)	Sec. 1 II 2 III 3 IV	MWF MWF MWF	S	Mr. Iverson
Phys.Ed.19f- 20w-21s	Gymnastics (3 cred.; jr., sr.; prereq., 1-2-3)	III	TThS	A	Mr. Keller
Phys.Ed.22f-23w	Kinesiology (4 cred.; jr., sr.; prereq., 1-2-3, Anat. 4)	VI	TTh	A	Mr. Keller
Phys.Ed.24s	Technique of Gymnastic Teaching (2 cred.; jr., sr.; prereq., 22-23, Anat. 4)	VI	TTh	A	Mr. Keller
Phys.Ed.28f	Physical Examination and Nor- mal Diagnosis (2 cred.; sr.; prereq., Physiol. 57-58)	III	MWF	A	Dr. Cooke
Phys.Ed.29w	Orthopedic and Remedial Gym- nastics (2 cred.; sr.; prereq., 22-23-24, 29)	III	MWF	A	Dr. Cooke
Phys.Ed.30s	Athletic Training (2 cred.; sr.; prereq., none)	I	MWF	A	Dr. Cooke
Phys.Ed.31f	History of Physical Education .. (2 cred.; sr.; prereq., Ed. 1)	II	TThS	A	Mr. Keller
Phys.Ed.32w	Principles of Physical Education (3 cred.; sr.; prereq., 31, 10-11- 12, 23-24)	II	TThS	A	Mr. Keller
Phys.Ed.33s	Organization and Administration of Physical Education (3 cred.; sr.; prereq., 32)	II	MWF	A	Mr. Luehring
Phys.Ed.37s	Football Coaching (3 cred.; sr.; no prereq.)	Lect. VI Ar Lab. VI	MWF Ar MWF	A	Dr. Spears
Phys.Ed.38w	Basket-Ball (2 cred.; sr.; no prereq.)	VI	MWF	A	Mr. MacMillan
Phys.Ed.39s	Track Athletics (2 cred.; sr.; no prereq.)	VII	MWF	A	Mr. Finger
Phys.Ed.42f	Baseball (2 cred.; sr.; no prereq.)	VI	MWF	A	Mr. Keller
Phys.Ed.43f- 44w-45s	Practice Teaching (6 cred.; sr.; prereq., 10-11-12, 22-23-24, Ed. 55)	Ar	Ar	A	Mr. Keller

PHYSICAL EDUCATION FOR WOMEN

Major Adviser: J. Anna Norris

No.	Title	Hour	Day	Bldg.	Instructor
Phys.Ed.1f-2w-3s*	Elem. Physical Training (No cred.; required of all students; no prereq.)				
	Sec. 1	III	MWF	3, 151, 153	WGm Ar
	2	IV	MWF	3, 151, 153	WGm Ar
	3	VI	MWF	3, 151, 153	WGm Ar
	4	VIII	MWF	3, 151, 153	WGm Ar
	5	III	TThS	3, 151, 153	WGm Ar
Phys.Ed.4f	Preliminary Hygiene (No cred.; required of all students; no prereq.)				
	Sec. 1	I	M	201	WGm Dr. Norris
	2	II	T	201	WGm
	3	III	W	201	WGm
	4	IV	M	201	WGm
	5	VI	T	201	WGm
Phys.Ed.4w	Preliminary Hygiene (See 4f)				
	Sec. 1	II	T	201	WGm
	2	III	W	201	WGm
	3	II	Th	201	WGm
Phys.Ed.4s	Preliminary Hygiene (See 4f)	II	T	201	WGm
Phys.Ed.7f-8w*	Sophomore Danish Gymnastics (No cred.; soph.; prereq., 1-2-3)	IV	TS	153	WGm Miss Conger
Phys.Ed.9s	Archery (No cred.; soph.; prereq., 1-2-3)	II	MW	Ar	Ar
Phys.Ed.10f-11w-12s†	Sophomore Orthopedic Gymnastics (No cred.; soph.; prereq., 1-2-3)	IV	TS	3	WGm Dr. Tolg
Phys.Ed.10f-11w†	Sophomore Orthopedic Gymnastics (See 10-11-12)				
	Sec. 1	VI	TTh	3	WGm Miss Denny
	2	II	MW	3	WGm Miss Denny
Phys.Ed.13f-14w-15s	Sophomore Interpretive Dancing (No cred.; soph.; prereq., 1-2-3)	VI	TTh	151	WGm Miss Baker
Phys.Ed.13f-14w*	Sophomore Interpretive Dancing (See 13f-14w-15s)	II	MW	151	WGm Miss Bock-struck
Phys.Ed.13s	Sophomore Interpretive Dancing (See 13f-14w-15s)	II	MW	151	WGm Miss Bock-struck
Phys.Ed.16f-17w	Sophomore Games and Folk Dancing (No cred.; soph.; prereq., 1-2-3)	I	TTh	151	WGm Ar

* The third quarter is open to students who have not taken the preceding quarters. The winter quarter is not open to students who have not had the fall quarter.

† Students may enter course in any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
Phys.Ed.18s	Tennis				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
	2	I	TTh	151WGm	
		3	IV	TS	151WGm
		4	VIII	TTh	151WGm
Phys.Ed.19f	Sophomore Hockey				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
		2	V	TTh	151WGm
		3	VIII	TTh	151WGm
Phys.Ed.20w	Sophomore Basket-Ball				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
		2	V	TTh	151WGm
		3	VIII	TTh	151WGm
Phys.Ed.21s	Sophomore Baseball				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
		2	V	TTh	151WGm
		3	VIII	TTh	151WGm
Phys.Ed.22f,s- 23w§*	Sophomore Elem. Swimming ..				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	IV (11:30)	MW	51WGm	Ar
	2	VII	MW	51WGm	Ar
	3	II	TTh	51WGm	Ar
	4	IV	TS	51WGm	Ar
	5	VII	TTh	51WGm	Ar
	6	VIII (3:30)	TTh	51WGm	Ar
7	VIII (4:00)	TTh	51WGm	Ar	
8	III	MW	51WGm	Ar	
Phys.Ed.25f,s- 26w§*	Sophomore Intermediate Swim- ming				
	(No cred.; soph.; prereq., 1-2-3, elementary swimming test)				
	Sec. 1	VIII½ (4:00)	MW	51WGm	Miss Conger
		2	III	TTh	51WGm
		3	II	WF	51WGm
Phys.Ed.28f,s- 29w§*	Sophomore Advanced Swimming (No cred.; soph., jr., sr.; prereq., 1-2-3, intermediate swimming test)	VIII (3:30)	MW	51WGm	Miss Conger
Phys.Ed.30w	Sophomore Elementary Skating (No cred.; soph.; prereq., 1-2-3)	VII½	WF		Miss Lane
Phys.Ed.31s	Sophomore Life Saving and Water Sports	IX	MW	51WGm	Miss Conger
	(No cred.; soph., jr., sr.; prereq., 1-2-3, and adv. swimming test)				

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

* The third quarter is open to students who have not taken the preceding quarters. The winter quarter is not open to students who have not had the fall quarter.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
Phys.Ed.36w	Sophomore Intermediate Skating (No cred.; soph.; prereq., 1-2-3 and ability to skate)	VII	WF		Miss Lane
Phys.Ed.37f-38w	Freshman Major Sports (No cred.; fr. majors in phys. ed.) (Fall—Field Hockey) (Winter—Basket-ball)	I (fall) VI½ (winter)	TTh MW	151WGM	Miss Hazelton
Phys.Ed.40f	Freshman Major Hygiene (1 cred.; fr.; no prereq.)	III I	W S	201WGM	
Phys.Ed.44w-45s	Play and Playground (2 cred., winter, 1 cred. spring; jrs. and srs.; prereq., 6 qtrs.)	Lect. IV (winter) Lab. V Lect. IV (spring) Lab. II	MW F M TTh	201WGM 151WGM 201WGM 151WGM	Miss Kissock Miss Kissock
Phys.Ed.48f	Freshman Majors (Tennis and Orthopedic Gymnastics) (No cred.; fr. majors in phys. ed.; no prereq.)	VI½	MWF		
Phys.Ed.49w	Gymnastics for Freshmen (No cred.; fr. majors in phys. ed.; no prereq.)	I II	TTh F	151WGM	Miss Conger
Phys.Ed.50s	Baseball for Freshmen Majors (Other hours assigned to Course 3s may be substituted) (No cred.; fr. majors in phys. ed.; no prereq.)	VI	MWF		
Phys.Ed.51f-52w	Gymnastics for Sophomores (1 cred.; soph. majoring or jrs. minoring; prereq., 1-2-3)	II	TTh	153WGM	Miss Hazelton
Phys.Ed.54f-55w	Gymnastics for Juniors (1 cred.; jrs. majoring and srs. minoring; prereq., 51-52)	II	MW	153WGM	Miss Lane
Phys.Ed.56w-57s	Swimming with Technique (1 cred.; soph., jr.; prereq., Phys.Ed. 28)	Lect. IV (winter) Lab. VIII VI (spring)	M F TTh	201WGM 51WGM	Miss Conger
Phys.Ed.58w-59s	Advanced Folk Dancing with Technique (2 cred.; jr.; prereq., 6 qtrs.)	Lect. I (winter) II Lab. I (spring)	M TTh MWF	151WGM	Miss Baker
Phys.Ed.60f	Minor Sports with Technique .. (1 cred.; jr.; prereq., 6 qtrs.)	I	MWF	153WGM	
Phys.Ed.61s	Minor Sports with Technique .. (See 60f)	VI	MTTh	153WGM	
Phys.Ed.63f- 64w-65s	Major Sports with Technique .. (3 cred.; soph., jr.; prereq., 3, 37, 38)	VII VI Lect. IV Lab. I	MWF MTTh M TTh		Miss Hazelton Miss Kissock Miss Hazelton

PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
Phys.Ed.66f-67w-68s	Interpretive Dancing (3 cred.; jr.; prereq., 6 qtrs.)	VII	TThF	151WGm	Miss Baker
Phys.Ed.69f-70w-71s	Advanced Interpretive Dancing with Technique (2 cred.; sr.; prereq., 66-67-68)	IV	MTS	151WGm	Miss Baker
Phys.Ed.72f-73w	Gymnastics for Seniors (1 cred.; sr.; prereq., 54-55)	I (fall) I (winter)	MF WF	151WGm	Miss Baker Miss Baker
Phys.Ed.75w	History of Physical Education .. (2 cred.; jr., sr.; prereq., Ed. 1)	VI	TTh	201WGm	Miss Hazelton
Phys.Ed.76w	Physical Diagnosis and Prophylaxis (2 cred.; sr.; prereq., Physiol. 57-58)	I, II	S	201WGm	Dr. Barron
Phys.Ed.80f-81w	Kinesiology (3 cred. fall, 4 cred. winter; jr.; prereq., Anat. 3, Farm Engr. 23)	III II	TThS F	201WGm	Miss Denny
Phys.Ed.82s	Physical Examination (2 cred.; jr.; prereq., 80-81)	III	MWF	201WGm	Dr. Tolg
Phys.Ed.83s	Technique of Gymnastic Teaching (3 cred.; jr.; prereq., 54-55, 80-81)	II VIII½ VII	MWF TTh M	Ar 201WGm	Miss Baker
Phys.Ed.84f	Principles of Gymnastics (2 cred.; sr.; prereq., 54-55, 83)	Lab. I Lect. II	W MW	201WGm 201WGm	Miss Hazelton Miss Hazelton
Phys.Ed.85w-86s	Principles of Physical Education (2 cred. winter, 1 cred. spring; prereq., 44, 84, 91)	II (winter) IV (spring)	MF W	201WGm	Miss Baker
Phys.Ed.87s	Personal and School Hygiene .. (3 cred.; sr.; prereq., Physiol. 57-58)	II	MWF	201WGm	Miss Bockstruck
Phys.Ed.88f-89w-90s	Orthopedic and Remedial Gym. (3 cred.; sr.; prereq., 82)	Lab. II (fall). Lect. II (fall) Lab. V (winter) Lect. II (winter) (Practice Teaching ar) Lab. Ar (spring) Lect. IV (spring)	TTh W T W F	3WGm 201WGm 3WGm 201WGm	Dr. Tolg Dr. Tolg Dr. Tolg Dr. Tolg
Phys.Ed.91f	Principles of Dancing (2 cred.; sr.; prereq., 66-67-68)	VII	MW	151WGm	Dr. Tolg Miss Baker
Phys.Ed.92f-93w-94s	Practice Teaching (6 cred.; sr.; prereq., 43-44-45-56-57, 63-64-65, 69, 91, 83)	Ar	Ar	Ar	Miss Baker and others
Phys.Ed.97s	Organization and Administration (3 cred.; sr.; prereq., 75)	III I	MW Th	201WGm	Dr. Norris
COURSES FOR WHICH NO REGISTRATION IS REQUIRED					
Phys.Ed.31s	Life Saving	IX	MW	51WGm	Miss Conger
Phys.Ed.32f,w,s	General Swimming (No cred.; all; no prereq.)	IX	TThF	51WGm	

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
Phys.Ed.33-34-35*	Hockey, Basket-Ball, and Base-ball	IX	MTWTh	151WGM	Miss Hazelton, Miss Lane
	(No cred.; fr., jr., sr.; prereq., permission of director)				

PUBLIC SCHOOL MUSIC

Major Advisers: Carlyle M. Scott, Abe Pepinsky

No.	Title	Hour	Day	Bldg.	Instructor
Mu.Ed.29-30-31	Grade School Methods	IX.X	F	John Marshall High School	
	(9 cred.; jr., sr.; no prereq.)				
Mu.Ed.32-33-34	High School Methods	IX.X	W	John Marshall High School	
	(9 cred.; jr., sr.; prereq., 29-30-31)				
Mu.Ed.51f-52w-53s	Instrumentation and Orchestration (3 cred.; jr., sr.; prereq., 1, 2, and 3 or equiv.)	VII	Th	3Mu	Mr. Pepinsky
Mu.Ed.64f-65w-66s	Orchestra Conducting	VII VIII	M Th W	4Mu	Mr. Pepinsky
	(6 cred.; jr., sr.) (Observation 7:30 p.m.)				
Mu.Ed.71-72-73	Class Instrument Teaching	I	T	3Mu	Mr. Pepinsky
	(6 cred.; soph.; no prereq.)				
Mu.Ed.74-75-76	Advanced Class Instrument Teaching	I	MW	4Mu	Mr. Pepinsky
Mu.Ed.81f-82w-83s	Observation of Teaching	Ar	Ar	Ar	
	(6 cred.; jr., sr.; prereq., 32-33-34)				

THEORY AND PRACTICE OF TEACHING

Major Advisers: Leo J. Brueckner, Earl Hudelson

GENERAL METHODS

No.	Title	Hour	Day	Bldg.	Instructor
T.15f,w,s	Technique of High School In-struction	IV	MWF	210OL	Mr. Hudelson
	(3 cred.; jr., sr.; prereq., Ed. 55)				
T.15s	Technique of High School In-struction	III	MWF	210OL	Mr. Hudelson
	(Limited section) (See 15f,w,s)				
T.16f,w,s	Practice Teaching	Ar	Ar	Ar	Mr. Boardman
	(5 cred.; sr., grad.; prereq., Ed. 15 and Special Methods Course)				

SPECIAL METHODS

T.17s	Practice Teaching of Subnormal Children	Ar	Ar	Ar	Mr. Boardman
	(2 cred.; jr., sr.)				

* The third quarter is open to students who have not taken the preceding quarters.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
T.18s	Teachers' Course in Animal Biology (3 cred.; jr., sr., grad.; prereq., An. Biol. 1-2, Ed. 15)	VI, VII, VIII	TTh	213AB	Mr. Sigerfoos
T.19w	Teachers' Course in Botany ... (5 cred.; jr., sr.; prereq., 18 cred. in botany and Ed. 15)	VII	MTWThF	213AB	Miss Mygrant
T.20s	Teachers' Course in Chemistry .. (3 cred.; jr., sr.; prereq., gen. chem. and qual. chem. and Ed. 15)	IV	MWF	315C	Mr. Geiger
T.23s	Teachers' Course in Geography .. (3 cred.; jr., sr.; prereq., Geog. 114 and Ed. 15)	VII	MWF	Ar	Mr. Hartshorne
T.35s	Teachers' Course in Norwegian (3 cred.; sr., grad.; prereq., Scand. 4-5, or 10-11-12 and Ed. 15)	Ar	Ar	206F	Mr. Bothne
T.39	<i>Social Science for Junior High Schools</i> (2 cred.; jr., sr.)	<i>Not offered in 1927-28</i>			
T.41w	Teachers' Course in Swedish .. (3 cred.; sr., grad.; prereq., Scand. 10-11-12 or 4-5 and Ed. 15)	VII	MWF	206F	Mr. Stomberg
T.42	<i>Fundamental Educational Theories Relating to Instruction in the Elementary School</i> (2 cred.; jr., sr.)	<i>Not offered in 1927-28</i>			
T.44	<i>Children's Literature</i> (2 cred.; jr., sr.; prereq., Ed. 37f)	<i>Not offered in 1927-28</i>			
T.45	<i>Teaching of Geography and History in the Elementary School</i> (2 cred.; jr., sr.; prereq., Ed. 37f)	<i>Not offered in 1927-28</i>			
T.46	<i>Practice Teaching with Special Methods</i> (5 cred.; jr., sr.)	<i>Not offered in 1927-28</i>			
T.47	<i>Field Problems in High School Training Departments</i> (2 cred.; jr., sr.)	<i>Not offered in 1927-28</i>			
T.50	<i>The Teaching of Composition in the Junior High School</i> (2 cred.; jr., sr.)	<i>Not offered in 1927-28</i>			
T.51	<i>The Teaching of English in the Junior High School</i> (2 cred.; jr., sr.)	<i>Not offered in 1927-28</i>			
T.52f-53w-54s†	Teachers' Course in English and Practice Teaching (9 cred.; jr., sr.; prereq., Ed. 15)	VIII	TTh	205Ed	Miss Prothers
T.56f-57w-58s†	Teachers' Course and Practice Teaching in Mathematics ... (9 cred.; jr., sr.; prereq., Math. 50 and Ed. 15)	VIII	TTh	113Ed	Mr. Stokes

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
T.62f-63w-64s†	Teachers' Course and Practice Teaching in Secondary School Science (9 cred.; jr., sr.; prereq., Ed. 15 and consent of instructor)	IX	MW	8Ed	Mr. Hurd
T.66f-67w-68s†	Teachers' Course and Practice Teaching in Social Science for Senior High Schools (9 cred.; jr., sr.; prereq., 30 cred. in history or social science. Consult instructor)	VIII	MWF	Ar	Mr. Krey, Mr. Tohill
T.70f-71w-72s†	Teachers' Course and Practice Teaching in German (9 cred.; jr., sr.; prereq., 52, 55, and Ed. 15)	VIII	TTh	101Ed	Mrs. Patterson
T.73f-74w-75s†	Teachers' Course and Practice Teaching in Latin (9 cred.; jr., sr.; prereq., any two of Courses 51-53 or equiv., 75, and Ed. 15)	VIII	TTh	112Ed	Miss Marlowe
T.76f-77w-78s†	Teachers' Course and Practice Teaching in the Romance Languages (9 cred.; jr., sr.; prereq., 13, 14, 15, and one conv. comp. course, one literary course, and Ed. 15)	VIII	TTh	111Ed	Mrs. Sundeen
T.80f-81w-82s†	Teachers' Course and Practice Teaching in Commercial Subjects (9 cred.; jr., sr.; prereq., Ed. 15 and consent of instructor)	II	MWF	222OL	Miss Davidson

COURSES OPEN TO GRADUATE STUDENTS

T.110f	Educational Diagnosis in Secondary Education (2 cred.; sr., grad.; prereq., Ed. Psy. 55)	III, IV	S	Ar	Mr. Hudelson
T.143f	Teaching of Reading in the Elementary School (2 cred.; jr., sr., grad.; prereq., 9 hrs. in Ed. incl. Ed. Psy. 55)	I, II	S	Ar	Mr. Peik
T.148	Teachers' and Supervisors' Course in Arithmetic for the Lower Grades (See Ed. Ad. 162aw-162bs)				
T.149	Teachers' and Supervisors' Course in Arithmetic for Intermediate and Upper Grades and for Junior High School Teaching (See Ed. Ad. 162aw-162bs)				

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
T.150	Normal School Teaching and Administration (4 cred.; jr., sr., grad.; prereq., 15 cred. in ed.)	Not offered in 1927-28			
T.181w	Technique of Elementary Instruction (3 cred.; jr., sr., grad.; 9 hrs. in education including Ed. Psy. 55)	I	MWF	ArEd	Mr. Peik
T.193w	Foundations of Secondary School Methods (3 cred.; sr., grad.; prereq., Ed. 15)	IX	MWF	Ar	Mr. Hudelson
T.195w	Problems of High School English Teaching (2 cred.; sr., grad.; prereq., Ed. 15 and 21)	III, IV	S	216OL	Mr. Hudelson
T201f-202w-203s	Teaching of History and Social Studies (Open to graduates and teachers)	Ar	Ar	Ar	Mr. Krey
T.222f-223w-224s	Research Problems in Secondary School Methods (2 cred.; grad.; prereq., Ed. 15 and 113)	Ar	Ar	Ar	Mr. Hudelson

ANIMAL BIOLOGY

Major Adviser: C. P. Sigerfoos

REQUIREMENTS OF THE DEPARTMENT

Credit is given for acceptable work done at any approved seaside laboratory.

For teacher's certificate.—Major recommendation: General Zoology, and at least 20 additional credits in the department. Medical Physiology (Course 4) is included among the electives.

Minor recommendation: General Zoology, and at least ten additional credits chosen from the following: General Physiology, Histology, Entomology, General Embryology, Ornithology, and Human Physiology (Medical Physiology, Course 4).

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	General Zoology (10 cred.; all; no prereq.)				Mr. Minnich
	Sec. 1 Lab.	III, IV	MWF	101AB	
	(Limit, 150) Lect.	III	TThS		
		IV	T	313AB	
	Sec. 2 Lab.	VI, VII	MWF	101AB	
	(Limit, 150) Lect.	VI, VII	TTh	313AB	
1w-2s†	General Zoology (See 1f-2w)				Mr. Sigerfoos
	Sec. 1 Lab.	I, II	MWF	101AB	
	Lect.	I	T		
		II	TThS	313AB	

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor	
1s-(2su† or 2w†)	General Zoology (See 1f-2w)	Lab. Lect.	VI, VII, VIII MTh	101AB 313AB	Ar	
5f-6w-7s†	General Zoology (12 cred.; pre-medical and pre- dental students; no prereq.)	Sec. 1 Lab. Lect.	I, II I	TS MWF	101AB 313AB	Mr. Ringoer
	(Pre-dental)	Sec. 2 Lab. Lect.	III, IV IV	TS MWF	101AB 313AB	Mr. Sigerfoos
	(Pre-medical)	Lab. Lect.	III, IV IV	WF MTS	101AB 313AB	
	(Spring)					
14f-15w-16s†	General Zoology (9 cred.; Agr., For., H.E.; no prereq.)		See College of Agriculture bulletin.			
21s	Introd. to General Physiology .. (5 cred.; fr., soph., jr., sr.; pre- req., 1-2, chem. or phys. desir- able)		VI, VII, VIII VI, VII, VIII, IX	MW F	Ar	Mr. Minnich
22s	General Ecology (5 cred.; fr., soph., jr., sr.; pre- req., 1-2)		VI, VII, VIII VI, VII, VIII, IX	MW F	401AB	Mr. Chapman
23f	Introd. Entomology (5 cred.; soph., jr., sr.; prereq., 1-2)		VI, VII	MTWThF	211AB	Ar
24f	Introd. Animal Parasitology .. (5 cred.; soph., jr., sr.; prereq., 1-2)		VI, VII, VIII	MWF	208AB	Mr. Riley
25w	Histology (5 cred.; soph., jr., sr.; prereq., 1-2)		VI, VII, VIII	MWF	201, 211AB	Mr. Ringoer
26w	Comm. Anatomy (5 cred.; soph., jr., sr.; prereq., 1-2)	III, IV	MTWFS	202, 211AB	Mr. Johnson	
27w	Technique (3 cred.; soph., jr., sr.; prereq., 15 cred.)	Ar		Ar	201AB	Miss Slider
37f-38w-39s†	General Entomology (9 cred.; soph., jr., sr.; prereq., 1-2)	I, II		MWF	208AB	Mr. Mickel
44s	Animal Parasites (3 cred.; fr., soph., jr., sr.; pre- req., 1-2)		VI, VII, VIII	WF	208AB	Mr. Riley
45w	Insects and Disease (3 cred.; fr., soph., jr., sr.; pre- req., 1-2)		VI, VII, VIII	WF	208AB	Mr. Riley
46w-47s†	Ornithology (6 cred.; soph., jr., sr.; prereq., 1-2 and permission of in- structor)		VI, VII, VIII	MW	314AB	Dr. Roberts
48f-49w-50s†	Histology and Organology (9 cred.; soph., jr., sr.; prereq., 1-2 and permission of the head of the department)	III, IV		MWF	201, 211AB	Mr. Downey

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

() Numbers in parentheses do not refer to the year 1927-28.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
75S	Nature Study (3 cred.; jr., sr.; prereq., 20 cred. incl. 1-2)	VI, VII, VIII	TTh	213AB	Mr. Sigerfoos
107f	Protozoology (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1-2)	I, II	MTWThF	211, 213AB	Mr. Sigerfoos
109f-110W-111S	Experimental Zoology (9 cred.; jr., sr., grad.; prereq., 20 cr.d. in an. biol.)	IV	MWF	10AB	Mr. Minnich
117f-118W-119S	Ecology of Insects (9 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1-2)	VI, VII, VIII	TTh	401AB	Mr. Chapman
120su	Advanced Ecology (5 cred.; jr., sr., grad.; prereq., 117-118-119)	Ar	Ar	Ar	Ar
125f-126W-127S	Advanced Entomology (9 cred.; jr., sr., grad.; prereq., 1-2 and 37-38-39)	Ar	Ar	208AB	Mr. Mickel
139f-140W†	Histol. and Develop. of Insects (6 cred.; jr., sr., grad.; prereq., 1-2 and 37-38-39)	III, IV and ar	TTh	208AB	Mr. Riley
144f-145W-146S	Animal Parasites and Parasitism (9 cred.; jr., sr., grad.; prereq., 1-2 and 5 add. cred.)	VI, VII, VIII	WF	208AB	Mr. Riley
15:f,w-155S†	Hematology (6 cred.; jr., sr., grad.; prereq., histol., embryol.)	VII, VIII, IX	TTh	201, 211AB	Mr. Downey
181f-182w	Embryology (6 cred.; jr., sr., grad.; prereq., 1-2 and 27 or equiv.)	VI, VII, VIII	TTh	201AB	Mr. Ringoen
183s	Genetics and Eugenics (3 cred.; jr., sr., grad.; prereq., 1-2 and 5 other cred. in an. biol. or botany)	IV V	TS Th	211AB	Ar
197f-198W-199S	Problems (9 or 18 cred.; sr., grad.; prereq., 1-2 and special requirements)	Ar	Ar	Ar	Ar

ENTOMOLOGY AND ECONOMIC ZOOLOGY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

NOTE.—Consult the bulletin of the College of Agriculture, Forestry, and Home Economics for program of hours, days, buildings, and instructors.

No.	Title	Hour	Day	Bldg.	Instructor
3f,w	Economic Entomology (3 cred.; soph., jr., sr.; prereq., an. biol. 9 cred.)	V, VI, VII	WF	306AB	Mr. Ruggles
4f	Economic Vertebrate Zoology .. (3 cred.; jr., sr.; prereq., an. biol. 9 cred.)	Ar	Ar	Ar	Mr. Johnson

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
8f	Variety and Habits of Fur Bearing Animals (3 cred.; soph., jr., sr.; prereq., an. biol. 9 cred.)	Ar	Ar	Ar	Mr. Johnson
150f.su	Insecticides and Their Action .. (3 or 6 cred.; jr., sr.; prereq., 37-38-39, Agr. Biochem. 7-8, or equiv.)	Ar	Ar	Ar	Mr. Strand
197f,w.s.su	Introduction to Research (5 or more cred.; sr.; prereq., 37-38-39 or 44-45 and other work as prescribed by the division)	Ar	Ar	Ar	Mr. Chapman, Mr. Ruggles, Mr. Mickel, Mr. Graham

ANTHROPOLOGY

Major Advisers: A. J. Jenks, W. D. Wallis

MAJOR SEQUENCE

At least 24 credits selected from the following courses: 80, 108, 110, 112, 113, 121, 161; Educational Psychology 111; History 121-122, 166. In addition, Psychology 125-126 is required. (Prerequisites: 15 credits from the biological sciences, 15 credits from the social sciences; Anthropology 51 (or 1) and two other courses.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
51f,w,s	Intro. to Anthropology (5 cred.; soph. with C average; jr., sr.; prereq., 10 cred. of a science and 10 cred. of a social science)	VI	MTWThF	15F	Mr. Jenks, Mr. Wallis
53s	Cultural Anthropology: Technology	II	TThS	15F	Mr. Wallis
54f	Cultural Anthropology: Social Organization	II	TThS	15F	Mr. Wallis
55s	Human Migrations with Special Reference to Immigration ... (3 cred.; jr., sr.; prereq., 51)	III	MWF	15F	Mr. Jenks
56w	Primitive Science	II	TThS	15F	Mr. Wallis
62w	Ethnology	IV	MWF	15F	Mr. Jenks
80w	The American Indian (3 cred.; jr., sr.; prereq., 51)	III	MWF	15F	Mr. Wallis
106f	Prehistoric Man	III	MWF	12F	Mr. Jenks
108s	Philippine Peoples	IV	MWF	15F	Mr. Jenks

* Open without petition to sophomores who have an average of C in the prerequisite courses and in all of their previous work.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
110f	Physical Anthropology (3 cred.; jr., sr.; prereq., 51)	III	TThS	12F	Mr. Wallis
112	<i>The American Negro</i> (3 cred.; jr., sr.; prereq., 51)	<i>Not offered in 1927-28</i>			
113W	Peoples of Europe (3 cred.; jr., sr.; prereq., 51)	II	MWF	15F	Mr. Jenks
121W	Advanced Phys. Anthropology .. (3 cred.; jr., sr.; prereq., 110)	III	TThS	12F	Mr. Wallis
122f,123w,124s	Problems in Anthropology (Cred. ar.; jr., sr., grad.; prereq., three courses. For honor course students, permission of instructor)	Ar	Ar	12F	Mr. Jenks, Mr. Wallis
161f	Primitive Religion (3 cred.; jr., sr.; prereq., 51)	II	MWF	12F	Mr. Wallis

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

Major Adviser: F. M. Mann

Junior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
21f-22w†-23s	Freehand Drawing (6 cred.; soph., jr., sr.; prereq., soph. standing)				
31f-32w†-33s	Elements of Architecture (15 cred.; soph., jr.; prereq., soph. standing)				
31w-32s†-33su	Elements of Architecture (See 31f-32w-33s)				
61f-62w-63s	Projections, Shades, and Shad- ows, Perspective (6 cred.; soph.; prereq., Math. 3 or 5)				
84-85-86f,w,s	Modeling (6 cred.; jr., sr.; no prereq.)				

Senior College Courses

14f-15w-16s	History of Architecture (6 cred.; jr., sr.; prereq., 31-32- 33)
17f-18w-19s	History of Architecture (6 cred.; jr., sr.; prereq., 14-15- 16)
34-35-36f,w,s	Architectural Design (12 cred.; jr., sr.; prereq., 31-32- 33, 23, 61-62-63)
51f-52w-53s	Building Construction (6 cred.; jr., sr.; prereq., 31-32- 33)
74f-75w-76s	Freehand Drawing (9 cred.; jr., sr., int. dec.; prereq., 23)

NOTE.—Consult the bulletin of the College of Engineering and Architecture for program of hours, days, buildings, and instructors.

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

No.	Title	Hour	Day	Bldg.	Instructor
81f	Stage Design				
	(2 cred.; stud. of dram.; prereq., Speech 91-92-93†)				
90-91-92f,w,s	Illustration				
	(3 cred.; jr., sr.; prereq., 21-22- 23 or equiv.)				
93-94-95f,w,s	Hand Print Process				
	(3 cred.; jr., sr.; prereq., 21-22- 23 or equiv.)				
134-135-136f,w,s	Interior Decoration Design				
	(21 cred.; sr.; prereq., 34-35-36)				
163s	History of Sculpture and Paint- ing				
	(2 cred.; jr., sr.; prereq., 14- 15-16)				
182f-183w	Decoration and Allied Arts ...				
	(6 cred.; sr.; prereq., 17-18-19)				

NOTE.—Consult the bulletin
of the College of Engineering
and Architecture for program
of hours, days, buildings, and
instructors.

ASTRONOMY

Major Adviser: Francis P. Leavenworth

No.	Title	Hour	Day	Bldg.	Instructor
11f§*	Descriptive Astronomy	III	MTThFS	124F	Mr. Beal
	(5 cred.; 3d qtr. fr., soph., jr., sr.; no prereq.)				
11w§*	Descriptive Astronomy				
	(See 11f)				
	Sec. 1	III	MTThFS	124F	Mr. Beal
	2	IV	MTWFS	124F	
11s§*	Descriptive Astronomy				
	(See 11f)				
	Sec. 1	I	TWThFS	124F	Mr. Beal
	2	III	MTThFS	124F	
25w§*	Stellar Astronomy	II	TThS	124F	Mr. Beal
	(3 cred.; soph., jr., sr.; prereq., 11)				
25s§*	Stellar Astronomy	IV	MWF	124F	
	(See 25w)				
51f-52w-53s*‡	General Astronomy	II	MWF	124F	
	(10 cred.; jr., sr.; prereq., Math. 5, 6, and 7, or phys. sci. and Math. 6)		(fall, winter) MWF and ar (spring)		
62f	Elements of Practical Astron. ...	III	MWF	123F	
	(3 cred.; jr., sr.; prereq., Astron. 11 or 51, and Math. 6, 7)				
101f-102w-103s	Practical Astronomy	Ar	Ar	123F	
	(9 or 18 cred.; jr., sr., grad.; prereq., Astron. 11 or 51, and Math. 50)				

† May be taken at the same time.

* Courses 11-25 and 51-52-53 cover much the same field. Students are advised not to take 51-52-53 and 11-25.

‡ Satisfies the junior college requirement for science. Open without petition to sophomores who have completed the prerequisites with a grade of C and have an average of one honor point per credit in all their work.

§ Does not satisfy the junior college requirement for science.

No.	Title	Hour	Day	Bldg.	Instructor
111f-112w-113s	Celestial Mechanics (9 cred.; sr., grad.; prereq., Math. 51)	Ar	Ar	123F	Mr. Beal
140w	Method of Least Squares (3 cred.; jr., sr., grad.; prereq., Math. 51)	II	TThS	123F	

BACTERIOLOGY

MEDICAL SCHOOL

Major Advisers: W. P. Larson, A. T. Henrici, R. G. Green

No.	Title	Hour	Day	Bldg.	Instructor
51f	General Bacteriology (5 cred.; jr., sr.; prereq., chem. 10 cred. and biol. 8 cred.)				
	Sec. 1	VI, VII, VIII	MWF	MH	Ar
	2	VI, VII, VIII, IX	TTh	MH	Ar
	3	I, II, III	MWF		
51w,s	General Bacteriology (See 51f)	VI, VII, VIII	MWF	MH	Ar
101f	Special Bacteriology for Medical Students (4 cred.; jr., sr.; prereq., 51)	I, II I, II, III	ThS T	MH	Ar
103w	Special Bacteriology for Students of Agriculture (5 cred.; jr., sr.; prereq., 51)	I, II, III	TS Th	MH	Ar
114s	Higher Bacteria (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
116w	Immunity (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
117s	Pathogenic Protozoa (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
118w	Morphology and Taxonomy of Bacteria (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
119w-120s	Bacteriological Chemistry (4 cred.; jr., sr.; prereq., 101 or 103; Physiology 100, 101, or Agr. Biochem. 111-112)	VI, VII, VIII	TTh	MH	Ar
121w	Industrial Bacteriology (3 cred.; jr., sr., grad.; prereq., 51)	I, II	TTh	MH	Ar
122s	Industrial Bacteriology Continued (3 cred.; jr., sr., grad.; prereq., 51)	I, II	TTh	MH	Ar
150f-151w or 150w-151s	Advanced Bacteriology (Cred. ar.; jr., sr., grad.; pre- req., see instructor)	VII, VIII	TTh	MH	Ar

COLLEGE OF EDUCATION

PLANT PATHOLOGY AND BOTANY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Introductory Courses

No.	Title	Hour	Day	Bldg.	Instructor
if	Plant Pathology (5 cred.; jr., sr.; prereq., Bot. 9 cred.)	VII, VIII, IX	MWF	1,2PP	Mr. Stakman, Mr. Christensen, Mr. Peterson
7w-8s	Weeds and Grasses (6 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	III IV	TThS TS	3PP 3PP	Mr. Larson
9f	Weeds and Seed Testing (3 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	III IV	TThS TS	3,4PP 2,4PP	Mr. Larson
10f	Forest Pathology (5 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	VII, VIII, IX	MWF	1,2PP	Mr. Stakman, Mr. Lindgren
10s	Forest Pathology (Same as 10f)	I I, II	MWF TThS	1PP 1,2PP	Mr. Stakman, Mr. Lindgren
12w	Seed Problems (3 cred.; jr., sr.; prereq., 9)	Ar	Ar	Ar	Mr. Larson
14s	Plant Disease Control (3 cred.; jr., sr.; prereq., 1, Ent. 3)	Ar	Ar	Ar	Mr. Christensen
105f-106w- 107s	Mycology (9 cred.; jr., sr.; prereq., 1, 10, or equiv.)	VI, VII, VIII	TTh	4,2PP	Mr. Freeman, Miss Dossdall
108f	Methods (3 cred.; jr., sr., prereq., 1 or 10, Bact. 51)	Ar	Ar	Ar	Mr. Leach
110w	Principles of Pathology (4 cred.; jr., sr.; prereq., 1 or 10, Bact. 51)	III, IV	MWF	1,2PP	Mr. Stakman, Mr. Henry
111w	Diseases of Field Crops (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	1,2PP	Mr. Stakman, Mr. Christensen
112	<i>Diseases of Fruit Crops</i> (3 cred.; jr., sr.; prereq., 1 or 10)	<i>Not offered in 1927-28</i>			
113s	Diseases of Vegetable Crops ... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	Ar	Mr. Leach
114s	Advanced Forest Pathology ... (3 cred.; jr., sr.; prereq., 1 or 10)	Ar	Ar	Ar	Mr. Stakman, Mr. Lindgren
116f	Pathological Histology (3 cred.; jr., sr.; prereq., 1 or 10)	III, IV	MWF	1,2PP	Mr. Leach

PROGRAM

BOTANY

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation, 31 credits in botany as follows: Courses 1-2, 7, 21, 22, and either 12 and 13 or 62 and 63; Course 51 advised.

Minor recommendation in botany 20 credits as follows: Courses 1-2, 7, and either 21 or 22; Course 51 advised.

No.	Title	Hour.	Day	Bldg.	Instructor
1f-2w†	General Botany				
	(10 cred.; all; no prereq.)				
	Lect. and quiz	VI, VII	TTh	BotAud	Mr. Huff
	Lab. Sec. 1	I, II	MWF	1,4,5,8Bot	
	2	III, IV	MWF		
	3	VI, VII	MWF		
	4	I, II	TThS		
1w-2s†	General Botany				
	(See 1f-2w)				
	Lect. and quiz	{ III, IV	T	BotAud	Mr. Huff
	Lab.	{ III	ThS		
		III, IV	MWF	1,4,5,8Bot	
1s-(2f)†	General Botany				
	(See 1f-2w)				
	Lect. and quiz	{ I	T	BotAud	Mr. Huff
	Lab.	{ II	TThS		
		I, II	MWF	1,4,5,8Bot	
(1s)-2f†	General Botany				
	(See 1f-2w)				
	Lect. and quiz	{ I	T	BotAud	Mr. Huff
	Lab.	{ II	TThS		
		I, II	MWF	1,4,5,8Bot	
7s	Taxonomy of Flowering Plants (3 cred.; all; prereq., 2)	I, II	MWF	1,4,5,8Bot	Mr. Rosendahl
12s	Morphology of Algae	I, II	TThS	110Bot	Miss Tilden
13	<i>Morphology of Fungi</i>	<i>Not offered in 1927-28</i>			
21f,s	Elementary Ecology	III, IV	MWF	214Bot	Mr. Cooper
22f,w	Elementary Plant Physiology .. (3 cred.; all; prereq., 2)				
	Lect.	III	Th	102Bot	Mr. Harvey
	Lab.	III, IV	TS		
23f,w	Bryophytes and Pteridophytes .. (3 cred.; all; prereq., 2)	VI, VII	MWF		Mr. Huff
51f	Histological Methods	I, II	MTWTThF		Miss Thompson
	(3 cred.; jr., sr.; prereq., 15 cred.)				

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

() Numbers in parentheses do not refer to the year 1927-28.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
63s	Gymnosperms and Angiosperms (3 cred.; jr., sr.; prereq., 7 or 23)	III, IV	MWF	Ar	Mr. Butters
101f,w	Elementary Biometry (3 cred.; jr., sr., grad.; prereq., 18 cred., biol. sci.)	I, II	MWF	202Bot	Mr. Harris
108w	Pteridophytes (5 cred.; sr., grad.; prereq., 7 and 23)	Ar	Ar	Ar	Mr. Butters
110	<i>Gymnosperms</i> (5 cred.; sr., grad.; prereq., 7 and 63)	<i>Not offered in 1927-28</i>			
113f-114w-115s§	Adv. Taxonomy of Flowering Plants (9 cred.; jr., sr., grad.; prereq., 15 cred. incl. 7)	VI, VII, VIII	TTh	303Bot	Mr. Rosendahl
118w	Cytology (5 cred.; jr., sr., grad.; prereq., 18 cred.)	I, II	MTWThF	303Bot	Mr. Rosendahl
125s,126f	Morphology and Taxonomy of Marine Algae (3 to 5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12, or consent of instructor)	Lect. III Lab. III, IV	Th TS	110Bot	Miss Tilden
127s	Anatomy of Vascular Plants (5 cred.; jr., sr., grad.; prereq., 18 cred.)	Lect. I Lab. Ar	MWF Ar	Ar	Mr. Butters
131f	Field Ecology (5 cred.; jr., sr., grad.; prereq., 21)	VI, VII, VIII	MWF	214Bot	Mr. Cooper
132w	Ecological Anatomy (5 cred.; jr., sr., grad.; prereq., 21)	VI, VII, VIII	MWF	214Bot	Mr. Cooper
133	<i>Forest Geography of North America</i> (5 cred.; jr., sr., grad.; prereq., 21)	<i>Not offered in 1927-28</i>			
134s	Research Methods in Ecology (5 cred.; jr., sr., grad.; prereq., 21)	VI, VII, VIII	MWF	214Bot	Mr. Cooper
140f,w	General Plant Physiology (5 cred.; jr., sr., grad.; prereq., 22, Elem. Inorg. Chem.)	VI, VII	MTWThF	102Bot	Mr. Harvey
141f	Physical Phases of Plant Physiology (5 cred.; sr., grad.; prereq., 22, 140, org. chem.)	I, II	MTWThF	101Bot	Mr. Harvey
142w	Plant Metabolism (5 cred.; sr., grad.; prereq., 22, 140, org. chem.)	I, II	MTWThF	101Bot	Mr. Harvey

§ Any quarter may be taken separately.

PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
143s	Plant Metabolism Continued ... (5 cred.; sr., grad.; prereq., 22, 140, org. chem.)	1, II	MTWThF	101Bot	Mr. Harvey
144s	Plant Microchemistry (5 cred.; sr., grad.; prereq., 22, 140, org. chem.)	Ar	Ar		Mr. Harvey
145f, 146w, 147§	Advanced Biometry (9 cred.; sr., grad.; prereq., 101)	III, IV	MWF	202Bot	Mr. Harris
149s, 150su, 151f§	Freshwater Algae (3 to 10 cred. per qtr.; jr., sr., grad.; prereq., 15 cred. incl. 12, or consent of instructor)	VI, VII, VIII	TTh	110Bot	Miss Tilden

CHEMISTRY

Major Adviser: I. W. Geiger

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation: Courses Inorganic Chemistry 6, 7, 8, or 9, 10, 12, 13; Analytical Chemistry 1, 2; Organic Chemistry 51, 52.

Minor recommendation: Courses Inorganic Chemistry 6, 7, 8, or 9, 10, 12, 13; Analytical Chemistry 1 and 2, or 7 and 6 additional credits in chemistry.

For teacher's certificate in natural science see Specialized Curriculum Part I of Education bulletin.

INORGANIC CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†-3s	Gen. Inorg. Chemistry (pre-med. and pre-dent.) (12 cred.; pre-dent., pre-med.; no prereq.)				
	Lect.	VI	MWF	225C	Mr. Reyerson
	Lab. Sec. 1	VI, VII	TTh	110C	Mr. Reyerson
	2	VIII, IX	TTh		and assistants
4f-5w†	Gen. Inorg. Chemistry (pre-med. and pre-dent.) (8 cred.; pre-dent., pre-med. only; prereq., entrance cred. in chem.)				
	Lect.	VI	MWF	100C	Mr. Stephens
	Lab. Sec. 1	VI, VII	TTh	210C	Mr. Stephens
	2	VIII, IX	TTh		and assistants
6f-7w†-8s	Gen. Inorg. Chemistry (15 cred.; those entering without chem.; no prereq.)				
	Lect.	II	MWF	225C	Miss Cohen
	Lab.	I, II, III	ThS	210C	Miss Cohen
					and assistants
9f-10w†	Gen. Inorg. Chemistry (10 cred.; all; prereq., entr. cred. in chem.)				
	Lect.	II	MWF	100C	Mr. Sneed
	Lab.	I, II, III	ThS	290C	Ar

§ Any quarter may be taken separately.

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
9w-10s†	Gen. Inorg. Chemistry (See 9f-10w)	Lect. III Lab. VIII, IX	MWF MWF	100C 290C	Mr. Kirk Ar
11f	Qual. Chemical Anal. (pre-med. and pre-dent.) (4 cred.; pre-med. and pre-dent. only; prereq. 3 or 5)	Lect. IV Lab. VI, VII	MWF MW	225C 290C	Miss Cohen Miss Cohen and assistants
11s	Qual. Chemical Anal. (Pre-med. and pre-dent.) (See 11f)	Lect. VI Lab. Sec. 1 VI, VII 2 VIII, IX	MWF TTh TTh	100C 210C 210C	Mr. Stephens Mr. Stephens
12f-13w†	Qual. Chemical Analysis (10 cred.; all; prereq., 8 or 10)	Lect. I Lab. VI, VII, VIII	TThS MW	325C 290C	Mr. Maynard
	Fall	Lect. I Lab. VI, VII, VIII	TThS MW	325C 290C	
	Winter	Lect. I Lab. VI, VII, VIII	TTh MWF	325C 290C	
12s†	Qual. Chemical Anal. (See 12f-13w†)	Lect. II Lab. I, II, III	MWF ThS	100C 290C	Mr. Sneed Mr. Sneed and assistants
13f†	Qual. Chemical Anal. (See 12f-13w†)	Lect. VI Lab. VII, VIII, IX VI, VII, VIII	MW MW F	111C 290C	Mr. Kirk
101s	History of Chemistry (2 cred.; sr., grad.; prereq., Org. Chem. 52)	Ar	Ar	Ar	Miss Cohen
102w	Adv. Qual. Chemical Anal. (2 or 3 cred.; jr., sr., grad.; prereq., Anal. Chem. 1, 2, Org. Chem. 52)	Ar	Ar	290C	Mr. Sneed
103f-104w-105s	Adv. Inorg. Chemistry (3 to 9 cred.; jr., sr., grad.; prereq., Anal. Chem. 1, 2, Org. Chem. 52)	IV	MWF	111C	Mr. Sneed
106f-107w-108s	Chemistry of the Rare Elements (3 cred.; jr., sr., grad.; prereq., quant. anal. or permission of instructor)	Ar	Ar	Ar	Mr. Kirk

ANALYTICAL CHEMISTRY

1w-2s*	Quant. Analysis (10 cred.; soph., jr., sr.; prereq., Inorg. Chem. 12-13)	Lect. VI Rec. VI Lab. VII-IX VI-IX	M F MF W	325C 315C 310C 310C	Mr. Geiger
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† Two quarters must be completed before credit is received for either quarter.

* Course 2s may precede 1w, if desired.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor			
7f	Quant. Analysis (pre-med.) (4 cred.; pre-med. only; prereq., Inorg. Chem. 11 or 13) (Limit 30)	Lect. Sec. 1	VI	M	325C	Mr. Geiger		
		Rec.	VI	W	315C			
		Lab.	VII-IX	MW	310C			
		(Limit 30)	Lect. Sec. 2	VI	M	325C	Mr. Geiger	
				Rec.	VI	M		315C
				Lab.	VII-IX	MF		310C
			Lect. Sec. 3	VI, VII	W	310C	Mr. Sarver	
				VI	Th	315C		
				I	S	315C		
		7w,s	Quant. Analysis (See 7f)	VI, VII, VIII	T	310C	Mr. Sarver	
				II, III	S	310C		
				VII-IX	Th	310C		
VI	Th			315C				
I	S			410C				
VII-IX	Th			310C				
123f-124w-125s	Adv. Analytical Chemistry (3 to 9 cred.; jr., sr., grad.; prereq., 1, 2, or 7)	VI, VII, VIII	T	310C	Mr. Sarver			
		II, III	S	310C				
		VI	T	315C				
		VII-IX	T	310C				
127f-128w-129s	Analytical Chemistry of Rare Elements (9 cred.; jr., sr., grad.; prereq., 1, 2)	VI-IX	Th	310C	Mr. Geiger			
		Ar	Ar	Ar				

ORGANIC CHEMISTRY

1f-2w†	Elem. Organic Chemistry* (8 cred.; pre-dent., pharm.; pre- req., Inorg. Chem. 11)	Lect.	I	MWF	100C	Mr. Lauer
		Lab. conference	II	Th	225C	Mr. Lauer
		Quiz	I	Th	Ar	
		Lab. Sec. 1	I-IV	T	390C	
			I-IV	S	390C	
			VI-IX	M	390C	
			VI-IX	T	390C	
			VI-IX	W	390C	
			VI-IX	Th	390C	
			VI-IX	F	390C	

* For pre-dent. and pharm. only. Others must have permission of the instructor in order to enter this course.

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
6w-7sf	Elem. Organic Chemistry* (8 cred.; pre-med.; prereq., Inorg. Chem. 11)				
	Lect.	IV	MWF	100C	Mr. Smith
	Lab. conference	III	T	100C	Mr. Smith
	Quiz	IV	T	Ar	
	Lab. Sec. 1	VI-IX	M	390C	
	2	VI-IX	T	390C	
	3	VI-IX	W	390C	
	4	VI-IX	Th	390C	
	5	VI-IX	F	390C	
	6	I-IV	S	390C	
51f-52wf-53s	Organic Chemistry (10 or 15 cred.; jr., sr.; prereq., 15 cred. in college chem.)				
	Lect.	III	MWF	325C	Mr. Hunter
	Rec.	III	Th	111C	Mr. Lauer
	Lab.	VI-VIII	TTh	390C	Mr. Lauer

For advanced courses in Organic Chem., see bulletin of the School of Chemistry.

PHYSICAL CHEMISTRY

101f-102w-103s	Physical Chemistry (9, 12, or 15 cred.; jr., sr., grad.; prereq., 2 yrs. col. chem., 1 yr. col. phys.)				Mr. MacDougall
	Lect.	IV	MWF	325C	
	Lab.	VI-VIII	F	15C, 117C	
	Rec.	IV	S	115C	
110f,w	Physical Chemistry (medic.) ... (4 cred.; pre-med. and biol. stu- dents; prereq., Org. Chem. 7)				
	Lect.	VI	TTh	225C	Mr. Taylor
			F	325C	
	Lab. Sec. 1	I-III	MW	15C	
	2	VII-IX	TTh	117C	
116f-117w-118s	Adv. Physical Chem. (9 or 12 cred.; jr., sr., grad.; prereq., 103 and calculus)	Ar	Ar	Ar	Mr. Taylor
120	<i>Prin. of Colloidal Chemistry</i> ... (2 cred.; sr., grad.; prereq., 102)	<i>Not offered in 1927-28</i>			
130	<i>Appl. of Colloidal Chemistry</i> ... (2 cred.; sr., grad.; prereq., 102)	<i>Not offered in 1927-28</i>			
131-132-133	<i>Colloid Chemistry Lab.</i> (Cred. ar.; sr., grad.; prereq., 129 or 130)	<i>Not offered in 1927-28</i>			
144s	Magnetochemistry (3 cred.; jr., sr., grad.; prereq., 103)	Ar	Ar	Ar	Mr. Taylor

TECHNOLOGICAL CHEMISTRY

100f-101w-102s	Food Analysis (9 cred.; jr., sr., grad.; prereq., Anal. Chem. 1, 2)				
	Lect.	III	F	215C	Mr. Stoppel
	Lab.	VI-VIII	TF	217C	Mr. Stoppel

* For pre-medic. only. Pre-dent. and others must have permission of the instructor to enter this course.

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

PROGRAM

AGRICULTURAL BIOCHEMISTRY

Major Adviser: R. A. Gortner

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
2f	Quantitative Methods (5 cred.; jr., sr.; prereq., Chem. 10 cred.)	VI, VII, VIII, IX	MWF	108BCh	Mr. Franke
3f-4w	Types of Carbon Compounds . . (6 cred.†; soph., jr., sr.; prereq., Chem. 10 cred.) (Limited to 40 each)	Sec. 1 I 2 I	MWF	113BCh	Mr. Bailey
3w-4s	Types of Carbon Compounds . . (Same as 3f-4w) (Limited to 40)	I	MWF	113BCh	Mr. Sandstrom
7f-8w	General Agricultural Biochemistry (10 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)	Lect. II Lab. VII, VIII, IX	TThS MW	113BCh 102BCh	Mr. Willaman
7w-8s	General Agricultural Biochemistry (Same as 7f-8w)	Lect. III Lab. VII, VIII, IX	TThS MF	113BCh 108BCh	Mr. Willaman
9w-10s	General Biochemistry for Students in Forestry (10 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)	Lect. VI Lab. VII-IX	MWF WF	116BCh 102BCh	Mr. Franke
15f	Principles of Animal Nutrition . . (3 cred.; jr., sr.; prereq., 7-8)	III	MWF	116BCh	Mr. Palmer
101f-102w	Agricultural Quantitative Analysis (6 cred.; jr., sr.; prereq., 7-8)	VI, VII, VIII	MWF	208BCh	Mr. Bailey
103s	Dairy Chemistry (5 cred.; jr., sr.; prereq., 7-8)	Lect. VI Lab. VII, VIII, IX	MWF MWF	116BCh 208BCh	Mr. Palmer
106f,w,s	Biochemistry in Industry (1 cred.‡; jr., sr.; prereq., org. chem.)	Ar	Ar	Ar	Mr. Bailey, Mr. Willaman
108s	Chemistry of Wheat and Wheat Products (3 cred.; jr., sr.; prereq., 3-4 or 7-8)	I	MWF	116BCh	Mr. Bailey
110s	Flour Laboratory Methods (3-5 cred.; jr., sr.; prereq., 101-102 or Technol. Chem. 100-101-102)	VI, VII, VIII, IX	MWF	202BCh	Mr. Bailey
111f-112w	Phytochemistry (6 cred.; sr.; prereq., Biol., 9 cred., org. chem.)	III VI	MWF Th	113BCh 113BCh	Mr. Gortner

† The full course must be completed before credit will be given.

‡ A total of not more than 6 credits may be earned in this course.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
110f	Economics of Agricultural Production I	I	TThS	206Da	Mr. Black
	(3 cred.; jr., sr.; prereq., 2)				
111w	Economics of Agricultural Production II	I	TThS	108Da	Mr. Black
	(3 cred.; jr., sr.; prereq., 110)				
126s	Economics of Consumption				
	(3 cred.; jr., sr.; prereq., 1)				
	Sec. 1	I	MWF	204Da	Mr. Waite
	2	IV	MWF	108Da	
130f	Prices of Farm Products	II	TThS	204Da	
	(3 cred.; jr., sr.; prereq., 2)				
131w	Market Prices	III	TThS	206Da	Mr. Waite
	(3 cred.; jr., sr.; prereq., 140)				
125s	Methods of Forecasting Prices ..	III	TThS	108Da	Mr. Waite

CHILD WELFARE

Major Adviser: J. E. Anderson

No.	Title	Hour	Day	Bldg.	Instructor
40w*	Child Training	IV	MW	206aP	Mr. Anderson, Mrs. Foster
	(3 cred.; jr., sr.; prereq., Psy. 1-2)	and one hour ar			
50w-51s†	Nursery School Methods	VI	MWF	114F	Mrs. Foster
	(6 cred.; jr., sr.; prereq., 60 and 6 cred. in psy. or ed.)				
52f-53w-54s†	Nursery School Technique	Ar	Ar	105CWI	Mrs. Foster
	(6 cred.; jr., sr.; prereq., 50-51 and permission of instructor)				
60f	The Nursery School and Parental Education Movement	IV	TS	110P	Miss Dixon
	(2 cred.; jr., sr.; prereq., 6 cred. in psy. and 5 cred. in soc. sci.)				
120s	Health Care of the Young Child	Ar	Ar	4CWI	Dr. Boyd
	(2 cred.; sr., grad.; prereq., 50-51 and 60 and permission of the instructor)				
130s	The Development of the Young Child	I	TThS	111OL	Mr. Anderson
	(3 cred.; sr., grad.; prereq., 12 cred. in psy. or equivalent, and permission of instructor)				
133f-134w-135s	Methods of Study of Development of Young Children	I	T	201CWI	Miss Good-enough
	(4 or 6 cred.; sr., grad.; prereq.; 10 cred. in psy. or ed. psy. incl. 4-5 or 7)	I, II	Th		
170f	Parental Education in Child Care and Training	IV	MWF	110P	Miss Dixon
	(3 cred.; sr., grad.; prereq., 52-53-54, or H.E. 34, 35, and 44, or 15 cred. in ed. or psy., or soc., or prev. med.)				

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

* Offered fall and spring as Home Economics Education 40. Consult bulletin of the College of Agriculture, Forestry, and Home Economics.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
173W-174S†	Technique and Practice of Parental Education (6 cred.; sr., grad.; prereq., and permission of instructor)	Ar	Ar	100CWI	Miss Dixon
190F-191W	Mental Examination of Pre-School Children (4 cred.; sr., grad.; prereq., Ed. Psy. 143-144-145 or 134-135-136 or equivalent, and permission of instructor)	III	TTh	201CWI	Miss Good-enough

COMPARATIVE LITERATURE

No.	Title	Hour	Day	Bldg.	Instructor
101F-102W-103S†	Drama (9 cred.; jr., sr., grad.; prereq., jr. col. requirement in Eng. and foreign lang.)	III	TThS	113F	Mr. Firkins
105F-106W-107S†	Criticism (9 cred.; jr., sr., grad.; prereq., jr. col. requirement in Eng. and foreign lang.)	VI	MWF	113F	Mr. Firkins
110W	Romantic Movement (3 cred.; jr., sr., grad.; prereq., permission of instructor)	II	TThS	113F	Mr. Firkins

COMPARATIVE PHILOLOGY

No.	Title	Hour	Day	Bldg.	Instructor
101-102†	<i>Science of Language</i> (4 cred.; jr., sr., grad.; prereq., see note)	<i>Not offered in 1927-28 (except for graduates)</i>			
103	<i>Universal Language</i> (2 cred.; jr., sr., grad.; prereq., see note)	<i>Not offered in 1927-28</i>			
105S	Life of Words (2 cred.; jr., sr., grad.; prereq., see note)	VI	TTh	217F	Mr. Klaeber
108S	Comparative Phonetics (3 cred.; jr., sr., grad.; prereq., see note)	Ar	Ar	Ar	Mr. Kroesch
109F-110W-111S†	History of German Lang. (6 cred.; jr., sr., grad.; prereq., see note)	Ar	Ar	Ar	Mr. Klaeber
141F-142W-142S†	Hist. Gram. of Eng. Lang. (6 cred.; jr., sr., grad.; prereq., see note)	Ar	Ar	Ar	Mr. Klaeber

NOTE.—Prerequisite for all courses, one of the following groups: (1) five years' foreign language; four may be in high school and one in college; (2) two years' foreign language in college; (3) 4 credits in Old English.

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

COLLEGE OF EDUCATION

DRAWING AND DESCRIPTIVE GEOMETRY
COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
41-42-43f.w.s	Technical Drawing			455C	Mr. Kirchner, Mr. Doseff
	(6 cred.; all; no prereq.)				
	Sec. 1	I, II	MWF	(fall, winter)	
		I, II	TThS	(spring)	
	2	III, IV	MWF		
	3	VIII, IX	MWF		
44f.w.s	Lettering				
	(1 cred.; all; no prereq.)				
	Sec. 1	IV	T	36EE	Mr. Schuck,
	2	II	Th		Mr. Levens
45f.w.s	Alphabets	II	TTh	206E	Mr. Kirchner
	(2 cred.; soph., jr., sr.; no pre- req.)				
87f	Introduction to the Graphic Arts	IV	MW	Ar	Mr. Kirchner
	(2 cred.; jr., sr.; prereq., 15 cred. of econ.)				
88w	Printing Types and Lettering ..	IV	MW	Ar	Mr. Kirchner
	(2 cred.; jr., sr.; prereq., 87)				
89s	The Picture and the Printed Word	IV	MW	Ar	Mr. Kirchner, Mr. Levens
	(2 cred.; jr., sr.; prereq., 88)				

ECONOMICS

Major Adviser: R. A. Stevenson

No.	Title	Hour	Day	Bldg.	Instructor
if-2w†*	Introduction to Economics				Mr. Black and others
	(10 cred.; pre-bus. fr.; no pre- req.)				
	Lect.	III	Th	OLAud	
	Sec. 1	I	TThFS	204B(fall) 107F(winter)	
	2	I	TThFS	1B	
	3	II	TThFS	6B(fall) 210P(winter)	
	4	II	TThFS	1B	
	5	III	MWFS	204B(fall) 306F(winter)	
	6	III	MWFS	202B(fall) Ar(winter)	
	7	IV	MWFS	109B(fall) Ar(winter)	
	8	IV	MWFS	Ar	
	9	V	MTWF	6B	
	10	V	MTWF	209B	
	11	VI	MWThF	204B	
	12	VII	MWThF	209B	
	13	VII	MWThF	6B	
	14	VIII	MWThF	6B	
	15	IX	MWThF	102B	

* Open to pre-business students only.

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
1w-2s†*	Introduction to Economics (See 1f-2w)	Lect. IV Sec. 1 III 2 V	T TThFS MTWF	202B 1B 204B	Mr. Black and others
1s-(2f)†*	Introduction to Economics (See 1f-2w)	Lect. III Sec. 1 II 2 VII	W TThFS MWThF	301F 1B 204B	Mr. Black and others
(1s)-2f†*	Introduction to Economics (See 1f-2w)	I	TWThFS	109B	Mr. Black and others
3f	The Mechanism of Exchange .. (5 cred.; 3d qtr. fr., soph., jr., sr.; no prereq.)	Lect. III Sec. 1 I 2 II	TTh TThS MWF	202B 6B 102B	Mr. Stehman and others
3w	The Mechanism of Exchange .. (5 cred.; 3d qtr. fr., soph., jr., sr.; no prereq.)	Lect. III Sec. 1 II 2 III 3 VI	TTh MWF MWF MWF	202B 102B 202B 6B	Mr. Stehman and others
3s	The Mechanism of Exchange .. (See 3w)	Lect. III Sec. 1 I 2 I 3 II 4 II 5 III 6 IV 7 IV 8 V 9 VI 10 VII	TS TThS MWF MWF TThS MWF MWF MWF MWF MWF MWF	OLAud 6B 209B 102B 209B 204B 209B 6B 202B 202B 6B	Mr. Stehman and others
4f*	Principles of Economics—Pre- Business Course (5 cred.; soph., pre-bus. only; prereq., 1-2)	Lect. II Sec. 1 II 2 III 3 IV 4 V 5 VI 6 VII	Th MWFS TThFS MWFS MTWF MWThF MWThF	301F 109B 6B 102B 202B 6B 102B	Mr. Hansen and others
4w*	Principles of Economics—Pre- Business Course (See 4f)	IV	MTWFS	102B	Mr. Hansen and others

* Open to pre-business students only.

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

() Numbers in parentheses do not refer to the year 1927-28.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
45*	Principles of Economics—Pre-Business Course (See 4f)	Lect. II Sec. 1 II 2 III 3 V	Th MWFS TThFS MTWF	202B 202B 6B 109B	Mr. Hansen and others
6f-7w†‡	Principles of Economics—General Course (10 cred.; soph., jr., sr.; no prereq.)	Lect. III Sec. 1 II 2 IV 3 V 4 VI	W TThFS MWFS MTWF MWThF	301F 209B(fall) 209B 109B 102B(fall)	6B(winter) 209B(winter)
6w-7s†‡	Principles of Economics—General Course (See 6f-7w)	Lect. II Sec. 1 I 2 II 3 IV 4 V 5 VI	T TThFS MWFS MWFS MTWF MWThF	301F 204B(w) 204B(winter) 109B(w) 102B 202B(winter)	102B(spring) 6B(spring) 202B(spring) 102B 6B(spring)
6s-(7f)†‡§	Principles of Economics—General Course (See 6f-7w)	Lect. III Sec. 1 II 2 IV 3 VI	W TThFS MWFS MWThF	202B 204B 109B 204B	Mr. Hansen and others
(6s)-7f†‡	Principles of Economics—General Course (See 6f-7w)	Lect. IV Sec. 1 II 2 IV	T MWFS MWFS	202B 204B 6B	Mr. Hansen and others
14f	Elements of Statistics (5 cred.; soph., jr., sr.; prereq., 4 or 6-7)	III	MTThFS	109B	Mr. Mudgett and others
14w	Elements of Statistics (See 14f)	Sec. 1 III 2 IV	MTThFS MTWFS	204B 6B	Mr. Mudgett and others
14s	Elements of Statistics (See 14f)	Sec. 1 I 2 II 3 III 4 IV 5 VI	TWThFS MTWThFS MTThFS MTWFS MTWThF	301B 301B 301B 301B 301B	Mr. Mudgett and others

* Open to pre-business students only.

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

‡ Not open to pre-business students.

§ Open with permission to third quarter pre-legal freshmen.

() Numbers in parentheses do not refer to the year 1927-28.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
25f-26w†*	Principles of Accounting (8 cred.; soph., jr., sr.; no pre-req.)				Mr. Heilman and others
	Lect. Sec. 1	I	MWF	301B	
		2	TThS	301B	
		3	MWF	301B	
		4	TThS	301B	
		5	MWF	301B	
		6	MWF	301B	
		7	MWF	301B	
		8	MWF	301B	
	Laboratory sections to be ar- ranged.				
25w-26s†*	Principles of Accounting (See 25f-26w)				Mr. Heilman and others
	Lect. Sec. 1	I	TThS	302B	
		2	MWF	303B	
		3	MWF	302B	
		4	MWF	302B	
	Laboratory sections to be ar- ranged.				
25s-(26f)†*	Principles of Accounting (See 25f-26w)				Mr. Heilman and others
	Lect. III		MWF	303B	
	Lab. VII-VIII		W	303B	
54f‡	Accounting Survey I (3 cred.; jr., sr.; prereq., 6-7)				Mr. Heilman and others
	Sec. 1	II	MWF	303B	
		2	TThS	301B	
55w‡	Accounting Survey II (3 cred.; jr., sr.; prereq., 54)				Mr. Heilman and others
	Sec. 1	II	MWF	109B	
		2	TThS	301B	
85f‡	Economics of Marketing (3 cred.; jr., sr.; prereq., 6-7)				Mr. Vaile
		II	MWF	202B	
85w‡	Economics of Marketing (See 85f)				Mr. Vaile
		II	MWF	209B	
103f-104w†	Value and Distribution (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 6-7)				Mr. Garver
		II	TThS	202B	
105	History of Economic Ideas (The Classical Economists) (3 cred.; jr., sr., grad.; prereq., 103-104)				Not offered in 1927-28
106s	History of Economic Ideas (The Critics of the Classical Econ- omists) (3 cred.; jr., sr., grad.; prereq., 105 or permission of in- structor)				Mr. Hansen
		IV	MWF	102B	

* Open to pre-business students only.

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

() Numbers in parentheses do not refer to the year 1927-28.

‡ Not open to School of Business Administration students.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
108w	Marketing Organization: Agricultural Products (2 cred.; jr., sr., grad.; prereq., 8s. Not open to agr. bus. stud.)	VIII	MWF	102B	Mr. Price
113w-114s	Theory of Statistics (6 cred.; jr., sr., grad.; prereq., 14)	I	MWF	6B	Mr. Mudgett
141f	Monetary and Banking Policy .. (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)				Mr. Stehman and others
	Sec. 1	I	MWF	209B	
	2	III	TThS	209B	
	3	IV	MWF	204B	
	4	VI	MWF	209B	
141w	Monetary and Banking Policy .. (See 141f)				Mr. Stehman and others
	Sec. 1	I	MWF	102B	
	2	II	TThS	102B	
	3	IV	MWF	204B	
141s	Monetary and Banking Policy .. (See 141f)				Mr. Stehman and others
	Sec. 1	II	MWF	209B	
	2	VII	MWF	209B	
142f	Comparative Banking (3 cred.; jr., sr., grad.; prereq., 141)	III	MWF	104B	Mr. Myers
149f	Business Cycles (3 cred.; sr., grad.; prereq., 3 and 4 or 6-7)	IX	MTW	202B	Mr. Ebersole
149w	Business Cycles (See 149f)				
	Sec. 1	III	MWF	6B	Mr. Myers
	2	IX	MTW	202B	Mr. Ebersole
149s	Business Cycles (See 149f)	III	MWF	102B	Mr. Myers
154s	Public Utilities (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Econ. 4 or 6-7)	II	TThS	102B	Mr. Garver
160w‡	The Modern Corporation (3 cred.; jr., sr., grad.; prereq., 3, and 6-7)				Mr. Stehman
	Lect.	IV	M	OLAud	
	Sec. 1	II	WF	202B	
	2	III	WF	109B	
	3	IV	TS	204B	
161f	Labor Problems and Trade Unionism (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	IV	MWF	202B	Mr. Hansen
161w	Labor Problems and Trade Unionism (See 161f)	III	TThS	109B,6B	Mr. Hansen

‡ Not open to School of Business Administration students.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
162w	Labor Movements (3 cred.; jr., sr., grad.; prereq., 161)	IV	MWF	202B	Mr. Hansen
163	<i>Economic Aspects of Population and Immigration</i> (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	<i>Not offered in 1927-28</i>			
164s	Labor Legislation and Social Insurance (3 cred.; jr., sr., grad.; prereq., 161)	III	TThS	109B	Mr. Stead
170s	Land Economics (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	2:30-4:00	TTh	209B	Mr. Black
172f	Economics of Transportation ... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	Sec. 1 VI 2 VII	MWF	202B	
172w	Economics of Transportation ... (See 172f)	VI	MWF	102B	
172s	Economics of Transportation ... (See 172f)	VII	MWF	202B	
174s	Transportation Problems (3 cred.; jr., sr., grad.; prereq., 172)	VI	MWF	102B	
176f	Commercial Policies (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	I	MWF	202B	Mr. Blakey
176s	Commercial Policies (See 176f)	I	MWF	202B	Mr. Blakey
187s	Market Prices (3 cred.; grad., sr. by permission; prereq., 101-102 or 103-104)	VIII-IX½	WF	104B	Mr. Vaile, Mr. Garver
191f-192w†	Public Finance (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	III	MWF	209B	Mr. Blakey
192s	State and Local Taxation (3 cred.; jr., sr., grad.; prereq., 191-192)	III	MWF	209B	Mr. Blakey

ENGLISH

Major Advisers: C. W. Nichols, Rewey B. Inglis

REQUIREMENTS OF THE DEPARTMENT

For teacher's certificate in English—

- a. English as the major subject: English 6 and 8, either 44-45 or 62, and six additional credits from Courses 44-45 50, 62, and courses numbered 100 and above; Composition 11-12, or 18-19, and 20; Speech 41-42-43 or 45-46.

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

COLLEGE OF EDUCATION

- b. English as a minor subject: English 6 and 8 and either 44-45 or 62; Composition 11-12, or 18-19, and 20.
- c. Speech as the minor subject: a student must satisfy the department that he is actively interested in some phase of public speaking either as a member of a literary or debating society or a participant in a contest or dramatic performance, or as a lecturer; he must complete the following courses: Speech 41-42-43, and 9 additional hours in public speaking.

No.	Title	Hour	Day	Bldg.	Instructor
Af-Bw-Cs	Freshman English	See	Composition		
21f-22w-23s*	Introduction to Literature (15 cred.; all; prereq.§)				
	Sec. 1	III	MTThFS	301F	Mr. Thomas
	2	VII	MTWThF	301F	Miss Jackson
31f-32w†	The English Novel	VI	MWF	301F	Mr. Hillhouse
	(6 cred.; all; prereq.§)				
33s	The Later English Novel	VI	MWF	301F	Mr. Hillhouse
	(3 cred.; all; prereq.§)				
51w	Spenser	VI	MWF	205F	Mr. Stoll
	(3 cred.; jr., sr.; prereq., 21-22 or 55-56)				
53	<i>Seventeenth-Century Lyrists</i> ...	<i>Not offered in 1927-28</i>			
	(4 cred.; jr., sr.; prereq., 21-22, or 55-56)				
55f-56w†	Shakespeare				
	(6 cred.; jr., sr.; prereq.‡)				
	Sec. 1	I	TThS	204F	Miss Jackson, Mr. Dunn
	2	VI	MWF	204F	Mr. Hillhouse
55w-56s†	Shakespeare	IV	MWF	205F	Mr. Hessler, Mr. MacLean
	(See 55f-56w)				
55s-(56w)†	Shakespeare	V	MWF	205F	Mr. Nichols
	(See 55f-56w)				
58f-59w†	Nineteenth-Century Prose	II	TThS	204F	Mr. Sutcliffe
	(6 cred.; jr., sr.; prereq., C, or 23, or 21-32)				
61s	American Pronunciation	I	MWF	204F	Mr. Ruud
	(3 cred.; jr., sr., prereq.‡)				
62f	Milton	VII	MTWF	204F	Mr. Stoll
	(4 cred.; jr., sr.; prereq., 21-22 or 55-56)				
62w	Milton	VII	MTWF	205F	Mr. Hessler
	(See 62f)				
63	<i>American Usage</i>	<i>Not offered in 1927-28</i>			
	(3 cred.; jr., sr.; prereq.‡)				
69	<i>Browning and Tennyson</i>	<i>Not offered in 1927-28</i>			
	(4 cred.; jr., sr.; prereq.‡)				

* Students may enter any quarter. Students must take two consecutive quarters to receive credit. Two quarters are required as prerequisite for a major sequence or for a teacher's certificate. Three quarters recommended. Limited to students with an average of 2/3 honor point per credit in their previous work, and to students exempt from English A-B-C.

§ English A-B-C, or Composition 4-5-6, or exemption from requirement.

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

‡ English A-B-C, or Composition 4-5-6 and 6 additional credits, or 10 credits in 21-22-23.

() Numbers in parentheses do not refer to the year 1927-28.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
70	<i>Elizabethan Drama</i>	<i>Not offered in 1927-28</i>			
73f-74w†	American Literature	IV	MWF	301F	Mr. Nichols, Miss Jackson
75f	Chaucer				
	(4 cred.; jr., sr.; prereq.‡)				
	Sec. 1	II	MTWF	205F	Mr. Ruud
	2	V	MTWF	204F	Miss Carr
75w	Chaucer	II	MTWF	205F	Mr. Ruud
	(See 75f)				
75s	Chaucer				
	(See 75f)				
	Sec. 1	II	MTWF	205F	Mr. Loveland
	2	V	MTWF	204F	Miss Carr
81-82†	<i>Survey of Middle English</i>	<i>Not offered in 1927-28</i>			
	(6 cred.; jr., sr.; prereq.‡)				
86w-87s†	Forms of English Verse	II	TThS	306F	Mr. Nichols
	(6 cred.; jr., sr.; prereq.‡)				
100f	Old English	III	TThFS	306F	Mr. Ruud
	(4 cred.; jr., sr., grad.; prereq., 8 cred. above 50)				
101f	Middle English	VI	TTh	217F	Mr. Klaeber
	(2 cred.; jr., sr., grad.; prereq., 75 and 100)				
103s	Beowulf	VII, VIII	T	217F	Mr. Klaeber
	(3 cred.; jr., sr., grad.; prereq., 100)	VII	Th		
105w-106s†	Eighteenth-Century Poetry	VII	MWF	204F	Mr. Moore
	(6 cred.; jr., sr., grad.; prereq., 8 credits above 50)				
107-108†	<i>Eighteenth-Century Prose</i>	<i>Not offered in 1927-28</i>			
	(6 cred.; jr., sr., grad.; prereq., 8 credits above 50)				
109f-110w†	Romantic Poets	III	TThS	204F	Mr. Nichols
	(6 cred.; jr., sr., grad.; prereq., 8 credits above 50)				
111f-112w†	Seventeenth-Century Prose	III	MWF	204F	Ar
	(6 cred.; jr., sr., grad.; prereq., 8 credits above 50)				
123-124-125†	<i>Technique of the Novel</i>	<i>Not offered in 1927-28</i>			
	(9 cred.; sr., grad.; prereq., 8 credits above 50 and permis- sion of instructor)				
126-127	<i>Drama, 1660-1880</i>	<i>Not offered in 1927-28</i>			
	(6 cred.; jr., sr., grad.; prereq., 8 credits above 50)				
129s	Modern Drama	II	MTWF	204F	Mr. Stoll
	(4 cred.; jr., sr., grad.; prereq., 55-56)				
133w	Ballads	I	MWF	204F	Mr. Ruud
	(3 cred.; jr., sr., grad.; prereq., 8 credits above 50)				
126s	Advanced Shakespeare	I	MTWF	205F	Mr. Stoll
	(4 cred.; jr., sr., grad.; prereq., 55-56)				

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

‡ English A-B-C, or Composition 4-5-6 and 6 additional credits, or 10 credits in 21-22-23.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
140s	Advanced Chaucer (3 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 75)	I, II	S	217F	Mr. Ruud
141f-142w-143s†	Historical Grammar (6 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 75 or 81-82)	Ar	Ar	Ar	Mr. Klæber
146-147†	<i>Metrical Romances</i> (6 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 75 or 81-82)	<i>Not offered in 1927-28</i>			
148f-149w†	Arthurian Romances (6 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 75 or 81-82)	II	MWF	204F	Miss Carr
150f	Victorian Poetry (4 cred.; jr., sr., grad.; prereq., 8 credits above 50)	VII	MTWF	205F	Mr. Stoll
151s	Recent Poetry (4 cred.; jr., sr., grad.; prereq., 8 credits above 50)	III	TWThS	204F	Miss Jackson
152-153†	<i>Pre-Elizabethan Drama</i> (6 cred.; jr., sr., grad.; prereq., 55-56)	<i>Not offered in 1927-28</i>			
155s	American Novel (4 cred.; jr., sr., grad.; prereq., 73-74)	VI	MTThF	205F	Ar
160w	History of English Language .. (2 cred.; jr., sr., grad.; prereq., 100)	VI	TTh	205F	Mr. Klæber
162f	Restoration Literature (4 cred.; jr., sr., grad.; prereq., 8 credits above 50)	IV	MWF	205F	Mr. Moore
164s	Dante in English (See Italian 164s)				
166s	Bacon and His Contemporaries (3 cred.; jr., sr., grad.; prereq., 55-56)	VI	MWF	204F	Mr. Dunn
171f-172w-173s	Honors Course (Credits arranged; 9 to 27 cred.; prereq., permission of the de- partment)	Ar	Ar	Ar	Ar

COMPOSITION

IMPORTANT NOTE.—Freshman English is a 15-credit course consisting of 9 credits of literature and 6 credits of composition. Composition 4-5-6 is a 9-credit course in composition. Either course satisfies the requirement in English for graduation or for

PROGRAM

admission to the Senior College. Students who register for Freshman English may be required to change their registration to Composition 4-5-6 if their standing in the placement tests of Freshman Week shows that they need the additional training in composition. Students who have already completed one or more quarters of Freshman English should consult the director of the course before registering.

No.	Title	Hour	Day	Bldg.	Instructor	
Af-Bw-Cs	Freshman English (15 cred.; all; no prereq.)	I	TWThFS	Ar	Ar	
		II	MWThFS			
		III	MTThFS			
		IV	MTWFS			
		V	MTWF	W		
		VI	MTWThF			
		VII	MTWThF	(fall, winter)		
		VII	MTThF	W		(spring)
Aw-Bs-(Cf)	Freshman English (15 cred.; all; no prereq.)	II	MWThFS	Ar	Ar	
		IV	MTWFS			
		VI	MTWThF			
(Aw-Bs)-Cf	Freshman English (15 cred.; all; prereq., A-B)	II	MWThFS	Ar	Ar	
		IV	MTWFS			
		VI	MTWThF			
4f-5w-6s	Freshman Composition (9 cred.; all; no prereq.) (Pre-med. only) Sec. 1	I	MWF			
		2	TThS			
		3	TThS			
		(Pre-med. only) 4	II	MWF		
		6	III	TThS		
		7	IV	MWF		
		8	V	MWF		
		9	VI	MWF		
		10	VII	MWF		
		4w-5s-(6su)	Freshman Composition 10s§	II	TThS	311F
V	MWF			302F	Mr. Hillhouse	
	Organization of Source Material (3 cred.; soph., jr., sr.; prereq., A-B-C or 4-5-6 or exemption from requirement)					

() Numbers in parentheses do not refer to the year 1927-28.

§ Students who have taken the prerequisite for this course elsewhere will be allowed to register provisionally, subject to their ability to pass certain tests given during the first recitation of the quarter.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor	
11f-12w†‡§	Description; Narration (6 cred.; soph., jr., sr.; prereq., A-B-C, or 4-5-6 or exemption from requirement)	Sec. 1	II	MWF	304F	Mrs. del Plaine
		2	III	MWF	302F	Mr. Nichols
		3	IV	MWF	305F	Mr. MacLean
		4	V	MWF	305F	Mrs. Phelan
		5	II	TThS	304F	Miss Gable
		6	III	TThS	304F	Mr. Hessler
11w-12s†‡§	Description; Narration (See 11f-12w)	Sec. 1	II	MWF	306F	Mr. Sutcliffe
		2	VI	MWF	306F	Miss Gable
11s-(12su-12w)	Description; Narration (See 11f-12w)	III	MWF	306F	Mrs. del Plaine	
18f-19w†‡§	Types of Writing (6 cred.; soph., jr., sr.; prereq., A-B-C or 4-5-6 or exemption from requirement)	Sec. 1	III	MWF	305F	Mrs. del Plaine
		2	V	MWF	303F	Mr. Loveland
		3	VII	MWF	306F	Ar
18w-19s†‡§	Types of Writing (See 18f-19w)	Sec. 1	II	MWF	305F	Mr. Loveland
		2	VII	MWF	304F	Mr. Hessler
20f	Informal Exposition (2 cred.; soph., jr., sr.; prereq., 11-12 or 18-19)	Sec. 1	II	MWF	305F	Mrs. Phelan
		2	V	MWF	306F	Mr. Hessler
20s	Informal Exposition (See 20f)	Sec. 1	II	MWF	304F	Mrs. del Plaine
		2	III	MWF	302F	Mr. Nichols
		3	IV	MWF	305F	Mr. Hessler
		4	V	MWF	304F	Mrs. Phelan
		5	VI	MWF	217F	Mr. Loveland
		6	III	TThS	306F	Miss Gable

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

‡ A student registering for either 11-12 or 18-19 must bring with him a written memorandum from his instructor in Freshman English specifying which course in sophomore composition he should elect. No student may receive credit for both 11-12 and 18-19.

§ Students who have taken the the prerequisite for this course elsewhere will be allowed to register provisionally, subject to their ability to pass certain tests given during the first recitation of the quarter.

() Numbers in parentheses do not refer to the year 1927-28.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
31w 67f-68w†¶	Technical Writing Imitative Writing (6 cred.; jr., sr., not open to sophomores; prereq., average of B in two quarters of either 11- 12, 10 or 20, or 18-19, 10 or 20)	Consult IV	College of MWF	Engineering 304F	bulletin. Mrs. Phelan
69s¶	Short-Story Writing (4 cred.; jr., sr., not open to sophomores; prereq., average of B in two quarters of either 11- 12, 10 or 20, or 18-19, 10 or 20)	IV	MTWF	304F	Mrs. Phelan
111f-112w-113s¶	Essay Writing (9 cred.; jr., sr., grad.; prereq., 11-12, or 18-19, and 10 or 20)	III	MWF	304F	Mr. Sutcliffe
119f-120w-121s¶	Seminary in Writing (9 cred.; sr., grad.; prereq., 9 cred., sr. col. courses, and per- mission of instructor)	VI, VII	Th	304F	Ar

COURSES IN SPEECH

No.	Title	Hour	Day	Bldg.	Instructor
41f-42w†-43s	Fundamentals of Speech (9 cred.; soph., jr., sr.; prereq., Eng. A-B-C or Comp. 4-5-6 or exemption)				Mr. Rarig and others
	Sec. 1	I	MWF	308F	
	2	II	MWF	308F	
	3	III	TThS	308F	
	4	II	TThS	311F	
41w-42s†-(43f)	Fundamentals of Speech (See 41f-42w-43s)	II	TThS	208F	
(41w-42s)-43f	Fundamentals of Speech (See 41f-42w-43s)	II	MWF	306F	
45f-46w	Fundamentals of Speech (10 cred.; soph., jr., sr.; pre- req., Eng. A-B-C or Comp. 4-5-6 or exemption)				
	Sec. 1	III	MTThFS	101F	
	2	IV	MTWFS	6F	
	3	VI	MTWThF	5F	
	4	VII	MTWThF	308F	
	5	VIII	MTWThF	308F	

¶ Students may not elect for credit two senior college courses to be taken simultaneously.

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

() Numbers in parentheses do not refer to the year 1927-28.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
45s-(46f)	Fundamentals of Speech				
	(See 45f-46w)				
	Sec. 1	III	MTThFS	25F	
	2	IV	MTWFS	3F	
	3	VI	MTWThF	125F	
	4	VII	MTWThF	308F	
(45s)-46f	Fundamentals of Speech				
	(See 45f-46w)				
	Sec. 1	IV	MTWFS	204F	
	2	VI	MTWThF	308F	
45w-46s	Fundamentals of Speech				
	(See 45f-46w)				
	Sec. 1	IV	MTWFS	101F	
	2	VI	MTWThF	308F	
51s	Advanced Speech	II	MWF	110F	Mr. Morse
	(3 cred.; jr., sr.; prereq., 41-42-43 or 45-46)				
55f-56w-57s†	Arg. and Debating	{ VII, VIII	{ T Th	OLAud	Mr. Morse
	(9 cred.; jr., sr.; prereq., 41-42-43 or 45-46)				
61s	Speech Correction	VI	MTThF	101F	Mr. Holmes
	(4 cred.; jr., sr.; prereq., 41-42-43 or 45-46; Psy. 1-2)				
67s	Phonetics	IV	MWF	19Mu	Mrs. Seybolt
	(3 cred.; jr., sr.; prereq., 41-42-43 or 45-46)				
81f-82w-83s	Interpretative Reading				
	(9 cred.; jr., sr.; prereq., 41-42-43 or 44-45)				
	Sec. 1	IV	MWF	308F	Mr. Rarig
	2	I	TThS	308F	Mr. Rarig
91f-92w-93s	Play Production	VII	MWF	19Mu	Mrs. Seybolt
	(9 cred.; jr., sr.; prereq., 81-82-83, Eng. 55-56)				
97f,w	Intercollegiate Debate Squad ..	Ar	Ar	308F	Mr. Rarig, Mr. Morse
	(3 cred.; jr., sr.; prereq.‡)				
101f-102w†	Advanced Speech Composition ..	III	MWF	308F	Mr. Rarig
	(6 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46)				
105s	Theory of Reading and Acting ..	III	MWF	308F	
	(3 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46)				
107	Seminar in Great Orators	Not offered in 1927-28			
	(3 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46, Psy. 1-2, and 10 cred. in hist., soc., or phil.)				
121f-122w†	Advanced Speech Problems ...	III	TThS	305F	Mr. Rarig, Mr. Morse
	(6 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46, Psy. 1-2)				

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

‡ Open to intercollegiate debaters and orators.

() Numbers in parentheses do not refer to the year 1927-28.

GEOGRAPHY

Major Adviser: D. H. Davis

REQUIREMENTS OF THE DEPARTMENT

For the teacher's certificate in geography.—Major recommendation: A minimum of 28 credits from the following courses in Geography: 51, 52, 61, 71, 91, 101, 135, 141, 151-152-153. An additional 5 credits from the following courses in Geology 1-2, 1-3, 8, or 29.

Minor recommendation: 19 credits as follows: 51, 52, 61, 71.

No.	Title	Hour	Day	Bldg.	Instructor
1w	Introd. to Human Geography .. (5 cred.; 3d qtr. fr., soph.; not open to jr., sr.; no prereq.)	I	MTThFS	103OL	Mr. Davis
1s	Introd. to Human Geography .. (See 1w)	II	MWThFS	103OL	Mr. Davis
2	<i>Introd. to Regional Geography</i> (5 cred.; 3d qtr. fr., soph.; not open to jr., sr.; prereq., 1 or 33)	<i>Not offered in 1927-28</i>			
33*	<i>Climatology</i>	<i>Not offered in 1927-28</i>			
51f‡	Human Geography	II	MWThFS	103OL	Mr. Davis
	(5 cred.; jr., sr.; prereq., 10 cred. in econ. or soc., or 15 cred. in hist.)				
52w§	Regional Geography of the World	III	MTThFS	103OL	Mr. Davis
	(5 cred.; jr., sr.; prereq., 51 or 33 or 1 and 10 cred. in econ. or soc.)				
61f	Geography of Commercial Production	IV	MTWFS	103OL	Mr. Hartshorne
	(5 cred.; prereq., 10 cred. in econ. or geog.)				
61w	Geography of Commercial Production	IV	MTWFS	103OL	Mr. Hartshorne
	(See 61f)				
61s	Geography of Commercial Production	IV	MTWFS	103OL	Mr. Hartshorne
	(See 61f)				
71f	Geography of North America ..	I	MWThF	103OL	Mr. Davis
	(4 cred.; jr., sr.; prereq., 1 or 51, or 61, or 20 cred. in soc. sci. to include at least one course in geog.)				
91f	Cartography	VI	MWF	103OL	Mr. Hartshorne
	(3 cred.; jr., sr.; prereq., 10 cred. in sen. col. work in geog., geol., hist., or other subject in which the use of maps is necessary)				

* Not open to those who have had Course 1 or 51.

‡ Not open to those who have had Course 1.

§ Not open to those who have had Course 2.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
101W	Geography of Europe (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in geog.)	I	MWF	103OL	Mr. Hartshorne
102S	Trade Routes and Trade Centers (3 cred.; jr., sr., grad.; prereq., 61)	III	MWF	103OL	Mr. Hartshorne
135S	Geography of Minnesota (3 cred.; jr., sr., grad.; prereq., 12 cred., or 20 cred. in soc. sci. incl. at least 8 cred. in geog. Limited to 15. Per- mission of instructor neces- sary)	I	MWF	103OL	Mr. Davis
141	<i>Field Course in Geography</i>	<i>Not offered in 1927-28</i>			
151-152W-152S	Seminar in Geography (3 cred.; sr., grad.; prereq., 20 cred. or permission)	VII	Th	103OL	Mr. Davis, Mr. Hart- shorne
201f,w,s	Research Problems in Geography	Ar	Ar	Ar	Mr. Davis

GEOLOGY AND MINERALOGY

Major Adviser: G. A. Thiel

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*†	General Geology (Dynamic and Historical) (10 cred.; all; prereq., any course in chemistry in high school or college)				
	Lect. Sec. 1	I	TWThF	210P	Mr. Thiel
	Lab.	I-II	M or S	212P	
	Lect. 2	VII	MTWTh	110P	Mr. Allison
	Lab.	VI-VII	F	212P	
	or	VIII-IX	Th		
1f-3w*†	General Geology (Dynamic and Economic) (10 cred.; all; prereq., any course in chemistry in high school or college)				
	Lect.	III	MTFS	110P	Mr. Emmons
	Lab.	III-IV	W	212P	
	or	VI-VII	Th		
1w-2S*†	General Geology (Dynamic and Historical) (See 1f-2w)				
	Lect.	IV	TWFS	110P	Mr. Brownell
	Lab.	III-IV	M	212P	
	or	VI-VII	T		

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

* For a three-quarter sequence, Course 2 may be followed by Course 3 or 4 or 11, and Course 3 by Course 2.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
1w-3s*†	General Geology (Dynamic and Economic)	Lect. II Lab. I-II	WThFS T	200aP 212P	Mr. Allison
1s-(2f)*†	General Geology (Dynamic and Historical)	Lect. III Lab. III-IV	MTThF W	110P 112P	Mr. Emmons
(1s)-2f*†	General Geology (Dynamic and Historical)	Lect. III Lab. II-III	MTWTh F	212P 104P	Mr. Davidson
1s-(3w)†	General Geology (Dynamic and Economic)	Hours, days, rooms, as for 1s-(2f)			
4s	Geology of Minnesota	IV	MTWFS	210P	Mr. Thiel
8f‡	Introductory Geology	II	MWThFS	210P	Mr. Thiel
8w‡	Introductory Geology	IV	MTWFS	210P	Mr. Thiel
8s‡	Introductory Geology	II	MWThFS	210P	Mr. Thiel
11f	Elements of Paleontology	II	MWThFS	105P	Mr. Stauffer
15s¶	Minerals and Rocks	Ar	Ar	100P	Mr. Gruner
23w-24s-(25f)†	Elements of Mineralogy	Lect. II Lab. III	WF WF	110P 100P	Mr. Gruner
	(For other sections, see Mines bulletin)				
	(Spring)	Lect. II Rec. IX Lab. Sec. 1	MWF T M		Mr. Gruner
		2	VII, VIII VI, VII III, IV VII, VIII	M T M F	
(23w-24s)-25f†	Elements of Mineralogy	Lect. III Rec. VIII Lab. Sec. 1	MWF F MW	100P	Mr. Gruner
	(See 23w-24s-(25f))	2	{ VII, VIII VI, VII	T F	

* For a three-quarter sequence, Course 2 may be followed by Course 3 or 4 or 11, and Course 3 by Course 2.

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

‡ Does not satisfy the junior college requirement for science. May be followed by Course 2 or 4 with instructor's permission.

¶ Does not count for a senior college course. Not open to sophomores.

() Numbers in parentheses do not refer to the year 1927-28.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
275f	Outlines of Mineralogy (1 cred.; jr., sr.; no prereq.)	Ar	Ar	100P	Mr. Gruner
29f§	General Physiography (5 cred.; soph., jr., sr.; no prereq.)	III	MTThFS	200aP	Mr. Allison
49s	Physiography of the United States (5 cred.; jr., sr.; prereq., 2 or 3)				Mr. Allison
	Lect.	II	TThS	200aP	
	Lab.	Ar	Ar	Ar	
61f	Blowpipe Analysis (2 cred.; jr., sr.; prereq., 25)	Consult	Mines	program	Mr. Gruner
65f	Crystallography (3 cred.; jr., sr.; prereq., Math. 7 and Inorg. Chem. 6-7-8 or 9-10)	Ar	Ar	100P	Mr. Gruner
67w	Mineralogy of Chemical Materials (3 cred.; jr., sr.; prereq., Chem., 5 cred.)	Consult	Chemistry	program	Mr. Gruner
73f	Economic Geology (3 cred.; jr., sr.; prereq., 24)	VI	MWF	110P	Mr. Schwartz
85s	Field Work in Northern Minne- sota (4 cred.; jr., sr.; prereq., 2, 3, or 11)	Ar	Ar	Ar	Mr. Gruner, Mr. Thiel
91f-92w-93s	Index Fossils of North America (9 cred.; jr., sr.; prereq., 2 3, or 11)				
	Lect.	I	F	105P	Mr. Stauffer
	Lab.	VI, VII	MW	105P	Mr. Stauffer
101f	Sedimentation (3 cred.; jr., sr., grad.; prereq., 24)	Ar	Ar	Ar	Mr. Allison
102w-103s	Micropaleontology (6 cred.; jr., sr., grad.; prereq., 11 or 91)	Ar	Ar	Ar	Mr. Stauffer
105f	Rock Study (3 cred.; jr., sr., grad.; prereq., 24)				
	Lect.	VI	TTh	110P	Mr. Grout
	Lab. Sec. 1	VII, VIII	T	200P	
	2	VII, VIII	Th	200P	
106w	Petrography (3 cred.; jr., sr., grad.; prereq., 105)	VII, VIII	MF	200P	Mr. Grout
107f-108w-109s	Palaeontologic Practice (9 cred.; jr., sr., grad.; prereq., 91-92-93)	Ar	Ar	105P	Mr. Stauffer
111f	Ore Deposits (3 cred.; sr., grad.; prereq., 2, 3, or 11, and 105)	I	TThS	110P	Mr. Emmons
112w	Geology of Petroleum (3 cred.; sr., grad.; prereq., 111)	I	TThS	110P	Mr. Emmons
113s	Prob. in Ore Deposits (3 cred.; sr., grad.; prereq., 112)	VI-IX	Th	104P	Mr. Emmons

¶ Does not count for a senior college course. Not open to sophomores.

§ Does not satisfy the junior college requirement for science.

No.	Title	Hour	Day	Bldg.	Instructor
124w-125s	Struct. and Metamorphic Geol. (6 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 105)	VI	MWF	200aP	Mr. Schwartz
127f	Geol. of Lake Sup. Region (3 cred.; jr., sr., grad.; prereq., 124-125)	Ar	Ar	Ar	Mr. Thiel
131f-132w-133s	Adv. Petrology				
	(9 cred.; jr., sr., grad.; prereq., 106)	Lect. III Lab. Ar	TThS F	200P 200P	Mr. Grout
137w	Testing Econ. Minerals				
	(3 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 105)	Lect. VI Lab. VIII, IX	T MW	200P 200P	Mr. Grout Mr. Thiel
140w-141s	Applied Petrography				
	(6 cred.; jr., sr., grad.; prereq., 121)	Lect. II Lab. I, II	F MW	200P 200aP	Mr. Grout Mr. Allison
144w-145s	Inter. of Geologic Maps	VII-IX	TTh	200aP	Mr. Allison
	(6 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 124)				
149s	Methods of Field Geology	Ar	Ar	Ar	Mr. Schwartz
	(1 cred.; jr., sr., grad.; to be taken with 150; prereq., 2, 23- 24-25, 106, 124-125)				
150s	Field Geol. (Black Hills)	Ar	Ar	Ar	Mr. Emmons, Mr. Schwartz
	(Cred. ar.; jr., sr., grad.; see members of department)				
151f-152w-153s	Adv. General Geology	III	MWF	210P	Mr. Stauffer
	(9 cred.; jr., sr., grad.; prereq., 2, 3, or 11)				
166w-167s	Mineralography	Ar	Ar	103P	Mr. Schwartz
	(6 cred.; sr., grad.; prereq., 111, 131)				

GERMAN

Major Adviser: C. Schlenker

For a teacher's certificate.—Major recommendations: Courses 50-51-52, 56-57-58, 62 or 63, 64, 66, 67, 108, and nine additional credits in courses numbered above 50. Course 65 may be substituted for either Course 66 or 67.

Minor recommendations: Courses 50-51-52, 108, and eight additional credits in courses numbered above 50.

Credit may be earned for either Course 62 or Course 63, but not for both courses.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
1f*	Beginning A				
	(5 cred.; all; no prereq.)				
	Sec. 1	I	TWThFS	207F	Ar
	2	I	TWThFS	209F	Ar
	3	I	TWThFS	209½F	Ar
	4	I	TWThFS	125F	Ar
	5	II	MWThFS	114F	Ar
	6	III	MTThFS	213F	Ar
	7	III	MTThFS	212F	Ar
	8	IV	MTWFS	207F	Ar
	9	IV	MTWFS	212F	Ar
	10	IV	MTWFS	209F	Ar
	11	VI	MTWThF	207F	Ar
	12	VI	MTWThF	209F	Ar
	13	VI	MTWThF	209½F	Ar
1w*	Beginning A				
	(See 1f)				
	Sec. 1	II	MWThFS	209F	Ar
	2	VII	MTWThF	207F	Ar
	3	VII	MTWThF	109F	Ar
1s*	Beginning A				
	(See 1f)				
	Sec. 1	II	MWThFS	212F	Ar
	2	VI	MTWThF	25F	Ar
2f*	Beginning B				
	(5 cred.; all; prereq., 1 or one yr. prep. German)				
	Sec. 1	II	MWThFS	207F	Ar
	2	VII	MTWThF	209½F	Ar
2w*	Beginning B				
	(See 2f)				
	Sec. 1	I	TWThFS	207F	Ar
	2	I	TWThFS	209F	Ar
	3	I	TWThFS	209½F	Ar
	4	I	TWThFS	125F	Ar
	5	II	MWThFS	114F	Ar
	6	III	MTThFS	213F	Ar
	7	III	MTThFS	212F	Ar
	8	IV	MTWFS	207F	Ar
	9	IV	MTWFS	212F	Ar
	10	IV	MTWFS	209F	Ar
	11	VI	MTWThF	207F	Ar
	12	VI	MTWThF	209F	Ar
	13	VI	MTWThF	209½F	Ar
2s*	Beginning B				
	(See 2f)				
	Sec. 1	II	MWThFS	209F	Ar
	2	{ VII	MTThF	207F	Ar
		} V	W		
	3	{ VII	MTThF	109F	Ar
		} V	W		
3f	Beginning C				
	(5 cred.; all; prereq., 2)				
	Sec. 1	III	MTThFS	209F	Ar
	2	VII	MTWThF	209F	Ar

* Credit is usually not given for more than one beginning language. See paragraph 2, page 7, Science, Literature, and Arts bulletin.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor	
3w	Beginning C (See 2f)	Sec. 1	II	MWThFS	207F	Ar
		2	VII	MTWThF	209½F	Ar
3s	Beginning C (See 3f)	Sec. 1	I	TWThFS	207F	Ar
		2	I	TWThFS	209F	Ar
		3	I	TWThFS	209½F	Ar
		4	I	TWThFS	125F	Ar
		5	II	MWThFS	114F	Ar
		6	III	MTThFS	213F	Ar
		7	III	MTThFS	212F	Ar
		8	IV	MTWFS	207F	Ar
		9	IV	MTWFS	212F	Ar
		10	IV	MTWFS	209F	Ar
		11	VI	MTWThF	207F	Ar
		12	VI	MTWThF	209F	Ar
		13	VI	MTWThF	209½F	Ar
4f	Intermediate German (5 cred.; all; prereq. 3)	Sec. 1	II	MWThFS	209F	Ar
		2	II	MWThFS	212F	Ar
		3	III	MTThFS	102F	Ar
		4	IV	MTWFS	316F	Ar
		5	VII	MTWThF	207F	Ar
4w	Intermediate German (See 4f)	Sec. 1	III	MTThFS	209F	Ar
		2	VII	MTWThF	209F	Ar
4s	Intermediate German (See 4f)	Sec. 1	II	MWThFS	207F	Ar
		2	{ VII V	MTThF W	209½F	Ar
7f	Prose and Poetry (5 cred.; all; prereq., 2 yrs. prep. German)	III	III	MTThFS	207F	Ar
8w	Adv. Prose and Poetry (5 cred.; all; prereq., 7)	III	III	MTThFS	207F	Ar
15f	Narr. Prose for Pre-Medics (4 cred.; pre-med.; prereq., 2 yrs. prep. German)	I	I	MTWTh	212F	Ar
24f-25w-26s†	Begin. for Chemists (12 cred.; chemists, miners; no prereq.)	IV	IV	MTWF	209½F	Ar
27f	Narr. Prose for Chemists (3 cred.; chemists, miners; prereq., 26 or 2 yrs. prep. German)	I	I	MWF	108F	Ar
28w-29s†	Chemical German (6 cred.; chemists, miners; prereq., 27 or 4)	II	II	MWF	209½F	Ar

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

No.	Title	Hour	Day	Bldg.	Instructor
31W-32S†	Medical German (6 cred.; pre-med.; prereq., 4 or 13)				
	Sec. 1	I	MWF	212F	Ar
	2	I	TThS	3F	Ar
	3	I	TThS	212F	Ar
(31S)-32F†	Medical German (See 31F-32W)	I	TThS	107F	Ar
31S-(32F)†	Medical German (See 31W-32S)	I	MWF	217F	Ar
50F-51W-52S†	Composition (6 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German)	IV	TS	213F	Mr. Schlenker
56F-57W†	Essay Writing (6 cred.; jr., sr.; prereq., 52)	III	MWF	209½F	Mr. Kroesch
62W¶	Nineteenth-Century Prose (5 cred.; jr., sr.; prereq., 4 or 8, or 4 yrs. prep. German)	II	MWThFS	212F	Mr. Kroesch
62S¶	Nineteenth-Century Prose (See 62W)	III	MTThFS	209F	Mr. Davies
63F¶	Modern Drama (3 cred.; jr., sr.; prereq., 4 or 8)	IV	MWF	217F	Mr. Davies
64W	Classic Drama (3 cred.; jr., sr.; prereq., 62 or 63)	IV	MWF	217F	Mr. Davies
65S	Survey through Reformation .. (3 cred.; jr., sr.; prereq., 3 cred. above 60)	III	TThS	209½F	Mr. Kroesch
66F	Eighteenth-Century Survey (3 cred.; jr., sr.; prereq., 3 cred. above 60)	III	TThS	209½F	Mr. Burkhard
67W	Nineteenth-Century Survey (3 cred.; jr., sr.; prereq., 3 cred. above 60)	III	TThS	209½F	Mr. Burkhard
77S	Faust I (3 cred.; jr., sr.; prereq., 62 or 64 or 6 cred. above 60)	IV	MWF	202F	Mr. Schlenker
100F-101W-102S†	Middle High German (9 cred.; sr., grad.; prereq., 65 and 11 cred. above 60)	VIII	MWF	312Lib	Mr. Kroesch
108S	Phonetics (3 cred.; sr., grad.; prereq., 9 senior college cred. in mod. lang.)	I	TThS	204F	Mr. Kroesch
109F-110W-111S†	Hist. of German Language (9 cred.; sr., grad.; prereq., see statement under Comp. Phil.)	Ar	Ar	Ar	Mr. Klaeber
115-116-117†	Middle High German Literature (9 cred.; sr., grad.; prereq., 65 and 11 credits above 60)	<i>Not offered in 1927-28</i>			
140F-141W-142S†	Early New High German Literature, 1500-1700 (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	Ar	Ar	Ar	Mr. Lussky

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

() Numbers in parentheses do not refer to the year 1927-28.

¶ Students may not receive credit for both 62 and 63.

PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
143f-144w-145s†	Der Roman (Novel) (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	Ar	Ar	Ar	Mr. Lussky
150-151-152†	Novelle (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	Not offered in 1927-28			
153f-154w-155s†	Studies in German Literature of the Nineteenth Century—Die Dorfgeschichte (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	VII, VIII, IX	T	301Lib	Mr. Burkhard
160-161-162	Lyric Poetry (9 cred.; sr., grad.; prereq., 66 or 67 and 11 cred. above 60)	Not offered in 1927-28			
163-164-165†	German and English Literary Relations, 16th, 17th, 18th cen- turies (9 cred.; sr., grad.; prereq., 65 or 67 and 11 cred. above 60)	Not offered in 1927-28			
225f-226w-227s†	Lit. Problems (9 cred.; grad.; sr. with com- pleted major sequence)	VII, VIII, IX	Th	301Lib	Mr. Schlenker

GREEK

Major Adviser: C. A. Savage

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†-3s	Beginning Greek (15 cred.; all; no prereq.)	IV	MTWFS	114F	Mr. Savage, Miss Strong
14f	History: Xenophon (3 cred.; all; prereq., 1-2-3)	III	TThS	108F	Miss Strong
15w	History: Herodotus (3 cred.; all; prereq., 1-2-3)	III	TThS	108F	Mr. Savage
16s	Epic Poetry: Homer (3 cred.; all; prereq., 14 or 15)	III	TThS	108F	Miss Strong
17f,w	Greek Sources (Everyday Greek) (2 cred.; soph., jr., sr.; prereq., 1 yr. of any foreign language)	VIII	TTh	114F	Mr. Savage, Miss Strong
17s	Greek Sources (Everyday Greek) (See 17f,w)	I	TTh	114F	Miss Strong
51f	Philosophy (3 cred.; jr., sr.; prereq., any two of 14, 15, and 16)	Ar	Ar	112F	Mr. Savage
52w	Oratory (3 cred.; jr., sr.; prereq., any two of 14, 15, and 16)	Ar	Ar	112F	Mr. Savage
53s	Dramatic Poetry (3 cred.; jr., sr.; prereq., 51 or 52)	Ar	Ar	112F	Mr. Savage
105f	Lyric Poetry (3 cred.; sr., grad.; prereq., 53)	Ar	Ar	112F	Mr. Savage
106w*	Advanced Drama (3 cred.; sr., grad.; prereq., 53 or 105)	Ar	Ar	112F	Mr. Savage

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

No.	Title	Hour	Day	Bldg.	Instructor
107w*	Advanced Prose (3 cred.; sr., grad.; prereq., 51-52, or 51-53, or 52-53)	Ar	Ar	112F	Mr. Savage
108s§	Advanced Epic Poetry (3 cred.; sr., grad.; prereq., 105 or 106)	Ar	Ar	112F	Mr. Savage
109s§	New Testament (3 cred.; jr., sr., grad.; prereq., 51 and 52)	Ar	Ar	112F	Mr. Savage
<i>Courses for Which No Knowledge of Greek Is Required</i>					
42s¶	Greek Sculpture (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Mr. Savage
43f¶‡	Greek Drama (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Mr. Savage
44w¶‡	Greek Literature and Life (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Mr. Savage
44s¶‡	Greek Literature and Life (See 44w)	I	WF	114F	Mr. Savage
45f¶	Greek Mythology (2 cred.; jr., sr.; no prereq.)	I	WF	114F	Mr. Savage
45w¶	Greek Mythology (See 45f)	I	WF	114F	Mr. Savage

HISTORY

Major Adviser: A. C. Krey

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation: at least 45 credit hours; at least 15 credits must be in senior college courses, and of these one course (5 credits) must be numbered from 151 to 200.

Minor recommendation: a minor recommendation will be given upon the completion of at least 18 credit hours with a satisfactory grade.

No major recommendation to teach history will be given unless the candidate has taken at least the general course in American history, History 7-8.

No.	Title	Hour	Day	Bldg.	Instructor
1ff†	Modern World, 1648-1795 (5 cred.; all; no prereq.)				
	Lect.	II	TThS	OLAud	Mr. Ford
	Sec. 1	I	MTh	2F	
	2	I	TF	2F	
	3	I	WS	2F	
	4	I	MW	112OL (fall, winter) 111OL (spring)	
	5	II	MW	2F	
	6	II	MW	111OL	
	7	III	MTh	2F	
	8	III	TF	2F	

* Courses 106 and 107 are offered alternately.

§ Courses 108 and 109 are offered alternately.

‡ Students may not get credit for both Courses 43 and 44 except by special permission.

¶ Not a senior college course. Not open to sophomores.

† To receive credit for Course 1, a student must complete both 1 and 2. To receive credit for Course 2, a student must complete either 1 and 2 or 2 and 3, but students are strongly advised to begin with History 1.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
		9	III	WS 2F	
		10	IV	MW 2F	
		11	IV	TF 2F	
		12	IV	TS 209OL	
		13	V	MW 2F	
		14	V	TF 2F	
		15	VI	MW 2F	
		16	VI	TTh 2F	
		17	VII	MW 2F	
		18	VII	TTh 2F	
		19	VIII	MW 2F	
		20	VIII	TTh 2F	
2w*	Modern World, 1795-1871 (5 cred.; all; no prereq.)	Lect. II	TThS	OLAud	Mr. Ford
			Sections as in if		
3s	Modern World, 1871 to Present (5 cred.; all; prereq.. 2)	Lect. II	TThS	OLAud	Mr. Ford
			Sections as in if		
4f-5w†	England to 1815 (10 cred.; all; no prereq.)	Lect. VII	MW	OLAud	Mr. White
		Sec. 1 I	TThS	112OL	
		2 II	TThS	209OL	
		3 II	TThS	2F	
		4 III	TThS	201F	
		5 VI	TThF	5Lib	
		6 VII	TThF	6F	
		7 VII	TThF	113F	
		8 VII	TThF	15F	
4s-(5w)†	England to 1815 (See 4f-5w)	III	MTThFS	211OL	Mr. White
6s	England since 1815 (5 cred.; all; prereq.. 10 cred.)	I	TWThFS	112F	Miss Thompson
7f-8w†	American History (10 cred.; soph., jr., sr.; no prereq.)	Sec. 1 I	TWThFS	211OL	Mr. Shippee
		2 VII	MTWThF	211OL	and others
9s	Recent American History (5 cred.; soph., jr., sr.; prereq.. 10 cred. in hist. or pol. sci.)	Sec. 1 I	TWThFS	211OL	Mr. Shippee
		2 VII	MTWThF	211OL	and others
11f-12w-13s†‡	Medieval History (10 cred.; 3d qtr. fr., soph., jr., sr.; prereq.. 10 cred. except for mus. and int. dec.)	Lect. IV	MW	221OL	Miss Thompson
		Sec. 1 IV (fall, winter)	F	221OL	
		IV (spring)	F and Ar	221OL	
		2 III (fall, winter)	F	211OL	
		III (spring)	Ar	Ar	

* To receive credit for Course 1, a student must complete both 1 and 2. To receive credit for Course 2, a student must complete either 1 and 2 or 2 and 3, but students are strongly advised to begin with History 1.

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

‡ Students may not receive credit for both 11-12-13 and 16.

() Numbers in parentheses do not refer to the year 1927-28.

No.	Title	Hour	Day	Bldg.	Instructor
16s†	Europe, in the Middle Ages .. (5 cred.; all; prereq., 10 cred. in hist. if taken by fr.)	II	MWThFS	221OL	Mr. Krey
33s	English Legal Institutions (5 cred.; 3d qtr. fr., soph., jr., sr.; prereq., Hist. 4-5)	II	MWThFS	112OL	Mr. White
8of	Introduction to Economic History (3 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ., pol. sci., or sociol.)	III	TThS	221OL	
81w	Introduction to Economic History (3 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ. or sociol.)	III	TThS	221OL	
82	<i>Economic History of the United States: Colonial Period</i> (3 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ., pol. sci., or sociol.)	Not offered in 1927-28			
83	<i>Economic History of the United States: Early National Period</i> (See 82)	Not offered in 1927-28			
84	<i>Economic History of the United States since 1860</i> (See 82)	Not offered in 1927-28			
101-102	<i>French Revolution: Napoleonic Era</i> (6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci. incl. 10 cred. in hist.)	Not offered in 1927-28			
102s	Pol. Hist.: Greece (5 cred.; jr., sr., grad.; prereq., 20 cred. or major in Greek or Latin)	IV	MTWFS	211OL	
104f	Near East: Modern (3 cred.; jr., sr., grad.; prereq., Hist. 1-2 or 2-3 and 10 cred. in soc. sci.)	II	MWF	211OL	Mr. Steefel
105s	History of Rome (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	VII	MTWThF	209OL	
106f-107w-108s§	Europe, 1815-1914 (9 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci.)	VII	MWF	111OL	Mr. Steefel
111w	European Background of American Immigration (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	VI	MWF	112OL	Mr. Blegen

† Students may not receive credit for both 11-12-13 and 16.

§ With the permission of the instructor, a student may enter the second or third quarter.

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No.	Title	Hour	Day	Bldg.	Instructor
112f	American Immigration (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	VI	MWF	112OL	Mr. Blegen
113-114-115	<i>Econ. Hist. of Europe since 1750</i> (9 cred.; jr., sr., grad.; pr req., 20 cred. in soc. sci.)	<i>Not offered in 1927-28</i>			
116f-117w-118s	Econ. Hist. of Europe, 1300-1750 (9 cred.; jr., sr., grad.; pr req., 20 cred. in soc. sci.)	II	TThS	111OL	
119s	Renaissance and Reformation . . (5 cred.; jr., sr., grad.; prereq., 15 cred.)	III	MTThFS	112OL	Mr. Krey
120f	Medieval Civilization (5 cred.; jr., sr., grad.; prereq., 15 cred.)	III	MTThFS	112OL	Mr. Krey
121w	English Backgrounds and American Colonization (5 cred.; jr., sr., grad.; prereq., 20 cred. in hist. or pol. sci.)	II	MWThFS	112OL	Mr. White
123f	European Expansion to 1815 . . (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	IV	MWF	211OL	Mr. Willson
124w	European Expansion since 1815 (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	IV	MWF	211OL	Mr. Steefel
125f-126w†	American Diplomatic History . . (6 cred.; jr., sr., grad.; prereq., 20 cred. in hist. and pol. sci. or 15 in hist. or pol. sci.)	III	MWF	221OL	Mr. Shippee
127	<i>Feudal Institutions</i> (5 cred.; jr., sr., grad.; prereq., 15 cred.)	<i>Not offered in 1927-28</i>			
128w	Rise of Nationalism in Europe (5 cred.; jr., sr., grad.; prereq., 15 cred.)	III	MTThFS	112OL	Mr. Krey
130s	Introduction to the History of Russia (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Hist. 1-2 or 16)	II	MWF	111OL	Mr. Steefel
131-132	<i>France under Louis XIV and Louis XV</i> (6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 in soc. sci. incl. 10 in hist.)	<i>Not offered in 1927-28</i>			
133	<i>Near East: Old Orient</i> (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	<i>Not offered in 1927-28</i>			

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
134	<i>Ancient Civilization: Greece</i> .. (2 cred.; jr., sr., grad.; prereq., 20 cred. incl. 103 or equiv. or major in Greek or Latin and consent of instr.)	Not offered in 1927-28			
135	<i>Ancient Civilization: Rome</i> ... (3 cred.; jr., sr., grad.; prereq., 134 or consent of instructor; 20 cred. incl. 105 or equiv., or major in Greek or Latin and consent of instr.)	Not offered in 1927-28			
136-137†	<i>Far Eastern Government and Politics</i>	Not offered in 1927-28			
138f-139w†	<i>Far Eastern Diplomacy</i>	See Political Science program			
141f	<i>West in Amer. Hist. to 1815</i> .. (3 cred.; jr., sr., grad.; prereq., History 7-8* and 10 cred. in soc. sci. or 5 cred. in hist.)	II	TThS	221OL	Mr. Buck
142w	<i>West in Amer. Hist. 1815-1865</i> (3 cred.; jr., sr., grad.; prereq., see 141)	II	TThS	221OL	Mr. Shippee
143w	<i>American Political Parties</i> (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist. incl. 7-8 or equiv.)	II	MWF	221OL	Mr. Blegen
144-145†	<i>History of Minnesota</i>	Not offered in 1927-28			
146-147†	<i>Constitutional Hist. of U. S.</i> .. (See Political Science)	Not offered in 1927-28			
148-149†	<i>English Colonies in America</i> .. (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 in hist., or 15 cred. in hist.)	Not offered in 1927-28			
152w	<i>Select Topics, West to 1815</i> .. (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8 or equiv.)	VIII, IX	TTh	328Lib	Mr. Buck
152s	<i>Topics, West since 1865</i>	VIII, IX	TTh	328Lib	Mr. Buck
154	<i>Topics, Minnesota</i>	Not offered in 1927-28			
155f	<i>United States, 1850-1865</i>	VIII, IX	WF	301Lib	Mr. Shippee
156	<i>U. S. Reconstruction</i>	Not offered in 1927-28			

* May be taken at the same time.

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

No.	Title	Hour	Day	Bldg.	Instructor
157f-158w	Topics, Nineteenth Century; Europe	VIII, IX	TTh	239Lib	Mr. Steefel
	(10 cred.; sr., grad.; prereq., 20 cred. incl. 106-107-108 or 101-102; equiv. of Hist. 2-3 and French or German)				
159s	Topics, Europe since 1914	VIII, IX	TTh	315Lib	Mr. Steefel
	(5 cred.; sr., grad.; prereq., 20 cred. and consent of instructor)				
162	<i>Beginnings of Parliament</i>	<i>Not offered in 1927-28</i>			
	(5 cred.; sr., grad.; prereq., 20 cred., knowledge high school Latin)				
164	<i>Studies in Crusades</i>	<i>Not offered in 1927-28</i>			
	(5 cred.; sr., grad.; prereq., 20 cred., knowledge high school Latin)				
166f	Topics, Hist. of Immigration ..	VIII, IX	MW	315Lib	Mr. Blegen
	(5 cred.; sr., grad.; prereq., 20 cred., consent of instr.)				
168s	Topics, American Foreign Relations	VIII, IX	TTh	339Lib	Mr. Shippee
	(5 cred.; sr., grad.; prereq., 20 cred. in hist. incl. 9, or 20 cred. in pol. sci.)				
169s	Econ. Hist. of U. S. since 1865	III	TThS	221OL	
	(3 cred.; sr., grad.; prereq., 20 cred. in hist. or econ.)				
183s	Stuart Period	VIII, IX	MW	328Lib	Mr. Willson
	(5 cred.; sr., grad.; prereq., 20 cred. incl. 4-5)				
184s	Topics in Modern English History	Ar	Ar		
	(5 cred.; sr., grad.; prereq., 20 cred.)				
197f-198w-199s	Honors Course	See Anthropology 122-123-124			

HOME ECONOMICS

Major Advisers: Wylle B. McNeal, Clara M. Brown

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

NOTE.—Only courses with 15 credits prerequisite will count as senior college courses.

Junior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
3s	Textil's	I, II	MTWThF	311,307HE	Miss Weller
	(5 cred.; all; no prereq.)				
	(Limited to 24)				

No.	Title	Hour	Day	Bldg.	Instructor
4f,s	Textiles (Ed., S. L. & A.) (3 cred.; not open to students in H.E.; no prereq.) (Limited to 24)	VI, VII	MWF	311,307HE	Miss Weller, Miss Eppel
11f,s	Clothing Planning and Construc- tion A (3 cred.; all; no prereq.)	Sec. 1 I, II	MWF	304HE	Miss Gorham, Miss Eppel
	(Limited to 24)	2 I, II	TThS	304HE	Miss Gorham, Miss Eppel
		3 VI, VII, VIII	TTh	304HE	Miss Gorham, Miss Eppel
11w	Clothing Planning and Construc- tion A (See 11f)	Sec. 1 I, II	TThS	304HE	Miss Gorham
		2 VI, VII, VIII	TTh	304HE	Miss Gorham
13f,s	Clothing Planning and Construc- tion B (3 cred.; all; prereq., 3, 11, 50, 51) (Limited to 24)	I, II	MWF	305HE(f)	Miss Gorham
		III, IV	MWF	114HE(s) 304HE	
15f,w,s	Clothing Problems (3 cred.; 3d qtr. fr., soph.; prereq., 3, 50, 51 or parallel)	Lect. II	S		
		Rec. VI	Th		
		Lab. VI, VII, VIII	T		
21f	Foods and Cookery (5 cred.; soph., jr., sr.; prereq., Agr. Biochem. 3 and 4*)	I, II	MTWThF	209HE	Miss Olson
21w,s	Foods and Cookery (See 21f)	Sec. 1 VI, VII	MTWThF	209HE	Miss Olson
	(Limited to 20 each)	2 III, IV	MTWFS	209HE	Miss Kolshorn
22i,w	Food Economics (5 cred.; soph., jr., sr.; prereq., 21 or 26)	III, IV	MTWFS	203,207HE	Miss Kolshorn
22s	Food Economics (See 22f)	Sec. 1 III, IV	MTWFS	203,207HE	Miss Kolshorn
	(Limited to 20 each)	2 VI, VII	MTWThF	203,207HE	Miss Kolshorn
50f,w	Color and Design I (3 cred.; no prereq.)	Sec. 1 I-II	MWF	401HE	
		2 I-II	TThS	401HE	
50s	Color and Design I (See 50f)	Sec. 1 I-II	TThS	402HE	
		2 I-II	MWF	112HE	
51f	Color and Design II (3 cred.; prereq. 50)	Sec. 1 I, II	MWF	402HE	Miss V. Goldstein
	(Limited to 20 each)	2 I, II	TThS	402HE	Miss V. Goldstein

* Course 21 may be taken parallel with Agricultural Biochemistry 4.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor	
51w	Color and Design II (See 51f) (Limited to 20 each) Sec. 1	III, IV	MWF	402HE		
	2	I, II	TThS	402HE	Miss V. Goldstein	
51s	Color and Design II (See 51f) (Limited to 20 each) Sec. 1	VI, VII, VIII	TTh	402HE	Miss V. Goldstein	
	2	I, II	MWF	112HE	Miss Bacon	
53f,s	Advanced Design (3 cred.; soph., jr., sr.; prereq., 51 or 56)	Sec. 1	III, IV	MWF	402HE	Miss H. Goldstein
	2	VI, VII	MWF	402HE	Miss H. Goldstein	
53w	Advanced Design (See 53f) (Limited to 20)	VI, VII	MWF	402HE	Miss H. Goldstein	
56f	Applications of Color and Design (3 cred.; no prereq.)	VI, VII, VIII	TTh	402HE	Miss V. Goldstein	
70f	Food Preparation (3 cred.; ‡ prereq., 10 cred. in a laboratory science) (Limited to 20)	VI, VII	MWF	209HE	Miss Whiteside	
161f,w,s	Art History and Appreciation .. (3 cred.; jr., sr., grad.; no pre- req.)	VIII	MWF	313HE	Miss H. Goldstein	
<i>Senior College Courses</i>						
17f,w	Advanced Clothing (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 24)	III, IV	MWF	305HE	Miss Gorham, Miss Carlotta Brown	
17s	Advanced Clothing (See 17f,w)	Sec. 1	III, IV	MWF	305HE	Miss Gorham, Miss Carlotta Brown
	2	I, II	TThS	305HE	Miss Gorham	
71w	Elementary Dietetics (3 cred.; jr., sr.; ‡; prereq., 70)	VI, VII	MWF	207,313HE	Miss White- side	
72s	Special Problems in Home Man- agement for Social Workers .. (3 cred.; jr., sr.; ‡; prereq., H.E. 71, Econ. 6-7 prereq. or parallel)	VI	MWF	103HE	Miss Whiteside	
123f,w	Clothing Economics (2 cred.; jr., sr., grad.; prereq., 13, Econ. 6-7)	III	TTh	203HE	Miss Weller	
131f,w	Home Management: House Plan- ning and Equipment (5 cred.; sr., grad.; prereq., 161, 53) (Limited to 20)	III, IV	¹ MTWFS	401HE	Miss Morse	
131s	Home Management: House Plan- ning and Equipment (See 131f)	Sec. 1	I, II	MTWThF	401HE	Miss Morse
	2	VI, VII	MTWThF	401HE	Miss Morse	

‡ Not open to students in Home Economics except by special permission of the chief of the division.

COLLEGE OF EDUCATION

HUMAN ANATOMY

MEDICAL SCHOOL

For Course 2, Elementary Anatomy, primarily for nurses, see Nursing School program.

Students in this college may elect other courses in human anatomy (see Medical School program) only by arrangement with the head of the Department of Anatomy.

HUMAN PHYSIOLOGY

MEDICAL SCHOOL

Major Advisers: F. H. Scott and J. F. McClendon

No.	Title	Hour	Day	Bldg.	Instructor
4w,s	Human Physiology (5 cred.; all; prereq., 1 qtr. biol., 1 qtr. chem.)	Lect. IV Lab. I, II, III	MTWFS Th	315MH	Dr. Greisheimer, Dr. King, and others
57f	Physiol. Chemistry (4 cred.; jr., sr.; prereq., An. Biol. 1-2 or 5-6-7; Inorg. Chem. 1-2-3 or 4-5)	I Lab. II, III, IV	TThS T	310MH	Mr. Pettibone and others
	Div. A B	VI, VII, VIII	W		
58w,59s	Human Physiology (8 cred.; jr., sr.; prereq., An. Biol. 1-2 or 5-6-7; Inorg. Chem. 1-2-3 or 4-5)	I Lab. II, III, IV	TThS T	301MH	Dr. Lyon, Dr. King, and others
	Div. A B	VI, VII, VIII	W		
100w-101s*	Physiol. Chemistry (12 cred.; jr., sr.; prereq. biol., org. chem., and physics)	IV Lab. I, II, III	MWF TTh	301MH	Mr. McClendon, Mr. Pettibone, and others
	Div. A B	Lab. I, II, III	FS		
103f*	Physiology of Muscles, etc. (9 cred.; jr., sr.; prereq., an. biol. and org. chem.)	IV VI-VIII	MTWF MWF	301MH	Dr. Lyon, Mr. Scott, Dr. Greisheimer; Dr. King, and others
104w*	Physiol. of Nervous System, etc. (7 cred.; jr., sr.; prereq., an. biol. and org. chem.)	IV VI-VIII	MWFS M	301MH	Dr. Lyon, Mr. Scott, and others
	Div. A B	VI-VIII	F		

For other courses see Medical School bulletin and program.
All the above courses are repeated in the summer quarter.

* Students may register for lectures without laboratory.

JOURNALISM

Major Adviser: E. M. Johnson

No.	Title	Hour	Day	Bldg.	Instructor
5f,s	The American Newspaper (3 cred.; soph., jr., sr.; no prereq.)	II	MWF	110P	
13f	Introduction to Reporting (3 cred.; soph., jr., sr.; prereq., Eng. A-B-C, Comp. 4-5-6, or exemption)	I	MWF	110P	Mr. Cason
14w-15s†	Newspaper Reporting and Corre- spondence (6 cred.; soph., jr., sr.; prereq., 13 or practical experience, and Comp. 11-12 or 18-19§)	I	MWF	Ar	Mr. Cason
51f-52w	Copy Reading and Newspaper Make-up	II	TTh	214P	
53s	Mechanics of Journalism (1 cred.; jr., sr.; prereq., 51)	IV	T	Ar	
55	Advertising Typography (2 cred.; sr.; prereq., 51 and Bus. Admin. 88)	<i>Not offered in 1927-28</i>			
56	Newspaper Typography (2 cred.; jr., sr.; prereq., 51)	<i>Not offered in 1927-28</i>			
57	Magazine Typography (2 cred.; jr., sr.; prereq., 51)	<i>Not offered in 1927-28</i>			
58	Advanced Typography (2 cred.; jr., sr.; prereq., 55, 56, or 57)	<i>Not offered in 1927-28</i>			
60f-61w†-62s	The Community Newspaper (9 cred.; jr., sr.; prereq., 15)	II	MWF	104P	
65f	Women's Departments (3 cred.; jr., sr.; prereq., 15)	VI	MWF	104P	
70w-71s†	Trade and Technical Journals (6 cred.; jr., sr.; prereq., 51)	VII	MWF	Ar	
73w-74s	Special Feature Articles (6 cred.; jr., sr.; prereq., 51)	VI	MWF	Ar	Mr. Steward
75s	Law of the Press (3 cred.; jr., sr.; prereq., 51)	II	TThS	Ar	
76s	Critical Writing (3 cred.; jr., sr.; prereq., 73)	III	TThS	Ar	Mr. Cason
77w	Advanced Reporting (3 cred.; sr.; prereq., 73)	II	MWF	Ar	Mr. Cason
80f	Newspaper Reference Library (1 cred.; jr., sr.; prereq., 51 and Lib. Meth. 1)	VIII-IX	T	104P	
82s	Supervision of School Publica- tions (3 cred.; jr., sr., grad.; prereq., 51)	IV	MWF	Ar	Mr. Johnson

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

§ May be taken at the same time.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
95w	Editorial Administration (3 cred.; sr.; prereq., 52)	II	TThS	Ar	
96f	Financial Writing (3 cred.; sr.; prereq., 73, and 25 credits in econ., including 141, 149, and 176)	VI	MWF	200aP	
97s	Press Associations and Corre- spondence (3 cred.; sr.; prereq., 111 and reading knowledge of one for- eign language)	I	MWF	Ar	
98f	Court Procedure and Evidence (3 cred.; jr., sr.; prereq., 75 and 10 credits in pol. sci.)	I	TThS	104P	
104f	Editorial Writing (3 cred.; sr., grad.; prereq., 73, and 25 credits in soc. sci.)	III	TThS	210P	Mr. Cason
110f	History of Journalism (3 cred.; jr., sr., grad.; prereq., 51, and Hist. 7-8)	III	MWF	108F	Mr. Johnson
111w	Foreign News Sources (3 cred.; jr., sr., grad.; prereq., 51 and one of the following: Pol. Sci. 25 or Hist. 104 or 108)	III	MWF	Ar	Mr. Johnson
112s	Current Newspaper Problems .. (3 cred.; sr., grad.; prereq., 111, and Pol. Sci. 187)	III	MWF	Ar	Mr. Johnson
130f-131w†	Public Opinion and the News- paper (6 cred.; sr., grad.; prereq., 110, Psy. 140, and 20 additional credits in soc. sci.)	II	MWF	200aP	Mr. Johnson
190f-191w-192s	Senior Topics Course (9 cred.; sr., grad.; prereq., 104 and 110)	VIII-IX	W	200aP	Mr. Johnson

LATIN

Major Adviser: J. B. Pike

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation: Course 73 any two of Courses 71, 52, 53 and three courses in the hundred sequence.

Minor recommendation: Course 73 and any two of Courses 71, 52, and 53.

Junior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†§	Beginning Latin (10 cred.; all; no prereq.)				
	Sec. 1	IV	MTWFS	109F	Mrs. Babcock
	2	VI	MTWThF	109F	Mr. Cram

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

§ Credit is usually not given for more than one beginning language. See paragraph 2, page 7. Science, Literature, and the Arts bulletin

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor	
3s	Caesar (5 cred.; all; prereq., 1-2, or 1 yr. Latin)	Sec. 1	IV	MTWFS	109F	Mrs. Babcock
		2	VI	MTWThF	109F	Mrs. Babcock
11f	Virgil I and II (5 cred.; all; prereq., 1-2, 3, or 2 yrs. Latin)	Sec. 1	III	MTThFS	109F	Mr. Cram
		2	VI	MTWThF	107F	Mrs. Babcock
		3	VII	MTWThF	110F	Mrs. Babcock
12w	Virgil III and IV (5 cred.; all; prereq., 1-2, 3, or 2 yrs. Latin)	Sec. 1	III	MTThFS	109F	Mr. Cram
		2	VI	MTWThF	107F	Mrs. Babcock
		3	VII	MTWThF	110F	Mrs. Babcock
13s	Ovid (5 cred.; all; prereq., 1-2, 3, or 2 yrs. Latin)	III	MTThFS	109F	Mr. Cram	
21f	Selections (5 cred.; all; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)	IV	MTWFS	107F	Mr. Pike	
22w	Selections and Survey (5 cred.; all; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)	IV	MTWFS	107F	Mr. Pike	
23s	Plautus and Terence (5 cred.; all; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)	IV	MTWFS	107F	Mr. Pike	

Senior College Courses

51	Pliny's Letters (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	Not offered in 1927-28			
52w	Horace's Satires and Epistles .. (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	108F	Mr. Cram
53	Suetonius, Selected Lives (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	Not offered in 1927-28			
62	Horace's Odes and Epodes (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	Not offered in 1927-28			

Students entering winter quarter.—Students with one year of Latin may elect 2w. Students with two years of Latin may elect 12w. Students with three or four years of Latin may elect 22w.

Students entering spring quarter.—Students with one year of Latin may elect 3s. Students with two years of Latin may elect 13s. Students with three or four years of Latin may elect 23s.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
63s	Apuleius (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	107F	Mr. Cram
71f	Cicero's De Amicitia and De Senectute (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	108F	Mr. Cram
73s	Advanced Grammar and Composition* (3 cred.; jr., sr.; prereq., 51 and 52, or 71 and 62)	III	MWF	107F	Mr. Pike
121f	Advanced Virgil (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
122	<i>Cicero's Letters</i> (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	<i>Not offered in 1927-28</i>			
123	<i>Medieval Latin</i> (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	<i>Not offered in 1927-28</i>			
131	<i>Juvenal</i> (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	<i>Not offered in 1927-28</i>			
132w	Seneca's Epistles (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
133s	Vulgar Latin (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
201-202-203	<i>Grad. Seminar: Tacitus</i> (9 cred.)	<i>Not offered in 1927-28</i>			
211-212-213	<i>Grad. Seminar: Lucretius</i> (9 cred.)	<i>Not offered in 1927-28</i>			
221f-222w-223s	Graduate Seminar: Cicero's Phil. Works (9 cred.)	VIII-IX	T	312Lib	Mr. Pike
231f-232w-233s	Graduate Seminar: Cicero's Rhetorical Works (9 cred.)	Ar	Ar	Ar	Mr. Pike

Courses for Which No Knowledge of Latin Is Required

43s‡	Roman Literature (3 cred.; jr., sr.‡; no prereq.)	VI	MWF	110F	Mr. Cram
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* Required of students who expect a teaching recommendation.

‡ Not a senior college course. Not open to sophomores.

LIBRARY METHODS

No. if,w,s§	Title	Hour	Day	Bldg.	Instructor
	Use of Books and Libraries .. (2 cred.; fr., soph. only; no prereq.)				
	Sec. 1	II	MW	5Lib	Miss Firkins
	2	IV	MW	5Lib	Mr. Russell
	3	VI	MW	5Lib	Mr. Walter
101f-102w	Bibliographic Seminar (4 cred.; sr., grad.; prereq., for- eign language†)	II	TTh	5Lib	Mr. Walter

NOTE.—For courses in hospital library service, consult special bulletin.

MATHEMATICS

Major Adviser: A. L. Underhill

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation: 8 credits in courses numbered over 50 in addition to the courses required for a minor recommendation.

Minor recommendation: entrance credit in solid geometry or its equivalent; † Course 1 (Higher Algebra) taken either in high school or in college; Courses 6, 7, 30, 50, 51.

Junior College Courses

3f*	Higher Algebra, Short Course .. (4 cred.; all; prereq., 1 yr. elem. alg.)	VII	MTThF	105F	Ar
3w*	Higher Algebra, Short Course .. (See 3f)	VIII	MTThF	105F	Ar
4f*	Algebra and Trigonometry (4 cred.; all; prereq., 3 or 5, or prep. higher alg.)	VIII	MTThF	105F	Ar
4w*	Algebra and Trigonometry (See 4f)	VII	MTThF	105F	Ar
4s*	Algebra and Trigonometry (See 4f)	VIII	MTThF	105F	Ar
5f	Higher Algebra				
	(5 cred.; all; prereq., 1 yr. elem. alg.)				
	Sec. 1	II	MWThFS	105F	Ar
	2	VI	MTWThF	104F	Ar
5w	Higher Algebra	VI	MTWThF	105F	Ar
	(See 5f)				
5s	Higher Algebra	I	TWThFS	102F	Ar
	(See 5f)				

† Enough of one foreign language to meet the Group B requirements for admission to the Senior College, and 9 additional credits in the same or another foreign language.

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

§ For students in the College of Science, Literature, and the Arts. Others must obtain a special card from the junior college office.

† Those who did not present solid geometry for entrance may meet this requirement in one of the following ways: (1) By taking the subject in the summer school or in the General Extension Division by correspondence; (2) By passing a college entrance examination or a special examination given by the Department of Mathematics.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
6f¶	Trigonometry (5 cred.; all; prereq., 5 or prep. higher algebra)	IV	MTWFS	104F	Ar
6w¶	Trigonometry (See 6f)	IV	MTWFS	105F	Ar
6s¶	Trigonometry (See 6f)	IV	MTWFS	105F	Ar
7f¶	College Algebra (5 cred.; all; prereq., 6)	IV	MTWFS	105F	Ar
7w¶	College Algebra (See 7f)	IV	MTWFS	104F	Ar
7s¶	College Algebra (See 7f)	IV	MTWFS	104F	Ar
8ff	Commerce Algebra (5 cred.; pre-bus. students; pre- req., 5 or prep. high. alg.)	I	TWThFS	104F	Ar
8wf	Commerce Algebra (See 8f)	II	MWThFS	105F	Ar
8sf	Commerce Algebra (See 8f)	VI	MTWThF	105F	Ar
20w	Mathematics of Investment (5 cred.; all; prereq., 8, or 6 and 7)	I	TWThFS	105F	Ar
20s	Mathematics of Investment (See 20w)	II	MWThFS	105F	Ar
30f	Analytical Geometry (6 cred.; all; prereq., 6 and 7)	III	MTWThFS	104F	Mr. Brink
30w	Analytical Geometry (See 30f)	I	MTWThFS	104F	Mr. Underhill
30s	Analytical Geometry (See 30f)	I	MTWThFS	104F	Mr. Underhill
47f-48w-49s*	Mathematics for Students of Sta- tistics (12 cr d.; jr., sr.*; prereq., 5 or prep. higher algebra)	Ar	Ar	Ar	Mr. Brink

Senior College Courses

50f§	Calculus I (5 cred.; jr., sr.; prereq., 30)	III	MTThFS	105F	Mr. Jackson
50w§	Calculus I (See 50f)	III	MTThFS	104F	Mr. Brink
51w§	Calculus II (5 cred.; jr., sr.; prereq., 50)	III	MTThFS	105F	Mr. Jackson
51s§	Calculus II (See 51w)	III	MTThFS	104F	Mr. Brink

§ Courses 50, 51, and 52 are open without petition to sophomores who have an average of C in the prerequisite courses and in all of their previous work.

¶ Courses 6 and 8 involve some duplication of material, and no student may take both without special permission. No student may receive credit for both of Courses 7 and 8. Pre-business students who elect mathematics to meet the requirement of 10 credits in mathematics or laboratory science, should take 5 and 8 if they have not had high school higher algebra, and 8 and 20 if they have had high school higher algebra.

* A student who has had, or is taking courses numbered above 5, will not receive full credit for 47-48-49.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
52f§	Calculus III (5 cred.; jr., sr.; prereq., 51)	II	MTWThFS	101F	Mr. Underhill
52s§	Calculus III (See 52f)	III	MTThFS	105F	Mr. Jackson
60	<i>Synthetic Metric Geometry</i> (3 cred.; jr., sr.; prereq., 30)	<i>Not offered in 1927-28</i>			
62w	Theory of Equations I (3 cred.; jr., sr.; prereq., 50)	VII	MWF	101F	Mr. Bussey
63	<i>Theory of Equations II</i> (3 cred.; jr., sr.; prereq., 62)	<i>Not offered in 1927-28</i>			
70s	Hist. of Elemt. Math. (3 cred.; jr., sr.; prereq., 30)	VII	MWF	101F	Mr. Bussey
71s	Solid Analytical Geometry (3 cred.; jr., sr.; prereq., 50)	VI	MWF	103F	Miss Gibbens
102-103-104	<i>Adv. Analytic and Synthetic Geometry</i> (9 cred.; jr., sr., grad.; pre- req., 50)	<i>Not offered in 1927-28</i>			
106f	Differential Equations (3 cred.; jr., sr., grad.; pre- req., 51)	III	MWF	103F	Mr. Hart
107w-108s	Advanced Calculus (6 cred.; jr., sr., grad.; pre- req., 52)	III	MWF	103F	Mr. Hart
115f-116w-117s	Differential Geometry (9 cred.; jr., sr., grad.; prereq., 50-51)	III	TThS	103F	Mr. Underhill
118-119-120	<i>Vector Analysis</i> (9 cred.; jr., sr., grad.; prereq., 50-51)	<i>Not offered in 1927-28</i>			
121-122-123	<i>Math. Theory of Statistics</i> (9 cred.; jr., sr., grad.; prereq., 50-51, or 47-48-49)	<i>Not offered in 1927-28</i>			
140w‡	Method of Least Squares (3 cred. jr., sr., grad.; prereq., Math. 51)	See Astronomy Program			
144f-145w-146s	Topics in Math. Analysis (9 cred.; jr., sr., grad.; prereq., 106, 107-108, or Math. and Mech. 151, 152-153*)	Ar	Ar	Ar	Mr. Jackson
206-207-208	<i>Theory of Functions</i> (9 cred.; sr., grad.; prereq., 106, 107-108, or Math. and Mech. 151, 152-153*)	<i>Not offered in 1927-28</i>			

NOTE.—Some of the courses listed in the Graduate School bulletin are open to properly qualified juniors and seniors. For more information consult the chairman of the Department of Mathematics.

§ Courses 50, 51, and 52 are open without petition to sophomores who have an average of C in the prerequisite courses and in all of their previous work.

‡ Identical with Astronomy 140.

* See bulletin of the College of Engineering.

MECHANICAL ENGINEERING

COLLEGE OF ENGINEERING AND ARCHITECTURE

NOTE.—Students will register for these courses in the order 11-12-13. They may be reassigned by the department as the enrolment demands. A student transferred to 12 for his first quarter will follow this by 13 and then 11; a student transferred to 13 for his first quarter will follow this by 11 and then 12.

No.	Title	Hour	Day	Bldg.	Instructor
11f,w,s, 12f,w,s, 13f,w,s	Elem. Shop Practice (2 cred. per qtr.¶; pre-dent. only no prereq.)	VII, VIII, IX†	MW MF	ME(f,w) (spring)	Mr. Shipley and others

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w	First Year Basic Course (No cred.; fr.; no prereq.)				
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	IV	MWF	A	Ar
	4	V	MWF	A	Ar
	5	VI	MWF	A	Ar
	6	VII	MWF	A	Ar
	7	VIII	MWF	A	Ar
3s	First Year Basic Course (No cred.; fr.; no prereq.)	VII, VIII, IX	T or W	A	Ar
4f-5w	Second Year Basic Course (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	IV	MWF	A	Ar
	4	V	MWF	A	Ar
	5	VI	MWF	A	Ar
	6	VII	MWF	A	Ar
	7	VIII	MWF	A	Ar
6s	Second Year Basic Course (No cred.; soph.; prereq., 1-2-3)	VII, VIII, IX	T or W	A	Ar
51f-52w	First Year Advanced Course (Cred.¶; prereq., 4-5-6)	Total of five hours selected from the following: II III VI VIII	MWF MWF MWF MWF	A A A A	Ar Ar Ar Ar
		(One two-hour period to be arranged)			
53s	First Year Advanced Course (Cred.¶; prereq., 4-5-6)	VII, VIII, IX	T or W	A	Ar
		(One two-hour period to be arranged)			
54f-55w	Second Year Advanced Course (Cred.¶; prereq., 51-52-53)	Total of five hours selected from the following: II III VI VIII	MWF MWF MWF MWF	A A A A	Ar Ar Ar Ar
		(One two-hour period to be arranged)			
56s	Second Year Advanced Course (Cred.¶; prereq., 51-52-53)	VII, VIII, IX	T or W	A	Ar
		(One two-hour period to be arranged)			

† Students having conflicts with this program may register with one of the engineering or chemistry sections, with permission from Professor Shipley.

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

|| For the amount of credit given for the work of the Advanced R.O.T.C., see pages 15 and 16 Science, Literature, and the Arts bulletin, Part II.

MUSIC

Major Advisers: C. M. Scott, D. N. Ferguson, and E. C. Killeen

For specialized curriculum in Public School Music see Part I of Education bulletin.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s†	Harmony (9 cred.; fr. mu.; no prereq.)				
	Sec. 1	II	MWF	Mu	Mr. Scott
	2	VI	MWF	Mu	Mr. Scott
1w-2s-(3su)†	Harmony (See 1f-2w-3s)	III	MWF	Mu	Miss Reeves
4f-5w-6s†	Counterpoint (6 cred.; soph. mu.; prereq., 1-2-3)	III	TTh	Mu	Mr. Ferguson
7f-8w-9s†	Ear Training (3 cred.; † fr., soph. mu.; no prereq.)	VI	TTh	Mu	Miss Reeves, Mrs. Twichell, Miss Kendall
7w-8s†	Ear Training (See 7f-8w-9s)	VII	TTh	Mu	Miss Kendall
10f-11w-12s	First Year Organ (6 or 12 cred.; fr. mu.)	Ar	Ar	Mu	Ar
13f-14w-15s	Second Year Organ (6 or 12 cred.; soph. mu.; prereq., 10-11-12)	Ar	Ar	Mu	Ar
16f-17w-18s	First Year Pianoforte (6 or 12 cred.; fr. mu.)	Ar	Ar	Mu	Ar
19f-20w-21s	Second Year Pianoforte (6 or 12 cred.; soph. mu.; prereq., 16-17-18)	Ar	Ar	Mu	Ar
22f-23w-24s	First Year Violin (6 or 12 cred.; fr. mu.)	Ar	Ar	Mu	Ar
25f-26w-27s	Second Year Violin (6 or 12 cred.; soph. mu.; prereq., 22-23-24)	Ar	Ar	Mu	Ar
28f-29w-30s	First Year Vocal Training (6 or 12 cred.; fr. mu.)	Ar	Ar	Mu	Ar
31f-32w-33s	Second Year Vocal Training .. (6 or 12 cred.; soph. mu.; prereq., 28-29-30)	Ar	Ar	Mu	Ar
34f-35w-36s	First Year of Other Orchestral Instruments (6 or 12 cred.; fr. mu.)	Ar	Ar	Mu	Ar
37f-38w-39s	Second Year of Other Orchestral Instruments (6 or 12 cred.; soph. mu.; prereq., 37-38-39)	Ar	Ar	Mu	Ar
40f-41w-42s*	Orchestra (3 cred.; jr., sr.)	7:30 p.m.	W	Mu	Mr. Pepinsky
43f-44w-45s¶	University Chorus‡ (3 cred.; fr. and soph. mu., acad. jr., sr.)	7 p.m.	T	Mu	Mr. Killeen

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

() Numbers in parentheses do not refer to the year 1927-28.

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

¶ Students may receive credit for 2 years of chorus.

‡ Does not carry credit for academic freshmen and sophomores.

No.	Title	Hour	Day	Bldg.	Instructor
86f-87w-88s	Normal Piano (6 cred.; jr.; prereq., 2 yrs. piano)	VII	MWF	Mu	Miss Reeves
89f-90w-91s	Adv. Normal Piano (6 cred.; sr.; prereq., 86-87-88)	VIII	MWF	Mu	Miss Reeves
100f-101w-102s	Composition-Orchestration (6 cred.; jr., sr.; prereq., 1-2-3, 4-5-6)	Ar	Ar	Mu	Mr. Ferguson
103f-104w-105s	Analysis (3 cred.; jr., sr.; prereq., 1-2-3, 4-5-6)	III	T	Mu	Mr. Pepinsky
106f-107w-108s†	History of Music (9 cred.; jr., sr.; prereq., 1-2-3)	II	MWF	Mu	Mr. Ferguson
106f-110w-111s†	Bach and Beethoven (9 cred.; sr.; prereq., 106-107-108)	VII, VIII	TTh	Mu	Mr. Ferguson
112f-113w-114s	Ensemble (6 cred.; jr.)				
	Sec. 1	II	TTh	Mu	Mr. Pepinsky
	(For voice students)	2	TTh	Mu	Miss Hull
113f-116w-117s	Adv. Ensemble (6 cred.; sr.; prereq., 112-113-114)				
	Sec. 1	IV	MW	Mu	Mr. Pepinsky
	(Voice)	2	MW	Mu	Mr. Killeen
121f-122w-123s	Romantic Movement (6 cred.; jr., sr.; prereq., 106-107-108)	VII	WF	Mu	Miss Kendall
124f-125w-126s	Advanced Harmony (6 cred.; jr., prereq., 4-5-6)	Ar	Ar	Mu	Mr. Scott

NOTE.—For more advanced courses in music, consult special bulletin.

ORIENTATION

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Orientation (10 cred.; entering freshmen only; no prereq.)				
	Lect.	VI‡	M	OLAud	
	Sec. 1	I	TWThFS	5Lib	
	2	II	MWThFS	213F	
	3	III	MTThFS	5Lib	
	4	VI	MTWThF	211OL	
	5	VII	MTWThF	5Lib	
1w-2s†	Orientation (Sec 1f-2w)	III	MTThFS	209OL	

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

‡ There will be five meetings of the class each week, sometimes five recitations, sometimes four recitations and one lecture.

PHILOSOPHY

Major Advisers: D. P. Swenson

No. if	Title	Hour	Day	Bldg.	Instructor
	Problems of Philosophy (5 cred.; soph., jr., sr.; no pre- req.)				
	Sec. 1	I	TWThFS	321F	Mr. Conger
	2	II	MWThFS	321F	
	3	VII	MTWThF	322F	Mr. Conger
	4	III	MTThFS	321F	Mr. Swenson
1w	Problems of Philosophy (See if)	VII	MTWThF	321F	Mr. Conger
1s	Problems of Philosophy (See if)				
	Sec. 1	IV	MTWFS	321F	Mr. Conger
	2	VI	MTWThF	321F	
2f	Logic (5 cred.; soph., jr., sr.; no pre- req.)	IV	MTWFS	321F	
2w	Logic (See 2f)	VI	MTWThF	321F	
2s	Logic (See 2f)	II	MWThFS	321F	
3f	Ethics (5 cred.; soph., jr., sr.; no pre- req.)	IV	MTWFS	321F	Mr. Wilde
3w	Ethics (See 3f)	I	TWThFS	321F	
3s	Ethics (See 3f)	I	TWThFS	322F	Mr. Wilde
4w-5s	Logic (3 cred.; soph., jr., sr.; prereq. 1 or 3 with grade of C or better)	III	TThS	321F	Mr. Swenson
10s	Science and Religion (2 cred.; soph., jr., sr.; prereq., 10 cred. in phil. or a science)	VII	TTh	204F	Mr. Swenson
50w	Ancient and Medieval Philosophy (5 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.)	IV	MTWFS	322F	Mr. Wilde
51s	Modern Philosophy (5 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.)	IV	MTWFS	322F	Mr. Wilde
100f	History of Religions (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Mr. Conger
101w	Psychology of Religion (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Mr. Conger
102s	Philosophy of Religion (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Mr. Swenson
103s	Esthetics (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	MWF	322F	Mr. Swenson

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
104	<i>History of Esthetic Theory</i> ... (3 cred.; jr., sr., grad.; prereq., 10 cred.)				<i>Not offered in 1927-28</i>
108-109	<i>History of Ethics</i> (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)				<i>Not offered in 1927-28</i>
110W	Contemporary Philosophy (3 cred.; jr., sr., grad.; prereq., 50 or 51)	III	MWF	321F	Mr. Conger
120	<i>Scandinavian Philosophy</i> (3 cred.; jr., sr., grad.; prereq., 10 cred.)				<i>Not offered in 1927-28</i>
124f	Political and Social Ethics (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	I	TWThFS	322F	Mr. Wilde
129W	Modern Political Thought (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	I	TWThFS	322F	Mr. Wilde
135f-136w	Philosophy of Plato (6 cred.; jr., sr., grad.; prereq., 10 cred.)	VIII	MWF	339Lib	Mr. Swenson
141s	Metaphysics (6 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2)	VIII	MTWThF	322F	Mr. Conger
147f-148w	Advanced Logic (6 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2)	II	MWF	322F	Mr. Swenson
151-152	<i>Modern Idealism</i> (6 cred.; sr., grad.; prereq., 15 cred. in phil.)				<i>Not offered in 1927-28</i>
161f-162w-163s	Seminar in Philosophy (9 cred.; sr., grad.; prereq., 20 cred. in phil. and consent of instructor)	Ar		Ar Ar	Mr. Wilde, Mr. Swenson, Mr. Conger

PHYSICS

Major Adviser: H. A. Erikson

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Sixteen quarter credits in physics.For university teacher's certificate in natural science, see specialized curriculum.
Part I of Education bulletin.*Introductory Courses*

No.	Title	Hour	Day	Bldg.	Instructor
3f	Elem. of Mechanics and Sound (3 cred.; all; prereq., Math. 4, or 6)				
	Lect.	VIII	MWF	30Ph	Mr. Erikson
	Quiz	II	Th	305E	
	or	IX	Th	100C	

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
3w	Elem. of Mechanics and Sound (See 3f)	Lect. VIII Quiz IX	MWF F	120Ph 120Ph	Mr. Erikson
3s	Elem. of Mechanics and Sound (See 3f)	Lect. III Quiz IX*	TThS F	120Ph 120Ph	Mr. Erikson
4f,w,s	Elem. of Mechanics Lab. (1 cred.; all; prereq., 3 or reg. in 3)	Sec. 1 VI, VII§ 2 VIII, IX§ 3 I, II§ 4 VIII, IX§	T T Th Th	16Ph 16Ph 16Ph 16Ph	Mr. Buchta and assistants
9s‡	Acoustics (3 cred.; all; no prereq.)	VIII	MWF	132Ph	Mr. Buchta
23f	Heat (3 cred., all; prereq., 3)	Lect. III Quiz IX	TThS Th	30Ph 100C	Mr. Miller Mr. Miller
23w	Heat (See 23f)	Lect. Sec. 1 I 2 II 3 VI Quiz Sec. 1 II 2 IX	MWF MWF MWF Th Th	130Ph 130Ph 130Ph 120Ph 120Ph	Mr. Miller
24f	Heat Laboratory (1 cred.; all; prereq., 4, 23, or reg. in 23)	Sec. 1 V, VII 2 VIII, IX 3 VI, VII 4 VIII, IX	M M T T	23Ph 23Ph 23Ph 23Ph	Mr. Miller and assistants
24w	Heat Laboratory (See 24f)	Sec. 1 VI, VII 2 VIII, X 3 I, II 4 VIII, IX	T T Th Th	23Ph 23Ph 23Ph 23Ph	Mr. Miller and assistants
33f,s	Optics (3 cred.; all; prereq., 3)	Lect. I Quiz IX	TThS F	30Ph 30Ph	Mr. Valasek Mr. Valasek
34f,s	Optics Laboratory (1 cred.; all; prereq., 4 and 33 or 35 or reg. in 33 or 35)	Sec. 1 VI, VII 2 VI, VII	Th F	23Ph 23Ph	Mr. Valasek Mr. Valasek
43w	Electricity (3 cred.; all; prereq., 3)	Lect. III Quiz IX	TThS Th	132Ph 120Ph	Mr. Zeleny

* Students who take Inorganic Chemistry 108 laboratory at VIII, IX, MWF should try to arrange with Professor Erikson for another quiz hour.

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

§ Students who cannot enter one of the four sections listed should register for the course at "hours to be arranged" and report to Professor Erikson.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
43S	Electricity (See 43W)				
	Lect. Sec. 1	I	MWF	132Ph	Mr. Zeleny
	2	II	MWF	132Ph	
	3	VI	MWF	132Ph	
	Quiz Sec. 1	II	Th	120Ph	
	2	IX	Th	120Ph	
44W	Electricity Laboratory (1 cred.; all; prereq., 4. 43 or reg. in 43)				
	Sec. 1	VI, VII	T	31Ph	Mr. Zeleny and assistants
	2	VIII, IX	T	31Ph	
	3	VI, VII	W	31Ph	
44S	Electricity Laboratory (See 44W)				
	Sec. 1	VI, VII	T	31Ph	Mr. Zeleny and assistants
	2	VIII, IX	T	31Ph	
	3	I, II	Th	31Ph	
	4	VIII, IX	Th	31Ph	
<i>Intermediate Courses</i>					
52f	Laboratory Arts (3 cred.; jr., sr.; prereq., 16 cred.)				
	Sec. 1	VI, VII, VIII	MW	2Ph	Mr. Buchta
	2	VI, VII, VIII	TTh	2Ph	
101f-103W-105S	Theoretical Physics (15 cred.; jr., sr., grad.; prereq., 12 cred. in phys., Math. 51)	IV	MTWFS	2Ph	Mr. Tate
104W	Precision Mechanics (3 cred.; jr., sr., grad.; prereq., 12 cred. and Math. 51)	V, VII, VIII	MW	2Ph	Mr. Buchta
114f-116W-118S	Elem. Phys. Investigation (3 cred.; jr., sr., grad.; prereq., 104, Math. 51)	Ar	Ar	1Ph	Ar
115f-117W-119S	Problem Course (3 cred.; jr., sr., grad.; prereq., 12 cred., Math. 51)	Ar	Ar	20Ph	Mr. Buchta
124S	Pyrometry and Heat (3 cred.; jr., sr., grad.; prereq., 23 and 24)	V-IX	MW	23Ph	Mr. Miller
134f,w	Applied Optics (3 cred.; jr., sr., grad.; prereq., 33 and 34)	VII, VIII, IX	MW	3Ph	Mr. Valasek
144f	Elect. Measurements (3 cred.; jr., sr., grad.; prereq., 43 and 44)	See 144f,	Engineering	program	Mr. Zeleny
146W	Advanced Electrical Measure- ment (3 cred.; by permission from in- structor; prereq., 144)	Ar	Ar	12Ph	Mr. Zeleny

POLITICAL SCIENCE

Major Adviser: C. D. Allin

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate in government.—Major recommendation: at least 36 credits in political science including American Government, State or Municipal Government, Introduction to Political Science, and at least 12 credits in senior college courses not including Course 51-52-53.

Minor recommendation: at least 18 credits in political science including American Government, Introduction to Political Science, and either State or Municipal or Comparative European Government.

NOTE.—The following courses in other departments carry credit also in this department:

Economics 154, Public Utilities; 169, Labor and Socialist Movement in Europe; 191-192, Public Finance; and 193, State and Local Taxation.

History 33-34, English Legal Institutions; 106-107-108, Europe 1815-1914; 109, Modern England; 146-147, Constitutional History of the United States; 153, The West in American Politics since 1865; 168, Topics in American Foreign Relations.

Sociology 140, History of Social Theory.

Civil Engineering 53, Municipal Engineering.

Philosophy 129, Modern Political Thought.

Introductory Courses

1f,w,s	American Government (5 cred.; soph., jr., sr., and f. with 10 cred. in hist. or econ.; no prereq.)	Lect. IV Sec. 1 I	WF MWF	OLAud 221OL(fall, winter) 109F(spring) 112OL(fall) 107F(w), 209OL(spring) 125F(fall) 112OL(winter, spring) 112OL	Mr. Young
		2 II	TThS		
		3 VI	MWF		
		4 VII	MWF		

Intermediate Courses

2f,w,s	State Government (5 cred.; soph., jr., sr.; prereq., 1)	Lect. VII	MTWThF	221OL	Ar
3f,w,s	Comparative European Govern- ment (5 cred.; soph., jr., sr.; prereq., 1)	IV	MTWFS	112OL	Ar
11f,s	Municipal Government (5 cred.; soph., jr., sr.; prereq., 1)	I	TWThFS	209OL	Mr. Anderson
15f,w,s	Introduction to Political Science (5 cred.; soph., jr., sr.; prereq., 1)	III	MTThFS	111OL	Ar

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
25f,w,s	World Politics (5 cred.; soph., jr., sr.; prereq., 1, or 10 cred. in hist.)	VI	MTWThF	209OL	Mr. Quigley
51f-52w-53s*†	Business Law (9 cred.; jr., sr.; prereq., 10 cred. in pol. sci. or 10 cred. in econ., or 5 cred. in each)	Lect. II Sec. 1 I 2 II 3 III 4 VI 5 I 6 II 7 III 8 IV	WF	OLAud	Mr. Young
102s	Political Parties (3 cred.; jr., sr., grad.; prereq., 15 cred.)	II	MWF	209OL	Ar
105s	Colonization (3 cred.; jr., sr., grad.; prereq., 15 cred. or 20 cred. in soc. sci.)	IV	MWF	209OL	Mr. Allin
111w-112s†	Municipal Powers and Func- tions (6 cred.; jr., sr., grad.; prereq., 18 cred. incl. 11)	III	TThS	12Lib	Mr. Anderson
113f	Municipal Administration (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 11)	III	TThS	211OL	Mr. Anderson
121f-122w†	International Law (6 cred.; sr., grad.; prereq., 20 cred. in soc. sci.)	IV	MWF	209OL	Mr. Allin
123s	International Organization (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	VII	MWF	6F	Mr. Quigley
124	<i>Problems of International Law</i> (3 cred.; sr., grad.; prereq., 121- 122)	<i>Not offered in 1927-28</i>			
125f-126w†	American Diplomatic History .. (6 cred.; jr., sr., grad.; prereq., 20 cred. in hist. and pol. sci. or 15 cred. in hist. or pol. sci.)	III	MWF	221OL	Mr. Shippee
127	<i>American Foreign Relations</i> ... (3 cred.; jr., sr., grad.; prereq., 20 cred. in hist. and pol. sci. or 15 cred. in hist. or pol. sci.)	<i>Not offered in 1927-28</i>			
130	<i>Introduction to Administration</i> (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci., incl. 10 cred. in pol. sci.)	<i>Not offered in 1927-28</i>			

* Cannot be counted for a minor sequence.

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
131-132†	<i>Principles of Public Administration</i> (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci., incl. 10 cred. in pol. sci.)				<i>Not offered in 1927-28</i>
136-137†	<i>Far Eastern Government and Politics</i>				<i>Not offered in 1927-28</i>
138f-139w†	Far Eastern Diplomacy (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 25, or 10 cred. in pol. sci. and Hist. 1-2 or 2-3)	VII	MWF	209OL	Mr. Quigley
141f	Problems in State Government and Constitutional Law (3 cred.; jr., sr., grad.; prereq., 15 cred.)	VI	MWF	221OL	Mr. Kumm
145w	Legislative Power and Methods (3 cred.; jr., sr., grad.; prereq., 15 cred.)	II	TThS	211OL	Mr. Young
146-147	<i>Constitutional History of the U.S.</i>				<i>Not offered in 1927-28</i>
151w-152s†	Constitutional Law (6 cred.; jr., sr., grad.; prereq., 15 cred. incl. one sen. col. course)	VI	MWF	221OL	Mr. Kumm
155s	Administrative Law (3 cred.; jr., sr., grad.; prereq., 15 cred.)	I	TThS	221OL	Mr. Kumm
157f	Recent Social Legislation (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	II	TThS	211OL	Mr. Young
158s	Government and Business (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	II	TThS	211OL	Mr. Young
159w	Law of Public Utilities (3 cred.; jr., sr., grad.; prereq., 15 cred., or Econ. 155)	I	TThS	221OL	Mr. Kumm
161-162†	<i>Comparative Federal Government</i>				<i>Not offered in 1927-28</i>
166w-167s†	Government and Politics of the British Empire (6 cred.; jr., sr., grad.; prereq., 15 cred. or Hist. 109)	II	MWF	211OL	Mr. Allin
171s	Political Psychology (3 cred.; jr., sr., grad.; prereq. §)	See Psychology 141			

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

§ Open to majors in social science who have had Psy. 1-2 and 4-5 or 7, or Animal Biology 1-2 and to majors in psychology who have had 20 credits in social science.

No.	Title	Hour	Day	Bldg.	Instructor
181w	Modern Political Thought (3 cred.; jr., sr., grad.; prereq. 20 cred. in soc. sci. or 10 cred. in phil.)	I	TWThFS	322F	Mr. Wilde
187f	Problems of Democracy (3 cred.; jr., sr., grad.; pre- req., 20 cred. in soc. sci.)	VI	MWF	112OL	
190*	Jurisprudence (2 cred.; grad. and sr. of suit- able preparation)	See Law School bulletin			Mr. Rott- schaefer

PREVENTIVE MEDICINE AND PUBLIC HEALTH

Major Adviser: H. M. Diehl

MEDICAL SCHOOL

NOTE.—Students desiring to major in this department are advised to consult the special bulletin, obtainable at the office of the registrar.

No.	Title	Hour	Day	Bldg.	Instructor
2f	First Aid (1 cred.; prereq., 10 cred. An. Biol.) (Limited to 20 women)	VI, VII	W	§	Miss Fisher
2w	First Aid (See 2f) (Limited to 20 women)	VI, VII	W	§	Miss Fisher
3f,w,s†	Personal Hygiene and Elementary Sanitation (2 cred.; fr., soph.; no prereq.) (Limited to 80 men) (1 section —40 women)	IV	TS	101bMH	Dr. Lees, Dr. Cady Dr. Duryea
4s	Increasing the Span of Human Life (3 cred.; fr., soph.; prereq., 3. or Phys. Ed. 4)	III	TThS	101bMH	Dr. Myers
5of,w	Public and Personal Health . . . (3 cred.; jr., sr.; prereq., An. Biol. 1-2 and Psy. 1-2 or per- mission of instructor)	V	MWF	101bMH	Dr. O'Brien
52f,w,s	Health Care of the Family . . . (3 cred.; jr., sr.; prereq., Bact. 51, Physiol. 4) (Lab. sections limited to 20)	Lect. I Sec. 1 VI, VII 2 VI, VII (fall, spring) VI, VII (winter)	S TTh MF TTh	213HE § § §	Dr. Duryea Miss Fisher Miss Fisher Miss Fisher
53f	Elements of Preventive Medicine (3 cred.; jr., sr.; prereq., Psy. 1-2; Bact. 51 or equiv.)	II	MWF	101bMH	Dr. Diehl

* Second semester.

† Students who take this Course 3 need not take Physical Education for Men 4.

§ Woman's Hall, University Farm.

PROGRAM

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No.	Title	Hour	Day	Bldg.	Instructor
53s	Elements of Preventive Medicine (3 cred.; jr., sr.; prereq., Psy. 1-2; Bact. 51 or equiv.)	II	TThS	101bMH	Dr. Diehl
57f	Health of Infant and Pre-School Child	IV	TS	101bMH	Dr. Boynton
	(2 cred.; jr., sr.; prereq., An. Biol. 1-2, Psy. 1-2; or 50, 52, or 53)				
58w	Maternal and Child Hygiene .. (2 cred.; jr., sr.; prereq., 50 or 52 or 53) (For public health nurses)	VI	MW	101bMH	Dr. Boynton and others
59w	Social Hygiene	I	F	101bMH	Ar
	(1 cred.; jr., sr.; prereq., 50 or 52 or 53)				
60w	Tuberculosis and Its Control ..	IV	TS	101bMH	Dr. Myers
	(2 cred.; jr., sr.; prereq., 50 or 52 or 53)				
61w	Mental Hygiene	III	W	101bMH	Ar
	(1 cred.; jr., sr.; prereq., 50 or 52 or 53, Psy. 1-2)				
62f,w	Principles of Public Health Nursing	Ar	Ar	101bMH	Miss Butzerin
	(3 cred.; jr., sr.; for public health nurses)				
63w,s	Special Fields in Public Health Nursing	Ar	Ar	101bMH	Miss Butzerin
	(3 cred.; jr., sr.; public health nurses; prereq., 62 or equiva- lent)				
64f,w,s	Field Practice in Infant Welfare Nursing	Ar	Ar	Ar	Miss Butzerin, Miss Peck
	(3 cred.; jr., sr.; prereq., 58 and 62)				
65f,w,s	Field Practice in School Nursing	Ar	Ar	Ar	Miss Butzerin
	(2 cred.; jr., sr.; prereq., 62)				
66f,w,s	Field Practice in County Nursing	Ar	Ar	Ar	Miss Butzerin
	(2 cred.; jr., sr.; prereq., 62)				
67f,w,s	Field Practice in a Tuberculosis Sanatorium	Ar	Ar	Ar	Dr. Mariette
	(2 cred.; jr., sr.; prereq., 60 and 62)				
68f,w,s	Field Practice in Visiting Nurs- ing	Ar	Ar	Ar	Miss Butzerin, Miss Houlton
	(5 cred.; jr., sr.; prereq., 62)				
70f,w	Home Nursing and Child Care	Ar	Ar	Ar	Miss Butzerin
	(3 cred.; public health nurses; prereq., 62, 63, or equiv.)				
73w	Occupational Hygiene and Dis- ease	IV	MW	101bMH	Dr. Myers
	(2 cred.; jr., sr.; prereq., 53)				
80w	Child Health and Educational Hygiene	II	MWF	101bMH	Dr. Diehl
	(3 cred.; jr., sr.; prereq., 50 or 52 or 53)				

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
102w	Sanitation	Ar	Ar	*	Mr. Whittaker, Mr. Childs
	(Cred. ar.; jr., sr., grad.; pre- req., Bact. 101; Anal. Chem. 1-2 or 7; Org. Chem. 7 or 53; Phys. 24, 34, 44)				
103s	Public Health Bacteriology	VII, VII	MWF	*	Miss Wade
	(3 cred. or ar.; jr., sr., grad.; prereq., Bact. 101, 116)	or ar	or ar		
106f,w,s	Public Health Administration ..	Ar	Ar	Ar	Dr. Diehl
	(Cred. ar.; jr., sr., grad.; prereq., 53 or 101)				
107s	Sanitary Surveys	Ar	Ar	Ar	Dr. Diehl
	(2 cred.; jr., sr., grad.; prereq., 53 or 100)				

PSYCHOLOGY

Major Advisers: R. M. Elliott, D G. Paterson, M. A. Tinker

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	General Psychology				Mr. Elliott and others
	(6 cred.; soph., jr., sr.; no pre- req.)				
	Lect.	Sec. 1	I	MW	OLAud
		2	III	MW	OLAud
	Rec. (one hour)		I	Th or F or S	Psy
			II	Th or F or S	Psy
			VII	Th or F	Psy
			VIII	Th or F	Psy
	(For pre-bus. stud.)	III	Th or F or S	Psy	
	Rec. (one hour)	IV	F or S	Psy	
1w-2s†	General Psychology	Ar	Ar	Ar	
	(See 1f-2w. Registration limited. Written permission must be ob- tained from junior college office‡)				
1s,2s	General Psychology	Ar	Ar	Ar	
	(6 cred.; see 1f-2w. Registration limited. Written permission must be obtained from junior college office§)				
2s	Psychology Applied to Daily Life				
	(3 cred.; soph., jr., sr.; prereq., 1-2)				
	Lect.	II	MW	301F	Mr. Paterson and others
	Rec. (one hour)	I	F	Psy	
		II	Th or F	Psy	

* State Board of Health.

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

‡ Offered VI MWF, VII MWF, VIII MWF.

§ Offered II MTWThFS, III MTWThFS.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
4f-5w†	Intro. Lab. Psychology (4 cred.; soph., jr., sr.; with or after 1-2) (Sections limited to 48)				
	Sec. 1	I, II	TTh	211Psy	Mr. Tinker
	(For pre-leg. stud.) 2	III, IV	TS	211Psy	and others
	3	VI, VII	TTh	211Psy	
	4	VIII, IX	TTh	211Psy	
	5	III, IV	MW	211Psy	
7s	Intro. Lab. Psychology (See 4f-5w) (Identical with 4f-5w combined)				
	Sec. 1	VI, VII	MTThF	211Psy	Mr. Tinker
	2	III, IV	MTWF	211Psy	and others
15s	Psychology of Sensation (3 cred.; soph., jr., sr.; prereq., 1-2)	II	TThS	211Psy	Mr. Tinker
56w*	Psychology of Advertising (3 cred.; jr., sr.; prereq., 1-2, and Prin. of Econ.)	VII	MWF	322F	Mr. Paterson
6of	Psychology in Personnel Work . . (3 cred.; jr., sr.; prereq., 1-2, and Prin. of Econ. or 10 cred. in pol. sci.)	VII	MWF	115Psy	Mr. Paterson
101f-102w†-103s	Experimental Psychology (6 or 9 cred.; jr., sr., grad.; pre- req., 1-2, and 4-5 or 7 or 8 cred. in physics)	VII VIII	MWF WF	116Psy	Mr. Tinker
108f	Systematic Psychology (3 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7)	III	TThS	109Psy	Miss Heid- breder
109w	Readings in Psychology (3 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7, or An. Biol. 1-2)	III	TThS	109Psy	Miss Heid- breder
114f-115w†	Human Behavior (6 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7, or An. Biol. 1-2)	II	TThS	115Psy	Mr. Elliott
124f	Psychology of Learning (3 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7)	IV	MWF	109Psy	Mr. Heron
125f-126w†-127s	Psy. of Individual Differences . . (6 or 9 cred.; jr., sr., grad.; pre- req., 1-2; 4-5 or 7, or Ed. Psy. 116-117)	II	MWF	109Psy	
130s	Vocational Psychology (2 cred.; jr., sr., grad.; prereq., 1-2, 4 additional cred. in psy., ed., or a soc. sci.)	IX, X	F	301F	Mr. Paterson
137s	Psychology of Learning (3 cred.; jr., sr., grad.; prereq., 124 or equiv.)	III	MWF	109Psy	Mr. Heron

* Cannot be counted for a minor sequence.

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
140W	Social Psychology (3 cred.; jr., sr., grad.; prereq. 1-2; 4-5 or 7, or An. Biol. 1-2 or 10 cred. in a soc. sci.)	III	TThS	109Psy	Mr. Bird
141S	Political Psychology (3 cred.; jr., sr., grad.; prereq.**)	III	TThS	109Psy	Mr. Bird
144W-145S†	Abnormal Psychology (6 cred.; jr., sr., grad.; prereq. 1-2; 4-5 or 7, or An. Biol. 1-2 or 10 cred. in a soc. sci.)	IV	MWF	PsyAmph	Mr. Anderson
151f-152w†-153s	Animal Psychology (6 or 9 cred.; jr., sr., grad.; prereq. 1-2, 4-5 or 7, or An. Biol. 1-2)	VII VIII	MW MWF	Ar	Mr. Heron

ROMANCE LANGUAGES

Major Adviser: F. B. Barton

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation: 36 credits in one language numbered above 4, these courses to include in the case of French. Courses 59-60-61; Course 49 or Course 62; and survey.

Minor recommendation: 18 credits in one language in courses numbered above 4.

(NOTE.—One credit less for each recommendation to be accepted if the student elects 20 in place of 50-51-52 and 53-54-55.)

Courses in French and Spanish conversation.—May be taken only when accompanied by the corresponding courses in composition. No credit will be given for work done in a course in conversation unless the course in composition is passed also. Courses in composition may be taken separately.

Admission to advanced courses.—No student will be allowed to elect courses more advanced than intermediate French or Spanish, who has not received an average grade of C in the intermediate courses.

FRENCH

No.	Title	Hour	Day	Bldg.	Instructor
(1s)-2f†*	Beginning French (See 1f-2w)	I VI	TWThFS MTWThF	202F 213F	Ar Ar
1f-2w†*	Beginning French (10 cred.; all; no prereq.)	I II IV VI VII	TWThFS MWTThFS MTWFS MTWThF MTWThF	213F 227F 227F 226F 202F	Ar Ar Ar Ar Ar
1w-2s†*	Beginning French (See 1f-2w)	IV VI	MTWThF MTWThF	202F 202F	Ar Ar

** Open to majors in social science who have had Courses 1-2 and 4-5 or 7, or Animal Biology 1-2 and to majors in psychology who have had 20 credits in social science.

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

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

* Credit is usually not given for more than one beginning language. See paragraph 2, page 7, Science, Literature, and the Arts bulletin.

() Numbers in parentheses do not refer to the year 1927-28.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
1s-(2f)†||	Beginning French	I	TWThFS	227F	Ar
		IV	MTWFS	102F	Ar
(3s)-4f	Intermediate French	II	MWThFS	113F	Ar
		IV	MTWFS	124F	Ar
		VI	MTWThF	202F	Ar
3f-4w	Intermediate French	I	TWThFS	124F	Ar
		III	MTThFS	226F	Ar
		VII	MTWThF	213F	Ar
3w-4s	Intermediate French	I	TWThFS	202F	Ar
		VI	MTWThF	213F	Ar
3s-(4f)	Intermediate French	I	TWThFS	213F	Ar
		II	MWThFS	227F	Ar
		IV	MTWFS	227F	Ar
		VI	MTWThF	226F	Ar
8f-9w-10s§	Scientific French (pre-medic.) ..	I	MWF	3F	Ar
20f‡	Oral and Written French	III	MTThFS	303F	Ar
		VII	MTWThF	227F	Ar
20s‡	Oral and Written French	I	TWThFS	15F	Ar
		III	MTThFS	226F	Ar
		VII	MTWThF	213F	Ar
21f-22w-23s†	Survey of French Lit.	II	TThS	209½F	Mr. LeCompte
		III	TThS	227F	Mr. Barton
		VII	MWF	107F	Mr. Searles
24w-25s†	Survey of French Lit.	III	MTThFS	303F	Miss Nisson
		VII	MTWThF	303F	Mr. Ditchy
49f,w,s	French Pronunciation	VIII	MWF	207F	Mr. Morand
50f-51w-52s	French Conversation|| .....	III	MW	201F	Ar
		VI	MW	304F	Ar
53f-54w-55s	French Composition	III	F	201F	Ar
		VI	F	304F	Ar
56f-57w-58s	Adv. French Conversation|| ....	II	MW	203F	Ar
		VI	MW	108F	Ar
59f-60w-61s	Adv. French Composition	II	F	203F	Ar
		VI	F	108F	Ar
62w	Practical French Phonetics	VIII	MWF	203F	Mr. Ditchy

* Open without petition to sophomores who have an average of C in all their previous work and in the prerequisite courses.

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

‡ See departmental requirements, note on freshmen entering with three years' high school French (or Spanish).

() Numbers in parentheses do not refer to the year 1927-28.

§ Students may enter any quarter.

|| Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately.

|| Credit is usually not given for more than one beginning language. See paragraph 2, page 7, Science, Literature, and the Arts bulletin, Part II.

No.	Title	Hour	Day	Bldg.	Instructor
80f-81w-82s	French Lit.; 19th Century ... (9 cred.; jr., sr.*; prereq., 21-22-23 or 24-25)	IV VII	MWF MWF	201F 206F	Mr. Barton Mr. LeCompte
100s	French Oral Diction (4 cred.; jr., sr., grad.; prereq., 62)	VIII	MTWF	203F	Miss Guinotte
103f-104w-105s	French Syntax and Comp. (3 cred.; jr., sr., grad.; prereq., 59-60-61)	VI	F	203F	Mr. Barton
115f-116w-117s	French Lit.: 17th Century ... (9 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)	III	MWF	227F	Mr. Searles
118f-119w-120s	French Lit.: 18th Century (9 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)	III	TThS	114F	Mr. Clefton
121f-122w-123s	French Lit.: 16th Century (9 cred.; jr., sr., grad.; prereq., 80-81-82, or 115-116-117 or 118-119-120)	III	MWF	113F	Mr. Krappe
145s	Explication de Textes (4 cred.; jr., sr., grad.; prereq., 80-81-82 or 115-116-117 or 118-119-120)	VII	MTWF	203F	Mr. Morand
150f-151w-152s	French Dramatic Lit. (6 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)	III	TTh	203F	Mr. Olmsted
153s	Contemporary French Lyric Poetry (4 cred.; jr., sr., grad.; prereq., 20-21-22 or 24-25)	VI	MTWTh	212F	Mr. LeCompte
156w	Molière (4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)	IV	MTWF	316F	Mr. Searles
157w	Contemporary French Novel ... (4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)	VI	MTWTh	217F	Mr. Ditchy
171f-172w-173s†	History of French Language .. (3 cred.; jr., sr., grad.; prereq., 59-60-61)	VIII	Th	203F	Mr. LeCompte
174f-175w-176s	Lectures in French (6 cred.; jr., sr., grad.; prereq., 50-51-52, 53-54-55 (or 20); and 80-81-82)	IX	TTh	201F	Mr. Morand

ITALIAN

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

1f-2w†	Beginning Italian (10 cred.; all; no prereq.)	II	MWThFS	226F	Miss Phelps
3s-(4f)	Intermediate Italian (10 cred.; all; prereq., 1-2)	II	MWThFS	226F	Miss Phelps
7I	Modern Poetry (Leopardi, Carducci) (4 cred.; jr., sr.*; prereq., 3-4‡)	Not offered in 1927-28			

* Open without permission to sophomores with an average of C in all their previous work and in the prerequisite courses.

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

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
72w	Modern Drama (Giacosa, Bracco, Pirandello)	III	MWThF	217F	Miss Phelps
	(4 cred.; jr., sr.*; prereq., 3-4‡)				
73	Boccaccio	Not offered in 1927-28			
	(4 cred.; jr., sr.*; prereq., 3-4‡)				
74s	Petrarch	III	MWThF	217F	Miss Phelps
	(4 cred.; jr., sr.*; prereq., 3-4‡)				
159-160	Dante	Not offered in 1927-28			
	(6 cred.; jr., sr., grad.; prereq., one course above 50)				
161f-162w	The Sixteenth Century	IV	MWF	203F	Miss Phelps
	(6 cred.; jr., sr., grad.; prereq., one course above 50)				
164s	Dante (in English)	IV	MWF	213F	Miss Phelps
	(3 cred.; jr., sr., grad.; prereq., French 21-22-23 or 24-25, or 8 cred. in Eng. above 50)				

SPANISH

(1s)-2f‡	Beginning Spanish	III	MTThFS	322F	Ar
	(See 1f-2w)				
1f-2w†	Beginning Spanish	I	TWThFS	226F	Ar
	(10 cred.; all; no prereq.)	IV	MTWFS	226F	Ar
		VI	MTWThF	201F	Ar
1w-2s†	Beginning Spanish	VII	MTWThF	227F	Ar
	(See 1f-2w)			(winter)	
		{ VII	MTThF	(spring)	
		{ V	W	(spring)	
1s-(2f)†	Beginning Spanish	II	MWThFS	201F	Ar
	(See 1f-2w)				
(3s)-4f	Intermediate Spanish	II	MWThFS	202F	Ar
	(See 3f-4w)	VI	MTWThF	227F	Ar
3f-4w	Intermediate Spanish	II	MWThFS	201F	Ar
	(10 cred.; all; prereq., 1-2 or 2 yrs. high school Spanish)	III	MTThFS	202F	Ar
		VI	MTWThF	102F	Ar
3w-4s	Intermediate Spanish	III	MTThFS	322F	Ar
	(See 3f-4w)	VII	MTWThF	201F	Ar
3s-(4f)	Intermediate Spanish	I	TWThFS	226F	Ar
	(See 3f-4w)	IV	MTWFS	226F	Ar
		VI	MTWThF	201F	Ar
20s§	Oral and Written Spanish	III	MTThFS	202F	Ar
	(5 cred.; all; prereq., 4, or 3 yrs. high school Spanish)				
30s	Spanish Commercial Correspondence	VII	MWF	205F	Ar
	(3 cred.; all; prereq., 3)				
50f-51w-52s	Spanish Conversation¶	II	MW	302F	Mr. Arjona
	(3 cred.; jr., sr.*; prereq., 3-4)				

* Open without permission to sophomores with an average of C in all their previous work and in the prerequisite courses.

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

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

() Numbers in parentheses do not refer to the year 1927-28.

§ See departmental requirements, note on freshman entering with three years' high school French (or Spanish).

¶ Credit is usually not given for more than one beginning language. See paragraph 2, page 7, Science, Literature, and Arts bulletin, Part II.

¶ Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
53f-54w-55s	Spanish Composition (3 cred.; jr., sr.*; prereq., 3-4)	II	F	302F	Mr. Arjona
56f-57w-58s	Adv. Spanish Conversation¶ . . . (3 cred.; jr., sr.*; prereq., 20 or 50-51-52)	VI	MW	203F	Mr. Fichter
59f-60w-61s	Adv. Spanish Composition (3 cred.; jr., sr.*; prereq., 20 or 53-54-55)	VI	F	217F (fall, winter) 212F (spring)	Mr. Fichter
62	<i>Practical Spanish Phonetics</i> . . . (3 cred.; jr., sr.*; prereq., 65- 66-67, and 20, or 50-51-52 and 53-54-55)	<i>Not offered in 1927-28</i>			
65f-66w-67s†	Survey of Spanish Lit. (9 cred.; jr., sr.*; prer.q., 3-4)	II	TThS	302F	Mr. Fichter
68w-69s†	Survey of Spanish Lit. (10 cred.; jr., sr.*; prereq., 3-4)	VI	MTWThF	227F	Mr. Arjona
83-84-85	<i>Spanish American Lit.</i> (6 cred.; jr., sr.*; prereq., 65- 66-67 or 68-69 or 20 or 50- 51-52 and 53-54-55)	<i>Not offered in 1927-28</i>			
100	<i>Spanish Oral Diction</i> (4 cred.; jr., sr., grad.; prereq., 56-57-58)	<i>Not offered in 1927-28</i>			
103-104-105	<i>Spanish Syntax</i> (3 cred.; jr., sr., grad.; prereq., 59-60-61)	<i>Not offered in 1927-28</i>			
110f-111w-112s	Spanish Lit.: 19th Century (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	IV	MWF	108F	Mr. Arjona
115-116-117	<i>Spanish Lit.: 17th Century</i> (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	<i>Not offered in 1927-28</i>			
141S	Contemporary Spanish Novel . . . (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	III	TThFS	305F	Mr. Fichter
150w-151s	Spanish Dramatic Lit. (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	III	MW	203F	Mr. Olmsted
156f-157w-158s	Spanish Lit.: 16th Century . . . (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	IV	MWF	206F	Mr. Fichter, Mr. Krappe
174f-175w-176s	Lectures in Spanish (6 cred.; jr., sr., grad.; prereq., 20 (or 50-51-52 and 53-54-55) and 65-66-67)	IX	TTh	202F	Mr. Arjona

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

¶ Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately.

* Open without permission to sophomores with an average of C in all their previous work and in the prerequisite courses.

SCANDINAVIAN

Major Advisers: A. A. Stomberg, G. C. Bothne

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	Beginning Norwegian (10 cred.; all; no prereq.)	I	TWThFS	206F	Mr. Bothne
3s	Intermediate Norwegian (5 cred.; all; prereq., 1-2, cr 1 yr. high school)	I	TWThFS	206F	Mr. Bothne
4f-5w	Adv. Norwegian (Survey) (10 cred.; soph., jr., sr.; prereq., 1-2-3 or 2 yrs. high school)	III	MTThFS	206F	Mr. Bothne
7f-8w*	Beginning Swedish (10 cred.; all; no prereq.)	II	MWThFS	206F	Mr. Stomberg
9s	Intermediate Swedish (5 cred.; all; prereq., 7-8 or 1 yr. high school)	II	MWThFS	206F	Mr. Stomberg
10f-11w	Adv. Swedish (10 cred.; soph., jr., sr.; prereq., 7-8-9 or 2 yrs. high school)	I	TWThFS	110F	Mr. Stomberg
12s	Ancient and Medieval Scandina- vian History (5 cred.; soph., jr., sr.; prereq., 10-11, or 4-5, or Hist. 1-2)	I	TWThFS	110F	Mr. Stomberg
45	Scandinavian Mythology (3 cred.; jr., sr. §; prereq., none)	<i>Not offered in 1927-28</i>			
101f-102w-103s	Modern Norwegian Lit. (9 cred.; jr., sr., grad.; prereq., 4-5)	II	TThS	110F	Mr. Bothne
104-105	Mod. Scand. History (6 cred.; jr., sr., grad.; prereq., 10-11-12, or 4-5, or 15 cred. in hist.)	<i>Not offered in 1927-28</i>			
107f-108w-109s	Modern Swedish Lit. (9 cred.; jr., sr., grad.; prereq., 10-11-12)	VI	MWF	206F	Mr. Stomberg
110f	Ihsen (3 cred.; sr., grad.; prereq., 101- 102-103)	II	MWF	110F	Mr. Bothne
111-112-113	Old Norse (Icelandic) (6 cred.; sr., grad.; prereq., con- sent of instructor)	<i>Not offered in 1927-28</i>			
114	Strindberg (3 cred.; sr., grad.; prereq., 107- 108-109)	<i>Not offered in 1927-28</i>			
116	History of Scandinavian Lan- guages (3 cred.; sr., grad.; prereq., 101- 102-103 or 107-108-109 or 117 or 111)	<i>Not offered in 1927-28</i>			
117s	Earlier Norwegian Lit. (5 cred.; jr., sr., grad.; prereq., 4-5)	III	MTThFS	206F	Mr. Bothne

* Credit is usually not given for more than one beginning language. See paragraph 2, page 7, Science, Literature, and Arts bulletin, Part II.

§ Does not count as a senior college course. Not open to sophomores.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
130-131-132	Danish Lit. of the 19th Century (9 cred.; jr., sr., grad.; prereq., 4-5)				Not offered in 1927-28
134-135	The Landsmaal Movement (6 cred.; sr., grad.; prereq., 101-102-103, or 130-131-132)				Not offered in 1927-28
136w	Björnson	II	MWF	110F	Mr. Bothne
	(3 cred.; sr., grad.; prereq., 101-102-103, or 130-131-132)				

SOCIOLOGY AND SOCIAL WORK

Major Adviser: F. S. Chapin

No.	Title	Hour	Day	Bldg.	Instructor
if	Intro. to Sociology				
	(5 cred.; soph., jr., sr., and 3d qtr. fr.; no prereq.)				
	Lect. I		TTh	OLAud	Mr. Chapin,
	Sec. 1 I		MWF	25F	Mr. Sutherland,
	2 III		MWF	5F	and others
	3 IV		MWF	25F	
	4 V		MWF	15F	
	5 VI		MWF	25F	
	6 VII		MWF	5F	
	7 III		TThS	5F	
	(Univ. Farm. 3 cred.) 8 IV		MWF	*	
iw	Intro. to Sociology				
	(See if)				
	Lect. I		TTh	OLAud	Mr. Chapin,
	Sec. 1 I		MWF	25F	Mr. Sutherland,
	2 III		MWF	5F	and others
	3 IV		MWF	25F	
	4 V		MWF	15F	
	5 VI		MWF	25F	
	6 VII		MWF	5F	
	7 IV		TThS	5F	
	(Univ. Farm. 3 cred.) 8 IV		MWF	*	
is	Intro. to Sociology				
	(See if)				
	Lect. I		TTh	OLAud	Mr. Chapin,
	Sec. 1 I		MWF	25F	Mr. Sutherland,
	2 II		MWF	3F	and others
	3 III		MWF	5F	
	4 IV		MWF	25F	
	5 V		MWF	15F	
	6 VI		MWF	5F	
	7 VII		MWF	5F	
	8 VII		MWF	25F	
	9 II		TThS	3F	
	10 III		TThS	5F	
	(Univ. Farm. 3 cred.) 11 IV		MWF	*	

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
6f,w,s	Modern Social Reform Move- ments (3 cred.; soph., jr., sr.; pre- req., 1)	Sec. 1 II 2 IV 3 VI		TThS 5F MWF 5F MWF 6F	
14f,w	Rural Sociology (3 cred.; soph., jr., sr.; pre- req., 1)	Sec. 1 III 2 V 3 VI 4 IV		TThS 15F MWF 25F MWF 3F TThS *	Mr. Zimmer- man and others
14s	(University Farm) Rural Sociology (See 14f,w)	Sec. 1 III 2 V 3 VI		TThS 15F MWF 25F MWF 3F	Mr. Zimmer- man and others
45f,w	Social Statistics (5 cred.; soph., jr., sr.; pre- req., 1)	VII	MTWThF	25F	Mr. Chapin
51f,w,s	The Occurrence of the Socially Inadequate (3 cred.; jr., sr.; prereq., 10 cred. in soc. or Soc. 1 and 10 cred. in soc. sci. or psy.)	I	MWF	5F	Miss Wheeler
52f,w,s	Elem. Case Work (3 cred.; jr., sr.; prereq., 51, 90, or simultaneously)	I	TThS	5F	Miss Colcord
53f,w,s	Elem. of Criminology (3 cred.; jr., sr.; prereq., same as for 51)	III	MWF	3F (fall, winter) 221OL (spring)	Mr. Sutherland Miss Salsberry
55w	Housing Problems (3 cred.; jr., sr.; prereq., same as for 51)	I	MWF	109F	Miss Salsberry
60f,w	Child Welfare (3 cred.; jr., sr.; prereq., 51 and 52)	IX	MWF	25F	Mrs. Doyle
70f,w	Group Work in the Community (3 cred.; jr., sr.; prereq., 51)	I	MWF	15F	Miss Mead
71f,w	Elementary Field Training in Group Work (2 cred.; jr., sr.; prereq., 51, 70, or simultaneously)	Ar	Ar	Ar	Mrs. Mudgett and Miss Jones
90f,w,s-91f,w,s- 92f,w,s	Elementary Field Training in Case Work (6 cred.; jr., sr.; prereq., 51 for 90; 52 for 91) (Fall)	Sec. 1 I, II, III 2 I, II, III 3 VI, VII, VIII 4 VI, VII, VIII 5 VI, VII, VIII		MW WF MW WF TTh	Mrs. Mudgett

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

COLLEGE OF EDUCATION

No.	Title (Winter)	Hour	Day	Bldg.	Instructor	
		Sec. 1	II, III, IV	MW	Mrs. Mudgett	
		2	II, III, IV	WF		
		3	VI, VII, VIII	MW		
		4	VI, VII, VIII	WF		
		5	VI, VII, VIII	TTh		
	(Spring)	Sec. 1	VI, VII, VIII	MW	Mrs. Mudgett	
		2	VI, VII, VIII	WF		
		3	II, III, IV	TTh		
		4	VI, VII, VIII	TTh		
106f	Social Psychology (3 cred.; primarily for sociology students; jr., sr., grad.; prereq., Soc. 1, Psy. 1-2, and 11 cred. in soc. sci., ed., phil., and psy.)		II	TThS	25F	Mr. Chapin
101W	Social Organization (3 cred.; jr., sr., grad.; prereq., 4 courses in soc. or Soc. 1 and 15 cred. in soc. sci., ed., phil., or psy.)		II	TThS	25F	Mr. Sorokin
102S	Social Control (3 cred.; jr., sr., grad.; prereq. same as for 101)		II	MWF	5F	
103S	Sociology of Conflict (3 cred.; jr., sr., grad.; prereq. same as for 101)		II	MWF	25F	Mr. Sutherland
110W	Rural Organization (2 cred.; jr., sr., grad.; prereq., same as for 101)		VIII, IX	Th	5F	Mr. Zimmerman
112f	The Rural Social Survey (3 cred.; jr., sr., grad.; prereq., same as for 101)		VIII	MWF	25F	Mr. Zimmerman
114S	Rural Social Institutions (3 cred.; jr., sr., grad.; prereq., same as for 101)		I	MWF	*	Mr. Lundquist
115	<i>The Rural Church As a Social Institution</i> (3 cred.; jr., sr., grad.; prereq., same as for 101)		<i>Not offered in 1927-28</i>			
119f	The Family (3 cred.; jr., sr., grad.; prereq., same as for 101)		III	TThS	3F	Mr. Sutherland
120f	Social Progress (3 cred.; jr., sr., grad.; prereq., same as for 101)		II	MWF	15F	Mr. Wallis
121W	Advanced Statistical Methods (3 cred.; jr., sr., grad.; prereq., 4 courses in soc., including 45 or its equivalent)		VII	MWF	108F	Mr. Chapin
122W-123S	Methods of Social Investigation (6 cred.; jr., sr., grad.; prereq., same as for 101 but including 45 or its equivalent for 123S)		VIII	MWF	3F	Mr. Sutherland

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
126s	Technique of Leadership in Group Work (3 cred.; sr., grad.; prereq. 70, 71)	I	TThS	113F	Miss Mead
128s	Principles of Administration Applied to Social Work (2 cred.; jr., sr., grad.; prereq., same as for 101)	VIII, IX	Th	5F	Mr. Bradley
130s	Advanced Case Work (2 cred.; sr., grad.; prereq., same as for 101 incl. 51 and 52)	VIII, IX	T	3F	Miss Colcord
132	Juvenile Courts and Probation (2 cred.; jr., sr., grad.; prereq. 51, 52, 53)	<i>Not offered in 1927-28</i>			
133f	Social Case Work in Health Problems (3 cred.; jr., sr., grad.; prereq., 52, 90, and Prev. Med. 50, or 53, or simultaneously)	III, IV Ar	S and Ar	9F	Mrs. Young
134s	Legal Protection of the Child .. (3 cred.; jr., sr., grad.; prereq., same as for 101 incl. 60)	I	MWF	113F	Mr. Waite
135s	Field Practice in Legal Protection of the Child (2 cred.; jr., sr., grad.; prereq., 90, open to students taking 134)	Ar	Ar	15F	Mrs. Mudgett
138w-139s	Mental Case Work (6 cred.; jr., sr., grad.; prereq., 52, 90, and Psy. 114-145, or Prev. Med. 61, or simultaneously)	III, IV	S and ar	9F	Mrs. Young
140w	History of Social Theory (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	25F	Mr. Sorokin
141s	Contemp. Social Theory (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	TThS	25F	Mr. Sorokin
152	Seminar: Problems of Institutional Administration (2 cred.; sr., grad.; prereq., consent of director)	<i>Not offered in 1927-28</i>			
153f.w.s-154f.w.s-155f.w.s	Advanced Field Training in Group or Case Work (3 cred. per qtr.; jr., sr., grad.; prereq., 90 and 91)	Ar	Ar	Ar	Mrs. Mudgett and Miss Jones
158	The Sociology of Revolution .. (3 cred.; jr., sr., grad.; prereq., same as for 101)	<i>Not offered in 1927-28</i>			
160f	Population Problems (2 cred.; jr., sr., grad.; prereq., 4 courses in soc., or Soc. 1 and 15 cred. in soc. sci., ed., phil., or psy.)	III	MWF	15F	Mr. Sorokin

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The Bulletin
of the University of
Minnesota

The Graduate School
Announcement for the Years
1927-1929



Vol. XXX No. 72 August 30 1927

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

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

1927							1928													
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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3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
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31
AUGUST							FEBRUARY							AUGUST						
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9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20
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23	24	25	26	27	28	29	29	30	28	29	30	31
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NOVEMBER							MAY							NOVEMBER						
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6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
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18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	30	31

UNIVERSITY CALENDAR

1927-28

1927			
September	19-23		Registration of graduate students Physical examination for new students
September	26	Monday	Fall quarter begins, 8:30* a.m.
October	6	Thursday	Examinations in German and French for candidates for advanced degrees
November	3	Thursday	Last day for filing thesis of candidates for the fall quarter
November	5	Saturday	Last day for filing subject-matter of Master's thesis for the spring quarter
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	15	Thursday	Commencement Convocation
December	17	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
1928			
January	4	Wednesday	Christmas vacation ends, winter quarter begins, 8:30* a.m.
January	12	Thursday	Examinations in German and French for candidates for all advanced degrees
February	4	Saturday	Last day for filing thesis for candidates for the winter quarter
February	13	Monday	A holiday (February 12, Sunday, Lincoln's birthday)
February	22	Wednesday	Washington's birthday; a holiday
March	17	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.
March	26	Monday	Spring vacation ends, spring quarter begins, 8:30* a.m.
April	5	Thursday	Examinations in German and French for candidates for all advanced degrees
April	6	Friday	Good Friday; a holiday
April	30	Monday	Last day for filing thesis of candidates for all advanced degrees
May	14	Monday	Last day for filing written examinations for candidates for all advanced degrees
May	26	Saturday	Last day for oral examinations for candidates for all advanced degrees
May	30	Wednesday	A holiday; Memorial Day

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

THE GRADUATE SCHOOL

June	4	Monday	Last day for filing bond for publication of Doctor's thesis; last day for depositing binding fee for Master's degree
June	9	Saturday	Spring quarter closes
June	10	Sunday	Baccalaureate service
June	11	Monday	Fifty-fifth annual commencement
June	18	Monday	Summer Session, first term begins
July	5	Thursday	Last day for filing thesis of candidates at summer convocation
July	28	Saturday	First term, Summer Session closes
July	30	Monday	Summer Session, second term begins
September	1	Saturday	Second term Summer Session closes

THE GRADUATE SCHOOL

ORGANIZATION

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

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

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 any of the higher degrees until his case has been duly considered and approved.

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

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

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

Advanced standing may be granted for work done in other approved graduate schools. Credits for advanced courses earned while the student is registered in an undergraduate college, even if in excess of the credits required for the baccalaureate degree, cannot be transferred to the Graduate School. In exceptional cases, with permission of the dean of the under-

graduate college concerned and of the dean of the Graduate School, undergraduates lacking not more than 9 quarter credits may be permitted to register also in the Graduate School for partial credit.

REGISTRATION

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

FEEES

	Quarter
Tuition fee (except for clinical medicine).....	\$10.00
Credit hour tuition for students carrying less than full work.....	1.00
Deposit (first quarter in residence).....	3.00
Special deposit for Chemistry laboratory.....	5.00

Incidental fee.—An incidental fee of \$5 a quarter is charged each student for which the student receives the privileges of the Minnesota Union or Shevlin Hall, the Health Service, the *Minnesota Daily* including the Official Daily Bulletin, the University post-office service, and the *University Address Book*.

Registration in the Graduate School includes the making out of the program and paying fees for the entire year (or for the balance of the year when registration occurs after the fall quarter).

Fees must be paid not later than one week following the approval of the registration by the dean of the Graduate School in order to avoid a \$2 penalty fee.

All the fees above mentioned apply to the regular session. For the Summer Session fees, see special bulletin.

FELLOWSHIPS AND SCHOLARSHIPS

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

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

CALEB DORR RESEARCH FELLOWSHIPS IN AGRICULTURE, FORESTRY, AND HOME ECONOMICS

By the request of the late Caleb Dorr, of Minneapolis, the income from twenty thousand dollars is available for graduate fellowships in the Department of Agriculture of the University of Minnesota. Usually three fellowships of \$500 each will be awarded each year. The holders of these

fellowships are exempt from all tuition fees. The basis of the award is scholarship and the prospect and promise of productive research.

Caleb Dorr fellows will devote their entire time during the academic year (nine months) 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.

Candidates for these fellowships should file their applications before March 1 with the dean of the Graduate School. Application blanks may be secured from the dean of the Graduate School or from the dean of the College of Agriculture, Forestry, and Home Economics.

THE DUPONT FELLOWSHIP IN CHEMISTRY

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

THE ALBERT HOWARD SCHOLARSHIP

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

THE CLASS OF 1890 FELLOWSHIP

On the twenty-fifth anniversary of its graduation the class of 1890 founded a fellowship yielding \$200 and exemption from tuition. This fellowship is open to graduates of the colleges of Science, Literature, and the Arts, and Engineering and Architecture desiring to pursue advanced work. Applications should be filed with the dean of the Graduate School before March 1.

HONORARY FELLOWSHIPS FOR VISITING SCHOLARS

Professors or other eminent scholars from other institutions, who may desire temporarily the privileges of the library, research facilities, and seminars in the University, and who are not candidates for a degree, may upon recommendation of the dean of the Graduate School and the approval of the president of the University be appointed as honorary fellows without stipend.

Honorary fellows shall not be required to pay any fees except to cover the cost of unusually expensive supplies or equipment.

DEPARTMENTAL SCHOLARSHIPS

Besides the above stipends there are about seventy scholarships assigned to various departments, yielding \$225 and exemption from tuition and fees. The holders may be required to render service not to exceed ten hours a week in laboratory or office work, or not more than three hours in classroom assistance. Where these regulations are 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 and teaching fellowships, some yielding as high as \$1,000 are available, but the amount of work required is greater and

the length of residence of the holder of one of these appointments would be increased proportionately.

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

GRADUATE WORK IN THE SUMMER

Work of graduate character done in the Summer Session of the University of Minnesota under a member of the graduate faculty may be counted for residence credit for advanced degrees. In exceptional cases, the course work for the Master's degree may be completed in four summer sessions of six weeks each. In this case, the candidate may be permitted to carry *in absentia* thesis work to complete the equivalent of three quarters. 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. Theses of summer session students must be completed at least four weeks before the end of the session in which they take the degree.

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

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

GRADUATE WORK IN MEDICINE

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

GRADUATE WORK BY UNDERGRADUATES

1. No graduate credit allowed for any courses taken without previous arrangement by petition with the Graduate School.

2. No credit is possible for courses taken by undergraduates who lack more than 9 quarter credits toward the Bachelor's degree.

3. If not more than 9 quarter credits of undergraduate credit are lacking, petition may be filed to carry a limited amount of graduate work (approved courses above 100) for graduate course credit, such courses not to be applied toward an undergraduate degree.

4. With permission of the dean of the undergraduate college concerned, undergraduates lacking not more than 6 quarter credits may be permitted to register also in the Graduate School. This will be permitted in exceptional cases only.

WORK IN THE LAW SCHOOL

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

MASTER OF LAWS

A course leading to the degree of master of laws may be taken under the direction of the Graduate School of the University. Candidates must have completed two years of college work, and the work required for the first law degree in a school which is a member of the Association of American Law Schools. No specific course of study is required, but the course elected must be approved by an adviser. Subjects in the curriculum of the Law School not counted towards the first degree may be elected and additional work in subjects already studied. The candidate may also elect studies in the social sciences in the College of Science, Literature, and the Arts, and in the School of Business Administration. The candidate must complete eight year hours of classroom work and prepare a thesis that will be accepted for publication in the *Minnesota Law Review*. The course may be shaped to secure a more extensive survey of the law and related subjects, or to give a more thoro training in some special branch.

LIBRARY METHODS

The course in Bibliographic Seminar (101-102) offered by the librarian, Frank K. Walter, is recognized for general graduate credit. With the approval of the adviser, it may be counted toward any major or minor.

REQUIREMENTS FOR THE MASTER'S DEGREE

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

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

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

PROGRAM OF STUDY

A full program for a student who expects to meet the requirements in one academic year must cover the necessary courses in the fields of the major and minor and the preparation of a satisfactory thesis. The work must be selected from graduate courses offered in this bulletin and must amount to not less than 6 or more than 9 credit hours each quarter. In addition, thesis work (or courses upon which the thesis is based) should be carried to make a total of not less than 15 hours per week for three quarters. In general, 9 quarter credits in the minor and 18 quarter credits in the major, in addition to the thesis (or courses upon which the thesis is based), is regarded as the minimum program for the Master's degree. A grade not less than B must be obtained in any course offered as fulfilling the requirement in the major. A grade not less than C must be obtained in minor courses.

THE MAJOR

The major work must be in a department in which the candidate has had at least three years of work (18 semester or 27 quarter credits) if it be a department open to freshmen, or two years of work (12 semester or 18 quarter credits) if it be a department not open to freshmen. Part or all of this preliminary work may consist of designated prerequisite courses in the same or allied departments. Any special requirements will be noted in the corresponding departmental statement. At the end of the year, a final written examination (in addition to the usual course examinations) will be given in the major as noted below.

THE MINOR

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

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

LANGUAGE REQUIREMENT

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

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

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

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

MASTER'S THESIS

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

The thesis is required to be in quadruplicate in order to facilitate its consideration. Two copies are retained for the University Library (as noted below), the third copy being finally returned to the candidate. The fourth copy is necessary in cases where the department or adviser desires to retain a copy. Since one copy is usually desired by the adviser or department concerned, a fourth copy should be provided for this purpose. One copy must be upon the specially required linen stock and the others may be carbon copies on bond paper. Ample margin should be left for binding purposes. Samples in the dean's office of both the linen stock and carbon paper should be examined before the thesis is type-written. The body of the thesis should be double spaced, but footnotes may be single spaced.

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

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

If the thesis is accepted, the candidate must deposit with the registrar, at least one week before commencement, the sum of one dollar and fifty cents for binding one copy of this thesis, which will be cataloged and deposited in the University Library. This copy cannot be taken from the library. The second copy, however, may be borrowed from the library.

EXAMINATIONS

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

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

If the final written examination is satisfactory, and the thesis accepted, the final oral examination of the candidate will be held, not later than two weeks before the end of the quarter in which he takes his degree. The adviser will act as chairman of the examining committee, which will include all the instructors with whom the candidate has taken work, the thesis committee, and, ex-officio, the head or chairman of the department in which the major work is done. Any member of the graduate faculty may attend as a visitor, and due notice shall be sent by the chairman of the committee to all members of the graduate faculty in the major and minor departments. The final oral examination will cover all the work offered for the degree, and may include other work fundamental thereto. At the close of the examination, the committee will vote upon the candidate, taking into account all of his work. A majority vote is required for approval.

TABULAR SUMMARY OF REQUIREMENTS FOR THE MASTER'S DEGREE

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

Candidates who are eligible for the "preliminary examination" for the Doctor's degree may substitute this examination for the final oral examination for the Master's degree, provided that all other requirements for the preliminary examination (see p. 18) have been met.

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

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

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

MASTER OF SCIENCE IN ENGINEERING OR ARCHITECTURE

The requirements and procedure for the degree of master of science in civil, mechanical, electrical, chemical, or architectural engineering or architecture will correspond to those outlined for this degree in other subjects. The major subject and thesis will lie in the field represented by the degree. The thesis will be filed and final written examination taken at least six weeks before graduation. The language requirement will be waived in all of these cases except chemical engineering, in which German is required.

THE ENGINEER DEGREES REQUIREMENTS

The advanced professional degrees, civil engineer, mechanical engineer, electrical engineer, chemical engineer, and architectural engineer will be conferred upon the recommendation of the Graduate School faculty as a result of the satisfactory completion of the following requirements:

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

b. One full academic year of graduate engineering study (three quarters) in residence at this University. Graduates of this University may be permitted to carry on this study *in absentia* under the direction of the faculty. Work done *in absentia* may not be substituted for the residence work required for the master of science.

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

d. A thesis of professional grade.

Candidates for the degree of chemical engineer must have a reading knowledge of German.

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

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

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

MASTER'S DEGREE WITH THE ENGINEER DEGREE

It is recommended that the student who is entering upon the graduate year's study in residence for the Engineer degree register for and obtain the Master's degree for this year's work, that is, the degree of master of science in the corresponding branch of engineering. The essential difference lies in the requirement of a thesis if the Master's degree is sought. However, the aggregate amount of work is intended to be the same in both cases, namely, from 15 to 18 credit hours per week for the three quarters. If the graduate study does not lead to the Master's degree, the student is not required to prepare a thesis as a part of the year's work. The Master's thesis, however, will not satisfy the requirement for the professional thesis which is intended to be related to the practical experience after the Bachelor's degree was received.

PLAN OF STUDY

Upon entrance to the Graduate School, the candidate, with the approval of the dean, will select his adviser in the field represented by the desired degree, in which field the major work and the thesis, if one be taken, will lie. With the approval of his adviser and the dean, he will also select a minor, and will outline a study program for the year.

If the student registers for the Master's degree in engineering or architecture, he will conform to the requirements for that degree as regards major and minor work, thesis, examinations, etc.

If the graduate study during the year of residence or *in absentia* is towards the Engineer's degree only, it will be divided into major and minor work, of which the major will usually constitute about two thirds and the minor one third of the total of 15 to 18 credit hours which will be carried each quarter.

STUDY IN ABSENTIA

Only graduates of this University will be permitted to undertake the graduate study *in absentia* towards one of the Engineer degrees. This permission must be obtained from the head of the department represented by the degree, who will usually act as the adviser, and from the dean of the Graduate School. It is not necessary that this study be coincident with the academic year; it may be undertaken at any time.

The proposed plan of study should be arranged with the approval of the adviser. The tuition fee of ten dollars per quarter will be charged for three quarters only, altho the study may, and generally will, extend over more than nine months. At least 1,500 actual hours of work should be performed as the equivalent of a year's study in residence.

The detailed requirements of reports and examinations will be established by the adviser. A separate written report must be submitted at the end of each quarter's work. A written examination covering the entire study, both major and minor, will be held at the close of the year's work. Under favorable circumstances this examination may be held in the place where the candidate resides.

Upon the satisfactory completion of the year's work, the proper credits will be recorded towards the engineering degree.

STUDY IN RESIDENCE

The work will consist of regular courses offered in this bulletin and may include research if desired by the student, even tho the Master's degree be not sought.

THESIS

At least six months before the graduate degree is expected, the thesis subject must be approved by the adviser and the group committee. The thesis itself must be filed with the dean at least six weeks before the commencement at which the degree is to be obtained together with a deposit of one dollar and fifty cents to cover binding the thesis.

STATEMENT OF EXPERIENCE

With the thesis, the candidate must file a detailed statement of his professional experience since receiving his Bachelor's degree. This should amount to at least four years, if the graduate study was in residence, or five if *in absentia*.

TABULAR SUMMARY OF REQUIREMENTS FOR THE ENGINEER'S DEGREE

WORK	UNDER THE DIRECTION OF	DATE
Program, major and minor	Adviser and dean of the Graduate School	On registration
Quarterly reports if <i>in absentia</i>	Adviser	
Written examination	Adviser and major and minor staff	At end of year's study or later, as arranged
Thesis subject	Adviser and group committee	Six months before graduation
Experience statement	Adviser and major staff	Six weeks before graduation
Filing thesis	Dean of Graduate School	Six weeks before graduation
Fee for binding thesis	Registrar	One week before graduation

ATTENDANCE AT COMMENCEMENT

Unless specifically excused for an important reason, the candidate will be present in person to receive the degree.

DOCTOR'S DEGREE

In the Graduate School, one Doctor's degree, doctor of philosophy (Ph.D), is conferred by the University of Minnesota. This degree is granted, not on the basis of successful completion of a definite amount of

prescribed work but chiefly in recognition of the candidate's high attainments and ability in this special field, to be shown, first, by the preparation of a thesis, and second, by successfully passing the required examinations covering both the general and the special fields of the candidate's subjects as detailed later.

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

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

PROGRAM OF WORK

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

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

LANGUAGE REQUIREMENTS

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

THE MAJOR WORK

The major work must be in a department in which the candidate has had, in his undergraduate study at least the equipment of three years of work (18 semester or 27 quarter credits) if it be a department open to freshmen, or two years of work (12 semester or 18 quarter credits) if it

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

be a department not open to freshmen. Part or all of this preliminary work may consist of designated prerequisite courses in the same or allied departments.

During the period of work for the Doctor's degree a student shall spend not less than two thirds of his time¹ on the major subject, including the work of the thesis. During the last two years, he shall carry an average of at least one course per quarter in his major outside the work from which this thesis is developed.

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

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

THE MINOR WORK

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

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

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

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

THESIS

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

Not later than six weeks before the commencement at which he expects to take the degree, the student shall deposit at the dean's office his thesis, typewritten, in triplicate copy to facilitate reading by the thesis

¹ In estimating the distribution of time, a week of 15 credit hours may be assumed.

committee. The requirements concerning form, copyrighting, and printing adopted in June, 1922, may be consulted in the Graduate School office.

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

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

EXAMINATIONS

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

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

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

thesis and the field of the candidate's special studies and shall not exceed three hours.

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

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

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

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

TABULAR SUMMARY OF REQUIREMENTS FOR THE DOCTOR'S DEGREE

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

DESCRIPTION OF COURSES

EXPLANATIONS

A dagger (†) indicates that all quarters of a course must be completed before credit is received for any quarter.

AGRICULTURAL BIOCHEMISTRY

Professors Ross Aiken Gortner, Clyde H. Bailey, Leroy S. Palmer; Associate Professor John J. Willaman; Assistant Professors Walter F. Hoffman, Cornelia Kennedy; Instructor William M. Sandstrom.

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

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

All students majoring in this division and all minoring for the Doctor's degree must include either Course 201 or 202 in their study programs.

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w. Agricultural Quantitative Analysis. Includes estimation of inorganic and organic constituents of biological products, proximate analysis of foods and feeding stuffs, and the use of special apparatus. Prerequisite: quantitative analysis. Three credits each quarter. MWF VI, VII, VIII; 208BCh.
- 103s. Dairy Chemistry. Lectures and laboratory work on the physical, colloidal, and chemical properties of milk and dairy products, and of the processes involved in the manufacture of dairy products. Lect. three credits, lect. and lab. five credits. Lect. MWF VI; Lab. MWF VII, VIII, IX; 116 and 208BCh. Mr. Palmer.
- 106f,w,s. Biochemistry in Industry. A seminar course. Prerequisite: organic chemistry. One credit each quarter.¹ Ar. Mr. Bailey, Mr. Willaman.
- 108s. Chemistry of Wheat and Wheat Products. A lecture course, with collateral library reference work, on the chemical technology of the production and milling of wheat and its conversion into food. Prerequisite: organic chemistry. Three credits. MWF I; 116BCh. Mr. Bailey.

¹ Not more than 6 credits can be earned by registering for Course 106.

- 110s. Flour Laboratory Methods. A laboratory course. Analysis of wheat and its products. Designed to train students for research in the cereal industry. Prerequisites: Course 101-102 or food analysis. Three, four, or five credits depending on the amount of work completed. MWF VI, VII, VIII, IX; 202BCh. Mr. Bailey.
- 111f,su-112w,su. Biochemistry. An advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes and pigments, and their physico-chemical relations to vital processes. Prerequisites: organic chemistry, biology, 1 year. Three credits each quarter. Lect. MWF III; Rec. Th VI; 113BCh. Mr. Gortner.
- 113f,su-114w,su-115s. Biochemical Laboratory Methods. A laboratory course paralleling the lectures in 111-112. Prerequisite: quantitative analysis, parallel 111-112. Two credits each quarter. T VI, VII, VIII; Th VII, VIII, IX; 202-208BCh. Mr. Sandstrom.
- 116w. Advanced Animal Nutrition. Recent developments in animal nutrition, covering the field of proteins, mineral metabolism, and vitamins. Prerequisite: Course 111 or physiologic chemistry. Three credits. T III; Th II, III; 116BCh. Mr. Palmer, Miss Kennedy.
- 117f,w,s. Laboratory Problems in Animal Nutrition. A laboratory course on methods used in nutrition studies. (Because of limited laboratory facilities permission should be obtained from the instructor before registration.) Prerequisite: Course 116.¹ Three credits. Ar. Miss Kennedy.
- 118f,w,s,su. Laboratory Problems in Biochemistry. Special laboratory work in the preparation and isolation of pure compounds, and in special methods of identification or determination of biochemical products. Prerequisites: Courses 111-112, 113-114; or 103 or 110. Three or five credits. Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman, Miss Kennedy.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f,w,s. Seminar in Plant Chemistry, Colloids, and Proteins. One credit. F IX; 310BCh. Mr. Gortner, Mr. Bailey, Mr. Willaman.
- 202f,w,s. Seminar in Nutrition and Dairy Chemistry. One credit. Ar. Mr. Palmer, Miss Kennedy.
- 203f,w,s,su. Research Problems. Special work on particular research problems other than the student's major thesis. Facilities are provided for biochemical investigations and for advanced studies in plant or animal nutrition. Two to 5 credits. Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman, Miss Kennedy.
- 205f,w,s,su. Special Topics in Biochemical Literature. Library work followed by the preparation of written reports upon either the historical development or the current literature of special biochemical problems.

¹ Graduate students with acceptable prerequisites may be permitted on request to parallel Courses 116 and 117.

A reading knowledge of German is necessary and of French desirable. Prerequisite: Course 206, 207, or 208. Three credits. Mr. Gortner, Mr. Bailey.

- 206f. Colloids. Lectures dealing with the colloidal state, the preparation and properties of colloidal systems, and the relation of these to biochemical processes. Prerequisite: Course 111-112, or physical chemistry. Three credits. MWF II; 113BCh. Mr. Gortner.
- 207s. Enzymes.² A lecture and library course on the nature of enzyme action, including methods of preparation and investigation of enzymes, their physical and chemical properties and their methods of action. Prerequisites: Course 111-112, or physiologic chemistry. Three credits. MWF III; 116BCh. Mr. Willaman.
- 208w. Proteins.² Lectures on the composition, structure, physical chemistry, biochemical reactions, and functions of the proteins and amino acids. Prerequisite: Course 111-112, or advanced organic chemistry. Three credits. MWF II; 113BCh. Mr. Gortner.
- 209w. Carbohydrates.³ A lecture and library course on the synthesis, structure, reactions, and functions of carbohydrates, with especial reference to those which play a rôle in biochemical or industrial processes. Prerequisite: Course 111-112, or advanced organic chemistry. Three credits. MWF II; 116BCh. Mr. Willaman.
- 212f.w.s. Special Topics in Nutritional Chemistry. A special library course with written reports on assigned readings in protein, mineral and vitamin nutrition, primarily to train the student as a critic in this field. Prerequisite: Course 116 and reading knowledge of German. Three credits. Mr. Palmer.

ANATOMY

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

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

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

ANIMAL BIOLOGY

For offerings see Zoology.

² Offered in alternate years, will be offered in 1927-28.

³ Offered in alternate years, not offered in 1927-28.

ANIMAL HUSBANDRY

Professors Walter H. Peters, Evan F. Ferrin; Assistant Professor Phillip A. Anderson.

Prerequisite.—Students majoring in this division are exempted from the language requirement for the Master's degree.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f. Advanced Livestock Judging. Competitive judging of all types, breeds, and classes of livestock supplemented by visits to nearby stock farms. Three credits. MWF VI, VII; center arena, St(F). Mr. Ferrin.
- 102s. Horse Husbandry. Stud farm management; the selection of foundation stock and the breeding, feeding, and marketing of horses. Horse power; factors determining a horse's efficiency for work. Three credits. TTh II; 3St(F) and F V, VI, VII; center St(F). Mr. Peters.
- 103s. Beef Cattle Husbandry. The management of purebred and grade herds of beef cattle, sales and shows, building equipment, labor, with practical exercises. Three credits. MW III; 3St(F) and T V, VI, VII; BB.
- 104s. Sheep Husbandry. Similar in method to 103, with practice in shearing, blocking, feeding, and caring for lambs. Three credits. WF IV; 3St(F) and M V, VII, VII; center St(F). Mr. Anderson.
- 105s. Swine Husbandry. Topics of 103 as applied to swine production, marketing, costs, feeding, etc. Three credits. TS III; 3 St(F) and T V, VI, VII; center St(F). Mr. Ferrin.
- 106w. Advanced Meats. Practice work in dressing animals and cutting carcasses; also a study of the chemical composition of meat. Three credits. WF V, VI, VII; Meat Shop. Mr. Anderson.
- 108f. Seminar. Special assignments and review of investigations pertaining to the livestock industry. One credit. Mr. Peters.
- 109w. Seminar. Continuation of 108. One credit. Mr. Peters.
- 110s. Seminar. Continuation of 109. One credit. Mr. Peters.

COURSES PRIMARILY FOR GRADUATE STUDENTS

201. Advanced Study of Livestock Breeding. Studies of the methods followed in the building up of breeds of livestock and distinguished blood lines within the breeds. Review of scientific literature on livestock breeding. Three to ten credits. Mr. Peters.
202. Advanced Livestock Feeding. A study of experimental results bearing upon feeding questions and review of scientific literature applicable to them. Three to ten credits. Mr. Ferrin.
203. The Marketing of Livestock. A study of the methods used in the principal livestock markets. Three credits.
204. Advanced Study of the Breeds of Livestock. A study of the history, development, characteristics, and blood lines in any of the leading breeds of livestock. Three credits. Mr. Peters, Mr. Ferrin, Mr. Anderson.

205. Experimental Methods. Theory, plan, and conduct of experimental work in animal husbandry. Factors affecting results, sources of error, interpretation of data. Three credits. Mr. Ferrin.
207. Meat Problems. The wholesale cuts and grades of meat, the packing industry and utilization of by-products, special problems and visits to meat packing establishments. Three to nine credits. Mr. Anderson.

ANTHROPOLOGY

Professors Albert Ernest Jenks, Wilson D. Wallis.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 106f. Types of Prehistoric Men and Cultures. Problems of chronology and distribution. MWF III; 12F. Mr. Jenks.
- 108s. Philippine Peoples. Ethnology of the Philippines. (Alternates annually with 112.) MWF IV; 15F. Mr. Jenks.
- 110f. Physical Anthropology. The physical types of man, prehistoric and contemporary. TThS III; 12F. Mr. Wallis.
- 112s. The American Negro. The physical types. Problems and methods of interracial adjustments. (Alternates annually with 108. Not offered in 1927-28.) MWF IV; 15F. Mr. Jenks.
- 113w. Peoples of Europe. Racial and cultural characteristics. MWF II; 15F. Mr. Jenks.
- 121w. Advanced Physical Anthropology. A critical study of problems in physical anthropology. Based on 110. TThS III; 12F. Mr. Wallis.
- 122f-123w-124s. Problems in Anthropology. Advanced work with individual guidance. Also honors course, anthropological backgrounds of the social sciences, on recommendation of their advisers. Hours and credits arranged. Mr. Jenks, Mr. Wallis.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 204f-205w-206s. Seminar in Anthropology. Individually directed research. Three credits each quarter. Hours arranged. 12F. Mr. Jenks, Mr. Wallis.

ARCHITECTURE

Professors Frederick M. Mann, Leon E. Arnal; Associate Professors S. Chatwood Burton, Robert T. Jones.

- 219f,w,s. Special Researches in Architectural History. Prerequisite: completion of undergraduate architectural history. Five credits or less per quarter. MW III; 320ME. Mr. Mann.
- 220f,w,s. Archeology. Prerequisite: completion of undergraduate architectural history. Three credits or less per quarter. Hours arranged. Mr. Arnal.

221. Life Drawing and Figure Composition. Prerequisite: completion of undergraduate freehand drawing. Two credits per quarter. Hours arranged. Mr. Burton.
- 239f,w,s. Advanced Architectural Design. Prerequisite: completion of undergraduate design. Ten credits or less per quarter. MTWThF VI, VII, VIII, IX; S I, II, III, IV; 317ME. Mr. Arnal.
- 240f,w,s. Technology of Building Materials. Prerequisite: Arch. 49 or Arch. 143. Three credits per quarter. Hours arranged. Mr. Jones.
243. Advanced Interior Decoration Design. Prerequisite: Arch. 136. Ten credits or less per quarter. Hours arranged. Mr. Arnal.

ASTRONOMY

Professor —————; Assistant Professor William O. Beal.

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

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

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w-103s. Practical Astronomy. Theory and use of astronomical instruments; astronomical photography, with measures of plates; study of method of least squares. Prerequisite: Mathematics 50. Three to 6 credits. MWF III; 124F.
- 111f-112w-113s. Celestial Mechanics. Prerequisite: Mathematics 51. Three credits. Ar. Mr. Beal.
- 140w. Method of Least Squares. Applied especially to engineering, physics, and astronomy. Prerequisite: Mathematics 51. Three credits. TThS II; 124F.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Advanced Practical Astronomy. Prerequisite: Astronomy 101-102. Three credits.
- 204f-205w-206s. Astrophotography. Prerequisite: Astronomy 102. Three credits.
- 208f-209w-210s. Calculation of Orbits. Prerequisite: Mathematics 51. Three credits. Mr. Beal.

BOTANY

Professors J. Arthur Harris, George O. Burr, C. Otto Rosendahl, Josephine E. Tilden; Associate Professors Frederic K. Butters, William S. Cooper, Rodney B. Harvey.

NOTE.—For courses in plant pathology and mycology, see Department of Plant Pathology.

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

Language requirements.—Candidates for the Master's degree must have a reading knowledge of German or French; for the Doctor's degree, both are required.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101. Elementary Biometry. An introduction to the mathematical analysis of biological data. Prerequisite: 18 credits in biological sciences (or other advanced work approved by the instructor). Three credits. MWF I-II; 202Bot. Mr. Harris.
- 108s. Morphology and Taxonomy of the Pteridophytes. An intensive study of lycopods, ferns, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. Prerequisites: Courses 7 and 23. Five credits. Ar.; 304Bot. Mr. Butters.
- 110w. Morphology and Taxonomy of the Gymnosperms. An intensive study of cycads, conifers, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. Prerequisites: Courses 7 and 63. Five credits. (Not offered in 1927-28.) Mr. Butters.
- 113f-114w-115s. Advanced Taxonomy of the Flowering Plants. An advanced course in which special attention is given to the taxonomy and difficult natural groups, involving systematic principles and practice, rules of nomenclature, systems of classification, etc. Prerequisite: 15 credits, including Course 7. Nine credits. TTh VI, VII, VIII; 303Bot. Mr. Rosendahl.
- 118w. Cytology. A survey of cell structure and the various phenomena of division, fusion, and metamorphosis, together with a review of the history of cytological investigations. Methods of cytological research indicated in the laboratory. Prerequisite: 18 credits. Five credits. MTWThF I, II; 303Bot. Mr. Rosendahl.
- 125s,su-126su,f. Morphology and Taxonomy of Marine Algae. Advanced studies in selected groups. Prerequisite: 15 credits including Course 12, or consent of instructor. Three to five credits. TThS III, IV; 110Bot. Miss Tilden.
- 127s. Anatomy of Vascular Plants. The microscopic structure of vascular plants with particular attention to the development and evolution of the vascular system in the root, stem, and leaf. Prerequisite: 18 credits. Five credits. Laboratory ar. Lecture MWF I; 304Bot. Mr. Butters.
- 131f. Field Ecology. A survey of the local plant communities and successions, and a study of the general principles of plant association and succession. Prerequisite: Course 21. Five credits. MWF VI-VII, VIII; 214Bot. Mr. Cooper.

- 132w. Ecological Anatomy. The individual plant and its parts as related to environment; special plant forms and structures, their causes and significance. Prerequisite: Course 21. Five credits. MWF VI, VII, VIII; 214Bot. Mr. Cooper.
- 133s. Forest Geography of North America. Preliminary discussion of the principles of plant distribution followed by a detailed study of the forest regions of North America. Prerequisite: Course 21. Five credits. MWF VI, VII, VIII; 214Bot. Mr. Cooper.
134. Research Methods in Ecology. Theory and practice of instrumental study of the habitat and of precise investigation of community and succession. Prerequisite: Course 21. Five credits. MWF VI, VII, VIII; 214Bot. Mr. Cooper.
- 140f,w. General Plant Physiology. Advanced survey of the whole field of plant physiology. Prerequisites: Course 22 and elementary inorganic chemistry. Five credits. MTWThF VI, VII; 102Bot. Mr. Harvey.
- 141f. Physical Phases of Plant Physiology. The intake and translocation of materials, and the energy relations of the plant. Prerequisites: Courses 22 and 140 and general organic chemistry. Five credits. MTWThF I, II; 102Bot. Mr. Harvey.
- 142w. Plant Metabolism. The synthesis of plant food, its transformation and utilization by the plant. Prerequisites: Courses 22 and 140 and general organic chemistry. Five credits. MTWThF I, II; 102Bot. Mr. Harvey.
- 143s. Plant Metabolism and Growth. A continuation of Course 142, dealing with respiration, growth, and movement. Prerequisites: Courses 22 and 140 and general organic chemistry. Five credits. MTWThF I, II; 102Bot. Mr. Harvey.
- 144s. Plant Microchemistry. A study of the location of materials of physiological importance in the plant and their relation to physiological processes. Prerequisites: Courses 22 and 140 and general organic chemistry. Five credits. Ar.; 102Bot. Mr. Harvey.
- 145f,146w,147s. Advanced Biometry. Theory and practical exercises in the statistical analysis of biological data. Prerequisite: Course 101. Nine credits. MWF III, IV; 202Bot. Mr. Harris.
- 149s-150su-151f.¹ Freshwater Algae. A general survey based on studies in the field and laboratory. Designed for teachers and research workers who wish to acquire a practical knowledge of the algae. Problems assigned and reports required. Prerequisite: 15 credits including Course 12, or consent of instructor. Three to ten credits. TTh VI, VII, VIII; 110Bot. Miss Tilden.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202-203. Research Problems in the Morphology of Vascular Plants. Mr. Butters.
- 205-206-207. Research Problems in the Taxonomy of Angiosperms. Mr. Rosendahl.

¹ Any of the above courses may be taken separately.

- 209s-210su-211f. Research Problems in Algae. Miss Tilden.
 213-214-215. Research Problems in Embryology. Mr. Butters.
 217s-218su-219f. Special Research Problems in the Taxonomy and Distribution of Algae. Miss Tilden.
 221-222-223. Research Problems in Ecology. Mr. Cooper.
 225-226-227. Research Problems in Plant Physiology. Mr. Harvey.
 228f,w.s. Research Methods in Plant Physiology. Mr. Harvey.
 229-230-231. Research Problems in Cytology. Mr. Rosendahl.
 233-234-235. Seminar. Students may register for one-hour seminar credit per quarter in any of the research subjects.
 237-238-239. Biometric Problems. Mr. Harris.
 241s-242su-243f. Review of Phycological Literature with Reference to Selected Problems. Miss Tilden.
 245-246-247. Botanical Problems. Mr. Harris.

CHEMISTRY

Professor and Director, Samuel C. Lind.

NOTE.—The work in the School of Chemistry is organized in six divisions or branches, namely, Inorganic, Analytical, Organic, Physical, Technological Chemistry, and Chemical Engineering. Course numbers must be preceded by the name of the division in which they occur, as Org. Chem. 151f.

In addition to the completion of the prescribed work, the candidate for a higher degree is expected to show a maturity acquired by intensive personal study of the literature and of the methods of chemistry.

Prerequisites.—(a) A branch of chemistry as a major subject: All candidates who choose chemistry as a major subject for the Doctor's degree must offer the following courses or their equivalent as prerequisites: at least 12 quarter credits in general inorganic chemistry and qualitative analysis, at least 10 credits in quantitative analysis, and at least one year of organic chemistry. All candidates must present at least one year of college physics and one year of college mathematics. (b) Chemistry or a branch of chemistry as a minor subject: It is not possible to state exactly those courses which will be required in each case. If the major is not chosen in one of the divisions of chemistry, the usual prerequisites will be at least 12 credits of general inorganic chemistry and qualitative analysis and 5 credits of quantitative or 5 credits of organic chemistry.

Students may not select two branches of chemistry as major and minor subjects except with the approval of the graduate faculty in the School of Chemistry.

The choice of the particular courses to be presented in fulfillment of a minor will be made after consultation with the student's adviser. Either Analytical Chemistry, Courses 120-121 or Organic Chemistry, Courses 151-152-153 will be acceptable as a minor for the Master's degree, or for not more than one half of a minor for the Doctor's degree, if the student is not taking major work in chemistry.

Language requirements.—Candidates for the Master's degree must have a reading knowledge of German or French; German is preferred. For the Doctor's degree, both are required.

CHEMISTRY, INORGANIC

Professor M. Cannon Sneed; Associate Professors Lillian Cohen, Lloyd H. Reyerson,¹ Henry N. Stevens.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101s. History of Chemistry. The theories of chemistry from the period of the ancients, with particular emphasis on modern theories and laws. Prerequisite: Course 36. Two credits. Miss Cohen.
- 102w. Advanced Qualitative Analysis. Includes an analysis of minerals, alloys, paints, and the methods of detecting some of the rarer elements. Prerequisite: Course 21. Two or three credits. Mr. Sneed.
- 103f-104w-105s. Advanced Inorganic Chemistry. A discussion of the periodic system and the chemistry of the elements and their compounds and of special subjects of inorganic chemistry such as valency, oxidation and reduction, complex ions, etc. Prerequisites: Courses 21, 36. Three credits per quarter. Lect. MWF IV; 111C. Mr. Sneed.
- 106f-107w-108s. Chemistry of the Rare Elements. History, occurrence, preparation, and properties of the less usual elements. Classification, valence, and atomic structure of these elements as related to the natural system of the chemical elements. Preparation and properties of their compounds. Use of the microscope and the spectroscope in following the course of the purification. Prerequisite: qualitative analysis or by permission. Three credits. Mr. Kirk.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 301f-302w-303s. Research Work in Inorganic Chemistry. Credits arranged. Mr. Sneed, Mr. Reyerson.

CHEMISTRY, ANALYTICAL

Associate Professor Isaac W. Geiger; Assistant Professor Landon A. Sarver.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101w, 102s. Quantitative Analysis. General principles, methods, and procedure both gravimetric and volumetric. Typical problems; laboratory practice. Prerequisite: Inorg. Chem. 13. Five credits per quarter. Lect. M VI; 325C. Rec. F VI; 315C. Lab. W VI-IX; MF VII-IX; 310C. Mr. Geiger.
- 123f-124w-125s. Advanced Analytical Chemistry. A systematic survey by general lectures with typical procedures selected for laboratory practice. Drill in application of modern chemical theory to analytical problems. Sanitary analysis of water is included in spring quarter.

¹ Absent on leave, 1927-28.

One lecture, seven laboratory hours per week. Prerequisites: Courses 101 and 102 or 7. Three credits. Lect. T VI; 315C. Lab. T VII-IX; Th VI-IX; 310C. Mr. Sarver.

- 127f-128w-129s. Analytical Chemistry of the Rare Elements. A survey of the quantitative methods for the estimation of the rare elements other than the rare earths. Analyses of commercially important alloys, ores, and compounds. One lecture and seven laboratory hours per week. Prerequisite: Anal. Chem. 101, 102. Three credits per quarter. Mr. Geiger.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 301,302,303. Research in Quantitative Analysis. Credits arranged. Mr. Geiger.

CHEMISTRY, ORGANIC

Professor William H. Hunter; Assistant Professors Walter M. Lauer, Lee I. Smith, Henry N. Stephens.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w-103s. Advanced Organic Chemistry. An introduction to the literature of organic chemistry. Structure, reaction, mechanism, and relation of physical properties to constitution. May be accompanied by appropriate laboratory work in Course 139. Prerequisite: Course 53. Three credits per quarter. TThS III; 315C. Mr. Hunter.
- 111f. Reagents in Organic Chemistry. A discussion of typical reagents used in organic reactions: their limits of applicability, methods of use, and types of substances with which they react. May be accompanied by appropriate laboratory work in Course 137. Prerequisite: Course 153. Three credits. MWF II; 325C. Mr. Smith.
- 113s. The Aliphatic Compounds. An advanced descriptive course, with special emphasis upon the compounds having more than one functional group. May be accompanied by appropriate laboratory work in Organic Chemistry 139. Prerequisite: Course 153. Three credits. (Not offered in 1927-28.) Mr. Smith.
- 115s. The Heterocyclic Compounds. A discussion of the nomenclature, preparation, properties, and uses of the typical heterocyclic systems. May be accompanied by appropriate laboratory work in Course 139. Prerequisite: Course 153. Three credits. (Not offered in 1927-28.) Mr. Smith.
- 116w. The Terpenes. The terpenes and their oxygen derivatives. The constituents of essential oils. The constitution of the rubber hydrocarbon with the important theories of oxidation and of vulcanization. Prerequisite: Course 153. Three credits. Mr. Stephens.
- 122w. The Aromatic Compounds. The chemistry of the aromatic compounds with special reference to dye intermediates and synthetic drugs. Prerequisite: Course 153. Three credits. Mr. Lauer.

- 123s. Dyes. A study of the important classes of dyes from the viewpoint of the organic chemist. Prerequisite: Course 153. Three credits. Mr. Lauer.
- 137f. Advanced Organic Chemistry Laboratory. Difficult preparations and problems. It is intended primarily to supplement the student's knowledge of the methods of organic chemistry. Prerequisite: Course 153. Two to five credits. Laboratory arranged. 390C. Mr. Lauer.
- 139f,w,s. Advanced Organic Chemistry Laboratory. Selected laboratory problems of an advanced nature, including some original work. An introduction to research work. These advanced laboratory courses may be taken under any member of the Division of Organic Chemistry. Students may also register for this course who desire appropriate laboratory work for other advanced courses. Prerequisite: Course 153. Two to five credits. Mr. Hunter.
- 151f-152w-153s. Organic Chemistry. An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. Not offered to students taking major work in chemistry. See introductory statement. Prerequisite: Fifteen credits in chemistry. Five credits per quarter. Lect. MWF III; 325C. Rec. Th III; Lab. TTh VI-VIII; 390C. Mr. Hunter.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Organic Chemistry Seminar. One hour per week. One credit. Open only to students taking research in organic chemistry. Mr. Hunter.
- 301f-302w-303s. Research in Organic Chemistry. Credits arranged. Mr. Hunter, Mr. Lauer, Mr. Smith, Mr. Stephens.

CHEMISTRY, PHYSICAL

Professors Samuel C. Lind, Frank H. MacDougall; Associate Professor Lloyd H. Reyerson;¹ Assistant Professor Nelson W. Taylor.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w-103s. Physical Chemistry. A general survey of the subject. Three lectures and one recitation. Laboratory work three or six hours per week. Prerequisites: two years college chemistry, one year college physics. Three, four, or five credits, depending on the amount of laboratory work. Lect. MWF IV; 325C. Rec. S IV; 115C. Lab. WF VI-VIII; 15C, 117C. Mr. MacDougall.
- 110f-w. Physical Chemistry. Designed chiefly for medical and biological students. Prerequisite: Org. Chem. 7. Four credits. Mr. Taylor.
- 116f-117w-118s. Advanced Physical Chemistry. Three lectures and one recitation. Laboratory work for one three-hour period may be taken if desired. Prerequisites: Course 103 and calculus. Three credits per quarter, or four with laboratory. Mr. Taylor.
- 129s. Principles of Colloidal Chemistry. Prerequisites Course 14I and calculus. Two credits. (Not offered in 1927-28.) Mr. Reyerson.

¹ Absent on leave, 1927-28.

- 130s. Application of Colloidal Chemistry. Prerequisite: Course 141. Two credits. Mr. Reyerson.
- 131f-132w-133s. Colloid Chemistry Laboratory. Credits and hours arranged. Must be preceded or accompanied by Course 129 or 130. Mr. Reyerson.
- 144s. Magnetochemistry. A course in atomic structure dealing specially with the magnetic properties of substances. Lectures, discussions, reports, Prerequisite: Course 103. Three credits. Mr. Taylor.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Thermodynamics and Chemistry. A detailed study of the principles of thermodynamics and their application to physical and chemical phenomena. Prerequisites: Course 103 and calculus. Four credits per quarter. Mr. MacDougall.
- 204f-205w-206s. Kinetic Theory and Atomistics. Kinetic theory of gases and liquids, crystal structure, structure of atom, quantum theory. Prerequisites: Course 103 and calculus. Four credits per quarter. (Not offered in 1927-28.) Mr. MacDougall.
- 251f-252w-253s. Physical Chemistry Seminar. One hour a week. For students taking advanced courses in physical chemistry. One credit. Mr. MacDougall, Mr. Reyerson, Mr. Taylor.
- 211f-212w-213s. Advanced Physical Chemistry Laboratory. To accompany or follow any of the advanced courses in physical chemistry. Prerequisite: Course 103. Credits arranged. Mr. MacDougall.

PHOTO AND RADIO CHEMISTRY

- 161f-162w-163s. Radioactivity. Discovery; theory of atomic disintegration; properties, transformations, and preparation of radioactive elements; properties and effects of alpha, beta, and gamma rays; radioactive and non-radioactive isotopes. Prerequisite: Phys. Chem. 103. Two credits per quarter. Mr. Lind.
- 164f,w,s. Radioactivity Laboratory. Use and standardization of electroscopes, radioactive measurements, and quantitative determination of radium in ores, minerals, waters, and plant products. One or two credits. Must be preceded or accompanied by Radioactivity 161. Mr. Lind.
- 175s. Photochemistry. History, development, and present status of photochemistry. Prerequisite: optics and Phys. Chem. 103. Three credits. Mr. Lind.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 271f-272w-273s. Chemical Activation. (Seminar 1 hour per week for graduate students). The current theories of chemical activation, including photochemical excitation, gaseous ionization, and the kinetics of cluster and of chain reactions. Prerequisites: physics and physical chemistry. One credit per quarter. Mr. Lind.
- 301f-302w-303s. Research in Physical Chemistry, including work in electrochemistry, photo and radio chemistry, and colloids. Credits arranged. Mr. Lind, Mr. MacDougall, Mr. Reyerson, Mr. Taylor.

CHEMISTRY, TECHNOLOGICAL

Associate Professor Everhart P. Harding.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 100f-101w-102s. Food Analysis. Prerequisite: Course 21. Three credits per quarter. Lect. T IV; 215C. Lab. F II-III, VI-IX; 217C. Mr. Harding.
- 103w. Exact Gas Analysis. Prerequisite: Anal. Chem. One or two credits. Mr. Harding.
- 104s. Microchemistry. The precipitation, examination, and identification of minute quantities of substances and the examination of food materials, fibers, etc., by means of the microscope. Prerequisite: Course 21. One or two credits. Mr. Harding.
- 105f. Gas and Fuel Analysis. The chemical analysis and colorimetry of solid and gaseous fuels and methods of testing municipal gas. Prerequisite: Anal. Chem. I. Three credits. Lect. S I; 215C. Lab. TTh I-III; 10C, or Th VI-VIII, S II-IV; 10C. Mr. Harding.
- 106w. Petroleum and Petroleum Products. Examination and testing principally of gasoline, illuminating and lubricating oils. Prerequisite: Anal. Chem. I. Three credits. Lect. S I; 111C. Lab. TTh I-III; 10C, or Th VI-VIII; S II-IV; 10C. Mr. Harding.
- 107f,w,s. General Technical Analysis. Includes a large range of topics; textiles and paper, paints and varnishes, asphalt and tars, boiler waters, soaps, edible oils and fats, and various other food materials and food products. Prerequisite: Anal. Chem. I. One, two, or three credits. Lect. Th II; 215C. Lab. TS I-III; 217C. Mr. Harding.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 361f-362w-363s. Research in Technological Chemistry. Credits arranged. Mr. Harding.

CHEMICAL ENGINEERING

Professor Charles A. Mann; Associate Professor George H. Montillon; Assistant Professor Ralph E. Montonna.

Prerequisites.—Before being admitted to major work in chemical engineering, the student should have received the Bachelor's degree in chemical engineering or its equivalent. If he has not met this requirement, it will be necessary for him to pursue such additional preparatory studies as may be prescribed by the adviser.

The student selecting chemical engineering as a minor must present as prerequisites mathematics including integral calculus, physics, analytical and organic chemistry, and mechanical drawing.

Requirements.—For the degree of master of science in chemical engineering, the major subject and the thesis must be taken in Chemical Engineering.

Students may not select chemical engineering in combination with any branch of chemistry as major and minor subjects except with the approval of the group committee.

The candidate for the Master's or the Doctor's degree with chemical engineering as a major must have completed, as undergraduate or graduate, a year's work in physical chemistry, such as, for example, Phys. Chem. 101s-131f-132w, or their equivalent.

For the requirements for the professional degree of chemical engineer, see page 13.

Languages.—Candidates for the Master's degree in chemical engineering must have a reading knowledge of German or French; German is preferable in this field. For the Doctor's degree, both are required.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101s. Unit Processes. Principles and materials of construction, operation, and uses of machinery for the unit processes. Lectures and recitations. Laboratory work in operating and testing. Visits to chemical plants. Prerequisites: Anal. Chem. 1, 2, Org. Chem. 52. Four credits. MTWThF I; 111C. Mr. Mann.
- 102f. Unit Process Problems. Problems in combustion, furnaces, and kilns, the application of industrial heating and cooling devices, the study of crystallization on a commercial scale. Prerequisite: Course 101. Two credits. WF II; 111C. Mr. Montillon.
- 103w. Unit Process Problems. Problems in heat transfer, the use and design of heat exchangers, single and multiple effect evaporators, the applications of the laws of fluid flow, filtration, filter presses and centrifugals. Prerequisite: Course 101. Two credits. WF II; 111C. Mr. Montillon.
- 104s. Unit Process Problems. Problems in leaching and dissolving, counter-current extraction, gas absorption, and distillation. Drying by air, steam, and direct heat dryers. Prerequisite: Course 101. Two credits. WF II; 111C. Mr. Montillon.
- 111f-112w-113s. Design of Chemical Equipment and Plants. Laying out of plants and design of equipment based on collected data for the same. Classroom and laboratory work. Prerequisites: Courses 102, 103, 104, 131, 132. Two credits per quarter. M II-IV, VI-VIII; 410C. Mr. Montillon.
- 131f. Industrial Inorganic Chemistry. Operations common to chemical industries, chemistry involved, apparatus used, marketing of products, utilization of by-products, use of trade journals. Topics: acids and alkalies, salts, chlorine, ammonia, glass, pigments, etc. Lectures and recitations. Prerequisite: Course 101. Four credits. MTWThF I; 111C. Mr. Mann.
- 132w. Industrial Organic Chemistry. Similar to 131f but covering organic field. Destructive distillation of coal and wood, petroleum oils, paper, unit organic processes, vegetable and animal oils, fats, waxes, soap, sugar, starch, etc. Lectures and recitations. Prerequisite: Course 101. Four credits. MTWThF I; 111C. Mr. Mann.

- 133f. Chemistry of Explosives. The history and development of modern explosives, their manufacture and uses. Lectures, required reading, and reports. Prerequisite: Course 132. Four credits. (Not offered in 1927-28.) Mr. Montonna.
- 134s. Intermediates and Dyestuffs. Their technical chemistry and manufacture. Processes, purification, uses, etc. Lectures and recitations. Prerequisite: Course 132 or equiv. Three credits. (May be accompanied by laboratory work in 160.) Arranged. Mr. Montonna.
- 136w. Chemistry and Technology of Cellulose. Discussions on processes and industries based on the use of cellulosic materials including the chemical and technological considerations. Pulp and paper, plastics, esters, artificial silks, etc. Lectures and recitations. Prerequisite: Org. Chem. 52 or equiv. Three credits. Arranged. Mr. Montonna.
- 141s. Gas Manufacture and Distribution. Fundamental principles of manufacture of coal gas, carbureted water gas, and other industrial fuel gases, and the apparatus for manufacture and distribution. Open to chemists and chemical engineers. Prerequisite: Org. Chem. 52. Three credits. Arranged. Mr. Montillon.
- 151f,su. Chemical Manufacture. (Inorganic) Manufacture of technical products on a scale large enough to afford data for the determination of costs of manufacture. Use of semiplant scale equipment. Technical trade journals used. Laboratory. Prerequisite: Course 101. Three or more credits. Arranged. Mr. Montonna.
- 152w,su. Chemical Manufacture. (Organic) Similar to 151 but covering the organic field. Laboratory. Prerequisite: Course 101. Three or more credits. Arranged. Mr. Montonna.
- 153f-154w-155s-156su. Special Laboratory Problems. Laboratory investigations on equipment and the manufacture of special chemical products on a large scale. Prerequisites: Courses 151, 152. Three or more credits. Arranged. Mr. Montonna.
- 160s. Intermediates and Dyestuffs Laboratory. The manufacture of intermediates and dyestuffs on a large scale using semi-works equipment. Operations on sulphonation, hydroxylation, nitration, reduction, alkylation, diazotization, coupling, etc. Laboratory. Prerequisite: arranged. Three or more credits. Arranged. Mr. Montonna.
- 176f-177w. Applied Electrochemistry. Application of the electric current to chemical processes. Laws and phenomena of electrochemistry, batteries, electroplating, electric furnace construction and operation, and electrochemical products. Class and laboratory work. Prerequisite: Phys. Chem. 103. Four credits per quarter. Lect. I MWF; 215C. Lab. VI-VIII W or Th; 25C. Mr. Mann.
- 179s. Advanced Applied Electrochemistry. The more recent development in the manufacture of inorganic and organic products. Lectures and recitations. Laboratory optional. Prerequisites: Courses 176, 177. Three credits. Arranged. Mr. Mann.
- 187s. Inspection Trip. Various industrial plants in the middle west are visited by the class on a trip which lasts about ten days, during the spring vacation period. Written reports covering the plants must be submitted.

Required of seniors in Chemical Engineering. Prerequisites: Courses 131, 132. Two credits. Spring vacation. Mr. Mann.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Seminar. Presentation and discussion of papers concerning the newer developments in chemical industries. One credit per quarter. Arranged. Mr. Montonna.
- 301f-302w-303s. Research in Chemical Engineering. Unit processes, applied electrochemistry and electric furnace work, and chemical manufacture. Credits arranged. Mr. Mann, Mr. Montillon, Mr. Montonna.

CHILD WELFARE

For staff and description of courses see pp. 114, 115.

CIVIL ENGINEERING

Professors Frederic Bass, Alvin S. Cutler, Frederick M. Mann. John I. Parcel, Frank B. Rowley; Associate Professor Fred C. Lang.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

For prerequisites see bulletin of College of Engineering and Architecture.

- 121f. Railway Engineering. Design and construction of railroad buildings and tracks. Methods of computing earthwork, and estimates and reports. Three credits. Mr. Cutler.
- 122w. Railway Engineering. Train resistance, grades, curvature, distance, rise and fall, as factors in location and operation of railroads. Train loading, acceleration, retardation; locomotives and equipment, Operating costs governing grade revision. Three credits. Mr. Cutler.
- 123s. Railway Engineering. Lectures, office work, and field inspection. Design and operations of various types of yards and terminals, and terminal facilities. Signaling and interlocking. Three credits. Mr. Cutler.
- 124w. Transportation. Operating problems of railway, highway, ocean, and inland waterway transportation. Typical design and equipment. Cost and value of service, valuation, regulation, present systems, and organizations. Three credits. Mr. Cutler.
- 125s. Transportation. Specific illustrative problems: Twin City and Mississippi Valley traffic situation, Mississippi River experiment, New York Barge Canal, Great Lakes traffic, St. Lawrence River project, Panama Canal status. Rapid transit, motor transport. Aerial transport. Three credits. Mr. Cutler.
- 131f. Bridge Analysis. Stresses in simple span railway bridge trusses of the larger type. Four credits.
- 132w. Bridge Design. Design and detail drawing of railway plate girder viaduct. Three credits.
- 133s. Bridge Design. Complete design and detail drawing of railway pin truss span. Three credits.
- 134s. Statically Indeterminate Structures. General theory deflections and statically indeterminate stresses and their application to continuous girders, frames, swing bridges, redundant members. Three credits. Mr. Parcel.

- 135s. Reinforced Concrete Design. The structural layout of various types of buildings. Types of floor systems, columns, and footings calculated and studied for special cases. Prerequisite: Course 33. Four credits. Mr. Parcel.
- 141f. Reinforced Concrete. Principles of reinforced concrete. Theory of beams, slabs, and columns and the application to ordinary structures. Prerequisite: M.&M. 128. Three credits.
- 141(a)f. Reinforced Concrete. Similar to 141 with problems of special interest to students in architectural engineering. Prerequisite: M.&M. 128. Three credits.
- 142f,w. Reinforced Concrete Design. Continuation of 141 with especial emphasis on the practical features of the design of buildings, bridges, retaining walls, etc. Prerequisite: Course 141. Three credits.
- 142(a)w. Reinforced Concrete Design. Similar to 142 with problems of special interest to students in architectural engineering. Prerequisite: Course 141(a). Three credits.
- 143w,s. Reinforced Concrete Analysis. Advanced problems in design including reinforced concrete arch. Prerequisite: Course 142. Three credits.
- 144f. A general course in plain and reinforced concrete for students other than civil engineers. Lectures, laboratory, and design. Prerequisites: M.&M. 84 and 85, or 127 and 128. Three credits.
- 146f,w,s. Cement and Concrete Laboratory. Laboratory technique and experimental investigation of special problems in cement, concrete, and reinforced concrete. Three credits.
- 161f. Hydrology. Rainfall, evaporation, transpiration, percolation, run-off. Flood and low water flows of streams. Storage problems. Three credits. Mr. Bass.
- 162w. Water Supply Engineering. Sources of supply. Laboratory methods of testing water; wells, surface water intakes, conduits and pipe lines, distribution systems, and purification plants. Selection of pumping machinery and motive power. Three credits. Mr. Bass.
- 163s. Sanitary Engineering. Quantities of sewage and storm water; precipitation and run-off. Sanitary sewer system for a small community; storm water system for a city district. Steam pollution and sewage disposal. Three credits. Mr. Bass.
- 164w-165s. Water Power. Types of low, medium, and high head developments. Details of developments. Types of dams. Turbine settings and characteristics. Three credits. Mr. Bass.
- 171f. Building Sanitation. The location and orientation of buildings; lighting, ventilation, water supply, plumbing, sewage, and refuse disposal. Two credits. Mr. Bass.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 221f-222w-223s. Railway Administration. An analysis of railway organization and methods of management and operation. Principles of valuation and rate making. Three credits. Mr. Cutler.

224. Railway Terminals and Yards. A continuation of Course 123. Three credits. Mr. Cutler.
- 234f-235w-236s. Advanced Structural Design. Fundamental theory of stresses applied to special problems. Relative economy in design. Comparative study of specifications. Three to five credits per quarter. Mr. Parcel.
- 237-238. Structural Laboratory. Similar to 234, but dealing mainly with experimental problems in structural steel. Strain gauge study of actual stress distribution in beams, columns, and riveted joints. Three to five credits per quarter.
- 245f-246w-247s. Advanced Reinforced Concrete Analysis. Critical review of the literature of reinforced concrete and study of the advanced theory. Study of test data and analysis of stresses in reinforced concrete structures. Three to five credits per quarter.
- 251s. Highway Laboratory. Investigation in co-operation with State Highway Department. Three to five credits. Mr. Lang.
252. Highway Administration. Problems of highway administration and finance. Three to five credits. Mr. Lang.
- 261s. Water and Sewage Purification. Continuation of Course 163. Design of water purification and sewage disposal. Three to five credits. Mr. Bass.
262. Water Supply Problems. Continuation of Course 162. Three to five credits. Mr. Bass.
272. City Planning. The physical elements of the city; topography, drainage, geology. Public works and structures. Street arrangements; rapid transit; railroad terminals. City districting. Subsurface structures. Esthetic features of the city; the civic center; parks; boulevards; public buildings. Three to five credits. Mr. Bass, Mr. Mann.
- 280f-281w-282s. Civil Engineering Research. Original work along lines of plain and reinforced concrete, structural steel, hydraulics, municipal and transportation problems. Investigations, reports, tests, designs. Five credits per quarter. Mr. Bass, Mr. Cutler, Mr. Parcel, Mr. Lang.

COMPARATIVE LITERATURE¹

Professor Oscar W. Firkins.

- 101-102-103.† Drama. An outline of the history of drama, including the drama of today. Lectures and readings. TThS III; 113F. Mr. Firkins.
- 105-106-107.† Principles of Criticism. Lectures and readings. MWF VI; 113F. Mr. Firkins.
110. The International Romantic Movement in Europe (1775-1825). TThS II; 113F. Mr. Firkins.
203. The Arthurian Legend: from Geoffrey of Monmouth to Tennyson and Wagner. Mr. Firkins.
206. French and English Literary Criticism: from the sixteenth century to the present time. Mr. Firkins.

¹ Prerequisites for graduate work same as English language and literature.

COMPARATIVE PHILOLOGY

Professors Frederick Klaeber, Samuel Kroesch.

Prerequisites.—This department, besides offering courses in the general principles of linguistic science, affords an opportunity for elementary studies in comparative Indo-European philology, and more particularly the investigation of Old Germanic dialects. Related courses in English philology will be found under English Language and Literature.

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

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w. General Introduction to the Science of Language. Prerequisite, one of the following groups: (1) five years' foreign language, four may be in high school and one in college; (2) two years' foreign language. Six credits. IV; 205F. Mr. Klaeber.
- 103f. Universal Language. Comparison of families of languages, grammatically and lexically. Movement for creation of an international language. Prerequisites same as for Course 101. Three credits. TS IV; 205F. Mr. Klaeber.
- 105s. The Life of Words. Etymology, and semasiology. Growth of vocabulary; change of words in form and meaning. Prerequisites same as for Course 101. Three credits. TTh VI; 205F. Mr. Klaeber.
- 108s. Comparative Phonetics. A study of speech sounds and the nature of their production with especial reference to English, French, and German. Open to students of the modern languages. Prerequisites: 2 credits in other than elementary courses. This course is identical with German 108. Three credits. Hours arranged. Mr. Kroesch.
- 109f-110w-111s. History of the German Language. Identical with German 109-110-111. Nine credits. Hours arranged. Mr. Klaeber.
- 141f-142w-143s. Historical Grammar of the English Language. I. Sounds and spelling. II. Accidence and syntax. Nine credits. Hours arranged. Mr. Klaeber.

COURSES PRIMARILY FOR GRADUATE STUDENTS

201. Comparative Grammar of the Greek, Latin, and Germanic Languages. A general survey of the field of Indo-Germanic philology will be included.
- 202-203. Gothic. The relation of Gothic to other Germanic dialects will be particularly emphasized. Study of the grammar, reading of texts, discussion of problems. Mr. Klaeber.
205. *Urgermanische Grammatik*. Lectures and study of standard works. Mr. Klaeber.
- 206-207-208. Old Saxon. Old Saxon grammar; interpretation of the *Heliand* and *Genesis*. Mr. Klaeber.

- 209-210-211. Old High German. Braune's *Althochdeutsche Grammatik*; Braune's *Althochdeutsches Lesebuch*. This course is identical with German 209-210. Mr. Klaeber.
- 212-213. Research Seminar. Competent graduate students will be advised and assisted in research along special lines. Mr. Klaeber.

DAIRY HUSBANDRY

Professors Clarence H. Eckles, Willis B. Combs; Associate Professor Otto G. Schaefer; Assistant Professor Harold Macy.

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f. Milk Production. Problems of the dairy farmer. MTWFS IV; 210HH. Mr. Eckles.
- 102s. Market Milk. Lectures and laboratory work. MW IV; Th VI, VII, VIII; 210 HH. Mr. Macy.
- 103w. Dairy Stock Feeding. Application of the principles of nutrition to special problems of feeding the dairy cow and growing the young animals. MWF III; 210HH. Mr. Eckles.
- 104s. Advanced Study of Dairy Breeds. Practice in comparative judging; selection and valuation; visits to purebred herds. MW VI, VII, VIII; F VI; 210HH. Mr. Schaefer.
- 105f-106w-107s. Seminar. Special investigations and study of selected topics. Reports on assigned subjects and reviews of recent scientific investigations. S II; 214HH. Mr. Eckles.
- 111f. Dairy Products I. The chemical, bacteriological, and economic problems in the manufacture and marketing of butter, condensed and powdered milk. MW VI; F VI, VII, VIII; 210HH. Mr. Combs.
- 112s. Dairy Products II. Similar to Course 111f with special application to cheese and ice cream. TS IV; T VI, VII, VIII; 210HH. Mr. Combs.
- 113s. Technical Control. Chemical and bacteriological laboratory methods used in technical control of milk and its products. TTh I, II, III; 102HH. Mr. Combs, Mr. Macy.
- 114su. Problems in Dairy Husbandry. A study of special problems in dairy husbandry. Open only to the teacher of agriculture and the extension worker. (See Summer Session bulletin.) 210HH. Mr. Schaefer.
- 115f,w,s. Problems in Dairy Bacteriology. Investigations of specific problems in the bacteriology of milk and dairy products. Prerequisite: Dairy Husbandry 2 or equivalent, Dairy Husbandry 111 or 112. Ar. Mr. Macy.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201w. Dairy Bacteriology. Lectures, assignments, laboratory work. Types of milk organisms, relation of the bacteria of milk to dairy manufacturers and to public health, the bacteriology of dairy products. MWF VI, VII. VIII; 210HH. Mr. Macy.
- 202f-203w-204s-208su-210su. Research in Dairy Husbandry. Facilities offered for study and investigation of subjects pertaining to dairy cattle. Students are allowed to assist at times with investigations under way in the experiment station. Arranged to meet the needs of the individual student. Open in the Summer Session only to those who have had preliminary graduate work. Mr. Eckles.
- 205f-206w-207s-209su-211su. Dairy Products. Opportunity and facilities are offered for study and investigation of problems concerning dairy products. The work is arranged to meet the needs of the individual student. Open in the Summer Session only to those who have had preliminary graduate work. Mr. Combs.

ECONOMICS

Professors Russell A. Stevenson, Roy G. Blakey,¹ Frederic B. Garver, Alvin H. Hansen, Arnold W. Lahee, Bruce D. Mudgett, H. Bruce Price, Roland S. Vaile; Associate Professors Ernest A. Heilman, Arthur W. Marget, Clare L. Rotzel, J. Warren Stehman, Warren C. Waite; Assistant Professors Budd A. Holt, Dorothea Kittredge, Walter R. Myers, John J. Reighard, William H. Stead.

Candidates for higher degrees will be accepted as majors in economics in the following fields: money and banking, public finance, economic theory, economic history, labor statistics, agricultural economics (marketing, land economics, farm finance, economics of agricultural production, agricultural prices); in accounting, only for the Master's degree.

GENERAL ECONOMICS AND BUSINESS ADMINISTRATION

Prerequisites.—For major work, 27 quarter credits for those offering Economics 1-2 and 3, or their equivalent; 18 quarter credits for those not presenting one of these courses or an equivalent. These credits should include Money and Banking, Statistics, and Accounting. Candidates not presenting these fundamental courses upon registration in the Graduate School may be required to complete them in addition to the regular course requirements for the degree.

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

¹ Absent on leave, 1927-28.

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

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

AGRICULTURAL ECONOMICS

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

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

Language requirement.—Candidates for the Master's degree in agricultural economics are not required to have a reading knowledge of a foreign language.

GENERAL ECONOMICS

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

NOTE.—The following courses in other departments carry credit also in Economics: History 113-114-115, Economic History of Europe since 1750; 116-117-118, Economic History of Europe, 1300-1750; 169, Economic History of the United States since 1865; 210-211-212, Graduate Seminar in Economic History. Political Science 105, Colonization; 157, Recent Social Legislation; 158, Government and Business; 159, Law of Public Utilities.

BUSINESS ADMINISTRATION

101f-102w. Advanced General Economics. Six credits. (1) TThS I; 102B. (2) MWF III; 102B. Mr. Garver.

101w-102s. Advanced General Economics. Six credits. TThS I; 109B. Mr. Garver.

109s. Business Policy. Three credits. MWF VII; 102B. Mr. Stevenson.
112f. Business Statistics. Three credits. MWF I; 6B. Mr. Mudgett.

130f,s. Cost Accounting. General Survey. Three credits. Fall, (1) TThS I; 303B. (2) TThS III; 303B. Spring, TThS I; 303B. Mr. Ostlund.

131f-132w-133s. Cost Accounting. Nine credits. TThS II; 303B. Mr. Ostlund.

134f. Income Tax Accounting. Three credits. MWF II; 302B. Mr. Reighard.

135w-136s. Auditing. Six credits. MWF II; 302B. Mr. Reighard.

- 137f-138w. Accounting Practice and Procedure. Six credits. MWF IV; 303B. Mr. Heilman.
- 139s. Advanced General Accounting. Three credits. MWF IV; 303B. Mr. Heilman.
- 145s. Foreign Exchange. Three credits. MWF IV; 204B. Mr. Myers.
- 146f. Investments. Three credits. (Offered in alternate years, not offered in 1927-28.)
- 147s. Bank Administration. Three credits. MTW IX; 202B.
- 148w. The Securities Market. Three credits. (Offered in alternate years, not offered in 1927-28.)
- 150s. Advanced Farm Finance. Three credits. W VI, VII; 104B.
- 152s. Real Estate Valuation and Land Utilization. Three credits. TThS III; 204B. Mr. A. G. Black.
153. Real Estate Management and Practice. Three credits. Ar.
- 155s. Corporation Finance. Three credits. Lect. Th III; 202B. (1) TTh I; 204B. (2) MW III; 6B. (3) MW VI; 209B. Mr. Stehman.
- 156f. Finance Management. Three credits. (1) TThS I; 202B. (2) TThS II; 102B. Mr. Stehman.
- 167w. Personnel Administration. Three credits. (1) TThS I; 202B. (2) TThS II; 109B. Mr. Stead.
- 168s. Advanced Personnel Administration. Three credits. TThS I; 209B. Mr. Stead.
- 177w. Foreign Trade. Three credits. MWF I; 202B.
- 180f-181w-182s. Seminars for Seniors and Graduates. Intensive study of problems in respective fields of specialization. In 1927-28 they will be offered as follows:

No.	Title	Credits	Day	Hour	Bldg	Instructor
A.	Accounting	9	TThS		II 104B	Mr. Reighard
B.	Business Finance	6	T	VII-VIII	204B	Mr. Myers and others
C.	Marketing	9	TTh	VI-VII½	104B	Mr. Vaile
D.	Personnel	9	Ar	Ar	Ar	Mr. Stead and others
E.	Secretarial Practice*	6	MWF	IV	1B	Miss Leonard
F.	Statistics	9	Ar	Ar	Ar	Mr. Mudgett

194f-195w-196s. Advanced Advertising Procedure. Three credits. Ar. Mr. Vaile.

243f-244w-245s. Seminar in Private Finance. M VII-VIII; 104B.

ECONOMICS

- 103f-104w. Value and Distribution. Six credits. TThS II; 202B. Mr. Garver.
- 105s. History of Economic Ideas: The Classical Economists. Three credits. (Offered in alternate years, not offered in 1927-28.) Mr. Garver.
- 106s. History of Economic Ideas: The Critics of the Classical Economists. Three credits. MWF IV; 102B. (Offered in alternate years.) Mr. Hansen.

* Fall and winter quarters only.

- 108w. Marketing Organization: Agricultural Products. Three credits. MWF VIII; 102B. Mr. Price.
- 113w-114s. Theory of Statistics. Six credits. MWF I; 6B. Mr. Mudgett.
- 141f,w,s. Monetary and Banking Policy. Three credits. Fall, (1) MWF I; 209B. (2) TThS III; 209B. (3) MWF IV; 204B. (4) MWF VI; 209B. Winter, (1) MWF I; 102B. (2) TThS II; 102B. (3) MWF IV; 204B. Spring, (1) MWF II; 209B. (2) MWF VII; 209B. Mr. Stehman.
- 142f. Comparative Banking. Three credits. MWF III; 104B. Mr. Myers.
- 149f,w,s. Business Cycles. Three credits. Fall, MTW IX; 202B. Winter, (1) MWF III; 6B. Mr. Myers. (2) MTW IX; 202B. Spring, MWF III; 102B. Mr. Myers.
- 154s. Public Utilities. Three credits. TThS II; 102B. (Offered in alternate years.) Mr. Garver.
- 160w. The Modern Corporation. Three credits. Lect. M IV; OLAud. (1) WF II; 202B. (2) WF III; 109B. (3) TS IV; 204B. Mr. Stehman.
- 161f,w. Labor Problems and Trade Unionism. Three credits. Fall, MWF IV; 202B. Winter, TThS III; 109B, 6B. Mr. Hansen.
- 162w. Labor Movements. Three credits. MWF IV; 202B. Mr. Hansen.
- 163s. Economic Aspects of Population and Immigration. (Offered in alternate years, not offered in 1927-28.) Mr. Hansen.
- 164s. Labor Legislation and Social Insurance. Three credits. TThS III; 109B. Mr. Stead.
- 172f,w,s. Economics of Transportation. Three credits. Fall, (1) MWF VI; 202B. (2) MWF VII; 202B. Winter, MWF VI; 102B. Spring, MWF VII; 202B.
- 174s. Transportation Problems. Three credits. MWF VI; 102B.
- 176f,s. Commercial Policies. Three credits. MWF I; 202B.
- 187s. Market Prices. Three credits. WF VIII-IX½; 104B. Mr. Garver, Mr. Vaile.
- 191f-192w. Public Finance. Three credits. MWF III; 209B. Mr. Blakey.
- 193s. State and Local Taxation. Three credits. MWF III; 209B. Mr. Blakey.
- 203f-204w-205s. Seminar in Economic Theory. Nine credits. TTh VIII½-IX; 104B. Mr. Garver.
- 210f-211w-212s. Seminar in Labor. Ar. Mr. Hansen.

AGRICULTURAL ECONOMICS

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 110f-111w. Economics of Agricultural Production. The principles of production economics elaborated in terms of the production of the major farm products and producing areas. Economic geography of agriculture. National production policies. Six credits. TThS I; (fall) 206 Da; (winter) 108Da. Mr. A. G. Black.
- 126s. Economics of Consumption. Formulation of the economic principles relating to choice between different uses of income and time and energy

- of individuals and family organizations. Three credits. MWF I; 204Da.; MWF IV; 108Da. Mr. Waite.
- 131w. Market Prices. Analysis of the price making process as it works out in the market places where the major farm products are sold. Market quotations and price quoting. Three credits. TThS III; 206Da. Mr. Waite.
- 135s. Methods of Price Analysis. Statistical technique involved in analyzing seasonal and year-to-year movements in prices of farm products. Interpretation of results. Three credits. TThS III; 108Da. Mr. Waite.
- 140f. Marketing Organization: Staples. Principles of production economics applied to the organization of markets and marketing organization for the grains, tobacco, cotton, and wool. Especial attention to co-operative organization. Three credits. MWF I; 108Da. Mr. Price.
- 141w. Marketing Organization: Dairy and Poultry Products. Three credits. TThS II; 204Da. Mr. Price.
- 142s. Marketing Organization: Fruits and Vegetables. Two credits. MW III; 108Da. Mr. Price, Mr. Holt.
- 143w. Marketing Organization: Livestock and Meats. Two credits. TS IV; 206Da. Mr. Price.
- 145w-146s. Marketing Management. Analysis of major problems of business set-up and operation of important types of marketing enterprises, especially of the co-operative types. Three credits. MWF IV; 206Da. Mr. Holt.
- 160s.¹ Advanced Farm Finance. Three credits. F VI-VII; 104B. Mr. A. G. Black.
- 170s.¹ Land Economics. Three credits. TTh VII-VIII½; 209B. Mr. A. G. Black.
- 190f. Agricultural Statistics. Intended for beginning graduate students who have had no course in the elements of statistical method. Three credits. TThS III. Mrs. Kittredge.

COURSES FOR GRADUATE STUDENTS

- 200f-201w-202s. General Seminar in Agricultural Economics. Credits to be arranged. Ar. (Under this head are arranged special seminars on subjects suited to the needs of the particular groups of graduate students, or on subjects upon which members of the staff are doing work at the time.) Mr. Price, Mr. Waite.
- 203f-204w. Current Problems and Literature. No credits. Required of all candidates for degrees. Monday evening; 204Da. Mr. Price, Mr. Waite.
220. Seminar in Farm Household Economics. Rural living, administration of farm income. To be arranged.
- 237w. Seminar in Research Methods in Price Analysis. A survey and analysis of the various types of research projects being worked upon in the field of prices of farm products. Three credits. F VIII-IX; 204Da. Mr. Working.

¹ These courses are offered on the Minneapolis campus.

- 240s. Seminar in the Marketing of Cereals. Three credits. MF VI-VII½.
(Offered in 1928-29 and in alternate years thereafter.) Mr. Price.
- 241s. Seminar in the Marketing of Livestock and Livestock Products.
Three credits. MF VI-VII½. (Offered in 1927-28 and in alternate
years thereafter.) 206Da. Mr. Price.
- 244w. Seminar in Co-operative Marketing. Three credits. TTh VI-VII½.
(Offered in 1927-28 and in alternate years thereafter.) 206Da.
246. Seminar in the Economics of Consumption. To be arranged.
- 247f. Seminar in Research Methods in Marketing. Three credits. (Not
offered in 1927-28.) Mr. Price.
- 251w. Seminar in Transportation of Farm Products. Consideration of
special topics, such as rural highway economics, incidence of trans-
portation costs of farm products. To be arranged. (Offered in 1928-29
and in alternate years thereafter.)
- 265f. Seminar in Agricultural Taxation. Three credits. MW VI-VII½.
(Offered in 1928-29 and in alternate years thereafter.)

EDUCATION

Professors Fred Engelhardt, Melvin E. Haggerty, Earl Hudelson, Leonard V. Koos, Wylie B. McNeal, Wilford S. Miller, Charles A. Prosser, Ashley V. Storm; Associate Professor Leo J. Brueckner, Frank W. Lathrop; Assistant Professors Ross L. Finney, Marvin J. Van Wagenen; Professorial Lecturer Anne D. Blitz.

Prerequisites.—For major work at least six quarter credits in psychology and in addition to this a total of not less than 12 quarter credits of undergraduate work in education.

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

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

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

GENERAL COURSES

- 208f. Methods in Educational Research. A study of the methods employed in treatment and presentation of educational problems. Designed to aid students in the preparation of theses. Suggested for all candidates for degrees. Two credits. S I, II. Ar. Mr. Haggerty.
- 228-229-230. Problems of College Education. Fall term: Problems of Student Personnel. Winter term: Problems of College Instruction. Spring term: Problems of Organization and Administration. The course will consist of discussions and lectures by members of the university staff. May be taken for credit by graduate students. Six credits. Monday 7:30-9:30 p.m.

ADMINISTRATION AND SUPERVISION

- 113f. High School Curriculum. A study of types of programs of study, curricula, subjects of study, constants, variables, electives, distribution of subject-matter by years and units. Prerequisites: 10 hrs. in education including Ed. 55. Three credits. M IX; TTh VIII; 112Ed. Mr. Koos.
- 115af, 115bw, 115cs. Practice in Supervision. Problems and practice in the supervision of instruction in the elementary schools of Minneapolis and St. Paul. Three, six, or nine credits. Mr. Brueckner, Mr. Peik.
- 119s. Elementary School Curriculum. A study of the principles underlying the organization of subject-matter for courses in the elementary school, including an examination of curricula, syllabi, and school texts in the light of their function in the teaching and administration of the curriculum. Prerequisites: Courses 1, 3. Three credits. MWF I; arranged. Mr. Peik.
- 119Tf-120Tw. Elementary School Curriculum. (Same as above for teachers.) Four credits. S I, II; 113Ed. Mr. Peik.
- 121w. Educational Advising of Women and Girls. A course designed to acquaint students with the problems of educational advising of girls and young women, particularly those of high school age. Students admitted to the course through conference with instructor. Three credits. Ar. Miss Blitz.
- 123s. Supervision of High School Instruction. The present status of high school supervision; its proper scope and function. A course combining consideration of principles and their application to improving high school instruction in the academic and special subjects. Prerequisites: 10 hrs. in education. Three credits. MTTh VIII. Ar. Mr. Koos.
- 124f. Educational Administration. The present status and tendencies in the organization and administration of state and city school systems with interpretations. Prerequisites: 10 hrs. in education. MWF IX; 110OL. Mr. Engelhardt.
- 125w-126s. City School Administration. For superintendents and principals. Detailed study of the principles and practice of city school administration. Prerequisite: Ed. 124. Six credits. MWF IX; 110OL. Mr. Engelhardt.
- 127s. The City School Superintendent. A practical consideration of the duties of the superintendent: history; qualifications; present status; relations to the board of education, the staff, the pupils, and the public; types of administrative procedures; records; reports; professional ethics. Prerequisite: 10 hrs. in education. Two credits. (Not offered in 1927-28.)
- 128f,w,s. Special Problems in Educational Administration. This course is designed primarily for superintendents and principals qualified to make intensive studies of specific problems related to the administration of a school system. Prerequisite: Ed. 124-125-126 or equivalent. One or two credits. Ar. Mr. Engelhardt.

- 133aw-133bs. Guidance in Secondary Schools. Emphasizes practices in educational and vocational guidance in junior and senior high schools, considering such phases as giving information about vocations, utilizing test results and school marks, and organizing the staff for guidance. Prerequisite: 10 hrs. in education, including Ed.Psy. 55. Four credits. T IX, X. Mr. Kefauver.
- 160f. Principles of Supervision. An analysis of the functions and duties of a supervisor as related to the improvement of instruction; specific supervisory technique; objective analysis of classroom activity; concrete applications to present day problems; case studies. Prerequisite: Ed. 15 or equivalent. Two credits. S III, IV. Mr. Brueckner.
- 161aw. Supervision: Uses of Educational Tests in Improving Instruction. Objective evaluation of the results of teaching; diagnosis of pupil difficulty; remedial work; tests as aids to teaching; following up a testing program. Prerequisite: Ed. 15 or equivalent. Two credits. S III, IV. Ar. Mr. Melby.
- 161bs. Supervision. The adjustment of the curriculum to the abilities of pupils in the elementary school; methods of classifying pupils according to achievement and intelligence. Prerequisite: Ed. 15 or equivalent. Two credits. W IX, X. Ar. Mr. Peik.
- 162aw. Supervision of English in the Elementary Schools. Improvement of instruction in oral and silent reading; the results of scientific investigation in reading; use of standardized and informal tests; remedial work; some consideration of spelling and writing. Prerequisite: Ed. 15 or equivalent. Two credits. S III, IV. Mr. Brueckner.
- 162cs. Supervision of Arithmetic in the Elementary Schools. The improvement of instruction in arithmetic; the evaluation of the course of study; standardized drill exercises; diagnosis of specific pupil difficulty and remedial work; tests as aids of teaching. Prerequisite: Ed. 15 or equivalent. Two credits. S III, IV. Mr. Brueckner.
- 164w. High School Administration. A study of elimination from school, secondary vocational education, the marketing system, classification of students, high school library, social organization and extra-curricular activities, community relationships, teaching schedule, building, costs. Prerequisite: 10 hrs. in education, including Ed. 55. Three credits. TThS I. Ar. Mr. Koos.
- 167w-168s. Junior High School. A study of the special purposes of this institution and the appropriate reorganization to achieve them; the history of the movement. Prerequisites: 10 hrs. in education, including Ed. 55. Four credits. S III, IV; Ar.
- 169f. Extra-Curricular Activities. Types of activities in junior and senior high schools; aims and values; practices in organizing, administering, and supervising; methods of evaluation. Prerequisite: 10 hrs. in education including Ed. Psy. 55. Two credits. T IX, X. Ar. Mr. Kefauver.
- 170f,w,s. Special Problems in Secondary Education. Planned primarily for those at work in high schools who are qualified to make intensive

- studies relating to administration and supervision of secondary education. Consult instructor before registering. Prerequisite: 10 hrs. in education including Ed. Psy. 55. Two credits. Ar. Ar. Mr. Koos.
- 175s. City School Finance. Study of the problems of school support peculiarly related to the city district; municipal school funds, sources and expenditures; analysis of unit costs, comparative cost accounting systems, budgets, financial records and reports. Prerequisites: 124, 125. Three credits. MWF VIII; 205Ed. Mr. Engelhardt.
- 178f-179w. School Surveys. A study of the literature and methods of school surveys, as a basis for the investigation of practical problems in school administration and supervision. Six credits. MWF, VIII. Ar. Mr. Engelhardt.
- 184f. Supervision of Practice Teaching. A course primarily for teachers engaged in the direction of practice teachers in secondary schools. Two credits. Saturday morning. Mr. Boardman.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 205f-206w-207s. Seminar in Educational Administration. Prerequisites: 124-125-126, 160-161-162. Six credits. Ar. Mr. Engelhardt.
- 218f-219w-220s. Seminar in Secondary School Problems. Th IX, X; 111Ed. Mr. Koos.
- 225f-226w-227s. Seminar in Elementary School Problems. Th IX, X. Ar. Mr. Brueckner.

AGRICULTURAL EDUCATION

Prerequisites.—For major or minor work, 18 credits in agricultural education and preparation in agricultural subjects satisfactory to the Department of Agricultural Education.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 131w,s. Methods in Teaching High School Agriculture. Fundamentals of method in teaching as related to teaching agriculture in high school. Organizing subject-matter of daily work; selection and manipulation of devices. Classroom and laboratory method. Specific plans for teaching secondary agriculture. Prerequisites: Ag.Ed. 11, 41. Five credits. MTWThF III winter; MTWFS IV spring; 202Ad(F). Mr. Lathrop.
141. Supervised Practice in Vocational Agriculture. A special methods course dealing with the selection, planning, supervising, and summarizing of the practical work in agriculture. Special emphasis on the problem method of teaching, and the use of the farm and community for teaching purposes. Prerequisite: Ag.Ed. 11. Ar. Three credits. Mr. Lathrop.
- 144w,su. Course Organization and Instruction for the Individual in Vocational Agriculture. Subject-matter content for the individual should be based on farm activities. Individuals should progress according to abilities and needs. Accepting these principles, this course includes selection and organization of content, administration, and teaching technique. Prerequisites: Ag.Ed. 11, 41, 131, 151. Three credits. Ar. Mr. Storm, Mr. Lathrop.

- 151w,s. Organization and Management. Organization and management of work in secondary schools, particularly in Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and co-ordination of work. Prerequisites: Ag.Ed. 11, 21. Five credits. MTWFS IV. 202Ad(F). Mr. Storm, Mr. Lathrop.
- 153f. Consolidated Rural Schools. To prepare principals to meet the problems of organization and management peculiar to consolidated rural schools, such as building arrangements, curriculum adjustments, transportation of pupils, and home project work. Prerequisite: Ag.Ed. 11. Three credits. Ar.
- 154w,s. Rural Education and Community Life. The rural school as a community center, and ways and means of organizing educational and recreational activities, such as clubs, festivals, fairs, and other desirable features of rural community life. Prerequisite: Ag. Ed. 11. Three credits. Ar.
155. Consolidated Rural School Problems. Opportunity for intensive study and research in special problems of administration and supervision of village and consolidated rural schools. Prerequisites: Ag. Ed. 11, 153 or equivalent. Three credits. Ar.
- 171w,s. Problems in Procedure. For agriculture teachers. Emphasizes working out problems in detail in order that the processes as formulated can be used in teaching the following year by those enrolled. Discussions, readings, papers, laboratory. Prerequisites: Ag. Ed. 11, 41, 42, 131, or equivalent. Three credits. Ar. Mr. Lathrop.
- 176s. Problems in Visual Presentation. Special attention to use of visual aids in teaching agriculture. The development of proper visual methods by means of research. Prerequisite: Ag. Ed. 75. Three credits. Ar.
- 191f,192w,193s. Seminar in Agricultural Education. Critical studies of important problems in agricultural education; opportunity for individual investigation and research; review and interpretation of current educational literature. Prerequisites: Ag. Ed. 11, 41, 42, 131, 151. Two credits each. Ar. 200Ad(F). Mr. Storm, Mr. Lathrop.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Advanced Seminar. Study of the broader administrative problems and policies in the field of agricultural education. Opportunity for independent investigation and research. One to 2 credits per quarter. 200Ad(F). Mr. Storm, Mr. Lathrop.
- 221f-222w-223s-224su. Graduate Problems. Making investigations, gathering data, and formulating plans regarding agricultural education. Three credits. 207Ad(F). Mr. Storm, Mr. Lathrop.
- 241f. Operation of Vocational Agriculture. Problems involved in the state and local activities in conducting vocational agriculture. It includes a study of federal and state laws and regulations, courses of study,

- duties of the state supervisor, reports, records, and conferences. Two credits. Ar. 202Ad(F). Mr. Storm, Mr. Lathrop.
- 242w,s. Organization and Administration of Teacher Training for Vocational Agriculture. Development of teacher training institutions, agricultural college curricula, professional needs of high school teachers, professional courses and their content, equipment, itinerant teacher training, practice teaching, teacher evaluation. Two credits. Ar. 202Ad (F). Mr. Storm, Mr. Lathrop.
- 243su. Same as 242 with the addition of concrete studies of specific institutions. Not open to students having credit for 242. Three credits. Ar. 202Ad(F). Mr. Storm, Mr. Lathrop.

THEORY AND PRACTICE OF TEACHING

110. Educational Diagnosis in Secondary Education. The application of educational measurements to the solution of the problems of high school instruction. Analysis of the specific learning processes involved in the various high school subjects; a critical survey of the means of diagnosing and alleviating high school pupils' learning difficulties; the use of educational measurements in improving high school teaching. Prerequisite: Ed. Psy. 55. Two credits. Sr., grad.; MWF. Ar. Mr. Hudelson.
143. The Teaching of Reading in the Elementary School. An intensive course in the content and the technique of teaching reading in the elementary schools in the light of educational and psychological research. Prerequisite: 9 hrs. in education including Ed. Psy. 55. Three credits. Sr., grad. Mr. Peik.
181. Technique of Elementary School Instruction. A course in fundamental and special methods of teaching elementary school subjects. Prerequisite: 9 hrs. in education including Ed. Psy. 55. Three credits. Jr., sr., grad.; MWF I. Ar. Ed. Mr. Peik.
- 193w. Foundations of Secondary School Methods. A study of the investigations which form the bases of the technique of high school instruction and the application of their results to high school subject-matter and to high school classroom procedure. Prerequisite: Ed. 15. Three credits. MWF IX; ar. Mr. Hudelson.
- 195w. Problems of High School English Teaching. An intensive study of various means of adapting subject content to high school pupils; observations; classroom experiments; conferences with classroom teachers; pupil advisory work; submission of proposals of special methods. Prerequisite: Ed. 15 and 21. Two credits. S III, IV; 112Ed. Mr. Hudelson.
- 201f-202w-203s. Research Problems in the Teaching of History and the Other Social Studies. Open only to graduate students who have had teaching experience. Consent of the instructor is necessary. Two credits per quarter. W IX, X. Mr. Krey.
- 222f-223w-224s. Research Problems in Secondary Education. Prerequisite: Ed. 15 and 113. Two credits. Ar. Mr. Hudelson.

TRADE AND INDUSTRIAL EDUCATION

- Ind.110w. Guidance in the Schools. The history of the guidance movement; typical public school means and methods; the presentation of occupational information; the junior wage earning situation; attendance, child labor and continuation laws; placement and follow-up plans. Prerequisite: Ed. Psy. 134. Two credits. S III, IV; 201OL. Mr. Smith.
- Ind.150f-151w-152s. Seminar in Vocational Education. Survey of studies in the field, individual and group investigation, reports, and criticisms. Required of all students writing theses in the special field of industrial education, general or vocational. Six credits. T 7:30-9:30 p.m.; 206OL. Mr. Prosser.
- Ind.171f. Administration of Industrial Education—Day Schools. National, state, and local organization and support of day industrial schools; adaptable types, buildings, and equipment, promotion and advertising, co-operative agreements and relationships, supervision of instruction, student placement. General versus unit course organization. Relation to part time and evening instruction. Two credits. Th IX, X; 210OL. Mr. Craig.
- Ind.172w. Administration of Industrial Education—Evening Schools. Development of the after training of adults; agencies and scope of the movement; state supervision, national and state legislation; qualifications of instructors, problems and difficulties, records and certification, fees and charges; buildings, equipment, and instruction facilities. General versus unit course organization. Costs. Prerequisite: Course 171. Two credits. W IX, X; 210OL. Mr. Bass.
- Ind.173s. Administration of Industrial Education—Part Time Classes. A study of the new movement for part time education. Social and economic background, methods of organizing classes, a study of the special student groups, courses of study. Typical schools, comparative state legislation and plans. Minnesota's problems. Prerequisite: Course 172. Two credits. M IX, X; 210OL. Mr. Prosser.

ELECTRICAL ENGINEERING

Professors Franklin W. Springer, William T. Ryan; Associate Professor Cyril M. Jansky, Jr.; Assistant Professors Elmer W. Johnson, John H. Kuhlmann, George W. Swenson, Milo E. Todd.

Prerequisites.—For major work, Courses 121 to 126 or their equivalent; for minor work, 6 credits in physics, also integral calculus.

DIRECT CURRENT

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 111f-113w-115s. Electrical Machinery. Prerequisite: one year in college physics, three credits per quarter. MWF 9:30. Mr. Springer.
- 112f-114w-116s. Electrical Machinery Laboratory. To be taken with Course 111-113-115. Lectures and practice. Prerequisite: Physics 41-42. Two credits per quarter. Mr. Springer.

ALTERNATING AND TRANSIENT CURRENTS

- 121f-123w-125s. Alternating Currents. Prerequisite: Electrical Engineering 115. Three credits per quarter. MWF 10:30 or 11:30. (Two sections.) Mr. Ryan.
- 122f-124w-126s. Alternating Current Laboratory. To be taken with Course 121-123-125. Prerequisite: Electrical Engineering 116. Two credits per quarter. Mr. Ryan.
- 127f. Transient Electrical Phenomena. Mathematical study of the electric circuit containing resistance, inductance, and capacity. Abnormal currents and voltage upon switching circuits containing iron core inductances. Prerequisite: Electrical Engineering 121. Two credits. Mr. Jansky.
- 128w. Transient Electrical Phenomena. Current and voltage distribution in circuits containing distributed resistance, inductance, and capacity. Distortion in telephone lines and its correction. Prerequisite: Electrical Engineering 127. Two credits. Mr. Jansky.
- 129s. Transient and High Frequency Phenomena. Transient phenomena in coupled circuits. Distribution of current and flux in conductors at high and low frequencies. Change of resistance with frequency. Theoretical study of special problems. Prerequisite: Electrical Engineering 128. Two credits. Mr. Jansky.

DESIGN

- 132f-134w-136s. Electrical Design. Prerequisite: Electrical Engineering 115. To be taken with Course 121-123-125. Two credits per quarter. Mr. Kuhlmann.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 232f-234w-236s. Electrical Design. Special problems. Prerequisites: Electrical Engineering 125, 136. Credits as arranged. Mr. Kuhlmann.
- 237s. Electric Power Transmission Design. Preparation of detailed plans and specifications for the construction of high voltage transmission lines and distributing systems. Economic, electrical, and mechanical principles and calculations. Mr. Ryan.

ELECTRIC POWER

- 141f. Central Stations. Operation, design, and construction of electric power generating stations. Prerequisite: Electrical Engineering 115. Two credits. ThS 10:30. Mr. Ryan.
- 142w. Electrical Transmission. Prerequisite: Electrical Engineering 141. Two credits. ThS 10:30. Mr. Ryan.
- 144w. Railway Electrical Engineering. Prerequisite: Electrical Engineering 115 or 45. Two credits. MW 11:30. Mr. Johnson.
- 145s. Steam Railroad Electrification. Prerequisite: Electrical Engineering 144. Two credits. MW 11:30. Mr. Johnson.

ELECTRIC LIGHTING

- 151f. Electric Lighting. Lectures, problems, and laboratory practice. Prerequisite: one year in college physics. One credit. Mr. Johnson.
- 152f. Photometric Laboratory. Photometric studies of incandescent and arc electric lamps, gas and oil lamps. Bench and radial photometers and illuminometers. To be taken with Electrical Engineering 151. One credit. Mr. Johnson.
- 251w-253s. Illuminating Engineering. Lectures and laboratory work. Methods of determining location, kind, and quality of lights for obtaining desired illumination. Prerequisite: Electrical Engineering 151. Two credits per quarter. Mr. Johnson.

COMMUNICATION

- 161f. Radio Communication. Phase relations in high frequency circuits. Mathematical theory of damped wave transmission and receiving circuits. Inductance and capacity measurements using damped waves. The electron tube as a detector and amplifier. Signal Corps apparatus. Prerequisite: registration in Electrical Engineering 121. Three credits. ThS 8:30. Laboratory sections. Mr. Jansky.
- 162w. Radio Communication. Theory and measurement of logarithmic decrement. Undamped wave transmitting and receiving circuits. Heterodyne reception. The arc, high frequency generator, and electron tube as sources of high frequency power. High frequency measurements, using undamped waves. Prerequisite: Electrical Engineering 161. Three credits. ThS 8:30. Laboratory sections. Mr. Jansky.
- 163s. Radio Communication. Mathematical theory of the electron tube and its use in the radio circuit. Design of electron tube oscillator and amplifier circuits. Radio telephony, modulation, carrier frequencies. Direction finding apparatus and selective circuits for interference elimination. Prerequisite: Electrical Engineering 162. Three credits. ThS 8:30. Laboratory sections. Mr. Jansky.
- 164f. Telegraph and Telephone Apparatus. Theoretical and experimental study of apparatus used for signaling, telegraphy, and telephony. Lectures and laboratory. Prerequisite: to be taken with Course 121. Two or three credits. Mr. Swenson.
- 165w-166s. Telegraph and Telephone Circuits. Theoretical and experimental study of telegraph and telephone circuits and the phenomena of long line transmission. Prerequisite: Course 164. Two credits per quarter. Mr. Swenson.
- 167f-168w-169s. Radio Station Operation. For men already proficient, licensed radio operators. Open only to a limited number by permission. One or two credits per quarter. Mr. Jansky.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 275f-276w-277s. Electrical Engineering Research. Investigation of special research problems in laboratory or library. Prerequisite: Electrical Engineering 126. Two to four credits per quarter. Mr. Springer, Mr. Ryan, Mr. Jansky, Mr. Johnson, Mr. Kuhlmann, Mr. Swenson, Mr. Todd.

MEASUREMENTS

- 183f-184w-185s. Electrical Laboratory. Efficiency tests and special problems. Prerequisite: Electrical Engineering 126. Credits as arranged. Mr. Springer.
- 186w or s. High Tension Testing. Low frequency pressure up to 320,000 volts and high frequency to several million volts applied to the study of dielectric phenomena, testing of high tension equipment, etc. Prerequisite: Electrical Engineering 124. Two credits. Mr. Springer.
- 187f,188w,189s. Special Communication Laboratory. Special problems in electrical communication. Open by permission to qualified students. Includes weekly seminar meeting. One to twelve credits total. Mr. Swenson.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 281w-282s. Advanced High Frequency Measurements. Vector treatment of circuit networks. Bridge circuits for the measurement of resistance, inductance, and capacity at audio and radio frequencies. Prerequisite: Electrical Engineering 126. Two credits per quarter. Mr. Jansky.
- 284f-285w-286s. Precise Electrical Engineering Measurements. Lectures and laboratory work. Open to a limited number subject to approval. Prerequisites: Electrical Engineering 123, 124. One or two credits. Mr. Todd.

MISCELLANEOUS

- 291f-292w-293s. Graduate Seminar. Discussions of problems and results of research work. One credit per quarter.
- 294f-295w-296s. Electrical Ignition and Automobile Electrical Accessories. The study of ignition apparatus; characteristics of automobile accessories, such as generators, starters, controllers, etc. Laboratory and lectures. Prerequisite: Electrical Engineering 121 or equivalent. Two credits per quarter. Mr. Springer.
- G.E.111s. Valuation of Public Utility Properties. Factors affecting value, depreciation, taxation, and regulation of public utility properties. Elements of engineering economics; cost analysis, economic investigations, rate making. Open only to seniors and graduates. One credit. Mr. Ryan and non-resident lecturers.
- G.E.124w. Engineering Relations. Lectures, assigned reading, and discussions on the human side of engineering. Relations of the engineer to employer, employees, customers, and public. Engineering code of ethics. Bridging between college and business. Practical training of engineering graduates. Open only to seniors and graduates. (Not offered in 1927-28.)

ENGLISH

Professors Joseph M. Thomas, Joseph W. Beach,¹ Frederick Klaeber (Comparative Philology), Cecil A. Moore, Frank M. Rarig, Martin B. Ruud, Elmer E. Stoll; Assistant Professors John Douglas Bush, Muriel B. Carr, William P. Dunn, Elizabeth Jackson, Charles W. Nichols, Emerson G. Sutcliffe.

¹ Absent on leave, 1927-28.

Before registering for graduate courses, students should consult with the director of graduate work for the department, Mr. Moore.

Before the acceptance of his subject for a thesis, a candidate for the degree of M.A. or Ph.D. must have given evidence to the department that he speaks and writes English with propriety.

REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS

1. *Prerequisite.*—(1) For major work, not less than 27 credit hours in English literature, 12 of which must be of senior college grade, including a satisfactory course in either Chaucer or Shakespeare; for minor work, not less than 27 credit hours in English literature. (2) Unless special exception is made upon petition to the department, the candidate is required to have a reading knowledge of French and German.

2. The minimum requirement of 18 credits in the major is interpreted to mean 18 credits in subjects listed below as "Courses in English." If the candidate has not previously had an elementary course in Old English, this subject must be included in his program of graduate study.

REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

1. *Delimitation of the field.*—The general field of English is divided into two periods (1) Early English and (2) Modern English. The boundary line between these periods may be drawn anywhere between 1500 and 1550 according to the requirements of the candidate's program. A candidate may select as his major subject either the Early English or the Modern English period.

2. The candidate will be examined as to his knowledge of the whole field of English literature, but much more thoroly in that portion of the field covered by his major. Special emphasis will be laid, in the examination, on one particular period or one particular type (such as drama, lyric, or essay) with which he is presumed to be especially familiar. This particular period or type would naturally be that connected with his thesis.

3. The candidate must have completed, before examination, advanced courses in Chaucer and Shakespeare.

4. A good reading knowledge of Latin is in all cases desirable, and in some cases may be indicated by the candidate's adviser as indispensable.

COURSES IN ENGLISH

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 100f. Old English. Old English prose and poetry. The relation to modern English is particularly emphasized. Prerequisite: 8 credits above 50. Four credits. TThFS III; 306F. Mr. Ruud.
- 101f. Middle English. An outline of Middle English grammar, including the interpretation of selected texts. Prerequisites: English 75 and 100. Two credits. TTh VI; 217F. Mr. Klaeber.

- 103s. *Beowulf*. An introduction to the Old English poem, with reading of considerable portions of the text. Prerequisite: Course 100. Three credits. T VII, VIII, Th VII; 217F. Mr. Klaeber.
- 105w-106s. Eighteenth-Century Poetry. From Pope to Burns, with special reference to the rise and growth of romanticism. Prerequisite: 8 credits above 50. Six credits. MWF VII; 204F. Mr. Moore.
- 107w-108s. Eighteenth-Century Prose. Special study of fiction and the essay. Prerequisite: 8 credits above 50. Six credits. MWF VII; 204F. Mr. Moore. (Not given in 1927-28.)
- 109f-110w. The Romantic Poets of the Nineteenth Century. From Wordsworth to Keats. Prerequisite: 8 credits above 50. Six credits. TThS III; 204F. Mr. Nichols.
- 111f-112w. Seventeenth-Century Prose. General survey of the prose of the century to 1660. History 4-5 is desirable as preparation for this course. Prerequisite: 8 credits above 50. Six credits. MWF III; 204F. Mr. Bush.
- 123f-124w-125s. The Technique of the Novel. Special studies in novels of the late nineteenth and twentieth centuries, with particular regard to structure. Prerequisite: 8 credits above 50 and the permission of the instructor. Nine credits. T 4:00 to 6:00 p.m.; 204F. (Not given in 1927-28.)
- 126-127. Drama. 1660-1880. (Not given in 1927-28.)
- 129s. Modern Drama. Contemporary drama from 1870 to the present. Prerequisite: English 55-56. Four credits. MWThF II; 204F. Mr. Stoll.
- 133w. The English and Scottish Popular Ballads. A study of a large number of traditional ballads, English and foreign, and of ballad style and origins. Prerequisite: 8 credits above 50. Three credits. MWF I; 204F. Mr. Ruud.
- 136s. Advanced Shakespeare. Shakespeare's development traced to the end. A careful analysis of four plays. Problems in the interpretation of Shakespeare's dramatic methods. Prerequisite: English 55-56. Four credits. MTWF I; 205F. Mr. Stoll.
- 140s. Advanced Chaucer. The more important poems (except those read in Course 75). The treatment will be primarily literary and historical, linguistic proficiency being presumed. Prerequisite: 8 credits above 50, including 75. Three credits. S I, II; 217F. Mr. Ruud.
- 141f-142w-143s. Historical Grammar of the English Language. This course is identical with Comparative Philology 141-142-143. Prerequisite: 8 credits above 50, including 75 or 81-82. Six credits. Mr. Klaeber.
- 146f-147w. The Metrical Romances. The more important Middle English romances of the non-Arthurian cycles. Six credits. MWF VII; 205F. (Not given in 1927-28.)
- 148f-149w. Arthurian Romances. An introduction to the great stories of love and chivalry connected with King Arthur and the Round Table. Prerequisite: 8 credits above 50, including 75 or 81-82. Six credits. MWF II; 204F. Miss Carr.

- 150f. Victorian Poetry. The poetry of the Victorian era, aside from Browning's and Tennyson's. The principal names are: Matthew Arnold, the Rosettis, Fitzgerald, Morris, Swinburne, and Meredith. Prerequisite: 8 credits above 50. Four credits. MTWF VII; 205F. Mr. Stoll.
- 151s. Recent Poetry. Poetry in England and America since the death of Queen Victoria. The main tradition and tendencies now prevailing. Prerequisite: 8 credits above 50. Four credits. TWThS III; 205F. Miss Jackson.
- 152w-153s. Pre-Elizabethan Drama. The late medieval and the Renaissance drama, moralities, interludes, and farces up through the earlier years of the Elizabethan period. Prerequisite: 55-56. Six credits. TThS III; 205F. (Not given in 1927-28.)
- 155s. The American Novel. The history of the American novel from the beginning to the present. Prerequisite: English 73-74. Four credits. MTThF VI; 205F.
- 160w. History of the English Language. Prerequisite: English 100. Two credits. TTh VI; 205F. Mr. Klaeber.
- 162f. Restoration Literature. Prerequisite: 8 credits above 50. Four credits. MTWF IV; 205F. Mr. Moore.
- 164s. Danté in English. See Italian 164s. Three credits. MWF IV; 203F. Miss Phelps.
- 166s. Bacon and His Contemporaries. Prerequisite: English 55-56. Three credits. MWF VI; 204F. Mr. Dunn.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f. Old English. Comparative study of Anglo-Saxon (Old English) grammar and reading of prose texts. Once a week, two hours. Three credits. Th VIII, IX. Mr. Klaeber.
- 202w-203s. Old English Poetry. Critical reading of poems. Once a week, two hours. Six credits. Th VIII, IX. Mr. Klaeber.
208. Piers the Plowman. A study of critical problems relating to the text and authorship. Three credits. (Not given in 1927-28.)
- 209f-210w-211s. The Middle English Lyric. (Not given in 1927-28.)
- 213f-214w-215s. Seminar in Eighteenth-Century Drama. Special attention will be given to the rise and progress of sentimental comedy and domestic tragedy. Nine credits. Th 4:00 to 6:00 p.m. Mr. Moore.
- 217f-218w-219s. Seminary in the Restoration Drama. The drama from the Restoration to the rise of sentimental comedy. Special attention given to the comedy of manners (from Etherege to Farquhar) and its relation to the life of the time. Nine credits. (Not given in 1927-28.) Mr. Stoll.
- 220f-221w-222s. Seminary in Medieval Drama. Nine credits. (Not given in 1927-28.) Mr. Ruud.
- 225-226-227. Seminary in Elizabethan Drama. Elizabethan and Jacobean dramatists, from Lyly to Shirley. Problems assigned may involve Shakespeare, and in general his contemporaries will be studied less for their own sakes than for the light they shed upon him. Nine credits. (Not given in 1927-28.) Mr. Stoll.

- 228-229-230. Seminary in Eighteenth-Century Novel. The rise and development of the novel as a form of literature; the use made of the novel as a medium of religious, social, and political theory. Nine credits. (Not given in 1927-28.) Mr. Moore.
- 231f-232w-233s. Shakespeare's Tragic and Comic Art. Nine credits. M 4:00 to 6:00 p.m. Mr. Stoll.
- 234f-235w-236s. Seminary in Middle English Alliterative Poetry. A literary and linguistic study of selected Middle English alliterative poems. Nine credits. W 4:00 to 6:00 p.m. Mr. Ruud.
- 237f-238w-239s. Seminar in Chaucer. A study of some of the important problems in the Chaucer canon and in the works of Chaucer. Nine credits. (Not given in 1927-28.) Mr. Ruud.
- 240f-241w-242s. Seminary in the *Canterbury Tales*. Nine credits. (Not given in 1927-28.) Mr. Ruud.
- 243f-244w-245s. Seminary in the Classical Backgrounds of Elizabethan Literature. Nine credits. F 4:00 to 6:00 p.m. Mr. Bush.

For courses in Comparative Literature see page 38.

COURSES IN COMPOSITION

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 111f-112w-113s. Essay Writing. Practice in writing didactic, biographical, critical, and informal essays. Analysis of a considerable body of modern essays. Prerequisites: Courses 11-12 or 18-19, and 10 or 20. Nine credits. MWF III; 304F. Mr. Sutcliffe.
- 119f-120w-121s. Seminar in Writing. Open to advanced students who write with facility and who desire personal direction. Criticism of manuscripts submitted. Prerequisites: 9 credits in senior college courses, and permission of instructor. Nine credits. Th VI, VII; 304F. Ar.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Seminary in Rhetoric. (Graduate seminary but open to seniors taking the Honors Course.) For those who are specializing in rhetoric and composition. Prerequisites: Courses 11-12 or 18-19 and 9 additional credits in rhetoric. Nine credits. Mr. Thomas.

COURSES IN SPEECH

- 101f-102w.† Advanced Speech Composition. Structure and oral style. Psychology of persuasion. Briefing. Critical study of models. Written speeches. Reports. Prerequisites: Speech 41-42-43 or 45-46. Six credits. MWF III; 308F. Mr. Rarig.
- 105s. Theory of Reading and Acting. The forms of literature; literature regarded as an art; psychology of creative imagination; speech elements in literature; technique governing use of auditory and visual symbols. Collateral readings, speech problems, reports, term papers. Prerequisites: Speech 41-42-43 or 45-46. Three credits. MWF III; 308F. Mr. Rarig.

- 107s. Seminar in Great Orators. A critical study of the great English and American orators. One historical period each year. Prerequisites: Speech 41-42-43 or 45-46; Psychology 1-2; ten credits in history, sociology, or philosophy. Recommended: Psychology 140. Three credits. MWF III; 308F. Mr. Rarig.
- 121f-122w.† Advanced Speech Problems. Factors determining the behavior of speakers and audiences. Prerequisites: Speech 41-42-43 or 45-46; Psychology 1-2. Recommended: Psychology 114-115; Anatomy 4. Six credits. TThS III; 305F. Mr. Rarig, Mr. Morse.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors Royal N. Chapman, William A. Riley, Arthur G. Ruggles; Associate Professor Robert A. Wardle; Assistant Professors Maynard S. Johnson, Clarence E. Mickel, August L. Strand.

Prerequisites.—Eighteen credits in animal biology and entomology.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 117f-118w-119s. General Ecology of Insects. General ecology with special reference to the insects of Minnesota. Frequent field trips. Lectures, laboratory, and field work. TTh V-VII; 208-210AB. Mr. Chapman.
- 124su. Advanced Ecology. Similar to 117-118-119 with special field work. Mr. Chapman.
- 125f-126w-127s. Advanced General Entomology. Morphology and classification of insects with lectures on the history of entomology. Lectures and laboratory. TThS III, IV; 208-210AB.
- 139-140. History and Development of Insects. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. Individual work along these lines is available to properly qualified students under Course 197. TTh II-IV, and arrange; 211Ad (F). Mr. Riley.
- 144f-145w-146s. Animal Parasites and Parasitism. Lectures and laboratory work. Second term devoted primarily to the relation of insects to diseases of man and animals. WF V-VII; 208-210AB. Mr. Riley.
160. General Forest Entomology. Lectures, laboratory, and library work treating of the life history, habits, and ecological relationships of insects that affect trees and forest products.
- 175f-176w-177s. Advanced Economic Entomology. A study of the principles of insect control, followed by special studies of insecticides and the history of economic entomology. Lectures and laboratory. Three credits per quarter. MWF I; 302Ad(F). Mr. Ruggles, Mr. Wardle, Mr. Strand.
- 197f,w,s,su. Introduction to Research. Preparation for investigational work in lines of entomology, parasitology, or economic zoology. Summer work should be planned when possible. Mr. Riley, parasitology, insect morphology; Mr. Ruggles, general economic entomology; Mr. Johnson, economic vertebrate zoology; Mr. Strand, insecticides; Mr. Mickel, systematic entomology.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-204. Research in Entomology. Mr. Chapman, Mr. Riley, Mr. Mickel.
 205-208. Research in Economic Entomology. Mr. Ruggles.
 209-212. Research in Economic Vertebrate Zoology. Mr. Johnson.
 261-264. Research in Parasitology and Medical Entomology. Mr. Riley.
 265-268. Research in Insecticides. Mr. Strand.

EXPERIMENTAL ENGINEERING

Professors Frank B. Rowley, Jacob O. Jones, John I. Parcel, Charles F. Shoop; Associate Professors Fred C. Lang, George C. Priester, Burton J. Robertson.

The regular courses offered in the Experimental Engineering laboratories are listed under the respective departments: Mathematics and Mechanics, Civil Engineering, and Mechanical Engineering. Advanced research and work of a special character relating to the various branches of engineering may be arranged through consultation with the director, Professor Rowley.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- C.E.237w-238s. Structural Laboratory. Similar to Course 243, but dealing mainly with experimental problems in structural steel.
 C.E.243w-244s. Cement and Concrete Laboratory. Laboratory technique and experimental investigation of special problems in cement, concrete, and reinforced concrete.
 C.E.251. Highway Laboratory. Investigations in co-operation with State Highway Department. Mr. Lang.
 C.E.263. Hydraulic Laboratory. Study of special hydraulic problems in laboratory, drafting room, and field. Mr. Jones.
 M.E.287-288-289. Research in Mechanical Engineering. Courses may be elected which involve investigations in connection with steam and gas engines, heating, and ventilating. Reports, special problems, and related tests. Three to nine credits. Mr. Rowley, Mr. Shoop, Mr. Robertson.

FARM MANAGEMENT, AGRONOMY, AND PLANT GENETICS

Professors Andrew Boss, Herbert K. Hayes; Associate Professors Albert C. Army, George A. Pond; Assistant Professors Harvey E. Brewbaker, Lewis F. Garey, Howard B. Sprague, Frederick J. Stevenson.

Prerequisites.—In farm management, for major work, Courses 102, 103, or their equivalents, and at least 6 credits in elementary and agricultural economics. Courses in economics, statistics, and other intimately related fields may, with the approval of the adviser, be accepted in satisfaction of the requirements for the major. For minor work, at least 12 credits in the elementary agricultural sciences. Exemption from the language requirement may be made in individual cases.

In agronomy, sufficient work in plant science to satisfy the adviser that advanced work may be pursued profitably. Further courses may be required without credit if in the opinion of the adviser this is necessary. With the approval of the adviser, courses in agricultural biochemistry, pathology, plant physiology, and soils may be accepted as part of the major work.

In plant genetics, for major or minor work, sufficient credits in plant sciences must be presented to satisfy the adviser. Candidates for the Master's degree must have a reading knowledge of German or French. With the approval of the adviser, courses in agricultural biochemistry, botany, farm crops, horticulture, plant physiology, and plant pathology may be accepted as major work. Students majoring in plant genetics are required to continue study during at least one summer. Exemption is made if similar training has been obtained at some other institution.

COURSES IN FARM MANAGEMENT

FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 102f,w. Farm Organization. The business side of farming with emphasis on farm organization and equipment. Prerequisites: Farm Corps I, Agricultural Economics I. Three credits. MWF II; 118Ad(F). Mr. Garey.
- 103w,s. Farm Operation. A continuation of Course 102 with special attention to farm operation. Prerequisites: same as above with Course 102. Three credits. MWF I; 118Ad(F). Mr. Garey.
- 104s. Types of Farming. A study of types of farming and of prevailing farm practices in the principal agricultural production areas. Prerequisites: Courses 102, 103, or equivalent. Three credits. MWF II; 118Ad(F). Mr. Boss.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 220f. Farm Surveys. An intensive study of the factors entering into farm organization. Special emphasis on selection, assembling, validity, and analysis of data. Attention given to studies in local production areas. Three credits. Arranged. Mr. Boss, Mr. Garey.
- 221w. Farm Organization Studies. A seminar study of the principles involved in the analysis of farm organization data and the computation of farm costs. Attention will be given to methods used in collecting and compiling these data with special emphasis on farm records and accounts as a basis for farm organization study. Three credits. Mr. Pond.
- 222Ar. Problems in Farm Record Analysis. A laboratory study of methods of recording and analyzing the farm business. Three to six credits. Mr. Pond.
- 223f-224w. Systems of Farming. A seminar course, including an intensive study of the factors determining the various systems of farming and production areas, with emphasis on specific types of farming. Three to six credits. Ar. Mr. Boss, Mr. Garey.

- 225w-226s. Advanced Farm Organization. Analysis of farm organization and the application of survey factors and cost factors in organizing the business of farming. Three to six credits. Ar. Mr. Boss, Mr. Pond.
- 227s. Seminar. Use of statistical methods in analyzing farm practices. Correlation studies. Importance of factors studied and measures of efficiency. Interpretation of results. Three credits. Ar. Mr. Garey.
- 228s. Seminar in Farm Management. A study of the development of farm management research with special attention to the literature and with comparisons of methods employed. One to three credits. Ar. Mr. Boss, Mr. Pond, Mr. Garey.
- 230Ar. Research Problems in Farm Organization and Operation. A study of methods of conducting research work and analyzing problems in farm organization and operation. Students will be assigned to individual research problems or to special phases of research work being conducted by members of the staff. Reports covering progress of work and analysis of findings required as a basis for credit. Three to nine credits. Mr. Boss, Mr. Pond.

COURSES IN AGRONOMY

FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 121f. Grain Crops. Structure, function, culture, improvement, and uses of corn, wheat, oats, barley, rye, flax, and buckwheat. Prerequisites: Botany 4, 5, 6. Three credits. TTh VI, VII, VIII; 100Ad(F). Mr. Sprague.
- 122w. Grain and Hay Grading. History of grading, study of grading methods, and actual practice in grading grain and hay samples according to federal standards. Prerequisite: Agronomy 121, or equivalent. Three credits. TTh VI, VII, VIII; 100Ad(F).
- 123s. Forage Crops. A study of the structure, function, culture, and improvements and uses of forage crops including meadow and pasture management. Prerequisites: Botany 4, 5, 6. Three credits. TTh VI, VII, VIII; 100Ad(F).
- 124w. Special Crops. Climate and soil requirements as related to distribution and culture of the following crops: legumes for seed production, potatoes, sugar beets, sorghum for sirup, flax and hemp for fiber, tobacco, and other minor crops. Three credits. MWF III, IV; 100Ad(F). Offered in alternate years. (Not offered in 1927-28.) Mr. Sprague.
- 125w,s. Advanced Farm Crops. The ecology of crop plants and the application of plant science to crop production. Prerequisites or concurrent: Botany 127 and 142 or 143 and Soils 4 and 5. Three credits per quarter. Offered in alternate years. (Offered in 1927-28.) Ar. Mr. Army, Mr. Sprague.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201Ar. Research in Farm Crops. Original work on special problems in the production and classification of crop plants. Prerequisites: Agronomy 121, 123. Three to nine credits. Mr. Army.

- 202f,w. Farm Crops Seminar. Weekly meetings for reviews and discussions of articles and thesis problems. Prerequisites: 9 credits in farm crops. One and one-half credits per quarter. W VIII, IX; 105Ad(F). Mr. Arny.
- 203s. Methods in Farm Crops Research. Studies in the interpretation of the published results from investigations with crop plants and the applications of the results of agronomic problems together with practice in outlining plans for research in agronomy. Prerequisites: Agronomy 121, 123. Offered in alternate years. (Offered in 1927-28.) Three credits. 105Ad(F). Mr. Arny.
- 204s. History and Classification of Crop Plants. Assignments, discussions, and laboratory work covering (a) the historical, botanical, and geographical origin of crop plants, and (b) a study of the characteristics of species and varieties of crop plants which is useful in identification and systematic classification. Prerequisites: Botany 113 or 114 or 115 and Agronomy 121. Offered in alternate years. (Offered in 1927-28.) Three credits. MWF I, II; 105Ad(F). Mr. Sprague.

COURSES IN PLANT GENETICS

FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 131f,w. Principles of Genetics. Designed to familiarize students with the fundamental principles of inheritance. Three credits. ThS I; T I, II; 102Ad(F). Mr. Stevenson.
- 132s. Farm Crops Plant Breeding. Methods of breeding farm crops from the genetic mode of attack. Prerequisites: Course 131 or its equivalent. Three credits. ThS I; T I, II. 102Ad(F). Mr. Stevenson.
- 134f,w. Laboratory Problems in Genetics. Special problems in breeding *Drosophila*. Further study of the principles of genetics in controlled crosses. May parallel Course 131. Three credits. Ar. 102Ad(F). Mr. Brewbaker.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 241Ar. Research in Plant Genetics. Special problems in plant breeding, inheritance of plant characters, and cytological studies in relation to plant genetics. May be taken as major or minor work. Mr. Hayes, Mr. Brewbaker, Mr. Stevenson.
- 242f,s. Plant Breeding Seminar. Plant genetics in relation to plant breeding, and a discussion of research problems. One credit per quarter. F VII, VIII; 102Ad(F). Mr. Hayes.
- 243f. Methods in Plant Breeding. The application of biometrical methods to field plot technique, the results of inbreeding and outbreeding, and the results of selection and crossing as a means of improving crop plants. Practice in outlining the correct mode of attack for special plant breeding problems. Three credits. Ar. Mr. Hayes.
- 244su,f. Laboratory Methods in Plant Breeding. Supplementing 243f. Practice in plant breeding technique, methods of controlling pollination, and handling of plant cultures. Three credits. Ar. Mr. Stevenson.

- 245w. Advanced Genetics. The establishment of a genetic factor hypothesis, linkage, gene mutations, chromosomal aberrations, and the goodness of fit of Mendelian ratios will be emphasized. Three credits. Ar. Mr. Hayes.
- 246w. Genetics Seminar. Important contributions to genetic theory and practice. Two credits. F VII, VIII; 102Ad(F). Mr. Hayes.

FORESTRY

Professors Henry Schmitz, John H. Allison, Edward G. Cheyney, Raphael Zon; Associate Professor John P. Wentling; Assistant Professor Thorald S. Hansen.

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

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

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101w. Advanced Dendrology. A continuation of Course 3-4 with special studies in classification and distribution of the timber species of the world. Prerequisites: 10 credits in botany and 8 credits in dendrology. Three credits. TThS I; 301Hr(F). Mr. Wentling.
- 107f. Uses of Wood I. The economic hard and soft woods, both foreign and domestic from the standpoint of regions of production, distribution centers, qualities, amounts, and prices in relation to the wood using industries. Lectures, reading, reports. Prerequisite: Course 33-34. Three credits. MWF IV; 301Hr(F). Mr. Wentling.
- 108w. Uses of Wood II. A continuation of Course 107 dealing with the industries and the woods they use. Kinds, grades, qualities, properties, requirements for each product. Use, re-use, distribution of product. Regions of production and relation to other industries. Lectures, readings, reports. Prerequisite: Course 33-34. Three credits. MWF IV; 303Hr(F). Mr. Wentling.
- 109s. Uses of Wood III. The actual use of wood in the industries. At least six hours per week must be spent in actual study in a factory. Complete reports and collateral readings. Prerequisites: Courses 107 and 108. Three credits. TTh VI, VII, VIII; 303Hr(F). Mr. Wentling.
- 112w. Advanced Forest Mensuration. Continuation of Course 10 with special emphasis on tree forms, the development of the formula used in study of volume and growth of trees. Ar. Mr. Hansen.
- 113f. Wood Pulps and Papers. A detailed study of production of wood pulp and paper products, naval stores, tannins, oils, wood distillation

- products, etc. Lectures, reading, reports. Prerequisites: Course 33-34, Chem. 3 or 10 and Chem. 36. Three credits. Juniors and seniors. Ar. 302Hr(F). Mr. Allison.
- 114f-115w-116s. Mechanical and Physical Properties of Wood. Study of strength as related to density, quality, etc. Wood stresses, failures, and methods of testing timbers. Prerequisite: Course 33-34. Nine credits. TThS I, II; 303Hr(F). Mr. Wentling.
- 119w. Advanced Wood Structure I. A detailed study of the elements and structure of native and foreign economic woods. Preparation, sectioning, and mounting of typical sections. Reference reading and reports. Six hours per week. Prerequisite: Course 33-34. Three credits. TTh VI, VII, VIII; 303Hr(F). Mr. Wentling.
- 120s. Advanced Wood Structure II. Study of wood structure in relation to seasoning, mechanical failures, penetration or preservatives, variation in strength, etc. Six hours per week. Prerequisite: Course 33-34. Three credits. WF VI, VII, VIII; 303Hr(F). Mr. Wentling.
- 125s. Wood Preservation. Lectures and collateral reading upon the history, development, and methods of wood preservation. Different systems now in use and preservatives used. Mr. Schmitz.
- 126f. Silvics. The fundamentals forming the basis of silviculture with special attention to the silvics of the important tree species. Lectures, readings, and required papers. Mr. Cheyney.
- 127w. Silviculture. A study of the general principles underlying the art of silviculture, and a brief study of the European methods as applied to American conditions. Mr. Cheyney.
- 128s. Silvicultural Laboratory. Nursery practice and field planting. Field investigations and planting plans. Seed collecting, extracting, and storing. Daily nursery and field work. Mr. Cheyney.
- 130f. Forest Valuation. The business of forest management. A study of the different factors entering into the valuation of forest property. Mr. Allison.
- 131w. Forest Policy and Administration. The policy of the United States and the states toward the utilization of the public forest resources. Policy of other owners toward forest resources controlled by them. Administration of the national and state forests. Mr. Allison.
- 132s. Forest Regulation Laboratory. Field work. The collection of the data necessary to work up a forest working plan. Includes the making of the timber estimates, growth studies, and maps necessary to a forest working plan. Mr. Allison.
- 136f. Forest Economics. The place of the forest in the productive utilization of land; past and present markets and source of supply of timber and timber products, particularly with reference to the present situation in North America. Mr. Allison.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202. Research Problems in Science and Practice of Silviculture. Mr. Cheyney, Mr. Wentling.

- 203-204. Research Problems in Forest Management and Working Plans. Mr. Allison.
- 205-206. Research Problems in Forest Economics. Mr. Allison.
- 207f-208w-209s. Research in Wood Technology. Mr. Wentling.
- 210f-211w-212s. Special Problems in Forest Research and Research Methods. Mr. Zon.
- 213f-214w-215s. Special Problems in Forest Utilization. Mr. Schmitz, Mr. Wentling.
- 216f-217w. Forest Seminar. Mr. Zon.

GEOGRAPHY

Professor Darrell H. Davis; Instructor Richard Hartshorne.

Prerequisites.—For major work, Courses 1-2 or 51-52, 61, and 5 additional credits in geography, Economics 6-7, and Geology 1 or 8. For minor work, 10 credits in the department.

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101w. Geography of Europe. A study of the various European countries and their economic development. Prerequisite: 20 credits in social science, to include 10 credits in geography. Three credits. MWF I; 103OL. Mr. Hartshorne.
- 102s. Trade Routes and Trade Centers. A study of the major land and ocean routes, ports and interior trade centers, and the nature and significance of the traffic. Prerequisite: Course 61. Three credits. MWF III; 103OL. Mr. Hartshorne.
- 135s. Geography of Minnesota. A regional economic study of the state. The basis for existing industry and city development will receive special consideration. Prerequisite: 12 credits in geography, or 20 credits in social science to include at least 8 credits in geography. Permission of instructor necessary. Three credits. MWF I; 103OL. Mr. Davis.
- 141f,s. Field Course in Geography. A consideration of the problems of field work, illustrated by field trips. Prerequisite: 20 credits in geography. Three credits. Hours arranged. (Not offered in 1927-28.) Mr. Davis.
- 151f,152w,153s. Seminar in Geography. A survey of current literature with reports and discussions on assigned topics. Prerequisite: 20 credits in geography or permission of instructor. Three credits. Th VII; 103OL. Mr. Davis.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f,w,s. Research Problems in Geography. Credits and hours arranged. Mr. Davis.

GEOLOGY AND MINERALOGY

Professors William H. Emmons, Frank F. Grout, Clinton R. Stauffer;
Assistant Professors Ira S. Allison, John W. Gruner, George M.
Schwartz, George A. Thiel.

Prerequisites.—For major work in:

General geology and economic geology. Courses 1, 2, or 3, 21, 22; a knowledge of general chemistry. Course 105 must be carried along with other graduate work.

Petrology, Courses 1, 3, 21, 22, elementary chemistry and physics.

Paleontology, Courses 1, 11, or 91-92-93. Animal biology is a desirable antecedent.

A student selecting some branch of geology as a major will not be allowed to select general geology as a minor.

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

101f. Principles of Stratigraphy. Origin and structure of sedimentary deposits; the interpretation of these in relation to paleogeography; field work in connection with Cambrian and Ordovician problems. Ar. Three credits. Mr. Allison.

102w-103s. Micropaleontology. The study and classification of Foraminifera, diatoms, and other small fossil organisms and their use for purposes of correlation in oil fields. Three credit hours of laboratory work. Hours arranged. Winter and spring quarters. Open to students who have had Geology 11 or 91. Mr. Stauffer.

105f. Elements of Rock Study. Prerequisite: Course 22 or 25. Three credits. TTh VI, VII; 110P. Mr. Grout.

106w. Petrography. The identification and study of minerals and rocks by topical methods; the study of igneous rocks, crystalline schists, and metamorphic rocks. The origin and classification of rocks. Prerequisite: Course 105. Three credits. MF VII, VIII; 110P. Mr. Grout.

107f-108w-109s. Paleontologic Practice. The collection, preparation, and study of materials, with a view to gaining a working knowledge of groups of fossils, and the use of literature. Prerequisite: Course 59. Nine credits. MWF V, VII; 105P. Mr. Stauffer.

111f. Ore Deposits. The nature, distribution, and genesis of ore deposits of the United States; relations of ore deposits to geologic structure; the deformation and superficial alteration of ore deposits. Prerequisites: Courses 10, 105. Three credits. TThS I; 110P. Mr. Emmons.

112w. Geology of Petroleum. First part treats deposits of metals, giving special attention to those outside of the United States. Second half treats the nature, origin, and distribution of petroleum and discusses the various oil fields of the world. Prerequisite: Course 111. Three credits. TThS I; 110P. Mr. Emmons.

- 113s. Problems in Ore Deposits. Field excursions, map work, lectures on field and laboratory methods. Prerequisite: Course 112. Three credits. Th VI-IX; 110P. Mr. Emmons.
- 124w-125s. Structural and Metamorphic Geology. The conditions, processes, and results of metamorphism; structural features resulting from deformation under varying conditions of load. Prerequisites: Courses 9 or 10, 105. Six credits. MWF VI; 200aP. Mr. Schwartz.
- 127f. Geology of the Lake Superior Region. Structure and correlation of districts. Interpretation of field notes and survey reports. Practical problems. The use of geologic bibliographies and literature. Prerequisites: 124-125. Three credits. Hours arranged. 104P. Mr. Thiel.
- 131f-132w-133s. Advanced Petrology. Advanced optical methods. Regional and genetic studies. Petrographic reports. Prerequisite: Course 106. Nine credits. TThS II-III; 200P. Mr. Grout.
- 137w. Testing Economic Minerals. Laboratory tests of coal, clay, oil, building stone, and metallic ores. Prerequisites: Courses 1, 105. Three credits. MT VI-VIII; 200P. Mr. Grout.
- 140w-141s. Applied Petrography. Determination of ore and gangue minerals, microscopic studies of paragenesis of ores and other mineral associations. Practical problems in mining and geology, settled by microscopic and optical examination. Prerequisite: Course 131. Six credits. MW I; MWF II; 200P. Mr. Grout, Mr. Gruner.
- 144w-145s. Construction and Interpretation of Geologic Maps. Methods of geological examination; study and problems in construction and interpretation of geologic maps. Prerequisite: Courses 9 or 10. Six credits. TTh VII-IX; 104P. Mr. Allison.
- 149s. Methods of Field Geology. General methods of field work necessary for Course 150. Mr. Schwartz.
- 150s. Field Geology. Detailed, systematic work, conforming to official surveys. Reports to be written week before college opens. For prerequisites see members of the department. Credits arranged. Mr. Emmons, Mr. Schwartz.
- 151f-152w-153s. Advanced General Geology. Geologic processes and their results; development of the North American continent. Prerequisite: Course 9. Nine credits. MWF III; 104P. Mr. Stauffer.
- 166f-167w. Mineralography. Methods of studying opaque minerals and application of the methods to problems in ore genesis and history. Prerequisite: Course 111. Six credits. Hours to be arranged. 103P. Mr. Schwartz.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 211f-212w-213s. Advanced Paleontology. Selected groups of fossils. Class work supplemented by reference reading and thesis. Three credits. Mr. Stauffer.
214. Seminar in Ore Deposits. Three credits. Mr. Emmons.

- 215s. Geology and Ore Deposits of the Western Hemisphere. Open to graduate students and to those undergraduates who have had Course 111. Three credits. Mr. Emmons.
- 216s. Geology and Ore Deposits of the Eastern Hemisphere. Prerequisites same as for Course 215. Three credits. Mr. Emmons.
220. Glacial Geology. Hours to be arranged. The drift sheets, glacial lakes, the gorge of St. Anthony Falls, the dalles of the St. Croix, and other problems. Lectures, reference reading, and field work.
241. Field Course in Geology. To be arranged with individual students upon application to the department. Credit will be given for field work done satisfactorily as prescribed in the joint announcement of various universities.
- 243-244. Research Course in Geology. Advanced work in general geology; chiefly individual work on selected subjects. Data and collections of material gathered in the course of field work studied under instructor. Methods follow standards of federal and state surveys. Mr. Emmons, Mr. Grout, Mr. Stauffer.
246. Pre-Cambrian Geology. The problems of pre-Cambrian correlation and structure; the pre-Cambrian stratigraphy of North America. Given in alternate years. Three credits.
- 251-252. Original Problems. Morphology and physical measurements of minerals. Three credits each. Mr. Gruner.
- 253-254. Research Course in Ore Deposits. Methods of Course 243-244 applied to ore deposits. Three credits each. Mr. Emmons, Mr. Grout, Mr. Gruner, Mr. Schwartz.
- 263-264. Research Course in Petrology. Methods of Course 243-244 applied to petrology. Three credits each. Mr. Emmons, Mr. Grout.

GERMAN

Professors Carl Schlenker, Frederick Klaeber (Comparative Philology); Associate Professors Oscar C. Burkhard, Samuel Kroesch; Assistant Professors James Davies, George Lussky.

Prerequisites.—For major work, 27 senior college quarter credits or equivalent. For minor work, 18 senior college credits or equivalent.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 100f-101w-102s. Middle High German. Phonology, morphology, and syntax. Nine credits. MWF VI. Ar. (Offered in 1927-28.) Mr. Kroesch.
- 107f. Historical German Grammar. Phonology, inflection, word formation, syntax. Intended primarily for prospective teachers of German. Three credits. (Not offered in 1927-28.) Mr. Kroesch.
- 108s. Comparative Phonetics. A study of speech sounds and the nature of their production, with special reference to English, French, and German. Open to students in the modern languages. Three credits. MWF III; 217F. Mr. Kroesch.

- 109f-110w-111s. History of the German Language. Lectures, discussions, assigned readings. This course is identical with Comparative Philology 109-110-111. Nine credits. (Offered in 1927-28.) Mr. Klaeber.
- 115-116-117. Middle High German Literature. The Niebelungen Lied, Court Epic, Minnesang. Nine credits. (Not offered in 1927-28.) Mr. Kroesch.
- 140-141-142. Early High German Literature, 1500-1700. German literature from the Reformation and the Renaissance to the beginning of the modern High German classical period. Nine credits. T VII. (Offered in 1927-28.) Mr. Lussky.
- 143f-144w-145s. Der Roman (Novel). A study of its technique and development. Nine credits. (Not offered in 1927-28.) Mr. Lussky.
- 150f-151w-152s. Die Novelle. A study of the technique and development. Assigned readings and reports. Nine credits. (Not offered in 1927-28.) Mr. Burkhard.
- 153f-154w-155s. Studies in German Literature of the Nineteenth Century. Subject for 1927-28, Die Dorfgeschichte. Nine credits. T VI, VII, VIII; ar. Mr. Burkhard.
- 160f-161w-162s. Lyric Poetry of the Eighteenth and Nineteenth Centuries. Nine credits. M VI, VII, VIII; 209F. (Offered in 1928-29.) Mr. Davies.
- 163-164-165. German and English Literary Relations in the Sixteenth, Seventeenth, and Eighteenth Century. Nine credits. M VI, VII, VIII; 211F. (Not offered in 1927-28.) Mr. Davies.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 225f-226w-227s. Literary Problems. Subject for 1927-28, Romantic School and Yunge Deutschland. For 1928-29, The Moderns (from 1880—). Nine credits. Th VI, VII, VIII; ar. Mr. Schlenker.

For description of the following courses see the statement of the Department of Comparative Philology.

- 202-203-204. Gothic. Mr. Klaeber.
205. Urgermanische Grammatik. Mr. Klaeber.
- 206-207-208. Old Saxon. Mr. Klaeber.
- 209-210-211. Old High German. Mr. Klaeber.

GREEK

Professor Charles Albert Savage.

Prerequisites.—For major work, Courses 105, 106 or 107, 108, or their equivalent. For minor work, Courses 51 (Philosophy), 52 (Oratory), 53 (Dramatic Poetry), or their equivalent.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 105f. Lyric Poetry. Selections from the elegiac, iambic, lyric, and bucolic poets. Three times a week. Prerequisites: Greek 51 and 53, or 52 and 53. Three credits. Ar. 112F. Mr. Savage.

- 106w. Advanced Drama. Aeschylus, Sophocles, or Aristophanes. Special attention given to the development of the drama, and to the literary form and dramatic representation of the plays read. Three times a week. Prerequisite: Greek 53 or 105 or equivalent. Three credits. Ar. 112F. Mr. Savage.
- 107w. Advanced Prose. Selections from the Greek historians, or from Plato, or from the orators. Alternates with Course 106. Equivalent prerequisites. Ar. 112F. Mr. Savage.
- 108s. Advanced Epic Poetry. A course of rapid reading in the *Iliad* or the *Odyssey*. Three times a week. Prerequisite: Greek 105 or 106. Three credits. Ar. 112F. Mr. Savage.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202-203. Oratory (advanced). A study of the development of oratorical style among the Greeks; selected readings. Twice weekly, one, two, or three quarters. Mr. Savage.
- 204-205-206. Dramatic Poetry (advanced). The reading and critical study of representative Greek plays. Twice weekly, one, two, or three quarters. Alternates with 201-202-203. Mr. Savage.
- 207-208-209. Seminar in Philosophy or Oratory. Once a week, one, two, or three quarters. Mr. Savage.
- 210-211-212. History (advanced). Selected readings from Greek historians. Once a week, one, two, or three quarters. Alternates with 207-208-209. Mr. Savage.

HISTORY

Professors Guy Stanton Ford, Solon J. Buck, Herbert Heaton, August Charles Krey, Lester Burrell Shippee, Albert Beebe White; Professorial Lecturer Theodore C. Blegen; Assistant Professors Lawrence D. Steefel, George M. Stephenson,¹ Faith Thompson; Instructor, David H. Willson.

Notice.—When the program in History for 1927-28 was made out the courses in Ancient History were tentatively cancelled. An appointment has been made to take care of this work and the courses in Ancient History will be offered to students registering in 1927-28.

Prerequisites.—Of the four fields in which general survey courses in history are usually given, namely, ancient, American, English, and European, students entering upon graduate work in history will usually be expected to have covered two or three courses, with credit not exceeding 18 hours. For the other 9 hours, they should have a more advanced course in one of these fields and a second course in some field of history in which intensive work is done with the beginnings of investigation. In meeting these requirements consideration will be given to work done from the historical point of view in others of the social sciences, especially

¹ Absent on leave, 1927-28.

political science. The department attaches considerable importance to adequate preparation in the foreign languages, which may be used by the student in the course of advanced and research work. An especially good equipment here will be taken into consideration in weighing the student's preparation for graduate work.

AMERICAN HISTORY

- 112s. History of American Immigration. Settlement and development of typical racial stocks in America. Contributions of European immigrants to American life. Attention to political history. Prerequisites: 20 credits in social science group or 15 credits in history. Three credits. MWF VI; Ar. Mr. Stephenson (Mr. Blegen).
- 125f-126w.† American Diplomatic History. Prerequisites: 20 credits in history and political science or 15 credits in either history or political science. Six credits. MWF III; 221OL. Mr. Shippee.
- 141f. The West in American History to 1815. Prerequisites: 20 credits in social science group, including History 7-8. Three credits. TThS II; 221OL. (Not offered in 1928-29.) Mr. Buck.
- 142w. The West in American History, 1815-65. This course, while offered separately, follows, and is calculated to form a natural sequence to History 141. Prerequisites: see History 141. Three credits. TThS II; 221OL. (Not offered in 1928-29.) Mr. Shippee.
- 143w. American Political Parties. Prerequisites: 20 credits in social science or 15 credits in history. Three credits. MWF II; 221OL. Mr. Stephenson (Mr. Blegen).
- 144-145.† History of Minnesota. The settlement and development—political, economic, and social—of a typical American commonwealth. Prerequisites: 15 credits in social science including History 7-8. Six credits. (Not offered in 1927-28.)
- 146f-147w.† Constitutional History of the United States. See Political Science.
- 148f-149w.† English Colonies in America. A brief consideration of the period of discovery and the founding of the English colonies, followed by a more detailed examination of the political and social institutions to 1689. The second quarter will be devoted primarily to imperial organization and the causes of the Revolution. Prerequisites: 20 credits in the social science group including 10 in history or 15 in history. Six credits. MWF I; 112OL. (Not offered in 1927-28.)
- 152w. Select Topics: West to 1815. Prerequisites: 20 credits in history including History 7-8. Five credits. TTh VIII, IX; 328Lib. Mr. Buck.
- 153s. Select Topics: West since 1865. Prerequisites: 20 credits in history including History 7-8. Five credits. TTh VIII, IX; 328Lib. Mr. Buck.
- 154s. Select Topics: History of Minnesota. Students taking this course are expected to do a portion of their work in the library of the Minnesota Historical Society. Prerequisite: 20 credits in history including History 7-8. Five credits. (Not offered in 1927-28.) Mr. Buck.

- 155f. United States, 1850-65. Prerequisites: 20 credits in history including History 7-8. Five credits. WF VIII, IX; 301Lib. Mr. Shippee.
- 156f. The Reconstruction Period. Prerequisites: 20 credits in history, including History 7-8. Five credits. (Not offered in 1927-28.) Mr. Shippee.
- 166f. Topics: History of Immigration. Prerequisites: 20 credits in history and consent of instructor. Five credits. MW VIII, IX; 315Lib. Mr. Stephenson (Mr. Blegen).
- 168s. Topics: American Foreign Relations. Prerequisite: 20 credits in history including History 9, or 20 credits in political science and consent of instructor. Five credits. TTh VIII, IX; 339Lib. Mr. Shippee.
- 208f-209w-210s†. Seminar in American History. Required of graduate students whose major field is American history. The first term will be principally occupied with bibliographical and technical topics. Selected fields in American history will be studied in other terms. Nine credits. S III, IV; 301Lib. Mr. Buck, Mr. Shippee, Mr. Blegen, Mr. Stephenson.
- See also History 113-114-115 under Economic History, History 121 under English History, and History 111 under European History.

ANCIENT HISTORY

- 103f. Political History of Greece. With special reference to the reaction upon cultural progress. Prerequisites: 20 credits in history or a major in Greek or Latin. Five credits. MTThFS III. Miss Kendall.
- 105w. History of Rome. Prerequisites: 20 credits in social science group. Five credits. MTThFS III. Miss Kendall.
- 133s. The Near East, Old Orient. Origin of Egyptians, Babylonians, Assyrians, and Persians, and main features of their political history and civilization. History of the Hebrews discussed so far as it bears upon general oriental problems. Prerequisites: 20 credits in social science group. Five credits.
- 134f-135w.† Ancient Civilization. Social and intellectual life of classic lands. Prerequisites: 20 credits in history, or a major in Greek or Latin. Six credits. MTW VI. Miss Kendall.

ECONOMIC HISTORY

- 113-114-115. Economic History of Europe since 1750. Prerequisites: 20 credits in history or economics, or both. Nine credits. (Not offered in 1927-28.)
- 116f-117w-118s. Economic History of Europe, 1300-1750. Prerequisites: 20 credits in history or economics, or history and economics combined. Nine credits. TThS II; 111OL. Mr. Heaton.
- 169s. Problems in Economic History. Prerequisites: 20 credits in history or economics, or history and economics combined. Three credits, TThS III; 221OL. Mr. Heaton.
- 205f-206w-207s.† Seminar in Economic History. Nine credits. Ar. Mr. Heaton.

ENGLISH HISTORY

- 121w. English Backgrounds and the American Colonies. Prerequisite: 20 credits in history or political science. Five credits. MWThFS II; 112OL. Mr. White.
- 162f. The Beginnings of Parliament. From the Norman Conquest to the reign of Edward I, based wholly on original sources. Prerequisites: 20 credits in history including History 4-5; knowledge of at least high school Latin. Five credits. (Not offered in 1927-28.) Mr. White.
- 183s. Stuart Period. Prerequisites: 20 credits in history including History 4-5. Five credits. MW VIII, IX; 328Lib. Mr. Willson.
- 184s. Topics in Modern English History. Prerequisites: 20 credits in history. Ar. Mr. Willson.
- See also courses in Economic History.

EUROPEAN HISTORY

- 101f-102w.† The French Revolution and Napoleonic Era. Prerequisites: 20 credits in social science including 10 credits in history, or 15 credits in history. Reading knowledge of French desirable. Six credits. TThS I. Mr. Tucker.
- 104s. The Near East, Modern. Rise and decline of the Ottoman Empire; development of the Balkan states; action of the great powers in the Near East. Prerequisites: 20 credits in social science including History 1-2 or 2-3. Three credits. MWF II; 211OL. Mr. Steefel.
- 106f-107w-108s. Europe, 1815-1914. Prerequisites: 15 credits in history or 20 credits in social science. A reading knowledge of French and German will be helpful. Nine credits. MWF VII; 111OL. Mr. Steefel.
- 111w. European Background of American Immigration. Prerequisites: 20 credits in social science group or 15 credits in history. Three credits. MWF VI; 112OL. Mr. Stephenson (Mr. Blegen).
- 119s. The Renaissance and Reformation. Especial emphasis upon the work of individual men and upon ideas rather than upon politics and institutions. Prerequisites: 15 credits in history. Five credits. MTWFS III; 112OL. Mr. Krey.
- 120f. Medieval Civilization. A study of the social and intellectual development of Europe from the period of the German migration to the end of the thirteenth century. Prerequisites: 15 credits in history. Five credits. MTWFS III; 112OL. Mr. Krey.
- 123f. European Expansion to 1815. Period of the great discoveries. Foundation of the European empire in America, Asia, and Africa. The old colonial system. The struggle for empire. Prerequisites: 20 credits in social science or 15 credits in history. Three credits. MWF IV; 211OL. Mr. Willson.
- 124w. European Expansion since 1815. Expansion and development of British dominion in India. Russian expansion in Central Asia and Siberia. The partition of Africa. Imperialism and the reaction of the non-European peoples. Prerequisites: 20 credits in social science

- or 15 credits in history. Three credits. MWF IV; 211OL. Mr. Steefel.
- 127w. Feudal Institutions. Prerequisites: 15 credits in history. (Not offered in 1927-28.) Mr. Krey.
- 128w. Rise of Nationalism in Europe. A study of the growth of central government and the influence which led to the formation of nations to 1600. Chief attention to France. Prerequisites: 15 credits in history. Five credits. MTWFS III; 112OL. Mr. Krey.
130. Introduction to the History of Russia. Survey of the history of the Russian people and the development of the Russian state. As far as time permits attention will be paid to foreign affairs and to the development of Poland. Reading knowledge of French and German desired. Prerequisites: 20 credits in social science including History 1-2 or History 16. Three credits. MWF IV; 111OL. Mr. Steefel.
- 131-132. France under Louis XIV and Louis XV. Reading knowledge of French desired. (Not offered in 1927-28.)
- 157f-158w. Topics: Nineteenth Century Europe. Prerequisites: 20 credits including History 106-107-108 or History 101-102, equivalent of History 2-3, and French or German. Ten credits. TTh VIII, IX; 339Lib. Mr. Steefel.
- 159s. Topics, Europe since 1914. Prerequisites: 20 credits in history and consent of instructor. Five credits. TTh VIII, IX; 315Lib. Mr. Steefel.
- 164w. Studies in the Crusades. Prerequisites: 20 credits in history, knowledge of at least high school Latin. Five credits. (Not offered in 1927-28.)

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s.† Historical Bibliography and Criticism. Required of candidates for advanced degrees in history who do not present evidence of similar training elsewhere. F VIII; 328Lib. Mr. Ford, Mr. White, and others.
- 204f-205w-206s.† Seminar in Medieval History. Nine credits. Ar. Mr. Krey, Mr. White.
- See also Political Science 136-137 and 138-139.

HOME ECONOMICS

Professor Wylle B. McNeal; Associate Professors Alice Biester, Clara M. Brown, Harriet Goldstein, Marion Weller; Assistant Professors Alice Child, Jane Leichenring, Katharine McFarland, Amy P. Morse, Ethel Phelps, Lucy A. Studley.

Prerequisites.—For major work, credits in general inorganic chemistry, qualitative and quantitative analysis, organic chemistry, botany, bacteriology, and human physiology satisfactory to the instructor with whom the student wishes to work. In addition each student must have had elementary courses in that field of home economics in which she wishes to specialize, such as foods, nutrition, or textiles. The undergraduate subject-matter courses must be satisfactory to the adviser under whose direction the major work is done.

For a minor, the prerequisites to the courses to be pursued must be met. The minor sequence should be arranged with a graduate adviser of the field in which the student proposes to work.

Students majoring in Home Economics for a Master's or Doctor's degree, and those minoring in this division for the Doctor's degree must include Course 205 in the study program.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 103f,w,s. Nutrition of the Family. The fundamental principles of human nutrition as applied to the feeding of individuals and groups under conditions of health and under such pathological conditions as are chiefly dependent upon dietetic treatment. Prerequisites: H.E. 22, 23, or parallel. Three credits. Lect. F III. Lab. MW III, 203-207 HE. Miss Biester.
- 104f,w,s. Field Work in Nutrition. Laboratory, case, and group work in problems of feeding. Prerequisites: H.E. 103 or parallel, H.E.Ed. 40. Three credits. Lect. F III. Lab. MTWThF IV. Miss Biester, Miss Leichsenring.
- 105f,w,s. Experimental Cookery. An intensive study of problems in foods and food preparation with individual laboratory problems. Prerequisites: H.E. 22, 23. Three credits. Fall, MWF I, II; 107 H.E. Miss Child.
- 106f,w,s. Experimental Cookery. Same as 105 except that additional work will be required. Five credits. Fall, MWF I, II; 4 hours to be arranged. 107H.E. Miss Child.
- 108f,w. Nutrition II. A study of metabolism including work on tissues, blood and urine. Prerequisite: H.E. 23. Five credits. Fall, MTWThF I, II; 211, 213H.E.; winter, Sec. 1, MTWFS III, IV; Sec. 2, MTWThF I, II; 211, 213H.E. Miss Biester, Miss Leichsenring.
- 109w. Advanced Nutrition. A study of selected quantitative methods applicable to investigations relative to digestion and metabolism. Prerequisites: Agr. Biochem. 2; H.E. 23. Five credits. Lect. TTh I. Lab. TTh VI, VII, VIII, IX; 311 H.E. Miss Biester.
- 110s. Special Problems in Dietetics. An intensive study involving assigned readings, discussions, and field work. Prerequisite: H.E. 103 or parallel. Three credits. MWF VI; 213H.E. Miss Biester.
- 111f,s. Special Food Problems. A continuation of experimental cookery involving more advanced problems. Prerequisites: H.E. 105, Agr. Biochem. 2. Three credits. TTh VI, VII, VIII; 107H.E. Miss Child.
- 112f,s. Special Food Problems. Same as 111f. Prerequisites: H.E. 105, Agr. Biochem. 2. Five credits. TTh VI, VII, VIII; 107H.E. Four hours to be arranged. Miss Child.
- 122f,s. Advanced Textiles. An intensive study of textile materials with special reference to the following: Nature of the raw materials, economic chemical and physical applications involved in their manufacture and use; methods and significance of physical testing. Prerequisites:

- Textiles 5 cred., Organ. Chemistry 5 or 6 cred., Principles of Economics 5 cred., or parallel. Three credits. Fall, TTh VI, VII, VIII, spring, MWF VI, VII; 311H.E. Miss Phelps.
- 123f,w. Clothing Economics. A study of the economics aspect of clothing which directly or indirectly affects the consumer. Prerequisites: Dressmaking 5 cred., Economics 5 cred. Two credits. TS III; 313H.E. Miss Weller.
- 126w. Textile Analysis. Problems and applications of quantitative analysis with special reference to establishing standards for fabrics. Prerequisites: Quant. Chem. 5 cred., Adv. Textiles 3 cred. Three credits. MWF VI, VII, VIII; 311H.E. Miss Phelps.
131. Home Management: House Planning and Equipment. Study of the small house which aims at more intelligent planning in building and furnishing. House plans, kitchen arrangements and equipment of house studied from homemaker's point of view of economy, convenience, and beauty. Prerequisites: H.E. 161, 53. Five credits. Fall and winter, MTWFS III, IV; spring, Sec. 1, MTWThF I, II; Sec. 2, MTWThF VI, VII; 401HE. Miss Morse.
- 136s. Budget Problems. An intensive study of problems relating to individual and family budgets involving readings, discussions, and field work. Prerequisites: H.E. 34, 35, 103, 123, Agr. Econ. 126 or parallel. Three credits. Lect. MW VII; 213HE. Lab. one-half day to be arranged. (Not offered in 1927-28.) Miss Studley.
- 145s. Home Economics Survey. A discussion of the historical development of home economics with emphasis upon current practices and problems. Two credits. TS IV; 203HE. Miss McNeal.
- 151s. Institution Management Problems. Lectures and discussions of the problems involved in institution management; organization; service; institution planning, decoration, and equipment; budgets; and the study of different types of institutions. Prerequisites: H.E. 61, 63. Four credits. ThS III; T III, IV; 106HE. Miss McFarland.
- 160w. Organization and Methods for Related Art Teaching. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes. Prerequisites: 42 or parallel; H.E. 53, 131 or parallel. Three credits. TThS III, 302 H.E. Miss H. Goldstein.
- 161f,w,s. Art History and Appreciation. The historical development of art, architecture, decoration, furniture, and costumes, studied with special emphasis on design and influence upon modern styles. Prerequisite: 51. Three credits. MWF VIII. Miss V. Goldstein.
- 162w. Advanced Interior Design. Special problems of small house interior decoration will be studied. Elevation drawings made. Actual materials will be used as far as possible. Prerequisites: 161, 53, 131. Three credits. TTh VI, VII, VIII. Miss Morse.
- 163s. Advanced Costume Design. A study of figure construction; line, color, and textures for beautiful arrangements and with reference to individual types. Laboratory work with fabrics and designs carried

- out in pencil and water colors. Prerequisites: 13, 53, 55. Three credits. TThS I, II. Miss H. Goldstein.
- 180s. Nutrition in Disease. A study of the fundamental principles involved in using diet in the treatment of certain diseases. Prerequisites: H.E. 103, 108. Three credits. Lect. MWF VII; 213HE. Miss Biester.
- 181f. Digestion and Metabolism. An intensive study of problems relating to digestion and metabolism involving lectures, readings, demonstration, and laboratory work. Prerequisites: H.E. 108; Physiol. 4. Three credits. TTh VI, VII, VIII; 213HE. Miss Leichsenring.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 203f,w,204s. Home Economics Problems. Opportunity is offered for the investigation of selected problems in home economics in fields such as foods, nutrition, textiles, and related arts. Three or five credits. Hours and days arranged. Miss McNeal, Miss Biester, Miss Child, Miss Goldstein, Miss Leichsenring, Miss Phelps.
- 205f,w,s. Home Economics Seminar. A critical study of recent advances in home economics in fields such as foods, nutrition and textiles, involving outside reading and oral or written reports. One credit. Hours and days arranged. Miss McNeal, Miss Goldstein, Miss Biester, Miss Child, Miss Leichsenring, Miss Phelps.
222. Animal Fibers. An advanced course dealing with the structure, composition, chemical and physical properties, and special problems of manufacture of wool and silk in relation to their use. Prerequisites: Quant. Chem. 5 cred., Organic Chem. 5 or 6 cred., Adv. Textiles 3 cred. Two credits. Hours and days arranged. Miss Phelps.
223. Plant and Manufactured Fibers. Study of the structure, composition, physical and chemical properties, and special problems of manufacture of cotton, flax, artificial silk and certain minor fibers in relation to their use. Prerequisites: Botany 5 cred., Quant. Chem. 5 cred., Organic Chem. 5 or 6 cred., Adv. Textiles 3 cred. Two credits. Hours and days arranged. Miss Phelps.
224. Microanalysis of Textile Fibers. Laboratory applications of histological and microchemical methods in the study of textile materials. Prerequisites: Botany 5 cred., Biological Sciences 10 cred., Organic Chem. 5 or 6 cred., Textile Analysis 3 cred. Two or three credits. Hours and days arranged. Miss Phelps.
280. Principles of Human Nutrition. An intensive study of such factors as the energy, protein, mineral, and vitamin requirement in human nutrition. Hours and days arranged. Miss Biester, Miss Leichsenring.

HOME ECONOMICS EDUCATION

Professor Wylle B. McNeal, Associate Professor Clara M. Brown.

Prerequisites.—For a major, 24 credits in general psychology, educational psychology, and undergraduate education courses, and preparation in home economics subjects satisfactory to the adviser.

For a minor, the prerequisites for the courses pursued must be met.

- 141f,su. Problems in Vocational Education in Home Economics. The place and development of home economics in the vocational education program. Study of problems of the all day, evening, and part time schools. Prerequisite: H.E.Ed. 42. Two credits. Hours and days arranged. Miss McNeal, Miss Brown.
- 142s,su. Educational Measurement in Home Economics. Survey of accomplishment in this field; evaluation and construction of objective tests. Prerequisite: Ed.Psy. 55, H.E.Ed. 42. Two credits. Hours and days arranged. Miss Brown.
- 143f,s,su. Home Economics Curricula. A study of the objectives of home economics in the junior and senior high schools; organization of curricula. Prerequisites: H.E.Ed. 42 or parallel. Two credits. Jr., sr., grad. TTh VIII. Miss Brown.
- 145f,w,s. Administration and Supervision of Home Economics. A study of the duties and problems of teacher trainers, and city and state supervisors of home economics. Prerequisites: H.E.Ed. 42, 49, 143. Three credits. Grad. Hours and days arranged. Miss McNeal, Miss Brown.
- 149f,w,s. Research Problems. A study of the methods used in collection, treatment, and interpretation of data in the field of home economics. Credits arranged. Sr., grad.¹ Hours and days arranged. Miss McNeal, Miss Brown.
- 242f,w,s. Seminar in Home Economics Education. Current problems in home economics education will be studied. Required of all candidates majoring in home economics education. One credit. Graduates only. Hours and days arranged. Miss McNeal, Miss Brown.

HORTICULTURE

Professor William H. Alderman; Associate Professor Wilfrid G. Brierley; Assistant Professors John H. Beaumont, Fred A. Krantz.

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 107f. Orchard Management. A detailed study of the various operations in orchards and berry fields. Operating costs and profits. Lectures, laboratory, and individual problems. Prerequisites: Horticulture 6, Botany 9 credits. Three credits. TS IV; W VI, VII; 210Hr. Mr. Brierley.
- 109f,w. Principles of Genetics. Given in co-operation with Division of Agronomy and Farm Management. Designed to familiarize students with underlying principles of breeding. Prerequisites: Botany 9

¹ Must secure permission of instructor.

- credits, or Animal Biology 9 credits. Three credits. ThS I; T I, II; 212Hr. Mr. Beaumont.
- 110w. Horticultural Crop Breeding. Applied genetics is emphasized. Methods of breeding each of the important horticultural crops with special attention to experiment station investigations and to the methods used by plant breeders. Prerequisite: Horticulture 109 or Agronomy 131. Three credits. TThS III; 215Hr. Mr. Wilcox.
- 111f. Systematic Pomology. A study of fruit varieties. Lectures, laboratory, and a survey of the literature. Prerequisites: Horticulture 6, Botany 9 credits. TTh II; Th VI, VII; 8Hr. Mr. Brierley.
- 131f,132w. Vegetable Production. Reviews and reports on literature, special problems. Prerequisites: Horticulture 32, Botany 9 credits. Three credits per quarter. Mr. Krantz.
- 135w. Potato Production. A study of the origin, botany, regional distribution, economic importance, group classification, standardization of varieties according to soil, climate, and markets. Identification, exhibiting, judging, cultural methods, seed selection and certification, marketing and utilization. Prerequisite: Horticulture 6 or 32, Botany nine credits. Three credits. 102Hr. Mr. Krantz.
- 190f-191w-192s. Special Problems. A study of problems based upon the work given in the preceding courses. Two to four credits per quarter. Mr. Alderman, Mr. Brierley, Mr. Beaumont, Mr. Cary, and Mr. Krantz.
- 193f-194w-195s. Horticultural Seminar. Reports and discussions of problems and investigational work. Required of graduate students. One credit per quarter. Horticultural staff.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 242w. Methods and Interpretation of Horticultural Research. A critical analysis of the more important horticultural investigations, together with a study of methods and organization of research work in horticulture. Two credits. Mr. Alderman.
- 243f-244w. Advanced Topics in Horticulture. A critical analysis of recent research on horticultural crops. Three credits per quarter. Mr. Alderman, Mr. Beaumont, Mr. Krantz.

JOURNALISM

Professor Edward Marion Johnson.

Prerequisites.—A total of 27 quarter credits in Journalism and English, distributed as follows:

In Journalism, a minimum of 15 credits including reporting, copy reading, and newspaper make-up, and special feature articles. In English, additional credits to make up the 27 credits, including a sophomore English composition course. Freshman composition will not satisfy the

requirement. A reading knowledge of at least one modern foreign language.

104f. Editorial Writing. Three credits. TThS III; 210P. Mr. Cason.

110f. History of Journalism. A study of the history of American journalism, briefly considering its old world origin. Three credits. MWF III; 108F. Mr. Johnson.

111w. Foreign News Sources. A comparison of American journalism with that of other countries and a study of the news gathering agencies of the world. The course is designed to prepare students for the handling of foreign news dispatches. Three credits. MWF III; Ar. Mr. Johnson.

112s. Current Newspaper Problems. An analysis of current tendencies in contemporary journalism. Three credits. MWF III; Arranged. Mr. Johnson.

130f-131w. Public Opinion and the Newspaper. Prerequisites: Journalism 15, Psychology 127, and 20 additional credits in the social sciences. Six credits. MWF II; 200P. Mr. Johnson.

190f-191w-192s. Topics in Journalism. Required of all journalism majors. Original research. Nine credits. W VIII, IX; 200P. Mr. Johnson.

LATIN

Professor Joseph B. Pike; Assistant Professor Robert V. Cram.

Prerequisites.—Any four of Courses 21-73, and 6 credits in addition selected from standard courses. A reading knowledge of French, German, or Greek is required of candidates for the Master's degree.

The degree of master of arts: For a major in Latin, any nine-credit sequence in the two hundred series, and in addition one course each quarter selected from Courses 121-133. The student will be expected to choose for his thesis some problem connected with one of these courses. Besides, a minor is to be carried throughout the year in one of the following departments: Comparative Philology, English, German, Greek, History, Romance Languages, or Scandinavian. For a minor in Latin, any nine-credit sequence in the two hundred series or one course each quarter selected from Courses 121-133.

Candidates for the degree of doctor of philosophy in Latin will be expected to spend at least three years in preparation and will carry each quarter in addition to one seminar course and one of the courses listed below, one course in advanced Greek (i.e., in advance of three years of preparatory Greek). A knowledge of Greek and Roman history, Greek and Roman literature, and a special knowledge of a particular Latin author, or group of authors, will be required. In addition to the particular author or authors assigned the candidate will be expected to have read in the original the following list of Latin authors:

Caesar: A considerable portion of the Gallic War and the Civil War.

Catullus: All except LXIII-LXVIII.

- Cicero: Fourteen orations (*e.g.*, Roscius Amerinus, Verres Actio Prima, Imperium Pompeii, Catilinarians I-IV, Murena, Archias, Milo, Marcellus, Ligarius, Deiotarus, Philippics II; Cato Maior, Laelius, Tusculan Disputations, Book I.)
- Horace: All.
- Juvenal: Satires I, III, IV, VII, VIII, X, XI.
- Livy: Books I, II, XXI, XXII.
- Lucretius: Books I-III, V.
- Martial: At least one half.
- Ovid: About four thousand verses of the *Metamorphoses*.
- Plautus: *Amphitruo*, *Aulularia*, *Captivi*, *Menaechmi*, *Miles Gloriosus*, *Moscellaria*, *Rudens*, *Trinummus*.
- Pliny the Younger: At least one half.
- Quintilian: Book X, C. I.
- Suetonius: Iulius, Augustus, Tiberius, Nero, Domitian.
- Tacitus: *Annals* I-VI or XI-XVI.
- Terence: *Adelphoe*, *Andria*, *Hautontimorumenus*, *Phormio*.
- Virgil: All except the minor poems.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

121. Advanced Virgil. Selection from the *Eclogues*, *Georgics* and from Books 7-12 of the *Aeneid*. Prerequisites: any two of Courses 51-73 or an equivalent. Three credits. MWF II; 109F. Mr. Pike.
- 122w. Cicero's Letters. Prerequisites: any two of Courses 51-73 or an equivalent. Three credits. MWF II; 101F. Mr. Pike.
- 123s. Medieval Latin. The course aims to accustom students to handle medieval Latin easily for historical or literary purposes. Prerequisites: any two of Courses 51-73 or an equivalent. Three credits. MWF II; 109F. Mr. Pike.
- 131f. Juvenal. Selection from Juvenal's work. Prerequisites: any two of Courses 51-73 or an equivalent. Three credits. Alternates with Course 121. MWF II; 107F. Mr. Pike.
132. Seneca's Epistles. Prerequisites: any two of Courses 51-73 or an equivalent. Three credits. Alternates with Course 122. MWF II; 107F. (Offered in 1927-28.) Mr. Pike.
133. Vulgar Latin. Lectures on vulgar Latin; selections from Petronius and Gregory of Tours. Prerequisites: any two of Courses 51-73 or an equivalent. Alternates with Course 123. Three credits. MWF II; 107F. (Offered in 1927-28.) Mr. Pike.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Tacitus. (Graduate seminar, but open to students who register for honors in Latin.) Prerequisites: seven years of Latin or any two of Courses 51-73. Nine credits. Th VIII and IX. (Not offered in 1927-28.) Mr. Pike.
- 221-222-223. Graduate Seminar. Cicero's Philosophical Works. Prerequisites: seven years of Latin or any two of Courses 51-73. Nine credits. T VIII and IX. Ar. (Offered in 1927-28.) Mr. Pike.

- 211-212-213. Graduate Seminar. Lucretius. Prerequisites: seven years of Latin or any two of Courses 51-73. Nine credits. T VIII, IX. Ar. Mr. Pike.
- 231-232-233. Graduate Seminar. Cicero's Rhetorical Works. Prerequisites: seven years of Latin or any two of Courses 51-73. Nine credits. T VIII, IX. Ar.

MATHEMATICS AND MECHANICS

Professors William E. Brooke, William H. Bussey, Hans H. Dalaker, William L. Hart, William F. Holman, Dunham Jackson, Jacob O. Jones, William H. Kirchner, John H. Van Vleck; Associate Professors Raymond W. Brink, Royal R. Shumway, Anthony L. Underhill; Assistant Professors Gladys Gibbens, William O. Beal; Instructor Elizabeth Carlson.

Professor Dalaker is chairman and Professor Underhill is secretary of the group. Students majoring in mathematics should consult one or the other.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 102f-103w-104s. Advanced Analytic and Synthetic Geometry. Three credits per quarter. Miss Gibbens.
- 106f. Differential Equations. Three credits. MWF III; 108F. Mr. Hart.
- 107w-108s. Advanced Calculus. Three credits per quarter. MWF III; 108F. Mr. Hart.
- 111f-112w-113s. Celestial Mechanics. Three credits per quarter. (This course is identical with Astronomy 111-112-113.) Mr. Beal.
- 115f-116w-117s. Differential Geometry. Three credits per quarter. TThS III; 103F. (Offered in 1927-28.) Mr. Underhill.
- 118f-119w-120s. Vector Analysis. Three credits per quarter. Mr. Jackson.
- 121f-122w-123s. Mathematical Theory of Statistics. Three credits per quarter. (Offered in 1928-29.) Mr. Brink.
- 127w,s. Technical Mechanics. Five credits. Mr. Wilcox.
- 128w,s. Strength of Materials. Five credits. Mr. Holman.
- 140w. Method of Least Squares. Three credits. (This course is identical with Astronomy 140.)
- 144f-1145w-146s. Topics in Mathematical Analysis. Three credits per quarter. (Offered in 1927-28.) Mr. Jackson.
- 150w. Advanced Mathematics for Electrical Engineers. 3 credits. Mr. Herrmann.
- 151f-152w-153s. Differential Equations and Advanced Calculus Applied to Engineering Problems. Three credits per quarter. Mr. Dalaker, Mr. Hartig.
- 161f-162w-163s. Advanced Technical Mechanics. Three credits per quarter. Mr. Wilcox.
- 171f-172w-173s. Aerodynamics. Three credits per quarter. Mr. Boehnlein.
- 180s. Advanced Strength of Materials. Three credits. Mr. Priestler.

- 184f-185w-186s. Advanced Testing Materials Laboratory. Two to six credits. Mr. Priester.
 191f-192w-193s. Hydraulic Motors and Pumps. Three credits per quarter. Mr. Jones.
 194f,w,s-195f,w,s-196f,w,s. Special Problems in Hydraulics. Three credits per quarter. Mr. Jones.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 205s. Advanced Dynamics. Three credits. (This course is identical with Physics 205s.) Mr. Van Vleck.
 206f-207w-208s. Theory of Functions of Real and Complex Variables. Three credits per quarter. (Offered in 1928-29.)
 221f-222w-223s. Calculus of Variations. Three credits per quarter. Mr. Underhill.
 241f. Electrostatics. Three credits. (This course is identical with Physics 241f.) Mr. Van Vleck.
 243w. Electromagnetism. Three credits. (This course is identical with Physics 243w.) Mr. Van Vleck.
 248-249-250. Reading and Research. Competent students will be assisted in independent readings and reports, by members of the department. One to three credits per quarter.
 253s. Electrodynamics and Electron Theory. Three credits. (This course is identical with Physics 245s.) Mr. Van Vleck.
 274f-275w-276s. Dynamics of a Particle. Three credits per quarter. (Offered in 1928-29.) Mr. Brooke.
 291f-292w-293s. Hydrodynamics. Prerequisites: 123, 153. Three credits per quarter. (Offered in 1927-28.) Mr. Brooke.

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

114. The Mathematics of Small Vibrations.
 131. Advanced Differential Equations.
 254-255-256. Modern Analysis. (Based on Whittaker and Watson's Text.)
 261-262-263. Theory of Functions of a Complex Variable. Three credits per quarter throughout the year.
 267-268-269. Advanced Dynamics. Vol. II. Routh's *Dynamics*.
 271-272-273. Theory of Linear Differential and Integral Equations.
 277-278-279. Advanced Statics.
 294-295-296. Theory of Elasticity.
 Projective Geometry.
 The Theory of Numbers.
 The Galois Theory of Equations.
 Higher Plane Curves.
 The Calculus of Finite Differences.
 Modern Theories of Integration.
 Advanced Descriptive Geometry.
 Perspective.

Fourier's Series and Spherical Harmonics.
 Advanced Analytic Geometry of Space.
 Elliptic Functions and Integrals with Applications.
 Limits and Series.
 Modern Higher Algebra.

MECHANICAL ENGINEERING

Professors S. Carl Shipley, Frank B. Rowley, Charles F. Shoop; Associate Professor John V. Martenis; Assistant Professors John Flodin, Burton J. Robertson.

INDUSTRIAL ENGINEERING

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 120w. Industrial Plants. Factory organization and construction for economical manufacture. Organization of the industry. Location and type of buildings, power development. Layout of plant. Routing systems and machine layout. Heating and ventilating requirements. Distribution of power; internal transportation. Lectures, recitations, and drawing room practice. Three credits. Open to seniors with 15 or 16. Mr. Shipley.
- 121f. Production Methods. Principles and practice involved in economical production. Standardization. Requirements for uniformity and interchangeability. Jigs, fixtures, and special equipment; gages and inspection systems. Division of labor. Lighting, heating, and sanitation. Conveying, handling, and stores control. Fatigue elimination. Three credits. Open to seniors with 15 or 16. Mr. Shipley.
- 123s. Industrial Management. General principles. The Taylor system; wage, bonus, and profit sharing systems. Maintenance and depreciation. Purchasing. Allocation of cost, overhead, and machine burden. Graphical representation. Prerequisite: 121. Mr. Shipley.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 224f. Industrial Management Laboratory. Planning department. Time and motion studies; rate setting. Instruction cards. Production control. Shop practice with investigation in local factories. Lectures, assigned reading, practice, and reports. Prerequisite: 123. Three credits. Mr. Shipley.
- 225w. Industrial Management. Labor administration. Foreman training. Training the worker; job analysis. Employment and turnover; the human element, service departments. Stabilization of labor. Lectures, reading, shop visits, and reports. Prerequisite: 224. Three credits. Mr. Shipley.
- 226s. Safety Engineering. Safety of the worker; fire and other hazards; prevention of industrial accidents. Compensation laws. Fire prevention; construction; automatic sprinkler systems. Effect of safety on production. Factory sanitation. Safety organization. Lectures, assigned reading, factory inspections, and reports. Prerequisite: 121. Three credits. Mr. Shipley.

227f-228w-229s. Industrial Engineering Problems. Special investigations of practical problems and suggested methods of procedure. Lectures, assigned reading, shop visits and reports. Prerequisites: 223, 224, 225 or registered in 223, 224, 225. Three credits. Graduates only. Mr. Shipley.

MACHINE DESIGN

131f-132w-133s. Advanced Engineering Design. Original design, including machinery for changing size and form, cranes, pumping, transmission machinery, and engineering appliances. Lectures, problems, and drawing room practice. Two credits per quarter. Prerequisite: 35. Mr. Flodin.

STEAM ENGINEERING

- 135f. Steam Engine Design. Design of a high speed automatic or Corliss steam engine. Theoretical indicator, force and turning moment diagrams. Weights of reciprocating and rotating parts. Determination of details and working drawings. Senior option. Prerequisite: 42. Two credits. Mr. Shoop.
- 144f. Heat Engines. Properties of steam, steam calorimetry. Use and calibration of engine room instruments. Types, details, and tests of simple and compound engines and turbines. Study and tests of condensers, pumps, and engine room equipment. Prerequisite: M. & M. 26. Three credits. Mr. Shoop, Mr. Larson.
- 145w. Heat Engines. Combustion, fuels, mechanical stokers, smoke prevention. Construction and operation of boilers and boiler auxiliaries. Selection and testing of power equipment. Prerequisite: 144. Three credits. Mr. Shoop, Mr. Larson.
- 146s. Gas Engines and Producers. Laws of gases; gas cycles, Otto, semi-Diesel, and Diesel engines. Carburetion, cooling, lubrication, and governing. Gas producers and by-product gases. Prerequisite: 145. Three credits. Mr. Hazen, Mr. Robertson.
- 147w. Heat Engines. Study of steam properties, steam calorimetry, types and details of steam engines and turbines. Elementary thermodynamics. Calibration and use of engine and boiler room instruments. Valve setting. Test of steam radiator, surface condenser, simple steam engine, steam pump. Prerequisite: M. & M. 84. Four credits. Mr. Shoop.
- 148s. Heat Engines. Study of construction and operation of boilers, stage evaporators, feed heaters. Combustion, stokers, smoke prevention. Selection and testing of power plant units such as fans, compressors, boilers, evaporators, steam and gas engines. Prerequisite: 147. Three credits. Mr. Shoop.
- 149f,w,s. Heat Engines. Steam generation and properties. Fuels and combustion. Construction and operation of boilers, and auxiliaries. Elementary thermodynamics. Use and calibration of engine room instruments. Types, details, and tests of steam engines, steam turbines, gas engines, and air compressors. Performance and adaptability of

- power equipment. Prerequisite: M. & M. 26. Four credits. Mr. Shoop.
- 151s. Elementary Thermodynamics. Properties of heat media, heat transformation into work, throttling of gases, gas mixtures, flow of fluids. Application of the elementary principles of thermodynamics to heat motors and power plant equipment. Treatment of the actual and ideal cycles. Prerequisite: 43. Three credits. Mr. Shoop.
- 152w. Steam Turbines. Theory and practice applied to various types. Thermodynamics and mechanical analysis of problems involved in the design of nozzles, blades, rotors, etc. Condition of operation; systems of transmission; lubrication; economy; field of service. Laboratory investigation. Prerequisite: 151. Three credits. Mr. Shoop.
- 162f. Power Plant Machinery. Advanced study and application of engines, stokers, boilers, fans, purifiers, heaters, coal and ash handling equipment, etc. Prerequisite: 43. Three credits. Mr. Shoop.
- 163w. Applied Thermodynamics. Laws of heat transmission, mean temperature difference, in condensers, boilers, brine coils, feed water heaters. Treatment of cooling towers, accumulators, multiple stills, stage evaporators, vapor refrigeration; air compressors, multi staging, inter-cooling, etc. Prerequisite: 151. Three credits. Mr. Shoop.
- 164s. Design of Power Plant Units. Treatment of condensers, air pumps, boilers, cooling towers, stage evaporators, heaters, steam piping lubricating systems, etc. Prerequisite: 163. Two credits. Mr. Flodin.
- 165s. Fuels and Combustion. Fuels: classification and analyses. Hand and stoker treatment; regulation. Pulverized and liquid fuels. Types of burners, controls. Combustion: generation of heat; furnace gases; stratification; flame way; smoke prevention. Furnaces. Lectures and recitations. Prerequisite: 43. Three credits. Mr. Shoop.
- 181w. Advanced General Laboratory. (a) Tests of air compressor, steam turbine, compound steam engine, centrifugal fan, gas engine. (b) The use of hydraulic measuring devices, weirs, differential gages, etc., in tests of centrifugal pumps, hydraulic turbines, and rams. Prerequisite: mech. Four hours. Mr. Shoop.
- 182f,w. Advanced Steam Laboratory. Tests of steam turbines, uniflow and compound steam engines, condensers, evaporators, and vacuum pumps. Tests of compound steam pump. Air compressor, boiler, superheater, and power plant. Studies of fluid flow meters and air conditioning apparatus. Prerequisite: 151. Two credits. Mr. Shoop.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 251f. Advanced Thermodynamics. Reversible changes of state and efflux of wet and superheated vapors. Flow of compressible fluids in mains, moving channels, into receivers, and communicating vessels. Gas mixtures, critical points, liquefaction. Power plant cycles: regenerative, reheating, and bleeding. Prerequisite: 163. Three credits. Mr. Shoop.
- 265f-266w. Power Plant Design. Problems, designs, and estimates for power plants and central stations. Selection of motive powers, relative advantages of steam, producers, and gas plants. Choice of en-

- gines and boilers; pumps, piping, and accessories. Prerequisite: 164. Two credits per quarter. Mr. Shoop.
- 267s. Power Plant Management. Operation and maintenance of boilers, engines, steam turbines, and accessory apparatus. Smoke prevention, lubricants and lubrication. Power plant finance. Daily logs and power costs. Study of recent power researches. Prerequisite: 164. Three credits. Mr. Shoop.

HEATING, VENTILATION, AND REFRIGERATION

- 153f. Heating and Ventilation. Principles of heating and ventilation including the design and layout of furnace, steam, hot water, vapor, vacuum, and fan systems of heating. The requirements and design of ventilating systems. General principles of central station heating. Recitations, lectures and design. Prerequisites: M. & M. 127, 128, 129. Four credits. Mr. Rowley.
- 154s. Heating and Ventilation. Principles of heating and ventilation. Heating systems; furnaces, steam, hot water, vapor, vacuum and fan blast. Piping systems. Ventilation: humidification, synthetic air chart. Temperature regulation. Prerequisite: M.&M. 92. Two credits. Mr. Rowley.
- 155f,w,s. Advanced Heating and Ventilating. Advanced course for seniors and graduates. To cover special problems as selected. Prerequisite: 53. Three credits. Mr. Rowley.
- 156s. Compressed Air and Refrigerator Machinery. (a) Air compressors and motors; power transmission by compressed air. (b) Principles of refrigeration. Various types of refrigerating machines, refrigerants application to ice making, cold storage, cooling of air, liquids, and solids. Lectures and recitations. Prerequisite: 151. Three credits. Mr. Rowley.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 255f,w,s. Advanced Heating and Ventilating. Special course for graduate students. To be taken in connection with research work in the laboratory, Course 287. Prerequisite: 53. Credits to be arranged. Mr. Rowley.
- 257w. Mechanical Equipment of Buildings. Selection of heating, ventilating, and plumbing systems for various types of buildings. Piping layouts, piping for fire protection, air, gas, and vacuum cleaning, elevators. Design and layout of equipment. Lectures and drafting. Prerequisites: 153, Phys. 43. Three credits. Mr. Martenis.

GAS ENGINES AND AUTOMOTIVES

- 136f,w. Gas Engine Design. Calculations and working drawings of a gas motor for heavy duty tractor, truck, marine, or other service. Theoretical diagrams and details of parts. Senior option. Prerequisite: registration in 150. Two credits. Mr. Hazen, Mr. Robertson.
- 137w,s. Advanced Gas Engine Design. Continuation of Course 136. Prerequisite: 136. Two credits. Mr. Hazen, Mr. Robertson.
- 138s. Advanced Gas Engine Design. Continuation of Course 137. Prerequisite: 137. Two credits. Mr. Hazen, Mr. Robertson.

- 141w. Automobile and Motor Truck Engines. Continuation of 150 with special reference to automobile and motor truck engines. Theoretical consideration of fuels, combustion, detonation, lubrication, etc. Prerequisite 150. Three credits. Mr. Robertson.
- 142s. Automobile Engine Testing. Use of modern research instruments and methods for testing. Experiments showing effect of fuel mixture, distribution, spark timing, etc. upon general engine performance. Standard engine and chassis road tests. Prerequisite: 141. Two credits. Mr. Hazen, Mr. Robertson.
- 143s. Automotive Fleet Maintenance. Study of available types of motor coaches and trucks, their design features from a maintenance viewpoint, a survey of service depot requirements with a study of fleet service methods and maintenance practice. Lectures and recitations. Prerequisite: M.E. 40. Three credits. Open to seniors only. Mr. Hazen, Mr. Robertson.
- 146s. Gas Engines and Producers. Laws of gases, gas cycles, Otto, semi-Diesel, and Diesel engines. Carburetion, cooling, lubrication, and governing. Gas producers and by-product gases. Prerequisite 145. Three credits. Mr. Hazen, Mr. Robertson.
- 150f. Gas Engines and Producers. Laws of gases; gas cycles. Otto, semi-Diesel, and Diesel engines. Mechanism of various types. Carburetion, governing, cooling, lubrication. Principles of design. Gas producers; types, suction, pressure, blast furnace. By-products recovery. Prerequisites 41, 43. Three credits. Mr. Hazen, Mr. Robertson.
- 183f,w. Power and Gas Engine Laboratory. Tests of gas and gasoline engines, and gas producers. Power and lighting plants. Prerequisite: registration in 150. Two credits. Mr. Hazen, Mr. Robertson.
- 193f,194w,195s. Aviation. Airplanes, their structure and rigging. Aviation engines, instruments. Aerial navigation. Air craft communications. Handling of sea planes and land planes. (This course is accepted as preliminary qualification for student aviators in the U. S. Naval Reserve.) Two credits per quarter. Open to seniors. Mr. Hazen, Mr. Robertson.
- 196f,w,s. Aeronautical Engineering. Design of aerial propellers, aeroplane engines. Application of theory of propellers and gasoline engines to aeroplanes. Includes calculations and drawings for high speed, multi-cylinder, light weight engine; balancing reciprocating parts; uniform torque; theoretical diagrams. Prerequisite: 150. Three credits. Mr. Hazen, Mr. Robertson.
- 197f,w,s. Aeroplane Design. Calculations and drawings for a given aeroplane; stability, strength, propulsion, and motive power required. Prerequisites: 136, M.&M. 173. Two credits. Mr. Hazen, Mr. Robertson.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 231f,232w,233s. Automobile and Motor Truck Design. Theory and design of the automobile and motor truck engine and chassis in which the design of the complete engine, transmission, and chassis is carried out. Lecture and drawing room. Two credits. Graduates. Mr. Robertson.

- 237s. Gas Tractor Design. Selection of wheel sizes; horse power weight and drawbar pull. Bearing pressures; ratios and strength of gearing. Details of principal parts. Senior option. Prerequisite: 136. Two credits. Mr. Robertson.
- 241f,242w,243s. Automobile Testing and Research. Dynamometer and road tests including over-all efficiency of cars and motor trucks, transmission efficiencies, performance of cars at various speeds, fuel consumption, effect of road surface on traction, efficiencies, and general performances. Special research problems. Three credits per quarter. Graduates. Mr. Robertson.
- 245s. Motor Truck and Bus Transportation. Problems involving motor truck transportation, capacity of trucks, trailers, drawbar pull. Efficiencies. Effect of road surface. Freight handling. Analysis of costs of truck operation and maintenance. Relative costs of transportation. Prerequisite: 142. Three credits. Mr. Robertson.

WATER POWER MACHINERY

- 166s. Water Turbines. The theory of operation, design, construction, and regulation of water turbines. Turbine testing; characteristics, selection of type. Cost of turbines and water power. Senior option. Prerequisite: M.&M. 129. Three credits. Mr. Jones.

RAILWAY MECHANICAL ENGINEERING

- 271f. Railway Technology. Systematic course of visits to the various railroad shops in the vicinity to study locomotive details and classifications. Locomotive practice. Lectures and reports. Prerequisites: M.&M. 127, 128, 129. One credit. Mr. Martenis.
- 272f-273w-274s. Locomotive Design and Construction. Locomotive details. Design of boiler, cylinders, frame, springs, trucks, axles, wheels, running gear, equalizing arrangements, valve gears, lubrication. Lectures, assigned reading, and drafting. Prerequisite: 271. Three credits per quarter. Mr. Martenis.

NAVAL ARCHITECTURE

- 170f,w,s. Theoretical Naval Architecture. Ship measurement; stability and trim; resistance, coefficients, speed, and powering. Two credits; jr., sr., preferably preceded by 39. Mr. Flodin.
- 171f,w,s. Theoretical Naval Architecture. Strength of ship as a whole, and of various parts of the ship under local stresses; effect of rolling, pitching, and vibration. Prerequisite: jr., sr. Two credits. Mr. Flodin.
- 172f,w,s. Ship Drawing. Preliminary design of commercial ships, including consideration of mechanical equipment, with special emphasis on river and lake transportation. Prerequisites: 138, 139. Two credits. Mr. Flodin.

SEMINARS AND RESEARCH

- 184s. Advanced Engineering Laboratory. Opportunity will be offered for carrying on investigations and tests of power units, refrigerators, compressors, fans or other problems as arranged. Prerequisites: 182, 183. Two credits. Mr. Rowley.
- 190f-191w-192s. Seminar. Reading of assigned articles in current technical press. Classroom presentation of principal features of assigned articles. One credit. Arranged for seniors and graduates. Mr. Shipley.
- 287f-288w-289s. Mechanical Engineering Research. Courses may be elected which involve investigations in connection with lubrication, fuels, furnaces, boilers, steam engines, turbines, gas engines, heating and ventilation, industrial and other engineering problems. Reports, special problems, and related tests. Prerequisite: 184 or registered in 184. Credits as arranged per quarter.

MEDICINE

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

The graduate work in the Department of Medicine is designed to prepare students for practice of the specialty of internal medicine, research in the problems of general medicine, and for the specialty of nervous and mental diseases, as the case may be, and to train men as teachers in their respective fields. Prospective students who have had no special work in addition to that of the undergraduate course in physiology, physiologic chemistry, therapeutics, experimental medicine, or pathology are advised to devote a year or more to these subjects before entering the regular three-year graduate course. Throughout the course it is recommended that a minor be carried in one or more of the following departments: Physiology, Pharmacology, Pathology, Immunology, and Pediatrics. For students specializing in nervous and mental diseases, minors in anatomy and psychology are especially valuable, and for those desiring it, work would be arranged in the Department of Ophthalmology and Oto-Laryngology, giving a special opportunity to study lesions of the eye occurring in systemic disorders. In the Medical School, during at least the third year of the three-year fellowship, the fellow acts as an officer of the clinic with definite responsibility in the care of patients in the University Hospital.

For courses of study see special bulletin of graduate courses in medicine.

METALLOGRAPHY

Professor Oscar E. Harder; Assistant Professor R. L. Dowdell; Instructor Ludwig J. Weber.

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

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 150f. Metallography for Electrical Engineers. Principles of metallography, including pyrometry, thermal analysis, constitution diagrams, microscopic and photomicrographic technique; study of typical alloys with special reference to electrical resistance, conductivity, magnets, etc. Laboratory work and demonstrations. Two lectures, three laboratory hours per week. Three credits. MW I; 315M. M VI, VII, VIII; 307M. Mr. Dowdell, Mr. Weber.
- 151w. Advanced Metallography for Electrical Engineers. Continuation of 150. Two lectures, three laboratory hours per week. Prerequisite: Course 150. Three credits. MW I; 315M. M VI-VIII; 307M. Mr. Dowdell, Mr. Weber.
- 153f-154w-155s. Metallography. (Long course for metallurgical engineers.) Theory of metallic alloys. Metallographic technique. Properties of metals and alloys. Metallography of iron and steel and commercial alloys. Technical metallography. Three lectures, four laboratory hours per week each quarter. Prerequisites: Chemistry 28, Physics 43. Five credits per quarter. MWF VI or VII; 305M. T VI-IX; 307M. Mr. Dowdell, Mr. Weber.
- 156f. Metallography for Mechanical Engineers. Similar to 150 but specially arranged for students in mechanical engineering. Two lectures, three laboratory hours per week. Three credits. ThS III; 112M. W or F VII-IX; 307M. Mr. Harder, Mr. Weber.
- 157w. Advanced Metallography for Mechanical Engineers. Continuation of 156. Two lectures, three laboratory hours per week. Three credits. Prerequisite: Course 156. ThS III; 112M. W or F VII-IX; 307M. Mr. Harder, Mr. Weber.
- 160f. Metallography for Chemical Students. Principles of metallography, including constitution diagrams, preparation and standardization of thermocouples, preparation and thermal analysis of alloys, microscopic examination and making of photomicrographs; typical alloy systems as iron carbon (steel and cast iron), some non-ferrous alloys. Prerequisite: Chemistry 20. Two lectures and 3 laboratory hours per week. Three credits. MW II; 112M. Th VI-VIII; 307M. Mr. Dowdell, Mr. Weber.
- 161w. Advanced Metallography for Chemical Students. Metallography and heat treatment of iron and steel, including alloy steels, commercial uses of various steels, and engineering specifications. Prerequisite: Course 160. Two lectures and three laboratory hours per week. Three credits. MW II; 112M. Th VI-VIII; 307M. Mr. Dowdell, Mr. Weber.
- 162s. Advanced Metallography for Chemical Students. Metallography of the non-ferrous metals with a study of the constitution diagrams, properties, and uses of important commercial alloys. Prerequisite: Course

160. Two lectures and three laboratory hours per week. Three credits. MW II; 112M. Th VI-VIII; 307M. Mr. Dowdell, Mr. Weber.
- 163f. Advanced Metallography. Seminar work on recent advances in metallography. Lectures and recitations, with outside reading and special reports. May be accompanied by laboratory work. Prerequisites: Courses 151, 155, 157, or equivalent. Credits and hours arranged. 305M. Mr. Harder.
- 164w. Advanced Metallography. Advanced consideration of the structures, properties, and uses of metals and alloys. May be accompanied by laboratory work. Prerequisites: Courses 151, 155, 157, or equivalent. Credits and hours arranged. 305M. Mr. Harder.
- 165s. Advanced Metallography. Technical metallography as applied to the automotive industry. Lectures and special reports. May be accompanied by laboratory work. Prerequisites: Courses 151, 155, 157, or equivalent. Credits and hours arranged. 305M. Mr. Harder.
- 163f-164w-165s. Laboratory. Laboratory work on special problems in ferrous, non-ferrous, and X-ray metallography. Hours and credits arranged. Mr. Harder.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Advanced Metallography for Graduate Students. Intended primarily for research work. Credits and hours arranged. 305M. Mr. Harder.

METALLURGY

Professors Peter Christianson, Levi B. Pease.

Prerequisites.—Elements in physics and chemistry.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 104w. Metallurgy of Pig Iron and Wrought Iron. General underlying principle of iron ore reduction, including construction, operation and regulation of the iron blast furnace together with direct reduction of iron ore and refining products in the hearth and puddling furnaces. Prerequisite: 3f General Metallurgy. Three lectures and one consultation hour per week. Three credits. TThS I. 108M. Mr. Christianson.
- 105s. Metallurgy of Steel. General principles involved in the refining and purification of pig iron and scrap into various grades of steel. Three lectures and one consultation hour per week. Three credits. TThS I. 108M. Mr. Christianson.
- 106f. Metallurgy of Base Metals. Lead, copper, zinc. Consideration of methods and principles involved in roasting, smelting, and refining base metals. Hydrometallurgy and electrolytic refining. Four lectures per week. Three credits for graduates. TThS III; F, I. 108M. Mr. Pease.

- 107w. Metallurgy of Base Metals. Continuation of Course 106f. Four lectures per week. Three credits. Mr. Pease.
- 108s. Metallurgy of Precious Metals. Principles involved and methods used in the extraction of gold, silver and other precious metals. Cyanidation, amalgamation and refining. Four lectures per week. Three credits. TThS III; F IV. 108M. Mr. Pease.
- 110f-111w. Ore Dressing. General principles involved in the crushing, sizing, gravity separation, flotation and magnetic concentration of ores. Three credits. Lectures MWF III. Conferences. 202M. Mr. Pease, Mr. Allard.
- 112f-113w-114s. Ore Dressing Laboratory. Practical examination of ores. Operation of laboratory ore dressing equipment. Laboratory concentration of common ores. Two credits. Laboratory and conference. Th VI-IX. Mr. Pease, Mr. Allard.
- 117w. Advanced Metallurgy. Metallurgical calculations to determine heat balance and heat distribution in furnaces. Four lectures and six laboratory hours per week. Four credits. TWThFS II; Th VI, VII, VIII, IX. 108M. Mr. Christianson.
- 118s. Advanced Metallurgy. Designs of furnaces together with laboratory work. Consultations. Hours same as 117s. 108M. Mr. Christianson.
- 123f. Electrometallurgy. Application of electricity to the production of heat for the smelting of ores and refining of metals. Relative cost of fuel and electric heating; also relative efficiencies of fuel and electric furnaces. Construction of high temperature furnaces and operation of commercial plants. Three lectures and one consultation hour per week. Three credits. MW I; S IV. 108M. Mr. Christianson.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 204f-205w-206s. Thesis courses for graduate students. Intended primarily for research work. Credits and hours arranged. Mr. Christianson, Mr. Pease.
- 207-208-209. Special Problems in Metallurgy. Seminar work on metallurgical problems. Credits and hours arranged. Mr. Christianson, Mr. Pease.
- 210-211-212. Special Problems in Advanced Metallurgy. Intended primarily for research work. Credits and hours arranged. Mr. Christianson, Mr. Pease.

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

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

OBSTETRICS AND GYNECOLOGY

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

PATHOLOGY

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

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

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

PEDIATRICS

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

PHARMACOLOGY AND THERAPEUTICS

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

PHILOSOPHY

Professors Norman Wilde, David F. Swenson; Assistant Professor George P. Conger.

Prerequisites.—For a major, 18 credits; for a minor, 9 credits.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 100f. History of Religions. Prerequisite: 10 credits. Three credits. TThS II; 322F. Mr. Conger.
- 101w. Psychology of Religion. Prerequisite: 10 credits. Three credits. TThS II; 322F. Mr. Conger.
- 102s. Philosophy of Religion. Prerequisite: 10 credits. Three credits. TThs II; 322F. Mr. Swenson.
- 103s. Esthetics. Prerequisite: 10 credits. Three credits. MWF II; 322F. Mr. Swenson.
- 104s. History of Esthetic Theory. Prerequisite: 10 credits. Three credits. MWF II; 322F. (Alternates with 103. Not given in 1927-28.) Mr. Swenson.
- 110w. Contemporary Philosophy. Prerequisite: Philosophy 50 or 51. Three credits; MWF III; 321F. Mr. Conger.
- 120w. Scandinavian Philosophy. Prerequisite: 10 credits. Three credits. TTh 1:00-3:20; 316F. (Not given in 1927-28.) Mr. Swenson.
- 124f. Political and Social Ethics. Prerequisite: 20 credits in any social science, or 10 in philosophy. Five credits. T-S I; 322F. Mr. Wilde.
- 129w. Modern Political Thought. Prerequisite: 10 credits in philosophy, or 20 credits in any social science. Five credits. T-S I; 322F. Mr. Wilde.

- 135f-136w. The Philosophy of Plato. Prerequisite: 10 credits. Six credits. MWF VIII; 338Lib. Mr. Swenson.
- 141s. Metaphysics. Prerequisite: 10 credits, including Philosophy 2. Five credits. M-F VIII; 322F. Mr. Conger.
- 147f-148w. Advanced Logic. Prerequisite: 10 credits, including Philosophy 2. Six credits. MWF II; 338Lib. Mr. Swenson.
- 151f-152w. Modern Idealism. Prerequisite: 15 credits. Six credits. MWF VIII; 338Lib. (Not given in 1927-28.) Mr. Swenson.
- 161f-162w-163s. Seminar in Philosophy. Individual investigation, topics to be determined after consultation with the department. Prerequisite: 20 credits. Nine credits. Mr. Wilde, Mr. Swenson, Mr. Conger.

PHYSICS

Professors Henry A. Erikson, John T. Tate, John H. Van Vleck, Anthony Zeleny; Associate Professors Louallen F. Miller, Joseph Valasek; Assistant Professor J. William Buchta.

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

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

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-103w-105s. Theoretical Physics. Intensive analytical survey of fundamental principles of mechanics, sound, heat, light, electricity and magnetism, designed to supplement the general courses and to prepare students for more specialized courses. Five lectures a week. Prerequisites: 12 credits in physics, Math. 51. Five credits per quarter. MTWFS IV; 2Ph. Mr. Tate.
- 102f. Laboratory Arts. Designed to acquaint students with the methods used in glass blowing, silvering, etching, metal-to-glass seals, making quartz fibers, soldering, spinning, spot welding, etc., as a preparation for general experimental work. Two three-hour sessions a week. Prerequisite: 12 credits in physics. Three credits. (1) MW VI-VIII; 2Ph. (2) TTh VI-VIII; 2Ph. Mr. Buchta.
- 104w. Precision Mechanics. Standard methods of precise measurements of length, mass, and time. Two three-hour sessions a week. Prerequisites: 12 credits in physics and Math. 51. Three credits. Hours to be arranged. Mr. Buchta.
- 114f-116w-118s. Elementary Physical Investigation. The experimental or theoretical study of physical phenomena the nature or laws of which

- are not as yet understood. Prerequisites: Physics 104, Math. 51. Three credits per quarter. Hours to be arranged. Staff.
- 115f-117w-119s. Problem Course. The work of this course consists entirely in solving problems and exercises designed to give practice in the mathematical analysis of physical problems. Prerequisites: Physics 105, Math. 51. Three credits per quarter. Mr. Buchta.
- 122s. Pyrometry and Heat. An experimental study of pyrometry, heat quantity, heat transfer, hygrometry, and gas liquefaction. One lecture, two three-hour sessions in the laboratory a week. Prerequisites: Courses 21 and 22. Three credits. MW VI-IX; 23Ph. Mr. Miller.
- 132w. Applied Optics. Special experimental work in spectrometry, optical instruments, photometry, absorption, polarized light. Two three-hour laboratory periods a week. Prerequisites: Courses 31 and 32. Three credits. 3Ph. Hours to be arranged. Mr. Valasek.
- 142f. Electrical Measurements. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux. Three two-hour laboratory periods a week. See engineering program. Mr. Zeleny.
- 146w. Electrical Measurements of Precision. Precision measurements of electromotive force, current, resistance, capacity, inductance, and magnetic flux. Use of apparatus of highest precision. Three two-hour laboratory periods a week. Prerequisite: Course 142. Three credits. Hours to be arranged. Mr. Zeleny.
- 148w. Radioactivity. An analytical study of the theories and methods of investigation supplemented by laboratory technique. Those pursuing this course should continue with Chemistry 151, Radiochemistry. Prerequisites: Courses 41 and 42. Three credits. Hours to be arranged. Mr. Erikson.
- 150s. Conduction through Gases. An analytical study of the theories and methods of investigation, supplemented by laboratory technique. Prerequisite: Courses 41 and 42. Three credits. Hours to be arranged. Mr. Erickson.

COURSES PRIMARILY FOR GRADUATE STUDENTS

Physics 101-103-105 and Mathematics 51 are prerequisites for all the courses listed below. The normal sequence of courses after 101-103-105 is 241-243-245 or 241-243-248, and simultaneously if possible 211-213-215 or 231-233-235. Courses 205 and 221-223 are usually given in alternate years. All the courses have as many lectures per week as credits.

- 205w. Advanced Dynamics. Hamilton's principle; least action; Lagrange's equations; invariance of Hamiltonian form under contact transformations; and other general dynamical principles, including modifications required by the restricted relativity theory. Illustrated by the mechanics of small vibrations or by applications to atomic structure. Four credits. Mr. Van Vleck.
- 211f. Atomic Structure and Spectral Lines. Radioactivity; scattering experiments; structure of the nucleus. Photo-electricity. Simple Bohr

- theory of the hydrogen spectrum. The correspondence principle. Three credits. Mr. Van Vleck, Mr. Buchta.
- 213w-215s. Quantum Theory of Atomic Structure. A continuation of 211f. The new Schroedinger wave mechanics and the Heisenberg matrix quantum dynamics. Relativity fine-structure; the spin electron; Zeeman effect; Stark effect. Series notation; survey of non-hydrogenic spectra. Inner quantum numbers and multiplets. Critical potentials; excitation of spectra; infra-red absorption bands; X-rays; dispersion. Three credits per quarter. Mr. Van Vleck.
- 221f-223w. Thermodynamics, Statistical Mechanics, Kinetic Theory. Equations of state; first and second laws of thermodynamics, etc. Statistical mechanics; equipartition; mean free path. Quantum theory of specific heats and dissociation equilibrium, with astrophysical applications. Chemical constants and absolute entropy. Three credits per quarter. Mr. Van Vleck.
- 231f. Advanced Optics. X-ray diffraction. Geometrical optics and optical instruments. Interference, diffraction, and polarization with applications to spectrum analysis. Diffraction of X-rays by crystals. Crystallography and crystal structure. Four credits. Mr. Valasek.
- 233w. Radiation. Optical properties of matter. Black body radiation and luminescence. Reflection and refraction by transparent substances, metals, and crystals. Three credits. Mr. Valasek.
- 235s. Theories of Optical Properties. Dispersion, optical rotation, magneto- and electro-optical properties. Optical phenomena due to motion. Optical properties of moving media. The Lorentzian transformation and introduction to the theory of relativity. Three credits. Mr. Valasek.
- 241f. Electrostatics. Designed to cover the first half of Jean's *Electricity and Magnetism*. Vector analysis. Fundamental mathematical processes applicable to potential theory. Images, spherical harmonics, Fourier series, etc. Four credits. Mr. Van Vleck.
- 243w. Electromagnetism. Current flow in continuous media. Magnetostatics. Magnetic fields due to electric currents. Electromagnetic induction; dynamical theory. Maxwell's equations and their solution; retarded potentials; radiation. Three or four credits. Mr. Van Vleck, Mr. Buchta.
- 245s. Electron Theory. Large and small scale field equations. Illustration of conservation of momentum by Compton and Doppler effects. Electromagnetic mass. Electron theories of conduction and of magnetism. Three credits. Mr. Van Vleck, Mr. Buchta.
- 248s. Thermionics and Thermal Electricity. Peltier effect; Thomson effect, contact difference of potential. Emission of electricity from hot bodies. Phenomena occurring in gaseous and electronic conduction; limitation of current by space charges; ion sheaths, etc. Theories of the electric arc. Fundamental principles of three-electrode vacuum tubes. Three credits. Mr. Buchta.

252f-254w-256s. Research. Under the special direction of individual members of the staff.

261f-263w-265s. Seminar. Study of present day problems in physics. Three credits. One hour a week. Open to those who are doing graduate work in physics. Mr. Tate.

The following courses will be offered provided at any time there is sufficient demand for them:

Hydrodynamics and Theory of Elasticity.

Advanced Topics in Electron Theory and the Special Theory of Relativity.

The General Theory of Relativity.

Advanced Quantum Theory.

The Partial Differential Equations of Mathematical Physics.

Applications of Vector Analysis to Physical Problems.

Applied Electricity—Theory of Electrical Circuits.

PHYSIOLOGY AND PHYSIOLOGIC CHEMISTRY

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

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

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

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

PLANT BREEDING

Plant breeding may be elected as a field for either major or minor work. For prerequisites for specialization and statement of courses of study see announcement under Farm Management, Agronomy, and Plant Genetics.

PLANT PATHOLOGY AND BOTANY

Professors Edward M. Freeman, Elvin C. Stakman; Assistant Professors Jonas J. Christensen, Julian G. Leach; Instructor Louise T. Dosdall.

Note.—For courses in botany including plant physiology see Department of Botany.

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 105f-106w-107s. Mycology. Morphology, taxonomy, and biology of fungi. Lecture, laboratory, greenhouse, and field work. Prerequisites: Botany 1 and 2 or equivalent. Three credits per quarter. TTh VI, VII, VIII; 41PP. Mr. Freeman, Miss Dosedall.
- 108f. Methods. Plant pathological methods, including mycological and bacteriological technique. Lectures, laboratory, field, and greenhouse work. Special problems. Prerequisites: Course 1 or 10 and Bacteriology 51. Three credits per quarter. Ar. 1, 2PP. Mr. Leach.
- 111w. Diseases of Cereal Crops. Symptomatology, etiology, and practical methods of control. Laboratory, lecture, and field work. Prerequisite: Course 1 or 10. MWF VI, VII; 1, 2PP. Mr. Christensen.
- 112s. Diseases of Fruit Crops. Especially those important in Minnesota. Laboratory, lecture, and greenhouse work. Three credits. MWF VI, VII; 1, 2PP. (Given in alternate years; not offered in 1927-28.) Mr. Leach.
- 113s. Diseases of Vegetable Crops. Diseases of potatoes and other vegetable crops. Lecture, reference, laboratory, and greenhouse work. Three credits. MWF VI, VII; 1, 2PP. (Given in alternate years; offered in 1927-28.) Mr. Leach.
- 114w. Advanced Forest Pathology. Wood rots, including a study of the deterioration of wood products caused by fungi. Lectures, laboratory, and greenhouse work. Three credits. MWF VIII, IX; 1, 2PP. (Given in alternate years; offered in 1927-28.) Mr. Stakman, Mr. Lindgren.
- 116f. Pathologic Histology. A study of the histological changes in diseased plants. Lectures, laboratory, and reference work. Prerequisite: Courses 1 or 10. Three credits. MWF III, IV; 1, 2PP. Mr. Leach.
- 117s. Diseases of Forage and Fiber Crops. Symptomatology, etiology, and methods of control. Lectures, laboratory, and field work. Prerequisite: Courses 1 or 10. Three credits. MWF III, IV. (Given in alternate years. Offered in 1927-28.) Mr. Henry.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 203f-204w-205s. Special Problems. Special assignment of work in laboratory and field problems in pathological research. Mr. Freeman, Mr. Stakman, Mr. Christensen, Miss Dosedall, Mr. Henry, Mr. Leach.
- 207f-208w-209s. Research in Mycology. Research work along following suggested lines: taxonomy of natural groups; fungous flora of particular regions, localities, or habitats; investigation of fungi involved in special industrial or natural processes; morphology or physiology of special forms. Prerequisite: Course 105-106-107. For minor or major. Three credits per quarter. Mr. Freeman, Mr. Stakman, Miss Dosedall.
211. History of Plant Pathology. Development of important mycological, pathological, and physiological researches; historical basis of modern science of plant pathology. Two credits per quarter. Mr. Stakman.
213. Seminar. Assigned topics with special reference to current pathological problems. Historical review of literature on special problems

and critical study of current literature. Two credits per quarter. Mr. Stakman.

- 214w. Principles of Pathology. Physiology of plant pathogens; pathological plant anatomy, parasitism, biologic specialization, resistance, and immunity. Prerequisites: Course 1 or 10 and Bacteriology 51. Three credits. MWF III, IV; 1, 2PP. Mr. Stakman, Mr. Henry.

POLITICAL SCIENCE

Professors Cephas D. Allin, William Anderson, Harold S. Quigley, Jeremiah S. Young, Morris B. Lambie; Associate Professor Harold F. Kumm; Instructor Herman Beyle.

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

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 102s. Political Parties. The nature, function, organization, and methods of political parties; legal control of parties and elections; public opinion as a factor in popular government. Mr. Beyle.
- 105s. Colonization. The economic and political factors in colonization; forms of government, commercial policies, and mandates. MWF I; 221OL. Mr. Allin.
- 111w-112s. Municipal Powers and Functions. A study of the constitutional status, the common law attributes, the creation, alteration, and dissolution, the organization, officers and procedure, the corporate and governmental powers, and the expanding functions of municipal corporations. TThS III; 211OL. Mr. Anderson.
- 113f. Municipal Administration. Administrative organization, personnel, and finance; planning, public works, safety, sanitation, and utilities. TThS III; 211OL. Mr. Anderson.
- 121f-122w. International Law. Nature, sources, and sanction of international law. The laws of peace, war, and neutrality. MWF IV; 209OL. Mr. Allin.
- 123s. International Organization. Systems of international relations, international administrative organizations, and political guarantees of the past with a detailed study of the League of Nations. MWF IV; 209OL. Mr. Quigley.
124. Problems in International Law. Intensive study of the solution of selected international controversies by national and international courts, arbitration tribunals, and diplomatic conferences. (Not offered in 1927-28.)

- 125f-126w. American Diplomacy. The history, principles, and policies of American diplomacy. MWF III; 221OL. Mr. Shippee.
- 127s. American Foreign Relations. Such topics as the Monroe Doctrine, freedom of the seas, the "open door," arbitration, and disarmament will be considered with particular reference to the future policy of the United States. (Not offered in 1927-28.)
- 130s. Introduction to Administration. Introduction to the administrative aspects of the problems of social control; the formulation of policy, the organization of administration, and control over administration. MWF II; 209OL.
- 131w-132s. Principles of Public Administration. Source of the administrative power; administrative areas; the budget; personnel; purchasing; organization; public service as a career. Special problems relating to education, finance, safety, health, welfare, commerce, labor, and conservation of natural resources. (Not offered in 1927-28.)
- 136f-137w. Far Eastern Government and Politics. The constitutional development of Japan and China; government, parties, and political problems. (Not offered in 1927-28.)
- 138f-139w. Far Eastern Diplomacy. The international relations of China from the earliest period; early contacts between Japan and China; the policy of exclusion gradually overcome by western powers; the opening of the Far East in the nineteenth century; the "open door" policy; the contemporary situation. MWF VII; 209OL. Mr. Quigley.
- 141f. Problems in State Government and Constitutional Law. A selected group of current problems in state government will be studied intensively in their constitutional and political aspects. MWF VI; 221OL. Mr. Kumm.
- 145w. Legislative Power and Methods. Source and scope of the legislative power; methods used by legislative bodies; current political questions; formulation and defense of legislative bills. TThS II; 211OL. Mr. Young.
- 151w-152s. Constitutional Law. Separation of powers; relationship of states to national government; fundamental rights and immunities of citizens; obligation of contracts; due process of law; equal protection of laws. MWF VI; 221OL. Mr. Kumm.
- 155s. Administrative Law. The nature and scope of administrative law with special reference to the law of officers and special administrative tribunals. TThS I; 221OL. Mr. Kumm.
- 157f. Recent Social Legislation. The governmental powers and methods used for social legislation, both state and federal; peace and security; safety and health; public morals; economic relations that are semi-social, such as advertising, minimum wage, city planning and police power restrictions on the use of private property. TThS II; 211OL. Mr. Young.
- 158s. Government and Business. Governmental powers; restraint of trade and manipulation of prices; protection of debtors; business affected with a public interest; combinations of laborers; corporations; com-

- pulsory benefits; conservation of natural wealth; vested rights; confiscatory legislation. TThS II; 211OL. Mr. Young.
- 159w. Law of Public Utilities. The rise and development of the law of public service companies; the rights and duties of such companies; present methods of control. TThS I; 221OL. Mr. Kumm.
- 161s. Comparative Federal Government. Ancient and modern federal unions. (Not offered in 1927-28.)
- 166w-167s. Government and Politics of the British Empire. Organization, working, and international status of the Imperial and Dominion government. MWF II; 211OL. Mr. Allin.
- 171s. Political Psychology. A biographical and psychological approach to political theory and problems. The political significance of individual differences in intellect and temperament in relation to belief, propaganda and public opinion will be emphasized. TThS III. Mr. Bird.
- 181w. Modern Political Thought. (See Philosophy 129.) TWThFS I; 322F. Mr. Wilde.
- 187s. Problems in Democracy. An examination of a few key problems of a democratic society—individual and class differences, opinion, dictatorships, expert knowledge, and leadership. MWF VI; 205F. Mr. Beyle.
190. Jurisprudence. (See Law School program.) Mr. Rottschaefer.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Seminar in Public Law. Mr. Young and others.
- 211f-212w-213s. Seminar in Modern Government and Political Theory. Mr. Allin and others.
- 221f-222w-223s. Seminar in Local Government and Administration. Mr. Anderson and others.
- 231f-232w-233s. Seminar in International Relations. Mr. Quigley and others.

Note.—A student registered in a seminar course will be expected to complete a satisfactory piece of research before receiving credit for the course. The Bureau for Research in Government is designed to give all possible assistance in the conducting of such research, but is not intended to relieve the student of his personal responsibility.

PSYCHOLOGY

Professors Richard M. Elliott, John E. Anderson, Donald G. Paterson; Assistant Professors Arthur G. Bills, Charles Bird, Edna F. Heider, William T. Heron.

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

- 101f-102w†-103s. Experimental Psychology. The theory and technique of the leading methods of experimental investigation in human psychology. Individual minor research problems in the third quarter. One lecture, four laboratory hours per week. Six or nine credits. MWF VII; WF VIII; 116Psy. Mr. Bills.

- 108f. Systematic Psychology. A comparative study of the problems, methods, and viewpoints of modern psychology. Three credits. TThS III; 109Psy. Miss Heidbreder.
- 109w. Readings in Psychology. Intensive study of selected topics such as attention, perception, emotion, thinking. For properly qualified students with special interests, much of the classroom work will be replaced by individual assignments. Three credits. TThS III; 109Psy. Miss Heidbreder.
- 114w-115s.† Human Behavior. An analysis of the development and organization of human behavior. Consciousness or mind, as a property of the living body, is discussed in its dependence upon response. Six credits. TThS II; 109Psy. Mr. Elliott.
- 124f. Psychology of Learning. A study of the literature and experiments of memory and habit formation. Lectures, readings, and reports. Three credits. MWF IV; 109Psy. Mr. Heron.
- 125f-126w†-127s. Psychology of Individual Differences. Experimental and statistical study of the influence of sex, race, immediate ancestry, and environment in the causation of individual differences in mental traits. Each student participates in investigation of problems and in analysis of results. Individual minor research problems in the third quarter. Six or nine credits. MWF II; 109Psy.
- 130s. Vocational Psychology. Psychology of individual differences in intelligence, aptitudes, interests, and training, with special reference to vocational guidance. Two credits. F IX-X; 301F. Mr. Paterson.
- 137s. Psychology of Learning. A continuation of 124f which is prerequisite. Three credits. MWF III; 109Psy. Mr. Heron.
- 140w. Social Psychology. A critical study of the experimental investigations of group behavior including the social significance of instinct, habit, imitation, suggestibility, and personality traits. Three credits. TThS III; 115Psy. Mr. Bird.
- 141s. Political Psychology. A biological and psychological approach to political theories and problems. The political significance of individual differences in intellect and temperament in relation to belief, propaganda, and public opinion will be emphasized. Three credits. TThS III; 115Psy. Mr. Bird.
- 144w-145s.† Abnormal Psychology. Normal and abnormal behavior contrasted. Varieties of maladjustment as illustrated in criminality, deficiency, fanaticism, and insanity. Stress will be laid on the inadequacies of personality as shown in everyday life. Six credits. MWF IV; Psy Amph. Mr. Anderson.
- 151f-152w†-153s. Animal Psychology. Vertebrate behavior is emphasized. A critical study of the literature, and of the relationship between animal and human psychology. Individual investigation of special problems in the third quarter. Six or nine credits. MW VII; MWF VIII; 109Psy. Mr. Heron.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 200f. Seminar in History of Psychology. I. Men and Schools. Emphasis on the modern period. Open to advanced students with permission of instructor. (Given in alternate years. Offered in 1928-29.) Three credits. TTh 2:00-3:30; 301Psy. Mr. Anderson.
- 203f. Seminar in the History of Psychology. II. Methods and Problems. Emphasis on the modern period. Open to advanced students with permission of instructor. (Given in alternate years. Offered in 1927-28.) Three credits. TTh 2:00-3:30. 301Psy. Mr. Anderson.
- 205s. Advanced Differential Psychology. Three credits. Mr. Paterson.
- 206-207-208. Research in Animal Behavior. Mr. Heron.
- 210f-211w-212s. Research Problems. Laboratory investigations. Open to graduate students only. Mr. Elliott, Mr. Paterson, Mr. Anderson, Mr. Bird, Mr. Bills, Miss Heidbreder, Mr. Heron.
- 228w. Perception of Space. An intensive study of visual, auditory, and somesthetic space perception. Lectures, readings, and reports. Open to advanced students with permission of the instructor. Three credits. TThS II. Mr. Heron.
- 215f-216w-217s.† Seminar in Psychology. Fortnightly meetings attended by teaching staff and advanced students for discussion of some of the fundamental problems of behavior and for reports of research in progress. Three credits. Alternate Thursdays 7:15-9:15 p.m. 301Psy. Mr. Elliott.
- 220f-221w-222s.† Journal Club. Advanced students meet every other week for reports on current publications and discussion of contemporary trends in psychology and related sciences. Attendance of graduate students who are candidates for degrees is required. One credit per quarter. Alternate Thursdays 7:15-9:15 p.m. 301Psy. Mr. Paterson.

ROMANCE LANGUAGES

Professors Everett W. Olmsted, Irville C. LeCompte, Ruth S. Phelps; Associate Professors Francis B. Barton, Edward H. Sirich; Assistant Professors Jay K. Ditchy, William L. Fichter, Alexander H. Krappe.

Prerequisites.—For major work, 27 senior college credits or equivalent; for minor work, 18 senior college credits or equivalent. Candidates for Master's degree must also have a reading knowledge of at least one other modern language. Candidates for the Doctor's degree must have had at least two years' work in Latin, and are required to take also the course in medieval Latin in the Latin Department. A reading knowledge of a second Romance language and of German is also required.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

FRENCH

- 100s. Diction Française. Etude, théorique et pratique du français parlé. MTWF VIII; 203F.
- 103-104-105. French Syntax and Composition. Special studies in characteristic problems of French syntax. F V; 203F. Mr. Barton.

- 115-116-117. French Literature: Seventeenth Century. First quarter: formation of the classic ideal, the salons, the Academy, Corneille; second quarter: littérature mondaine; third quarter: Racine, Molière, Corneille. MWF III; 227F. Mr. Searles.
- 118-119-120. French Literature: Eighteenth Century. First quarter: beginnings of the philosophic movement, Bayle, Montesquieu, Diderot; second quarter: Voltaire; third quarter: Rousseau, the theater, the novel. TThS III; 114F. Mr. Sirich, Mr. Clefthon.
- 121-122-123. French Literature: Sixteenth Century. First quarter: the Rhétoriciens, Marot, Rabelais; second quarter: the Pléiade; third quarter: Montaigne, Amyot. MWF III; 113F. Mr. Krappe.
- 145s. Explication de Textes. MTWF VII; 203F. Mr. Morand.
- 150-151-152. French Dramatic Literature. A study of the development of dramatic literature in France from the classical period to the present time. TTh III; 203F. Mr. Olmsted.
- 153s. French Lyric Poetry. Contemporary French poets. MTWF VI; 212F. Mr. LeCompte.
- 156w. Molière. MTWF IV; 316F. Mr. Searles.
- 157w. Contemporary French Novel: Bourget, Loti, France, etc. MTWF VI; 217F. Mr. Ditchy.
- 171-172-173.† History of the French Language. Lectures and illustrative texts giving the development of the French language from its origins to the nineteenth century. Especially intended for prospective teachers. Th VIII; 203F. Mr. LeCompte.
- 174-175-176. Lectures in French. TTh IX; 201F. Mr. Morand.

SPANISH

100. Spanish Oral Diction. Exercises in diction, syntax, and vocabulary. (Not offered in 1927-28.)
- 103-104-105. Spanish Syntax. Special studies in characteristic problems of Spanish syntax. (Not offered in 1927-28.)
- 115-116-117. Spanish Literature: Seventeenth Century. First quarter: the drama; second quarter, the novel; third quarter, lyric and epic poetry. Alternates with 156-157-158. (Not offered in 1927-28.)
- 141s. Spanish Contemporary Novel. TThFS III; 305F. Mr. Fichter.
- 150w-151s. Spanish Dramatic Literature. Contemporary dramatists. MW III; 302F. Mr. Olmsted.
- 156-157-158. Spanish Literature: Sixteenth Century. First quarter, the drama; second quarter, Cervantes and the novel; third quarter, poetry, the mystics. Alternates with 115-116-117. MWF Ar.; 217F. Mr. Fichter, Mr. Krappe.
- 174-175-176. Lectures in Spanish: Twentieth Century Literature. First quarter, the drama; second quarter, the novel; third quarter, poetry. TTh IX; 202F. Mr. Arjona.

ITALIAN

- 159-160. Dante. The *Divina Commedia*. (Alternates with 161-162. Not offered in 1927-28.)
- 161-162. The Sixteenth Century. Reading of texts and study of literary influences. Alternates with 159-160. MWF IV; 203F. Miss Phelps.
164. Dante in English. Lectures, reading, and discussion of the *New Life*, and parts of the *Divine Comedy*. MWF IV; 213F. Miss Phelps.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Old French Phonology and Morphology. Lectures on the origin and development of the French language, with practical exercises and reports on assigned topics. Six credits. Mr. LeCompte.
- 204f-205w-206s. Reading in Old French Literature. An introductory course in the reading of Old French. Different types of literature will be read and their origin and development discussed. A certain amount of collateral reading required. Three credits. Mr. LeCompte.
- 207f-208w-209s. Old Provençal. Reading in early Provençal literature with special attention to the poetry of the troubadours. Six credits. Mr. LeCompte.
- 222f-223w-224s. Seminar in Modern French Literature. Six credits. Mr. Searles.
- 230-231-232. Research Methods and Material. Three credits. Mr. Krappe.
- 241f-242w-243s. Old Spanish Philology. Two credits. Mr. Krappe.
- 244f-245w-246s. Old Spanish Literature. Every year a different genre is studied, such as the epic. Subject to be decided by agreement of students. Two credits. Mr. Krappe.
- 250f-251w-252s. Spanish Seminar. Six credits. Mr. Fichter.
- 259f-260w-261s. Research in Romance Languages. Credit depends upon amount of work accomplished.

SCANDINAVIAN

Professors Gisle Bothne, Andrew A. Stomberg.¹

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w-103s. Modern Norwegian Literature. From 1814 to the present day. Prerequisites: Scandinavian 1-2 and 3-4. Nine credits. TThS II. Mr. Bothne.
- 104f-105w-106s. Modern Scandinavian History. Knowledge of Scandinavian not required. Nine credits. MWF IV. Mr. Stomberg.
- 107f-108w-109s. Modern Swedish Literature. The Swedish novel. Study of a selected list of Swedish classics. Nine credits. MWF V. Mr. Stomberg.

¹ Absent on leave, 1927-28.

- 110f. Ibsen. Prerequisite: Scandinavian 101-102-103. Three credits. Mr. Bothne.
- 111f-112w-113s. Old Norse. (Icelandic). Grammar and reading. Gunnlaug's Saga Ormstungau. Six credits. (Not offered in 1927-28.) TTh V. Mr. Bothne.
- 114f. Strindberg. Prerequisite: Scandinavian 107f-108w-109s. Three credits. Mr. Stomberg.
- 117w-118s. Earlier Norwegian Literature. Prerequisite: Scandinavian 102. Five credits. TS III. Mr. Bothne.
- 131f-132w-133s. Danish Literature of the Nineteenth Century. From Oehlenschläger to the present time. Nine credits. Mr. Bothne.
- 134f-135w. The Landsmaal Movement and Literature. From Aasen to Garborg. Mr. Bothne.
- 136w. Björnson. A study of his activity as a central figure in modern Norway. Mr. Bothne.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202-203. Seminar in History of Scandinavian Languages. Mr. Bothne.
- 209-210. Seminar in Modern Swedish Language and Literature. The course is based upon Schuck and Warburg's *Illustrated Svensk Litteraturhistoria* and includes a study of special authors. Nine credits. Mr. Stomberg.
- 215-216-217. Seminar in Norwegian Literature. The various phases of the cultural development of modern Norway are discussed. The complete works of Björnson or Ibsen are especially studied. Also Holborg and the eighteenth century. Mr. Bothne.

SOCIOLOGY AND SOCIAL WORK

Professors F. Stuart Chapin, Pitirim A. Sorokin, Edwin H. Sutherland, Wilson D. Wallis (Anthropology), Malcolm M. Willey; Assistant Professors Ross L. Finney, Gustave A. Lundquist, Mildred D. Mudgett, Carl C. Zimmerman; Professorial Lecturer Joanna C. Colcord

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 100f. Social Psychology. Primarily for sociology students. The social attitudes; their development and modification under social pressures; the interactions of individuals and groups. TThS II; 9F. Mr. Chapin.
- 101w. Social Organization. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; the purposive social organization. TThS II; 9F. Mr. Sorokin.
- 102s. Social Control. Nature, purpose, and methods of social control; institutional and non-institutional controls; the evaluation of sanctions in social control; the revision of the social controls under the influence of modern science. TThS II; 9F. Mr. Finney.

- 1103s. Sociology of Conflict. MWF II; 9F. Mr. Sutherland.
- 110w. Methods of Community Organization and Social Work in Small Towns and Country. Concrete problems and methods are emphasized. Th VIII, IX; 9F. Mr. Zimmerman.
- 112f. The Rural Social Survey. MWF VIII; 9F. Mr. Zimmerman.
- 114s. Rural Social Institutions. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. MWF I; 105Ag.Eng. Mr. Lundquist.
- 115f. The Rural Church As a Social Institution. MWF VII.
- 116w. The Newspaper As a Social Institution. Three credits. TThS III. Mr. Willey.
- 119f. The Family. The evolution of the family; its various forms and their relation to other social institutions; the service of the family in social evolution; contemporary problems of the family (standards of living, birth rate, feminism, etc.). MWF III; 9F. Mr. Sutherland.
- 120f. Social Progress. A study of the basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. MWF II; 9F. Mr. Wallis.
- 121w. Advanced Statistical Methods. MWF VII; 5F. Mr. Chapin.
- 122w-123s. Methods of Social Investigation. Methods of gathering and presenting community facts; social statistics; social surveys. Lectures, problems, and field work. MWF VIII; 9F. Mr. Sutherland.
126. The Technique of Leadership in Group Work. Miss Mead.
- 128s. Charitable Administration. A technical study of methods of organizing charitable agencies, of financing them, and of making the public aware of their work. Lectures and practice work. Th VIII, IX; 5F. Mr. Bradley.
- 130s. Advanced Social Case Work. An intensive study of social case work as the basis of practical dealing with problems of dependency and defectiveness. Lectures and conferences. T VIII, IX; 3F. Miss Colcord.
- 132s. Juvenile Courts and Probation. Primarily a course in probation practice work, but prefaced by lectures on social and legal aspects of the juvenile court and probation. (Not offered in 1927-28.)
- 133f. Health Aspects of Case Work. A course open only to students who are properly grounded in case work and who wish to specialize in medical social work. WF and ar IX and ar; 5F. Mrs. Young.
- 134s. Legal Protection of the Child. A study of the relation of law to child welfare. A survey of existing children's protective legislation, of its administration and its future development. MWF I; 5F. Mr. Waite.
- 135s. Field Practice in Legal Protection of the Child. Designed to meet the individual needs of students taking 134. Ar. Ar.

- 138w-139s. Mental Case Work. A study of mental abnormality and its treatment through case work. Lectures and clinical instruction. S I, II; 9F. Mrs. Young.
- 140w. History of Social Theory. From the time of the Greeks, with special reference to the more recent development of sociology. The theories are related to their social backgrounds. MWF II; 5F. Mr. Sorokin.
- 141s. Contemporary Social Theory. An intensive study of developments in the social theory of the late nineteenth and the twentieth centuries. TThS II; 9F. Mr. Sorokin.
- 152s. Problems of Institutional Administration. (Not offered in 1927-28.)
- 153f-154w-155s. Advanced Field Work. Ar. Ar.
- 158w. The Sociology of Revolution. MWF III; 204F. (Not offered in 1927-28.) Mr. Sorokin.
- 160f. Population Problems.
- 187f,w,s. Seminar in Educational Sociology. S I, II; 206OL. Mr. Finney.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 200f-201w-202s. Seminar in Applied Sociology. Mr. Sutherland.
- 203f-204w-205s. Seminar in Social Theory. Mr. Sorokin.
- 206f-207w-208s. Seminar: Statistical Theory in Relation to Social Theory and Practice. T 4-6 p.m.; 9F. Mr. Chapin.
- 209f-210w-211s. Seminar: The Theory of Social Evolution. Mr. Chapin, Mr. Willey.
- 215f-216w-217s. Seminar in Rural Sociology. Mr. Sorokin, Mr. Zimmerman.
- 218f-219w-220s. Seminar in Social Work. Mrs. Mudgett and staff.
- 221f-222w-223s. Graduate Field Training. Twelve hours per week each semester.

SOILS

Professor Frederick J. Alway; Associate Professor Clayton O. Rost; Assistant Professor Paul R. McMiller.

Prerequisites.—For major work, at least two years of work in chemistry, including both quantitative analysis and organic chemistry, and one year of work in general physics. Those students who have not had courses in the elements of geology and mineralogy will be expected to take Geology I and 2I during the first year of graduate work. A reading knowledge of French or German is required for the Master's degree. In certain cases where some other modern foreign language would be more valuable in connection with the thesis it may be substituted.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f. Chemical Analysis of Soils. A laboratory course on the chemical examination of soils, including both fusion and extraction methods for mineral nutrients. Prerequisites: Soils 4 and 5 and quantitative analysis. Five credits. MWF 1:30-5:20; 156Ch. Mr. Rost.

- 102f,w,s. Special Problems in Soils. Individual laboratory or field work upon some special soil problem in soil physics, soil chemistry, or soil management. Arrangements must be made in advance. Prerequisites: Soils 4 and 5, and other courses according to problem selected. Three to five credits, according to work. 156Ch. Mr. Alway, Mr. Rost.
- 104s. Soil Surveying. Field practice in surveying soils and the preparation of soil maps. Prerequisites: Soils 4 and 5. Three credits. Mr. McMiller.
- 105w. Minnesota Soils. Detailed study of the soils of Minnesota. Origin, formation, and classification; physical and chemical characteristics; moisture relations; response to manures, fertilizers, and soil amendments; naturally unproductive types and their reclamation. Lectures and laboratory. Prerequisites: Soils 4 and 5. Three credits. TThS III; 251Ch. Mr. Alway.
- 107w. Fertilizers and Manures. Sources, composition, and uses of the various fertilizers, manures, and soil amendments. Lectures and laboratory work. Prerequisites: Soils 4 and 5. Two credits. TS IV; 251Ch. Mr. Rost.
- 108w. Physical Properties of Soils. A laboratory course on the determination of physical constants of soils, including mechanical composition, moisture equivalent and hygroscopic coefficient. Prerequisites: Soils 4 and 5. Three credits. TTh I:30-5:20; 156Ch. Mr. McMiller.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201w. Classification of Soils. Study of the various systems of classification which have been proposed. Individual work, with assigned readings and conferences. Open only to those graduates who have a reading acquaintance with French and German. Prerequisites: Soils 4, 5, 101, and 108. Three credits. Mr. Alway.
- 202f,w,s. Research in Soils. The investigation in the field, in the laboratory, or in both, of soil problems. The particular problem which a student may select will depend upon his previous training in agronomy, botany, chemistry, geology, and physics. Credit, according to work. Mr. Alway.
- 203w. Seminar in Soils. Review of current literature; presentation and discussion of papers on research; study of methods of investigation of soils. Required of graduate students. One credit. T VII; 251Ch. Mr. Alway.

SURGERY

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

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

VETERINARY MEDICINE

Professors Clifford P. Fitch, Myron H. Reynolds.

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101w-102s. Advanced Anatomy of Domestic Animals. Advanced study of the structures involved in the type, conformation, and nutrition of the common farm animals. Dissection of farm animals, including a study of the osseous, muscular, and other principal anatomical structures. Mr. Kernkamp.
- 103f-104w. Advanced Comparative Physiology. An advanced course in physiology of the domestic animals, including laboratory work with special emphasis on animal nutrition. Mr. Hewitt.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s-204su. Problems in Animal Sanitation. Losses to animal husbandry from disease. Causes and prevention of such losses. Organization of sanitary control work. Mr. Reynolds.
- 205f-206w-207s-208su. Veterinary Pathology and Bacteriology. Advanced problems. Specially adapted to meet the needs of graduate students. Offered as major or minor work. Credits to be arranged. Mr. Fitch.

ZOOLOGY (ANIMAL BIOLOGY)

Professors William A. Riley, Royal N. Chapman, Hal Downey, John B. Johnston, Arthur G. Ruggles, Charles P. Sigerfoos; Associate Professor Dwight E. Minnich; Assistant Professors Maynard S. Johnson, Adolph R. Ringoen.

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

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 107s. Protozoology. Lectures, references, and laboratory work on the structure and life histories of Protozoa. Three credits. MWF I, II; 211,213AB. Mr. Sigerfoos.
- 109f,110w,111s. Experimental Zoology. A survey of animal behavior from the physiological viewpoint. Lectures, laboratory, reading. Nine credits. MWF IV; 10AB. Mr. Minnich.
- 117f-118w-119s.† Ecology of Insects. General principles of ecology with special reference to the insects of Minnesota. Lectures, laboratory, assigned reading and field work. Nine credits. TTh VI, VII, VIII; 401AB. Mr. Chapman.
- 120su. Advanced Ecology. Similar to Course 117-118-119 with special field work. Five credits. Ar. 202AB. Mr. Chapman.

- 125f-126w-127s.† Advanced Entomology. Morphology and classification of insects, with lectures on the history of entomology. Nine credits. TThS III, IV; 208AB.
- 139-140.† Histology and Development of Insects. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. Six credits. TTh III, IV and ar.; 208AB. Mr. Riley.
- 144f-145w-146s. Animal Parasites and Parasitism. Lectures and laboratory work. Origin and biological significance of parasitism; the structure, life history, and economic relations of representative parasites. Second term devoted primarily to the relation of insects to diseases of man and animals. Nine credits. WF VI, VII, VIII; 208AB. Mr. Riley.
- 181f-182w† Comparative Embryology. A survey of the principles of animal development dealing with fundamental invertebrate and vertebrate types. Lectures, reference and laboratory work. Six credits. TTh VI, VII, VIII; 201AB. Mr. Ringoen.
- 183.† Genetics and Eugenics. Facts and theories of heredity and the application of the laws governing natural inheritance for the improvement of the race. Three credits. MWF IV; 211AB.
- 197f-198w-199s. Problems. Advanced work in some special line. Nine or 18 credits. Hours and days arranged. Mr. Riley, Mr. Chapman, Mr. Downey, Mr. Johnston, Mr. Sigerfoos, Mr. Minnich.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-204. Research in Entomology. Hours and days arranged. Mr. Riley, Mr. Chapman.
- 205-208. Research in Economic Entomology. Mr. Ruggles, Mr. Graham.
- 209-212. Research in Economic Vertebrate Zoology.
- 217-218-219. Experimental Zoology. Mr. Minnich.
- 229-232. Research in Animal Histology. Mr. Downey.
- 233-236. Research in Vertebrate Connective Tissue with Special Reference to the Cellular Elements. Mr. Downey.
- 237-238. Research in Vertebrate Hematology. Mr. Downey.
- 245-248. Comparative Neurology. A study in the structure and functions of the nervous system of vertebrate animals and of the evolution of the chief nervous mechanisms. Prerequisites: two years in comparative or human anatomy. Mr. Johnston.
- 249-252. Research in Neurology. Mr. Johnston.
- 261-264. Research in Parasitology and Medical Entomology. Mr. Riley.
- 265-268. Research in Insecticides. Mr. Strand.

CHILD WELFARE

- Professor John E. Anderson; Assistant Professors Edith Boyd, Edith D. Dixon, Josephine C. Foster, Florence L. Goodenough.
- 120s. Health Care of the Young Child. Physical care, illnesses, prevention of disease, and health problems of the young child, primarily for nursery school teachers and those in charge of groups of children and for

- parental education workers. Two credits. Sr., grad. by permission of instructor; hrs. ar.; 4CWI. Dr. Boyd.
- 130s. The Development of the Young Child. An advanced course dealing with the development of the pre-school child from the anatomical, physiological, psychological, educational, and social aspects. Lectures, readings in the experimental literature, and reports. Prerequisite: 12 credits in psychology or equivalent, and permission of instructor. Three credits. Sr., grad.; TThS I; IIIOL. Mr. Anderson.
- 133f, 134w, 135s. Observational and Experimental Methods in the Study of the Development of the Young Child. The various methods and techniques such as growth records, mental tests, ratings, controlled observations, etc., used in the experimental study of the young child. Practical exercises and problems on institute records and data will be given. Prerequisite: 10 credits in psychology or educational psychology, including one laboratory course, or the equivalent, and permission of instructor. Four to six credits. Sr., grad.; T I; Th I, II; 201CWI. Miss Goodenough.
- 170f. Parental Education in Child Care and Training. A consideration of the content and methods used in courses and study groups for parents in the care and training of young children. Lectures, discussions, and reports. Prerequisite: 15 credits in education, or psychology or sociology, or preventive medicine. Three credits. Sr., grad.; MWF IV; 110P. Miss Dixon.
- 173w-174s. Technique and Practice of Parental Education. Field work in the technique of organizing and conducting parental study groups and courses for the study of the young child. Prerequisite: C.W.I. 170 and permission of instructor. Six credits. Sr., grad.; hours ar.; 100CWI. Miss Dixon.
- 190f-191w. Mental Examination of Pre-School Children. A study of the methods used in testing young children together with practice in such testing. Prerequisite: Ed. Psy. 143-144-145 or 134-135-136, or equivalent, and permission of instructor. Two or four credits. Sr., grad.; TTh III; 201CWI. Miss Goodenough.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 230-231-232. Seminar in the Development of the Young Child. Reviews of current literature, discussion of fundamental problems, and reports on research. Meetings in alternate weeks. Attendance of graduate students who are candidates for degrees is required. Three credits. Grad. students only; permission of instructor; hrs. ar.; 104CWI. Mr. Anderson.
- 233-234-235. Research in the Development of the Young Child. Credits arranged. Grad. students only. Mr. Anderson.
- 250-251-252. Seminar in Nursery School Education. Reviews and interpretations of current literature, discussion of fundamental problems and theory, problems of administration and organization. Three credits. Grad. students only; permission of instructor; hrs. ar. 105CWI. Mrs. Foster.

Bulletin *of the University of* Minnesota

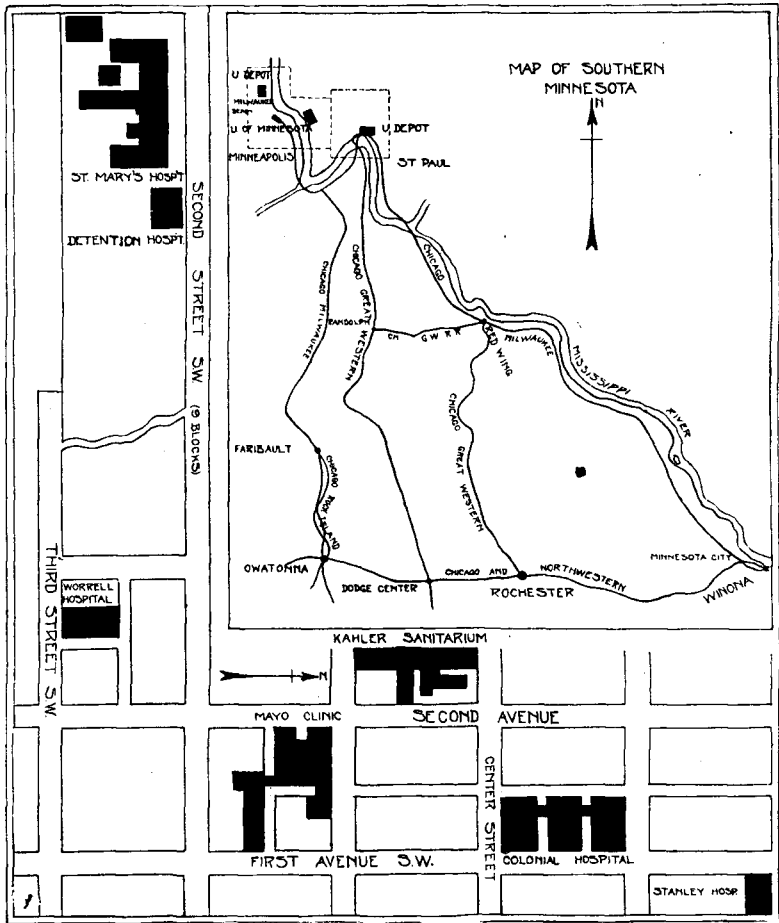
The Graduate School
Announcement of Graduate Work in
Medicine in the Medical School
and the Mayo Foundation
1926-1928



Vol. XXIX No. 50 August 25 1926

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

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



Map of a portion of Rochester showing clinics and hospitals serving the Mayo Foundation for teaching purposes.

1926							1927														
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	2
4	5	6	7	8	9	10	2	3	4	5	6	7	8	3	4	5	6	7	8	9	
11	12	13	14	15	16	17	9	10	11	12	13	14	15	10	11	12	13	14	15	16	
18	19	20	21	22	23	24	16	17	18	19	20	21	22	17	18	19	20	21	22	23	
25	26	27	28	29	30	31	23	24	25	26	27	28	29	24	25	26	27	28	29	30	
..	30	31	31	
AUGUST							FEBRUARY							AUGUST							
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8	9	10	11	12	13	14	6	7	8	9	10	11	12	7	8	9	10	11	12	13	
15	16	17	18	19	20	21	13	14	15	16	17	18	19	14	15	16	17	18	19	20	
22	23	24	25	26	27	28	20	21	22	23	24	25	26	21	22	23	24	25	26	27	
29	30	31	27	28	28	29	30	31	
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SEPTEMBER							MARCH							SEPTEMBER							
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12	13	14	15	16	17	18	13	14	15	16	17	18	19	11	12	13	14	15	16	17	
19	20	21	22	23	24	25	20	21	22	23	24	25	26	18	19	20	21	22	23	24	
26	27	28	29	30	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..	
OCTOBER							APRIL							OCTOBER							
..	..	..	..	..	1	2	..	..	..	..	..	1	2	..	..	..	..	..	..	1
3	4	5	6	7	8	9	3	4	5	6	7	8	9	2	3	4	5	6	7	8	
10	11	12	13	14	15	16	10	11	12	13	14	15	16	9	10	11	12	13	14	15	
17	18	19	20	21	22	23	17	18	19	20	21	22	23	16	17	18	19	20	21	22	
24	25	26	27	28	29	30	24	25	26	27	28	29	30	23	24	25	26	27	28	29	
31	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER							
..	1	2	3	4	5	6	..	1	2	3	4	5	6	7	1	2	3	4	5
7	8	9	10	11	12	13	8	9	10	11	12	13	14	6	7	8	9	10	11	12	
14	15	16	17	18	19	20	15	16	17	18	19	20	21	13	14	15	16	17	18	19	
21	22	23	24	25	26	27	22	23	24	25	26	27	28	20	21	22	23	24	25	26	
28	29	30	29	30	31	27	28	29	30	
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DECEMBER							JUNE							DECEMBER							
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12	13	14	15	16	17	18	12	13	14	15	16	17	18	11	12	13	14	15	16	17	
19	20	21	22	23	24	25	19	20	21	22	23	24	25	18	19	20	21	22	23	24	
26	27	28	29	30	31	..	26	27	28	29	30	25	26	27	28	29	30	31	
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UNIVERSITY CALENDAR

1926-1927

1926			Registration of graduate students
September	20-October 18		Fall quarter begins, 8:30* a.m.
September	27	Monday	Examinations in German and French for candidates for all advanced degrees
October	7	Thursday	Election Day; a holiday
November	2	Tuesday	Armistice Day; a holiday
November	11	Thursday	Last day for filing thesis subject of candidate for the Master's degree
November	20	Saturday	Thanksgiving Day; a holiday
November	25	Thursday	Commencement convocation
December	16	Thursday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	18	Saturday	
1927			
January	3	Monday	Christmas vacation ends, winter quarter begins, 8:30* a.m.
January	13	Thursday	Examinations in German and French for candidates for all advanced degrees
February	12	Saturday	Lincoln's Birthday; a holiday
February	22	Tuesday	Washington's Birthday; a holiday
March	19	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.
March	28	Monday	Spring vacation ends, spring quarter begins, 8:30* a.m.
April	7	Thursday	Examinations in German and French for candidates for all advanced degrees
April	15	Friday	Good Friday; a holiday
May	2	Monday	Last day for filing theses of candidates for all advanced degrees
May	30	Monday	Memorial Day; a holiday
May	28	Saturday	Last day for written examinations for candidates for all advanced degrees
May	31	Tuesday	Last day for oral examinations for candidates for all advanced degrees
June	11	Saturday	Last day for filing bond for publication of Doctor's thesis; last day for depositing binding fee for Master's thesis
June	11	Saturday	Spring quarter closes
June	12	Sunday	Baccalaureate service

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

GRADUATE WORK IN MEDICINE

June	13	Monday	Fifty-fifth annual commencement
June	20	Monday	Summer Session, first term begins, 8 a.m.
July	4	Monday	Independence Day; a holiday
July	15	Friday	Last day for filing thesis of candidates at summer convocation
July	30	Saturday	Summer Session, first term closes
August	1	Monday	Summer Session, second term begins
September	3	Saturday	Summer Session, second term closes

GRADUATE WORK IN MEDICINE

ORGANIZATION

The graduate work in medicine in the Medical School and the Mayo Foundation is a part of the work of the Graduate School of the University. Its management is entrusted by the Board of Regents to a committee composed as follows:

The President of the University, Lotus Delta Coffman, Ph.D., LL.D.
 The Dean of the Graduate School, Guy Stanton Ford, Ph.D.
 The Dean of the Medical School, Elias Potter Lyon, Ph.D., M.D., LL.D.
 The Director of the Mayo Foundation, Louis B. Wilson, M.D.
 Clarence Martin Jackson, M.S., M.D., LL.D., of the Medical School
 Jennings C. Litzenberg, B.S., M.D., F.A.C.S., of the Medical School
 Elexious T. Bell, B.S., M.D., of the Medical School
 Frederic W. Schlutz, B.A., M.D., of the Medical School
 Donald C. Balfour, M.D., of the Mayo Foundation
 William F. Braasch, B.S., M.D., of the Mayo Foundation
 Melvin S. Henderson, M.D., of the Mayo Foundation
 Leonard G. Rowntree, M.D., D.Sc., of the Mayo Foundation

GENERAL INFORMATION

The graduate work in medicine here outlined is not intended for those seeking brief practitioners' or review courses. Opportunities of this kind are to be found in the bulletin of the Medical School.

History.—In the fall of 1914, the University of Minnesota began graduate work in various fields of medicine and surgery in addition to that already offered for some time in the laboratory branches. The conditions laid down for this work as regards admission, residence, thesis, and examinations were those already applied by the Graduate School in approving all candidates for graduate degrees.

The training of medical graduates for special work in pathology, clinical medicine, and surgery by means of internships, residencies, and assistantships had been developed in the Mayo Clinic at Rochester, until in 1912 definite three-year services in these subjects for graduates in medicine, who had previously had one year's internship in a general hospital, were provided. These services were designated "fellowships," a term intended to cover internships, assistantships, residencies, and so forth. In order to perfect the organization and place the work on a permanent basis, February 9, 1915, a corporation, the Mayo Foundation for Medical Education and Research, was founded by William J. and Charles H. Mayo. On June 9, 1915, the University of Minnesota and the Mayo Foundation for Medical Education and Research entered into an agreement, by the terms of which the funds and income of the Mayo Foundation for Medical Education and Research are devoted, under the direction of the regents of the University of Minnesota, to the promotion of graduate work in medicine and to research in this field. The agreement covered a trial period of six years. On September 13, 1917, the funds and income of the Mayo Foundation were transferred entirely to the regents of the University.

Purpose.—In an age of specialization with the development of graduate work in all fields and phases of the sciences, letters, and arts, such educational work needs no elaborate justification. In a subject like medicine, intimately connected with established fields of research such as biology, chemistry, anatomy, physiology, pathology, and bacteriology the need for scientific research and for the training of scientific specialists, investigators, and teachers is as great as in any subject, and of as vital importance.

The possibilities of such work hitherto have suffered less from neglect than they have from the lack of organization, standardization, and certification by the educational institutions which have found it possible and advisable to put such applied subjects as agriculture, education, engineering, and commerce upon a scientific basis, and have freely recognized the accomplishments of trained students by the granting of higher earned degrees in these fields. In medicine in the United States, the leading specialists in practice and the trained productive investigators have usually been developed by long years in internships, minor teaching positions, hospital residencies, or personal apprenticeships to other specialists. A few have obtained their

special training in general practice, gradually narrowing to a particular field. Many men in both groups have broadened themselves by visits to other laboratories and clinics for observation and by longer or shorter periods of foreign study. A much larger body of clinical specialists of varying attainments have been developed by so-called postgraduate or poly-clinic medical courses or by the simple and convenient method of self-proclamation.

Taken as a whole, by such undirected processes graduate students are apt to waste time on unessentials and to acquire very inadequate knowledge of many of the essentials. In clinical branches such processes fail to provide any sure protection to the public against the untrained specialist or to open any avenue to the public's confidence for the properly trained specialist. And medical education, if it is to advance, must at least be able to supplement a faculty of skilled practitioners with men trained to carry forward the frontiers of medical science.

The objects of this graduate work in medicine are accordingly the training for medical practice of fully equipped and properly certified specialists and of investigators and teachers of medicine.

Standards.—In graduate work in medicine the University of Minnesota, in order to secure results and safeguard scientific standards, adopted those general policies and methods already indicated by the established graduate work in other sciences. The development has depended upon the maintenance of real standards of admission; the supply of qualified advisers to graduate students; the provision of adequate laboratory, clinical, and library equipment; and the institution of rigid tests in course and examinations in residence, with evidence of the power of productive research on the part of the student as evidence in a thesis.

In doing this work the University of Minnesota is not seeking to multiply the opportunities for securing simply technical training through practitioners' courses. The graduate work is definitely intended to provide opportunities in three years of work for the well-prepared serious-minded student to fit himself in the science, as well as in the art, of some special field of medicine or surgery. Entrance upon the work and continuance in it, as well as the holding of scholarships or fellowships in the Medical School or on the Mayo Foundation, will be strictly conditioned upon evidences of power and growth along scientific lines. The value of technical or mechanical skill as a practitioner or operator has its place, but will be subordinated to, and measured by, the power and product of the brain that guides the hand. From the standpoint of both the University and the prospective student it is highly important that this distinction in purpose be kept clearly in mind.

By the present arrangement of courses in arts, science, and medicine a properly prepared student may enter the University, and in seven years secure the usual doctorate degree in arts, in science, or in medicine. The object of the plan pursued at this University since 1914 is to provide three years of additional work on the basis of the degree of doctor of medicine,

and leading to the special degree of master of science (M.S.) or doctor of philosophy (Ph.D.) in medicine, in surgery, in pathology, etc.

In clinical branches the degree of master of science is intended primarily to indicate scientific proficiency. To be recommended for this degree the candidate must have given evidence by two or three years of residence that he is competent to begin the practice of a clinical specialty in a scientific manner without the supervision of others. The doctorate of philosophy in clinical subjects will be given only to those men who have given evidence not only of proficiency at least equal to that required for the Master's degree, but who in addition present evidence of well-marked ability to advance medical science.

Work in public health.—By the choice of appropriate studies students may prepare themselves to follow various careers in public health work. Graduate students with the proper qualification may prepare themselves to serve as specialists in certain fields of public health work or they may procure a thoro general training with a certain amount of practical experience in public health.

Such undergraduate and graduate students as satisfactorily fulfill the requirements of the University will be granted appropriate degrees.

Further inquiries concerning the above mentioned courses and curricula should be addressed to Dr. H. S. Diehl, Millard Hall, University of Minnesota.

Laboratory equipment.—The laboratory equipment for the prosecution of graduate work in medicine is located in Minneapolis, St. Paul, Rochester, and Pokegama.

The laboratory branches are well housed in excellently equipped buildings on the campus at Minneapolis and at Rochester. Anatomy, chemistry, pathology, and bacteriology are in modern university buildings especially designed for them. Physiology, physiologic chemistry, and pharmacology are located in Millard Hall, a modern building of the best type. The laboratories for experimental medicine and surgery and extensive animal quarters are also in this building. The University museums of anatomy, pathology, and surgery contain a large number of specimens available for teaching purposes.

In Rochester, the laboratories of general pathology, pathologic anatomy, clinical pathology and bacteriology, physiologic chemistry, roentgenology, photography are in the Mayo Clinic Building, as is also the pathologic working museum, which contains over 150,000 specimens. The Institute of Experimental Medicine provides facilities for all experimental work in physiology, pathology, bacteriology, and surgery.

Laboratories of surgical pathology are at St. Mary's, Colonial, Worrell, and Kahler hospitals. The metabolic laboratory is at the Kahler Hospital. Electrocardiographic laboratories are maintained in the Clinic Building and in the Kahler Hospital. A laboratory of physiologic chemistry is at St. Mary's Hospital. A farm for experimental animals is maintained outside the city.

Clinical equipment.—The University owns and controls Elliot Memorial Hospital with its service building. This provides a clinic of 293 beds, and has the accumulated hospital records of twelve years. Nearly 100 beds were added in 1925 by the completion of the George Chase Christian Memorial Cancer Institute and the Todd Memorial Hospital. The Out-Patient Department of the hospital is housed in Millard Hall and received 15,334 new patients and 62,763 patients' visits during the year ending June 30, 1925.

The State Hospital for the Crippled and Deformed at Phalen Park, St. Paul, offers the University full participation in its clinical opportunities.

The city hospitals of Minneapolis and the City and County Hospital of St. Paul, representing in all some 1,400 beds, exhibit every phase of clinical service in their wards and amphitheatres. This material, and also that of the new Miller Hospital, St. Paul, is available for graduate work.

In Rochester St. Mary's, Colonial, Worrell, Curie, Alfred, and Kahler hospitals and the Damon Sanitarium have an aggregate of about 1,500 beds with twelve operating rooms for general surgery and six for diseases of the organs of the special senses. All patients are examined clinically in the Mayo Clinic Building and its annexes. In 1925, 66,959 patients were examined. In addition more than 535,000 clinical histories are on file and available for investigative studies. During 1925, 25,866 operations were performed.

Consent for post-mortems is obtained with about 85 per cent of patients dying in the clinic.

The working museum contains more than 230,000 pathologic specimens. All case histories and specimens are classified and arranged so as to be readily available for scientific research.

Arrangements have been made whereby fellows or other graduate students in medicine may divide their time, part of their work being taken in the Mayo Foundation at Rochester, and part in the Medical School at Minneapolis and St. Paul.

Libraries.—Besides the University Library and the departmental libraries, there are at the disposal of the student the general medical and biological libraries in the new University Library and the Mayo Clinic Building, and the collections of the Hennepin County and Ramsey County Medical Societies. Current issues and complete files of the most important medical periodicals are available either in Minneapolis or Rochester.

Methods of study.—Every attempt is being made to establish the graduate work in medicine on a true university basis. Little class work is done. No short cramming courses are offered. The Mayo Foundation lectures at Rochester and frequent special lectures at the Medical School, are given by men who are enthusiastically interested in their particular topics, but each lecturer presumes that his hearers are already well grounded in the fundamentals of his subject. Attendance at these lectures is purely optional with the graduate student. No quizzes are held and no examinations are given on these lectures. The same is true of the clinical and laboratory demonstrations and departmental seminars. Everything is done to impress

the graduate student that his residence is an opportunity for him to find out things for himself and not a period in which he will be instructed by undergraduate methods. The student's work is carefully graded by his immediate chief, whose duty it is to determine the student's ability by daily intercourse with a smaller number of students rather than by class quizzes and formal examinations. Students holding fellowships who do not evince strong personal initiative will not be recommended for annual reappointment, or may be asked to resign their fellowships before the end of their period of appointment. In the arrangement of work the best opportunities will be consistently given to the best qualified men. Low grade and mediocre men will not be permitted to continue to fill appointments to the exclusion of high grade men. Work which receives a grade below B will not be counted for graduate credit in the major field, nor if below C in the minor.

Registration and number of students.—All students entering upon graduate work in medicine will register with the dean of the Graduate School. Students who begin their residence work in Rochester may fulfill the preliminary requirements by registering there with the director of the Mayo Foundation.

The number of graduate students who will be registered for work is determined by the clinical opportunities. This limitation applies to those doing their major work in clinical medicine and surgery and not to those majoring in the laboratory departments.

Tuition.—The tuition fee for the graduate work in clinical medicine and surgery for those not holders of fellowships or otherwise entitled to exemption is \$60 per quarter. For students in the fundamental laboratory branches, the tuition fee is \$10 per quarter. Extra fees may be charged to cover the cost of materials and supplies for exceptional laboratory experimentation. The fees for graduate work in the Summer Session are stated in the special summer session bulletin. Fellows, scholars, and members of the teaching or scientific staff are exempt from tuition.

Fellowships and scholarships.—Teaching fellowships in the Medical School are now established as follows: in surgery, 2; in internal medicine, 2; in obstetrics, 2; in ophthalmology and oto-laryngology, 2; in mental and nervous diseases, 2; and in pediatrics, 3. These include fellowships in the Minneapolis General Hospital. Three fellowships are also available in the University Health Service. They carry a stipend of \$800 the first year, \$900 the second, and \$1,000 the third. These teaching fellows are required to devote their entire time (excepting an annual vacation of three weeks) to graduate work, including a small amount of teaching.

Similar teaching fellowships have been established in the fundamental laboratory department of the Medical School as follows: in anatomy (including histology and embryology), 3; in physiology and physiologic chemistry, 1; in pathology, 1; in pharmacology, 1. These fellowships carry a stipend of \$900 the first year, \$1,200 the second, and \$1,500 the third year. They require a small amount of teaching, the remainder of the time being devoted to graduate work leading to advanced degrees.

In addition, there are at Minneapolis 5 scholarships without stipend, carrying free tuition with opportunity for graduate study in any of the clinical departments.

The attention of prospective medical graduate students is also called to the Shevlin Fellowship in medicine yielding \$500 and tuition. Applications should be in the hands of the dean of the Graduate School before March 1.

The Mayo Foundation carries the following basic and clinical fellowships: in clinical and experimental surgery, 22; in orthopedic surgery, 6; in ophthalmology, 4; in rhinology and oto-laryngology, 12; in dental surgery, 6; in clinical and experimental medicine, 45; in neurology, 4; in dermatology, 4; in urology, 6; in roentgenology, 4; in pathology, 4; in bacteriology, 2; in chemistry, 2. The fellowships in clinical branches pay \$800 the first year, \$900 the second year, and \$1,000 the third year. The fellowships in pre-clinical branches pay \$900 the first year, \$1,200 the second year, and \$1,500 the third year. They require full time with an annual vacation of two weeks. During residence in a hospital \$25 per month is deducted from the stipend for board and room.

The Mayo Foundation offers a limited number of fellowships in clinical investigation.

These fellowships are specially planned for students who wish to utilize in teaching, research, or practice the advantages derived from thoro study of problems involving prolonged work in pre-clinical sciences. Fellows may spend one, two, or more years in laboratories of the fundamental departments. During this time they may devote their efforts to any type of problem with or without clinical bearing. At least one year is spent in the clinical laboratories of medicine, surgery, or the specialties to emphasize the practical application of research. Clinical contacts are maintained by means of ward rounds, conferences, and seminars. Direct clinical responsibility is arranged when it is necessary for the carrying on of an investigation. The close correlation between the activities of the laboratories and of the clinical services offers unique facilities for such graduate clinical investigation.

The stipends for these fellowships are the same as for those in the basic medical sciences while the fellow is at work in those fields and the same as those in clinical fields while the fellow is at work in those fields.

Nominations for fellowships on the Mayo Foundation are made each quarter, beginning with October 1, for residence to begin three to six months later or as vacancies occur. Each applicant is notified of his nomination immediately after it is made and his acceptance or rejection thereof requested. In the Medical School appointments are made as vacancies occur.

The Miller Hospital Clinic, St. Paul, supports four clinical fellowships, one each in surgery, medicine, ophthalmology and oto-laryngology, and obstetrics and gynecology. Appointments are made as vacancies occur. Apply through the Graduate School.

All appointments are made for one year and are renewable annually for a period of three years upon the basis of satisfactory progress in the work pursued. Requests for blanks for application for fellowships and scholarships should be addressed to the dean of the Graduate School, University of Minnesota, Minneapolis, Minnesota, or to the director of the Mayo Foundation, Rochester, Minnesota.

Assistantships.—A few qualified assistants, such as traveling fellows from other universities, officers of the medical corps of the United States Army, Navy, or Public Health Service, et al., designated as special students and not candidates for degrees, may be accepted at Rochester in laboratory and clinical branches for short periods. The number is necessarily limited in order not to interfere with the work of the resident fellows. Correspondence concerning this work should be directed to the director of the Mayo Foundation, Rochester, Minnesota.

Several of the departments in the Medical School (including Anatomy, Physiology, and Pathology) have paid assistantships which may furnish means of self-support while the holder is pursuing graduate work. For further information, address the dean of the Medical School.

Clinical and class work for visiting or resident practitioners.—In order that there may be no misunderstanding, it should be stated that the graduate work for a limited number, described above, in no way changes or modifies the opportunities for observation hitherto extended visiting physicians and surgeons by the Mayo Clinic in Rochester, or the arrangements offered in Minneapolis by the Medical School for practitioners who wish to attend such undergraduate medical classes as may be of profit to them without interfering with the regular work of the staff and students of the Medical School. Inquiries concerning these opportunities should be addressed to the dean of the Medical School, Millard Hall, Minneapolis, Minnesota.

Summary of requirements.—The various steps involved in the requirements for the degree of doctor of philosophy (Ph.D.) in any one of the clinical or laboratory departments are briefly summarized on pages 17 and 18. The requirements for the Master's degree (M.A. or M.S.) are also indicated. Further information concerning graduate work in general may be found in the general Graduate School bulletin.

Requirements for advanced degrees in medicine.—1. Selection. In the selection of graduate medical students, and in making appointments to fellowships for medical graduate work, preference will be given, other things being equal, to students who have an unusually good training in the fundamental medical sciences (i.e., anatomy, physiology, pathology, etc.) through which they should make their approach to the specialty which they wish to take as a major subject. Personal interviews with applicants are desirable.

2. Admission. All graduate students are admitted by the dean of the Graduate School. Entrance upon work for the advanced degrees of master of science (M.S.) or doctor of philosophy (Ph.D.) in the clinical departments of medicine is limited to those who have: (a) the Bachelor's degree

in arts or science or its equivalent;* (b) the degree of doctor of medicine from acceptable institutions (i.e., those in Class A of the American Medical Association); and (c) one year's experience as an interne in an approved hospital or as an assistant in a laboratory in an acceptable medical school. In the fundamental laboratory sciences (anatomy, physiology, bacteriology, pathology, and pharmacology) properly prepared students may be admitted without (b) and (c) as candidates for the Master's degree (M.A. or M.S.) or the Doctor's degree (Ph.D.).

Applicants to be considered for fellowships are expected to read and speak English fluently. Fellows in the Mayo Foundation must pass a satisfactory physical examination including X-ray of the chest after nomination and before being finally accepted.

3. Licensure. Graduate students working in any field of clinical medicine must be licensed to practice in Minnesota within six months after beginning their work in either the Medical School or the Mayo Foundation.

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

The study program for the entire three years must be submitted at the beginning of the second year. This program requires approval of the student's adviser, by the dean, and by the Medical Group Committee.

Sufficient research work to train properly the fellow in the principles and methods of scientific investigation and to form the basis of an acceptable thesis is required.

4. Residence. For the Doctor's degree (Ph.D.) at least three full years of successful graduate study are required, including certain special requirements noted below. For the Master's degree (M.S.) in clinical subjects, two or three years are required. For the Master's degree in the laboratory sciences a minimum of one year of residence is required.

5. Language requirements. A reading knowledge of French and German in the field of the candidate's major must be certified by the professors in charge of these languages at least one year before the Doctor's degree is conferred, and before admission to the preliminary examination. The candidate's adviser or his representative is expected to attend this examination and to furnish appropriate literature for the test. For the Master's degree in the laboratory sciences, a reading knowledge of one foreign language is also required, which must be certified before the end of the second quarter of the year in which the candidate expects to present himself for the degree. For the Master's degree (M.S.) in the clinical branches, the language certificate is optional.

6. Minor. With the approval of his adviser and the dean of the Graduate School, each student upon entrance selects a minor, which must be logically related to his major subject, and (for the Doctor's degree)

* Students who have completed at least two years of pre-medical collegiate work, making an equivalent of the seven years combined Arts-Medicine Course at the University of Minnesota, are eligible for admission as graduate students.

must be completed by the end of the second year. The minor is preferably a laboratory subject in some other department, and should amount to not less than one sixth of the total work for the degree. At least one sixth of the work offered for the degree in a clinical subject should consist of graduate work in the fundamental laboratory branches, which will serve as a basis for the proposed clinical specialization. This fundamental work should be concentrated in the first part of the course so far as possible. The final examination in the minor for the Doctor's degree is included in the preliminary examination, as noted below. For the Master's degree no special examination is required in the minor, aside from the usual course examinations.

7. Major. The major is that department in which the student desires to specialize. Together with the thesis, it should occupy at least two thirds of the total work for the degree. At least one year before attaining the Doctor's degree, the following procedure is required in order that the candidate may become eligible for the preliminary examination. In addition to the completion of the minor work and of the language requirement, he must have the written approval of the department committee (which includes the graduate faculty members) of the major subject. The statement of the department committee should include the subject of the special problem for the thesis, and should certify as to the ability of the candidate to meet all requirements for the degree sought. It should be based on the quality of the candidate's daily work in residence.

8. Certificate of proficiency. Each candidate in a clinical field must have a certificate of proficiency signed by all members of the faculty with whom he has served, stating that in their opinion he is competent to begin the practice of medicine in his major field in a scientific manner without the supervision of others.

9. Admission to candidacy. For the Master's degree, students who have met the language requirement, whose daily work in residence as indicated by quarterly grades has been satisfactory, and whose thesis subject has been properly approved, are admitted to candidacy at the end of the second quarter by vote of the Executive Committee of the Graduate School. For the Doctor's degree, the student is required to pass a preliminary examination, as noted below, before admission to candidacy.

10. Preliminary examination. At least one calendar year before the Doctor's degree is conferred, a preliminary examination of the student shall be given by a committee appointed by the dean and including the student's adviser as chairman, a representative of the Medical Graduate Committee (other than the adviser), the head of his major department, a representative of the minor, and such additional members as the dean may consider necessary. Certificates of proficiency in French and German, completion of the minor work, and the recommendation of the major department shall be required before admission to this examination. The examination is in addition to the usual course examinations. It shall cover the graduate work previously taken by the student, *and may include any work fundamental thereto*. The field of the candidate's specialization and the thesis are reserved for the final examination. The examination is

both oral and written, the latter being arranged by faculty representatives from both Minneapolis and Rochester. Only after the successful completion of this examination may the student be enrolled as a candidate for the Doctor's degree. Students failing to pass this preliminary examination shall not be re-examined until at least one quarter has passed.

11. Thesis. Each candidate for an advanced degree (Master's or Doctor's) must submit a thesis. For the Master's degree the subject of the thesis should be filed with the dean of the Graduate School by November 15. The subject must be approved by the adviser and by the Medical Graduate Committee. The topic should be within the field of the major, and the thesis should represent approximately half of a year's work of the student. The thesis must be written in acceptable English. It must show ability to work independently and give evidence of power of independent thought both in perceiving problems and in making satisfactory progress toward their solution. Familiarity with the bibliography of the special field and correct citation of authorities are expected.

The Master's thesis must be typewritten in triplicate, one copy on a special form of linen stock, the other two as carbon copies. Samples of the paper required should be examined in the dean's office. The three copies of the thesis must be filed in the dean's office not later than six weeks before graduation. The thesis will be examined by a committee appointed by the dean on recommendation of the Medical Graduate Committee. Unanimous approval by the thesis committee is necessary for the acceptance of the thesis. If the thesis is accepted, the candidate must deposit with the registrar, at least one week before commencement, the sum of \$1.50 for binding one copy of the thesis, which will be cataloged and deposited in the University Library. An additional copy of the thesis is deposited in the Library for loan purposes.

For the Doctor's degree, a more elaborate thesis is required. The subject is to be stated in the written department recommendation, which precedes the preliminary examination at the end of the second year. The accumulation of material for the thesis should be started much earlier. The thesis must give evidence of originality and power of independent investigation. It must embody results of research forming a real contribution to knowledge and must exhibit a mastery of the literature of the subject and a familiarity of the sources of knowledge. The matter must be presented with a fair degree of literary skill. The kind of work required in theses for advanced degrees in medicine is exemplified in the volume, *Papers from the Mayo Foundation and the Medical School*, published by W. B. Saunders Company, Philadelphia, 1921 and 1923.

The thesis must be typewritten in triplicate, to facilitate reading by the thesis committee. The three copies must be filed in the dean's office not later than six weeks before graduation together with a summary or abstract. The dean will appoint a thesis committee with the student's adviser as chairman. Unanimous approval by this committee will be necessary for the acceptance of the thesis. If the thesis is accepted, the candidate must deposit with the registrar, not later than one week before commencement, a sufficient bond to cover the costs of printing as laid down in the

regulations adopted June 12, 1922. A copy of these regulations will be furnished on request.

12. Final written examination. In addition to the usual course examinations in all subjects where such are given, the candidate for the Master's degree must pass a final written examination in the field of the major. (No *special* final examination is required in the minor.) The final written examination will be held not later than four weeks before commencement. It is given by the members of the graduate faculty in the major department, the adviser acting as chairman. This examination shall cover all the work done in the major, and may include any work fundamental thereto.

For the Doctor's degree, a final written examination in the major subject is similarly given, after the thesis is presented and at least four weeks before commencement.

13. Final oral examination. If all other requirements for the degree have been met, including the final written examination and the acceptance of the thesis, the final oral examination will be held not less than two weeks before commencement.

For the Master's degree, the adviser will act as chairman of the examining committee, which will include all the instructors with whom the student has taken work, the thesis committee and, ex-officio, the head or chairman of the department in which the major work is done. Any member of the graduate faculty may attend as a visitor, and written notice shall be sent by the chairman of the committee to all members of the graduate faculty in the major and minor departments. The final oral examination will cover all the work offered for the degree, and may include other work fundamental thereto. All final examinations for the higher degrees in medicine will include questions on the history of medicine with special reference to the candidate's major field. At the close of the examination, the committee will vote upon the candidate, taking into account all of his work. A majority vote is required for approval.

For the Doctor's degree, the committee conducting the final oral examination will consist of the adviser as chairman, of a majority of the members of the graduate faculty in the major department, and of at least three other members of the graduate faculty appointed by the dean. At least one member of this committee shall be from a group other than the one in which the major department is included. This examination is to cover the special field of knowledge represented by the major work, including the thesis problem, and shall not exceed three hours. The date of the final oral examination for the doctorate shall be publicly announced, and the examination shall be open to any member of the graduate faculty. Upon completion of the examination, a formal vote of the committee shall be taken and an affirmative vote of at least two thirds of the members shall be necessary for recommendation of the candidate for the degree.

14. Recommendation by the faculty. The dean will report to the graduate faculty the names of those who have completed the requirements for the Master's and Doctor's degrees, and those duly approved will be recommended by the faculty to the Board of Regents of the University. Unless excused by the dean of the Graduate School and the president of the Uni-

versity, all candidates are required to be present at commencement when the degrees are conferred.

A tabular summary of requirements for the Master's degree follows:

WORK	UNDER THE DIRECTION OF	DATE
Program, major and minor	Adviser and dean of the Graduate School	On entrance.
Approval of thesis subject	Adviser and group committee	November 15.
Language requirement....	Adviser and language department	Before close of second quarter.
Approval of candidacy....	Executive committee	Beginning of third quarter.
Filing of thesis.....	Dean of the Graduate School	Six weeks before graduation.
Examination of thesis....	Thesis committee	Before admission to final oral examination.
Final written examination in major.....	Major department members of the graduate faculty...	Not later than four weeks before commencement and before final oral.
Final oral examination on all work.....	Thesis committee; all instructors; head of major department	Not later than two weeks before commencement.
(Course examinations as required at the usual time.)		
Fee for binding thesis....	Registrar	One week before commencement.

(For the Master's degree in clinical subjects, the dates refer to the last year.)

See tabular summary of requirements for the Doctor's degree below.

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

DESCRIPTION OF COURSES

The various divisions are grouped under the following departments:

1. Anatomy (including histology and embryology).
2. Biophysics.
3. Physiology and Physiologic Chemistry.
4. Pharmacology and Therapeutics.
5. Pathology.
6. Bacteriology and Immunology.
7. Medicine (including general medicine, dermatology, and mental and nervous diseases).
8. Pediatrics.
9. Surgery (including general surgery, experimental surgery, orthopedic surgery, urology, and dental surgery).
10. Obstetrics and Gynecology.
11. Ophthalmology and Oto-Laryngology.
12. Radiology.
13. Preventive Medicine and Public Health.

In each department the work is described in two separate groups: A—that given in the Medical School, and B—that given in the Mayo Foundation. All courses are numbered for purposes of registration. The courses given in the Mayo Foundation are given the special prefix M. The suffixed f, w, s, and su indicate fall, winter, spring, and summer quarters, respectively. The hyphen denotes courses continuous through the quarters indicated. Suffixed letters separated by commas indicate the repetition of the course in the corresponding quarters. The courses numbered between 100 and 200 are less advanced in character, and in some cases are open as electives to properly qualified undergraduates. The courses above 200 are primarily graduate in character, of the more advanced or research type.

ANATOMY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Clarence M. Jackson, M.S., M.D., LL.D., John B. Johnston, Ph.D., Thomas G. Lee, B.S., M.D., Andrew T. Rasmussen, Ph.D., Richard E. Scammon, Ph.D.

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

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

ing in clinical subjects who desire a minor in anatomy must have had the courses in anatomy usually required of medical students (including Courses 103, 107, and 111). A reading knowledge of either French or German is required of students who desire a major in anatomy for the Master's degree, and a reading knowledge of both French and German is required of those who are candidates for the Doctor's degree.

Courses for Undergraduate and Graduate Students

- 103s,su. Human Histology. A microscopic study of the various tissues and organs. Prerequisites: Anatomy 5-6, or equivalent. 9 credits. Dr. Rasmussen.
- 107s,su. Human Embryology. The development of the human body. Prerequisites: Anatomy 5-6, or equivalent. 6 credits. Dr. Scammon.
- 111s,su. Human Neurology. A study of the gross and microscopic structure of the central nervous system and sense organs of man. Prerequisites: Anatomy 103 and 107, or Animal Biology 9-10. 6 credits. Dr. Rasmussen.
- 115w. History of Anatomy. Prerequisite, Anatomy 5-6. 1 credit. Mr. Miller.
- 121f,s. Anatomical Technique. Lectures and laboratory work upon the principles and practice of microtechnique. Prerequisites: Anatomy 103, or Animal Biology 9-10. 3 credits. Dr. Lee.
- 129f-130w-131s. Topographic Anatomy. Based upon a study of cross sections of the human body. Lectures and laboratory work. Prerequisites: Anatomy 5-6-7. 2 credits (or more) each quarter. Dr. Jackson.
- 133f,su. Anatomy of the Fetus and Child. A survey of prenatal and postnatal development. Fourth, fifth, or sixth year medical, or graduate students. Limited to sixteen students. Prerequisites: Courses 5-6-7, 107. 3 credits. Dr. Scammon.
- 134w. Anatomy of the New-Born. A detailed laboratory study of the anatomy of the new-born. Fourth, fifth, or sixth year medical, or graduate students. Prerequisites: Course 133, or equivalent. 3 credits. Dr. Scammon.
- 135f,su. Physical Development of Childhood. Lectures, with study of illustrative material. Primarily for students in the College of Education; open to medical or graduate students by permission of instructor. 2 credits. Dr. Scammon.
- 137f-138w-139s-140su. Implantation and Placentation. A study of the implantation of the ovum, the formation of the placenta, and the earliest stages of development in man and mammals. Prerequisites: Anatomy 102 or equivalent. 3 credits (or less). Dr. Lee.
- 149w. Experimental Neurology. A study of the morphology of the central nervous system by experimental methods. Prerequisites: Course 111. 3 credits (or more). Dr. Rasmussen.
- 150w. Seminar in Neurology. Largely conferences upon assigned reading. Prerequisite: Anatomy 111. Hours and credits to be arranged. Dr. Rasmussen.

- 152s. Morphology and Significance of the Endocrine System. Prerequisites: Anatomy 103 and 107. Hours and credits to be arranged. Dr. Rasmussen.
- 153f-154w-155s-156su. 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. Special courses are arranged for clinical graduate students. Dr. Jackson, Mr. Johnston, Dr. Lee, Dr. Rasmussen, Dr. Scammon.
- 157w. Developmental Anatomy of the Head. 3 credits. Dr. Scammon.
- 160f-162w-163su. Seminar in Growth of Children. A study with graphic analysis of data on physical development of children of school age. Prerequisites: Course 135, or equivalent. Hours and credits to be arranged. Dr. Scammon.

Courses Primarily for Graduate Students

- 201f-202w-203s-204su. Research in Anatomy. Qualified students may undertake the investigation of problems in anatomy, including histology, embryology, and neurology. Special facilities are offered to graduate students in the clinical departments for work upon problems in applied anatomy. Dr. Jackson, Mr. Johnston, Dr. Lee, Dr. Rasmussen, Dr. Scammon.
- 205f-206w-207s. Anatomical Seminar. Reviews of the current literature and discussion of research work being carried on in the department. Reading knowledge of French and German required. Dr. Jackson.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

As yet no facilities are provided for advanced work in anatomy in the Mayo Foundation. Mayo Foundation fellows desiring to take such work for one or more quarters may avail themselves of the opportunities at the Medical School.

Limited facilities for dissection under the supervision of Dr. Thomas Byrd Magath are provided in the Mayo Foundation for fellows who desire a general review of anatomy.

BIOPHYSICS

WORK IN THE MEDICAL SCHOOL

Biophysics is a rather new field in medicine. It undoubtedly will develop rapidly in much the same way as biochemistry. The courses which are now offered in this field have been listed under Radiology as these courses are indispensable for those who wish to specialize in this branch of medicine. Other courses in biophysics will probably soon be offered in the Medical School, but they cannot be outlined until the laboratory has been equipped. Graduates who desire to specialize in biophysics may begin with the courses registered under Radiology and will soon have the opportunity to work with some research problem in the new laboratory which now is under construction in the Cancer Institute.

COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

Professor Charles Sheard, Ph.D.; Assistant Professors Edward J. Baldes, Ph.D.; John M. Ort, Ph.D.

The usual courses in Physiologic Optics and the Physics of Sound are listed under the Courses of Instruction in Ophthalmology and Oto-Laryngology and Rhinology.

RESEARCH

Opportunities are also offered for graduate work in biophysics in the Mayo Foundation. There are numerous problems suitable for the Master's degree. These researches are, in general, undertaken by the department in co-operation with various clinical and experimental sections of the Foundation. In addition to these, advanced work looking toward the doctorate is offered in the department of biophysics to one or two well-prepared fellows.

Biophysics. Research in physical measurements on structure and functioning of cells and tissues.

M251f,w,s,su. Spectroscopic, spectrophotometric, and polariscopic measurements; effects of radiant energy; ultramicroscopic and ultraviolet microscopic studies. Dr. Sheard.

M252f,w,s,su. Colloidal physics; oxidation and reduction potentials; membrane potentials; conductivity measurements. Dr. Ort.

M253f,w,s,su. Physical properties of the blood; surface tension, interfacial and viscosity measurements; blood gas analyses. Dr. Baldes.

M254f,w,s,su. Applications of audio frequency amplification to physiological problems. Dr. Baldes.

PHYSIOLOGY AND PHYSIOLOGIC CHEMISTRY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professors Elias P. Lyon, Ph.D., M.D., Jesse F. McClendon, Ph.D., Frederick H. Scott, Ph.D., M.B., D.Sc.; Associate Professor Chauncey J. V. Pettibone, Ph.D.; Assistant Professors Esther Greisheimer, Ph.D., M.D., Maurice Visscher Ph.D.; Instructor Joseph King, M.S., M.D.

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

For a minor or major in physiology, good courses in general zoology, general chemistry, organic chemistry, and college physics, are prerequisites. Physical chemistry is desirable.

For a minor or major in physiologic chemistry, physics, general chemistry and organic chemistry are prerequisite, and physical chemistry, quantitative chemistry, and biology are desirable.

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

Students majoring in clinical subjects, and who desire a minor in physiology or physiologic chemistry, must have had the courses in these branches usually required of medical students.

A reading knowledge of German or French is required of candidates for the Master's degree in this department, and reading knowledge of both French and German, of candidates for the Doctor's degree.

100w,su-101s,su. Physiologic Chemistry. The components of the animal body; foods, digestion, the excreta, and metabolism. Prerequisite: organic chemistry. 198 hours; 12 credits. Dr. McClendon, Dr. Pettibone.

103su,f. Physiology of Muscle, Nerve, Blood, Circulation, Respiration, Digestion. Fourth year medical students and others. Prerequisites: organic chemistry and animal biology. 154 hours; 9 credits. Dr. Scott, Dr. Lyon, Dr. Greisheimer, Dr. Visscher, and assistants.

104w,su. Physiology of the Nervous System and Special Senses, Metabolism, Nutrition, and Excretion. Fourth year medical students and others. Prerequisites: Course 103 or organic chemistry and neurology. 88 hours; 7 credits. Dr. Scott, Dr. Lyon, Dr. Greisheimer, Dr. Visscher, and assistants.

ELECTIVE COURSES

108f. Seminar in Physiologic Optics. For graduate and medical students. Prerequisite: Course 104 or equivalent. 22 hours; 2 credits. Dr. Lyon.

109w. Seminar in Physiology of the Senses. For graduate and medical students. Prerequisite: Course 104 or equivalent. 11 hours; 1 credit. Dr. Lyon.

113su,f,w,s. Problems in Physiology. Arranged by instructors with qualified students. Each student will be assigned a topic for special laboratory study, leading in some cases to original investigation. Conferences and reading. May be taken one or more quarters. Prerequisites: Courses 103, 104, or equivalent. 66 hours; 3 credits each quarter or arranged. Dr. Scott, Dr. Greisheimer or Dr. Visscher.

114w-115s. Applied Physiology. The application of physiology to the interpretation of symptoms and signs of abnormal function. Prerequisite: Courses 103, 104, or equivalent. 3 credits each quarter. Dr. Greisheimer.

131w. Advanced Physiology of Muscle, Blood, Circulation, and Digestion. Alterations due to physiologic conditions. Conference and laboratory work. Prerequisite: Physiology 103. 66 hours; 3 credits. Dr. Scott.

135f,w,s. Conference on Physiology, with qualified students. 11 hours; 1 credit. Dr. Scott.

153f,w,s,su. Problems in Physiologic Chemistry. Special work arranged by instructors with qualified students. May be taken one or more quarters. Prerequisite: Course 100-101. Hours and credits arranged. Dr. McClendon or Dr. Pettibone.

155f,156w,157s. Pathological Chemistry. Blood chemistry of diabetes and nephritis. Basal metabolism, deficiency diseases. Prerequisite: Courses

- 100-101. 66 hours, 3 credits each quarter. Dr. McClendon (with co-operation of Dr. Fahr).
- 163w. Metabolism. Lectures and laboratory work on special phases of metabolism. Prerequisite: Physiology 101. Lectures may be taken alone; number of students unlimited. 22 hours; 2 credits. Laboratory course limited to ten students. 33 hours; 1 credit. Dr. Pettibone.
- 201f,w,s. Seminar in Physiology and Pharmacology. For instructors and advanced students. 11 hours; 1 credit. Dr. Scott, Dr. Hirschfelder, and staff.
- 203f,w,s,su. Research in Physiology. Hours and credits arranged. Dr. Scott, Dr. Lyon Dr. Greisheimer, Dr. Visscher.
- 205f,w,s,su. Research in Physiologic Chemistry. Hours and credits arranged. Dr. McClendon, Dr. Pettibone.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professor Edward C. Kendall, Ph.D.; Instructors A. E. Osterberg, Ph.D., Edgar J. W. Witzemann, Ph.D.

Most of the opportunities for graduate work in physiologic chemistry in the Mayo Foundation are in connection with the departments of Medicine, Pediatrics, and Clinical Pathology, for which see announcements under these several departments. In addition to these, advanced work is offered in the Department of Biochemistry to a limited number of well-prepared fellows.

- M251f,w,s,su. Physiologic Chemistry. Research work in problems related to metabolism; includes training in the use of methods of organic and inorganic analysis. Dr. Kendall, Dr. Osterberg, Dr. Witzemann.
- M263f,w,s,su. Medical Chemistry. Chemical and metabolic studies (in nephritis, acidosis, diseases of the liver and of the blood) together with research work along biochemical and metabolic lines. Dr. Rowntree, Dr. Keith. (See Department of Medicine.)
- M254f,w,s,su. Medical Chemistry. Chemical and metabolic studies in diabetes, together with research work along biochemical lines. Dr. Wilder. (See Department of Medicine.)
- M255f,w,s,su. In connection with various medical departments, special courses in biochemistry may be taken—(a) In the metabolic laboratory at the Kahler Hospital. (b) In the clinical chemical laboratories at the clinic. (c) In the medical laboratory at St. Mary's Hospital.

PHARMACOLOGY AND THERAPEUTICS

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Arthur D. Hirschfelder, B.S., M.D.; Associate Professor Edgar D. Brown, Phm.D., M.D.

The laboratories of the Department of Pharmacology are excellently equipped for the study of both the chemical properties of drugs and their actions upon the functions of the living organs and tissues. They are well

equipped with chemical apparatus for the synthesis of new medicinal compounds, for studies upon the detection, isolation, and estimation of poisons in toxicology and for the isolation of medicinal plant constituents. By the co-operation of the clinical departments, special studies may be made of the action of drugs, old and new, upon patients in the University and allied hospitals.

Opportunities are afforded for the special study of the actions of drugs which are used in each of the clinical specialties and the literature bearing upon them. As the needs of each graduate student are individual in this regard, these studies are taken up by conference, seminar, and experiments specially devised to meet each case.

- 101w. Introduction to Pharmacology. The principles underlying the structure, physicochemical properties, physiologic, therapeutic, and toxic action of substances, natural or synthetic, used as medicines. At least one quarter of physiology is prerequisite. 22 hours; 2 credits. Dr. Hirschfelder, Dr. Brown.
- 102s. General Pharmacology. A study of the most important drugs used in medicine with consideration of their chemical properties, actions on the normal and abnormal body, modes of administration, preparations, dosages, etc. 132 hours; 6 credits. Dr. Hirschfelder, Dr. Brown.
- 105su,w. General Pharmacology, in continuation. Lectures on narcotic, saporific, analgesic, antipyretic drugs, remedies used for the treatment of arthritides, etc. Writing of prescriptions for the drugs used. 33 hours; 3 credits. Dr. Hirschfelder, Dr. Brown.
- 105f. General Pharmacology, in continuation. Lectures on the salts of the metals, antiseptics, antisyphilitic drugs, chemotherapy, etc. 33 hours; 3 credits. Dr. Hirschfelder, Dr. Brown.
- 109f,w,s,su. Pharmacological Problems. Special investigations and experimental study of one or more of the following topics: anesthetics; circulatory stimulants and depressants; drugs acting upon the kidneys; urinary antiseptics; poisons and antidotes; effects of common harmless drugs; internal secretions; action of drugs upon parasites, tumors, etc. Hours and credits by arrangement. Dr. Hirschfelder, Dr. Brown.
- 110f,w,s. Poisons. Their detection, actions, and antidotes. 66 hours; 2 credits. Dr. Brown.
- 201f,w,s. Seminar in Physiology and Pharmacology. Reviews of recent literature. 11 hours; 1 credit. Staff.
- 203su,f,w,s. Research in Pharmacology. Open to graduate and advanced students. Hours and credits arranged. Dr. Hirschfelder, Dr. Brown.
- 204f,w,s. Advanced Pharmacology. With collateral readings. Limited to six advanced students. 11 hours; 1 credit. Time to be arranged. Dr. Hirschfelder, Dr. Brown.
- 205f,w,s. Chemical Pharmacology. Collateral reading and discussion of the relation of chemical structure to pharmacological action. Limited to four graduate students. 11 hours; 1 credit. Hour and registration to be arranged. Dr. Hirschfelder, Dr. Brown.

B. COURSES OFFERED IN THE MAYO FOUNDATION

All opportunities for advanced work in pharmacology and therapeutics offered in the Mayo Foundation are in connection with the departments of Medicine, Pediatrics, and Surgery. See announcements of these department.

PATHOLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Elexious T. Bell, B.S., M.D.; Associate Professor Benjamin J. Clawson, M.D., Ph.D.; Assistant Professors James Shearer McCartney, B.A., M.D., Margaret Warwick, B.S., M.D.; Instructor John Franklin Noble, M.D.

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

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

- 104f,w,s,su. Autopsies. The average number of post-mortems available is about 65 per month or about 800 per year. Graduate students take part in post-mortems, prepare post-mortem records, and make microscopic examination of various organs and tissues. The student may attend as many post-mortems as his other work allows.
- 106f,w,s,su. Pathologic Technique. In this course the students may learn to prepare frozen sections from fresh tissues or tissues fixed in formalin. Instruction is also given in methods of preparing paraffin sections. There is also opportunity to learn some special staining methods. Hours to be arranged.
- 107f,w,s,su. Advanced Pathology. In this course the students may study the routine surgical specimens, of which about nine hundred a year are available. The material of the previous years is also available in the form of operation records and microscopic sections. Students who have access to surgical material from private hospitals in Minneapolis and St. Paul may prepare the clinical records of the case, and study the specimens grossly and microscopically under supervision. Hours to be arranged.
- 108f,w,s,su. Diagnosis of Tumors. In this course one two-hour period per week is devoted to the study of clinical cases which are discussed by the pathologist and the surgeon. Subsequent operative findings and the results of treatment are also reported. From four to eight clinical cases are demonstrated each period. One three-hour period per week is devoted to systematic laboratory work in the study of gross and microscopic preparations of tumors. Five hours per week. Dr. Bell, Dr. McCartney, Dr. Campbell.

- 109f,w,s,su. Clinical Pathologic Conference. The students are provided one week in advance with the clinical history of a case. The case is fully discussed clinically. The students are expected, in so far as possible, to predict the post-mortem findings from the clinical data. A full post-mortem report is then given, including the gross and microscopic demonstrations of the lesions that were found. One hour per week. Staff of the Department of Pathology with Dr. Fahr or Dr. Wangenstein.
- 111s. Neuropathology. This course comprises a thoro study of the various lesions of the nervous system. One or two hours a week are devoted to lectures and recitations. The rest of the time is spent in the laboratory and lesions are studied both grossly and microscopically in connection with the clinical phenomena presented by the patients. Special emphasis is given to abnormal physiology. Six hours per week. Dr. J. C. McKinley.
- 112w. Pathology of Diseases of the Eye, Ear, Nose, and Throat. This course consists of lectures, demonstrations, and laboratory work on diseases of these special organs. A fair number of museum preparations is available. Three hours per week. Dr. W. E. Camp.
- 113f,w,s,su. Voluntary Assistantship in Pathology. Medical students during the internship period may receive credit for full time work in pathology. Such students devote their time to the study of post-mortem and operative material. They are required to attend as many post-mortems as possible. They may also act as voluntary teaching assistants if they wish.
- 115s. Histopathology of the Skin. This course consists of lectures and microscopic studies of the various skin diseases. Some gross specimens are available and representative clinical cases are frequently brought over from the university dispensary. Dr. H. E. Michelson.
- 201f,w,s,su. Research. Graduate students, of the necessary preliminary training, may elect research, either as majors or minors in pathology. Hours and credits to be arranged.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professors Louis B. Wilson, M.D., William C. MacCarty, M.S., M.D., Frank C. Mann, M.A., M.D., Ralph G. Mills, B.A., M.D., Harold E. Robertson, B.A., M.D., D.Sc., Arthur H. Sanford, M.A., M.D.; Associate Professors Albert C. Broders, M.D., M.S. in Pathology, Thomas Byrd Magath, M.S., M.D., Ph.D.; Instructors Harold D. Caylor, B.S., M.D., James W. Kernohan, M.B., M.S.

Opportunities for advanced work in pathology are offered in five different sections in the Mayo Foundation, as follows:

1. Clinical Pathology. Dr. Sanford, Dr. Magath.

Work in this section includes diagnostic work in the laboratories of gastrology, urinalysis, serology, bacteriology, parasitology, and clinical chemistry. The total number of examinations in these laboratories in one year

is considerably more than 200,000. Of this number about 35,000 are Wasserman tests. Graduate students in these clinical laboratories may learn the technique of accepted diagnostic procedure. Special attention is called to the opportunity for experience and research in serology under the direction of Dr. Sanford, and for training and research in parasitology under the direction of Dr. Magath. This work may be taken either as a major, or fulfilling the conditions of a minor.

For opportunities in bacteriology offered in the clinical laboratories see announcements of this department.

2. Pathologic Anatomy. Dr. Robertson, Dr. Mills, Dr. Kernohan.

Post-mortem examinations are made in sufficient numbers to provide active work for approximately ten fellows at a time.

The service is designed to permit the laying of a thoro foundation in the general principles of pathologic anatomy. Each fellow serves as junior assistant three months and senior assistant three months, during which time he takes part in the routine of post-mortem examinations and studies the microscopic sections of these post-mortems, and engages in weekly conferences and seminars concerned with general and special subjects in pathologic anatomy. Each fellow is expected to take up some special line of work upon which he reports to the group. Microscopic and gross demonstrations are held at frequent intervals and the work throughout is intimately supervised. Collateral reading and study are encouraged and oftentimes the foundation may be laid for thesis subjects or special lines of research. In connection with this work there is a well-organized museum for both display and study purposes. Fellows are aided and encouraged in the use of this museum to further their knowledge.

3. Surgical Pathology. Dr. MacCarty, Dr. Broders, Dr. Caylor.

The laboratories of surgical pathology in St. Mary's, Colonial, Kahler, and Worrell hospitals receive immediately all tissue removed at operation. It is studied both grossly and microscopically. The minimum service in this work is six months, during which time opportunity is given to study a large amount of operative material. Besides the routine diagnostic work fellows are expected to begin to carry along in these laboratories some piece of pathologic research.

4. General Pathology. Dr. Wilson.

The work in this section consists entirely of individual research work. The minimum service in this section is six months.

5. Experimental Pathology. Dr. Mann.

Work in this section consists of research in problems of pathology involving the use of experimental animals.

M151f,w,s,su. Parasitology. Routine clinical and special research in parasitology, examination of stools, study of internal parasites. Dr. Magath.

- M152f,w,s,su. Clinical Pathology. Making and examination of cultures, preparation and administration of autogenous vaccines, Wasserman tests, special clinical and laboratory methods including hematology and serology and opportunity for research. Dr. Sanford.
- M153f,w,s,su. Laboratory Demonstration of clinical laboratory methods. Dr. Sanford, Dr. Magath.
- M154f,w,ssu. Clinical Chemistry. Studies in the newer methods of blood chemistry. Dr. Sanford, Dr. Magath.
- M155f-w,w-s,s-su,su-f. Necropsy Service. Junior assistant three months; senior assistant three months; demonstrations in clinico-pathologic conferences; microscopic examination of fixed tissues removed at necropsy and operations. Weekly seminar. Dr. Robertson, Dr. Mills, Dr. Kernohan.
- M156f,w,s,su. Laboratory Demonstration of tissue removed at necropsy and operation. Dr. Robertson, Dr. Mills, Dr. Kernohan.
- M157f-w,w-s,s-su,su-f. Surgical and Fresh Tissue Pathology. The diagnosis of surgical specimens (gross and microscopic) with immediate correlation with all clinical data. (Daily demonstrations and discussions.) Dr. MacCarty, Dr. Broders, Dr. Caylor.
- M158f,w,s,su. Studies of Tumor Cells with Vital Stains. Dr. MacCarty, Dr. Broders.
- M251f,w,s,su. Research Studies in Special Pathology; special pathology of various organs; gross and microscopic study of lesions; research work on assigned problems in the several fields. Dr. Wilson.
- M252f,w,s,su. Cancer Research. Cytologic, histogenetic, and statistical. Dr. MacCarty, Dr. Broders.
- M253f,w,s,su. Research Studies upon clinico-pathologic standardization. Dr. MacCarty, Dr. Broders.
- M254f,w,s,su. Research Work on assigned problems in experimental pathology. Dr. Mann.
- M255f,w,s,su. Research Work in clinical pathology. Dr. Sanford, Dr. Magath.

BACTERIOLOGY AND IMMUNOLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professors Winford P. Larson, M.D., Arthur T. Henrici, M.D.; Associate Professor Robert G. Green, M.A., M.D.

- 101f,su. Special Bacteriology for Medical Students. The study of pathogenic bacteria, especially in relation to definite diseases; bacteriological methods in clinical diagnosis; principles of infection and immunity, with practical application of serum reactions. Fourth year medical students and others. Prerequisite: general bacteriology. 66 hours; 4 credits. Dr. Larson and assistants.
- 105f. Food Bacteriology. The decay, fermentation, and putrefaction of foodstuffs; molds; canning; bacterial food poisoning; bacteriology of the cleansing processes. Prerequisite: general bacteriology. 44 hours; 3 credits.

- 114s. The Higher Bacteria. Study of morphology, cultivation, and classification of actinomycetes, yeasts, and molds. Study of the mycoses. Prerequisites: general and special bacteriology. 44 hours; 3 credits. Dr. Henrici.
- 116w. Course in Immunity. Laws of hemolysis. Quantitative relationships between antigen and antibody. Wasserman reaction. Opsonins. Vaccines. Precipitin reaction. Blood grouping. Abderhalden reaction. Anaphylaxis. Fifth and sixth year medical students. Limited to ten students. 44 hours; 3 credits. Dr. Larson.
- 117s. Pathogenic Protozoa. Study of parasitic Protozoa in men, including spirochaets; their morphology and life history; intermediate hosts as agents in the spread of disease; cultural methods. Prerequisites: general and special bacteriology; Animal Biology 45 and 107. 44 hours; 3 credits. Dr. Larson.
- 118f. Morphology and Taxonomy of Bacteria. Cytology of bacteria; their origin and systematic position; consideration of morphological, biochemical, and immunological characters as data for classification; variations and mutations in bacteria; the biometrical method as applied to bacteriology. Prerequisites: general and special bacteriology. 44 hours; 3 credits. Dr. Henrici.
- 119f. Bacteriological Chemistry. Microphysics of bacteria. Inorganic and organic constituents. Permeability of cells. Metabolism of bacteria. Enzymes of micro-organisms. Bacterial activity in the gastro-intestinal tract. Pigments. Prerequisites: general and special bacteriology; physiologic chemistry or phytochemistry. 66 hours; 4 credits. Dr. Green and assistant.
- 120w. Continuation of 119f. Bacteriolyants. Protein poisons. Bacterial toxins. Phagocytosis, application of quantitative laws to disinfection, hemolysis and immune reactions. Cataphoresis. Stability of bacterial suspensions. Protein chemistry of immune reactions. Dr. Green.
- 125w. Industrial Bacteriology. Bacteriology of foods, fermentations, enzyme production, commercial sterilization. Bacteria in chemical industries, manufacture of acetone, butyl, alcohol, acetic, lactic, and sulphuric acids, leather and sugar industries.
- 150f-151w (or 150w-151s). Advanced Bacteriology. An advanced course giving additional work in bacteriology and the opportunity of working out special problems. Limited to ten students. 44 hours; 3 credits. Dr. Larson, Dr. Henrici.
201. Research in Bacteriology. Graduate students of the necessary preliminary training may elect research, either as majors or minors, in bacteriology. Hours and credits arranged. Dr. Larson, Dr. Henrici.
203. Seminar in Bacteriology. One credit.
- 205s. Bacteriological Survey. A survey of original literature in bacteriology and related sciences. 3 credits. Dr. Larson, Dr. Henrici, Dr. Green.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

Professors Edward C. Rosenow, M.D., Arthur H. Sanford, M.A., M.D.; Associate Professor Thomas Byrd Magath M.S., M.D., Ph.D.; Instructors Halvor O. Halvorson, M.S., Robert L. Starkey, L. Thompson, Ph.D.

Opportunities for the graduate study of bacteriology and immunology are in connection with routine clinical examinations and in special research. They are open to (a) graduate students holding only their baccalaureate or Master's degree who have already had at least 176 clock hours of bacteriology but who have not had adequate preparation in pathology. Such students will not be permitted to attempt work involving a knowledge of pathology; (b) graduates in medicine or holders of Master's degrees who have had work both in bacteriology and pathology equivalent to that given in the medical course in the University. Such students will be given opportunity to do work in bacteriology involving pathologic relationships.

M151f,w,s,su. Clinical Bacteriology and Parasitology. Making and examination of cultures. Preparation and administration of autogenous vaccines. Wasserman tests; special laboratory methods in clinical bacteriology or parasitology. Dr. Sanford, Dr. Magath, Dr. Thompson.

M152f,w,s,su. Bacteriology of Necropsy Material. Collection of bacteriological material at necropsy under the supervision of a pathologist and its study in the laboratory under the supervision of a bacteriologist. Dr. Sanford, Dr. Magath, Dr. Robertson.¹

M153f,w,s,su. Bacteriology of Surgical Material. Collection of bacteriological material from operative specimens under the supervision of a pathologist and its study in the laboratory under the supervision of a bacteriologist. Dr. Sanford, Dr. Magath, Dr. MacCarty,¹ Dr. Broders.¹

M154f,w,s,su. Special Bacteriology of Medical Cases. A collection of bacteriological material in medical cases under the supervision of a physician and its study in the laboratory under the supervision of a bacteriologist. Dr. Sanford, Dr. Magath, Dr. Rowntree,² Dr. Keith.²

M251fw,s,su. Experimental Bacteriology. Research in the bacteriology of normal and diseased tissues, the blood, secretions and exudates. Experimental inoculation of animals and immunological studies. So far as possible work limited to study of pathogenesis and to development of specific methods of prevention and treatment of various diseases presumably of infective origin. Dr. Rosenow.

¹ See Department of Pathology.

² See Department of Medicine.

MEDICINE

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

The graduate work in the Department of Medicine is designed to offer opportunities for gifted men and women thoroly to prepare themselves for the practice of internal medicine or any of its subdivisions as a speciality. It also aims to guide its fellows in research in these fields and to give them a start in university teaching. Prospective fellows who have had no special work in addition to that of the ordinary undergraduate courses will profit greatly from some special work in medicine. While work in any of the fundamental subjects might be of value, physiology, biochemistry, bacteriology, and pathology at the present are of the greatest importance. Work in any of these subjects might be further continued during the work in medicine to meet the requirements for a minor subject. Such work may also be done in pharmacology. For fellows specializing in nervous and mental diseases work in anatomy or psychology might be of special value as a minor. Work can also be arranged in the Department of Ophthalmology and Oto-Laryngology for fellows working in nervous and mental diseases, thus giving special opportunity to study lesions of the eye occurring in systemic disorders.

GENERAL MEDICINE

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professors Hilding Berglund, M.D. (Head); S. Marx White, B.S., M.D., F.A.C.S.; Associate Professors George E. Fahr, B.S., M.D., Henry E. Michelson, B.Sc., M.D., Ernest T. F. Richards, M.D., C.M., John P. Schneider, M.D., Henry L. Ulrich, B.S., M.D.; Assistant Professors Moses Barron, B.S., M.D., Jay A. Myers, Ph.D., M.D.

For graduate work in internal medicine the University Hospital (officially, The Minnesota General Hospital) and the Minneapolis General Hospital afford a wide range of clinical material both in the wards and in the out-patient departments. For research work there are opportunities at the University Hospital in its laboratories for biochemistry, cardiography, basal metabolism, and experimental medicine. Similar opportunities might be made available at the Minneapolis General Hospital.

Anatomy, physiology, biochemistry, pathology, bacteriology, immunology, and pharmacology have their laboratories and teaching centers on the campus and the pursuit of a minor subject to the extent required by the Graduate School may be carried on alongside of, and in intimate relation to, the more definitely clinical studies. The large autopsy service of the Department of Pathology gives experience in this field and provides control of clinical diagnosis.

The more intensive clinical studies of the fellow are carried on in one or both of the hospitals mentioned and the out-patient departments are

utilized to the degree necessary for training of the fellow in the type of work to be met with later in practice.

During a longer or shorter period of his fellowship the fellow will act as assistant resident physician or as resident physician in one of the hospitals. In this position he has to assume greater responsibilities in the care of the patients than during the internship.

It is required that a certain amount of time be given by the fellow to teaching.

Besides the clinical work a fellowship also includes research work toward the fulfillment of the requirements for an acceptable thesis. This work may be purely clinical, but more preferably, a combined clinical and laboratory study. The character of the thesis work will vary considerably with the intellectual capacity of the fellow, but as a general principle it can be stated that the thesis work aims to lead the fellow into the field of research.

The courses listed below are described in the broadest outlines and for purposes of recording the character of the work done. No hard and fast program is contemplated, the individual capabilities, needs, and purposes of the fellow being given particular attention.

- 201f,w,s,su. Clinical Medicine. Study of general diagnosis and methods of investigation and of the recording of clinical data. Emphasis placed on methods of treatment. Dr. Berglund, Dr. Fahr, Dr. Richards, Dr. Ulrich.
- 202f,w,s,su. Diseases of Cardiovascular Apparatus. Special study of diseases of the heart and blood vessels, including technique and application of the polygraphs, electrocardiograph and interpretation of outlines of the heart and great vessels obtained by means of radiograms and orthodiagram. Dr. Fahr.
- 203f,w,s,su. Research in Medicine. University Hospital. Dr. Berglund, Dr. White, Dr. Fahr, Dr. Richards, Dr. Schneider, Dr. Barron, Dr. Myers.
- 204f,w,s,su. Problems in Medicine. Specific problems in diagnosis and treatment, including problems in immunology viewed from the clinical standpoint. General Hospital. Dr. Ulrich.
- 205f,w,s,su. Tuberculosis. Opportunities in the study of problems relating to tuberculosis are offered. Co-operation between the Medical School and tuberculosis sanatoria is close, and problems may be studied, both the clinical and laboratory sides. An out-patient department is also available. Dr. Myers.
- 206f,w,s,su. Research in Mouth Infections. A study of dental and parodontal infections as related to systemic diseases. Experimental study to determine the lesion produced in animals by bacteria from these sources. Dr. Hartzell.
- 209f,w,s,su. Neurologic Research. Dr. Hamilton.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

Professors Leonard G. Rowntree, M.D., D.Sc. (Chief), Henry S. Plummer, M.D., Arthur H. Sanford, M.A., M.D., Russell M. Wilder, B.S., M.D., Ph.D.; Associate Professors Walter C. Alvarez, M.D., Walter M. Boothby, M.A., M.D., George B. Eusterman, M.D., Herbert Z. Giffin, B.S., M.D., Norman M. Keith, B.A., M.D., Willis S. Lemon, M.B., Archibald H. Logan, M.D., Robert D. Mussey, M.D.; Assistant Professors David M. Berkman, M.D., M.S. in Med., George E. Brown, M.D., Louis A. Buie, B.A., M.D., Fred W. Gaarde, B.S., M.D., Dorr F. Hallenbeck, M.D., Howard R. Hartman, B.S., M.D., Charles S. McVicar, M.B., William A. Plummer, M.D., Lee W. Pollock, B.S., M.D., Leda J. Stacy, M.D., Frederick A. Willius, M.D., M.S. in Med.; Instructors S. Franklin Adams, M.D., Clifford J. Barborka, B.S., M.D., J. Arnold Bargaen, B.S., M.D., Arlie R. Barnes, M.A., M.D., Maurice B. Bonta, B.A., B.S., M.D., Phillip Walling Brown, B.A., M.D., Harry M. Conner, M.D., Della G. Drips, B.A., M.S., M.D., William P. Finney, B.A., M.D., Carl H. Greene, Ph.D., M.D., Harold C. Habein, B.A., M.D., Samuel F. Haines, B.S., M.D., Duncan M. Masson, M.B., Herman J. Moersch, M.D., M.S. in Med., Monte C. Piper, M.D., Andrew B. Rivers, M.D., Irene Sandiford, Ph.D., Albert M. Snell, B.S., M.D., Porter P. Vinson, B.S., B.A., M.D., James F. Weir, B.A., M.D., M.S.

The clinical work in internal medicine in Rochester consists of diagnostic work on the floor of the clinic or in one of the hospital medical services, and includes history taking, physical examinations, the recommendation of patients for special examinations with correlation of the results thereof, and the formation of independent judgments concerning diagnoses and indications and recommendations for medical and surgical treatment, all under the immediate direction of the head of the section and his associate or first assistant.

Each service consists of six days each week for one calendar year, except as noted, in a clinical section. There are thirteen general diagnostic sections in which the fellow may work in the clinic and eight medical hospital services. The satisfactory completion of at least two services of one year each in these sections is required for recommendation for an advanced degree. When he is sufficiently competent in clinical work the fellow may be appointed to a first assistantship for a period of one year. This provides him with opportunities for informal teaching of junior men and with an additional stipend of \$1,000 a year, from the Mayo Clinic.

The Medical Department has recently been extended and has been furnished amply with medical beds—in the neighborhood of four to five hundred—in St. Mary's, Kahler, and Colonial hospitals. Laboratories have been established in St. Mary's and Kahler hospitals and equipped with ample facilities for the best type of routine medical practice and for medical research and investigation. Special services have been created for the intensive study of metabolic, cardiorenal vascular diseases, and diseases of the glands of internal secretion.

Most medical graduates are usually lacking in autopsy experience. Efficiency in this most essential field can be made up by a service of six months or more in the Section of Pathologic Anatomy. Such a service gives the fellow good experience in autopsy technic and diagnosis.

In graduate work in medicine the didactic lecture plays but a minor rôle. In the diagnostic clinic and hospitals much of the teaching is done through seminars, through ward rounds, and by contact between the professor and the fellow in the handling of the patients, or in the carrying out of laboratory procedures. In both clinical and hospital sections the fellow enters the section as an assistant and assists in the actual work of these sections under the supervision of the head of the section and his associates.

Seminars are conducted in each section. In the clinical seminars cases of unusual interest are discussed and presented. In the hospital services additional seminars are conducted on special phases of medicine, on laboratory methods, on current medical literature, and pathologic conferences are conducted in cases coming to operation and necropsy. In these seminars the fellows themselves play an active rôle in presenting to the group cases or subjects which have been assigned to them by their chiefs.

In the laboratories fellows are given every opportunity to work out for themselves the problems of their choice or to participate in investigations being carried out by members of the staff.

Staff meetings are held weekly on Wednesday evenings and problems and cases of interest are presented and discussed. Foundation lectures are given five evenings a week by members of the staff or by invited lecturers.

As soon as he becomes oriented, each fellow is expected to find time, in addition to his clinical work, to begin and carry forward persistently some piece of research. While this may be purely clinical, in most instances it will be found to have relationships requiring detailed study in physiology, physiologic chemistry, pathology, or bacteriology.

Research work in special laboratory departments is done under the head of the department with the advice and counsel of the head of the clinical department in which the fellow is registered.

The usual fellow will find that approximately two thirds of his time should be devoted to diagnosis and treatment of disease, but provision is also made for the occasional fellow with unusual research ability who desires to devote his entire time, or the major part of it, to scientific investigation.

Tho the minimum time required for recommendation for the degree of master of science for work done in these fields is three years, it will usually be found that considerably more time is desirable and supplementary stipends are provided for men desiring to devote four or five years to the work.

M151f,w,s,su. Laboratory of Hematology and Urinalysis. Dr. Sanford.

M152f,w,s,su. Gastrological Laboratory. Dr. Sanford.

- M153f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special reference to diseases of the gastro-intestinal and accessory digestive tracts. Dr. Alvarez, Dr. Eusterman, Dr. Hartman, Dr. McVicar, Dr. Rivers, Dr. Weir.
- M154f,w,s,su. Clinical Demonstration of diseases of the gastro-intestinal and accessory digestive tracts. 24 hours. Dr. Eusterman, Dr. Hartman, Dr. McVicar, Dr. Rivers, Dr. Weir.
- M155f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special references to diseases of the intestines. Dr. Logan, Dr. Bargaen, Dr. P. W. Brown.
- M156f,w,s,su. Clinical Demonstration of diseases of the intestines. 24 hours. Dr. Logan, Dr. Pollock.
- M157f,w,s,su. Proctology. Dr. Buie.
- M158f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special reference to diseases of the chest and esophagus. Dr. Lemon, Dr. H. J. Moersch, Dr. Vinson.
- M159f,w,s,su. Clinical Demonstration of diseases of the chest and esophagus. 48 hours. Dr. Lemon, Dr. H. J. Moersch, Dr. Vinson.
- M160f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special reference to diseases of the blood and blood-forming organs. Dr. Giffin, Dr. Bonta, Dr. Conner.
- M161f,w,s,su. Clinical Demonstration of diseases of the blood and blood-forming organs. 24 hours. Dr. Giffin, Dr. Bonta, Dr. Conner.
- M162f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special reference to diseases of the cardiovascular system and ductless glands. Dr. H. S. Plummer, Dr. Boothby, Dr. W. A. Plummer, Dr. Willius, Dr. Barnes, Dr. Haines.
- M163f,w,s,su. Clinical Demonstration of diseases of the thyroid. 24 hours. Dr. H. S. Plummer, Dr. Boothby, Dr. W. A. Plummer, Dr. Willius, Dr. Barnes, Dr. Haines.
- M164f,w,s,su. Clinical Demonstration of diseases of the cardiovascular system. 24 hours. Dr. H. S. Plummer, Dr. Willius.
- M165f-w,w-s,s-su,su-f. Diagnosis and Research (clinical and laboratory) in cardiorenal and vascular and metabolic diseases. Dr. Rowntree, Dr. Wilder, Dr. Keith, Dr. G. E. Brown, Dr. Adams, Dr. Greene, Dr. Snell.
- M166f,w,s,su. Clinical Demonstration of cardiorenal, vascular, and metabolic diseases. 24 hours. Dr. Rowntree, Dr. Keith, Dr. G. E. Brown.
- M167f,w,s,su. Clinical Demonstration of pancreatitis and diabetes. 24 hours. Dr. Wilder.
- M168f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special reference to gynecology. Dr. Stacy, Dr. Drips.
- M169f,w,s,su. General Medical and Surgical Diagnosis. Dr. Berkman, Dr. Gaarde, Dr. Pollock, Dr. Barborka, Dr. Finney, Dr. Masson.
- M170f,w,s,su. Radium Therapy. Dr. Bowling.
- M171f,w,s,su. Roentgen Therapy. Dr. Desjardins.
- M172f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special reference to acute emergency conditions. Dr. Hallenbeck, Dr. Long, Dr. Habein, Dr. Piper.

- M251f,w,s,su. Advanced Work in Electrocardiographic Laboratory. Dr. H. S. Plummer, Dr. Willius, Dr. Barnes.
- M252f,w,s,su. Metabolic Laboratory. Respiratory exchange and allied physiologic problems. Dr. Boothby, Miss Sandiford.
- M253f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M153. 12 hours. Dr. Alvarez, Dr. Eusterman, Dr. Hartman, Dr. McVicar.
- M254f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M155. 24 hours. Dr. Logan.
- M255f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M158. 60 hours. Dr. Lemon, Dr. Gaarde, Dr. H. J. Moersch, Dr. Vinson.
- M256f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M160. 12 hours. Dr. Giffin, Dr. Bonta, Dr. Conner.
- M257f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Courses M162, M251, or M252. 12 hours. Dr. H. S. Plummer, Dr. Boothby, Dr. W. A. Plummer, Dr. Willius, Dr. Barnes, Dr. Haines.
- M258f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M165. 12 hours. Dr. Rowntree, Dr. Wilder, Dr. Keith, Dr. G. E. Brown.
- M259f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M171. 12 hours. Dr. Hallenbeck, Dr. Piper.
- M260f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M168. 12 hours. Dr. Stacy.
- M263f,w,s,su. Medical Chemistry. Chemical and metabolic studies (in nephritis, acidosis, diseases of the liver and of the blood) together with research work along biochemical and metabolic lines. Dr. Rowntree, Dr. Keith.
- M264f,w,s,su. Medical Chemistry. Chemical and metabolic studies in diabetes, together with research work along biochemical lines. Dr. Wilder.
- M265f,w,s,su. Research in Medicine. Dr. Rowntree, Dr. Wilder.

DERMATOLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

No advance courses in dermatology are offered in the Medical School. Graduate students desiring this work will be given opportunity in the Mayo Foundation.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

Associate Professor Paul A. O'Leary, M.D.; Assistant Professor W. H. Goeckerman, M.D.

The Department of Dermatology of the Mayo Foundation offers excellent opportunities for the study of dermatology and syphilology. The service cares for about 5,000 out-patients annually, of whom approximately 2,000 have syphilis. The patients come to the section both direct and by refer from other departments. In the majority of cases they have been

studied from every medical angle, so that the opportunity to master the relations and background of the specialty as well as its immediate diagnostic problems is unusually good. All the syphilis seen in the Mayo Clinic ultimately reaches this section, and provides a rich material for the study of every aspect of the disease. The in-patient service of the section includes a special hospital of 70 beds, with a treatment equipment through which pass from 20,000 to 25,000 patients per year. Approximately 10,000 arsphenamine injections and 3,000 intraspinal injections are given per year, and all such patients are retained under hospital care for at least 24 hours, which permits a full study and interpretation of their reactions and response to treatment. The section has a social worker who assists in the adjustment of the personal and social problems of patients, and directs the operation of the follow-up system. The department has special laboratories adapted to the prosecution of research problems and the general laboratories of the clinic and foundation are likewise available for this purpose.

The Department of Dermatology and Syphilology offers two types of graduate medical work.

1. *Short term service.*¹—Offered only to fellows in the Mayo Foundation, with preference to those majoring in internal medicine. This course consists of three to six months of training in clinical diagnosis especially as applied to syphilology but with due emphasis on dermatology. The fellows in this group see all entering patients of the department. They are systematically drilled in methods of examination, including the objective approach, the use of the dark field, and the making of smears, stains, and special preparations of the types essential in office diagnosis. The results of special examinations in other departments of the clinic are co-ordinated and the proper use of the X-ray, the eye examination, the spinal fluid examination, the provocative procedure, and so forth in the modern diagnosis of syphilis are impressed upon the student. The fellows follow the treatment of their patients on the hospital service of the section, learning under direction, the theory of the expert management of various phases of syphilis and of cutaneous disease. Special emphasis is placed throughout the dermatologic work upon the relation of dermatology to internal medicine both from the standpoint of diagnosis and treatment. By means of conferences, quizzes, and hospital rounds, the fellow is kept alert to all aspects of the subject.

No training in technic of treatment is offered in connection with this service.

2. *Long term service.*—Fellows who take this course elect dermatology and syphilology as a major. Three years are devoted to the mastery of the specialty and to gaining the necessary groundwork in related branches, including serology, radiotherapy, neurologic diagnosis, and such elective courses as may seem called for in the individual case. The purpose of major work in dermatology and syphilology is the training of experts,

¹ Limited to three fellows.

able to attack intelligently any problem which cutaneous and syphilologic diagnosis and treatment may present, and to assume, if necessary, organizing and teaching responsibility. The fellow in dermatology and syphilology is trained in diagnosis by at least two years of constant contact with every aspect of cutaneous disease and syphilis in both out-patient (office) service and hospital. He is trained in teaching methods by an experience of 10,000 arsphenamine treatments of various types, 3,000 to 5,000 diagnostic spinal punctures and 2,000 to 3,000 intraspinal treatments of various types, with the necessary amount of technical preparation in the simpler procedures such as intramuscular injection, etc. This is equivalent to approximately a year of treatment service. A full equipment for hydrotherapeutic work, ultra-violet light, high frequency and electrocoagulation, radium and X-ray therapy insures familiarity with the most advanced methods of dermatologic treatment.

Immediate contact with the patient while reaching a diagnosis and throughout the course of his treatment is insured by a period of hospital residence varying from six months to one year as house officer of the Dermatological Hospital, a service of 70 beds, with equipment for every refinement of dermato-syphilologic practice in a private clientele.

Training in the fundamentals of the pathology of syphilis and cutaneous disease is likewise an essential part of the equipment of the expert, and is accomplished by a laboratory and demonstration course.

Training in methods of investigation and research, and in the technic of preparing and publishing new material is given to the full-time fellow as a necessary part of his equipment. This training begins with the statistical study of clinical problems and in the preparation of a case report. It will be extended for fellows who are suitably equipped to include an investigation, with a laboratory phase in chemistry, serology, or immunology, which the fellow exploits as his special field over his own name and uses as a basis for his thesis. A Journal Club furnishes the necessary training in the searching and interpretation of the literature.

After the second year of service fellows in dermatology and syphilology who exhibit special proficiency and fitness may be appointed assistants in the section. This provides an increase of \$1,000 per year in stipend over and above the fellowship remuneration. It makes possible the training of the fellowship man in the problems and responsibilities of consultant diagnosis, and permits his participation in teaching work. During an assistantship, the incumbent is expected to prepare and deliver a course of lectures under the supervision of the head of the department upon the history and recent developments in some important aspect of the specialty.

Discipline in executive responsibility and instruction in the problems of departmental administration are available for those who exhibit special aptitude and who are likely to be called upon to undertake organizing duties.

While full time fellowship standing in the Department of Dermatology and Syphilology is limited to those who carry the work as a major for three years, the department is prepared to consider as applicants for one

or two years of service, those who, because of previous graduate medical work in the specialty, may be regarded as already partially equipped to meet the ultimate standards of the department. No application for less than one year of service will be considered, and no "brushing up" courses for practitioners are offered.

M172f,w,s,su. General Diagnosis with special reference to dermatology and syphilology. All day. Dr. O'Leary, Dr. Goeckerman.

M173f,w,s,su. Clinical Demonstration of dermatologic and syphilologic material. 24 hours. Dr. O'Leary, Dr. Goeckerman.

M261f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M172. 24 hours. Dr. O'Leary, Dr. Goeckerman.

NERVOUS AND MENTAL DISEASES

For students specializing in nervous and mental diseases, minors in anatomy, physiology, and psychology are especially valuable, and for those desiring it work could be arranged in the Department of Ophthalmology and Oto-Laryngology, giving a special opportunity to study lesions of the eye occurring in systemic disorders.

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Arthur S. Hamilton, B.S., M.D.; Associate Professors Ernest M. Hammes, M.D., J. Charnley McKinley, M.D., Ph.D. in Neurology.

For fellows in general medicine opportunity is given for the study of clinical neurology in the Hospital and in the Out-Patient Department. For fellows specializing in nervous and mental diseases there are excellent facilities for the study of the anatomy, physiology, and pathology of the nervous system. In addition to the work in the University Hospital and Out-Patient Department the student has access to the Minneapolis General Hospital, the St. Paul City and County Hospital, and to the laboratories of the Department of Psychology of the University, as well as to the Child Guidance Clinic established in Minneapolis.

The close relation between the Division of Nervous and Mental Diseases and the Department of Eye, Ear, Nose, and Throat gives an opportunity for study under trained specialists of the special senses in their relation to diseases of the nervous system.

The clinics in general medicine are freely open to the student.

207f,w,s,su. Pathology of the Nervous System. The preparation of gross and microscopic material from diseased nervous tissues; the relations existing between pathologic lesions, signs, and symptoms; the chief neuron systems and principles underlying their degeneration. Dr. Hamilton.

208f,w,s,su. Clinical Neurology. Advanced diagnosis of nervous diseases; practical experience in diagnostic procedures employed in the study of diseases of the nervous system. Dr. Hamilton.

209f,w,s,su. Neurologic Research. Dr. Hamilton.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

Professor Walter D. Shelden, B.S., M.D.; Associate Professor Henry W. Woltmann, B.S., M.D., Ph.D. in Neurology; Instructors John B. Doyle, M.D., M.S. in Neurology, Frederick P. Moersch, B.S., M.A., Harry Lee Parker, M.B., M.S. in Neurology.

A practical clinical course for fellows in general medicine and neurology is conducted for periods of six months or longer. This includes a daily conference on cases of special diagnostic importance, a weekly conference for the review of current neurologic literature, and a monthly clinical pathological conference for the study of autopsy material. For fellows majoring in neurology special work in neuropathology is offered. Considerable opportunity for psychiatry is offered and weekly visits are made to the Rochester State Hospital for the Insane.

This department is closely associated with the departments of the eye, ear, nose, and throat, and with various laboratories for the study of neurology as a specialty and its relationship to general medicine.

M174f-w,w-s,s-su,su-f. General Diagnosis in Neurology and Psychiatry.

Dr. Shelden, Dr. Woltmann, Dr. Doyle, Dr. Moersch, Dr. Parker.

M175f,w,s,su. Clinical Demonstration of neurological diseases. 24 hours.

Dr. Shelden, Dr. Woltmann, Dr. Doyle, Dr. Moersch, Dr. Parker.

M261f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M174. 12 hours. Dr. Shelden, Dr. Woltmann, Dr. Doyle, Dr. Moersch, Dr. Parker.

M262f,w,s,su. Neuropathology. Open to fellows who are majoring in neurology and who have had adequate preparation in general pathology. Dr. Woltmann.

PEDIATRICS

The graduate work of the Department of Pediatrics is arranged with the intention (a) of preparing students to become competent pediatricists; (b) to put them in position to attack original pediatric problems; and (c) to make them competent teachers in the subject.

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Frederic W. Schlutz, B.A., M.D., Chief; Associate Professors Walter R. Ramsey, M.D., Frederick C. Rodda, M.D.; Assistant Professors Edgar J. Huenekins, B.A., M.D., Naboth O. Pearce, M.D., M.S., Max Seham, M.D., Rood Taylor, M.D., Ph.D. in Pediatrics.

The work of the department is conducted in the wards and Out-Patient Department of the University Hospitals, the Minneapolis General Hospital, and Lymanhurst in Minneapolis, the Ancker and Miller hospitals and the Out-Patient Department of the Wilder Charities in St. Paul. The Child Welfare organizations, the Child Guidance Clinic and special arrangements with the Board of Education afford excellent opportunities of all phases of preventive pediatrics.

The general library of the University, an unusually complete departmental library, and complete files of all journals dealing with pediatrics furnish adequate reference facilities.

Research laboratories attached to the Department of Pediatrics and the large general laboratory attached to the departments of Physiology, Anatomy, Bacteriology, and Pharmacology are at the disposal of the graduate students, and afford every possible opportunity for research.

As a prerequisite a general understanding of physiologic (physical) and analytic chemistry and a working knowledge of French and German are essential.

Prospective students will find preparatory study in physiology and quantitative analysis of value.

Students will be encouraged to carry a minor in some of the fundamental branches.

The following electives in other departments are desirable. (For further information see description of courses under departmental headings.)

- Quantitative Analysis
- Organic Chemistry
- Physical Chemistry
- Mental Retardation
- Physiologic Chemistry
- Physiology of Muscle, Nerve, Blood, Circulation, and Digestion
- Physiology of the Nervous System and Special Senses: Respiration, Metabolism, Nutrition, and Excretion
- Physical Chemistry of Cells
- Electrophysiology
- Metabolism
- Quantitative Methods
- Human Neurology
- Fetal Anatomy
- General Roentgenologic Technique
- Interpretations of Roentgenologic Findings
- Hematology
- Course in Immunity
- The Physiological and Chemical Basis of Pharmacology (Pharmacology 113)
- Diseases of Cardiovascular Apparatus (Medicine 123-124)
- Medical Chemistry
- Orthopedic Service
- Orthopedic Diagnosis
- Advanced Ophthalmoscopy

103f,w,s,su. Clinic in Pediatrics. Conducted at the University Hospital and the General Hospital; a part of course in required clinics.

104f,w,s,su. Contagious Diseases. The advanced study of contagious diseases, including the practice of intubation and tracheotomy, with training upon the cadaver.

- 111f,w,s,su. Diseases of the New-Born.
- 115f,w,s,su. Theory and Practice of Infant Feeding including diseases of the gastro-intestinal tract.
- 117f,w,s,su. Pediatric Clinic. Out-Patient Clinic; University Hospital.
- 125f,w,s,su. Special Graduate Contagious Course. Advanced study of contagious diseases, including practice of intubation with training upon the cadaver and the living dog. Limited to graduates.
- 127f,w,s,su. Thesis Course.
- 129f,w,s,su. Pediatrics Seminar.
- 130f,w,s,su. Course consisting of three to twelve months' residence in pediatrics and contagious diseases at General Hospital.
- 142f,w,s,su. Preparation of Infant Foods. Practical work.
- 144f,w,s,su. Contagious Diseases. Advanced study of contagious diseases.
- 200f,w,s,su. Advanced Study of Diseases of Infants and Children.
- 202f,w,s,su. Research in Diseases of New-Born. Students undertaking this work should have had the equivalent of Fetal Anatomy and Pediatrics III.
- 204f,w,s,su. Research in Physiology of New-Born. Prerequisite: Pediatrics III. Prerequisite preparation in physiology will depend upon the type of work undertaken.
- 206f,w,s,su. Research in Diseases of Infants and Growing Children. Prerequisite work will depend upon the type of work undertaken.
- 208f,w,s,su. Research in Physiology of Infants and Growing Children. Prerequisite preparation will depend upon the type of work undertaken.
- 210f,w,s,su. Research in Anatomy of Infants and Growing Children. Prerequisite preparation will depend upon the type of work undertaken.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professor Henry F. Helmholtz, B.S., M.D.; Associate Professor Samuel Amberg, M.D.

The opportunities offered in pediatrics in the Mayo Foundation are designed for the purpose of training a few selected men for the special practice of pediatrics. The courses are also valuable to fellows majoring in special clinical fields.

The work of the department comprises:

a. The care of the new-born.

Immediately after the birth of the infant the Pediatrics Department assumes charge.

b. The Pediatrics Department is practically in charge of the work in preventive pediatrics in the City of Rochester and in Olmsted County, co-operating with the City Health Department and the Olmsted County Public Health Association. This work comprises infant welfare work as well as the care of the child of pre-school and school age.

c. A special advantage lies in the large number of cases presenting unusual manifestations of common diseases, as well as those conditions which are not so frequently seen in the ordinary hospital and out-patient departments.

d. The work in the city affords a chance for routine practice in pediatrics, including the usual infectious diseases.

e. The department has a service of its own at St. Mary's Hospital. In addition it has the supervision of all children below the age of fourteen years in the other hospitals. The Pediatrics Department co-operates with the surgical section in the pre-operative and post-operative management of the patient.

f. Research is regarded as an important feature of the graduate work, and there are ample clinical and laboratory facilities for investigative study.

M151f-w,w-s,s-su,su-f. Diagnosis of Medical and Surgical Diseases of Infancy and Childhood. Dr. Helmholz, Dr. Amberg.

M152f,w,s,su. Clinical Demonstration of diseases of infancy and childhood. 24 hours. Dr. Helmholz, Dr. Amberg.

M153f-w,w-s,s-su,su-f. Preventive Pediatrics. 24 hours. Limited to two fellows. Dr. Helmholz, Dr. Amberg.

M251f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Courses M151, M153, and M252. Dr. Helmholz, Dr. Amberg.

M252f-w,w-s,s-su,su-f. Research in Diseases of Infancy and Childhood. Dr. Helmholz, Dr. Amberg.

SURGERY

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

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Arthur C. Strachauer, M.D., F.A.C.S.; Associate Professors J. Frank Corbett, M.D., F.A.C.S., Emil S. Geist, M.D., F.A.C.S., Arthur A. Law, M.D., F.A.C.S., William Lerche, M.D., F.A.C.S., Arthur T. Mann, B.S., M.D., F.A.C.S., John T. Rogers, M.D., F.A.C.S., Franklin R. Wright, D.D.S., M.D., F.A.C.S.; Assistant Professors Carl C. Chaterton, M.D., F.A.C.S., Gilbert J. Thomas, M.D., Harry B. Zimmerman, M.D., F.A.C.S.; Instructor Frederick E. B. Foley, Ph.B., M.D.

Graduate work in surgery at the Medical School is designed to offer superior training to a limited number of fellows in three or more years of residence. The practical and scientific aspects of a well-rounded surgical course are equally emphasized.

The prospective fellow must be able to qualify as a candidate for the Ph.D. degree so far as his preliminary education is concerned. (See requirements for higher degrees.)

The fundamental laboratories of the Medical School offer numerous graduate courses closely related to surgery. (See statements of Anatomy, Pathology, Physiology, Physiologic Chemistry, and Bacteriology.) Opportunity for special investigative and research work is found in these departments. The minor subjects must be taken in one of the above departments; anatomy or pathology is usually selected by the fellow. The proximity of

the medical buildings and arrangement of courses afford opportunity for co-ordination of clinical and laboratory work which is highly desirable.

The courses offered by the Department of Surgery consist of animal, experimental, and cadaver surgery, together with work in the hospital and out-patient departments in surgical diagnosis, operative surgery, and some of the surgical specialties, particularly urology and roentgenology.

Unexcelled opportunities for technical and experimental work under aseptic conditions comparable to a first-class operating room are offered in the laboratories of animal and experimental surgery. In these laboratories the fellow conducts his investigative work for his thesis.

The fellow assists in the instruction of undergraduate senior students in cadaver surgery and applied anatomy. These courses are repeated three times each year. This repetition is to the great advantage of the fellow. Clinical instruction is given throughout the entire fellowship period.

The University Hospital fellowship provides a house surgeonship in the University Hospital, with or without residence. The fellow aids the surgical staff in diagnosis and in the pre-operative and post-operative care of patients. He helps to direct and supervise the work of the internes, and after his first year assists in the bedside teaching of the surgical clerks. He acts as first assistant in operations performed by the general surgical staff. As soon as he proves himself capable, the more simple major operations are delegated to him to perform, with the surgeon acting as first assistant. Later, he is permitted to operate under the supervision of the surgeon, and finally, when he has demonstrated his ability, he operates independently. Increasingly difficult cases are assigned as his ability warrants. Supervision is always given until the staff surgeon is satisfied of the fellow's ability to perform independently any stated operation.

A Medical School surgical fellowship is also offered with assignment and residence at the Minneapolis General Hospital, which has a total of 679 beds.

By courtesy of and arrangement with the Mayo Foundation the second year of both of these fellowships may be spent in residence at Rochester, where exceptional opportunities for general and special diagnostic and operating room services are available.

The new General Memorial Cancer Hospital of fifty beds, with complete operating, X-ray, and radium equipment greatly enhances the opportunities for general surgical training at the Medical School.

A six months' special training in urology is offered to all graduate students. The student acts, for a limited period, as first assistant on this service, where he is taught the various diagnostic methods including cystoscopy and the allied procedures. Assisting and independent operating in this field are also provided.

Regular graduate students who are not fellows are offered combination courses leading to qualification for advanced degrees. The University Hospital fellowships are limited to candidates for the Ph.D. degree.

- 101f,w,s. Advanced Minor Surgery. The student is required to assist in the out-patient surgical clinic, and in this connection makes a special study of the diagnosis and treatment of selected cases. Staff.
- 102f,w,s. Operative Surgery on the Cadaver. Technique of abdominal incision and closure; of bowel suturing, appendix removal, kidney exploration, nephrotomy, tracheotomy, amputations, ligations, etc. Graduate students act as laboratory assistants, and may work out upon the cadaver various independent problems in emergency surgery. Dr. Dunn, Dr. Wangenstein.
- 103f,w,s. Operative Surgical Technique. A study of surgical technique by cardinal operations upon living animals. Dr. Zierold, Dr. Wangenstein.
- 105f,w,s. Proctoscopy and Sigmoidoscopy. The treatment and diagnosis of the pathological conditions found in the lower bowel, including minor surgical operations. Dr. Fansler.
- 201w,s. Surgery of the Kidney. Review of the embryology, anatomy, and pathology. Diagnosis, cystoscopic study, including kidney function estimation and pyelography; operative technique. Study of special problems involved. Dr. Strachauer, Dr. Thomas.
- 205f-206w-207s. Surgical Diagnosis. In this course the graduate student assists in the practical instruction of the clinical clerks and internes in the University Hospital, and makes a special study of problems in surgical diagnosis. Dr. Strachauer, Dr. Law, Dr. Ritchie.
- 208f-209w-210s. Surgical Service. The graduate student acts as house surgeon, and in connection with the service is required to make a special study of the patients, preparing them for clinics and observing them after operations. Dr. Strachauer, Dr. Law, Dr. Ritchie.
- 211f-212w-213s. Operative Surgery. In this course the surgical fellow acts as first assistant at all operations by the surgical staff in the University Hospital. When properly qualified, the fellow will be permitted to operate, beginning with simpler surgical procedures. Dr. Strachauer, Dr. Law, Dr. Ritchie.
- 216f,w,s. Surgical Research. Properly qualified students may undertake original investigation of problems in either experimental or clinical surgery. The work may be used for thesis purposes. Dr. Strachauer, Dr. Law, Dr. Ritchie.
- 217f,w,s. Surgical Seminar. Conference for reports on surgical literature, with presentation and discussion of specially interesting cases and research work by members of the surgical staff. Staff.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professors Donald C. Balfour, M.D. (Chief); E. Starr Judd, M.D., Frank C. Mann, M.D., Charles H. Mayo, M.A., LL.D., M.D., D.Sc., F.A.C.S.; Associate Professors Alfred W. Adson, M.D., M.S. in Surgery, M.A., Walter E. Sistrunk, Ph.M.C., M.D.; Assistant Professors, Louis A. Buie, B.A., M.D., Verne C. Hunt, B.S., M.D., M.S. in Surgery, James C. Masson, M.D., John de J. Pemberton, B.A., M.D., M.S. in Surgery;

Instructors Stuart W. Harrington, M.D., M.S. in Surgery, John S. Lundy, B.A., M.D., Fred L. Smith, M.D., Waltman Walters, M.D., M.S. in Surgery.

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

The opportunities for preparation in surgery in the Mayo Foundation are principally in the field of surgical pathology, in general and surgical diagnosis and in operative and experimental surgery. For work in pathology see the Department of Pathology. For work in surgical diagnosis see the Department of Medicine.

Fellows majoring in surgery usually select pathology as their minor. This the faculty recommends tho a minor may be taken in any other supporting preclinical field.

Men majoring in surgery usually begin their work with three or six months in postoperative care of ambulatory patients; with six months in pathologic anatomy; with six months in surgical pathology; or with a year's work in general diagnosis. This general diagnostic work is divided into two services of six months each. Anyone desiring more diagnostic work may take an additional half year. Fellows select the diagnostic sections in which they desire to work and their requests are followed so far as arrangements of the schedule will permit. The work in the minor field, pathology, anatomy, or physiology, and at least one year of diagnostic work should be completed before the fellow begins his operative service, at the Colonial, Kahler, or St. Mary's Hospital.

Operating room service for fellows in general surgery is given at St. Mary's, Kahler, and Colonial hospitals. The Kahler Hospital of 150 beds is at present utilized for the observation and surgical treatment of goiter, under the direction of Dr. Plummer, Dr. Pemberton, and Dr. Sistrunk. A limited amount of general surgery is also done in this hospital. Fellows on this service are charged with the pre-operative and postoperative care of the patients and act as second assistants in the operating room.

The Colonial Hospital of 325 beds is utilized for general surgery, including practically all the emergency surgery, and a large part of the surgery of certain specialists: neurology (Dr. Adson), the thorax (Dr. Harrington), orthopedics (Dr. Henderson and Dr. Meyerding), and urology (Dr. Hunt). During the fellow's service at the Colonial he acts as second assistant in the operating rooms and may have an opportunity to act as first assistant.

St. Mary's Hospital contains 600 beds, 400 of which are available for general surgery. During the fellow's service in this hospital he works in various rooms as second assistant, and may have opportunity of acting as first assistant.

In their operative service fellows act as second assistants for a period of six months to one year. The service also includes postoperative care of all patients in the operating room in which the fellow is on service.

During this service the fellow works in various rooms as second assistant and has occasional opportunity to act as first assistant. All second assistants are resident in the hospitals in which they are on operative service.

Fellows who are considered best qualified are appointed first assistants for a period of one or two years. This service may begin during the third year of residence. There are eleven such first assistantships available. There are also three positions as house surgeon open to competent fellows. House surgeons act as alternate first assistants.

Besides the work already mentioned opportunities are offered for work in urology, roentgenologic diagnosis, orthopedics, neurology, maxillofacial surgery, animal experimentation, X-ray and radium therapy, and regional anesthesia.

It will thus be seen that fellows in surgery may find it desirable to remain for longer than the minimum of three years. Recently the average residence is about four years, tho this is not required.

- M152f,w,s,su. Post-operative Care of Patients; treatment of complications, surgical and medical. Dr. Sistrunk, Dr. Smith.
- M153f-w,w-s,s-su,su-f. Operative Surgery. Second assistantship in operating rooms; occasional substitute service as first assistant. Dr. Balfour, Dr. Judd, Dr. Mayo, Dr. Adson, Dr. Sistrunk, Dr. Hunt, Dr. Masson, Dr. Pemberton, Dr. Harrington, Dr. Walters.
- M154f,w,s,su. Surgery of the Abdominal Organs and the Ductless Glands. Operative technic; study of special problems involved. Dr. Mayo.
- M155f,w,s,su. Surgery of the Abdominal and Genito-Urinary Organs. Operative technic; study of special problems involved. Dr. Judd.
- M156f,w,s,su. Surgery of the Gastro-Intestinal Tracts and Pelvic Organs. Operative technic; study of special surgical problems. Dr. Balfour.
- M157f,w,s,su. Surgery of the Thoracic Organs. Operative technic; study of special problems involved. Dr. Harrington.
- M158f,w,s,su. Surgery of the Central Nervous System. Operative technic and study of special problems involved. Dr. Adson.
- M159f,w,s,su. Intravenous Medication. The work in intravenous therapy offers a large field for the study of problems related to blood physiology, the blood dyscrasias and the causes and prevention of reactions following such therapy. Dr. Pemberton.
- M160f,w,s,su. Regional Anesthesia. The technic of field block and nerve block procedures will first be practiced upon the cadaver while the student observes the performance of the work on patients. During the latter half of the term opportunity will be provided for the student himself to perform these anesthetic procedures as part of the pre-operative preparation on patients at St. Mary's, Colonial, and Kahler hospitals. Dr. Lundy.
- M161f,w,s,su. Surgical Technic. The purpose of this course is to develop surgical technic. The fellows are paired and one operates while the other assists in performing the classical operations adaptable to experimental surgery. Two afternoons per week each quarter. Open only to fellows in surgery. Dr. Mann.

- M162f,w,s,su. Proctology. Dr. Buie.
- M249f,w,s,su. Research work on assigned problems in experimental physiology. Dr. Mann.
- M250f,w,s,su. Applied Physiology. Demonstrations of physiological procedures and processes which are of value in relation to clinical medicine. Dr. Mann.
- M251f,w,s,su. Applied Pathology. Demonstrations of pathological procedures and processes which are of value in relation to clinical medicine. Dr. Mann.
- M252f,w,s,su. Surgical Research. Investigation of special problems in surgery. Open only to fellows of the department. Dr. Mann.
- M253f,w,s,su. Research work on assigned problems in experimental pathology. Dr. Mann.
- M254f,w,s,su. Surgical Seminar. Conference for the discussion of original work, problems, and surgical literature. Staff.

ORTHOPEDIC SURGERY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Associate Professor Emil S. Geist, M.D., F.A.C.S.; Assistant Professor Carl C. Chatterton, M.D., F.A.C.S.

- 214f,w,s. Orthopedic Service. Three months' service as house surgeon in the State Hospital for Crippled and Deformed Children at Phalen Park. Special facilities for the study of orthopedic diagnosis and treatment. Dr. Chatterton.
- 215f,w,s. Orthopedic Diagnosis and Treatment. History taking, physical examination, treatment, application and use of plaster of Paris casts and braces. The graduate student acts as assistant in the clinic. Dr. Geist.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professor Melvin S. Henderson, M.D., F.A.C.S.; Associate Professor Henry W. Meyerding, M.D., M.S. in Orthopedic Surgery, F.A.C.S.; Instructors Paul N. Jepson, M.D., M.S. in Orthopedic Surgery, Hugh T. Jones, B.S., M.D., M.S. in Orthopedic Surgery.

Orthopedic surgery in the Mayo Foundation embraces not only the deformities of childhood but practically all deformities of the extremities and the spine in the adult. Fractures, recent and old; osteomyelitis, acute and chronic; bone tumors, cervical ribs, and so forth, that usually are relegated to general surgery are taken care of in the orthopedic service. In addition all the usual congenital deformities, such as club feet, dislocated hips, torticollis, and so forth are seen on this service. The surgeon who is to cope successfully with such a broad field of surgery must have a sound general surgical training. On account of the breadth of this service and the close association with general surgery as it is ordinarily understood, five places are held for fellows in general surgery. These include the position of house officer at St. Mary's Hospital where a service of

thirty-five beds is maintained and a like position at the Colonial Hospital where a service of fifty beds is maintained. Here the hospital care of orthopedic patients is carried on. All emergency cases such as recent and compound fractures, acute osteomyelitis, etc. are also taken care of. The remaining three services for general surgery are confined to orthopedic diagnosis, treatment of non-operative patients, manufacture and fitting of braces, and out-patient and postoperative service. Careful history taking and complete general examinations are done on all patients.

Two three-year services are available for fellows showing special adaptability for orthopedic surgery. Such fellows will have one year in diagnosis, at least one year in orthopedic surgery, one year in general surgery, and a minor either in pathology, anatomy, or neurology. Ample opportunity will be given the men majoring in orthopedic surgery for first assistantship in the operating room and in the office.

In connection with the examining rooms at the Temporary Offices is a brace shop and special shoe shop where braces and shoes are made. Thus ample opportunity is given for the study of the manufacture and use of orthopedic appliances. A department of physiotherapy is equipped and maintained also in connection with the section, so that gymnastics and exercises can be given and the postoperative care can be followed to completion. If a fellow has a problem that demands experimental work in its study, special time off can be arranged so that it can be carried out properly under the direction of the head of the experimental laboratory.

M163f,w,s,su. Orthopedic Diagnosis. History taking and physical examination of orthopedic cases. Study of braces, material and construction, measurements and fitting; application and use of plaster of Paris; interpretation of radiograms of orthopedic cases; care of non-surgical and postoperative cases. Dr. Henderson, Dr. Meyerding, Dr. Jepson, Dr. Jones.

M164f,w,s,su. Orthopedic Surgery. One year in service is offered to fellows majoring in orthopedic surgery. Dr. Henderson, Dr. Meyerding, Dr. Jones.

M165f,w,s,su. Demonstration of Orthopedic Cases. 24 hours. Dr. Henderson, Dr. Meyerding.

M255f,w,s,su. Seminar in Orthopedic Surgery. Open to fellows of the department. 12 hours. Dr. Henderson.

UROLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Associate Professor Franklin R. Wright D.D.S., M.D., F.A.C.S.; Assistant Professor Gilbert J. Thomas, M.D.; Instructor Frederick E. B. Foley, Ph.B., M.D.

218f,w,s. Urologic Diagnosis. History taking, physical examination, and case study in diseases of the genito-urinary tract. Dr. Wright, Dr. Thomas, Dr. Foley.

219f,w,s. Cystoscopy and Urethroscopy. Cystoscopic examination; urethral catheterization; kidney function study; pyelography; intravesical operations; fulguration. Dr. Wright, Dr. Thomas.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professor William F. Braasch, B.S., M.D.; Associate Professor John L. Crenshaw, M.D.; Assistant Professor H. Carey Bumpus, Jr., Ph.B., M.D., M.S. in Urology; Instructor William H. Von Lackum, B.S., M.D.

Opportunity for graduate instruction in urology is offered as a major and as a minor course. Two appointments are made annually in each course. Those fellows having had advanced work in the fundamental sciences or who are otherwise unusually well qualified will be given preference.

The major course in urology extends over a period of three years, which includes one and one-half years devoted to the diagnosis and treatment of diseases involving the urinary tract in the Section of Urology, one year in operative surgery, and the remaining six months in pathology. The course is designed to provide a thoro experience in the diagnosis and treatment of diseases involving the urinary tract. Opportunity is given to spend additional time in the study of the anatomy and physiology of the urinary tract, and in experimental work.

Urologic diagnosis and treatment, including cystoscopy, urethroscopy, urography, fulguration, diathermy, removal of foreign bodies, lithotripsy, ureteral manipulation, pelvic lavage, radium treatment, and so forth, are conducted daily in the cystoscopic rooms on the second floor of the Kahler. A suite of ten rooms in the south wing of the Kahler is devoted to this purpose. These rooms have been equipped with the latest devices for urologic diagnosis and treatment. They also include a special urologic laboratory and library. The technical work is carried on during the mornings under the supervision of Dr. W. F. Braasch, Dr. J. L. Crenshaw, and Dr. H. C. Bumpus. The fellow is given an opportunity personally to examine patients and familiarize himself with the diagnosis of a wide range of diseases affecting the urinary tract. More than six thousand cystoscopic examinations have been made in these rooms annually in recent years. Of this number a comparatively small percentage were negative and the pathology involved was largely of a surgical nature. The afternoon is devoted to history taking and physical examinations of patients suffering from diseases of the urinary tract and allied conditions, in the examining rooms of the Mayo Clinic. The close relation of this work to general diagnosis broadens the field and affords the fellow a breadth of clinical vision which he might not otherwise have. This service extends over a period of twelve months, which is divided into junior and senior services.

The diagnostic experience is also enlarged by a course of six months as resident in the urologic wards of the Colonial Hospital. In these wards he has an opportunity to study the pre- and postoperative treatment of

urologic conditions, as well as the clinical study and urologic diagnosis of patients kept under observation in the Colonial Hospital.

The surgical training consists of work as second assistant in general and urologic surgery. Here opportunity is given to observe a large number of patients operated for diseases involving the urinary tract and associated organs. Additional opportunity is offered to assist in operations for general surgical conditions, and particularly general abdominal surgery.

Instruction in pathology similarly includes a great variety of pathological conditions involving the urinary tract, as well as those embraced in general pathology. The courses in pathology offered are general pathology with Dr. Wilson, surgical pathology with Dr. MacCarty and Dr. Broders and staff, and pathologic anatomy under Dr. Robertson and staff.

Opportunities for research work on problems in bacteriology of the genito-urinary tract are provided under the supervision of Dr. Rosenow, Dr. Sanford, and Dr. Magath.

Fellows in urology are encouraged to keep in touch with current literature and the facilities of a large and complete library are offered to them, not alone in the library of the section, but in the general library of the Mayo Clinic.

In the investigation of clinical problems, opportunity is offered for reviewing records in the record room of the Mayo Clinic, where records of some half million patients are kept. Special cross files on cases involving the diseases of the urinary tract are kept in special rooms, permitting of thoro study of the clinical records of these conditions.

The fellow in urology is expected to be interested in experimental work and is given every opportunity to do this work in the experimental laboratories under the direction of Dr. F. C. Mann. In the new laboratory recently completed for this purpose every opportunity will be given for experimental work in physiology and other work, in our attempt to solve the problems involved in urologic diagnosis.

At the Temporary Offices Dr. Von Lackum has charge of a urologic service, which involves the diagnosis and treatment of inflammatory infections of the urethra. Every opportunity is given for the careful study and treatment of urethritis and complications, and each fellow is expected to spend at least three months on this service.

Special attention is given to urography, including pyelography, ureterography, cystography, and urethrography. A considerable experience in interpretation is necessary in order to make this diagnostic feature of value. During the past year over a thousand urograms were made in the cystoscopic rooms. A special technician is attached to the urologic section, who devotes his time largely to urography and special roentgenograms of the urinary tract. The services of Dr. A. B. Moore, and Dr. C. G. Sutherland of the Department of Radiology are available for consultation.

Every day there is a conference of the urologic staff, during which time the problems arising during the morning are discussed and the cases reviewed.

A seminar covering the current urologic medical literature is held at stated intervals, in which all members of the section take part.

Minor course.—The course is open to a limited number of fellows (two annually) who are majoring in general surgery. It consists of a diagnostic service in the Section of Urology, extending over a period of six months.

MI66f,w,s,su. Urologic Diagnosis. Cystoscopic examination and history taking in diseases of the genito-urinary tract. Dr. Braasch, Dr. Crenshaw, Dr. Bumpus.

DR167f,w,s,su. Cystoscopy, Urethroscopy. Cystoscopic examination; urography; endoscopic operations; fulguration. Dr. Braasch, Dr. Crenshaw, Dr. Bumpus. (One and one-half years or more of service is offered as a part of a three-year fellowship for those desiring to specialize in urology.)

MI68f,w,s,su. Special Urologic Treatment. A course of three months is offered in the study and treatment of infections of the urethra and adnexa. This course may be taken by those who are enrolled by either the major or the minor course in urology. Dr. Von Lackum.

DENTAL SURGERY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Research Professor Thomas B. Hartzell, D.D.M., M.D.

206f,w,s,su. Research in Mouth Infections. A study of dental and parodontal infections as related to systemic disease. Experimental study to determine the lesions produced in animals by bacteria from these sources. Dr. Hartzell.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Associate Professor Boyd S. Gardner, D.D.S.

The work in dental surgery in the Mayo Foundation is designed primarily for fellows or special students who are graduates in dentistry and who are majoring in dental surgery. The work is also open to graduate medical students.

OBSTETRICS AND GYNECOLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Jennings C. Litzenberg, B.S., M.D., F.A.C.S. (Chief); Associate Professors Fred L. Adair, B.S., M.A., M.D., F.A.C.S., John L. Rothrock, M.A., M.D., F.A.C.S.; Assistant Professor Lee W. Barry, M.D., Ph.D., F.A.C.S.

Of the courses in other departments open to graduate medical students, the following are especially recommended for those desiring to specialize in obstetrics and gynecology.

Advanced Anatomy: gross and histological, of the female generative organs and abdomen (Anatomy 153f-154w-155s-156su)

Fetal Anatomy: dissection of fetus and new-born (Anatomy 133f and 134f,s,su)

Implantation and Placentation (Anatomy 137f,w,s)

Advanced Physiologic Chemistry (Physiology 153f,w,s,su)

Gynecological Pathology (Pathology 118s)

Experimental Pharmacology (Pharmacology 104, 109a,b)

Other courses in fundamental or clinical subjects may be elected.

The following graduate courses are offered in the Department of Obstetrics and Gynecology (at Minneapolis):

- 117f-118w-119s-120su. Advanced Pathology of the Female Generative Organs. Required of first or second year fellows in obstetrics and gynecology. Prerequisite: Pathology 108, or equivalent. Dr. Adair.
- 121f-122w-123s-124su. Clinical Obstetrics and Gynecology. A course in diagnosis and treatment, with special study of selected cases. Clinic in the Out-Patient Department of the University Hospital, MWF, throughout the year. Required of first year fellows and may be elected by second year fellows. Dr. Litzenberg and dispensary staff.
- 125f-126w-127s-128su. Clinical Obstetrics and Gynecology. Similar to Course 111-114, but on TThS. Required of second year fellows, and may be elected by first year fellows. Dr. Litzenberg and staff.
- 201f-202w-203s-204su. Advanced Obstetrics and Gynecology. Includes service in the University Hospitals or Minneapolis General Hospital, affording ample opportunity for experience in diagnosis, care, and treatment (operative and non-operative) of patients. Special facilities are offered for study of problems and cases of unusual interest. Required of first year fellows. Dr. Litzenberg, Dr. Adair.
- 205f-206w-207s-208su. Similar to Course 201-204, but more advanced, both in clinical and research aspects of the subjects adapted to the increased training and experience. Required of second year fellows. A special fellowship may be taken in the Swedish Hospital during the second year under Dr. Adair. Dr. Litzenberg, Dr. Adair.
- 209f-210w-211s-212su. Similar to Courses 201-204 and 205-208 but more advanced. Required of third year fellows. Dr. Litzenberg, Dr. Adair.
- 213f-214w-215s. Seminar. A conference, including the fellows and graduate students. Presentation and discussion of original work and reports upon the current literature in obstetrics and gynecology. Reading knowledge of French and German is necessary. Dr. Litzenberg.
- 216f-217w-218s-219su. Research. Clinical and laboratory research upon problems in obstetrics and gynecology. Required of third year fellows, who must complete a satisfactory thesis during the year. Elective for second year fellows or other properly qualified graduate students. Dr. Litzenberg, Dr. Adair.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

Associate Professor Robert D. Mussey, M.D.; Assistant Professor Leda J. Stacy, M.D.; Instructor Lawrence M. Randall.

Limited opportunities for work in obstetrics are available with Dr. Mussey.

M251f,w,s,su. Clinical Obstetrics and Gynecology. Diagnosis and treatment with special study of selected obstetric cases. Dr. Mussey.

Opportunities for diagnostic work in gynecology are available with Dr. Stacy. (See M168 and M260 in the Department of Medicine.)

Operative work in gynecology in the Mayo Foundation is not segregated in any surgical section. It is therefore impossible to offer opportunity for special study in this field.

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

The graduate courses in these subjects are designed to prepare selected men for advanced work in the various lines, to prepare them for practice in these specialties, and to develop research and productive work in these subjects.

Of elective courses in other departments, the following are highly desirable.

Physics of Light and Acoustics

Advanced Optics

Advanced Anatomy of the Head and Neck

Topographic Anatomy of the Head and Neck

Advanced Histology and Embryology of the Eye, Ear, Nose, and Throat

Advanced Physiology of the Vision and Hearing

Physiologic Optics Seminar

Special Pathology of the Eye, Ear, Nose, and Throat

Immunity

Advanced Neuropathology

The Department of Ophthalmology and Oto-Laryngology in the Medical School, also offers a one-year course, to properly qualified graduate students, beginning with the fall quarter. This course is designed to give graduate students a training in the fundamentals (special anatomy, histology, embryology, pathology, physiology of special senses, physiologic optics) and clinical teaching in the Out-Patient Department in diagnosis and treatment. On the completion of this one-year course, students are urged to continue their work as residents in special hospitals, or further graduate clinical work in recognized institutions. Tuition fee for this course is sixty dollars per quarter.

A. COURSES OFFERED AT THE MEDICAL SCHOOL

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Professor William R. Murray, Ph.B., M.D., F.A.C.S.; Associate Professor Frank E. Burch, M.D., F.A.C.S.; Assistant Professors Walter E. Camp, M.A., M.D., Horace Newhart, B.S., M.D., F.A.C.S.

100f. Refraction. Lectures and demonstrations on the theory of refraction. 22 hours.

101f,w,s,su. Advanced Refraction. Practical work in the refraction clinics. Prerequisite: Course 100.

- 102f,w,s,su. Clinical Ophthalmology. Diagnosis and treatment of diseases of the eye. Daily attendance in the Out-Patient Department. 132 hours per quarter.
- 103w. Ocular Muscles. 18 hours.
- 104w. Perimetry. 18 hours.
- 105w,s. Ophthalmoscopy. 22 hours.
- 106w,s. Operative Surgery of the Eye. Operations on the cadaver and animal eyes. 18 hours.
- 107s. Neuro-Ophthalmology. Lectures and demonstrations. 18 hours.
- 108f,w,s,su. Ophthalmic Surgery. Operative clinic in the University Hospital. 22 hours per quarter.
- 200w,s. Seminar in Ophthalmology. Conducted by members of the staff and open to fellows, scholars, and qualified graduate students. 22 hours.
- 201f,w,s,su. Advanced Ophthalmology. Daily service in the University Hospital. Required of second and third year fellows, who will serve as assistants in operative and other clinical work.
- 202f,w,s,su. Research. Required of second and third year fellows who must complete a satisfactory thesis, based upon original work.
- 120f,w,s,su. Clinical Otology. Diagnosis and treatment of diseases of the ear. Daily attendance in the Out-Patient Department. 132 hours per quarter.
- 121f,w,s,su. Clinical Rhinology and Laryngology. Diagnosis and treatment of diseases of the nose and throat. Daily attendance in the Out-Patient Department. 132 hours per quarter.
- 122w. Operative Surgery of the Temporal Bone. Operations and demonstrations on the cadaver. 18 hours.
- 123w. Operative Surgery of the Nose and Throat. Operations and demonstrations on the cadaver. 18 hours.
- 124w,s. Functional Ear Tests. 12 hours.
- 125w,s. Diseases of the Labyrinth. 12 hours.
- 126w,s. Endoscopy. Lectures and demonstrations. 18 hours.
- 203w,s. Seminar in Oto-Laryngology. Conducted by members of the staff and open to fellows, scholars, and qualified graduate students. 22 hours.
- 204f,w,s,su. Advanced Oto-Laryngology. Daily service in the University hospitals. Required of second and third year fellows, who will serve as assistants in operative and other clinical work.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

OPHTHALMOLOGY

Professor William L. Benedict, M.D.; Assistant Professors Walter I. Lillie, M.D., M.S. in Ophthalmology, Avery D. Prangen, B.S., M.D.; Instructors John F. Gipner, B.A., M.D., M.S. in Ophthalmology, Henry P. Wagener, M.D., M.S. in Ophthalmology.

Fellows majoring in ophthalmology in the Mayo Foundation spend from six to nine months on the physics of light, physiologic optics, and

anatomy, pathology, and bacteriology of the eye in the Medical School in Minneapolis. The remainder of their service is composed of the following:

- M151f,w,s,su. Clinical Ophthalmology. External diseases of the eye, ophthalmoscopy, ophthalmic surgery. Dr. Benedict.
- M152f,w,s,su. Refraction and Ophthalmic Myology. Theory of refraction, retinoscopy, diagnosis of refractive errors of the eye, prescribing of lenses, practical work on patients under supervision of instructor. Eye movements, disturbances of motility of the eyes. Dr. Prangen.
- M153f,w,s,su. Medical Ophthalmology. Ophthalmology in relation to general diseases. Dr. Benedict.
- M154f,w,s,su. Neuro-Ophthalmology. Ophthalmology in relation to diseases of the nervous system. Physiology of the eye, psychology of vision, functional eye disturbances. Dr. Lillie.
- M155f,w,s,su. Pathology of the Eye. Dr. Benedict.
- M156f,w,s,su. Physiological Optics. Fundamental laws and principles of catoptrics and dioptrics. Qualitative and quantitative determinations of retinal functions. Binocular and monocular vision. Dr. Sheard.

NOTE.—Laboratory facilities for research in pathology and bacteriology of the eye, animal experimentation; demonstrations; weekly seminars held jointly by sections on Ophthalmology, Oto-Laryngology and Rhinology, and Laryngology, oral and plastic surgery.

OTO-LARYNGOLOGY AND RHINOLOGY

- Professors Harold I. Lillie, B.A., M.D., Gordon B. New, D.D.S., M.D.; Assistant Professor Bert E. Hempstead, B.A., M.D.; Instructors Carl M. Anderson, M.D., Fred A. Figi, M.D., W. Berkeley Stark, M.B.
- M157f,w,s,su. Diagnostic and Out-Patient Service. Diagnosis of neoplasms of the nose, throat, mouth, and neck. Plastic surgery of face and neck (pre- and postoperative treatment). Advanced laryngology as related to neurology and general medicine. Six months. Dr. New, Dr. Figi.
- M158f,w,s,su. Hospital Service. Internship in Worrell Hospital. Operative and radium treatment of tumors of the nose, throat, and mouth. Plastic surgery of the face and neck (operative). Six months. Dr. New.
- M159f,w,s,su. Clinical Oto-Laryngology and Rhinology. Theory and practice with differential diagnosis of diseases of the ear, nose, accessory sinuses, pharynx, and larynx and their relations to general diagnosis. Half time for nine months. Dr. Lillie, Dr. Hempstead, Dr. Anderson, Dr. Stark.
- M160f,w,s,su. Pre-operative and Postoperative Care of Patients. Treatment of complications. Half time for nine months. Dr. Lillie, Dr. Hempstead, Dr. Anderson, Dr. Stark.

- M161f,w,s,su. Operative Oto-Laryngology and Rhinology. Internship, second assistantship in operating service in Worrell Hospital. Half time for nine months. Dr. Lillie, Dr. Hempstead.
- M162f,w,s,su. Operative Oto-Laryngology and Rhinology. First assistantship in operative service in Worrell Hospital. Half time for nine months. Dr. Lillie, Dr. Hempstead, Dr. Anderson, Dr. Stark.
- M163f,w,s,su. Physics of Sound. Elasticity and vibrations. Transverse and longitudinal waves. Interference and resonance. Musical notes, organ pipes, rods. Acoustical measurements. The physical principles of hearing. Recent researches in audition. Dr. Sheard.
- M251f,w,s,su. Pathology. Opportunity will be given fellows during the service to study the gross and microscopic pathology of tumors of the nose, throat, and mouth in connection with the clinical material. Dr. Broders, Dr. New.

RADIOLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Henry A. Erikson, Ph.D.; Associate Professor Karl W. Stenstrom, Ph.D. (Physicist to Cancer Institute); Assistant Professor Robert G. Allison, M.D.

Graduates of Class A schools who have completed at least one year's satisfactory internship in a recognized hospital are eligible for an appointment as a fellow in radiology. The student must carry one major and two minor branches. The major shall be in radiology and one of the minor branches must be in physics. The course extends over a period of three years. The course in radiology covers the use of the X-ray as a means or aid to diagnosis in all branches of medicine. In addition the use of both superficial and deep radiation in therapy is taught.

The X-ray departments of the following hospitals are all fully equipped with modern diagnostic and therapeutic equipment and are available to fellows in radiology.

1. *University Hospital*.—Offers unusual clinical material of a chronic nature. There is an immense amount of material available in gastrointestinal, chest, bone, and urological diagnosis. Unusual opportunity is given the student for pre-operative study of the case and postoperative study of the material removed at operation. The Dermatological Department furnishes a large number of both acute and chronic skin diseases for treatment.

2. *Minneapolis General Hospital*.—This institution offers an immense amount of material in acute and chronic diseases. There is an exceptional amount of work in acute respiratory and cardiac diseases. There is a very large fracture service in this institution.

3. *Glen Lake Sanatorium*.—This institution, with its 500 beds devoted to the treatment and diagnosis of all types of tuberculosis, offers the student excellent opportunity to follow both the clinical and radiological course of the diseases while undergoing treatment. Routine X-ray examinations,

both pulmonary and gastro-intestinal, are done on admission and at intervals during the patient's stay in the institution.

4. *Lymanhurst School*.—Routine physical and X-ray examinations of all school children suspected of having pulmonary tuberculosis are conducted at this institution. The student is given an unusual opportunity to correlate the physical and X-ray findings in childhood tuberculosis.

5. *The Cancer Hospital*.—This hospital is situated on the university campus and has an initial capacity of fifty beds. It is devoted entirely to deep roentgen ray and radium therapy. It is fully equipped with the newest types of deep therapy machines. A radium emanation plant is housed in this building. This institution is run and staffed by the staff of the University Hospital. The student here obtains experience in roentgen and radium therapy. He is also taught the collection and use of radium emanation.

201f,w,s. Physics of Roentgenology. Instructions will be given in electricity including the electron theory and electrical phenomena in gases so that a clear understanding of the Roentgen machines may be acquired. The principles of other Roentgen equipment will be explained. The proper methods for controlling the production of rays in the Roentgen tubes and for measuring the intensity of the rays will be demonstrated, also the making and usage of charts showing the distribution of radiation inside the body. Problems referring to the protection against exposure to the rays will be thoroly discussed. Dr. W. Stenstrom.

203f,w,s. Physics of Radium Therapy. An outline of the atomic theory and of the radioactive transformations will be given. The concentration, measuring, and handling of emanation will be demonstrated. The application of radium and emanation will be discussed and the calculation of dosage will be taught. Special attention will be given to problems of filtration and protection. Dr. W. Stenstrom.

205f,w,s. Physics of Light Therapy. The undulation theory and the electromagnetic theory of radiation will be briefly reviewed and spectroscopy discussed. The relation between wave length and absorption of the rays by certain inorganic and organic material especially by tissues will be outlined: The difference in the light from different sources, i.e., from a quartz mercury lamp and a carbon arc lamp, will be demonstrated. The management of such lamps will be taught and also the arrangement for treatments. Dr. W. Stenstrom.

207f,w,s. Roentgen Therapy. Fellowship men will have an opportunity to treat patients under supervision both with medium and high voltage machines. All problems in connection with these treatments will be thoroly discussed. Dr. G. Allison, Dr. W. Stenstrom.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Associate Professor Alexander B. Moore, M.D.; Assistant Professor Charles G. Sutherland, M.B.; Instructors Harry H. Bowing, B.S., M.D., Albert U. Desjardins, M.D., M.S. in Rad., Albert Miller, M.D.

The opportunities offered in radiology in the Mayo Foundation are designed to permit selected men to fit themselves for advanced work in

this specialty. Unless the prospective fellow's preparation in normal anatomy, physiology, and pathology has been unusually good, at least a year should be spent in intensive study before entering on the special three years course. The course in radiology covers every branch of work with the X-ray and radium as applied in medicine. All laboratories are modernly and thoroly equipped. In addition to the routine work, seminars are held weekly in each division for the discussion of unusual problems and interesting cases. The library of the clinic and that of the department are well supplied with texts and journals dealing with radiology, and free use of these is expected. Individual research is encouraged in any radiologic problem which especially interests the student.

M151f,w,s,su. General Roentgenologic Technic. Practical instruction in the employment of all varieties of roentgenologic apparatus including transformers, vacuum tubes, tables, plates, films, intensifying screens, Bucky-Potter diaphragms, and developers, as used in roentgenography, stereoroentgenography, and roentgenoscopy. Dr. Moore, Dr. Sutherland.

M152f,w,s,su. Special Applications of Roentgenology. By assisting in the routine work of the laboratory the student is given abundant opportunity to become familiar with the roentgenography of the osseous system, chest, heart, lungs, and urinary system, and with the special technics required for accessory sinuses, mastoids, ventriculography, and pyelography. Unusual facilities and material are furnished for the roentgenoscopy and roentgenography of the gastro-intestinal tract. Dr. Moore, Dr. Sutherland, Dr. Miller.

M153f,w,s,su. Roentgen Therapy. The installation for roentgen therapy comprises four medium voltage machines and one high voltage machine, the latter operating two rooms simultaneously. Fellows have the privilege of examining patients having the various benign and malignant diseases to which roentgen treatment is applicable, and observing its effects, both early and late. Technic suitable for the various conditions are taught by practical demonstration. Instruction is given as to the mode of production, sequelae, prevention, and treatment of roentgen dermatitis; the causes, symptoms, and methods of minimizing radiation sickness; and the avoidance of danger from high tension currents. Dr. Desjardins.

M154f,w,s,su. Radium Therapy. Technics are demonstrated in the preparation and handling of radium tubes, needles, and plaques for therapeutic use, with methods of protection from professional injuries produced by radium. A large number of patients and an adequate supply of radium permit a practical exhibition of its application in general surgery, gynecology, ophthalmology, internal medicine, and diseases of the ductless glands, showing the biologic effects, reactions, and dosage. Dr. Bowing.

M251f,w,s,su. Physics of Radiology. A physical research laboratory is affiliated with the Department of Radiology, and the problems of this department constitute the major portion of the work done. Instruction is offered in electricity and magnetism, their phenomena, nature,

and properties; sources of electric energy; types of currents, continuous and alternating; units of electric measurement, voltage, amperage, and wattage; the interrupterless transformer; vacuum tubes, types, penetration measurements. Training is offered in the use of instruments for measuring rays and for standardizing radiation apparatus. The physical laboratory is so situated that measurements can conveniently be made on the roentgen treatment machine. In the laboratory there is also a complete apparatus for radium emanations, with the necessary auxiliary measuring devices.

M257f,w,s,su. Interpretation of Roentgenologic Findings. This very important field of roentgenology receives particular attention, and thorough training is given in the reading of plates and screen images, the recognition of normal and abnormal conditions, the roentgen signs of disease, both direct and indirect, roentgenologic differential diagnosis, the correlation of plate and screen findings, and the correlation of clinical and roentgenologic findings. In addition to the large current material, an extensive file of lantern slide reductions, exemplifying a wide variety of disease conditions, is accessible for study and comparison. Dr. Moore, Dr. Sutherland, Dr. Miller.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Associate Professor Albert J. Chesley, M.D.; Professors Harold S. Diehl, M.A., M.D.; Assistant Professors Orianna McDaniel, M.D., Jay A. Myers, Ph.D., M.D., E. M. Wade, M.A., H. A. Whittaker, B.A.

Inquiries concerning other work in public health should be addressed to the director, Dr. H. S. Diehl, Millard Hall, Minneapolis.

102. Sanitation. Sanitary supervision of water and milk supplies, sewerage systems and sewage, refuse, and garbage disposal systems. Practical work including field investigations, laboratory examinations, interpretation of results, recommendations to correct unsatisfactory conditions, report writing and office procedure. Open only to graduate students who have had Bacteriology 101; Chemistry 20-21, 35-36; Physics 22, 32, 42. Credits arranged. Mr. Whittaker.
103. Public Health Bacteriology. Modern methods of a public health laboratory in making diagnoses; in the preparation of vaccines, and in research. Prerequisites: Bacteriology 101, 106. Credits arranged. Miss Wade.
104. Epidemiology. Lectures on principles and methods of epidemiological investigation. Analysis of data; methods of research conclusions; individual field work; collateral reading. Open only to graduate medical students. Credits arranged. Dr. Chesley, Dr. McDaniel.
105. Vital Statistics. Application of statistical methods to morbidity and mortality figures; births and deaths; the drawing of conclusions; preparation of tables and graphs; measurement of effectiveness of health activities; calculation of expectancy; actual experience with the State Board of Health. Prerequisites: 51 and Econ. 14. Credits arranged. Dr. Chesley.

106. Public Health Administration. Organization of state, municipal, and voluntary health activities; preparation of budgets; procedures in enforcing quarantine; in correcting unsanitary conditions; in controlling tuberculosis and venereal diseases; value of sanitary surveys, food inspections, etc. Prerequisite: 54 or 56. Credits arranged. Dr. Chesley, Dr. Diehl.
- 107s. Sanitary Surveys. For medical students. Conferences, practical field work and report on a specified survey. Of particular value to practitioners who may be called upon to serve as local health officers. Prerequisite: 53 or 100. 2 credits. Dr. Diehl, Dr. Myers.
108. Field Work in Public Health. This will consist of actual health work, under supervision, in one or more of the approved public health organizations. The time, assignment, and credits will be arranged. Prerequisite: 104 or 106.
201. Research. Opportunities will be offered by the University and by the various co-ordinated organizations for qualified students to pursue research work. Dr. Chesley, Dr. Diehl, Dr. Myers.

ADDITIONAL COURSES

Other courses offered in this and the Graduate School bulletin which bear on work in public health:

Department	Course Title	Course Number
Animal Biology	Protozoology	107
Economics	Theory of Statistics	113
Chemistry	Sanitary Water Analysis	126
Political Science	Government of Minnesota	111
Psychology	Social Psychology	127
Sociology	Methods of Social Investigation	122
Education	Elementary Educational Psychology	139
Education	Mental Tests and Mental Diagnosis.....	135-136
Physiology	Physiology	101-102-103-104
Pathology	Pathology	101-102
Bacteriology and Immunology	Special Bacteriology	101
Bacteriology and Immunology	Household Bacteriology	105
Bacteriology and Immunology	Higher Bacteria	114
Bacteriology and Immunology	Immunity	116
Engineering	Water Supply Engineering.....	162
Engineering	Sanitary Engineering	163
Engineering	Water and Sewage Purification	261

B. COURSES OFFERED IN THE MAYO FOUNDATION

The only work in Preventive Medicine and Public Health offered in the Mayo Foundation is in connection with the Department of Pediatrics. See statement of that department.

GRADUATE STUDENTS REGISTERED AT THE UNIVERSITY
OF MINNESOTA AND MAYO FOUNDATION FROM
JULY 1, 1925, TO JUNE 30, 1926

Name	Degrees Other Than Medical and Institutions Conferring Same	Institutions* Con- ferring Medical Degrees	Date of Beginning Graduate Work	Date of Departure	Major	Minor
Adams, Samuel Franklin		N.Y. 9-20	10- 1-21		Med.	Path.
Aldrich, Martha	B.A. Smith 19		10- 1-25		Phys. Chem.	Physiol.
Allan, Frank Nathaniel	B.S. Toronto 24	Ont. 1-22	10- 1-25		Med.	Phys. Chem.
Allen, Raymond Bernard	B.S. Minn 24 M.A. Minn 25		7-29-24		Anat.	An. Biol.
Anderson, Allan Ramseur	A.B. Trinity 15 A.M. Trinity 16	Pa. 1-23	10- 1-24		Med.	Path.
Anderson, Edward Waldemar		Iowa 3-23	1- 1-25		Med.	Path.
Anderson, Evelyn	B.S. Minn. 24		1- 8-26	3-29-26	Pub. Health	
Anderson, Mark John	B.S. Minn. 23	Minn. 4-25	7- 1-25		Surg.	Path.
Ash, Wilford Anthony	B.S. Creighton 23	Neb. 6-23	7- 1-24		Med.	Path.
Aurelius, John Richard	B.S. Minn. 20	Minn. 4-23	4- 1-25		Radiol.	Path.
Baken, Melvin P.	B.A. St. Olaf 17	Ill. 1-21	9-25-23		Obst. and Gyn.	Anat.
Balch, Franklin G.	A.B. Harvard 18	Mass. 1-23	7- 1-25		Urol.	
Bannick, Edwin George	B.S. U. of Iowa 16	Iowa 3-23	1- 1-25		Med.	Path.
Barborka, Clifford Joseph	B.S. U. of Chicago 16	Ill. 1-20	10- 1-21		Med.	Path.
Bargen, Jacob Arnold	B.S. U. of Chicago 16	Ill. 1-21	10- 1-25		Med.	Bact.
Barker, Nelson Waite	B.A. Dartmouth 21	Ill. 1-24	1- 1-26		Med.	Path.
Barnes, Arlie Ray	A.B. Indiana U. 15 A.M. Indiana U. 16	Ind. 20-19	7- 1-20		Med.	Path.
Barr, Robert N.	B.A. Macalester		1- 4-26	3-29-26	Bact.	Chem.
Bassel, Paul Maiden	A.B. U. of Texas 22	Texas 2-24	10- 1-25		Med.	Path.
Baumgartner, Conrad John	B.S. U. of Neb. 21	Neb. 5-23	1- 1-25		Surg.	Path.
Beach, Watson	B.A. City of Detroit 24	Mich. 7-24	10- 1-24		Surg.	Path.

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Name	Degrees Other Than Medical and Institutions Conferring Same	Institutions* Con- ferring Medical Degrees	Date of Beginning Graduate Work	Date of Departure	Major	Minor
Becker, Samuel William	B.S. Mich. 18	Mich. 1-21	5- 7-23	5- 1-26	Dermat.	Path.
Bergen, Ralph David	A.B. Cath. U. of Am. 17	Md. 7-21	7- 1-22		Surg.	Path.
Berkwitz, Nathan John	B.A. Minn. 22 B.S. Minn. 23 M.B. Minn. 24	Minn. 4-25	1-14-26		Nerv. and Mental Dis.	Physiol.
Bieter, Raymond N.	B.S. Minn. 21 M.S. Minn. 24	Minn. 4-24	10- 9-22		Pharmacol.	Physiol.
Bliss, John Herbert	A.B. Syracuse 17 B.S. Columbia 20 A.M. Columbia 21	N.Y. 1-22	10- 1-23		Surg.	Path.
Bloomer, Joseph Arnold		Man. 1-25	1- 1-26		Med.	Path.
Bockstruck, Elsa	B.S. Minn. 23		10-10-25	1- 1-26	Physiol.	Anat.
Bodine, Marc Williams		Pa. 1-24	7- 1-25		Med.	Path.
Borgeson, Egbert John	B.S. Minn. 17	Minn. 4-19	7- 1-25		Ophthal.	Anat.
Bothe, Frederick Augustus	B.S. Mich. 19 M.S. Surg. Minn. Gl—26	Pa. 1-21	1- 1-23	1- 1-26	Surg.	Path.
Bowles, John Herschel	B.S. Wis. 22	Ill. 1-24	4- 1-25		Surg.	Path.
Brading, Edward Thurston	Ph.B. Tusculum 18	Mass. 1-23	8- 1-24		Med.	Path.
Bratrude, Earl Jeffrey	B.S. Minn. 19	Minn. 4-22	4- 1-26		Surg.	Path.
Brockbank, Thomas William	A.B. St. Bonaventure 15 A.M. Catholic U. Ph.D. 15	D.C. 2-24	7- 1-25		Neurol.	Path.
Brown, Alex Edward	B.S. Minn. 19	Minn. 4-22	5-15-25		Med.	Path.
Brown, Felix Manning	A.B. Vanderbilt 20	Tenn. 5-24	7- 1-25		Med.	Path.
Brown, Philip Walling	B.A. Colo. 17	Pa. 1-20	9- 1-21		Med.	Biochem.
Brunsting, Louis Albert		Mich. 1-24	4- 1-26		Dermat.	
Brutsch, Geo. Chas.	B.A. Minn. 24		1- 6-25		Bact.	Path.
Bueermann, Winfred Henry	B.S. McMinnville 17	N.Y. 1-21	10- 1-22		Surg.	Path.
Burke, Mead	B.A. Wis. 17		6-20-25	9- 1-25	Bact.	Pharmacol.
Burman, Guy Elmer	A.B. Neb. 14	Neb. 5-18	4- 1-24	10- 1-25	Laryng.	

Burns, Arthur	B.A. Texas 19	Md. 7-22	7- 1-24		Med.	Path.
Cabot, G. Sheryl	B.S. Minn. 22	Minn. 4-24	10-21-25		Anat.	
	M.B. Minn. 23					
Campbell, Orwood J.	B.S. U. of Chicago 20	Ill. 1-22	1- 2-24		Surg.	Path.
Caylor, Harold Delos	B.S. U. of Chicago 18	Ill. 1-18	7- 1-21		Path.	Ex. Surg.
Challman, Allan	B.A. Minn. 25		9-28-25	3-29-26	Med.	Phys. Chem.
Chumley, Charles Lawrence	B.S. Tenn. 23	Tenn. 6-24	7- 1-25		Surg.	Path.
Clayton, Irene	B.S. Wis. 23		10- 5-26	1- 1-26	Physiol.	
Cobb, Donnell B.	B.S. N.C. 19	Pa. 1-21	1- 1-23	1- 1-26	Surg.	Path.
	M.S. in Surg. Minn. Gl—26					
Coffey, Jay Russell	B.S. Ore. Agr. Col. 16	Ore. 2-23	7- 1-24		Surg.	Path.
Collins, Harry Aloysius		Neb. 6-22	7- 1-23		Med.	Path.
Comfort, Mandred Whitset	A.B. Austin 16	Texas 2-21	7- 1-23		Neurol.	Path.
	M.S. in Neur. Minn. Gl—25					
Constam, Geo. Richard Martin		Switz. 7-24	10- 1-25		Med.	Physiol.
Constans, Geo. Maurice	B.A. Carleton 12	Minn. 4-17	10- 1-24		Ophthal.	Anat.
Counseller, Virgil Sheetz	B.S. Chicago 18	Ill. 1-20	1- 1-24		Surg.	Path.
Covell, Walter Page	B.S. Oregon A. C. 22		9-30-23	3-29-26	Anat.	An. Biol.
	M.S. Minn. 23					
	Ph.D. Minn. 26					
Craig, Winchell McKendree	B.A. Ohio Wesleyan	Md. 7-19	7- 1-21		Surg.	Path.
Crane, Wm. Whitfield	A.B. Stanford 17	Cal. 11-22	7- 1-23		Surg.	Path.
Cranston, Elizabeth M.	B.A. Minn. 25		3-29-26		Anat.	Path.
Culligan, Leo Courtney	B.S. Minn. 20	Minn. 4-22	7-1 -21	4- 1-25	Surg.	Path.
Daly, Joseph	B.A. Lavall U. 1909	Ont. 1-23	1- 1-15	6- 1-25	Med.	Path.
	B.A. Oxford 1912					
Davidson, Thorald Edward	B.S. Drake 18	Ill. 1-23	7- 1-25	7- 1-26	Surg.	Anat.
deCarle, Donald Wilson	B.S. Minn. 20	Minn. 4-24	9-29-20		Oto-Laryng.	Path.
Desloges, Alfred	B.S. Montreal 16	Que. 2-23	10- 1-25		Ophthal.	Path.
Dewey, Earl T.	B.A. Minn. 25		6-11-25	3-29-26	Bact.	Path.
Dixon, Claude Frank	B.S. Kansas 19	Kan. 2-21	10- 1-22		Surg.	Path.
	M.S. Surg. Minn. Gl. 25					

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Name	Degrees Other Than Medical and Institutions Conferring Same	Institutions* Con- ferring Medical Degrees	Date of Beginning Graduate Work	Date of Departure	Major	Minor
Dickerson, Geraldine	B.A. Minn. 25		10- 9-25		Bact.	Org. Chem.
Dixon, Robert Kenneth	B.S. Minn. 20	Minn. 4-23	10- 1-23		Med.	Path.
Dobson, Herbert Victor	B.A. Toronto 16	Ont. 1-19	10- 1-23		Med.	Path.
Dowler, Vernon Booth	B.A. Toronto 15	Ont. 1-16	4- 1-26		Ped.	Path.
	M.S. Toronto 19					
Drips, Della Gay	B.A. Wis. 08	Minn. 4-20	10- 1-21		Med.	Path.
	M.S. Minn. 17					
Dunlap, Harold Foster	B.S. Indiana 16	Ind. 20-20	1- 1-22		Med.	Path.
Dunn, Halbert Louis	B.A. Minn. 17	Minn. 4-22	7- 1-24	8- 1-25	Med.	Path.
	M.A. Minn. 19					
	Ph.D. Minn. 23					
Ebert, Joseph Wm.	B.S. Creighton 22	Neb. 6-21	10- 1-22		Med.	Biochem.
Ehrenberg, Claude J.	B.S. Minn. 19	Minn. 4-20	9-24-24		Obst. & Gynec.	Anat.
	B.M. Minn. 19					
Eitel, George D.	B.S. Minn. 22	Minn. 4-24	1- 5-25		Path.	Anat.
	B.M. Minn. 23					
Eskew, Don Carlos		Va. 1-24	7- 1-25		Surg.	Path.
Etheredge, Shuler Hardin		S.C. 1-24	7- 1-25		Med.	Path.
Faust, Louis Sanders	B.S. Northwestern 22	Ill. 6-22	7- 1-23		Med.	Path.
Fehland, Harold Roland	B.S. U. of Wis. 22	Minn. 4-25	4- 1-26		Surg.	Path.
Ferguson, James Vance	B.S. Ark. 21	La. 1-23	7- 1-25		Surg.	Path.
Figi, Fred Adam		Neb. 5-18	7- 1-18		Oto-Laryng.	Path.
Fink, Walter H.	B.S. Carleton 18	Minn. 4-21	1- 9-25	8- 1-25	Anat.	Ophth.
	B.S. Minn. 18					
Finney, Wm. Parker (Junior)	A.B. Princeton 08	Md. 7-12	11- 1-19		Med.	Path.
Fishback, Frederick Coleman	A.B. Harvard 19	Mass. 1-22	7- 1-25		Surg.	Path.
Fitts, Wm. Thomas	B.S. Nat'l Teachers Normal, Tenn.	Tenn. 5-13	10- 1-25		Med.	Path.

Flothow, Paul George	B.S. Neb. 21	Pa. 1-23	7- 1-24		Surg.	Path.
Ford, Frances Adelia	B.S. Minn. 14	Minn. 4-21	1- 1-22		Med.	Phys. Chem.
Forsberg, Carl Wm.	B.S. Minn. 17	Minn. 4-23	1- 1-24	1- 1-26	Surg.	Path.
Fortin, Henry John	A.B. Fargo Col. 12	Ill. 6-16	8- 1-25		Ortho. Surg.	Path.
Frater, Kenneth	B.A. Capetown 19	U. of Capetown 23	10- 1-25		Surg.	Path.
Freed, Cecil Forest	M.S. Surg. Minn. Gl-25	Pa. 1-20	4- 1-22	10- 1-25	Surg.	Path.
Freedman, Newman Barnett	B.S. McGill 20	Que. 1-23	7- 1-25	6- 1-26	Surg.	Path.
Garrow, Douglas M.	B.A. Macalester 24		6-19-25	8- 1-25	Physiol. Chem.	
Garvin, John Day	B.A. Yale 16, M.S. in Med. Minn. Gl. 26	Pa. 12-21	7- 1-22	4- 1-26	Med.	Path.
Gay, James Gaston	B.A. U. of Ga. 19	Md. 7-23	10-15-24		Surg.	Path.
Gemmell, John H.	B.A. Minn. 24 B.S. Minn. 25 M.S. Minn. 26		9-24-25		Physiol.	Phys. Chem.
Geyman, Milton J.	B.S. Minn. 20 M.B. Minn. 21	Minn. 4-20	10- 6-24		Roent.	Path.
Gorder, Arne Christian	B.S. Wis. 20, M.S. 21	Ill. 1-23	10- 1-24		Surg.	Path.
Gosin, Donne Edw.		Ill. 6-10	11-19-25	1- 1-26	Anat.	
Grain, Gerald Orton	B.A. Manitoba 12	Man. 1-16	1- 1-26		Neurol.	
Green, George Francis	B.S. Mich. 22	Mich. 1-24	10- 1-25		Surg.	Path.
Greene, Earle Ira	B.S. Chicago 20	Ill. 1-22	4- 1-24		Med.	Path.
Greenlee, Daniel Paul	B.S. Pittsburgh 22	Pa. 12-24	7-15-25		Surg.	Path.
Gregory, Raymond L.	B.A. Texas 22 M.A. Texas 23		9-25-23		Pharm.	Physiol.
Grier, James Parkes	B.S. Northwestern 20	Ill. 6-24	1- 1-26		Surg.	
Grob, Otto		Aus. 7-23	7- 1-24	5- 1-26	Ped.	Path.
Hackett, Joseph Frank	B.S. Mich. 22	Minn. 4-24	1- 1-26		Obst. & Gynec.	Anat.
Hager, Benjamin Harry	B.S. Chicago 15	Ill. 1-17	11- 1-22		Urol.	Path.
Haines, Samuel Faitoute	S.B. Harvard 15	Mass. 1-19	7- 1-21		Med.	Path.
Hallberg, Charles Albert		Ill. 11-11	7- 5-17		Surg.	Path.
Hamrick, Robert Arnold	B.S. Ala. 19	Md. 7-23	1- 1-25		Surg.	Path.

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Hand, John Redmond	B.S. Minn. 20	Minn. 4-24	1- 1-25		Urol.	Path.
Hane, Richard Lincoln	B.S. Ohio State 22	Ohio 40-24	1- 1-26		Surg.	Path.
Hansen, Arild	B.S. Minn. 22 M.B. Minn. 24	Minn. 4-25	1-13-26		Ped.	
Hanson, Wm. Arthur	B.S. Minn. 19	Minn. 4-23	7- 1-22	1- 1-25	Surg.	Path.
Hargis, Estes Henry		Pa. 1-21	7- 1-23		Surg.	Path.
	M.S. Surg. Minn. Gl.—26					
Harrington, Ethel R.	Ph.B. Chicago 12	Ill. 1-17	1- 1-24		Ped.	Path.
Harshbarger, Isaac Long		Va. 1-22	7- 1-24		Surg.	Path.
Hartig, Hermina	B.S. Minn. 12	Minn. 4-14	1-13-26	4-16-26	Ped.	
Havens, Fred Z.	S.B. Drake 12	Ill. 1-15	4- 1-26		Oto-Laryng.	Path.
Hazeltine, Matthew Emery	B.S. Cal. U. 16 B.A. Stanford 22	Cal. 11-25	1- 1-26		Surg.	Path.
Heetderks, Dewey Ralph	A.B. Mich. 18	Mich. 1-22	1- 1-23		Oto-Laryng.	Path.
Hench, Philip Showlater	A.B. Lafayette 16	Pa. 12-20	10- 1-21		Med.	Phys. Chem.
Henderson, Earl Fletcher	B.S. Grove City 13	Pa. 1-18	1- 1-24		Surg.	Path.
Hendricks, Wm. Anthony	B.S. Wis. 16	Pa. 1-18	10- 1-22	4- 1-26	Surg.	Path.
Herbolsheimer, Albert John	B.S. Ill. 13 B.M. Minn. 20 M.S. Minn. 26	Minn. 4-23	9-26-23		Ophthal. & Oto-Laryng.	Anat.
Herman, Arthur L.	B.S. Minn. 20 M.B. Minn. 22	Minn. 4-23	1- 3-25	1- 1-26	Anat.	Path.
Hess, Arthur P.	B.S. Western Reserve 23		9-26-25		Pharmacol.	Physiol.
Holt, John E.	B.S. Minn. 21 M.B. Minn. 23	Minn. 4-24	1-14-26		Med.	
Honan, Martin Stanislaus	B.A. U. Col. Dublin 18 M.A. 24	Ire. 3-24	10- 1-25		Med.	Path.
Horton, Bayard Taylor	B.A. Va. 21	Va. 1-22	7- 1-25		Med.	Path.
Horwitz, Alec	B.A. Geo. Wash. 20	D.C. 1-23	7- 1-24		Surg.	Path.

Houck, Knut Hoegh	B.S. Northwestern 21	Ill. 6-22	2-21-23		Neurol.	Path.
Houkom, Bjarne	B.A. Minn. 21		9-28-25		Path.	An. Biol.
	B.S. Minn. 24					
	M.S. Minn. 26					
Huffman, Lester Dale	B.S. Indiana 14	Ind. 20-16	4- 1-23		Med.	Path.
Hufford, Alvin Ray	M.S. (Phys.) Loyola 23	Ill. 43-22	1- 1-24		Med.	Physiol.
Hundley, Myrtle M.	B.A. Hope 25		3-28-25		Phys. Chem.	Bact.
Hunt, India	B.A. Agnes Scot 17	Pa. 7-21	1- 1-25	7- 1-26	Med.	Path.
Hurley, Michael Vincent	B.A. U. Col. of Cork 14	U. of Cork 19	10- 1-25		Surg.	Path.
Hurt, Holcombe Harris		Va. 1-24	7- 1-25	6- 1-26	Surg.	Path.
Hutchinson, Dorothy	B.A. Macalester 20	Penn. 12-24	7- 1-25		Med.	
Hymes, Charles	B.S. Minn. 17	Minn. 4-20	6-22-21		Ophthal.	Anat.
	B.M. Minn. 19					
Iler, Russell Hills	A.B. Cornell 20	N.Y. 20-24	7- 1-25		Ped.	Path.
Jacobs, Minard F.	B.A. Michigan 19	Mich. 1-23	7- 1-25		Med.	Path.
Janovsky, Felix M.	B.S. Chicago		8- 1-25	9- 1-25	Bact.	
Jepson, Paul Newton	B.A. Carleton 16	Pa. 1-20	9- 1-21		Orth. Surg.	Path.
	M.S. Orth. Surg. Minn. Gl—26					
Joannides, Minas		Mo. 2-23	9-25-23		Surg.	Anat.
Johnson, Arthur Charles	B.S. Minn. 18	Minn. 4-20	1- 1-20		Surg.	Path.
Johnson, Henry Peter	B.S. Bates Col. 16	Maine 1-21	4- 1-24		Oto-Laryng.	Path.
Johnson, Walter Royle	B.S. Minn. 22	Minn. 4-25	4- 1-26		Med.	Path.
Jones, Robert DuVa., Jr.	A.B. N.C. 20	Pa. 1-24	7- 1-25		Surg.	Path.
Jordan, Elverse Morris		Texas 2-23	7- 1-25		Med.	Path.
Kappes, Louise Osborne	B.S. Northwestern 17	Mich. 1-24	10- 1-25	7- 1-26	Ped.	Path.
Kennedy, Roger L. J.	B.S. Minn. 18	Minn. 4-22	7- 1-23		Ped.	Path.
Kepler, Elwin John	B.S. Pa. State 16	Minn. 4-25	10- 1-25		Med.	Path.
Kepler, Helen Mackeen	B.S. Minn. 18	Minn. 4-22	10- 1-25		Ped.	Path.
	M.A. Minn. 19					
Kernohan, James Watson	B.S. Queens 21	Ire. 1-21	10- 1-22		Path.	Bact.
Kestel, John L.	B.S. Creighton 22	Neb. 6-24	4- 1-26		Med.	Path.

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Name	Degrees Other Than Medical and Institutions Conferring Same	Institutions* Con- ferring Medical Degrees	Date of Beginning Graduate Work	Date of Departure	Major	Minor
Kilfoy, Edward Joseph	B.S. St. Louis U. 21	Mo. 34-21	4- 1-23	7- 1-26	Surg.	Path.
Kilgore, Allen Malone		Ill. 1-18	5-18-23	4- 1-26	Surg.	Path.
Killins, Wendell Allensworth		Neb. 5-21	9- 1-23		Med.	Path.
King, Joseph T.	B.S. Minn. 24 M.S. Minn. 24 M.B. Minn. 25	Minn. 4-25	10-10-23		Physiol.	Med.
Kleinheksel, John Lewis	A.B. Mich. 20	Mich. 1-24	7- 1-25		Med.	Path.
Koster, Basil McDonald		Que. 1-22	7- 1-24		Surg.	Path.
Kresback, Clare	B.S. Col. St. Teresa 20		9- 6-20	10- 1-25	Clin. Path.	An. Biol.
Lapp, Victor Roy		Que. 1-21	8-16-23		Oto-Laryng.	Path.
Lara, y Baldoria Casimiro		P.I. 2-19	8-22-24		Med.	Physiol.
Latchford, James Kyran	B.A. Toronto 4	Ont. 1-21	10- 1-22		Surg.	Path.
Leech, Charles Hoyt		Ohio 41-22	7- 1-23	10- 1-25	Surg.	Path.
Leonard, Harold J.	D.D.S. Minn. 12 B.A. Minn. 15		6-26-23		Phys. Chem.	Bact.
Leitch, Niel McLean	B.A. U. of Ill. 20 B.S. Ill. 24	Ill. 11-24	1- 1-26	5- 7-26	Surg.	Path.
Levine, Maurice	B.A. Cincinnati 23 M.A. Cincinnati 24		6-19-25	9- 1-25	Physiol.	
Lewis, David J.	B.S. Minn. 21		6-22-22		Path.	Anat.
Lincoln, Miriam	B.A. Radcliffe 22		9-28-25		Bact.	An. Biol.
Lindsey, Maude Louise	A.B. Colo. 23	Mo. 2-24	7- 1-25		Ped.	Path.
Loewen, David Frank	B.A. Carleton 26		4- 1-26		Phys. Chem.	
Loucks, Milo M.	B.S. Minn. 24 M.S. Minn. 25		10- 8-24		Physiol.	Phys. Chem.
Lyday, Russell Osborne	B.S. N.C. 18	Pa. 1-20	1- 1-23	7- 1-26	Surg.	Path.
McIndoe, Archibald H.		U. of Otago 23	1- 1-26		Surg.	Path.
McKeithen, Archibald M.	B.S. Davidson 16	Md. 7-20	10- 1-24		Surg.	Path.
McKnight, Roy Bowman	A.B. N.C. 14	Pa. 1-20	7- 1-24		Surg.	Path.

McNaugher, Wm. McMillan	B.S. Westminster 17	Pa. 1-24	7-15-25		Surg.	Path.
McQuiggan, Mark Ronald	B.S. Pittsburgh 21	Pa. 12-23	7-1-24		Med.	Path.
Macklin, Wm. E., Jr.	D.V.M. Iowa State 13		1-1-25		Vet. Med.	Path.
Madsen, Leo John	B.S. Minn. 19	Minn. 4-24	7-1-24	1-1-26	Surg.	Path.
Mailor, Robert	M.S. Surg. Minn. Gl—26	Scot. 3-23	4-1-23	7-1-26	Surg.	Path.
Malloy, Joseph Francis	B.S. Creighton 19	Neb. 6-21	7-1-22	7-30-25	Med.	Path.
Maloney, Frank Geo. Hiram		Ont. 1-24	7-1-25		Surg.	Path.
Marquis, Wm. James	Ph.G. U. of Neb. 18	Mass. 1-22	7-1-23	1-1-26	Radiol.	Path.
Marsh, Fred Eugene		Tenn. 5-22	7-1-23		Med.	Path.
Masson, Duncan Morrison	B.A. Toronto 18	Ont. 1-20	7-1-21		Med.	Path.
Mayer, Lillian	B.S. Minn. 18	Minn. 4-21	4-4-24	4-1-25	Ped.	Prev. Med.
Mayfield, Alfred Lisle	B.S. Wis. 15	Ill. 1-17	1-1-23		Surg.	Path.
Maytum, Charles Koran		Iowa 3-19	7-1-22		Med.	Path.
Melson, Madeline M.	B.A. Cal. 17	Cal. 2-24	1-1-25	10-1-25	Ped.	Exp. Path.
Melson, Oliver Clarence	A.B. Adelbert 13	Ohio 6-16	5-1-19	10-1-25	Med.	Path.
Mentzer, Stanley Herman		Cal. 2-23	7-1-23	7-1-26	Surg.	Path.
Michael, Joseph C.	B.S. Minn. 12	Minn. 4-13	11-4-23		Neurol.	Psy.
Miller, Tugo E.	B.A. Minn. 24		9-25-25		Physiol.	Path.
	B.S. Minn. 25					
Moersch, Frederick Paul	B.S. Minn. 11	Minn. 4-13	7-1-20		Neurol.	Path.
Montank, Irwin A.	B.A. Utah 21		10-4-21		Bact.	Chem.
Montgomery, Hamilton	A.B. Harvard 18	Mass. 1-22	1-1-25		Derm.	Path.
Morse, Harry Dodge	M.S. Urol. Minn. Gl—25	Que. 1-18	7-1-22	10-1-25	Urol.	Path.
Morton, Charles Bruce	B.S. Va. 20	Va. 1-22	9-1-24		Surg.	Path.
Muhme, Norman Benedict		Mich. 1-21	1-1-23	4-1-26	Surg.	Path.
Mulinos, Michael J.	B.A. Columbia 21	N.Y. 1-24	6-20-25		Ped.	Physiol.
	M.A. Columbia 22					
Murray, James Kenneth P.		Ont. 1-21	1-1-26		Surg.	Path.
Nagel, Gunther Wilibald	A.B. Stanford 17	Cal. 11-21	7-1-22		Surg.	Path.
	M.S. Surg. Minn. Gl—26					
Nelson, Edmond	B.S. S.D. State 19		1-8-21		Bact.	Vet. Med.
	M.S. Minn. 22					

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Nelson, Marque Ovid	B.S. Minn. 22	Minn. 4-23	1- 1-24		Dermat.	Path.
Nixon, Samuel Henry		Va. 4-20	4- 1-23	1- 1-26	Surg.	Path.
Nomland, Ruben	B.S. N.D. 22	Ill. 1-24	1- 1-26		Med.	
Nordin, Charles G.	B.S. Minn. 08	Minn. 4-10	9-29-25		Ophthal. & Oto-Laryng.	Anat.
Ochsenhirt, Norman Charles	B.S. Pittsburgh 16	Pa. 12-17	7- 1-24		Surg.	Path.
Ohrbeck, Esther C.	B.A. Minn. 25		10- 1-25		Physiol.	Phys. Chem.
Omohundro, Miles Parker		Va. 1-22	4- 1-24		Urol.	Path.
Osborne, Carver Haines	B.S. New Hamp. 17	Mass. 5-21	4- 1-25	4- 1-26	Surg.	Anat.
Palomeque, Emilio Jose		Pa. 1-23	10- 1-25		Surg.	Path.
Parker, Bennett Roland	S.B. Chicago 13	Ill. 1-15	10-20-19	4- 1-26	Surg.	Path.
Parker, James Wm., Jr.	B.S. Ill. 19	Ill. 11-20	4- 1-22		Surg.	Path.
Parker, Stephen Thomas	B.S. Gonzaga 23	Neb. 6-21	4- 1-23		Dermatol.	Path.
Parsons, Eloise	A.B. Ranolph-Macon 17	Ill. 1-24	7- 1-25		Med.	Path.
	Ph.D. Chicago 23					
Pederson, Arthur H.	B.S. Minn. 18	Minn. 4-21	9-23-22		Anat.	Path.
	M.B. Minn. 20					
Perry, Charles Clayton		Md. 1-20	4- 1-24	1- 1-26	Med.	Path.
Perry, Clarence Larimore	B.A. Ohio Wesley. 21	Ohio 40-24	4- 1-26		Surg.	Path.
Peterman, Mynie Gustav	B.S. Wis. 18, M.S. Wash. U. 21	Mo. 2-20	10- 1-22	10- 1-25	Ped.	Physiol.
Plankers, Arthur Gottfried	B.S. Minn. 16	Minn. 4-18	4- 1-22		Surg.	Path.
Pope, Charles Evans	B.A. Northwestern 23	Ill. 6-24	1- 1-26		Surg.	Path.
Prickman, Louis Elwood	B.S. Pittsburgh 21	Pa. 12-21	7-15-24		Med.	Path.
Prucha, Edward J.	B.A. Wis. 15		6-20-25	7-31-25	Physiol.	Chem.
Pugliese, Francis Michael		Pa. 1-23	4- 1-25		Surg.	Path.
Pulford, Delos Schuyler	S.B. Trinity 12	Md. 7-17				
	M.S. Path. Minn. Gl. 25					
Randall, Lawrence Merrill		Ia. 3-21	1- 1-24		Obst.	Phys. Chem.
Reddick, Charles Edgar		Ky. 2-24	1- 1-26		Surg.	Path.
Reid, John Spence	B.A. Toronto 14	Ont. 1-20	1- 1-22	4- 1-26	Surg.	Path.

Reid, Winfred Lee		Ill. 6-24	7- 1-25		Surg.	Path.
Remington, Roe E.	B.A. Colorado 05 M.A. Minn. 24		6-22-22	8- 1-25	Physiol.	Chem.
Rentschler, Calvin Balthaser	B.S. Dickinson 21 M.A. 24	Pa. 1-24	7- 1-25		Surg.	Path.
Rentschler, Edwin Balthaser	B.S. Dickinson 27	Pa. 1-24	7- 1-25		Med.	Path.
Rivers, Andrew Baptiste		Neb. 6-17	1-15-20		Med.	Phys. Chem.
Rockwell, Donald Carman	B.S. Mich. 17	Mich. 1-19	7- 1-20	10- 1-25	Oto-Laryng.	Path.
Roe, Harold E.	B.A. Cal. 23		10- 3-24		Anat.	Path.
Rohwer, Jacob Christian	B.S. Wash. 17 M.S. Neurol. Minn. Gl. 27	Pa. 1-21	4- 1-23	7- 1-26	Neurol.	Physiol.
Rubenstein, Myer W.		Pa. 2-23	4- 1-26		Dermatol.	
Rucker, Charles Wilbur	B.S. Minn. 23	Minn. 4-26	4- 1-26		Ophthal.	Anat.
Ryan, John Harold	B.S. St. Louis U. 20 B.S. in Med. 22	Mo. 34-24	4- 1-16		Surg.	Path.
Sager, Wm. Warren	B.A. Wash. & Lee 18	D.C. 1-22	7- 1-24		Surg.	Path.
Saint, James Harold	B.S. Durham 24	Eng. 4-24	4- 1-25	7- 1-26	Surg.	Path.
Sandiford, Kathleen	A.B. Radcliffe 19		10- 1-20		Chem. (bio)	Physiol.
Sawyer, Frances Marie	B.S. 22, M.S. 23, Wis.		7- 1-23		Phys. Chem.	Path.
Schaefer, John Hugo		Cal. 6-16	10- 1-23		Path.	Anat.
Schild, Emmett Leroy	B.S. Minn. 23 M.B. Minn. 24 M.S. Minn. 26		1-20-23		Bact.	Anat.
Schmidt, Edna V.	S.B. Chicago 07		10- 1-20	10- 1-25	Path.	
Schmitt, Earl Oriol Gregor	B.A. Minn. 19 B.S. Minn. 24	Minn. 4-23	10- 1-23		Med.	Path.
Schulz, Irwin W. P.	B.S. Wis. 21	Wis. 6-23	7- 1-24		Med.	Path.
Scott, Gordon Hattler	B.A. Southwestern 22 M.A. Minn. 25 Ph.D. Minn. 26		9-28-23	3- 1-26	Anat.	Bact.
Shafter, Royce Roemer	B.S. Michigan 19	Mich. 1-23	10- 1-24		Surg.	Path.

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Shippey, Stuart Hunter		Ga. 5-23	7- 1-24		Med.	Path.
Shugrue, John J.	B.A. Georgetown 15 B.S. Georgetown 17 M.D. Georgetown 19	D.C. 2-19	4- 1-25		Surg.	Path.
Simon, Harold Ewart	B.S. Pittsburgh 20	Pa. 12-22	10- 1-23		Surg.	Path.
Smith, Harry LeRoy		Ia. 3-16	6- 8-25		Med.	Path.
Smith, Newton Dean		N.Y. 6-23	1- 1-25		Surg.	Path.
Snell, Albert Markley	B.S. Minn. 16	Minn. 4-18	10- 1-25		Med.	Physiol.
Somerfield, Harold A.	B.A. Stanford 21 M.D. Stanford 25	Cal. 11-25	6-13-25		Obst. & Gynec.	Anat.
Stark, Wm. Berkley		Ont. 1-15	1- 1-22		Oto-Laryng.	Path.
Steggerda, Frederick	B.A. Hope 25		9-26-25		Physiol.	Phys. Chem.
Stephens, Brooks Palmer	B.S. Kansas 16	Kansas 2-20	2- 1-26		Ortho. Surg.	Path.
Stephenson, Robert A.	B.A. Columbia 18	N.Y. 1-18	10- 1-25		Ped.	Path.
Stinson, John Wesley		Pa. 2-21	4- 1-23		Surg.	Path.
Stoesser, Albert V.	B.S. Minn. 22 B.M. Minn. 24	Minn. 4-25	7- 6-25		Ped.	Physiol.
Swan, Theodore Strong	B.S. Geneva 16	Pa. 1-20	1- 1-22		Surg.	Path.
Swanson, Roy Edwin	B.S. Minn. 15	Minn. 4-16	1- 9-23	6-14-26	Obst. & Gyn.	Anat.
Synhorst, Alfred Paul		Iowa 3-22	4- 1-24		Surg.	Path.
Thomison, Walter Agnew		Tenn. 5-23	4- 1-25		Surg.	Path.
Thompson, Harold Lincoln	B.A. Iowa 19	Ill. 1-23	7- 1-25		Surg.	Path.
Thompson, John William, Jr.		Mo. 2-23	7- 1-24		Surg.	Path.
Tiber, Leon J.	B.S. Minn. 17 M.B. Minn. 19	Minn. 4-20	1- 5-25	1- 1-26	Anat.	
Tierney, Mary T.	B.A. Minn. 20 B.S. Minn. 23		9-29-25	1- 1-26	Prev. Med.	Ed.
Tillotson, Bradley Porter	B.S. N.D.A.C. 21 M.S. N.D.A.C. 23		6-15-25	8- 1-25	Anat.	An. Biol.

Tsiang, Kuen	M.D. 16 Chekiang Med. Col., China		9-21-22		Bact.	Pub. Health
Urner, John Arnold	B.S. Chicago 21					
	B.S. Wash. 22	Minn. 4-24	1- 4-26		Obst. & Gynec.	Anat.
	M.B. Minn. 23					
Vickery, Eugene Benton	A.B. N. Ga. Agr. 19	Md. 7-23	10- 1-25		Urol.	Path.
Viecelli, James Dominic		Colo. 2-23	7- 1-25		Med.	Path.
Wagener, Henry Patrick		S.C. 1-13	1- 1-20		Ophthal.	Anat.
	B.S. Col. of Charleston 09 M.S. Ophthal. Minn. Gl.—23					
Waller, Riley Moore	A.B. U. of Mo. 18	Mo. 2-20	7- 1-23		Surg.	Path.
	B.S. Dartmouth 17	Ill. 1-20	7- 1-20		Surg.	Path.
Wangensteen, Owen	M.S. Surg. Minn. Gl. 23					
	B.A. Minn. 19	Minn. 4-22	1-10-23	12-17-25	Med.	Path.
	B.S. Minn. 20					
	M.B. Minn. 21					
Watkins, Charles H.	Ph.D. Minn. 25					
	B.A. Minn. 24		4- 1-24		Anat.	An. Biol.
	M.A. Minn. 25					
Watson, Cecil J.	B.S. Minn. 23		12-11-25		Path.	Med.
	M.B. Minn. 25					
	M.S. Minn. 25					
Webber, Isaac Merwyn	B.S. Bowdoin 16	Maine 1-20	5- 1-23		Surg.	Path.
	M.S. Surg. Minn. Gl.—25					
Wetherby, MacNider	B.S. Minn. 20	Minn. 4-23	8- 1-25	1- 1-26	Med.	
	M.B. Minn. 22					
	A.B. Union U. 16	Tenn. 5-20	10- 1-25		Surg.	Path.
Whitten, Merritt Bryant	B.S. U. of Ore. 21	Ore. 2-24	7- 1-25		Med.	Path.
Wickham, Mont Cecil	B.S. Minn. 23	Minn. 4-25	4- 1-26		Urol.	Path.
Wilhelmji, Charles Martell	B.S. St. Louis 22	Mo. 7-22	10- 1-25		Med.	Path.
	M.S. 22					
Wilkinson, Henry Fielding	B.S. Dartmouth 19	Conn. 1-21	7- 1-24		Oto-Laryng.	Path.

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Williams, Henry Lane, Jr.	A.B. Yale 21	Pa. 1-24	7- 1-25		Oto-Laryng.	Path.
Williams, Thomas Bertram	B.A. Stanford 21	Cal. 11-25	1- 1-26		Oto-Laryng.	Bact.
Williamson, Carl Sneed	A.B. Mo. 18 M.S. Surg. Minn. Gl.—25	Pa. 1-20	10- 1-20	7- 1-26	Surg.	Path.
Williamson, George A.	B.A. G. Wash. 17	D.C. 2-21	1- 1-26		Med.	
Yater, Wallace Mason	B.A. G. Wash. 17	D.C. 2-21	1- 1-26		Med.	
Yoakem, Howard Haynes	B.A. Ohio State 17	Ohio 40-21	7- 1-23	7- 1-26	Surg.	Path.
Ziegler, Lloyd Hiram	A.B. Ind. U. 16 A.M. Ind. U. 16	Minn. 4-21	9- 1-24	9- 1-25	Med.	

The Bulletin
of the University of
Minnesota

The School of Business

Part I

Announcement of Courses for the Years
1926-1928



Vol. XXIX No. 26 May 10 1926

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

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

THE SCHOOL OF BUSINESS

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Albert G. Black, M.A., Assistant in Economics
Arthur Borak, B.S., M.A., Assistant in Economics

GENERAL INFORMATION

PURPOSE

The School of Business recognizes the professional status of the business executive. It aims to give prospective executives thorough training for the work they are to undertake. Professional education rather than detailed drill in narrow technical processes is the object toward which instruction is directed. Scientific method in analyzing business data, trained intelligence in dealing with the human relationships of which business is made up, and a well-developed sense of moral responsibility will be the foundations of business effectiveness in the future. The School of Business combines with a well-rounded university education the kind of training that will prepare students to analyze business situations accurately and to bring together results of analysis into practical working plans.

LOCATION AND EQUIPMENT

The University of Minnesota is well situated with respect to education for business. With the business districts of the Twin Cities on either side, the opportunities for observing business processes and for effective field work and research are unsurpassed. The cordial support of business organizations and individual concerns in the Twin Cities is a large factor in making the resources of the metropolitan district available for developing and presenting subject-matter in every field of study covered. Equally valuable is the support of business men throughout the state. The close contact which members of the faculty have with the business of the Northwest greatly enhances the opportunities that students in the School of Business enjoy. Co-operation with the College of Agriculture, Forestry, and Home Economics brings the School of Business in contact with the agricultural background of many business problems. This co-operation is especially exemplified in the joint provision in the two schools for work in agricultural economics. Co-operation with Engineering, Law, and various departments of the College of Science, Literature, and the Arts is also an important factor in bringing many viewpoints to bear upon the business problems with which the student has to deal.

The library and laboratory facilities of the University are of a sort to contribute effectively to the success of the work which the School of Business is undertaking.

THE SCHOOL OF BUSINESS TRAINING CLASSES IN TWIN CITY BUSINESS ESTABLISHMENTS

Arrangements have been made with a number of Twin City business firms whereby seniors in the School of Business are afforded the opportunity of supplementing their studies with carefully supervised business practice. Through a logically worked out system of rotation, familiarity is gained with the operation of each important department. The student's university program is so arranged that he is able to give an average of two days per week to this phase of his training.

ADMISSION TO THE SCHOOL OF BUSINESS

For admission to the School of Business a student must have satisfied the requirements of one of the two-year pre-business courses, either in the College of Science, Literature, and the Arts, the College of Agriculture, Forestry, and Home Economics, or the College of Engineering. (See page 8.) However, students entering from other colleges and universities of

recognized standing may be admitted if deficient in not more than two of the following: accounting, psychology, statistics, provided (1) that this deficiency is removed during the first year in the School of Business, and (2) that a minimum of 90 credits with one honor point per credit, is granted by the university examiner for the work done elsewhere.

SPECIAL STUDENTS

A limited number of high school graduates who have reached the age of twenty-four and can furnish evidence to the effect that they have had successful business experience in an executive capacity may be admitted as special students. If later they decide to become candidates for a degree they must complete the requirements of the pre-business course.

STUDENTS IN OTHER SCHOOLS OR COLLEGES OF THE UNIVERSITY

Regularly enrolled students in other schools or colleges of the University may be admitted to such courses in the School of Business as are authorized by the faculties of the School of Business and the school or college concerned. Such students are urged to select their business subjects in accordance with a definite plan, and as far as possible to complete a systematic course of business study. *Only those courses in the School of Business are open to students of other schools or colleges of the University which are announced in the bulletin of that school or college.*

ADVANCED STANDING

Appropriate credit in the School of Business may be given for work of a similar character done in other approved colleges and universities, but no student may become a candidate for a degree in the School of Business who has not completed the senior year under the faculty of that school.

CREDITS

Requirements for graduation are expressed in credit hours, indicating amount of work done, and in honor points, indicating grade of work. Honor points are computed as follows: Each credit hour with the grade of A carries 3 honor points; each credit hour with the grade of B, 2 honor points; each credit hour with the grade of C, 1 honor point.

No regular student will be permitted to elect more than 17 nor less than 13 hours of work in any one quarter unless he receives special permission by petition to the Students' Work Committee.

Candidates for the degree of bachelor of science in business must have earned a minimum of 180 credits and at least one honor point for each credit, (192 credits in the case of agricultural business and 187 credits in the case of industrial administration students) or a smaller number of credits determined as follows: For every 5 honor points in excess of 1 honor point per credit, the number 180 is diminished by 1, but no student will be recommended for graduation who has not acquired thoro proficiency in his field of specialization.

MILITARY SCIENCE AND TACTICS

Students who have completed the Basic Course, R.O.T.C., may be selected for advanced work by the professor of military science and tactics. Those who pursue the Advanced Course are required to sign an agreement with the Government to continue the two years' course to completion. This

includes attendance at a training camp, held normally during the summer following the first year's advanced work. The camp is conducted free of cost to the student, and in addition, while actually in camp, the student receives the pay prescribed for the seventh grade in the army. Students pursuing the Advanced Course are also furnished a special uniform and receive a fixed allowance per day. The total government compensation for the two years' advanced work amounts to something over \$200. Students who satisfactorily complete the Advanced Course will be commissioned in the Officers' Reserve Corps of the United States Army. The faculty of the School of Business will recommend for graduation students who have completed the work of the Advanced Course, and have earned 168 credits in the School of Business with a standing of one honor point per credit.

REGISTRATION

Pre-business sophomores and students coming with advanced standing from other institutions should obtain from the university registrar copies of their records and submit them to the dean of the School of Business. In the case of pre-business students this must be done before the close of the preceding spring quarter.

DEGREES

Bachelor of Science in Business

Candidates who have met the conditions for entrance to the School of Business, having satisfactorily completed the work covered in one of the pre-business courses at the University of Minnesota, should normally be able to qualify for the degree of bachelor of science in business at the end of the two full academic years of study in the School of Business.

If within a reasonable time after admission to the school, a student's work does not give promise of effectiveness in the business field, he will be discouraged from continuing the course, even tho he may have received passing grades in the subjects taken. It is expected that students will meet the requirements imposed with the same professional spirit and measure of precision demanded in well-regulated business houses, and students who fail to come up to the standard will not be recommended for the degree. The degree is not awarded merely as the result of pursuing a specified number of courses.

Master of Science in Business

Students who have completed the course of study required for the degree of bachelor of science in business or its equivalent may enroll in the Graduate School and become candidates for the degree of master of science in business. Emphasis will be laid on individual work under the direction of particular members of the faculty rather than upon class instruction, and the student must present evidence of at least six months of successful experience in a responsible business position.

The general requirements for the Master's degree may be found in detail in the annual announcement of the Graduate School.

EMPLOYMENT OF STUDENTS

Altho the School of Business does not promise to secure positions for its graduates, every effort is made to find positions for those students who have made a good record. Many business men have expressed a desire to

co-operate with the school in placing the students both for summer work and in permanent positions. Communications concerning positions should be addressed to Mr. J. L. O'Hara, in care of the School of Business.

FEEES

Tuition fees (per quarter)	
Residents of Minnesota.....	\$30.00
Non-residents	40.00
Incidental fee (per quarter).....	4.00
Deposit (first quarter only).....	5.00
Military deposit (required of all students taking military drill).....	10.00
Special fees:	
Examination for removal of condition.....	1.00
Examinations for credit (after the first quarter in residence)....	5.00
Special examination	5.00
Chemistry deposit	5.00
Graduation fee	10.00

Penalty Fees

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

For information concerning living expenses, students are referred to the bulletin of general information.

The School of Business does not encourage students to enter entirely without funds. The intensive work required in the school will make it highly desirable for a person to devote all of his time and energy to his studies.

STUDENT ORGANIZATIONS

The Commerce Club

The Commerce Club was organized by the students of the School of Business in the fall of 1919. The object of the club is to bring the men of the school together in an informal way for the purpose of promoting a serious interest in business problems. Some prominent business man addresses the students at each meeting. Membership is confined to the students and faculty of the School of Business and to pre-business students in the College of Science, Literature, and the Arts.

Beta Gamma Sigma

A chapter of Beta Gamma Sigma, the national honorary business fraternity, has been installed at the University. Members are selected upon the basis of scholarship and personality.

The University Business Women's Club

This is an organization of business and pre-business women. Its purposes are: (1) to form direct contacts with business problems through addresses by successful business men and women and visits to business establishments; (2) to bring together in a social way university women interested in business.

Gamma Epsilon Pi

A chapter of Gamma Epsilon Pi, a national honorary and professional business sorority, has recently been established. High scholarship, personality, and interest in school activities are requirements for membership.

COURSES OF STUDY

FRESHMAN AND SOPHOMORE YEARS

The work of the freshman and sophomore years known as the pre-business course is, in most cases, taken in the College of Science, Literature, and the Arts. For students interested in agricultural business, the pre-business course is taken in the College of Agriculture, Forestry, and Home Economics. A pre-business course in the College of Engineering and Architecture is available for students expecting to engage in manufacturing.

I. The two-year pre-business course in the College of Science, Literature, and the Arts, required for admission to the School of Business, is made up as follows:

1. Ten credits in Introduction to Economics (Economics 1-2)
2. Fifteen credits in English-Rhetoric
3. Ten credits in *one* of the following social sciences: geography, history, political science, sociology
- †4. Ten credits in mathematics or in *one* of the laboratory sciences (animal biology, botany, chemistry, physics)
5. Five credits in Mechanism of Exchange (Economics 3)
6. Six credits in psychology (Psychology 1-6)
7. Five credits in the Principles of Economics (Economics 4)
8. Eight credits in the Principles of Accounting (Economics 25-26)
9. Five credits in Statistics (Economics 14)
10. Sufficient electives to make a minimum of 90 credits with one honor point for each credit, or a smaller number of credits determined as follows: for every 5 honor points in excess of one honor point per credit, the number 90 is diminished by one.

II. Students who wish to prepare for some branch of business which relates to agriculture, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising, and the like, will find it to their interest to include courses in agriculture as part of their pre-business training. This may be arranged by registering in the College of Agriculture, Forestry, and Home Economics and taking the following courses:

1. Ten or twelve credits in General Inorganic Chemistry (Chemistry 1-2-3)
2. Five credits in Types and Breeds of Livestock (Animal Husbandry 11-12)
3. One credit in Tree Crops (Forestry 26)
4. Nine credits in Rhetoric (Rhetoric 1-2-3)
5. Nine credits in General Botany (Botany 4-5-6)
6. Five credits in Economic Geography of Agriculture (Agricultural Economics 7)
7. Five credits in Economic History of Agriculture (Agricultural Economics 6)
8. Five credits in Elements of Dairying (Dairy Husbandry 1)
9. Five credits in Principles of Economics (Agricultural Economics 1)
10. Three credits in Agricultural Economics (Agricultural Economics 2)
11. Nine credits in General Zoology (Animal Biology 14-15-16)
12. Three credits in Farm Crops (Agronomy 1)
13. Eight credits in Principles of Accounting (Economics 25-26)
14. Five credits in Farm Engineering (Agricultural Engineering 8)
15. Three credits in Fruit Growing (Horticulture 6) or Vegetable Growing (Horticulture 32)

† Students who expect to specialize in accounting or banking should take Mathematics 8 and 20.

16. Five credits in Statistics (Agricultural Economics 90)
 17. Six credits in psychology (Psychology 1-6)
 18. Sufficient work from the following list to make a minimum of 102 credits:
- Six credits in Soils (Soils 4-5)
 - Five credits in Argumentation (Rhetoric 11) or Public Speaking (Rhetoric 22)
 - Five credits in Agricultural Physics (Agricultural Engineering 23)
 - Five credits in Commerce Algebra (Mathematics 8) or Applied Mathematics
 - Five credits in bacteriology (Bacteriology 51)
 - Ten credits in Agricultural Biochemistry (Agricultural Biochemistry 7-8)
 - Two credits in Mechanical Drawing (Agricultural Engineering 3)

A standing of one honor point for each credit is required for admission to the School of Business.

Students considering this group of courses should consult the bulletin of courses in agriculture for further particulars as to courses, registration, etc.

III. Students who expect to engage in administrative work in manufacturing industries, should take their pre-business work in the College of Engineering and Architecture. The following prescribed program* for the freshman and sophomore years must be completed prior to registration in the course in Industrial Administration in the School of Business. A minimum of 97 credits is required for admission to the School of Business from this course.

FRESHMAN YEAR					
FALL		WINTER		SPRING	
	Hours		Hours		Hours
M. & M. 11 College Algebra	5	M. & M. 12 Trigonometry	5	M. & M. 13 Analytic Geometry	5
Chem. 4 General Inorganic Chemistry.....	4	Chem. 5 General Inorganic Chemistry.....	4	Qualitative Analysis...	5
or		or		Rhet. 6 Rhetoric.....	3
Chem. 14 General Inorganic Chemistry.....	5	Chem. 15 General Inorganic Chemistry.....	5	Draw. 3 Descriptive Geometry	3
Rhet. 4 Rhetoric and Composition	3	Rhet. 5 Rhetoric and Composition	3	M.E. 11, 12, or 13 Shop Practice	2
Draw. 1 Engineering Drawing	3	Draw. 2 Engineering Drawing	3	P.H. 2 Hygiene and First Aid	0
M.E. 11, 12, or 13 Shop Practice	2	M.E. 11, 12, or 13 Shop Practice	2	Mil. 3 Military Science and Tactics.....	0
G.E. 11 Orientation....	0	G.E. 12 Orientation....	0		18
Mil. 1 Military Science and Tactics.....	0	Mil. 2 Military Science and Tactics	0		
	17 or 18		17 or 18		

* See bulletin of College of Engineering and Architecture for description of courses.

COURSES OF STUDY

SOPHOMORE YEAR

FALL		WINTER		SPRING	
	Hours		Hours		Hours
M. & M. 91	Calculus.. 4	M. & M. 92	Mechanics.. 4	M. & M. 93	Materials.. 4
Phys. 3	Mechanics and Sound	Phys. 23	Heat..... 3	Phys. 43	Magnetism and Electricity
Phys. 4	Mechanics Lab- oratory	Phys. 24	Heat Labora- tory	Phys. 44	Electrical Lab- oratory
Econ. 8	General Eco- nomics	Econ. 9	General Eco- nomics	Econ. 10	General Eco- nomics
M.E. 14	Machine Shop Practice	Econ. 25	Principles of Accounting	Econ. 26	Principles of Accounting
Psy. 1	General Psy- chology	Psy. 6	General Psy- chology	M.E. 21	Mechanical Technology
	—		—	M.E. 41	Automotives.. 2
	18		18		—
					18

JUNIOR AND SENIOR YEARS

The work of the junior and senior years is taken in the School of Business, where stress is laid upon the adaptation of the student's curriculum to his future plans. In order to make this aim effective, every student is assigned to an adviser who makes a study of his needs and helps him to frame a program which will most nearly meet them.

The programs of study summarized below will therefore be varied as each particular case dictates. In some cases the student will be advised to elect subjects in other schools and colleges of the University in order to obtain a well-rounded preparation for his prospective career.

Certain basic courses are required of all candidates for degrees from the School of Business. These include the following: Monetary and Banking Policy, Corporation Finance, Business Law, Advanced General Economics, Business Cycles. Participation in one of the senior topics courses (180-181-182) is strongly recommended.

I. THE GENERAL COURSE IN BUSINESS

This course is recommended to those persons who desire a well-balanced training in the important fields of business education or for those who are not yet able to decide upon a specialized field. The program is made up of courses in finance, business law, marketing, transportation, labor, and advanced general economics, with sufficient leeway for electives in other fields.

II. ACCOUNTING

The program in accounting is designed to meet the needs of those persons who are preparing for public accounting, the teaching of accounting, or for positions as accountants in financial or business establishments. In this program, courses in cost and industrial accounting, practice and procedure, income tax accounting, and auditing are required in addition to courses which afford a survey of all of the important fields of business.

III. AGRICULTURAL BUSINESS

This line of specialization is intended for students who wish to prepare for some branch of business which relates to agriculture, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising, and the like. Supplementary courses in technical agriculture should be made a part of the freshman and sophomore programs of students who expect to choose this program. It differs from the general course chiefly with respect to the amount of work required in agricultural economics.

IV. BANKING

The program in banking is designed for persons who expect to become connected with banks and bond houses. It aims to supplement the broad general training in economics, given to all School of Business students, with courses which will be of value to persons who have to deal intimately with financial questions. Courses in foreign exchange, investments, corporate finance, and current financial problems are special requirements in this program.

V. FOREIGN TRADE

The course in foreign trade is designed for persons who plan to associate themselves with exporting houses or with export departments of large manufacturing and mercantile establishments. The special requirements of this course are an intimate knowledge of commercial policies, international commercial law, geography, and principles of international banking and exchange.

VI. PERSONNEL MANAGEMENT

This program offers basic training to (1) prospective heads of personnel departments in business establishments or of subdivisions thereof, and (2) to persons who expect to participate as trained experts in the adjustment of matters pertaining to the employment of labor. Thoro training in psychology and personnel administration are the outstanding features of the course.

VII. MERCHANDISING

The subjects offered here are sufficiently fundamental and the freedom of election sufficiently great to include preparation for both wholesaling and retailing businesses. Special attention is given to the problems of advertising, store management, and sales policy, but insistence is placed upon a thoro understanding of the economic, accounting, and statistical problems of the merchandising field.

VIII. SECRETARIAL COURSE

The courses offered in this program are arranged for the training of secretaries and assistants. If possible, the student should select supplementary courses which will best fit him for the special type of secretarial work he desires to enter. Emphasis is placed upon securing a high degree

of proficiency in shorthand and typewriting as well as a complete understanding of the duties of a secretary, the organization and management of an office, and a thoro mastery of spoken and written English.

IX. INDUSTRIAL ADMINISTRATION

As the name indicates, this course involves a knowledge of industrial processes and it should therefore be preceded by the two-year pre-business course offered in the College of Engineering and Architecture. The work offered to all business students is supplemented by such electives in business administration and engineering as will give a well-rounded foundation for a person who expects to engage in manufacturing.

RELATED COURSES IN OTHER COLLEGES

The following courses are given under the direction of the Department of Political Science, College of Science, Literature, and the Arts:

1. *Diplomatic and Consular Service*.—Students looking forward to this field of work should take a major sequence in political science and such additional work in economics, history, geography, languages, and law as may be prescribed by the major adviser or the committee in charge of the course. A fifth year of work to be taken in the Graduate School is also strongly recommended. Consult Mr. Allin or Mr. Quigley.
2. *Municipal Administration and Engineering*.—By arrangement with the College of Engineering and Architecture, a combined course in Municipal Administration and Engineering has been provided, leading to the bachelor of science degree at the end of the fourth year, and the master of science degree at the end of the fifth year.

In the Junior College the student should take the mathematics and drawing work required of engineering students, American and Municipal Government, Principles of Economics, and Physics. In the Senior College he should take from 24 to 30 credits in political science selected from the following courses: 111, 113, 115, 130, 131, 132, 141, 145, 151-152, 155, 157, and 159; from 15 to 18 credits in economics selected from the following courses: 14, 25-26, 154, 161, 191-192, 193; from 18 to 24 credits in civil engineering selected from the following courses: 11-12-13, 51-52-53, 162, 163, 272; and such work in bacteriology, public health, sociology, and other fields as may be prescribed by the adviser. Graduate work will be handled by special arrangement. Consult Mr. Anderson or Mr. Lambie.

DESCRIPTION OF COURSES*

ACCOUNTING

- 25f,w-26w,s.† Principles of Accounting. Agricultural students see Agricultural Economics 25. Engineering students see Economics 29, College of Engineering bulletin.
- 131f-132w-133s.† Cost Accounting. Business students who desire a single quarter's survey of this subject should elect it under the course number 130f,s, Cost Accounting (General Survey).
- 134f. Income Tax Accounting.
- 135w-136s.† Auditing.
- 137f-138w.† Accounting Practice and Procedure.
- 139s. Advanced General Accounting. A course intended particularly to meet the needs of the general student of business. Interpretation and analysis of statements and their utilization by executives. Relations of the accounts to budgets. Accounting methods and statements in a number of business fields.
- 180f-181w-182s.† Senior Topics Course. Section A. Accounting. The accounting process considered in its theoretical, executive, and analytical aspects. Term reports are required embodying investigations into accounting systems and findings in analyses of accounting and financial data. Solution of C.P.A. examination problems; discussion of theory and its application.

ADMINISTRATION

- 85f,s. Economics of Marketing. A general course dealing with (1) the market functions, (2) the organization of marketing enterprises, (3) measures of efficiency in marketing, (4) the manager's administration of marketing.
- 86s. Office Organization and Management.
- 88s. Advertising. The place of advertising in business. Advertising procedure. (This course follows Psychology 56w, Psychology of Advertising.)
- 89w,s. Production Management. Administration of business enterprises; co-ordination of men and departments; delegation of authority; planning, production control; scientific management.
- 108w.‡ Marketing Organization: Agricultural Products. The principles of organization of the market and of marketing enterprises applied especially to farm products. (Not open to those taking the agricultural business course of study.)

* For graduate courses in Economics and Business Administration, consult the bulletin of the Graduate School.

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

‡ Offered on Minneapolis campus.

- 180f-181w. § Senior Topics Course. Section C. Marketing. Selected topics in (1) market structure, (2) manufacturer's sales problems, (3) price policies, (4) trade association activities.
- 182s. Senior Topics Course. Section C. Marketing. Selected topics in retail store management, in co-operation with Twin City department store executives. Open, with permission of instructor, to a limited number of advanced students who have not taken 180-181C.
- 187s. Market Prices. A realistic study of the manner in which individuals determine their buying and selling prices. Factors which influence demand for specific commodities. Uniformity of prices and the economic significance of f. o. b., delivered, and other methods of pricing.

AGRICULTURAL ECONOMICS

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

- 110f-111w. Economics of Agricultural Production I and II.
- 130f. Prices of Farm Products.
- 135s. Methods of Forecasting Farm Prices of Farm Products.
- 145w-146s. ‡ Marketing Management.
- 170s. ‡ Land Economics.
- 171s. Land Tenure. (Not offered in 1926-27.)

COMMERCE

- 176f,s. Commercial Policies. Theory of international commerce; protective tariffs, free trade, reciprocity, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign politics, and other governmental and organized efforts to affect trade. American problems emphasized.
- 177w. Foreign Trade.

ECONOMIC THEORY

- 1f-2w. † Introduction to Economics. Principles of economics relating especially to productive organization, considered from standpoint of society as a whole and of individual enterprises. Application of principles and necessary description of industry and commerce. Emphasis upon localization of enterprises.
- 4f,s. Principles of Economics. One quarter course for pre-business students who have had 1-2.
- 6-7. † Principles of Economics. General survey for Arts and Education students. Engineering students see Economics 8-9-10, College of Engineering bulletin.
- 101f-102w. † Advanced General Economics.
- 103f-104w. † Value and Distribution.

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

‡ Offered on Minneapolis campus.

§ Both quarters must be completed before credit is received for either. All three quarters are required of students specializing in merchandizing.

- 105s. History of Economic Ideas—The Classical Economists.
 106s. History of Economic Ideas—The Critics of the Classical Economists.
 126s. Economics of Consumption. (See Economics 126s, College of Agriculture bulletin.)

FINANCE

- 3w.s. The Mechanism of Exchange. Elementary course in money and banking. Study of financial institutions and their relations as parts of the financial structure. Relation of financial organization to the economic organization.
- 141f,w,s. Monetary and Banking Policy. Advanced course in money and banking. Public policies relative to the banking organization, efficiency and safety of financial operations, stabilization of the price level, prevention of undue financial concentration, subsidizing certain economic groups.
- 145w. Foreign Exchange.
- 146f. Investments.
- 147s. Bank Administration.
- 148w. The Securities Market. Problem of adjusting business policy to the business cycle, with regard to purchase and sale of securities.
- 149f,w,s. Business Cycles. American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression, and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions.
- 150s. Advanced Farm Finance.
- 155s. Corporation Finance.
- 156f. Finance Management. The duties of the financial manager and the various sources from which private business concerns secure fixed or working capital. Attention is given also to certain specific financing problems.
- 180f-181w-182s.† Senior Topics Course. Section B. Finance. A weekly conference of finance faculty and seniors. Individual research and discussion of important current financial developments.
- 191f-192w.† Public Finance.
- 193s. State and Local Taxation.

GEOGRAPHY

See bulletin of College of Science, Literature, and the Arts.

33. Climatology.
51. Human Geography.
52. Regional Geography of the World.
61. Geography of Commercial Production.
62. Trade Routes and Trade Centers.
71. Geography of North America.
135. Geography of Minnesota.

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

HISTORY (Economic)

See bulletin of College of Science, Literature, and the Arts.

- 80f-81w. Introduction to Economic History. (Not offered in 1926-27.)
 118f-119w-120s. Economic History of Europe and the United States, 1750 to the Present.
 121f-122w-123s. Economic History of Europe, 1300-1750.
 175s. Economic History of the United States since the Civil War.

INSURANCE

- 59f. Life Insurance.
 60w. Property Insurance.
 62s. Social Insurance.

LABOR AND PERSONNEL MANAGEMENT

- 161f,w. Labor Problems and Trade Unionism.
 162w. Labor and Economic Reform Movements. The single tax, copartnership, co-operation, labor banks, anarchism, syndicalism, socialism, unionism, and labor parties.
 163s. Economic Aspects of Population and Immigration.
 167w. Personnel Administration. Managerial policy for various types of organization of labor. Special attention to job analysis, employment incentives, and regularization of employment.
 168s. Advanced Personnel Administration. Special attention to employee training, joint relations, health and safety, and methods of personnel research, e.g., by analysis of labor turnover.
 180f-181w.† Senior Topics Course. Section D. Personnel Management. Discussions and individual investigation of various features of personnel program. Study of actual practices and conditions prevailing in Twin City area.

MATHEMATICS

See bulletin of College of Science, Literature, and the Arts.

8. Commerce Algebra.
 20. Mathematics of Investment.

POLITICAL SCIENCE (including Business Law)

See bulletin of College of Science, Literature, and the Arts.

- 51f-52w-53s.† Business Law.
 157f. Police Power.
 158s. Government and Business.
 159w. Law of Public Utilities.
 165s. Colonization. (See Political Science 105.)

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

PSYCHOLOGY

See bulletin of College of Science, Literature, and the Arts.

- 1f-6w. General Psychology for Business Students. Offered only to business and pre-business students.
- 56w. Psychology of Advertising.
- 60f. Psychology in Personnel Work.
- 125f-126w. Psychology of Individual Differences.
- 130s. Vocational Psychology.

PUBLIC UTILITIES

- 73w. Railway Traffic and Rates. A technical course for shippers and railway traffic men.
- 153w. The Trust Problem.
- 154s. Public Utilities.
- 159w. Law of Public Utilities. (See Political Science 159.)
- 172f,w,s. Economics of Transportation. A general course in transportation. Rate theory and practice, principles of governmental regulation, etc.
- 174s. Transportation Problems. An intensive study of certain important problems such as valuation, public ownership, operation, and regulation.

REPORT WRITING

- 100f,w,s. Report Writing. Lectures and conferences upon the preparation of theses and reports. Actual preparation of reports in connection with Economics 141f,w,s, Monetary and Banking Policy.

SECRETARIAL TRAINING

- 94f-95w-96s.† Shorthand and Typewriting. Open only to secretarial course students who are inadequately trained with respect to this phase of secretarial duties.
- 97f-98w-99s.† Advanced Shorthand and Typewriting. (See 94-95-96.)
- 180f-181w.† Senior Topics Course. Section E. Secretarial Practice.

STATISTICS

- 14s. Elements of Statistics. Agricultural students see Economics 90, College of Agriculture bulletin.
- 112f. Business Statistics. Application of statistical methods in analyzing the internal and external aspects of business operations; internal aspects involving analysis of production, markets, etc., within business units; external aspects, dealing with general business conditions.
- 113w-114s. Theory of Statistics. The calculation and use of various constants of importance in the analysis of statistical data; averages, measures of dispersion and of correlation, partial correlation; and the theory of errors. Index numbers and analysis of time series.

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

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

The School of Business Administration
Part II
Announcement of Program for the Year
1927-1928



Vol. XXX No. 47 May 18 1927

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

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

FRESHMAN WEEK

Every student entering any department of the University for the first time as a freshman in the fall of 1927 is required to be here throughout the week before the opening of classes. Every new freshman must present himself at the registrar's office either Friday, September 16, Saturday, September 17, or Monday, September 19, to begin the process of registration. Those coming later than 5:00 p.m. Monday, September 19, will be subject to the usual penalty for late registration. See Penalty Fees, page 47 of the bulletin of general information.

During the week September 20 to 24, in addition to carrying out their registration, freshmen will meet for lectures on such subjects as how to study, the use of the library, important university and college regulations, and will visit the library, the scientific laboratories, and other points of interest to them in connection with their choice of studies and of their future occupations.

During this week there will be the usual physical examinations and psychological tests and such other examinations as will enable the faculty to place the students in classes for which they are best fitted.

The general purpose of the Freshman Week is to help the student to make a good start on his work and to adjust himself to the new and perplexing conditions of university life.

NOTICE THAT ATTENDANCE THROUGHOUT FRESHMAN WEEK IS A REQUIREMENT

It is recommended that as many as possible present themselves for registration on Friday, September 16, in order to avoid the inconvenience and delay incident to the congestion on the last day.

1927							1928													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	..	..	1	2	3	4	..	..	1	2	3	4		
7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25
28	29	30	31	..	..	..	26	27	28	29	..	..	..	26	27	28	29	30	31	..
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	1	2	3	4	..	..	..	1	2	3	..	..	..	1	2	3		
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
..	..	..	..	..	1	2	1	2	3	4	5	6	7	..	1	2	3	4	5	6
2	3	4	5	6	7	8	8	9	10	11	12	13	14	7	8	9	10	11	12	13
9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20
16	17	18	19	20	21	22	22	23	24	25	26	27	28	21	22	23	24	25	26	27
23	24	25	26	27	28	29	29	30	..	..	..	..	..	28	29	30	31	..	..	..
30	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	..	1	2	3	4	5	..	..	..	1	2	3	
6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
13	14	15	16	17	18	19	13	14	15	16	17	18	19	11	12	13	14	15	16	17
20	21	22	23	24	25	26	20	21	22	23	24	25	26	18	19	20	21	22	23	24
27	28	29	30	..	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..
DECEMBER							JUNE							DECEMBER						
..	..	..	1	2	3	4	..	..	..	..	1	2	..	..	..	..	1	2		
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

UNIVERSITY CALENDAR

1927-28

Fall Quarter

1927			
September	15	Thursday	Payment of fees closes, except for new students
September	15-17		Entrance examinations (for removal of entrance deficiencies)
September	16-19		Registration of all new students entering the freshman class
September	19-23		Examinations for removal of conditions Physical examinations Registration period, ¹ colleges of Science, Literature, and the Arts, and Education
September	20-24		Freshman week
September	22-23		Registration days ¹ for all colleges not included above
September	23	Friday	Payment of fees for new students closes
September	26	Monday	Fall quarter classes begin, 8:30 ² a.m. Fall semester extension classes ³ begin
October	20	Thursday	Senate meeting, 4:30 p.m.
October	22	Saturday	Homecoming Day
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	1	Thursday	State Day Convocation
December	14-17		Final examination period
December	15	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	17	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	21	Wednesday	Payment of fees closes for all students in residence fall quarter ⁴

Winter Quarter

December	27-29		Entrance examinations
1928			
January	3	Tuesday	Registration days for new students

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, general information bulletin, p. 47.

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

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

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

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

January	4	Wednesday	Christmas vacation ends, winter quarter classes begin, 8:30 ^a a.m.
January	28	Saturday	First semester extension classes close
January	30	Monday	Second semester extension classes begin
February	13	Monday	A holiday (February 12, Sunday, Lincoln's Birthday)
February	16	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	14-17		Final examination period
March	15	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ¹
March	17	Saturday	Winter quarter ends, spring vacation begins, 5:30 p.m.

Spring Quarter

March	19-21		Entrance examinations
March	23-24		Registration days for new students in all colleges
March	26	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ^a a.m.
April	6	Friday	Good Friday; a holiday
May	10	Thursday	Cap and Gown Day Convocation
May	17	Thursday	Senate meeting, 4:30 p.m.
May	26	Saturday	Second semester extension classes close
May	30	Wednesday	Memorial Day; a holiday
June	6-9		Final examination period
June	9	Saturday	Spring quarter closes, 5:20 p.m.
June	10	Sunday	Baccalaureate service
June	11	Monday	Fifty-sixth annual commencement

Summer Quarter

June	15-16		Summer Session first term begins, registration and payment of fees
June	18	Monday	Classes begin, 8:00 a.m.
July	4	Wednesday	Independence Day; a holiday
July	28	Saturday	Registration and payment of fees for second term closes
July	30	Monday	Second term classes begin
September	1	Saturday	Second term Summer Session closes

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, general information bulletin, p. 47.

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

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

THE COURSES OF STUDY

Students who have completed satisfactorily one of the two-year pre-business programs or its equivalent are eligible for admission to the junior class of the School of Business Administration. However, students entering from other institutions of recognized standing may be admitted if deficient in such subjects as accounting, psychology, or statistics, provided (1) that at least 90 credits with one honor point per credit have been granted by the university examiner for the work done elsewhere, (2) that the deficiency be removed during the first year in the School of Business Administration.

In the School of Business Administration stress is laid upon the adaptation of the curriculum to the future plans of the individual. In order to make this aim effective each student is assigned to an adviser who makes a study of his needs and helps him to frame a program which will most nearly meet them.

In connection with some of the programs of study, provision has been made for employment with business concerns. The student is employed full time for one term in an accounting office, a bank, trust company, or other business institution. On completion of a satisfactory report concerning his work he may be granted a maximum of three credits. This work is organized for the purpose of providing proper laboratory facilities in business practice.

I. THE GENERAL COURSE IN BUSINESS

Adviser, Mr. Mudgett and others

This course is recommended to those persons who desire a well-balanced training in the important fields of business education or for those who are not yet able to decide upon a specialized field of study.

JUNIOR YEAR

	Credits
Production Management (Bus. Adm. 89)	3
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1
Business Law (Economics 51-52-53)	9
Market Administration (Bus. Adm. 67)	3
Corporation Finance (Bus. Adm. 155)	3
Electives (See list below)	20 to 29

SENIOR YEAR

	Credits
Cost Accounting (Bus. Adm. 130)	3
Labor Problems (Economics 161)	3
Business Cycles (Economics 149)	3
Advanced General Economics (Bus. Adm. 101-102)	6
Economics of Transportation (Economics 172)	3
Personnel Administration (Bus. Adm. 167)	3
Geography of Commercial Production (Geog. 61)	5
Finance Management (Bus. Adm. 156)	3
Electives (See list below)	13 to 22

COURSES OF STUDY

7

RECOMMENDED ELECTIVES

	Hours
A Senior Topics Course	9
Market Prices	3
Public Utilities	3
Economic History	3 to 6
Investments	3 to 6
Advanced Personnel Administration	3
Advanced General Accounting	3
Accounting Practice and Procedure	6
Government and Business	3
Property Insurance	3
Public Finance	6
Advanced English Composition	9
Agricultural Economics	3
The Trust Problem	3
Commercial Policies	3
Railway Traffic and Rates	3
Economics of Agricultural Production	3
Office Management	3
Life Insurance	3
Marketing of Farm Products	3
Recent Social Legislation	3
Foreign Exchange	3
Business Policy	3

II. ACCOUNTING

Adviser, Mr. Heilman

The program in accounting is designed to meet the needs of those persons who are preparing for public accounting, the teaching of accounting, or for positions as accountants in financial or business establishments.

JUNIOR YEAR

	Credits
Cost Accounting (Bus. Adm. 131-132-133)	9
Accounting Practice and Procedure (Bus. Adm. 137-138)	6
Advanced General Accounting (Bus. Adm. 139)	3
Business Law (Economics 51-52-53)	9
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1
Corporation Finance (Bus. Adm. 155)	3
Electives (See list below)	9 to 22

SENIOR YEAR

	Credits
Advanced General Economics (Bus. Adm. 101-102)	6
Business Cycles (Economics 149)	3
Income Tax Accounting (Bus. Adm. 134))	3
Auditing (Bus. Adm. 135-136)	6
Accounting Topics Course (Bus. Adm. 180-181-182)	9
Electives (See list below)	15 to 24

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 6
Finance Management	3
Production Management	3
Commerce Algebra	5
Mathematics of Investment	5
Government and Business	3
Public Finance	6
State and Local Taxation	3
Market Administration	3
Office Management	3
Investments	3
Property Insurance	3
Business Statistics	3
Advanced English Composition	9
Business Policy	3

III. ADVERTISING

Adviser, Mr. Vaile

The program in advertising is designed to prepare students for work in advertising agencies as well as in advertising departments of merchandising establishments and of newspapers.

JUNIOR YEAR

	Credits
Market Administration (Bus. Adm. 67)	3
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1
Business Statistics (Bus. Adm. 112)	3
Cost Accounting (Bus. Adm. 130)	3
Business Law (Economics 51-52-53)	9
Psychology of Advertising (Psy. 56)	3
Advertising (Bus. Adm. 88)	3
Corporation Finance (Bus. Adm. 155)	3
Introduction to Reporting (Economics 35)	3
Writing of Special Articles (Economics 50)	3
Electives	9

SENIOR YEAR

	Credits
Advanced General Economics (Bus. Adm. 101-102)	6
Business Cycles (Economics 149)	3
Senior Topics Course (Marketing—Bus. Adm. 180-181-182)	9
Commercial Art (Bus. Adm. 64-65-66)	6
Advanced Advertising Procedure (Bus. Adm. 194-195-196)	9
Copy Reading and Make-up (Economics 36)	3
Electives	15

IV. AGRICULTURAL BUSINESS

Adviser, Mr. Black

This line of specialization is intended for students, who wish to prepare for some branch of business which relates to agriculture, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising, and the like. The student should also take

COURSES OF STUDY

9

supplementary courses in technical agriculture. It is recommended that as many as possible of these be taken during the pre-business years. One hundred ninety-two credits are required for graduation from this course.

JUNIOR YEAR

	Credits
Economics of Agricultural Production (Economics 110-111)	6
Principles of Marketing Organization (Agricultural Economics 140)	3
Prices of Farm Products (Agricultural Economics 130)	3
Agricultural Statistics (Agricultural Economics 90)	5
Business Law (Economics 51-52-53)	9
Marketing Organization: Semi-Perishables (Agricultural Economics 141)	3
Marketing Organization: Perishables (Agricultural Economics 142)	3
Market Prices (Agricultural Economics 131)	3
Mechanism of Exchange (Economics 3)	5
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1

SENIOR YEAR

	Credits
Advanced General Economics (Bus. Adm. 101-102)	6
Economics of Transportation (Economics 172)	3
Railway Traffic and Rates (Bus. Adm. 73)	3
Business Cycles (Economics 149)	3
Methods of Forecasting Prices (Agricultural Economics 135)	3
Advanced Farm Finance (Agricultural Economics 161)	3
Land Economics (Agricultural Economics 170)	3

RECOMMENDED ELECTIVES

	Hours
Business Policy	3
Market Prices	3
Economic History	3 to 6
Business Statistics	3
Theory of Statistics	3
Corporation Finance	3
Commercial Policies	3
Public Finance	6
Marketing Management	6
Farm Management Organization	3
Farm Management Operation	3

V. BANKING

Adviser, Mr. Stehman

This program is designed for persons who expect to secure connections with financial institutions.

JUNIOR YEAR

	Credits
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1
Corporation Finance (Bus. Adm. 155)	3
Business Law (Economics 51-52-53)	9
Electives (See list below)	22 to 31

SCHOOL OF BUSINESS ADMINISTRATION

SENIOR YEAR

	Credits
Advanced General Economics (Bus. Adm. 101-102)	6
Bank Administration (Bus. Adm. 147)	3
Finance Management (Bus. Adm. 156)	3
Investments (Bus. Adm. 146)	3
The Securities Market (Bus. Adm. 148)	3
Business Cycles (Economics 149)	3
Foreign Exchange (Bus. Adm. 145)	3
Finance Topics Course (Bus. Adm. 180-181-182)	6
Electives (See list below)	9 to 18

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 6
Production Management	3
Advanced Farm Finance	3
Cost Accounting	3
Public Finance	6
State and Local Taxation	3
Economics of Transportation	3
Advanced English Composition	9
Foreign Trade	3
Commercial Policies	3
Market Administration	3
Geography	5-9
Land Economics	3
Agricultural Economics	3
Life Insurance	3
Business Statistics	3
The Trust Problem	3
Public Utilities	3
Business Policy	3

VI. FOREIGN TRADE

Adviser, Mr. Blakey

This course is designed for persons who plan to associate themselves with exporting houses or with export departments of large manufacturing and mercantile establishments.

JUNIOR YEAR

	Credits
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1
Market Administration (Bus. Adm. 67)	3
Economics of Transportation (Economics 172)	3
Railway Traffic and Rates (Bus. Adm. 73)	3
Psychology of Advertising (Psychology 56)	3
Foreign Exchange (Bus. Adm. 145)	3
Advertising (Bus. Adm. 88)	3
Transportation Problems (Economics 174)	3
Geography of Commercial Production (Geography 61)	5
Electives (See list below)	7 to 17

COURSES OF STUDY

II

SENIOR YEAR

	Credits
Advanced General Economics (Bus. Adm. 101-102)	6
Business Law (Economics 51-52-53)	9
Commercial Policies (Economics 176)	3
International Law (Political Science 121-122)	6
Foreign Trade (Bus. Adm. 177)	3
Business Cycles (Economics 149)	3
Electives (See list below)	12 to 21

RECOMMENDED ELECTIVES

	Hours
A Senior Topics Course	4 to 9
Finance Management	3
Economic History	3 to 6
Production Management	3
Foreign Languages .....	..
Public Finance	6
Comparative European Government	5
Personnel Administration	3
Advanced Personnel Administration	3
Economics of Agricultural Production	3
Property Insurance	3
Business Statistics	3
Advanced English Composition	9
Business Policy	3

VII. PERSONNEL MANAGEMENT

Advisers, Mr. Paterson and Mr. Stead

This program offers basic training to (1) prospective heads of personnel departments in business establishments, or of subdivisions thereof, and (2) to persons who expect to participate as trained experts in the adjustment of matters pertaining to the employment of labor.

JUNIOR YEAR

	Credits
Labor Problems and Trade Unionism (Economics 161)	3
Labor Movements (Economics 162)	3
Economic Aspects of Population and Immigration (Economics 163)	3
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1
Business Law (Economics 51-52-53)	9
Market Administration (Bus. Adm. 67)	3
Production Management (Bus. Adm. 89)	3
Personnel Administration (Bus. Adm. 167)	3
Advanced Personnel Administration (Bus. Adm. 168)	3
Corporation Finance (Bus. Adm. 155)	3
Electives (See list below)	3 to 9

SCHOOL OF BUSINESS ADMINISTRATION

SENIOR YEAR

	Credits
Business Statistics (Bus. Adm. 112)	3
Casualty Insurance (Bus. Adm. 61)	3
Business Cycles (Economics 149)	3
Advanced General Economics (Bus. Adm. 101-102)	6
Psychology in Personnel Work (Psychology 60)	3
Introduction to Administration (Political Science 130)	3
Principles of Public Administration (Political Science 131-132)	6
Vocational Psychology (Psychology 130)	2
Personnel Topics Course (Bus. Adm. 180-181-182)	9
Electives (See list below)	17 to 20

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 6
Introduction to Anthropology	5
Psychology of Individual Differences	6
Theory of Statistics	3
Cost Accounting	3
Office Management	3
Introduction to Sociology	5
Advanced English Composition	9
Business Policy	3

VIII. MERCHANDISING

Adviser, Mr. Vaile

The subjects specified in this program are sufficiently fundamental and the freedom of election sufficiently great to include preparation for manufacturing, wholesaling, and retailing businesses.

JUNIOR YEAR

	Credits
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm 100)	1
Market Administration (Bus. Adm. 67)	3
Business Law (Economics 51-52-53)	9
Corporation Finance (Bus. Adm. 155)	3
Advertising (Bus. Adm. 88)	3
Psychology of Advertising (Psychology 56)	3
Business Statistics (Bus. Adm. 112)	3
Cost Accounting (Bus. Adm. 130)	3
Electives (See list below)	7 to 16

SENIOR YEAR

	Credits
Advanced General Economics (Bus. Adm. 101-102)	6
Economics of Transportation (Economics 172)	3
Railway Traffic and Rates (Bus. Adm. 73)	3
Commercial Policies (Economics 176)	3
Business Cycles (Economics 149)	3
Marketing Topics Course (Bus. Adm. 180-181-182)	9
Electives (See list below)	10 to 21

COURSES OF STUDY

13

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 9
Labor Problems	3
Production Management	3
Foreign Trade	3
Personnel Administration	3
Geography of Commercial Production	5
Prices of Farm Products	3
Public Utilities	3
Textiles	3
Market Prices	3
Theory of Statistics	3
Government and Business	3
Transportation Problems	3
Land Economics	3
Psychology in Personnel Work	3
Psychology of Human Behavior	6
Property Insurance	3
Constitutional Law	6
Advanced English Composition	9
Business Policy	3
Sales Management	3
Marketing Organization (Agricultural Products)	3

IX. REAL ESTATE

Adviser, Mr. Stevenson

This sequence of courses is designed primarily for those who plan to enter the field of real estate as professional realtors.

JUNIOR YEAR

	Credits
Business Law (Economics 51-52-53)	9
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1
Corporation Finance (Bus. Adm. 155)	3
Economics of Transportation (Economics 172)	3
Psychology of Advertising (Psychology 56)	3
Advertising (Bus. Adm. 88)	3
Property Insurance (Bus. Adm. 60)	3
Market Administration (Bus. Adm. 67)	3
Economic Aspects of Population and Immigration (Economics 163)	3
Real Estate Valuation and Land Utilization (Bus. Adm. 152)	3
Electives	8

SENIOR YEAR

	Credits
Advanced General Economics (Bus. Adm. 101, 102)	6
Investments (Bus. Adm. 146)	3
Business Cycles (Economics 149)	3
Public Utilities (Economics 154)	3
Public Finance and State and Local Taxation (Economics 191, 192, 193)	9
City Planning (Municipal and Sanitary Engineering 272)	3
Building Construction (Arch. 51, 52, 53)	6
Real Estate Management and Practice (Bus. Adm. 153)	3
Real Estate Law	3
Electives	6

SCHOOL OF BUSINESS ADMINISTRATION

RECOMMENDED ELECTIVES

	Hours
Municipal Powers (Political Science 111, 112)	6
Recent Social Legislation (Political Science 157)	3
Business Statistics (Bus. Adm. 112)	3
Theory of Statistics (Economics 113, 114)	6
Labor Problems (Economics 161)	3
Commercial Policies (Economics 176)	3
Economic History (History 82, 83, 84)	9

X. SECRETARIAL COURSE

Adviser, Miss Leonard

The courses offered in this program are arranged for the training of secretaries and assistants. The student should select, with the help of his adviser, the courses which will best prepare him for the special type of secretarial work he expects to enter. Among the positions for which he may prepare are: office manager and assistant; private secretary to persons engaged in educational, social, philanthropic, scientific, medical, legal, religious, literary, professional, or mercantile work; secretary in schools and institutions; business correspondent; registrar; teacher of commercial branches; civil service.

JUNIOR YEAR

	Credits
Shorthand and Typewriting (Bus. Adm. 94-95-96)	15
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1
Business Law (Economics 51-52-53)	9
Types of Writing (Rhetoric 18-19)	6
Corporation Finance (Bus. Adm. 155)	3
Electives (See list below)	12 to 21

SENIOR YEAR

	Credits
Advanced Shorthand and Typewriting (Bus. Adm. 97-98-99)	15
Advanced General Economics (Bus. Adm. 101-102)	6
Office Organization and Management (Bus. Adm. 86)	3
Business Cycles (Economics 149)	3
Secretarial Topics Course (Bus. Adm. 180-181)	6
Electives (See list below)	9 to 18

RECOMMENDED ELECTIVES

	Hours
Life Insurance	3
Casualty Insurance	3
Market Administration	3
Economics of Transportation	3
Advertising	3
Business Statistics	3
Investments	3
Economic History	3 to 6
Cost Accounting	3
Accounting Practice and Procedure	6
Advanced General Accounting	3
Labor Problems and Trade Unionism	3

Personnel Management	3
Commercial Policies	3
Geography of Commercial Production	5
American Government	5
Government and Business	3
Public Speaking	3 to 10
Business Policy	3

XI. INDUSTRIAL ADMINISTRATION

Adviser, Mr. O'Hara

This course follows the two-year pre-business course given in the College of Engineering. The program is designed primarily for students who wish to engage in purchasing, sales, employment, or cost accounting work in manufacturing establishments.

JUNIOR YEAR

	Credits
Market Administration (Bus. Adm. 67)	3
Business Law (Economics 51-52-53)	9
Mechanism of Exchange (Economics 3)	5
Railway Traffic and Rates (Bus. Adm. 73)	3
Corporation Finance (Bus. Adm. 155)	3
Elements of Statistics (Economics 14)	5
Production Management (Bus. Adm. 89)	3
Electives (See list below)	12 to 22

SENIOR YEAR

	Credits
Advanced General Economics (Bus. Adm. 101-102)	6
Cost Accounting (Bus. Adm. 131-132-133)	9
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1
Labor Problems (Economics 161)	3
Business Cycles (Economics 149)	3
Personnel Administration (Bus. Adm. 167)	3
Advanced Personnel Administration (Bus. Adm. 168)	3
Electives (See list below)	17 to 21

RECOMMENDED ELECTIVES

Students are expected to divide the time available for electives between groups A and B.

A. General and Business

	Hours
Economic History	3 to 6
Finance Management	3
Business Statistics	3
Theory of Statistics	3
Accounting Practice and Procedure	6
Advanced General Accounting	3
Geography of Commercial Production	5
Business Policy	3

B. Engineering

Gas Manufacturing and Distribution	3
Municipal Engineering	3
Contracts and Specifications	3
Estimating	3
Technical Writing	3
Industrial Management	9
Safety Engineering	3

XII. STATISTICS

Adviser, Mr. Mudgett

This sequence is designed for students who intend to become statisticians for business firms or associations. It will be possible to include additional courses in accounting in the sequence to the end that the student will be prepared to hold either statistics or accounting positions.

JUNIOR YEAR

	Credits
Market Administration (Bus. Adm. 67)	3
Economics of Transportation (Economics 172)	3
Business Statistics (Bus. Adm. 112)	3
Business Law (Economics 51-52-53)	9
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1
Theory of Statistics (Economics 113-114)	6
Corporation Finance (Bus. Adm. 155)	3
Advanced General Accounting (Bus. Adm. 139)	3
Pre-statistical Mathematics (Mathematics 47-48-49)	12
Electives	11

SENIOR YEAR

	Credits
Advanced General Economics (Bus. Adm. 101-102)	6
Market Prices (Economics 187)	3
Business Cycles (Economics 149)	3
Statistics Topics Course (Bus. Adm. 180-181-182)	9
Investments (Bus. Adm. 146)	3
Cost Accounting (Bus. Adm. 130)	3
Securities Market (Bus. Adm. 148)	3
Electives	15

RECOMMENDED ELECTIVES

	Hours
Logic	5
Theory of Statistics (Mathematics Department)	3
Personnel Administration	3
Foreign Exchange	3
Labor Problems	3
Production Management	3
History of Economic Ideas	3

XIII. TRAFFIC AND TRANSPORTATION

Adviser, Mr. Stevenson

This sequence is designed for those persons who wish to prepare for commercial traffic or railway work. A sufficient number of general courses are included to meet the needs of those who expect to obtain executive positions involving only an incidental amount of traffic work.

JUNIOR YEAR

	Credits
Business Law (Economics 51-52-53)	9
Economics of Transportation (Economics 172)	3
Monetary and Banking Policy (Economics 141)	3
Report Writing (Bus. Adm. 100)	1
Corporation Finance (Bus. Adm. 155)	3
Geography of Commercial Production (Geography 61)	5
Trade Routes and Trade Centers (Geography 62)	3
Commercial Policies (Economics 176)	3
Foreign Trade (Bus. Adm. 177)	3
Market Administration (Bus. Adm. 67)	3
Advanced General Accounting (Bus. Adm. 139)	3
Cost Accounting (Bus. Adm. 130)	3
Electives	3

SENIOR YEAR

	Credits
Advanced General Economics (Bus. Adm. 101-102)	6
Recent Social Legislation (Political Science 157)	3
Law of Public Utilities (Political Science 159)	3
Transportation Problems (Economics 174)	3
Business Statistics (Bus. Adm. 112)	3
Business Cycles (Economics 149)	3
Marketing Organization: Agricultural Products (Economics 108)	3
Railway Traffic and Rates (Extension course)	6
Electives	15

ELECTIVES

	Hours
A Senior Topics Course	6
Logic	5
Market Prices	3
Investments	3
Public Finance	6
Labor Problems	3
Personnel Administration	3
Production Management	3
Property Insurance	3
Public Utilities	3
Economics of Agricultural Production	3
Foreign Exchange	3
Psychology of Advertising	3
Advertising	3
The Trust Problem	3

PROGRAM*

1927-28

ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Introduction to Economics				Mr. J. D. Black and others
	(10 cred.; pre-bus. fr.; no prereq.)				
	Lect.	III	Th	OLAud	
	Sec. 1	I(f)	TThFS	204B	
		(w)		107F	
	2	I	TThFS	1B	
	3	II(f)	TThFS	6B	
		(w)		210F	
	4	II	TThFS	1B	
	5	III(f)	MWFS	204B	
		(w)		306F	
	6	III(f)	MWFS	202B	
	7	IV(f)	MWFS	109B	
	8	IV	MWFS	Ar	
	9	V	MTWF	6B	
	10	V	MTWF	209B	
	11	VI	MWThF	204B	
	12	VII	MWThF	209B	
	13	VII	MWThF	6B	
	14	VIII	MWThF	6B	
	15	IX	MWThF	102B	
1w-2s†	Introduction to Economics				Mr. J. D. Black and others
	(See 1f-2w)				
	Lect.	IV	T	202B	
	Sec. 1	III	TThFS	1B	
	2	V	MTWF	204B	
1s-(2f)†	Introduction to Economics				Mr. J. D. Black and others
	(See 1f-2w)				
	Lect.	III	W	301F	
	Sec. 1	II	TThFS	1B	
	2	VII	MWThF	204B	
(1s)-2f	Introduction to Economics	I	TWThFS	109B	Mr. J. D. Black and others
	(See 1f-2w)				
3f	The Mechanism of Exchange				Mr. Stehman and others
	(5 cred.; 3rd qtr. fr., soph., jr., sr.; no prereq.)				
	Lect.	III	TTh	202B	
	Sec. 1	I	TThS	6B	
	2	II	MWF	102B	
3w	The Mechanism of Exchange				Mr. Stehman and others
	(See 3f)				
	Lect.	III	TTh	202B	
	Sec. 1	II	MWF	102B	
	2	III	MWF	202B	
	3	VI	MWF	6B	

* Each course has in parentheses an abbreviated statement of credits and prerequisites. Thus (5 cred.; jr., sr., grad.; prereq., 3-4) means that the course carries 5 credits, is offered to juniors, seniors, and graduates, and demands Course 3-4 in the same department as a prerequisite.

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

() Numbers in parentheses do not refer to the year 1927-28.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
3s	The Mechanism of Exchange (5 cred.; 3rd qtr. fr., soph., jr., sr.; prereq. none)				Mr. Stehman and others
	Lect.	III	TS	OLAud	
	Sec. 1	I	TThS	6B	
	2	I	MWF	209B	
	3	II	MWF	102B	
	4	II	TThS	209B	
	5	III	MWF	204B	
	6	IV	MWF	209B	
	7	IV	MWF	6B	
	8	V	MWF	202B	
	9	VI	MWF	202B	
	10	VII	MWF	6B	
4f†	Principles of Economics—Pre-business (5 cred.; soph., pre-bus. only; prereq., 1-2)				Mr. Hansen and others
	Lect.	II	Th	301F	
	Sec. 1	II	MWFS	109B	
	2	III	TThFS	6B	
	3	IV	MWFS	102B	
	4	V	MTWF	202B	
	5	VI	MWThF	6B	
	6	VII	MWThF	102B	
4w†	Principles of Economics—Pre-business (See 4f)	IV	MTWFS	102B	Mr. Hansen and others
4s†	Principles of Economics—Pre-business (See 4f)				Mr. Hansen and others
	Lect.	II	Th	202B	
	Sec. 1	II	MWFS	202B	
	2	III	TThFS	6B	
	3	V	MTWF	109B	
14f	Elements of Statistics (5 cred.; soph., jr., sr.; prereq., 4 or 6-7)	III	MTThFS	109B	Mr. Mudgett and others
14w	Elements of Statistics (See 14f)				Mr. Mudgett and others
	Sec. 1	III	MTThFS	204B	
	2	IV	MTWFS	6B	
14s	Elements of Statistics (See 14f)				Mr. Mudgett and others
	Sec. 1	I	TWThFS	301B	
	2	II	MWThFS	301B	
	3	III	MTThFS	301B	
	4	IV	MTWFS	301B	
	5	VI	MTWThF	301B	
25f-26w†‡	Principles of Accounting (8 cred.; soph., jr., sr.; no prereq.)				Mr. Heilman and others
	Lect. Sec. 1	I	MWF	301B	
	2	I	TThS	301B	
	3	II	MWF	301B	
	4	II	TThS	301B	
	5	III	MWF	301B	
	6	IV	MWF	301B	
	7	V	MWF	301B	
	8	VI	MWF	301B	

Laboratory sections to be arranged.

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

‡ Open to pre-business students only.

SCHOOL OF BUSINESS ADMINISTRATION

No.	Title	Hour	Day	Bldg.	Instructor
25w-26s††	Principles of Accounting				Mr. Heilman and others
	(See 25f-26w)				
	Lect. Sec. 1	I	TThS	302B	
	2	II	MWF	303B	
	3	IV	MWF	302B	
	4	VI	MWF	302B	
	Laboratory sections to be arranged.				
25s-(26f)††	Principles of Accounting				Mr. Heilman and others
	(See 25f-26w)				
	Lect.	III	MWF	303B	
	Lab.	VII-VIII	W	303B	
35f	Introduction to Reporting	See Journalism 13			
36f	Copy Reading and Make-up	See Journalism 41			
50s	The Writing of Special Articles ...	See Journalism 69			
51f-52w-53s	Business Law	See Political Science 51-52-53			
56w	Psychology of Advertising	See Psychology 56			
80f-81w	Introduction to Economic History ..	See History 80-81			
82f-83w-84s	Economic History of the United States	See History 82-83-84			
90s	Economics of Consumption	See Agricultural Economics 126			
105s	History of Economic Ideas—The Classical Economists	Not offered in 1927-28			
	(3 cred.; jr., sr., grad.; prereq., 101-102 or 103-104)				
106s	History of Economic Ideas—The Critics of the Classical Economists (3 cred.; jr., sr., grad.; prereq., 105 or permission of instructor)	IV	MWF	102B	Mr. Hansen
108w*	Marketing Organization: Agricultural Products	VIII	MWF	102B	Mr. Price
	(3 cred.; jr., sr., grad.; prereq., 85 or 67; not open to agr. bus. students)				
110f-111w	Economics of Agricultural Production	See Agricultural Economics 110-111			
113w-114s	Theory of Statistics	I	MWF	6B	Mr. Mudgett
	(6 cred.; jr., sr., grad. prereq., 14)				
118f-119w-120s	Economic History of Europe 1750 to the Present	See History 113-114-115			
121f-122w-123s	Economic History of Europe 1300-1750	See History 116-117-118			
126s	Economics of Consumption	See Agricultural Economics 126			
141f	Monetary and Banking Policy				Mr. Stehman and others
	(3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7. Business students must take Econ. 100 in connection with 141)				
	Sec. 1	I	MWF	209B	
	2	III	TThS	209B	
	3	IV	MWF	204B	
	4	VI	MWF	209B	

* Section on main campus.

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

‡ Open to pre-business students only.

() Numbers in parentheses do not refer to the year 1927-28.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
141w	Monetary and Banking Policy (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)				Mr. Stehman and others
	Sec. 1	I		MWF 102B	
	2	II		TThS 102B	
	3	IV		MWF 204B	
141s	Monetary and Banking Policy (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)				Mr. Stehman and others
	Sec. 1	II		MWF 209B	
	2	VII		MWF 209B	
142f	Comparative Banking (3 cred.; jr., sr., grad.; prereq. 141)	III		MWF 104B	Mr. Myers
149f	Business Cycles (3 cred.; sr., grad.; prereq., 3, and 4 or 6-7)	VIII		MWF 202B	
149w	Business Cycles (See 149f)				
	Sec. 1	III		MWF 6B	Mr. Myers
	2	VIII		MWF 202B	
149s	Business Cycles (See 149f)	III		MWF 102B	Mr. Myers
151f	Prices of Farm Products See Agricultural Economics 130				
154s	Public Utilities (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 4 or 6-7)	II		TThS 102B	Mr. Garver
157f	Recent Social Legislation See Political Science 157				
158s	Government and Business See Political Science 158				
159w	The Law of Public Utilities See Political Science 159				
161f	Labor Problems and Trade Unionism (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)	IV		MWF 202B	Mr. Hansen
161w	Labor Problems and Trade Unionism (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)	III		TThS 109B 6B	Mr. Hansen
162w	Labor Movements (3 cred.; jr., sr., grad.; prereq., 161)	IV		MWF 202B	Mr. Hansen
163	Economic Aspects of Population and Immigration (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)	Not offered in 1927-28			
170s	Land Economics (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)	VII-VIII $\frac{1}{2}$		TTh 209B	Mr. Black
171s	Land Tenure See Agricultural Economics 171				
172f	Economics of Transportation (3 cred.; jr., sr.; prereq., 4 or 6-7)				
	Sec. 1	VI		MWF 202B	
	2	VII		MWF 202B	
172w	Economics of Transportation (3 cred.; jr., sr.; prereq., 4 or 6-7)	VI		MWF 102B	
172s	Economics of Transportation (3 cred.; jr., sr.; prereq., 4 or 6-7)	VII		MWF 202B	
174s	Transportation Problems (3 cred.; jr., sr.; prereq., 172)	VI		MWF 102B	

SCHOOL OF BUSINESS ADMINISTRATION

No.	Title	Hour	Day	Bldg.	Instructor
175S	Economic History of the United States since the Civil War	See History 169			
176f	Commercial Policies	I	MWF	202B	Mr. Blakey
	(3 cred.; jr., sr. grad.; prereq., 4 or 6-7)				
176S	Commercial Policies	I	MWF	202B	Mr. Blakey
	(3 cred.; jr., sr. grad.; prereq., 4 or 6-7)				
187S	Market Prices	VIII-IX $\frac{1}{2}$	WF	104B	Mr. Vaile, Mr. Garver
	(3 cred.; grad., sr. by permission; prereq., 101-102 or 103-104)				
191f-192w†	Public Finance	III	MWF	209B	Mr. Blakey
	(6 cred.; jr., sr. grad.; prereq., 3, 4 or 6-7)				
193S	State and Local Taxation	III	MWF	209B	Mr. Blakey
	(3 cred.; jr., sr. grad.; prereq., 191-192)				

BUSINESS ADMINISTRATION

No.	Title	Hour	Day	Bldg.	Instructor
59f	Life Insurance	III	TThS	102B	Mr. Graves
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
60w	Property Insurance	III	TThS	102B	Mr. Graves
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
61S	Casualty Insurance	III	TThS	102B	
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
64f-65w-66S	Commercial Art	IV	MW	Ar	Mr. Kirchner
	(6 cred.; jr., sr. grad.; prereq., 15 cred. in econ.)				
67f	Market Administration	I	TThS	209B	Mr. Vaile
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
67w	Market Administration	I	TThS	209B	Mr. Vaile
	(See 67f)				
67S	Market Administration	I	TThS	202B	Mr. Vaile
	(See 67f)				
68w	Sales Management	II	TThS	209B	Mr. Vaile
	(3 cred.; jr., sr.; prereq., 67)				
73w	Railway Traffic and Rates	VII	MWF	202B	
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
86S	Office Organization and Management	IV	MWF	1B	Miss Leonard
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
88S	Advertising	III	MWF	109B	Mr. Vaile
	(3 cred.; jr., sr.; prereq., 67, Psy. 56)				
89w	Production Management	I	TThS	6B	Mr. O'Hara
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
89S	Production Management	II	MWF	109B	Mr. O'Hara
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
94f-95w-96S†	Secretarial Training	Ar	MTWThF	1B	Miss Leonard, Mrs. Gray
	(15 cred.; jr., sr.; prereq., 4 or 6-7)				
97f-98w-99S†	Advanced Secretarial Training	Ar	MTWThF	109B	Miss Leonard
	(15 cred.; sr.; prereq., 94-95-96)				
100f,w,s	Report Writing	Ar	Ar	Ar	Mr. Heilman and others
	(1 cred.; jr., sr. To be taken in connection with Econ. 141)				

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
101f-102w†	Advanced General Economics (6 cred.; sr.; prereq., 4 or 6-7)				Mr. Garver
	Sec. 1	I	TThS	102B	
	2	III	MWF	102B	
101w-102s†	Advanced General Economics (See 101f-102w)	I	TThS	109B	Mr. Garver
109s	Business Policy (3 cred.; sr., grad.; prereq., 101-102)	VII	MWF	102B	Mr. Stevenson
112f	Business Statistics (3 cred.; jr., sr., grad.; prereq., 14)	I	MWF	6B	Mr. Mudgett
130f	Cost Accounting (General Survey) .. (3 cred.; jr., sr., grad.; prereq., 25-26)				Mr. Ostlund
	Sec. 1	I	TThS	303B	
	2	III	TThS	303B	
130s	Cost Accounting (General Survey) .. (3 cred.; jr., sr., grad.; prereq., 25-26)	I	TThS	303B	Mr. Ostlund
131f-132w- 133s†	Cost Accounting (9 cred.; jr., sr., grad.; prereq., 25-26)	II	TThS	303B	Mr. Ostlund
134f	Income Tax Accounting (3 cred.; jr., sr., grad.; prereq., 137-138-139)	II	MWF	302B	Mr. Reighard
135w-136s†	Auditing (6 cred.; jr., sr., grad.; prereq., 134)	II	MWF	302B	Mr. Reighard
137f-138w†	Accounting Practice and Procedure (6 cred.; jr., sr., grad.; prereq., 25-26)	IV	MWF	303B	Mr. Heilman
139s	Advanced General Accounting (3 cred.; jr., sr., grad.; prereq., 25-26)	IV	MWF	303B	Mr. Heilman
145s	Foreign Exchange (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)	IV	MWF	204B	Mr. Myers
146f	Investments (3 cred.; jr., sr., grad.; prereq., 3, and 155)	Not offered in 1927-28			
147s	Bank Administration (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)	VIII	MWF	202B	
148	The Securities Market (3 cred.; sr., grad.; prereq., 146, 149)	Not offered in 1927-28			
150s	Advanced Farm Finance (3 cred.; sr., grad.; prereq., 3, and 4 or 6-7)	VI-VII	W	104B	
152s	Real Estate Valuation and Land Utilization (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)	III	TThS	204B	Mr. A. G. Black
153	Real Estate Management and Prac- tice (3 cred.; jr., sr., grad.; prereq., 152)	Ar	Ar	Ar	

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

SCHOOL OF BUSINESS ADMINISTRATION

No.	Title	Hour	Day	Bldg.	Instructor
153s	Corporation Finance (3 cred.; jr., sr., grad.; prereq., 3, 4 or 6-7)				
	Lect.	III	Th	202B	Mr. Stehman
	Sec. 1	I	TTh	204B	and others
	2	III	MW	6B	
	3	VI	MW	209B	
156f	Finance Management (3 cred.; jr., sr., grad.; prereq., 155)				
	Sec. 1	I	TThS	202B	Mr. Stehman
	2	II	TThS	102B	
167w	Personnel Administration (3 cred.; jr., sr., grad.; prereq., 161)				
	Sec. 1	I	TThS	202B	Mr. Stead
	2	II	TThS	109B	
168s	Advanced Personnel Administration (3 cred.; jr., sr., grad.; prereq., 167)	I	TThS	209B	Mr. Stead
177w	Foreign Trade (3 cred.; jr., sr., grad.; prereq., 176)	I	MWF	202B	Mr. Blakey
180f-181w- 182s†	The Senior Topics Courses (School of Business Administration seniors)				
	A. Accounting (9 cred.)	II	TThS	104B	Mr. Reighard
	B. Business Finance (6 cred.)	VII-VIII	T	204B	Mr. Myers and others
	C. Marketing (9 cred.)	VI-VII½	TTh	104B	Mr. Vaile
	D. Personnel Management (9 cred.)	Ar	Ar	Ar	Mr. Stead and others
	E. Secretarial Practice (6 cred.; fall and winter only)	IV	MWF	1B	Miss Leonard
	F. Statistics (9 cred.)	Ar	Ar	Ar	Mr. Mudgett
194f-195w- 196s†	Advanced Advertising Procedure ... (3 cred.; jr., sr., grad.; prereq., 88)	Ar	Ar	Ar	Mr. Vaile

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

Bulletin *of the University of* Minnesota

General Extension Division
Announcement of Extension Classes
1927-1928



Vol. XXX No. 68 August 15 1927

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

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

Extension Calendar

In case a class observes other holidays than those here shown, the sessions missed are to be made up by extra meetings within the semester limits.

1927			
September	19-24		Registration
September	26	Monday	First semester begins
November	24	Thursday	Thanksgiving Day; a holiday
December	22	Thursday	Christmas recess begins
1928			
January	2	Monday	Class work resumed
January	23-27		Examinations, first semester classes
January	30	Monday	Second semester begins
May	21-25		Examinations, second semester classes

Attention is called to the fact that the campus office of the General Extension Division is now located on the fourth floor of the new Administration Building, on southeast State Street. A contact office, where information may be sought and bulletins or other printed material obtained, is maintained on the first floor.

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Opportunities through Extension Work

In his famous lecture, "Acres of Diamonds," Dr. Russell H. Conwell tells the story of Ali Hafed, an ancient Persian of great wealth, who sold his farm and other possessions at a sacrifice that he might go forth in search of a diamond mine, expecting thus to win even greater wealth and power than he had previously enjoyed. His search was in vain—and his experience all the more bitter because of the fact that, in the dooryard of his former possessions, diamonds of untold value were found by his successor.

Today we measure our "Acres of Diamonds" in terms of opportunity, which grow out of training and experience. And everyone owes it to himself or herself to secure this training, which is within the reach of all who are willing to avail themselves of it.

It is the function of the General Extension Division of the University of Minnesota to bring the benefits of university training to *all* citizens of Minnesota, including those who, for one reason or another, cannot take advantage of the instruction offered on the University campus. By this means, the University seeks to measure up to its full responsibility to the people of the state, who have built the University and who now support it.

There are many people to whom extension work opens an opportunity which otherwise they would lack. There are public school and high school teachers who wish to keep abreast of new developments in the work they are doing. There are industrial workers who must make a living, but who are anxious to devote spare time to training for advancement. There are business men and women who realize the advantages of a thoro training in the principles and practice of modern business, but who cannot give up their positions in order to pursue a full time vocational course. It is to serve these groups, as well as those who wish for further study with a view merely to self-development and culture, that the University has created the Extension Division.

The General Extension Division is prepared to organize and conduct late afternoon and evening classes in any community in the state where there is sufficient demand. For several years classes have been conducted in Minneapolis, St. Paul, Duluth,

Hibbing, Virginia, and at other points. The director of General Extension will welcome the opportunity to co-operate with other communities in a similar way.

Such extension classes include :

1. Courses leading to credit in the College of Science, Literature, and the Arts, in the College of Education, and in the School of Business Administration. In extension classes of this nature many persons are completing a considerable part of the work required for a degree in the colleges mentioned. A certificate is now awarded for the completion of 90 credits of junior college work.

2. Courses in business administration, accountancy, and finance. The student who so desires may arrange his work in such a way that he will be awarded an Extension Division certificate in accounting, banking and finance, or general business. Such certificates carry considerable weight in the business world, proving as they do the satisfactory completion of three years of university work in business subjects.

3. Practical courses in engineering and in industrial subjects. Certificates in engineering are awarded to students who complete satisfactorily three or four years of engineering study.

Full information regarding these courses may be found in this bulletin.

Other extension activities include correspondence courses in each of the three groups of subjects above, totaling about two hundred courses; and a Municipal Reference Bureau and Community Service Department (see last page of this bulletin).

General Extension Faculty

- Lotus Delta Coffman, Ph.D., LL.D., President
Richard Rees Price, M.A., Ed.D., Director of University Extension
Jean H. Alexander, M.A., Instructor in Education
Herbert D. Ambler, M.A., Instructor in English
Milton J. Anderson, B.S. in Arch., Instructor in Architecture, Duluth.
Carlos Arjona, Ph.D., Assistant Professor of Romance Languages
R. E. Ash, M.A., Instructor in Sociology, Hibbing
Frederick C. Austin, LL.B., in charge of Minneapolis office, General Extension Division
Charles L. Bane, Ph.D., Instructor in Psychology, Hibbing
Margaret Culkin Banning, B.A., Instructor in English, Duluth
Winfield W. Bardwell, LL.M., Judge of the Hennepin County District Court, Instructor in Business Law
William O. Beal, Ph.D., Assistant Professor of Astronomy and Assistant Astronomer
C. Ralph Bennett, B.A., Instructor in English
Charles Bird, Ph.D., Assistant Professor of Psychology
Adolph A. Blandin, B.S., Instructor in Accounting
David R. Blanpied, B.A., Instructor in Romance Languages
Donald S. Bleifuss, B.S., Instructor in Mathematics
Charles Boehnlein, M.E., Assistant Professor of Mathematics and Mechanics
Gisle C. Bothne, M.A., Professor of Scandinavian Languages and Literatures
William E. Brooke, B.C.E., M.A., Professor of Mathematics and Mechanics
Bryng Bryngelson, M.A., Assistant Professor of Public Speaking
J. William Buchta, M.A., Assistant Professor of Physics
S. Chatwood Burton, M.A., Associate Professor of Architecture
Eula B. Butzerin, B.S., R.N., Assistant Professor of Preventive Medicine and Public Health
Walter E. Camp, M.A., M.D., Assistant Professor of Ophthalmology and Oto-Laryngology
Jessie F. Caplin, M.S., Instructor in Textiles
Alfred M. Carlson, B.A., Instructor in Scandinavian
Clarence E. Cason, M.A., Instructor in Journalism
George G. Chapin, B.A., LL.B., Instructor in Business Law
Edward G. Cheney, B.A., Professor of Forestry
Arthur E. Christy, M.A., Instructor in English
Edwin L. Clarke, Ph.D., Assistant Professor of Sociology
Irene Clayton, B.S., Instructor in Swimming
Herbert E. Cleifton, Ph.D., Assistant Professor of Romance Languages
George P. Conger, Ph.D., Assistant Professor of Philosophy
Mary S. Conger, Instructor in Physical Education for Women
Charles Leroy Conley, B.A., Instructor in English

- William H. Crago, Instructor in Geology, Duluth
 John J. Creamer, B.A., LL.B., Instructor in English
 Chester C. Crellin, Instructor in Railway Traffic and Rates
 William C. Culmer, B.A., Instructor in Accounting, Duluth
 Alvin S. Cutler, C.E., Professor of Railway Engineering
 George C. Darrell, B.S. in Arch. Eng., Instructor in Civil Engineering
 James Davies, Ph.D., Assistant Professor of German
 Darrell H. Davis, Ph.D., Professor of Geology
 Ralph Dawson, M.A., Assistant in Zoology
 Paul R. DeFreece, B.S. in C.E., Instructor in Mechanical Drawing, Duluth
 Frances K. del Plaine, M.A., Instructor in English
 Harold S. Diehl, M.A., M.D., Associate Professor of Preventive Medicine
 and Public Health
 Jay K. Ditchy, Ph.D., Assistant Professor of Romance Languages
 Ann Dixon, Instructor in Music Methods, Duluth
 Edith D. Dixon, B.S., Assistant Professor, Institute of Child Welfare
 Charles H. Dow, C.E., Assistant Professor of Civil Engineering, in charge
 of St. Paul office, General Extension Division
 Oliver C. Edwards, B.S., M.E., Assistant Professor of Mechanical Engi-
 neering, General Extension Division
 Lu Lester Everly, M.A., Instructor in Geography
 Marion L. Faegre, B.A., Extension Worker, Institute of Child Welfare
 Donald N. Ferguson, M.A., Professor of Music
 William L. Fichter, Ph.D., Assistant Professor of Romance Languages
 Clarence Finger, B.A., Instructor in Finance
 Ross L. Finney, LL.B., Ph.D., Assistant Professor of Educational Sociology
 William K. Foster, LL.M., M.D., Assistant Professor of Physical Educa-
 tion for Men
 Jules T. Frelin, B.A., Assistant Professor of Romance Languages
 Robert W. French, B.S.(C.E.), Associate Professor of Drawing and
 Descriptive Geometry
 Iwao Fukushima, M.A., Assistant in Physics
 John S. Garns, B.A., Instructor in Public Speaking
 Isaac W. Geiger, Ph.D., Associate Professor of Chemistry
 Bueford M. Gile, M.A., Instructor in Agricultural Economics
 Ha'dor B. Gislason, B.A., LL.B., Assistant Professor of Public Speaking,
 General Extension Division
 George G. Glick, B.A., LL.B., Instructor in Business Law and Public Speak-
 ing, Duluth
 Ethel R. Gorham, M.A., Instructor in Home Economics
 Richard A. Graves, M.A., Instructor in Economics
 Harry S. Greiner, E.E., Instructor in Electric Vehicles
 Esther M. Greisheimer, Ph.D., M.D., Assistant Professor of Physiology
 Marguerite Guinotte, Brevet Supérieur, Certificat d'Aptitude Pédagogique,
 M.A., Instructor in Romance Languages
 Jennie Hall, M.A., Instructor in Nature Study
 Henry R. Halsey, B.S., Instructor in Investments, Duluth

Leah M. Hanley, B.S., Instructor in Art Education
Oscar E. Harder, Ph.D., Professor of Metallography
Donald Harries, LL.B., Instructor in Business Law, Duluth
Landreth M. Harrison, M.A., Instructor in Political Science
Richard Hartshorne, Ph.D., Assistant Professor of Geography
Edward W. Hawley, B.A., LL.M., Instructor in Parliamentary Law
Ronald M. Hazen, B.S.(M.E.), Assistant Professor of Mechanical Engineering
Donald C. Heath, B.S.(Arch.), Instructor in Architecture
Edna Heidbreder, M.A., Assistant Professor of Psychology
Ernest A. Heilman, Ph.D., Associate Professor of Accounting
Louis B. Hessler, Ph.D., Assistant Professor of English
Carl A. Herrick, M.E., Associate Professor of Mathematics and Mechanics
James T. Hillhouse, Ph.D., Assistant Professor of English
William F. Holman, Ph.D., Professor of Mathematics and Mechanics
F. Lincoln Holmes, M.A., Instructor in Public Speaking
Harvey Hoshour, B.A., LL.B., Instructor in Business Law, Duluth
G. Sidney Houston, Jr., Instructor in Accounting
Jerome Jackman, B.A., Instructor in Business Law, General Extension Division
Elmer Johnson, E.E., M.E., Assistant Professor of Electrical Engineering
Irving W. Jones, Ph.B., Assistant Professor of Music, Head of the Correspondence Study Department, General Extension Division
Gladys Kaercher, Instructor in Swimming
Rex H. Kitts, B.A., LL.B., Instructor in Business Law
Edwin W. Krafft, B.S.(Arch.), Instructor in Architecture
Alexander H. Krappe, Ph.D., Assistant Professor of Romance Languages
August C. Krey, Ph.D., Professor of History
Samuel Kroesch, Ph.D., Professor of German
John H. Kuhlman, B.A., E.E., Assistant Professor of Electrical Design
Mildred E. Lambert, Ph.D., Instructor in English
Pauline L. Lane, B.A., Instructor in Physical Education
Fred C. Lang, C.E., Associate Professor of Highway Engineering
Julian G. Leach, Ph.D., Assistant Professor of Plant Pathology
William LeBorious, Instructor in Accounting
Gustave A. Lundquist, Ph.D., Assistant Professor of Rural Sociology
George F. Lussky, Ph.D., Assistant Professor of German
John L. Macleod, in charge of Duluth office, General Extension Division
Mary Malcolm, B.S., Assistant in Music
Frederick M. Mann, M.S., C.E., Professor of Architecture
John V. Martenis, M.E., Associate Professor of Machine Design
William B. Millen, B.A., Instructor in Finance
Floyd B. Moe, M.A., Instructor in History and Economics, Duluth
Cecil A. Moore, Ph.D., Professor of English
Amy P. Morse, B.A., Assistant Professor of Drawing and Design
Wayne L. Morse, M.A., Assistant Professor of English

Helen P. Mudgett, M.A., Instructor in History
 Jay A. Myers, M.D., Ph.D., Associate Professor of Preventive Medicine
 Walter R. Myers, Ph.D., Assistant Professor of Economics
 Frank E. Nichol, B.S.(C.E.), Instructor in Engineering
 Charles W. Nichols, Ph.D., Assistant Professor of English
 William E. Niemackl, Instructor in Accounting
 Elizabeth Nissen, M.A., Instructor in Romance Languages
 Julius M. Nolte, B.A., Instructor in History and English, Duluth
 Harold H. Nott, Instructor in Foundry Practice
 William A. O'Brien, M.D., Assistant Professor of Pathology
 Everett W. Olmsted, Ph.D., Litt.D., Professor of Romance Languages
 John Henry Owens, M.A., Instructor in Romance Languages
 Benjamin W. Palmer, M.A., LL.B., Instructor in Business Law
 John I. Parcel, B.A., B.S.(C.E.), Professor of Structural Engineering
 Walter T. Pattison, B.A., Instructor in Romance Languages
 Abe Pepinsky, Instructor in Music
 Stanley H. Perry, B.A., Assistant Professor of History, General Extension
 Division, in charge of Collegiate courses
 Charles H. Preston, B.A., C.P.A., Associate Professor of Accounting
 George C. Priester, M.S., Associate Professor of Mathematics and Me-
 chanics
 Paul H. Rangere, Instructor in Advertising
 Frank M. Rarig, M.A., Professor of Public Speaking
 Samuel N. Reep, Ph.D., Instructor in Real Estate Practice
 William H. Richards, Assistant Professor of Pattern Making
 Arthur C. Ringsred, M.E., Instructor in Mathematics and Mechanics, Duluth
 M. Emma Roberts, Instructor in Art
 Burton J. Robertson, E.E., Associate Professor of Gas Engineering
 Julien M. Romieux, M.L., Instructor in French and Spanish, Duluth
 Gertrude D. Ross, B.S., Instructor in Art Education
 Clare L. Rotzel, B.C.S., C.P.A., Associate Professor of Accounting, Gen-
 eral Extension Division, in charge of Business courses
 Wilfrid E. Rumble, LL.B., Instructor in Business Law
 William T. Ryan, E.E., Professor of Electric Power Engineering
 Charles A. Savage, Ph.D., Professor of Greek
 Alfred J. B. Schmidt, B.S. in E., C.P.A., Instructor in Accounting
 Harold A. Seering, B.A., Instructor in Public Speaking
 Max Seham, M.D., Assistant Professor of Pediatrics
 John S. Shadbolt, B.A., Instructor in Rhetoric and Economics, Duluth
 S. Carl Shipley, B.S., M.E., Professor of Machine Construction and Super-
 intendent of Shops
 Lester B. Shippee, Ph.D., Professor of History
 Charles F. Shoop, B.S., B.S.(M.E.), Professor of Steam Engineering
 Miriam R. Small, Ph.D., Instructor in English
 Arthur V. Smith, Instructor in Accounting
 Dora V. Smith, M.A., Instructor in Education
 Homer J. Smith, Ph.D., Associate Professor of Industrial Education

- Herbert F. Sorenson, M.A., Instructor in Educational Psychology
J. Warren Stehman, Ph.D., Associate Professor of Economics
Thomas E. Steward, B.A., Assistant Professor of Journalism
Hazel B. Stevens, M.S., Instructor in English, General Extension Division
Andrew A. Stomberg, M.S., Professor of Scandinavian Languages and Literatures
Nettie Strate, Instructor in Educational Hygiene
Emerson G. Sutcliffe, Ph.D., Assistant Professor of English
Ray Rennington Sweet, B.S.(E.E.), Professorial Lecturer in Electrical Engineering
George W. Swenson, M.S.(E.E.), Assistant Professor of Telephone and Telegraph Engineering
Thomas A. H. Teeter, B.S.(C.E.), Associate Professor of Engineering, General Extension Division, in charge of Engineering courses
Mary A. Tillisch, Instructor in Nature Study
Milo E. Todd, B.A., E.E., Assistant Professor of Radio and Electric Power Engineering
Robert H. Tuttle, Instructor in Accounting
Roland S. Vaile, M.A., Professor of Economics
Marvin J. Van Wagenen, Ph.D., Assistant Professor of Educational Psychology
Archibald F. Wagner, B.A., C.P.A., Instructor in Accounting
Warren C. Waite, Ph.D., Associate Professor of Economics
Gina O. Wangsness, B.A., Instructor in German
Lehman Wendell, B.S., D.D.S., Instructor in Esperanto
Mary P. Wheeler, Lecturer in Sociology
Wendell White, Ph.D., Assistant Professor of Psychology, General Extension Division
Arthur N. Wilcox, M.S., Instructor in Horticulture
Hugh B. Wilcox, M.S., Assistant Professor of Mathematics and Mechanics
Norman Wilde, Ph.D., Professor of Philosophy
L. R. Wilkerson, Ph.D., Instructor in Education, Hibbing
Jeremiah S. Young, Ph.D., Professor of Political Science
Otto S. Zelner, B.S.(C.E.), Professor of Surveying

General Information

The General Extension Division is organized to meet the needs of persons who are unable to matriculate and enroll as full time students in the University. Its purpose is to serve office, store and factory employees, teachers and home makers, and persons seeking wider culture of sounder technical training. To this end, in addition to other activities, it organizes and directs late afternoon and evening classes in any part of the state where there is sufficient demand. Through such extension classes and through its correspondence courses the opportunity is presented to pursue subjects included in a liberal or vocational education, and to have these subjects credited toward an academic degree. It is understood that students desiring credit must meet the academic entrance requirements. For those whose preparation is incomplete, the opportunity is offered to make up the deficiencies and to continue with the regular course.

The extension year is divided into two semesters of sixteen weeks each, with an extra week devoted to examinations. Classes usually meet once a week in a two-hour session. Such classes ordinarily carry three credits or "credit equivalents" (see below). Those meeting more frequently and requiring more time in preparation carry more credit.

Admission.—It is not intended that any regulation should debar from the privilege of these courses any person who can profitably pursue them. Those persons who desire credit toward an academic degree must, however, comply with the regulations governing such degree. Those not desiring credit will be admitted, provided they are sufficiently mature (more than eighteen years of age), and can satisfy the department in which they wish to study that they are able to carry the work profitably to themselves and without hindrance to the class. Students may attend any class once before registering. All classes, except those in swimming, are open to both men and women.

Students who are graduates of accredited high schools or other approved preparatory schools are urged to file with the university registrar their credentials, so that the credits earned in the Extension Division may apply toward a university degree. Attention is called to the fact that those who are not graduates of accredited preparatory schools may satisfy the university entrance requirements in several other ways. They may take the University High School Board examinations; they may pass the regularly scheduled university entrance examinations; or they may take the entrance courses offered in the Correspondence Study Department of the Extension Division. (See the university bulletin of general information for further particulars.)

Registration.—Students should register at the Extension offices before the second meeting of the class in which they expect to enroll. Downtown offices are located in Minneapolis, St. Paul, and Duluth (see page 17 for location of these offices) in addition to the general office on the campus. A class card will be given to the student at the time of regis-

tration, which must be presented to the instructor. In towns where no extension offices exist students will register with the instructor.

No student will be regarded as registered in any class until he has paid the required fee and presented his class card to the instructor.

Students are urged to enroll in advance for all extension classes. Registrations, as a rule, will not be taken at classes but must be made either at the city offices or at the campus office of the division.

Advice on registration.—Students who have had sufficient preparation need not start at the beginning of a subject but may take up the work at the point where they can pursue it with advantage.

It has been found that many persons register who cannot take the work with any great profit to themselves because of inadequate preparation. For this reason it is desirable that students should consult with the head of the department concerned before taking up any course, so that they may have proper guidance and direction.

“Credit equivalents” for extension courses.—Every student who successfully completes a course offered by the General Extension Division (including passing the final examination in that course) receives a “credit equivalent” equal in amount to the credit stated in the announcement of the course.

“Credit equivalents” for subjects prescribed in group courses leading to extension certificates (see pages 19, 40, and 52) may be counted directly as credits toward such certificates.

The credits in the Extension Division are now computed in terms of “quarter” hours, in accordance with the present university usage, and not in “semester” hours, as was formerly the case. One semester credit equals one and one-half quarter credits. Courses meeting once a week for one semester normally carry three credits.

Conversion of credit equivalents into university credits.—Subject to the regulation that candidates for degrees must be regularly matriculated, and must complete in residence study a minimum of 45 quarter credits, “credit equivalents” may also be applied as credits toward a degree in any college of the University, so far as the subject conforms to the curriculum requirements of that college. The College of Engineering does not accept extension credits toward an engineering degree except by comprehensive examination.

Residence requirements.—By action of the University Senate, attendance on extension classes in Minneapolis, St. Paul and Duluth is interpreted as meeting the requirement of residence at the University.

Application of credits.—Students desiring credit toward a degree must, of course, satisfy the entrance requirements of the college in which the degree is sought. Virtually all the courses listed under the heading Collegiate Courses carry university credit unless otherwise specified, and the same is true of nearly all of the business courses. A few courses listed under Engineering carry credits, tho others do not. Such credits will be recorded in the registrar’s office when the student has matriculated and established a record in the University.

Students must indicate at the time of registration whether or not they desire university credit in the courses pursued. Changes from "no credit" (auditor) to "credit" registration will not be made after the middle of the semester, and will be made only with the consent of the instructor and at the campus office of the Extension Division. Changes from "credit" to "no credit" registration must be made one week before the end of the semester and at the campus office of the division.

In many cases, by departmental regulations, the completion of more work in a subject than is included in one extension semester course is required before credit for any part of it can be counted on a degree. For information as to such courses see bulletins of the several schools and colleges.

The following regulations govern 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 credits will 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 shall receive a certificate upon satisfactorily completing an approved course. The certificates entitle the holder to the corresponding university credits whenever he has earned forty-five credits in residence. The registrar or the Students' Work Committee shall in all cases pass upon the qualifications of the student.

5. The maximum credit towards a degree for work done in extension courses shall not exceed one-half the unit hours required for graduation.

6. Credit for an amount not exceeding one quarter of the unit hours required for graduation may be given at the University of Minnesota to students of such other extension schools or departments as may be approved by the Advisory Committee, provided that such credit shall be subject to the same provisions as govern credits in the General Extension Division of the University of Minnesota.

The following limitations as to students in residence at the University should also be noted:

1. No university student may enroll for extension courses for the purpose of removing a condition or failure.

2. No university student may enroll for an extension course if this would increase his credit hours beyond what the rules allow.

3. Any university student who wishes to enroll for an extension course must first obtain the approval of the dean of his college.

Examinations.—Examinations in all of the subjects given are conducted during the last week of each semester. All students who are eligible

for credit and desire it must pass these examinations.

Condition examinations will be conducted at the convenience of the instructors. Students having conditions must pass a condition examination within two semesters following the resumption of the student's extension work, otherwise the condition becomes a failure. A fee of \$1 is charged for each such examination.

A grade of "incomplete" not removed by the end of the second semester following the resumption of the student's extension work, becomes a condition or a failure as the instructor may direct.

Fees.—The fee for an extension class, meeting one evening a week for two hours, and continuing through one semester of seventeen weeks, with three hours credit, is \$10. Wherever the fee is more or less than this standard the amount is stated in the program of classes.

In case a student takes three or more courses simultaneously, a reduction of 10 per cent is made in the total fee of \$30 or more.

The fee does not include the cost of text or materials. Where mimeograph material is supplied in place of a basic text, a uniform charge of \$1 is made, payable at time of registration.

All fees are payable at the time of registration, and registration should not be deferred longer than the second meeting of any class. Checks should be made payable to the University of Minnesota.

Late registration.—Beginning with the first semester of 1925-26 an additional privilege fee for late registration is charged as follows: \$1 per course during the third week of the semester, and \$2 per course during the fourth week. Each week is construed to extend through Saturday evening. Two meetings of each class will therefore have been held before these privilege fees become operative. No registration will be accepted later than the fourth week of a semester after the week in which the class begins, without the approval of the director of University Extension.

Refunds.—Students who cancel their registration before the middle of any semester may obtain a pro rata refund of the tuition fee, provided written notice is given the office of the Extension Division at the time of cancellation. No refund is made after the eighth week of the semester. In no case will a refund be made to a student of a class organized on a minimum registration basis. Two dollars (\$2) of each fee is non-refundable, being withheld to cover expenses of registration.

Class attendance.—Every student is expected to attend the meetings of his class regularly. For credit toward a degree or a certificate the following rule must be adhered to:

"No student whose absence exceeds three of the regular scheduled sessions of the course for a semester shall be admitted to the final examination of the course without special permission of the director of University Extension."

Reports of students' work.—Reports of students' work and grades are sent to the office of the registrar of the University at the close of each semester. A report of the grade and credit earned is sent from that

office to the student. This information will not be given out at the office of the Extension Division.

Students' Work Committee.—The Students' Work Committee of the Extension Division has direct supervision over the scholastic work done by the students of the division. It also functions as an advisory group for students desiring information about sequence of courses, credits, certificates, relation of extension courses to courses offered in other colleges, credits offered from other institutions, and like matters. There is a representative of this committee at the main office of the Extension Division throughout the day, where he may be consulted or appointments made for consultation at other than business hours.

Credits from other institutions.—The Extension Division accepts credits from other institutions of equal grade with the University without examination upon a proper showing of work completed. In many instances students who have had courses in institutions not of equal grade may have credit allowed for such courses upon examination. A nominal fee is charged for this examination. Students desiring credit either with or without examination should consult the Students' Work Committee. If an examination is required this committee will arrange for it. The prospective student should submit an official statement showing the work done, grade and credit received from such other institution.

Normal load of extension work.—A normal load of extension work to be carried by an employed student is nine credit hours—the equivalent of three semester classes per week. The maximum is twelve credit hours—the equivalent of four semester classes a week, which may be allowed to a student by special permission of the director if his record of a previous semester shows an average of one and one-half honor points per credit hour. Permission to take more than the maximum of twelve credit hours will be granted by the director only under exceptional circumstances.

Correspondence study.—No student enrolled in extension classes is permitted to carry work by correspondence study without permission from the director of University Extension. No one may enroll for correspondence study if the work so taken would increase his credits beyond the permissible maximum.

Two-class schedule.—In a number of instances classes have been so scheduled that a student may take two classes in an evening. The first class normally commences at 6:20 p.m. and the second at 8:05 p.m. This schedule has been so arranged that a student may take two classes of his course on the same evening and thus avoid spending two evenings.

Length of courses.—Most of the classes meet once a week for two hours, for a period of sixteen weeks, with an additional week for final examination.

Program of classes.—The time of meeting of the classes is stated in a printed program or schedule of classes issued by the Extension Division at the beginning of each semester. Ordinarily the classes will meet at 6:30 and 7:30 p.m., but a suitable time will be scheduled for any group.

Classes arranged primarily for teachers often meet at 4:00 or 4:15 p.m. The program for the first semester will be sent out about September 15.

It should be understood that not all the courses listed in this bulletin are given in any one year. Final announcement of the courses offered in any semester will be found in a program issued for that semester.

The Minneapolis classes meet at the University, the Minneapolis City Hall, and the several schoolhouses. The St. Paul classes meet at the St. Paul City Hall, the Public Library, and also in schoolhouses. The Duluth classes meet in the St. Louis County Courthouse and the Central High School. In other places the classes will meet in such suitable quarters as may be obtained.

The exact place and time of meeting of each class will be announced in the program of classes.

Extension classes do not ordinarily observe the regular university holidays, except as shown in the calendar prefixed to this bulletin. In case sessions are missed for any reason they are to be made up by extra meetings within the semester limits.

Size of classes.—Classes will not ordinarily be organized for a smaller enrolment than fifteen. Under exceptional circumstances some continuation classes will be conducted for a minimum of twelve students. However, it should be understood that in some classes a larger registration will be required. Variations of the above rule will be made only at the discretion of the director.

Any course announced may be withdrawn if the registration for that particular course is considered insufficient. In case of withdrawal of any course the full fees paid will be refunded.

General Extension offices.—The General Extension Division maintains the following offices, where full information and bulletins may be obtained. Registration in all courses will be made at these offices:

Minneapolis: Room 736 Security Building (telephone, Main 0624).
New Administration Building, University campus (telephone, Dinsmore 2760).

St. Paul: Room 920 Pioneer Building (telephone, Cedar 7312).

Duluth: Room 404 Alworth Building (telephone, Melrose 7900).

Department of Collegiate Instruction

Purposes.—The courses offered in this department are selected largely from the College of Science, Literature, and the Arts. Three main purposes are in view.

1. To afford an opportunity to the student who is a candidate for a degree, but is unable to pursue his full course in the day classes at the University.

2. To enable the student who desires to complete the full requirements of the junior college course to do so, without the necessity of attending the day classes.

3. To bring the advantage of university training in cultural subjects to those who can devote one or more evenings a week to such work, regardless of any desire for university credit.

In general the purpose is to bring the advantages of the College of Science, Literature, and the Arts to the student who, because of employment, is unable to take advantage of the courses offered during the day on the University campus.

Courses offered.—Naturally only a portion of the numerous "academic" or "collegiate" courses offered by the University to its resident students can be given through extension classes. Graduate courses are excluded by a regulation of the Graduate School to the effect that no credits earned in extension courses may be counted toward an advanced degree. Research courses, advanced laboratory courses, and courses requiring a large amount of library reading are by their very nature unfitted for extension teaching; and some subjects tho of a more elementary nature are ruled out because of the difficulty of getting the minimum class of fifteen. Additional courses to those 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.

The number prefixed to the course is usually the same as that given to the corresponding course in the regular college bulletin. The letters *ex* affixed to a number indicate either that the course is not given in the regular campus work or that it is materially modified for the purposes of extension teaching.

Junior college certificate.—Credits earned in this department may be applied toward a university certificate, certifying that the student has completed the full course required in the Junior College. If the student desires to continue his work in the Senior College of the University of Minnesota or in any professional schools, he should advise early with the Students' Work Committee of the Extension Division, that proper care may be taken to plan so that the student may have the course required as preparation for a major in the Senior College, etc. Since it is impossible at the present to make available to evening students the courses in physical education and military drill required of all junior college students on the campus, arrangements have been made whereby students receiving their

junior college certificate through work accomplished in evening classes, will be allowed to carry the courses in physical education and military drill during the senior college years. Those students continuing their work in the Senior College will be expected to conform fully to the entrance requirements of that college.

General Course Leading to the Junior College Certificate

General requirements.—The student must earn 90 credits and must maintain a C average.

The student may not receive credit for beginning courses (two semesters, 6 credits) in more than one modern language, unless the Students' Work Committee approves such courses as necessary for the proper development of the student's work.

Special requirements.—The following special requirements should be noted:

Group A English.

Group B Foreign languages: French, Spanish, German, Scandinavian.

Group C Social sciences: Economics, History, Geography, Political Science, Sociology.

Group D Natural sciences: Zoology, Psychology, Chemistry, Astronomy.

Group E Architecture, Mathematics, Music, Philosophy, Art, Anthropology, Education, Child Welfare, Home Economics, Music, Journalism, Greek in English, Forestry, etc.

Candidates for the junior college certificate must have completed the following for the Junior College or the equivalent in another recognized institution:

1. Group A 15 credits in English, (English 1, 2, 4, 5, 6).

Group B The student must present for entrance four years of one foreign language, or he must complete 12 credits in one language in the Junior College. For every full year of a foreign language presented for entrance the above requirement shall be lowered 3 credits.

Group C 9 credits in one subject.

Group D 9 credits in one subject.

Group E No requirement.

2. Every student should plan to begin work in each of the Groups A, B, C, and D as early as possible because otherwise completion of the required subjects may delay the completion of his course.

3. In addition the student is urged to secure the necessary preparation for a senior college major sequence in one subject. (Consult bulletin of the College of Science, Literature, and the Arts.)

Credits and fees.—For detailed statement concerning credits and fees, see under General Information.

Schedule of classes.—A printed schedule indicating the time and place of meeting for each class is issued about ten days before the beginning of each semester, and will be sent upon request. Courses marked with a star (*) in the following lists were given last year.

ART

For courses in history of architecture, elements of architecture, etc., see under Department of Engineering Instruction. Under the heading Home Economics a course in interior decoration is listed.

*Art Ed. 1. Fundamental Principles of Design I. Elementary problems with emphasis on value relations; the decorative use of nature material. Three credits; one meeting a week, first semester. Mrs. Hanley.

NOTE.—Qualified students desiring the third term of Fundamental Principles of Design may take it at the same time that this course is offered.

*Art Ed. 2. Fundamental Principles of Design II. Design in relation to the home; a study of period furniture with trips to the Institute of Arts, also a continuation of design problems related to public school work. Three credits; one meeting a week, second semester. Mrs. Hanley.

*Art Ed. 7, 8, 9. Sketching. Drawing from the posed figure in charcoal, crayon, and pencil; action and memory drawing, blackboard practice. The course will help public school teachers in illustration work. Two credits; one meeting a week, second semester. Class limited to twenty-five. Mrs. Hanley.

Art Ed. 20, 21. Principles of Harmony in Form and Color I-II. Color theories of Munsell, Wilson, and Sargent, discussed and exemplified, with analysis of color harmonies and original work therein. Application of color harmonies in original designs throughout the year, with reference to execution in handicraft and by commercial processes. Six credits; one meeting a week, first and second semesters. Mrs. Hanley.

*24-25-26. Freehand Drawing I-II. Freehand perspective drawing in pencil, pen, charcoal, and wash from geometric solids and architectural details. Drawing in charcoal and water color from still life, figure details, and the antique. Three credits; one meeting a week, first and second semesters. Mr. Burton.

*27-28-29. Freehand Drawing III-IV. Continuation of I and II. Drawing and painting from life, with lectures on anatomy and figure composition; assigned readings. Students completing both semesters will be taught how to make etchings. Prerequisites: Freehand Drawing I and II. Three credits; one meeting a week, first and second semesters. Mr. Burton.

33. Bookbinding. An elementary course in the theory and practice of making books, such as simple folio books, the commercial cased books sewed over tapes, the old monastery books bound in leather and sewed over sunken cords and raised cords, the tooling and dyeing of leather, wood blocking, simple portfolio making, and designing and execution of a bookplate. Lectures and practice in practical problems adapted to the needs of city teachers, occupational therapists, and social workers. Two credits. (Not offered in 1927-28.) Miss Ross.

rex. Camp Craft Course. An elementary course in the theory and practice of crafts needed in camps, such as pottery, bookbinding, wood

blocking, stenciling, tie dying, batik, reed basketry, pine needle basketry, geso and clay substitutes.

- 2ex. Art Appreciation. A cultural course; being a survey of the art of Egypt, Persia, India, China, and Japan; the individual art of each country; interchange of influence; and effect upon present day art expression. The lectures will be illustrated by lantern slides and fabrics. Three credits. (Not offered in 1927-28.)

ASTRONOMY

- *11. Descriptive Astronomy I. Lectures and recitations on the general principles and fundamental facts of astronomy, illustrated by lantern slides, simple problems, naked-eye and telescopic observations. Three credits; one meeting a week, each semester. Mr. Beal.

CHEMISTRY

INORGANIC CHEMISTRY

- *9ex. General Inorganic Chemistry—the Non-Metals. A study of the common non-metallic elements and their principal compounds, with discussions of the laws and theories of chemistry. Five credits; one lecture, one recitation, and three hours laboratory work a week, first semester. Mr. Geiger.
- *12ex. General Inorganic Chemistry and Qualitative Analysis—the Metals and Qualitative Analysis. A study of the common metallic elements and their principal compounds, with a further discussion of the laws and theories of chemistry, and systematic qualitative analysis. Open to students who have completed Course 9 or its equivalent. Five credits; one lecture, one recitation, and three hours laboratory work a week, second semester. Mr. Geiger.

ANALYTICAL CHEMISTRY

- *1ex. Quantitative Analysis—Gravimetric. Introductory course covering the general principles and methods of quantitative analysis. Typical problems are assigned and attention given to proper laboratory practice. Prerequisite: Qualitative Analysis. Five credits; two meetings a week, 2½ hours each, first semester. Mr. Geiger.
- *2ex. Quantitative Analysis—Volumetric. Continuation of Course 1ex. Five credits; second semester. Mr. Geiger.
- *7ex. Quantitative Analysis—Pre-medical. An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention given to proper laboratory practice. Prerequisite: Qualitative Analysis. Given in connection with 2ex. Four credits; second semester. Mr. Geiger.

CHILD WELFARE

- C.W.I.40. Child Development and Training. A brief study of the physical and mental development of the child is followed by a discussion of the training of young children. Behavior problems in their various aspects, and techniques of good and bad management will be considered. Three credits; one meeting a week, first semester. Miss Dixon, Mrs. Faegre.
- C.W.I.50. Educational Methods for Young Children. A study of the education of the young child in the home. Stories, music, art, and dramatics, as well as the use of tools, toys, and a variety of occupational materials are discussed. The educational importance of play and of projects initiated and carried out by the children is stressed. Slides and moving pictures of children will be used for illustration and demonstration. Three credits; one meeting a week, second semester. Miss Dixon, Mrs. Faegre.

ECONOMICS

Classes in any of the subjects here listed will be formed on application of the minimum number of students.

3. Survey of Financial Institutions. For description, see Department of Business Instruction.
- *6. Principles of Economics. For description, see Department of Business Instruction. Three credits; one meeting a week, first semester.
- *7. Economic Problems. For description, see Department of Business Instruction. Three credits; one meeting a week, second semester.
85. Economics of Marketing. A general course dealing with the mechanism and operation of markets, the price making processes, wastes of competition, etc.
- *101. Advanced General Economics.
135. Methods of Price Forecasting. For description, see Department of Business Instruction.
- *146. Investments and the Stock Exchange. For description, see Department of Business Instruction.
- *149. Business Cycles and Forecasting. For description, see Department of Business Instruction.
- *155. Business Finance. For description, see Department of Business Instruction.
161. Labor Problems and Trade Unionism.
172. Economics of Transportation.
191. Public Finance and Taxation.

EDUCATION

In addition to the courses listed below, attention is directed to the courses described under the heading Psychology, and also to the special course in higher algebra (listed under Mathematics) in which considerable

attention is given to the related problems of arithmetic and their presentation in the schools.

*3. Educational Sociology. A course designed to explain, from the sociological standpoint, what the aims of education are, and what subjects are of most value; also designed to show how education can predetermine the institutions of the future. Three credits; one meeting a week, first semester. Mr. Finney.

*Ed.Psy.55. Elementary Educational Psychology. A survey of fundamental facts of human behavior involved in educational activities. Introduction to test and measurement in education, and general statistical methods; analysis of the learning process; suggestions for improvement of study; criticism of marks as measures of school work. Open to qualified students. Three credits in College of Education only; one meeting a week, each semester. Mr. White.

Ed.Psy.116. Elementary Educational Statistics. A study of statistical methods as applied to educational investigation. Designed chiefly to meet the needs of classroom teachers and principals. No knowledge of higher mathematics is assumed. Three credits; one meeting a week, first and second semesters.

Ed.Ad.119. Elementary School Curriculum. Study of the principles underlying the organization of subject-matter for courses in the elementary school; examination of curricula, syllabi, and texts in the light of their function. Survey of scientific research in curricular content by subjects. Three credits; one meeting a week, first semester. Mr. Sorenson.

Ed.Ad.124. Educational Administration. The present status and tendencies in the organization and administration of state and city school systems with interpretations. Three credits; one meeting a week, second semester. Mr. Sorenson.

Ed.Ad.160. Principles of Supervision. An analysis of the functions and duties of a supervisor as related to the improvement of instruction; specific supervisory technique; objective analysis of classroom activity; concrete applications to present day problems; case studies. Three credits; one meeting a week, first semester. Mr. Sorenson.

Ed.Ad.161. Supervision. Uses of educational tests in improving instruction. Objective evaluation of the results of teaching; diagnosis of pupil difficulty; remedial work; tests as aids to teaching; following up a testing program. Three credits; one meeting a week, second semester. Mr. Sorenson.

rex. Methods and Sources for Nature Study. For description see under Nature Study on page 32 of this bulletin.

H.Ed.101. Foundations of Modern Education. Historical analysis and interpretation of the more important elements in modern education derived from the Hebrews, Greeks, Romans, Middle Ages, and Renaissance. Three credits; one meeting a week, second semester. Miss Alexander.

H.Ed.103. History of Modern Elementary Education. The institutions, theories, and problems of modern elementary education in the light of

their history. Emphasis upon the rise of state systems and upon the history of modern educational reform. Three credits; one meeting a week, first semester. Miss Alexander.

- 2ex. Field Course in Nature Study. For description see under Nature Study on page 32 of this bulletin.

ENGLISH
COURSES IN LITERATURE

- *1. Survey of English Literature I. A general study of the most significant English classics from Shakespeare to Swift. Lectures, recitations, and assigned readings. Three credits; one meeting a week, first semester. Miss Stevens.
- *2. Survey of English Literature II. A continuation of Course I; from Swift to Stevenson. Three credits; one meeting a week, second semester. Miss Stevens.
- *55-56. Shakespeare I-II. Shakespeare's development as a dramatist. A careful study of a selected list of Shakespeare's plays. Six credits; one meeting a week, first and second semesters. Mr. Nichols.
- *66ex. The English Novel. A course dealing with the novel from the time of Scott to the present. Introductory lectures on the earlier novel; a study of Scott, Dickens, Thackeray, George Eliot, Meredith, Hardy, and others, with some work on twentieth-century fiction if time permits. Required reading of at least eight novels. Three credits; one meeting a week, first semester. Mr. Hillhouse.
70. Elizabethan Drama. Shakespeare's later development as a dramatist with some attention to the general history of English drama from 1603 to 1642. The course will include the reading of all Shakespeare's later plays and of the masterpieces of his chief successors. The decadence of Elizabethan dramatic art will be studied, and consideration given to the evolution of the modern, or picture stage. Three credits; one meeting a week, second semester. Mr. Hessler.
- *73-74. American Literature I-II. Lectures on American literature, with extensive readings from the principal poets and prose writers of the United States. Little attention is paid to the novelists in this course. Six credits; one meeting a week, first and second semesters. Mr. Moore, Mr. Nichols.
109. The Romantic Poets. A study of the Romantic School of poets from Wordsworth to Keats, and the influence of the French Revolution upon them. Three credits; one meeting a week.
- *129. Modern Drama. Reading of about twenty-five plays by the chief dramatists, English, American, and Continental, beginning with Ibsen. Lectures on background material, and class discussions of plays assigned. Three credits; one meeting a week, second semester. Mr. Hillhouse.
151. Recent Poetry. Poetry in England and America since the death of Queen Victoria; the main tradition and tendencies now prevailing. Three credits; one meeting a week, second semester.

- *155. The American Novel. The beginnings of the American novel and short story and their development to about 1865. Among the writers included are Charles Brockden Brown, Irving, Cooper, Poe, Hawthorne, Thomas Bailey Aldrich. Three credits. (Not offered in 1927-28.) Mr. Moore.

NOTE.—Graduate credit will not be allowed for this course.

COURSES IN COMPOSITION

For a course in Business English, see that heading under Department of Business Instruction.

- *4. Composition IV. Practical training in writing, largely exposition; analysis of prose selections and of compositions written by the class. The student will be required to do a certain amount of reading from the classics. Three credits: one meeting a week, each semester. Mr. Christy, Miss Small, Miss Stevens.
- *5. Composition V. A continuation of the preceding course. Three credits; one meeting a week, each semester. Mr. Christy, Miss Small.
- *6. Composition VI. A continuation of Courses 4 and 5. A brief study of the essay, and of exposition, description, and narration. Three credits; one meeting a week, each semester.

NOTE.—Survey of English Literature I and II plus Composition IV, V, VI is the equivalent of the freshman work in English in the University day school. Composition IV, V, VI is the equivalent of the work in English required of all technical students in the University.

11. Description and Narration. Principles and practice of description and narration, with analysis of selected specimens. Open to those who have completed Courses IV, V, VI. Three credits; one meeting a week, second semester. Miss Stevens.
20. Informal Exposition. Description and narration as methods of exposition; the informal essay. Extensive reading in the informal essay, both British and American; a study of the informal essay in current magazines, and practice in writing. Three credits; one meeting a week, first semester. Mrs. del Plaine.
- *69-70. Short-Story Writing. An advanced course in writing for those who have had experience in writing for publication or have had preliminary training in the technique of writing. Open for credit only to those who have had at least two years of college courses in writing or the equivalent. Six credits; one meeting a week, first and second semesters. Mr. Sutcliffe.
- 51ex. English for Engineers. A course in practical English, designed to meet the professional needs of engineering students. The material of this course will include business letters—about twelve types, reports, estimates, instructions, etc. Some attention will be given to oral English. Three credits; one meeting a week, first semester.

COURSES IN PUBLIC SPEAKING

Students in public speaking will be interested in the course in Parliamentary Law described on page 32.

- *41-42. General Course in Public Speaking I-II. Extemporaneous speaking based on outlines; analysis and organization of speech materials; study of model speeches. Attention is also given to correctness and effectiveness in delivery. This course is designed to meet the practical needs of business and professional students. Six credits; one meeting a week, first and second semesters. Mr. Rarig, Mr. Bryngelson, Mr. Morse, Mr. Garns, Mr. Holmes, Mr. Seering.
- *81-82-83. Interpretative Reading I-II. Interpretation and oral expression of the various forms of literature—the essay, the short story, lyric and narrative poetry, and the drama. Open to those who have credit for Courses 1-2, College Composition and Rhetoric, and Public Speaking 41-42. Six credits; one meeting a week, first and second semesters. Mr. Garns.
- *85-86. Advanced Public Speaking I-II. The distinctive characteristics of oratorical style; analysis of the styles of representative orators. Written and extemporaneous speeches. Individual criticism and direction. Six credits; one meeting a week, first and second semesters. Mr. Rarig.
- 9ex. Story Telling to Children. (1) Story telling, its place and value; (2) choice of the story qualities desirable and undesirable; (3) preparation of the story, application of the short-story ideals of "singleness of impression" and "dramatic struggle"; reconstruction of the story from the child's viewpoint; (4) the problem of delivery—the group consciousness, holding attention, self-effacement, vocal and verbal adaptation. No university credit: one meeting a week, first semester. (Not offered in 1927-28.) Mr. Garns.
- *91. Play Production. A teacher's course in classroom dramatic interpretation. (Not offered in 1927-28.)

ESPERANTO

- 1. Beginning Esperanto. Pronunciation, grammar, and selected readings in prose and poetry with special emphasis on conversation. No credit; one meeting a week, first semester. Dr. Wendell.
- 2. Advanced Esperanto. A continuation of Course 1. Advanced prose readings, composition, and correspondence with foreign Esperantists. No credit; one meeting a week, second semester. Dr. Wendell.

FORESTRY

- *1. Forest Conservation. Dealing with the history and development of the forests of Europe and discussing the forest problems of the United States in the light of the progress already made in other countries, with special emphasis on our national forest policy and our state forest policy; fire protection, taxation, etc. Three credits; one meeting a week, first semester. Mr. Cheyney.

GEOGRAPHY

- *51A. Human Geography. A study of space relationships and climatic types as they affect human activities and the distribution of population. No prerequisite. Three credits; one meeting a week, first semester. Mr. Davis, Mr. Everly.
- *51B. Human Geography. A study of soils, drainage, land forms, contact with the sea, and mineral wealth as they affect human activities and the distribution of population. Prerequisite: 51A. Three credits; one meeting a week, second semester. Mr. Davis, Mr. Everly.
- 61A. Geography of Commercial Production. A study of the geographic basis for the production of agricultural commodities entering into world trade, together with a consideration of the areas of consumption. Prerequisites: 51A and 51B. Three credits; one meeting a week, first semester. Mr. Davis.
- 61B. Geography of Commercial Production. A study of the forest and mineral industries and their geographic basis. Special attention will be given to the factors localizing great manufacturing districts. Prerequisite: 61A. Three credits; one meeting a week, second semester. Mr. Hartshorne.

GERMAN

- *1. Beginning German I and II. Pronunciation, grammar, conversation, and composition; selected readings in easy prose and verse. Open to students who have had no German, but both semesters must be completed before credit is given. Six credits; one meeting a week; first and second semesters. Mr. Kroesch.
- *2. Beginning German III and IV. Continuation of the above. Six credits; one meeting a week, first and second semesters. Miss Wangness.
10. Rapid Reading I and II. Short stories and dramas by Storm, Heyse, Baumbach, Lessing, Goethe, Schiller, Hebbel, and Sudermann. Class work and discussions are conducted in German. Open to students who have had at least one year of German. Six credits; one meeting a week, first and second semesters. Mr. Davies.
13. Elementary Conversation I and II. Conversation on topics of everyday life, aiming at fluency in the use of idiom; not a course in composition; organized on the laboratory basis. Intended for those who have had at least one year of German. Six credits; one meeting a week, first and second semesters. Mr. Davies.
- *17. German for Graduate Students. Open to students who have had one year of German. This course is intended for candidates for advanced degrees who wish to acquire a reading knowledge of German. One meeting a week, each semester. Mr. Lussky.

GREEK IN ENGLISH

- *1. Greek Mythology. A course of lectures, textbook work, and illustrative reading; dealing with the myths which appear in the literature and art of ancient Greece. The course will be illustrated with the stereopticon.

- The origin and evolution of the myth, its relation to Greek literature, philosophy, and religion, and its influence upon later literature will be touched upon. No knowledge of Greek is required for this course. Three credits; one meeting a week, second semester. Mr. Savage.
2. Greek Literature and Life. A course dealing with the literature, life, and art of the ancient Greeks. Lectures and illustrative readings by the instructor, assigned readings in translations and textbook work by the class; conferences and informal discussions. The character and influence of Greek culture, especially along the lines of literature and art will be discussed, and the course will be illustrated with the stereopticon. No knowledge of Greek is required. Three credits; one meeting a week, first semester. Mr. Savage.
 - *3. Greek Drama in English. A critical reading and interpretation of representative Greek plays in English translation, together with lectures on the origin, development, character and influence of the Greek drama, and special stereopticon illustrations of Greek plays and Greek theaters. Lectures supplemented by textbook work, readings, and informal discussions. No knowledge of Greek is required. Three credits; one meeting a week, first semester. Mr. Savage.

HISTORY

JUNIOR COLLEGE COURSES

- *1. Modern World I. Survey of political, social, and economic factors and events in European history from 1648 to the rise of Napoleon. Three credits; one meeting a week, first semester. Mr. Perry.
- *2. Modern World II. Survey beginning with the Napoleonic period, giving special attention to the reform and revolutionary movements, and to the formation of new states in Europe. Three credits; one meeting a week, second semester. Mr. Perry.
- *3. Modern World III. Europe since 1870, with particular reference to international alliances and rivalries, economic and political expansion and the new imperialism, the diplomatic background of the Great War, the Great War and the treaties of peace, efforts at reconstruction and the new Europe. Three credits; one meeting a week, first semester. Mr. Perry, Mrs. Mudgett.
- *7. United States, 1776-1840. Survey of development of the United States from the Revolution to 1840, with special reference to growth of democratic institutions, the influence of the West, and the growing nationalism. Three credits; one meeting a week, first semester. Mr. Perry.
- *8. United States, 1840-77. Survey of the background of the Civil War, the war and reconstruction, with special reference to slavery, westward expansion, the frontier, the Public Land question, and the social, political, and economic systems before and after the war. Three credits; one meeting a week, second semester. Mr. Perry.

- *9. Recent American History. The national period after 1877. Special emphasis on the social and economic factors. Three credits; one meeting a week for one semester. Mr. Perry.
- 14ex. The Middle Ages. An outline of medieval history from the fall of the Roman Empire to about 1300, with emphasis upon such topics as feudalism, the medieval church, the crusades, conflicts of papacy and empire, and medieval culture. Three credits. (Not offered in 1927-28.) Mr. Krey.
- 15ex. The Renaissance. Outline of European history from 1300 to 1648, with emphasis on the development of the intellectual, artistic, and social phases of civilization. Open to all. Three credits. (Not offered in 1927-28.) Mr. Krey.

SENIOR COLLEGE COURSES

- *112. History of American Immigration. Settlement and development of typical racial stocks in America. Text, lectures, and assigned readings. Three credits. (Not offered in 1927-28.) Mr. Stephenson.
- 122ex. Early Political Leaders of the United States. Outstanding men considered in connection with the political movement of their day. Lectures and assigned readings. Three credits; one meeting a week for one semester. Mr. Perry.
143. American Political Parties. A study of the origin, organization, and activity of political parties, considering in some detail important presidential campaigns. Lectures, assigned readings. Three credits. (Not offered in 1927-28.) Mr. Stephenson.
- For additional courses see schedule of classes issued before the opening of each semester.

HOME ECONOMICS

- *3. Textiles. Including a discussion of those points in fabric study that are of value to both the purchaser and seller of fabrics—fabric structure, fibres employed in their manufacture, methods of substitution and adulteration, tests for quality, art and economic considerations in their purchase for clothing and household purposes. Three credits; one meeting a week, each semester. Miss Caplin.
13. Clothing Planning and Construction B. A course in the technique of clothing construction that will give practice in the use of commercial patterns, modeling on the dress form, and application of construction processes. Instruction and practice in construction of a semi-tailored wool garment and a problem in infants' or children's clothing. Three credits; one meeting a week, first semester. Miss Gorham.
17. Advanced Clothing. Laboratory course in the designing, modeling, and construction of silk or wool costume, including millinery, and a problem to test acquired speed. Three credits; one meeting a week, second semester. Miss Gorham.

- 21ex. Nutrition. A brief course in the fundamental principles of human nutrition as applied to the feeding of adults, under conditions of health and under such pathological conditions as are chiefly depended upon dietetic treatment. Three credits. (Not offered in 1927-28.)
- 131ex. Interior Decoration I. The course will be prefaced by such a discussion of house plans as will give a necessary background for the major part of the work. The principles involved in house furnishing will be taken up in lecture, illustrated by lantern slides and actual materials wherever possible. Such subjects as wall treatment, rugs, selection and arrangement of furniture, hangings, pictures, and accessories will be discussed at first separately, and later as they relate to each other and the room as a whole. Three credits; one meeting a week, first semester. Miss Morse.
- *54. Interior Decoration II. A continuation of extension course 131ex. Furnishing schemes are planned for the living room, bedroom, and dining room; a special study is made of colonial work, accessories, silver, and china. Three credits; one meeting a week, second semester. Miss Morse.

JOURNALISM

- *1. News Writing I. Practice in writing types of stories covered by reports for metropolitan newspapers. Study of style, structure, news value, and news gathering methods, with practice in getting news. Analyses of American newspapers. Three credits; one meeting a week, first semester. Mr. Steward, Mr. Cason.
- *2. News Writing II. A continuation of the above, with study of feature stories. Three credits; one meeting a week, second semester. Mr. Steward, Mr. Cason.

MATHEMATICS

One class in higher algebra (Course 5) will be organized for grade school teachers. In this class the relations of arithmetic and algebra will be stressed in such a way as naturally to aid the arithmetic teacher. In general the last half hour of each session will be devoted to a discussion of specific teaching difficulties brought forward by members of the class, and to which a right understanding of the principles of algebra, and the relation to arithmetical processes, will usually suggest the solution.

- *A. Plane Geometry I-II. A course covering elementary geometry as usually given in accredited high schools. Rectilinear figures and the circle, with miscellaneous original exercises and some elementary construction problems; proportion, similar triangles, proportional properties of line segments, proportional properties of chords and secants; trigonometric ratios, areas of polygons, regular polygons, and circles. Prerequisite: elementary algebra. One entrance credit; one meeting a week, first and second semesters. Mr. Edwards.

- *B. Solid Geometry. A course of high school grade designed to give a knowledge of the standard theorems and exercises, to develop the student's imagination and initiative, and to give a well-rounded view of the subject by practice in special proofs and original exercises. Prerequisite: Course A. One-half entrance credit; one meeting a week, each semester. Mr. Edwards.
5. Higher Algebra I-II. A review and a collegiate treatment of the topics of elementary algebra for those who have had one year of elementary algebra. Not open for credit to those who present higher algebra for entrance to college. Prerequisite: Courses A and B or equivalent. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
 6. Trigonometry I-II. Logarithms and plane trigonometry. Prerequisite: Course 5 or preparatory higher algebra. Six credits; one meeting a week, first and second semesters. Mr. Teeter.
 7. College Algebra I-II. Quadratic equations, equations in the quadratic form, simultaneous quadratic equations, graphical representation, progressions, mathematical induction, the binomial theorem, permutations, combinations, probability, determinants, and the theory of equations with special reference to graphical methods. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
 30. Analytic Geometry I-II. The elements of plane analytic geometry including the geometry of the conic sections, with a brief introduction to solid analytic geometry. Prerequisite: Courses 6 and 7. Six credits; one meeting a week, first and second semesters. Mr. Teeter.
 50. Calculus I-II. Differential calculus. Prerequisite: Courses 6 and 7, and 30. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
 51. Calculus III-IV. Integral Calculus. Prerequisite: Course 50. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
 52. Calculus V-VI. Selected topics in differential and integral calculus with special reference to infinite series, partial differentiation, multiple integrals, and applications of the calculus. Prerequisite: Course 51. Six credits; one meeting a week, first and second semesters. Mr. Edwards.

MUSIC

- *1ex. How To Listen to Music, I and II. An approach to music from the point of view of the concert goer, the amateur; explaining in simple terms some of the facts and terminology of music, pointing out the criteria by which quality in music and in performance is judged, securing familiarity, through repeated hearing, with a representative list of typical compositions; the objective being sufficiently broadened understanding to insure a keener enjoyment of music heard. First and second semesters; one meeting a week; no credit. Mr. Jones.
- *49ex. Historical Appreciation of Music. A general non-technical account of the principal musical forms, together with their historical origins

- and associations, and a study of the nature and scope of musical expressions, designed to give an understanding of music as literature. Biographical and critical reading required. The course will be extensively illustrated. Three credits; one meeting a week, first semester. Mr. Ferguson.
4. Harmony. The study of chords, their construction, relations and progressions. Written exercises on basses, the harmonization of given melodies. (Covers the work of the first quarter of Harmony, as given in residence.) Three credits; one meeting a week, first semester. Miss Malcolm.
- 64ex. Orchestra Conducting (Including Band). Theory and practice of general principles of conducting. Technique of the baton and elements of interpretation. Comparison and differentiation of band and orchestra conducting. Elementary instrumentation. Two credits; one meeting a week, first semester. Mr. Pepinsky.
- 94ex. Ensemble Playing, Sight Reading, and Accompanying. A practical playing course for the study of chamber music literature. Open to players of all string instruments, piano, organ, flute, oboe, clarinet, bassoon, and French horn. Simple sonatas used for sight reading and accompanying; standard repertory for playing of trios, quartets, etc. Two credits; one meeting a week, first semester. Mr. Pepinsky.

NATURE STUDY

- 1ex. Methods and Sources for Nature Study. A survey of biological and physical nature study designed to meet the needs of teachers of elementary schools. Methods of developing nature study both in the schoolroom and out of doors, and of correlating it with other subjects are discussed. Three credits; one meeting a week, each semester. Miss Hall.
- 2ex. Field Course in Nature Study. Three credits; one meeting a week, second semester. Miss Tillisch.

PARLIAMENTARY LAW

- *7ex. Parliamentary Law. Presented not as a mere list of rules, but as a system, based upon principles, a knowledge of which will supply the answer to any of the seven thousand possible questions of procedure which may arise in the conduct of a deliberative assembly. The class is limited to forty members. No text is required, but *Robert's Rules of Order*, Revised, is used as a basis of the course; mimeographed material will be furnished to students without charge. No college credit; one meeting a week, each semester. Mr. Hawley.

PHILOSOPHY

- *1. Introduction to Philosophy. An introduction of the problems of philosophy through a reading of some of the more popular philosophic classics. Three credits; one meeting a week, first semester. Mr. Conger.

3. Principles of Ethics. A sketch of the development of morality followed by an analysis of conscience and a discussion of the nature and authority of moral principles. Three credits; one meeting a week, first semester. Mr. Wilde.
10. Science and Religion. A popular discussion of religious problems as affected by contemporary science. Three credits; one meeting a week, second semester. Mr. Conger.
124. Political and Social Ethics. A study of ethical basis of society and the state and a consideration of some of the unsettled problems of politics and economics from the ethical point of view. Three credits; one meeting a week, second semester. Mr. Wilde.

PLANT PATHOLOGY

- 10x. Fruit and Vegetable Diseases. A lecture and demonstration course on the diseases of fruits and vegetables with special reference to diseases of produce in storage and transit. Particular attention is paid to symptoms and identification. Considerable time is given to the physiology of stored produce in relation to the development of diseases. One meeting a week, first or second semester. Mr. Leach.

POLITICAL SCIENCE

The attention of students is called also to the course on Modern Political Thought listed under the heading Philosophy.

1. American Federal Government. An elementary course in American government and politics designed for those studying the problems of citizenship, and for teachers. Three credits; one meeting a week, first semester. Mr. Young.
3. Comparative European Government. An elementary course in the government and politics of the great European Powers of today with the special emphasis placed upon the study of Great Britain, Germany, France, Italy, and Russia. Three credits; one meeting a week, first semester. (Not offered in 1927-28.)
7. State Government. Complementary to Course 1 above. (Not offered in 1927-28.)
11. Municipal Government. The growth of cities; their legal status; municipal organization in the United States including the mayor and council, commission and city manager plans; municipal organization abroad; current municipal problems. Three credits; one meeting a week, first semester. Mr. Young.
25. World Politics. A general study of liberalism, nationalism, imperialism, and internationalism; a more detailed study of the government and present world problems of the British Empire; France and the Mediterranean, including Italy, Spain, and Belgium; Germany, Austria, Hungary, Czecho-Slovakia; Russia and the Baltic states; the Near East, including the Balkan states; the Far East, especially concessions and

- extra-territoriality; the United States as a world power. Three credits; one meeting a week, each semester. Mr. Young.
135. Current Political Problems. Physical problems such as territory and the people; citizenship and Americanization; the electorate—its burdens and such reforms as proportional representation and the short ballot; the place of political parties; distribution of political powers; the making and amending of constitutions; the reorganization and improvement of the three departments of government; recent experiments with popular control—the initiative, referendum, recall, and direct primaries; internationalism and foreign affairs; struggle of classes or government by blocs; some municipal problems; the place of education in a democracy. Three credits; one meeting a week. (Not offered in 1927-28.) Mr. Young.
- *145. Legislative Powers and Methods. Source and scope of the legislative power; methods used by legislative bodies; current political questions; formulation and defense of legislative bills. Three credits. (Not offered in 1927-28.) Mr. Young.
157. Recent Social Legislation. The governmental powers used for social legislation, both state and federal; the methods used; peace and security from crime; safety and health; public morals, including such subjects as gambling, lotteries, speculation, intoxicating liquors, sexual vice, and public amusements; economic relations that are semi-social, such as advertising, minimum wage, and restrictions on contracts, city planning and police power restrictions on the use of private property. Three credits; one meeting a week, second semester. Mr. Young.
- *158. Government and Business. Governmental powers; restraint of trade and manipulation of prices; protection of debtors; business affected with a public interest; combinations of laborers; corporations; compulsory benefits; conservation of natural wealth; vested rights; confiscatory legislation. Three credits. (Not offered in 1927-28.) Mr. Young.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

4. Increasing the Span of Human Life. History of control of disease conditions causing increase of length of human life since 1855. Diseases now causing high mortality; discussion of foods, rest, recreation, work, and other important factors increasing efficiency and length of life. Three credits; one meeting a week, second semester. Dr. Myers.
- *53. Elements of Preventive Medicine. The determining factor in individual health, susceptibility, resistance and immunity to disease; methods of spread and the prevention of communicable and degenerative diseases; protection of food, water, and milk; school health work; vital statistics. This course presents the basis essential to effective health work whether this work be in the practical field, such as public health nursing and physical education, or in the more theoretical side of teaching. Prerequisite: Psychology 1-2 and Biology 1-2, or by permission. Three credits; one meeting a week, first semester. Dr. Diehl.

57. Health of Infant and Pre-School Child. Growth and development of baby and young child. Care and feeding of normal child. Prevention and correction of physical defects. Prerequisites: Animal Biology 1-2 and Psychology 1-2, or 50, 52 or 53. Two credits. (Not offered in 1927-28.)
58. Maternal and Child Hygiene. The maternal welfare program; importance of breast feeding; conduct of infant welfare clinics in cities and rural communities; consideration of child of pre-school and school age as to malnutrition, physical defects, cardiac and nervous disorders. Prerequisite: 50 or 52 or 53. Two credits. This course is intended for graduate nurses. (Not offered in 1927-28.)
62. Principles of Public Health Nursing. Development, principles of organization, administration and supervision of public health nursing; methods of co-operative endeavor with social agencies; health teaching as an essential factor in the promotion of individual and community well-being. This course is primarily for students already active in the field of public health nursing. It aims to enlarge an appreciation of the community health problems and a knowledge of the most effective methods of dealing with them. Graduate nurses only are eligible for enrolment with credit. Prerequisite: Course 53. Three credits; one meeting a week, second semester. Miss Butzerin.
63. Special Fields in Public Health Nursing. Development of special field in public health nursing; scope of program; analysis of services; class demonstrations and discussions. Prerequisite: 62 or equivalent. Three credits; one meeting a week, first semester. Miss Butzerin.
80. Child Health and Educational Hygiene. Intended for teachers and others interested in child health and health education. Consideration of hygiene of physical and mental growth, health supervision of school children, teaching of health subjects, and sanitation of school environment. The course deals with practical problems of school health supervision and health education. Prerequisites: Course 50 or 53, or by permission. Three credits; one meeting a week, second semester. Dr. Diehl, Dr. Myers, Dr. Seham.

PSYCHOLOGY

- *1-2. General Psychology I-II. An introductory survey of psychology; its materials, fundamental laws, applications, and relations to other sciences. Six credits; one meeting a week, first and second semesters. Mr. Bird, Miss Heidbreder, Mr. White.
- *3. Psychology Applied to Daily Life. The applications of psychology to selected problems in advertising and selling, law, medicine, and daily life. Prerequisite for college credit: General Psychology 1-2. Three credits; one meeting a week, each semester. Mr. White.
- *Ed. 55. Elementary Educational Psychology. A survey of fundamental facts of human behavior involved in education activities. For full description see under Education. Open to qualified students. Credited in College of Education, but not in College of Science, Literature, and the Arts. Three credits; one meeting a week, each semester. Mr. White.

127. Social Psychology. A critical study of the experimental investigations of group behavior including the social significance of instinct, habit, imitation, suggestion, and personality traits. Prerequisite for college credit: Psychology 1-2 or 6, 4-5 or 7 (laboratory psychology) or Biol. 1-2 or 10 credits in a social science. Three credits; one meeting a week, each semester. Mr. Bird.

PUBLIC SPEAKING AND RHETORIC

See English on pages 24 to 26 of this bulletin.

ROMANCE LANGUAGES

FRENCH

- *1-2. Beginning French I-II. Grammar, pronunciation, reading, and practice in speaking; practice in conversation will be given early in the course. Open to all. Both semesters must be completed before credit is given for the first semester. Six credits; one meeting a week, first and second semesters. Mr. Clefton, Mr. Blanpied, Mr. Owens.
- *3. Intermediate French I-II. Reading, grammar, and composition. French grammar review, readings from modern authors. Open to all who enter the University with two years of French. Both semesters must be completed before credit is given for the first semester. Six credits; one meeting a week, first and second semesters. Mr. Ditchy, Miss Guinotte.
- *5. French Readings for Graduate Students. Outline of grammar and reading of texts to prepare students for the French examination required of those who are candidates for advanced degrees. No previous knowledge of French required. One meeting a week, each semester. Mr. Frelin.
- *6ex-7ex. French Rapid Reading I-II. Six credits; one meeting a week, first and second semesters. Mr. Ditchy.
- *20. Elementary French Conversation and Composition I-II. The course will include a careful drill in pronunciation and practical phonetics. Prerequisite: French 1-2. Six credits; one meeting a week, first and second semesters. Miss Nissen.

SPANISH

- *1-2. Beginning Spanish I-II. Grammar, pronunciation, reading, and practice in speaking. Open to all. Both semesters must be completed before credit is given for the first semester. Six credits; one meeting a week, first and second semesters. Mr. Olmsted, Mr. Krappe, Mr. Pattison.
- *3. Intermediate Spanish I-II. Readings from modern authors; grammar review; composition work, with some attention to correspondence and commercial practice if desired by the class. Spanish will be as largely as possible the language of the classroom. Open to those who have had Spanish 1-2 and are approved by the teacher. Six credits; one meeting a week, first and second semesters. Mr. Fichter.

- *20. Spanish Conversation and Composition I-II. Practical conversation including drill in pronunciation and phonetics; composition, including Spanish commercial correspondence. Prerequisite: Spanish 1-2. Six credits; one meeting a week, first and second semesters. Mr. Arjona.
- 65-66. Survey of Modern Literature. Readings in modern authors; lectures in Spanish; study of literary movements. Six credits. (Not offered in 1927-28.)

SCANDINAVIAN

- *5. Norwegian Survey I-II. Prose and Poetry. Six credits; one meeting a week, first and second semesters. Mr. Bothne.
7. Beginning Swedish. Grammar, composition, conversation, reading of selected texts. Three credits; one meeting a week, first semester. Mr. Carlson.
110. Ibsen. Lectures, reading, interpretation. Three credits; one meeting a week, first semester. Mr. Bothne.

SOCIOLOGY

- *1. Introduction to Sociology. The effect upon human society of such influences as geography, sex, race, custom, and invention. Means of controlling and directing these influences. Prerequisite to all other courses in sociology when taken for university credit. Three credits; one meeting a week, each semester. Mr. Lundquist.
3. Educational Sociology. A course designed to explain, from the sociological standpoint, what the aims of education are, and what subjects are of most value; also designed to show how education can predetermine the institutions of the future. Three credits; one meeting a week, first semester. Mr. Finney.
- *6. Modern Social Reform Movements. A survey of the causes, cures, and preventives of problems associated with poverty, industrial relations, immigration, race, feminism, civil liberties, and international relations. Three credits; one meeting a week, first semester. Mr. Finney.
- *14. Rural Sociology. The background and evolution of country life; rural conveniences, communication, co-operation; rural social institutions, especially the family, school, church, and social center; rural leadership, surveys, organization, social agencies. Three credits; one meeting a week, first semester. Mr. Lundquist.
51. The Occurrence of the Socially Inadequate. The significance of the socially inadequate in contemporary and industrial societies and the description of the methods used in their care. Three credits; one meeting a week, first or second semester. Miss Wheeler.
53. Elements of Criminology. The development of the general concept of crime and criminals; the types of criminals; causes of crime; social control of crime; treatment of the criminal; agencies for the prevention of crime. Three credits; one meeting a week, first semester.
100. Social Psychology. (Not offered in 1927-28 unless requested.)

101. Social Organization. A study of the social mind and its communication, the problems of democracy, of class and caste, of social conflict and revolution, and of social organization on the rational and scientific basis for social efficiency and progress. Lectures, reading, discussion. Course I is a prerequisite if university credit is desired. Three credits; one meeting a week, first semester. Mr. Finney.
102. Social Control. A study of the social, psychological, and physical factors which control and direct people in their social relationships. Subjects considered are the origin, evolution, and direction of social control; the means and technique of social control; the growth toward rational and scientific social control under the influence of a developing social science; the limits and purposes of social control. Designed for the same class of students as Course 100. Three credits; one meeting a week, second semester. Mr. Finney.
- *119. The Family. Economic and social problems of the normal family; contemporary problems of family instability. Three credits; one meeting a week, second semester.
120. Social Progress. (Not offered in 1927-28 unless requested.)
140. History of Social Thought. (Not offered in 1927-28 unless requested.)
141. Contemporary Social Thought. (Not offered in 1927-28 unless requested.)

SWIMMING

Instruction in swimming is given (to women) in the Women's Gymnasium of the University campus, through both semesters, one hour an evening, under competent instructors. The fee is \$5 a semester and a towel fee of ten cents is charged for each meeting. The courses carry no university credit. If a demand arises for classes for men, they will be organized in the University Armory. Persons taking the courses are required to conform to the regular university rules in regard to the gymnasium and the pool. Woolen suits are not permitted.

For sanitary reasons a health certificate signed by a reputable physician is required before registration is complete. For this purpose a physician will be at the gymnasium at the first meeting of the class, for whose service a nominal fee will be charged.

- *1ex. Swimming. Beginning and Advanced. Taught by a combination of class instruction and individual instruction. One meeting a week, each semester. Dr. Foster, Miss Conger, Miss Kaercher, Miss Lane.

ZOOLOGY

- 1-2. General Zoology. Structure, physiology, embryology, classification, and evolution of animals. Textbook, lectures, laboratory, and quizzes. Nine credits; two three-hour meetings a week, first and second semesters. Mr. Dawson.

Department of Business Instruction

Purpose.—The Department of Business Instruction recognizes the professional status of the business executive. It aims to give prospective executives thoro training for the work they are to undertake. Professional education rather than detailed drill in narrow technical processes is the object toward which instruction is directed. Scientific method in analyzing business data, trained intelligence in dealing with the human relationships with which business is made up, and well-developed sense of moral responsibility will be the foundations of business effectiveness in the future. Experience has proved that those persons whom the department is reaching can, by being actively employed during the day, comprehend and appreciate this course of instruction in a particularly advantageous manner. The courses are conducted in close co-operation with the School of Business Administration of the University.

Admission to courses.—Any person may be admitted to extension courses who is sufficiently mature and can satisfy the instructors in whose classes he wishes to register that he is able to carry the work profitably to himself and without hindrance to the class. (See under heading General Information.)

The admission requirements for the School of Business Administration are as follows:

1. Four high school units of English; or three units of English and four units of a foreign language; or three units of English and two units each of two foreign languages.

2. One unit of algebra and one unit of plane geometry, and enough additional work to make in all fifteen units, of which not more than four may be in Group F.

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

A detailed statement of the entrance subjects, grouped into six groups, may be found in the university bulletin of general information. The completion of preparatory courses as above outlined will also be accepted by the State Board of Accountancy as the preliminary high school training required of applicants for the degree of C.P.A.

Advanced standing in the School of Business Administration.—Students in the Extension Division who have completed with a grade of "C" the equivalent of three years of one of the four-year programs in the School of Business Administration of the University of Minnesota may obtain the degree of bachelor of science in business by registering in the School of Business Administration for their last year's work. A program of at least thirteen hours per quarter must be carried for the three quarters of the final or senior year. Students interested in the programs of study and

graduation requirements of the School of Business Administration should obtain a copy of its bulletin from the registrar.

Credits and fees.—The credits are stated throughout in terms of "quarter" hours, and not in "semester" hours as was formerly the practice. One and one-half quarter credits equal one semester credit. The fee for a class which meets once a week in a two-hour session and carries three credits is ten dollars. (For more detailed statement, see under General Information.)

Certificates.—Credits earned in this department may be applied toward forty-five- and ninety-credit business certificates and in addition, where the student has satisfied the university entrance requirements, may be applied toward a degree from the School of Business Administration under certain restrictions. (For further information on this subject see the bulletin of the School of Business Administration.)

The requirements for each of these certificates are set forth below. It is possible for a student to obtain two of the certificates listed above, but the second certificate will not be granted until the student has earned an additional 9 credits over the 45 credits required for the first certificate.

Group course in accountancy.—This course is designed to meet the needs of two classes of students, namely those who wish to prepare to take the state C.P.A. examinations with a view to becoming public accountants, and those who aim to fit themselves for responsible positions with private business firms as accountants or as managers.

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 accountancy will be granted.

Students of experience and some maturity may join a class as auditors, in case they do not care to secure credit for the course toward a certificate in accountancy. These students will not be called upon to take part in the discussions nor to turn in work, which is required of students registering for credit. In this way the University hopes to make available the benefits of the courses to those who feel they lack the opportunity or time to do the work regularly required in the course.

Attention is called to the following more specialized courses for those who desire to get the most out of their accounting studies:

- Constructive Accounting
- Accounting Systems
- Interpretation of Accounts
- Interpretative Practice and Procedure
- Business Management
- Functional Problems and Cases in Management

While these courses are not specifically required for a certificate in accounting, it is suggested that they be used as electives where practicable.

The course requires a total of 45 quarter credits, as follows:

Principles of Accounting A (3 credits), Principles of Accounting B (3), Accounting Laboratory A ($1\frac{1}{2}$), Accounting Laboratory B ($1\frac{1}{2}$), Accounting Practice and

Procedure A (3), Accounting Practice and Procedure B (3), Auditing A (3) and Auditing B (3), or Cost Accounting A (3) and Cost Accounting B (3), Business Law A (3), Business Law B (3), Business Law C or D (3), Economics (3), Business English (3), Elective subjects (9).

Group course in banking and finance.—This course is intended to meet the needs of (1) those who are preparing for, or who are now engaged in, such occupations as banking, corporation management, stock and bond brokerage, credit work, or financial journalism; and (2) business men who wish to utilize in their particular business modern scientific knowledge of practical financial nature.

Beginning with the year 1923-24, the University certificate in finance is granted to those who complete a total of 45 credits distributed as follows:

Principles of Economics (3), Banking and Finance A (3), Banking and Finance B (3), Banking and Finance C (3), Banking and Finance D (3), Business English (3), Principles of Accounting A (3), Principles of Accounting B (3), Accounting Laboratory A (1½), Accounting Laboratory B (1½), Business Law A (3), Business Law B (3), Business Law C or D (3), Elective subjects (9).

Group course in general business.—For the benefit of 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.

The University certificate in general business will be granted to those who successfully complete a total of 45 credits distributed as below.

The electives should be selected with a view to specializing in some particular field, as in advertising and selling, in railroad traffic, and the like.

Business English (3), Business Law A (3), Business Law B (3), Business Law C (3), Business Law D (3), Principles of Accounting A (3), Principles of Accounting B (3), Accounting Laboratory A (1½), Accounting Laboratory B (1½), Economics A (3), Economics B (3), Electives (15).

Ninety-credit secretarial course.—The subject-matter and sequence in this course have been arranged for those who are preparing for positions as private secretary. The certificate in this course will be granted only to those who present satisfactory evidence as to proficiency in shorthand and typewriting.

	Credits		Credits
English		Technical Office Work	
Business English and Business Correspondence	6	Office Technique	3
Public Speaking	6	Office Management	3
Report Writing	3	Banking Finance	
Economics		Elementary Money and Banking....	3
Principles of Economics and Economic Problems	6	Statistics or Business Cycles.....	3
Advanced Economics	3	Corporation Finance	3
Law		Psychology	
Business Law A.....	3	General Psychology I.....	3
Business Law B.....	3	Applied Psychology—Advertising and Salesmanship	3
Business Law C		Geography	
or		Human Geography	3
Business Law D.....	3	Geography of Commercial Production	3
Accounting			69
Principles of Acctg. A and B.....	6	Electives	21
Accounting Laboratory A and B....	3	Total	90

EXTENSION CLASSES

Ninety-credit course in management and administration.—Beginning with the year 1927-28, a University certificate in management and administration will be granted to those who complete a total of ninety credits, which comprise required studies in certain subject groups and electives as follows:

<i>Accounting</i>		
Required	Credits	Suggested Electives
Principles of Accounting A and B....	6	Cost Accounting C
Accounting Laboratory A and B.....	3	Cost Accounting D
Accounting Practice and Proced. A....	3	Income Tax Problems
Accounting Practice and Proced. B....	3	Accounting Seminar A and B
Auditing A).....	3	Constructive Accounting
Auditing B).....	3	Accounting Systems
or		
Cost Accounting A).....	3	
Cost Accounting B).....	3	
Interpretation of Accounts.....	3	
Interpretative Pract. and Proced. ...	3	
<i>Business Law</i>		
Business Law A.....	3	
Business Law B.....	3	
Business Law C.....	3	
Business Law D.....	3	
<i>Banking and Financing</i>		
Money and Banking.....	3	Investments and Stock Exchange
Financing a Business.....	3	Business Cycles and Forecasting
<i>English</i>		
Business English	3	
Business Correspondence	3	
Public Speaking	3	
Report Writing	3	
<i>Management and Administration</i>		
Elements of Economics.....	3	Business Management
Economic Problems	3	Functional Problems and Cases in Mgt.
Advanced General Economics.....	3	Railway Traffic and Rates
Business Management	3	Statistics
Functional Problems and Cases in		Advertising A
Business Management	3	Advertising B
		Insurance
		Economics of Retailing
		Financing of Real Estate
		Office Technique
		Office Management
<i>Psychology</i>		
General Psychology	3	
Applied Psychology (Adv. and		
Sales.)	3	
	—	
Total	78	
Electives	12	
	—	
Total	90	

Description of subjects offered.—A complete list of the subjects offered is given below:

ACCOUNTING

The first year's work consists of, first, a series of lectures and discussions in the principles of accounting; and second, the putting of these principles to practical application in the working out of specific problems. Students not desiring to specialize in accounting may omit this latter course, i.e., Accounting Laboratory A and B; but all who take the laboratory courses are required to take the corresponding courses in accounting principles.

- *10. Elements of Accounting. A course designed for those who are not prepared by experience or training to enroll immediately in Principles of Accounting, but who desire to overcome their deficiencies and pursue the regular accounting courses. The course will take up the purposes of accounting, the use of books of original entry, posting to the ledger, the trial balance, closing the ledger, preparation of simple trading statements. No credit; one evening a week, first and second semesters in Minneapolis. Mr. Houston.
- *10L. Elements of Accounting Laboratory. Class work in accounting problems to illustrate subject-matter covered in Elements of Accounting. No credit; one meeting a week, first and second semesters in Minneapolis. Mr. Houston.
- *25. Principles of Accounting A. Designed to cover fundamentals. Classification of the balance sheet and operating accounts; the books and records of original entry; special discussions on the trading margins, operating expenses, etc.; various bookkeeping and accounting operations, such as accruals, deferred charges; special systems of handling accounting data, such as departmentalization of accounts, imprest cash systems, the treatment of controlling accounts and auxiliary ledgers; preparation of simple working sheets and statements. Three credits; one meeting a week, first semester. Mr. Rotzel, Mr. Heilman, Mr. Blandin, Mr. Houston, Mr. Le Borious, Mr. Smith.
- *26. Principles of Accounting B. Continuation of Principles of Accounting A with more special reference to manufacturing and corporation accounts; treatment of goodwill and depreciation, accountant's working sheet; adjusting of surplus, sinking funds, and reserve accounts; drafting condensed balance sheets and income statements. Three credits; one meeting a week, second semester. Mr. Rotzel, Mr. Heilman, Mr. Blandin, Mr. Houston, Mr. Le Borious, Mr. Smith.
- *25L. Accounting Laboratory A. The working out of practical problems covering the subject-matter discussed in Principles of Accounting A, under the guidance of an instructor. One and one-half credits; one meeting a week, first semester. Mr. Blandin, Mr. Culmer, Mr. Le Borious, Mr. Niemackl, Mr. Smith.
- *26L. Accounting Laboratory B. Work of similar kind covering the subject-matter discussed in Principles of Accounting B. One and one-half

- credits; one meeting a week, second semester. Mr. Blandin, Mr. Culmer, Mr. Le Borious, Mr. Niemackl, Mr. Smith.
- *131. Cost Accounting A. A specialized course in manufacturing accounts. Chief objectives of the course are, first, the development of principles useful in determining the profitableness of each branch of manufacturing; and second, the establishment of a basis to judge relative efficiencies of operation. Subject-matter includes consideration of materials, labor, and burden; continuous process and production order costs; burden distribution methods, standard costs, etc. Three credits; one meeting a week, first semester. Mr. Rotzel, Mr. Tuttle.
- *132. Cost Accounting B. A continuation of Course 131. Three credits; one meeting a week, second semester. Mr. Rotzel, Mr. Tuttle.
133. Cost Accounting C (Advanced). A course in cost accounting, enlarging upon the principles laid down in Cost Accounting A and B and directing the student toward the practical application of cost accounting details. Layout of burden centers, development of burden in each burden center, constructive analysis of unearned burden, pro forma journal entries, design of forms, wage methods, means of changing from job to process cost methods, procedure in installing a cost system, round table discussions on elective subjects. Open to students who have completed Cost Accounting A and B or the equivalent. Three credits; one evening a week, first semester. Mr. Tuttle.
- 133a. Cost Accounting D (Advanced). A continuation of Cost Accounting C. Three credits; one evening a week, second semester. Mr. Tuttle.
- *134. Income Tax Problems. Course offered to those who have completed Principles of Accounting A and B for the purpose of familiarizing the accounting student with the accounting ramifications of the federal income tax law, and its application to various businesses and also to varying business conditions. The purpose of the course also will be to point out possible errors likely to be made in the preparation of the regular tax reports. Lectures, discussions, and working out of problems. Three credits; one meeting a week, first semester. Mr. Preston.
- *135. Auditing A. This course is essentially practical and is intended only for those whose previous training in the principles of accounting has been sufficient to enable them to be benefited by this advanced work. The chief aim will be to give students the training necessary to enable them to conduct audits and investigations either as private auditors or public accountants; to set up accounts for various purposes as a result of such audits or investigations and to prepare suitable reports thereon. Three credits; one meeting a week, first semester. Mr. Rotzel, Mr. Wagner.
- *136. Auditing B. A continuation of Course 135. Three credits; one meeting a week, second semester. Mr. Rotzel, Mr. Wagner.
- *137. Accounting Practice and Procedure A. 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. The work consists of the following: (a) a study of a distinctive group of accounting problems and the scientific solution of those problems; (b) a study of the accounting problems peculiar to representative business. Three credits; one meeting a week, first semester. Mr. Rotzel, Mr. Blandin, Mr. Houston, Mr. Le Borious, Mr. Wagner.
- *138. Accounting Practice and Procedure B. A continuation of Course 137. Three credits; one meeting a week, second semester. Mr. Rotzel, Mr. Blandin, Mr. Houston, Mr. Le Borious, Mr. Wagner.
140. Accounting Practice and Procedure C. Constructive accounting. A course outlining subject-matter relative to the design and installation of a modern accounting system. The make-up of various forms for use in the system, purchase orders, receiving slips, invoices, requisitions, shop tickets, and other forms. The design and ruling of books of original entry; ledgers of various kinds. Three credits; one meeting a week, first semester. Mr. Rotzel, Mr. Schmidt.
- *141. Accounting Practice and Procedure D. Interpretation of accounts. The meaning of accounting reports and statements including balance sheets, income accounts, cost statements, etc. The value of comparison in interpretation. Consideration of the base of comparison. Proper place of statistics in the accounting fabric. Development of accounting ratios and their meaning. Practical problems in the above case method used. Three credits; one meeting a week, first semester. Mr. Schmidt.
- *142. Accounting Practice and Procedure E. Interpretative practice and procedure. The student is here given specific problems to solve and present to the class with the aid of the instructor along the lines of the study of particular cases in interpretation of accounts. Three credits; one meeting a week, second semester. Mr. Schmidt.
- *148. Accounting Practice and Procedure F. Practical accounting systems. Classification of industry according to types of accounting problems. Special features encountered in each class of industry. Constructive, operative, and interpretative features considered. Case methods used. Three credits; one meeting a week, second semester. Mr. Rotzel, Mr. Schmidt.
180. Accounting Seminar A. A research course for accounting students who have completed their accounting studies in the Extension Division. During the year 1926-27, an investigation was made of accounting data as a basis for price standards. Three credits; one meeting a week, first semester. Mr. Rotzel.
181. Accounting Seminar B. A continuation of Course 180. Three credits; one meeting a week, second semester. Mr. Rotzel.

BANKING AND FINANCE

- *143. Finance A—Elementary Money and Banking. Designed as a general survey of the principles determining value and price and the inter-relationship of our various financial institutions. The origin, evolution, and functions of money; the nature and functions of credit and credit instruments; domestic and foreign exchange; functions of various credit agencies; government regulation of banking. Three credits; one meeting a week, first semester, Minneapolis; second semester. Minneapolis, if sufficient enrolment. Mr. Stehman.
- *155. Finance B—Corporation Finance. The corporate form of financial organization and problems, such as 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 revenue; intangible values; books and accounts; dissolutions, consolidations, and reorganization; trust and holding companies; the taxing of corporations; corporation statistics; the preparation and analysis of corporation reports; the corporation before the law. Prerequisite: Finance A. Three credits; one meeting a week, second semester, Minneapolis and St. Paul. Mr. Stehman, Mr. Gile.
- *146. Finance C—Investments and the Stock Exchange. Bonds, mortgages, stocks, and other forms of property in which funds may be invested, with emphasis on the needs of the conservative investor. The criteria of a good investment are carefully considered and tested by applying them to specific issues of governments, corporations, and individuals, including railroad, industrial, timber, and mining securities, and real estate loans. Stock exchange organization and operations. Prerequisites: Finance A and B, except that during 1927-28 this course may be taken with Finance A and on condition that Finance B is taken in the second semester, before credit is given for the course. Three credits; one meeting a week, first semester.
- *149. Finance D—Business Cycles and Forecasting. This course aims to give the student: first, a clear understanding of the sequence of events during a business cycle, and how business changes from depression to prosperity, and from prosperity to depression; and second, ability to find, read, and interpret such barometers of conditions as are readily available for determining the exact position of current events in the cycle. Prerequisites: Finance A and B, except that in 1927-28 this course may be taken at the same time that the student is taking Finance B. Three credits; one meeting a week, second semester.
147. Finance E—Banking Practice. Banking from the administrative point of view; organization of a bank; stockholders and directors; bank departments and their administration; deposits and tellers; bank reserves; circulating notes; checks, the clearing house, and transit department; collections; domestic and foreign exchange; problems involved

- in granting loans; credit department; how banks make a profit; accounting methods; the Federal Reserve System. Prerequisite: Finance A, except that during 1927-28 this course may be taken at the same time as the student is taking Finance A. Three credits; one meeting a week, first semester or second semester, Minneapolis or St. Paul, if sufficient enrolment.
145. Finance F—Foreign Trade and Foreign Exchange. The Middle West produces almost half of the goods exported from the United States. This course is designed to give a working knowledge of the foreign markets for our goods, how to get in touch with them, and the mechanism of foreign exchange which is used in paying and collecting for goods sold. A thoro discussion of foreign exchange, fundamentals as well as practice, and current foreign developments as they affect the foreign exchange market. Prerequisites: Finance A and E. Three credits; one meeting a week, second semester, St. Paul and Minneapolis, if sufficient enrolment. Mr. Millen.
41. Finance G—History of Banking and Finance in the United States. Prerequisite: Finance A. (Not offered in 1927-28.)
191. Finance H—Public Finance. Prerequisites: Finance A and elementary economics; second semester. (Not offered in 1927-28.)

BUSINESS ENGLISH

- *81. Business English. A practical course designed for business men and women who recognize the value of a command of English for business, and everyday writing and conversation. The types of letters to be studied include adjustment, acknowledgment, recommendation, application, collection, follow-up, sales, and interdepartmental. Ability to write simple, grammatically correct English is a prerequisite. No credit toward a degree, three credits for a certificate in business; one meeting a week, first semester; repeated second semester. Mr. Ambler, Mr. Bennett, Mr. Conley, Mr. Creamer.
- *82. Business Correspondence. This course logically follows Business English 81. Less stress is placed upon grammar and more upon the general principles underlying successful letter writing. Students who have not had Course 81 will be admitted to this course upon the recommendation of the instructor. No credit toward a degree, three credits for a certificate in business; one meeting a week, second semester. Mr. Ambler, Mr. Conley, Mr. Creamer.

BUSINESS LAW

The courses in Business Law are designed not merely to give a knowledge of the fundamental principles of law which should be known to every well-informed person, but particularly to aid the business or professional man in his practical legal problems. The credits may be applied in the College of Science, Literature, and the Arts, and as general academic credits in other colleges, but cannot be accepted as professional credits towards the degree of bachelor of laws.

- *51. Business Law A—Contracts and Agency. A brief introduction to the study of law with a general consideration of legal rights and remedies, followed by a more detailed survey of two subjects which are the legal basis for most business transactions. (1) Contracts—their formation, interpretation, operation, transfer and discharge, with some consideration of the Statute of Frauds. (2) Agency—the creation, nature, and termination of the relation; rights and liabilities of the parties. Three credits; one meeting a week, first semester; repeated in the second semester. Mr. Jackman, Judge Bardwell, Mr. Chapin, Mr. Kitts.
- *52. Business Law B—Personal Property, Negotiable Instruments. A brief consideration of the nature of personal property, its transfer by sale or bailment, followed by a more detailed study of the Uniform Negotiable Instrument Act and the Uniform Bills of Lading Act. Prerequisite: Business Law A. Three credits; one meeting a week, second semester. Mr. Jackman, Judge Bardwell, Mr. Chapin, Mr. Kitts.
- *53. Business Law C—Business Organizations, Insolvency, and Bankruptcy. The organization, management, and responsibility of associations, partnerships, corporations, and business trusts. Insolvency and the National Bankruptcy Act. Prerequisite: Business Law A. Three credits; one meeting a week, first semester. Mr. Jackman, Mr. Glick, Mr. Palmer, Mr. Rumble.
- *54ex. Business Law D—Real Estate, Mortgages. The nature and classification of estates in land; deeds and conveyances; landlord and tenant; recording and abstracting; Torrens titles; liens and mortgages. Prerequisite: Business Law A. Three credits; one meeting a week, second semester. Mr. Jackman, Mr. Glick, Mr. Palmer, Mr. Rumble.
- *7ex. Parliamentary Law. For description see Parliamentary Law under Department of Collegiate Instruction. No college credit; one meeting a week, first and second semesters. Mr. Hawley.

ECONOMICS AND ADMINISTRATION

- *6. Elements of Economics. A fundamental course in economic principles as a basis for the study of current economic problems. Three credits; one meeting a week, first semester. Mr. Myers.
- *7. Economic Problems. Current problems of importance will be studied, for example: business cycles and industrial depression, taxation, labor organizations, combinations and monopoly, immigration, international trade, and others. This course may be taken before Elements of Economics, but credit for it will not be granted until the elementary course has been successfully completed. Three credits; one meeting a week, second semester. Mr. Myers.
- *101. Advanced General Economics. A course in advanced economic theory, dealing chiefly with the theories relating to value. Considers the application of certain economic principles to current business problems from both the social and individual viewpoint. Critical analysis of such problems as, the economists' explanation of demand, relation

of cost to the supply of products, the determination of prices under conditions of competition and monopoly, and differences in costs, between firms. Three credits; one meeting a week, first semester. Mr. Waite.

135. **Methods of Price Forecasting.** A survey of the methods of study of the forces determining prices, forecasting price changes, and determining "established prices." The application of principles to particular cases. Deals largely with the prices of agricultural products. Three credits; one meeting a week, second semester. Mr. Waite.
85. **Economics of Retailing.** A course in retail merchandising and store management. Class work consists of discussions of problems actually encountered in retail stores. The problems presented cover the following topics: (1) store organization, location, and equipment, (2) stock purchase and control, (3) merchandise classification and layout, (4) administrative policies as to personnel and in relation to general business conditions. Three credits; one meeting a week, first semester. Mr. Vaile.
- *14. **Statistics.** Designed to familiarize students with the principles of statistical methods and their practical use in business. A study is made of the selection, tabulation, and interpretation of statistical data. The student is taught the construction and use of graphs, charts, and index numbers. Three credits; one meeting a week, first semester. Mr. Graves.
- *89. **Business Management.** Place of management in the field of business; business organizations, internal and financial; functions of business; principles of plant location; analysis of the functions of business; types of operating organizations; use of graphs in management; qualifications of executives; compensation of labor; waste in industry considered. Three credits; one meeting a week, first semester. Mr. Schmidt.
- *90. **Functional Problems and Cases in Management.** Operating laws. Administrative problems; promotion, management, and operating management contrasted. Sales and production policies. Practical problems in management and policies. Consideration of the human element. Aid given by accounting in making managerial decisions. Three credits; one meeting a week, second semester. Mr. Schmidt.
100. **Report Writing.** Lectures and conferences upon the preparation of theses and reports. Actual preparation of reports in connection with studies in auditing, accounting, economics. Three credits; one meeting a week.
86. **Office Technique.** Layout and arrangement of office equipment; kinds of office equipment and their uses; handling of files and routing of work; filing methods and organization. Lectures and discussion. Three credits; one meeting a week, first semester.
87. **Office Management.** A study of office work and results required in typical business and other offices. Control of incoming and outgoing mail; the city desk; telephone; the relation of executives to the office

- management problem. Specific cases discussed and analyzed. Three credits; one meeting a week, second semester.
- *59. Life Insurance. Personal and business uses of life insurance; types of contracts; the mortality table; calculation of premiums, reserves, and dividends; state laws and supervision. Three credits; one meeting a week, second semester. Mr. Graves.
- *61. Salesmanship. A course for specialty men and 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 use of suggestion in selling; the use of argument. The chief feature of the work will be demonstration sales. So far as possible each student will be given an opportunity to take part in a sufficient number of demonstrations that he may apply the principles laid out in the course. No credit for degree, three credits for certificate in business; one meeting a week, first and second semesters.
- *73. Railway Traffic and Rates. A practical study of the Act to Regulate Commerce and the other laws and regulations covering the transportation of property, locally and in foreign commerce, both by rail and by water. The student is acquainted with the correct compilation and interpretation of freight tariffs and economical and efficient methods in shipping. The lectures are comprehensive and embrace rate making bases, the classifying and tracing of freight, the preparation of claims, etc. Rulings of the Interstate Commerce Commission and of the various state commissions are referred to and rates are quoted from current tariffs and classifications. Six credits; one meeting a week, first and second semesters. Mr. Crellin.
- *88A. Advertising A. An elementary course in advertising, covering: the development of advertising and the place of modern advertising in business; the appeals used in advertising; the principles of layout and arrangement, including proper placing of headlines, borders, and other display elements; typography; illustrations; and advertising copy. Students will be given practice in the layout of advertisements and writing copy. No credit for a degree, three credits for a certificate in business; one meeting a week, first semester. Mr. Conley.
- *88B. Advertising B. A continuation of Advertising A. This course includes more intensive work in layout and copy writing with additional practice in these phases of the work; characteristics and selection of advertising media; the principles involved in the preparation of advertising campaigns, including the study of the product; analysis of the market and competition; the advertising appropriation; selection of media; methods of identification; co-ordinating with the complete campaign. No credit for degree, three credits for a certificate in business; one meeting a week, second semester. Mr. Conley.
- *1ex. Retail Advertising. A systematic presentation of the retail advertising problem from the study of merchandise features to be advertised to layout and copy. The course is built upon practical principles and

includes the planning of all art. No credit for degree. Three credits for a certificate in business; one meeting a week, first semester. Mr. Rangere.

*2ex. Financing of Real Estate. A study of methods for financing real estate and of the underlying fundamental principles covering same. Subject-matter includes such subjects as the following: first, second, and third mortgages, commissions and discounts, contracts for deed, ground leases, land trust certificates, stock and bond issues, sources and cost of mortgage money, tax certificates and titles with profits thereon, mortgage companies and building and loan associations, and mortgage banking organizations and administrations. Three credits; one meeting a week, first semester. Mr. Reep.

GEOGRAPHY

- 51A. Human Geography. Three credits; one meeting a week, first semester. Mr. Davis, Mr. Everly.
- 51B. Human Geography. Three credits; one meeting a week, second semester. Mr. Davis, Mr. Everly.
- 61A. Geography of Commercial Production. Three credits; one meeting a week, first semester. Mr. Davis.
- 61B. Geography of Commercial Production. Three credits; one meeting a week, second semester. Mr. Hartshorne.

For description of these courses see under Department of Collegiate Instruction, page 27 of this bulletin.

TEXTILES

- 3. Textiles. Three credits; one meeting a week, first semester. Miss Caplin.

For description of this course see under Department of Collegiate Instruction, page 29 of this bulletin.

Department of Engineering Instruction

Purpose.—The General Extension Division now offers groups of courses in (1) architecture, (2) civil engineering, (3) electrical engineering, and (4) mechanical engineering. These groups are arranged to be completed in from four to six years and are planned primarily for persons who are already employed.

Engineering requires thoro study. Mathematics is the foundation of the whole profession. No subject should be neglected. These courses have been laid out with care and are especially adapted to the needs of men working in shops and industrial establishments. They are planned so 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. These courses also offer an opportunity to college graduates who may wish to specialize in some subject not covered in their regular college work.

Credits and fees.—When 45 credits of engineering work have been completed, the Extension Division grants a certificate in engineering. When 90 credits of engineering work have been completed, the Extension Division grants an advanced certificate in engineering. Extension courses in engineering carry credit toward a degree in the College of Engineering and Architecture only as a result of the comprehensive examinations conducted by the college. In the past meritorious students have not found this provision burdensome.

Group course certificates.—Upon the completion of 45 credits in any of the group courses, a certificate in the group subject will be granted and upon completion of 90 credits in any one of the groups of courses indicated above, an advanced certificate in the group subject will be granted by the University of Minnesota. Students who have preparation equivalent to two years' high school work, including physics and algebra, together with at least one year's shop experience, can obtain the certificate in less time. Requests for advanced standing must be accompanied by a transcript of the work done, otherwise the fitness of a student to omit any part of the work must be determined by a comprehensive examination in the subject for which he desires credit. At least 30 per cent of the credits toward certificates must be earned in the extension classes of the University of Minnesota.

The following groups of courses can be completed in four years by devoting three evenings a week to class work. Students may, however, adapt the number of evenings a week to their own specific circumstances, bearing in mind that the minimum number of credits required for the first certificate is 45, and the advanced certificate is 90.

Group course in architecture.—The course in architecture in the Extension Division affords a training in the general practice of architecture for those who are employed during the major part of their time and for teachers in the public schools. While adequate attention is given to

structural studies, the course lays particular stress on the study of architectural design. It leads to a certificate in architecture on the completion of 45 credits, and an advanced certificate on completion of 90 credits as outlined below.

First Semester	Second Semester
Elements of Architecture I	Elements of Architecture II
Freehand Drawing I	Freehand Drawing II
Trigonometry I	Trigonometry II
Architectural Design I	Architectural Design II
Freehand Drawing III	Freehand Drawing IV
Analytic Geometry I	Analytic Geometry II
Architectural Design III	Architectural Design IV
History of Architecture I	History of Architecture II
Applied Mechanics	Structural Design
Strength of Materials	Reinforced Concrete
Architectural Design V	Architectural Design VI
Introduction to the Theory of Engineering	Heating and Ventilating
Architectural Construction I	Architectural Construction II

Group course in chemical engineering.—For students interested in a certificate in chemical engineering, the following list is offered.

First Semester	Second Semester
Trigonometry I	Trigonometry II
Inorganic Chemistry I	Inorganic Chemistry II
English IV	English V
College Algebra I	College Algebra II
Analytic Geometry I	Analytic Geometry II
Qualitative Chemistry	Quantitative Chemistry
Calculus I	Calculus II
Mechanical Drawing I	Mechanical Drawing II
Physics I	Physics II
Calculus III	Calculus IV
Organic Chemistry I	Organic Chemistry II
Technical Mechanics	Strength of Materials

Group course in civil engineering.—The course in civil engineering has been prepared for men who desire to specialize in this branch of the profession. It deals with the fundamentals of civil and structural engineering and is designed to fit men for either field or office work.

There are certain options allowed the student depending largely upon the work he intends to follow. This information must be furnished the Extension Division at the time the student registers and his options will then be given him. A certificate is granted on the completion of 45 credits and an advanced certificate on the completion of 90 credits as outlined below.

Group course in civil engineering (continued).

First Semester	Second Semester
Shop Mathematics I	Shop Mathematics II
Mechanical Drawing I	Mechanical Drawing II
Physics I	Physics II
Shop Mathematics III	Shop Mathematics IV
Applied Mechanics	Strength of Materials
Structural Drafting I	Structural Drafting II
Trigonometry I	Trigonometry II
Plane Surveying I	Curves and Earthwork
Elementary Structural Design I	Structural Design II
Concrete Tests I	Steel Tests I
Differential Calculus	Integral Calculus
Reinforced Concrete Design I	Reinforced Concrete Design II
Highways and Pavements I	Highways and Pavements II
Hydraulics	Water Power

Group course in electrical engineering.—The purpose of this course is to give the student a foundation in the fundamental principles of electricity together with a sufficient knowledge of professional practice to enable him to apply them in his daily work. The course is designed with special consideration for those already employed in the electrical industries. A certificate is granted on the completion of 45 credits and an advanced certificate on the completion of 90 credits as outlined below.

First Semester	Second Semester
Shop Mathematics I	Shop Mathematics II
Mechanical Drawing I	Mechanical Drawing II
Physics I	Physics II
Shop Mathematics III	Shop Mathematics IV
Direct Current I	Direct Current II
Direct Current Laboratory I	Direct Current Laboratory II
Applied Mechanics	Strength of Materials
Trigonometry I	Trigonometry II
Alternating Currents I	Alternating Currents II
Alternating Currents Laboratory I	Alternating Currents Laboratory II
Differential Calculus	Integral Calculus
Transformed Design	Motor Design
Central Stations	Power Transmission
Radio Communication I	Radio Communication II

Group course in mechanical engineering.—The course in mechanical engineering is designed for men employed as operating engineers as well as to fit men for such positions. It has been prepared and is taught by men who had practical experience in their fields. There is a continual demand for operating men to fill executive positions and to meet this demand the following course has been prepared. Certain options as indicated below are allowed and a certificate is granted on the completion of 45 credits and an advanced certificate on the completion of 90 credits as outlined below.

First Semester	Second Semester
Shop Mathematics I	Shop Mathematics II
Mechanical Drawing I	Mechanical Drawing II
Physics I	Physics II
Shop Mathematics III	Shop Mathematics IV
Mechanical Drawing III	Mechanical Drawing IV
Applied Mechanics	Strength of Materials
Trigonometry I	Trigonometry II
Machine Design I	Machine Design II
Boiler Room Practice	Engine Room Practice
Differential Calculus	Integral Calculus
Machine Design III	Machine Design IV
Elementary Thermodynamics	

Advanced courses in engineering.—From time to time as occasion demands advanced courses in the following subjects are offered:

MATHEMATICS AND MECHANICS

First Semester	Second Semester
College Algebra I	College Algebra II
Analytic Geometry I	Analytic Geometry II
Differential Calculus I	Differential Calculus II
Integral Calculus I	Integral Calculus II
Differential Equations I	Differential Equations II
Advanced Mechanics I	Advanced Mechanics II

CIVIL ENGINEERING

First Semester	Second Semester
Highways and Pavements I	Highways and Pavements II
Advanced Surveying	Map Drawing
Advanced Reinforced Concrete I	Advanced Reinforced Concrete II
Hydraulics	Water Power
Construction Cost Estimating	Economics of Engineering Costs
Advanced Structural Design	

ELECTRICAL ENGINEERING

First Semester	Second Semester
Central Stations	Electrical Power Transmission
Electrical Transformer Design	Induction Motor Design
Advanced Radio Communication	Telephony

MECHANICAL ENGINEERING

First Semester	Second Semester
Production Factors	Thermodynamics
Advanced Automotives	Foundry Practice
Lubricating Oils	Gasoline, Oil, and Diesel Engines

CHEMISTRY AND METALLURGY

First Semester	Second Semester
General Inorganic Chemistry	Metals and Qualitative Analysis
Quantitative Analysis	Quantitative Analysis
Metallography and Heat Treatment of Steel	Advanced Metallography
	Chemistry of Lubricating Oils

Description of engineering courses.—A detailed description of the courses in engineering offered through the Extension Division is given below.

ARCHITECTURE

- 14-15-16. Architectural History I. Sixteen lectures illustrated with lantern slides, covering the ancient and Renaissance periods. Suitable for students in architecture, teachers of art and history in high schools. Three credits; one meeting a week, first semester. Mr. Mann.
- 17-18-19. Architectural History II. Sixteen lectures illustrated with lantern slides, covering the medieval and modern periods. Suitable for students in architecture, teachers of art and history in high schools. Three credits; one meeting a week, second semester. Mr. Mann.
- *24-25-26. Freehand Drawing I and II. For description, see Art, under Department of Collegiate Instruction. Three credits; one meeting a week, first and second semesters. Mr. Burton.
- *27-28-29. Freehand Drawing III and IV. Continuation of I and II. For description, see Art, under Department of Collegiate Instruction. Three credits; one meeting a week, first and second semesters. Mr. Burton.
- *31-32-33ex. Elements of Architecture I-II. Shades, shadows, wash rendering, and perspective. Architectural elements, doors, windows, moldings, and the architectural orders; general drawing, exercises, and lectures in the application of these elements to simple problems in design; a survey of architectural history illustrated by lantern slides. Open to students who have had mechanical drawing, to those who have had one year in an architect's office, or equivalent experience. Six credits; two meetings a week, first and second semesters. Mr. Heath.
- *‡34-35-36. Architectural Design I-II. Regular Class B "Analytique" or order problems of the Society of Beaux Arts Architects, or equivalent designs in architectural problems from the regular course of the University of Minnesota. Open to those who have completed Course 31-32-33ex, or who have had two years in an architect's office, or equivalent preparation in an architectural school. Six credits; two meetings a week, first and second semesters. Mr. Heath.
- *‡37-38-39. Architectural Design III-IV. Class B, plan problems, and Class A, problems of the Society of Beaux Arts Architects, or equivalent design problems from the regular course in Architecture at the University of Minnesota. Open only to those who have completed the required "Analytique" or order problems, one or more years of design in any architectural school. Six credits; two meetings a week, first and second semesters. Mr. Krafft.
- 51-52-53. Architectural Construction I-II. Nature and use of building materials—wood, brick, stone, concrete, steel, etc. Lectures. Six credits; one meeting a week, first and second semesters. (Not offered in 1927-28.) Mr. Mann.
- ‡131-132-133. Architectural Design V-VI. Long, short, and sketch problems done under individual criticism dealing in general and more

‡ 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.

complex kinds of architectural composition with subjects involving special character and a decorative and imaginative interest. Prerequisite: Architectural Design III and IV. Six credits; two meetings a week, first and second semesters. (Not offered in 1927-28.) Mr. Mann.

CIVIL ENGINEERING

- *11. Plane Surveying. Elements of plane surveying, methods of chain, compass, transit, and stadia surveys; leveling; field notes; determination of area of irregular plots; computation and plotting of field notes; care, use, and adjustment of instruments; methods of subdivision of the United States public lands. Prerequisite: Trigonometry. Three credits; one meeting a week, first semester. Mr. Cutler, Mr. Teeter.
21. Curves and Earthwork. Mathematics of simple, compound, and spiral curves; plotting of profiles; vertical curves; cross sectioning and computation of earthwork volumes; methods of computing overhaul; mass diagram. Prerequisite: Trigonometry and Plane Surveying. Three credits; one meeting a week, second semester. Mr. Cutler, Mr. Teeter.
22. Earthwork and Special Problems. A continuation of Course 21. More detailed study of use of mass diagram; volumes of borrow pits, gravel pits, etc.; turnouts, etc. Special problems to meet the needs of the individual student. Prerequisite: Course 21 or its equivalent. Three credits; one meeting a week, either semester. Mr. Cutler, Mr. Teeter.
- *31-32-33. Structural Design I. Includes 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. Three credits; one meeting a week, first and second semesters. Mr. Edwards, Mr. Darrell.
142. Elementary Reinforced Concrete. A rapid review of the fundamental principles of beams and columns; elementary principles of reinforced beams, slabs, and columns. Prerequisite: Strength of Materials. Three credits; one meeting a week, first semester. Mr. Teeter.
- *135. Reinforced Concrete Design. Studies and problems in the structural layout of various types of buildings. Various types of floor systems, columns, and footings calculated and studied to determine their desirability in specific cases. Three credits; one meeting a week, first semester. Prerequisite: Structural Design 33. Mr. Teeter.
- *146. Concrete Materials: Selection and Tests. The selection of materials for concrete, their properties, and the tests to be applied. A study of the proper combinations for lowest cost. Local materials will be used. Students make their own specimens and perform all the tests. Prerequisite: Shop Mathematics I and II. Three credits; one meeting a week, first semester. Mr. Nichol.

- *147. Concrete and Steel Structures: Tests and Analysis. Study of the strength and carrying capacity of bridges and buildings; methods of testing in the field; special types of extensometers used and tests of laboratory models and buildings in actual service. Prerequisite: Concrete Materials 146. Three credits; one meeting a week, first semester. Mr. Nichol.
245. Advanced Reinforced Concrete Design. The theory and design of structures, for graduate students. Reinforced concrete arches, framed structures, continuous beams, culverts, and circular pipes, statically indeterminate methods, moments and shears, application of the most recent development in reinforced concrete design methods and materials. Prerequisite: Elementary Reinforced Concrete 142. Three credits; one meeting a week, either semester. Mr. Parcel.
- *51-52. Highways and Pavements I-II. Elementary economics, location, construction, and maintenance of highways and pavements, a study of road building materials and methods of testing with laboratory practice. Six credits; one meeting a week, first and second semesters. Mr. Lang.
129. Hydraulics. Mechanics of liquids, pressure in pipes, on gates and dams, flow through pipes and open channels, water hammer; the basic principles of centrifugal pumps and water wheels. Prerequisite: Strength of Materials and Trigonometry. Three credits; one meeting a week, first semester. Mr. Teeter, Mr. Edwards.
162. Water Power and Elements of Hydrology. Types of low, medium, and high head developments. Details of developments; spillway dams; hollow reinforced concrete dams, arch dams, high masonry dams, movable dams. Turbine settings and characteristics. Prerequisite: Hydraulics 129. Six credits; one meeting a week, first and second semesters. Mr. Teeter.

ELECTRICAL ENGINEERING

- *III-II3. Direct Current Machinery I-II. Elementary electricity, the simple laws of magnetism, the theory of direct current machinery; direct current motors and generators, armature windings, commutation, and wiring diagrams; of value to those who work with direct current apparatus, a foundation for the study of alternating current machinery and power plants. Prerequisites: Practical Physics 51ex and Trigonometry 12. Six credits; one meeting a week, first and second semesters. Mr. Todd, Mr. Edwards.
- *II2-II4. Direct Current Laboratory I-II. A course of experimental work to aid in understanding direct current theory. The laws of magnetism and direct current circuits illustrated in experiments performed by the student himself. Machine characteristics for several types of motors and generators. Prerequisite: registration in Direct Current Machinery, Practical Physics 51ex, and Trigonometry 12. Six credits; one meeting a week, first and second semesters. Mr. Swenson.

- *121-123. Alternating Currents I-II. An elementary course in alternating current circuits and machines; series and parallel circuits, single and polyphase systems, power and power factors, transformers, induction motors, alternators, synchronous motors, rotaries, single phase motors, and transmission lines. Prerequisite: Direct Current Machinery 111-113 and Direct Current Laboratory 112-114. Six credits; one meeting a week, first and second semesters. Mr. Johnson, Mr. Edwards.
- *122-124. Alternating Currents Laboratory I-II. Supplementary to Alternating Currents 121-123. An experimental study of alternating currents, regulation and efficiency tests of alternators, transformers, motors, and rotaries. Prerequisite: registration in Alternating Currents 121-123. Six credits; one meeting a week, first and second semesters. Mr. Kuhlman.
- 132-134. Electrical Machine Design I-II. The design of transformers, alternators, motors, and generators, the calculation of all dimensions and predetermination of operating characteristics. Prerequisite: Alternating Currents I-II, Mathematics VI, and Mechanical Drawing II. Six credits; one meeting a week, first and second semesters. Mr. Kuhlman.
141. Central Stations. The economics of electric-power generating and distributing systems; demand, diversity, and load factors, load diagrams; voltage regulation; protective apparatus; selection of prime movers and units; methods of charging and metering; maintenance of plants; emergencies. One evening a week, first semester. Prerequisite: Alternating Currents 121-123. (Not offered in 1927-28.) Mr. Ryan.
142. Electrical Transmission. The economics involved in the designing and building of transmission lines, Kelvin's law and its limitations, the transmission line as a mechanical structure, lightning arresters, study of particular high tension lines. Three credits; one meeting a week, second semester. Prerequisite: Mechanical Drawing II, Courses 134 and 141. Mr. Ryan.
- *143. Electric Vehicles. For truck owners, drivers, and garage men. Transportation engineering; cost analysis; the field for electric trucks in city transportation; principal types of electric trucks; general theory of motor and battery; study of motor controller, and charging equipment; storage batteries and their care as applied to electric trucks; maintenance and operation. Prerequisite: experience with gas or electric trucks. Three credits; one meeting a week, first semester. Mr. Greiner.
- *66. Radio Communication I. Analysis of the theory and operation of radio transmitting and receiving circuits, with emphasis on the various types of receiving sets now in use; economic status of radio communication. Prerequisite for credit: College Physics and Trigonometry or equivalent. Three credits; one meeting a week, first semester. Mr. Sweet.
- *67. Radio Communication II. Continuation of prerequisite Course 66 or equivalent. Three credits; one meeting a week, second semester. Mr. Sweet.

161-162-163. Advanced Radio Communication III-IV. Phase relations in high frequency circuits; theory of damped wave circuits; inductance and capacity measurements; the electron tube; undamped wave transmitting and receiving circuits; heterodyne reception; sources of high frequency power. Design of electron tube oscillator and amplifier circuits. Radio telephone modulation, carrier frequencies. Prerequisite: registration in Calculus and Alternating Currents I-II. Six credits; one meeting a week, first and second semesters. Mr. Sweet.

ENGINEERING DRAWING

- *1-2. Elementary Mechanical Drawing I-II. A beginning course in drafting; use of instruments and drawing materials, lettering, tracing, view drawing, dimensioning and working drawings of machine parts. Six credits; one meeting a week, first and second semesters. Mr. French, Mr. Dow, Mr. De Freece.
- *45ex. Teachers' Course in Mechanical Drawing I-II. A special course offered to those who teach drawing in grade and high schools and who wish better to acquaint themselves with standard drafting room practice. Six credits; one meeting a week, first and second semesters. Mr. French.
- *46ex. Mechanical Drawing for Women I-II. Similar to Course 1-2, with more emphasis on lettering and tracing at the option of the student. Six credits; one meeting a week, first and second semesters. Mr. French.
81. Construction Cost Estimating I. Labor and material costs. Reading of building and construction plans. Quantity surveying. Calculation methods. Instruction in use of slide rule optional with class. Cost estimates of typical structures in concrete, brick, timber, steel, etc. Miscellaneous costs. Knowledge of mechanical drawing not essential. Three credits; one meeting a week, each semester. Mr. French.
- 48ex. Plan Reading I. This is the same as Elementary Mechanical Drawing I and II except that plates will be drawn in pencil only. Full set of instruments not required. (Reading of building and construction plans is given in Cost Estimating Course 81, which see.) Six credits; one meeting a week, first and second semesters. Mr. French.
- *15. Structural Drafting. A practical course in structural detailing of various types of girders, columns, and roof trusses. Complete drawings of frame, mill, bent, and other structures. The solution of problems of simple structures. Prerequisite: Mechanical Drawing I. Three credits; one meeting a week, each semester. Mr. Herrick, Mr. French, Mr. Dow.
- *31-32. Advanced Mechanical Drawing I-II. A practical course in drafting and drafting room methods taking up the detail of machine parts, such as fastenings, screws, bolts, rivets, and rivet joints; keys, cotters, and pins; pipe and pipe fastenings; bearings and journals, pulleys and belting; gears; cams, etc.; the application of empirical design and the

- principles of mechanics; assembly, diagrammatic and layout drawings. It is assumed that the student has a previous knowledge of drawing equivalent to Course 1-2. Six credits; one meeting a week, first and second semesters. Mr. Herrick, Mr. Dow.
- 32ex. Gear Drawing. A course in development of gear teeth by the drafting room method. Study of curves used in gear teeth, sprockets, and chain wheels. Layouts of involute, cycloidal, and other forms for spur, annular, stub, bevel, worm, spiral, herringbone, and various other types of gear. Simple calculations to determine pitch, number of teeth, pitch diameter, etc. Prerequisite: Mechanical Drawing 31 or its equivalent. Three credits; one meeting a week, first or second semester. Mr. Herrick.
- *33. Mechanism and Kinematics. A study of motion without the consideration of the strength of parts; levers, gearing, linkwork, kinematic pairs; machine parts; construction of tooth profiles; paths and velocities of mechanism. Prerequisites: a previous knowledge of drawing equivalent to Course 1-2. Three credits; one meeting a week, first or second semester. Mr. Herrick.
- 34ex. Cam Drawing. A drawing course in the laying out of different types of cams; such as mushroom, face, wiper, rolling, yoke, cylinder, etc. Cam curves constructed on the straight line base, straight line combination curve, crank curve, parabola and elliptical curve. Problems in special cases. Three credits; one meeting a week, first or second semester. Mr. Herrick.
- *35-37. Machine Design I-II. An elementary course in the calculation and design of machines and machine parts, such as machine frames, shafting, flywheels, pulleys, riveted and screwed fastenings, bearings, spur gearing, bevel gearing, and helical gearing. Lectures and drawing room practice of practical problems. Prerequisites: previous knowledge of drawing equivalent to Course 1-2, and mathematics through Trigonometry; a working knowledge of Elementary Physics and Strength of Materials is desirable. Six credits; one meeting a week first and second semesters. Mr. Herrick, Mr. Edwards.

MATHEMATICS AND MECHANICS

For other courses in mathematics, see under that heading in the Department of Collegiate Instruction.

- *7. Shop Mathematics I and II. A general review of all elementary mathematics through geometry. Designed as an introductory course to meet the needs of anyone who wishes to take up engineering work of a higher grade. The course covers 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, elements of algebra, and plane geometry. Six credits toward an extension certificate, one meeting a week, first and second semesters. Mr. Teeter, Mr. Dow, Mr. Edwards.

9. Shop Mathematics III and IV. Higher Algebra. A continuation of Shop Mathematics I and II, including simultaneous equations, progressions, logarithms, theory of exponents, variation, quadratic equations, and graphical algebra. Prerequisite: Shop Mathematics II. Six credits; one meeting a week, first and second semesters. Mr. Teeter, Mr. Dow, Mr. Edwards.
- *11. College Algebra I and II. A course of college grade in fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, complex quantities, quadratic equations, indeterminate equations, ratio, proportion, variation, theory of equations, Horner's and Newton's methods. Textbook: Hall and Knight. Six credits; one meeting a week, first and second semesters. Mr. Teeter, Mr. Edwards, Mr. Wilcox.
- *12. Trigonometry I and II. A course of college grade in trigonometry. A study of angles, trigonometric functions, plane right angles, reduction formulae, fundamental relations, other trigonometric relations, identities and equations. Inverse functions, plane oblique triangles, De Moivre's theorem, trigonometric functions used in spherical trigonometry, spherical right triangles, quadrantal triangles. Textbook: Bauer and Brooke's, *Plane and Spherical Trigonometry*. Prerequisite: college algebra. Six credits; one meeting a week, first and second semesters. Mr. Teeter, Mr. Boehnlein, Mr. Edwards.
- *13. Analytic Geometry (plane and solid) I and II. Of great importance to the engineering student who wishes to take up the study of calculus. The straight line, circle, ellipse, parabola, hyperbola, tangents, normals, rotation of axes, and a few of the higher plane curves met with in practice. Space co-ordinates, plane, line and quadric surfaces, cylinders, and space curves. Prerequisite: Trigonometry I and II. Six credits; one meeting a week, first and second semesters. Mr. Teeter, Mr. Boehnlein, Mr. Edwards.
- *24. Differential Calculus I and II. Rules for differentiation. The various derivatives and their application to tangents, normals, evolutes, involutes, and maximum and minimum. Engineering examples will be given whenever possible. Prerequisite: Analytic Geometry I and II. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
- *25. Integral Calculus I and II. A continuation of Mathematics 24, taking up the standard forms of integration, special methods of integration. Important mechanical and electrical problems will be introduced and discussed in class. Prerequisite: Calculus I. Six credits; one meeting a week, first and second semesters. Mr. Teeter, Mr. Edwards.
- *151. Differential Equations I and II. For description see under Department of Collegiate Instruction. Mr. Teeter, Mr. Edwards.
- *50ex. Practical Physics I and II. Lectures and experimental demonstrations in general physics, designed to meet the needs of technical students and to be of value in understanding the machinery of everyday life. The subjects treated primarily are mechanics, heat and electricity; but geometrical optics, sound, and the general principles of radio-activity,

- X-rays, and vacuum tubes will also be taken up. This course should be taken in conjunction with Course 51ex. Six credits toward extension certificate; one meeting a week, first and second semesters. Mr. Buchta.
- *51ex. Practical Physics: Laboratory. Experiments by the student illustrating the principles taught in Physics 50ex. This course should be taken with the preceding one as it is of great value in understanding the fundamental ideas and their applications. Three credits toward extension certificate; one meeting a week, each semester. Mr. Buchta, Mr. Fukushima.
- *30ex. Elementary Applied Mechanics. A short practical course in the action of forces in engineering structures, for students who have limited mathematical training. It includes numerical calculations, simple graphical calculations, forces, simple mechanics, work, power, and energy. Prerequisites: Trigonometry 12 and Physics I. Three credits; one meeting a week, first semester. Mr. Brooke, Mr. Teeter, Mr. Edwards.
- *33ex. Strength of Materials. An elementary course designed to follow the course in applied mechanics. The subject includes the properties of materials, stress and strain, elastic and ultimate strength, deformations, principles of moments, moments of inertia, simple stresses, shear, riveted joints, the general elementary theory of beams, columns, and shafts. Prerequisites: Applied Mechanics and Trigonometry 12. Three credits; one meeting a week, first or second semester. Mr. Brooke, Mr. Teeter, Mr. Edwards.
- *126. Advanced Mechanics I. Statics, resolution of force, moments, theory of couples, conditions of equilibrium, free body method, catenary, and allied subjects. Prerequisite: Integral Calculus I and II. Three credits; one meeting a week; first semester. Mr. Wilcox.
- *127. Advanced Mechanics II. Dynamics of particles and of rigid bodies, center of gravity, moment of inertia, kinematics of circular, harmonic, and curvilinear motion in general, work, energy, and power. Prerequisite: Advanced Mechanics I. Three credits; one meeting a week, second semester. Mr. Wilcox.
141. Testing of Materials. (Not offered in 1927-28.)

MECHANICAL ENGINEERING

- *1ex. Metallography and Heat Treatment of Iron and Steel. A beginning course including lectures, demonstrations, and laboratory work, pyrometry, thermal analysis, preparation of alloys, microscopic examination of metals and alloys and the preparation of photomicrographs, the theory of heat treating, and its relation to practice. Suitable for those engaged in the practical heat treatment of iron and steel and for those who are writing specifications, purchasing or selling iron or steel. Three credits; one meeting a week, first semester. Mr. Harder.
- *2ex. Metallography and Heat Treatment of Alloy Steel. Course to follow 1ex. Lectures, demonstration, and laboratory work. Three credits; one meeting a week, second semester. Mr. Harder.
- 40ex. Steam Fitting. Covers steam using machines and equipment with particular emphasis on heating appliances and refrigerating machines. Three credits; one meeting a week, first semester. Mr. Martenis.

- *42. **Boiler Room Practice.** Designed for the benefit of persons who have charge of boiler plants; of value to janitors in charge of schoolhouses and apartment houses, as well as factory boiler shops. It will also be of benefit to those who are expecting to obtain licenses as boiler inspectors. Three credits; one meeting a week, first semester. Mr. Martenis.
- *43. **Engine Room Practice.** A continuation of the preceding course, taking up the subject of the steam engine and its accessories. This course is of value to those seeking a chief engineer's license. Three credits; one meeting a week, second semester. Mr. Martenis.
- *153. **Heating and Ventilating.** A course covering present heating and ventilating practice for heating contractors and others desirous of obtaining a fundamental knowledge of the subject; the study of heat; methods employed for heating and ventilating buildings; piping systems and temperature regulation. Three credits; one meeting a week, first semester. Mr. Martenis.
41. **Elementary Automobiles.** A course intended to acquaint men and women in a simple way with the mechanism of a motor car, intelligently to purchase and operate it, and more economically to analyze and remedy troubles. Illustrated lectures and laboratory demonstrations, with discussions of the engine, lubricating and cooling systems, gasoline and carburetors, ignition, and starting systems, the storage battery, the chassis, transmission, axles, etc., tires, cost of operation, and other kindred subjects. Three credits; one meeting a week, first or second semester. Mr. Hazen.
150. **Gasoline, Oil, and Diesel Engines.** A practical course in the theory, construction, and testing of gasoline engines, automobile engines, semi-Diesel and Diesel engines. Fuels, combustion, lubrication, theoretical and practical engine cycles. The use of indicators, planimeters, brakes, electric dynamometers, pyrometers, Orsat analyzers for determining horse power, mechanical and thermal losses in engine operation. The lectures will be followed by, and alternated with, actual tests of various styles of engines by the students in the class. Six credits; one meeting a week, first and second semesters. Mr. Robertson.
82. **Steam Engine and Power Plant Testing.** 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. Actual problems arising in power plant testing will be worked out in class, with explanations and instructions for their solution. The laws of mechanics, heat, power, work, and energy will be applied to engine and power plant testing. Three credits; one meeting a week, first semester. Mr. Shoop.
144. **Elementary Thermodynamics.** An elementary course required of all engineering students, relating to properties of steam, heat engines; the steam engine and boiler; the steam turbine, and the gas engine. The general problem of a modern power plant is considered for the benefit of those who do not devote further time to the subject. Three credits; one meeting a week, second semester. Mr. Edwards.
151. **Thermodynamics.** Advanced mechanical theory of heat as applied to steam, oil, and gas engines and gas producers, compressors, injectors,

- reheaters, and refrigeration apparatus. Prerequisite: Strength of Materials, Calculus. Three credits; one meeting a week, second semester. Mr. Shoop.
124. Foundry Practice and Pattern Making I and II. A course dealing with practical problems in the production of castings. Floor planning and core room arrangement; moulding machinery and equipment; materials used; melting and pouring; methods of cleaning and reclaiming castings. Moulding in green and dry sand; sweep and loam work; core making and dryers; patterns and core boxes, how made and used. Shop sketching and blue print study. Six credits; one meeting a week, first and second semesters. Mr. Richards.
- 58ex. Shop Methods. The practical application of shop mathematics to metal cutting machines. Screw cutting, gear and milling cutter calculations. Lectures and demonstrations. Three credits; one meeting a week, first semester. Mr. Shipley.
- 171ex. Production Factors. Principles and practice involved in economical production. Standardization. Requirements for uniformity and interchangeability, jigs, fixtures, special equipment, gauges, and inspection. Labor wage payment plans and management. Three credits; one meeting a week, second semester. Mr. Shipley.

COLLATERAL COURSES

3. Economics of Engineering Costs. Primary basis of price: fixed charges and operating costs; depreciation and appreciation; obsolescence, inadequacy, uselessness; fundamental financial calculations; basic costs and "vestances"; unit cost determination; size of systems for best financial efficiency. Prerequisites: registration in calculus and physics. Three credits; one meeting a week, second semester. Mr. Teeter, Mr. Edwards.
- 51ex. English for Engineers I and II. A course in practical English, designed to meet the professional needs of engineering students. The material of this course will include business letters—about twelve types: reports; estimates; instructions, etc. Some attention will be given to oral English. Six credits; one meeting a week, first and second semesters. Mr. Bennett.
7. Law for Engineers A. Personal and ethical relations; rights and remedies; agreements and contractual relations; proposals, advertising and letting of contracts; competency of parties; mutuality of obligations; legality; specifications and construction; evidence; authority of agents; employment; workmen's compensation acts. Three credits; one meeting a week, first semester. Mr. Jackman.
8. Law for Engineers B. Property, real and personal; sales; carriers and storage; land laws; surveys and boundaries; rights of way and water rights; negligence and damages; engineer's legal relations. Three credits; one meeting a week, second semester. Mr. Jackman.

Extension Certificates Granted 1926-27

CERTIFICATE IN ACCOUNTING

Jack Albert Barke	Edith Luella McKenzie
Lawrence Edward Coupe	Ralph Edward Nelson
F. Lawrence Durand	Edmund Anthony F. Nightingale
Charles Ludwig Erickson	Edward James Ovshak
Richard John Floeder	Samuel Milton Ralston
Boris Hestrin	Francis M. Redington
Minnie L. Kuehne	Adelbert Raymond Tymeson
Heman Stanley McCrea	Vernon LeRoy Underwood

CERTIFICATE IN GENERAL BUSINESS

John B. Andren	Karl Koehn
F. Lawrence Durand	Einar Lovik
Abraham J. Geller	S. Arthur Moy
R. Bruce Hooper	Edmund Anthony F. Nightingale

CERTIFICATE IN FINANCE

Hazen Carleton	Karl Koehn
Pearl M. Clinton	Robert C. Pfau
R. Bruce Hooper	John A. Wasgatt

CERTIFICATE IN CIVIL ENGINEERING

Norman Kantor	Carl Larson
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CERTIFICATE IN ELECTRICAL ENGINEERING

Elmer Hilding Fristedt	Earl William Jacobson
Arthur Cook Green	Lawrence Barclay Paist
Joseph Haefner	Robert R. Ward
Carl Edward Harrison	

CERTIFICATE IN MECHANICAL ENGINEERING

George Campaigne	Max Otto B. Pieper
Peter Hansen	Fred Zollner

Summary of Student Semester Registrations, 1926-27

Minneapolis collegiate	2,984	
Minneapolis business	1,602	
Minneapolis engineering	833	
St. Paul collegiate	1,169	
St. Paul business	947	
St. Paul engineering	232	
Duluth collegiate	929	
Duluth business	150	
Duluth engineering	230	
Hibbing collegiate	100	
Eveleth collegiate	77	
Virginia collegiate	185	
Virginia business	35	
Two Harbors collegiate	57	
Two Harbors business	26	
Chisholm collegiate	85	
Superior, Wisconsin, collegiate	11	
St. Cloud collegiate	31	
Total number of student semester registrations.....		9,683
Total number of individuals taking work 1926-27.....		5,488
Total collegiate registrations	5,628	
Total business registrations	2,760	
Total engineering registrations	1,295	

Extension Service

The Extension Service of the University of Minnesota is organized to include the following:

A. THE GENERAL EXTENSION DIVISION

- I. Extension classes in Minneapolis, St. Paul, Duluth, and other cities.
 1. Courses in Collegiate Instruction leading to credit in the College of Science, Literature, and the Arts, in the College of Education, and in the School of Business Administration.
 2. Courses in Business Administration, Accounting, and Finance leading to certificate and also to university credit.
 3. Practical courses in Engineering and in Industrial Subjects leading to certificates.
- II. Correspondence courses in each of the three groups of subjects above, totaling about 200 courses. (Special bulletin sent on request.)
- III. Municipal Reference Bureau, which compiles and furnishes to city officials information pertaining to municipal government and administration.
- IV. Community Service Department, with its subdivisions for (1) Extension lectures, singly or in groups; (2) Lyceum lectures, concerts, and entertainments; (3) Visual Instruction, through loan collections of lantern slides and films; (4) Drama Service, to aid clubs and school societies in the selection and production of amateur theatricals; and (5) Community Organization, through community institutes formed with the co-operation of a special adviser from the Extension Division. (Special bulletin sent on request.)
- V. Short Courses at the University for from one to twelve weeks for graduate dentists, physicians, retail merchants, bankers, and in such subjects as embalming, playground supervision, citizenship (for women voters), etc.

B. AGRICULTURAL EXTENSION DIVISION

Agricultural Extension includes lectures, demonstrations, institutes, and short courses under the direction of the College of Agriculture, Forestry, and Home Economics.

The Bulletin of the University of Minnesota

*Correspondence Courses
Announcement for the Year
1927-1928*



Vol. XXX No. 54 June 7 1927

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

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

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CORRESPONDENCE COURSES

FACULTY

- Lotus Delta Coffman, Ph.D., LL.D., President
William Watts Folwell, LL.D., President Emeritus
Richard R. Price, M.A., Ed.D., Director of University Extension
Irving W. Jones, Ph.B., Head of Correspondence Study Department
-
- John E. Anderson, Ph.D., Professor and Director, Institute of Child Welfare
Carlos V. Arjona, Ph.D., Assistant Professor of Romance Languages
William O. Beal, Ph.D., Assistant Professor of Astronomy and Assistant Astronomer.
Roy G. Blakey, Ph.D., Professor of Economics
Gisle C. Bothne, M.A., Professor of Scandinavian Languages and Literatures
Ruth E. Boynton, B.S., M.D., Assistant Professor of Preventive Medicine and Public Health and Director, Division of Child Hygiene, State Board of Health
Oscar C. Burkhard, Ph.D., Associate Professor of German
Clarence E. Cason, M.A., Assistant Professor of Journalism
Edward G. Cheyney, B.A., Professor of Forestry
Herbert E. Clefton, M.A., Assistant Professor of Romance Languages
Robert V. Cram, Ph.D., Assistant Professor of Latin
James Davies, Ph.D., Assistant Professor of German
Edith D. Dixon, B.S., Assistant Professor, Director of Extension in the Institute of Child Welfare
Oliver C. Edwards, B.S., M.E., Assistant Professor of Mechanical Engineering, General Extension Division
Jules T. Frelin, B.A., Assistant Professor of Romance Languages
Robert W. French, B.S. (C.E.), Associate Professor of Drawing and Descriptive Geometry
Alvin H. Hansen, Ph.D., Professor of Economics
Irving W. Jones, Ph.B., Assistant Professor of Music, General Extension Division
Samuel Kroesch, Ph.D., Associate Professor of German
Gustave A. Lundquist, Ph.D., Assistant Professor of Rural Sociology
George F. Lusk, Ph.D., Assistant Professor of German
John V. Martenis, M.E., Associate Professor of Machine Design
Walter R. Myers, Ph.D., Assistant Professor of Economics
Charles W. Nichols, Ph.D., Assistant Professor of English
Donald G. Paterson, M.A., Professor of Psychology
Stanley H. Perry, B.A., Assistant Professor of History, General Extension Division
Anna H. Phelan, Ph.D., Assistant Professor of English

CORRESPONDENCE COURSES

- Joseph B. Pike, M.A., Professor of Latin
 Albert W. Rankin, B.A., Professor of Education, Retired
 Charles A. Savage, Ph.D., Professor of Greek
 Homer J. Smith, Ph.D., Associate Professor of Trade and Industrial
 Education
 William H. Stead, Ph.D., Assistant Professor of Economics
 J. Warren Stehman, Ph.D., Associate Professor of Economics
 Thomas E. Steward, B.A., Assistant Professor of Journalism
 Andrew A. Stomberg, M.S., Professor of Scandinavian Languages and
 Literatures
 Emerson G. Sutcliffe, Ph.D., Assistant Professor of English
 George W. Swenson, M.S. (E.E.), Assistant Professor of Telephone and
 Telegraph Engineering
 Thomas A. H. Tecter, B.S. (C.E.), Associate Professor of Engineering,
 General Extension Division
 Roland S. Vaile, M.A., Associate Professor of Economics
 Wilson D. Wallis, Ph.D., Professor of Anthropology
 Wendell White, Ph.D., Assistant Professor of Psychology, General
 Extension Division
 Monica Keating Doyle, B.A., Lecturer in Sociology
 Jean H. Alexander, M.A., Instructor in History and Philosophy of
 Education
 Jessie Caplin, M.S., Instructor in Textiles
 John Creamer, B.A., LL.B., Instructor in English
 Frances K. del Plaine, M.A., Instructor in English
 Ralph H. Farmer, B.A., Instructor in Economics
 Harold G. Fraine, Com.Eng., Instructor in Accounting
 Mary Gold, M.A., Instructor, University High School
 Adah G. Grandy, B.L., Instructor in English
 Leah Miller Hanley, B.S. Instructor in Art, General Extension Division
 Jerome Jackman, B.A., Instructor in Business Law, General Extension
 Division
 Grayson N. Kefauver, M.A., Instructor in Education
 Frances R. Kelley, M.A., Instructor in Home Management
 Faith Leonard, B.A., B.S., Instructor in Secretarial Administration
 Sophia H. Patterson, M.A., Instructor, University High School
 Hazel B. Stevens, M.S., Instructor in English, General Extension Division
 G. Merrit Sugden, M.A., Instructor in Finance
 Harvey Walker, M.A., Instructor in Political Science
 Lehman Wendell, B.S., D.D.S., Instructor in Esperanto
 Nina L. Youngs, B.A., Instructor in Business
 Mary Malcolm, B.S., Assistant in Music
 Helen P. Mudgett, M.A., Assistant in History

GENERAL INFORMATION

CORRESPONDENCE STUDY

The last few years have demonstrated the effectiveness of university teaching by correspondence. The foremost American universities have recognized this opportunity for specific service. In thus extending its functions, the University offers a plan of practical instruction whereby preparatory, vocational, and collegiate training is made available to those who of necessity must devote a part of their time to other duties. Teaching by correspondence thus has become a part of the state educational system. It now is possible to contribute largely to the requirements for a Bachelor's degree by combining work in residence at the University Summer Session with correspondence study under the General Extension Division.

WHO MAY REGISTER

Correspondence courses are open to all who are prepared to pursue them with profit. Students who expect to secure credit toward a university degree must, of course, satisfy all entrance requirements; in addition the prerequisites listed for each course must be met, at least in equivalents. But those who do not desire or expect such credit are permitted to register for any course in which they have an interest and sufficient preparation to enable them to do the work for the course. Specific items of preparation are not insisted upon so long as a general level is indicated. Students of this character are welcomed, and are given the same careful instruction and criticism as those who are candidates for a degree.

ADVANTAGES

Correspondence study accommodates itself to a person's spare time, enabling him to make valuable use of short periods which would otherwise be wasted; it permits him to carry on work in a field of study in which he has a special interest, to prepare for special occupations, to broaden his intellectual outlook, or to make up defects in his education.

The student recites on every part of every lesson and receives the individual attention of the teacher in the correction of the papers he submits. Since a student is not hurried in his work, but may within reasonable limits take as much time as he needs for the preparation of a lesson, he can master the material thoroly.

THE INSTRUCTION

Upon the receipt of the application and fee for any course the first lessons are sent, together with instructions for the preparation of lessons and directions for making reports.

The teaching is done by teachers from the various faculties in the University who are in continuous charge of similar courses in residence and who are familiar with the needs of non-resident students.

Each lesson 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.

Each recitation report is returned to the student with such corrections, explanations, and suggestions as may be needed. It is expected that these will be carefully gone over. Lists of books, assignments for reading, and all necessary assistance will be furnished throughout the course, so that the student at no time will be left without adequate aid and guidance. Questions on the subject in hand are at all times encouraged.

THE UNIT COURSE

The unit course is divided, where practicable, into twenty-seven lessons, representing a five-credit course for one quarter in residence. Such a course represents 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 quarter. It is assumed that this work may be done by the average student in twenty-seven weeks with a minimum leisure for study of one hour per day, six days in the week. Variations from the unit course are indicated by the number of credits, or by the number of lessons when university credit is not allowed. Two lessons in correspondence approximately cover the ground in quantity of a week's work in residence.

Preparatory courses are arranged so that each lesson covers approximately the equivalent of a week's work in high school.

SELECTION OF COURSES

In selecting courses for university credit, the student should conform to the prescribed course of study of each college. It is advisable for such students to secure a copy of the bulletin of the college which they expect to enter, in order to find out what subjects are prescribed. The bulletin of any of the colleges of the University may be secured by addressing the registrar, University of Minnesota, Minneapolis.

PREPARATORY COURSES

This department now offers a variety of courses for entrance credit. These are sometimes spoken of as "high school" or "subfreshman" courses. They enable students to make up deficiencies in their preparatory work by home study or to do all or a major portion of it through this means.

The University of Minnesota entrance requirement (details of which may be found in the general information bulletin to be had from the registrar) is fifteen preparatory units, or thirty preparatory credits, selected from five specific groups of subjects. The particular requirements in the several colleges vary, but all include four units (eight credits) of English, and two units (four credits) or more of mathematics. Other universities and colleges have similar requirements. Practically all required subjects may be studied by correspondence.

A preparatory unit represents the equivalent of one year's work in a subject, for five classroom periods each week. A high school student, therefore, who studies four subjects each year for four years will have 16 preparatory units at graduation. The term "credit" is differently used in different secondary schools, but in general it represents some fraction of a year's work in one subject. The Correspondence Study Department uses the term "credit" to mean one-half year's work; that is, the equivalent of the study of a subject, five periods a week, for one half year. Each of the preparatory courses offered by correspondence carries one credit, two of which are necessary to make a unit.

Theoretically all students who register at the University must pass entrance examinations in all the required subjects. As a matter of fact many of them actually do so. But a large number are permitted to present credit certificates from approved schools and so are excused from examination. However, only graduates of such schools can escape examination in this manner. It cannot be too strongly emphasized that without a high school diploma it is useless to attempt to apply high school credits in the place of entrance examinations. One, two, or three years of high school work will not be counted. Nor can these credits be added to others to make up the required fifteen.

Then how can a student who is not a high school graduate enter the University? There are just three ways. He may obtain all the necessary entrance credits by any one of these three methods, or he may obtain some of them in any of the three ways and add these credits together to make up the required number. But he cannot add these credits to high school credits unless he has a high school diploma. These three ways are as follows:

1. Obtain credits by taking the regular university entrance examinations.
2. Obtain credits by passing the correspondence courses offered by the University.
3. Obtain credits by passing the Minnesota High School Board examinations, or the examinations of the College Entrance Examination Board.

The Correspondence Study Department of the University can help a student to obtain entrance credits in four different ways:

1. If he is a high school graduate but lacks one or more of the required entrance credits, he may obtain the necessary credits by correspondence study.
2. If he lacks a few credits of high school graduation he often can arrange with the high school in which he did most of his work to grant him a diploma after he has obtained the credits by correspondence from the University.
3. He can take the university entrance examinations or the State Board examinations, in those subjects for which he is prepared by previous schooling, and obtain the remaining credits by correspondence.
4. He can do all of his preparatory work by correspondence. However, this is a long and difficult task and is not recommended except to persons of great patience and determination. Still, it can be done.

Whether a state teachers' college or a local high school will accept the entrance or "high school" credits obtained from this department and apply them toward a diploma, and the extent to which such credits will be accepted and applied, depends entirely upon the rules of the school concerned. Many of them are known to accept such credits and none has been reported as refusing to do so, but this is a matter over which the University has no jurisdiction. Therefore, students who expect to make use of credits in this way should first make sure of the attitude of the school in which it is sought to apply them. No registration for entrance credit will be accepted from a student who is at the same time enrolled in a secondary school, except upon written permission from that school. The University does not grant a high school diploma for work done by correspondence.

LIST OF PREPARATORY COURSES

Below is a list of the courses offered by correspondence which may be taken for credit toward entrance. The student who successfully completes any of this work is not required to take entrance examination in the subjects covered. Certain subjects, such as elementary courses in languages, may be taken *either* for entrance or for college credit, but not for both; a subject presented for entrance credit may not be repeated for college credit.

Group A: English

English Literature A, B, C, and D

English Composition A, B, C, and D

Group B: Languages

German A, B, C, and D

See courses marked with an asterisk under Greek, Latin, Romance Languages (French and Spanish) and Scandinavian (Norwegian and Swedish).

Group C: History and Social Science

American History A and B

World History A and B

Social Science A

Social Science B

Group D: Mathematics

Algebra A and B

Plane Geometry A and B

Solid Geometry

Higher Algebra, Part I

Group E: Natural Science

Elementary Physics A and B

(No credit; see note on page 46.)

Group F:

Mechanical Drawing I and II

(See Engineering, Courses 3 and 4, page 27.)

Elementary Bookkeeping

(See Business, Course 7, page 21.)

BOOKS AND OUTFIT

All necessary textbooks, drawing outfits, and apparatus are extra and *must be procured by the student*. Money should *not be sent* to the University for the purchase of texts and other material. When ordering textbooks, the student should give the exact title, the author, and the publisher.

Some 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, with the author's name, title of the book, and the volume number, naming the course in which they are to be used and giving full instructions for mailing. Blanks are supplied for this purpose.

No list of textbooks is published by the department.

LOAN LIBRARY FACILITIES

The General Extension Division will inaugurate about October 1, 1927, in connection with some courses, a loan library service. This will be designed to furnish reference books to those unable to secure them near their homes or from other sources, and thus enrich the work of the courses. A small fee will be charged for the service. Details of the plan of the service will be supplied in connection with the first lessons of the courses for which it is available.

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 if he has not already obtained one. All applications must be made on the blank furnished by the department. He should fill out the blank with all the information called for and return it with the required fee to the Correspondence Study Department, General Extension Division, University of Minnesota, Minneapolis. Ink should be used in filling out the blank.

HOW TO SEND MONEY

Payment should be made by post-office or express money order, personal check, or draft. *Make all checks and orders payable to the University of Minnesota*. They should cover the exact amount of the fee, no more and no less.

GROUP STUDY BY CORRESPONDENCE

AN OPPORTUNITY FOR STUDY CLUBS

The General Extension Division has received many inquiries for suggestions for study programs for clubs and other groups desiring to carry on systematic study. These inquiries have indicated a need which the Correspondence Study Department proposes to serve by the Group Plan of Correspondence Study.

The plan, in brief, provides for the acceptance of registration for any of the courses offered by correspondence, from the club or group interested, through one of its members who may be chosen as correspondent for the group. The group will then in any manner which it agrees upon conduct its co-operative group study, make the lesson reports, and receive the corrections of an instructor just as if the course were given to a single individual. This will yield, therefore, both the advantages of co-operative effort in study and the value of having that study practically on an individual plan.

SUBJECTS AVAILABLE

Any course in any subject offered by correspondence may be pursued in this way. The wide variety of subjects thus made available will enable clubs to choose without restriction in making up a program.

The courses contain, in most cases, 16, 24, or 27 lessons or assignments. A club meeting weekly can, by covering one lesson at each meeting, complete the work of a twenty-seven-lesson course in one season. By a little lengthening of the season two sixteen-lesson courses might be completed. In some subjects it may be possible to cover the work of more than one lesson at a meeting.

ADVANTAGES OF THE PLAN

1. The greatest problem in group study is usually that of educational leadership. Under this group correspondence plan the instructor becomes the personal leader of the group. His university affiliation guarantees the leadership needed.

2. Each correspondence course is divided into lessons or assignments, covering practically equal amounts of work, and organized as a complete sequence. Such an array of carefully worked out units will obviously furnish an organic program that is ideal for club purposes and will reduce the labors of program committees to a minimum.

3. By this plan the personal comments and constructive criticisms of a competent instructor will furnish, on the completion of each lesson, guidance for the subsequent meetings of the group. All study clubs will recognize the value of such a check upon their discussions and conclusions. It is a close approximation of the actual presence of the instructor at the meetings.

4. Each member of a study club of any size can secure all the practical educational benefits of a course (except that of university credit) for the payment of only his share of the cost of the course. If there are ten persons, for example, in a group they may pursue a sixteen-lesson course at a cost of \$1 each, when if studied individually the course would cost \$10. In addition the texts and reference books required to do the study may be so circulated among members that the cost for this service will be only nominal for any member of the group.

PROCEDURE

No detailed method of conducting meetings or doing the study for each meeting is just now contemplated. Suggestions will be gladly given in connection with each specific course as outlined. In general the procedure should be as follows:

1. Meeting of the group and selection of a subject for study. (The advice of the department or individual instructors may be freely asked for in this connection.)

2. Election of the correspondent for the group who will make the registration and attend to subsequent correspondence with the department. Registration should be made in the name of this correspondent as the representative of the group. The name of the group should not be omitted from the registration.

3. Application for registration sent to the General Extension Division accompanied by the fee for the course. When this is received the department will forward at once the first lessons of the course with all necessary instructions for beginning work.

NOTE.—The cost of textbooks is not covered by the course fee.

4. First lesson assignment to be studied following whatever plan the group may adopt, and lesson report prepared, the joint effort of members of the group. This report is to be sent to the department for correction by the instructor.

5. The next meeting of the group to prepare the next assignment and receive the criticisms on the previous report. This plan to be carried through for each succeeding assignment in the course.

6. Following the completion of all the assignments there will be no final examination of the group as a whole. If, however, any individuals desire to take an examination, this privilege may be extended to them in consideration of a special examination fee of \$1. If there are several members in the group who desire this examination, it will be required that the examinations be conducted jointly under the proctorship of some local educator acting as representative of the University.

The only exception from the usual procedure is that no credit towards a university degree can be given to any member of the group. The reasons for this exception will be obvious. The usual objectives of group study are not, however, university credits, so that all the practical advantages of individual study are retained. Some sort of grade will, if desired, be given to each lesson report submitted as an index of the quality of work submitted. Similarly an unrecorded grade may be given to special examinations if desired.

SECRETARIAL STUDIES

There are now offered for the first time a series of courses directed toward the training of persons for secretarial positions. These courses are open to students who have a basic training in stenography and typewriting. This basic training is not offered by correspondence, but may be acquired in commercial schools or in the commercial courses of high schools.

A complete course of training should include something more than the bare outlines of office work. Accordingly the following courses are suggested as desirable to combine with the Secretarial Practice courses, listed on page 50.

- English Composition, one or more courses
- Business Correspondence
- Business Law, one or more courses
- Principles of Economics, one or two courses
- Principles of Accounting, at least one course

All of these courses, except Business Correspondence, carry university credit. They may be combined with residence or extension credits towards a degree or a certificate.

They are not limited, however, to students who are candidates for either degree or certificate. They are, in fact, designed quite particularly with the office employee in mind; the clerk or stenographer who desires to advance in business efficiency, and can by this means prepare for positions of greater responsibility. The courses need not be taken in any special order, except when carried for credit toward a degree; they may be grouped in parallel sequences, assuming that the student carries two at a time, the purely secretarial courses in one sequence, and the more general courses in the other.

More detailed information will be given in a special circular.

ESPERANTO COURSES

For the first time a course is now offered in Esperanto, the international language which has now gained a considerable recognition. This offering is made in the belief that such a language has a distinct and valuable place in the world's means of communications, and that its wider study is desirable. Esperanto is a simple and logical language, easy to learn, and even now capable of use in international correspondence. Over 2,000 persons responded with some kind of study to the Esperanto lessons broadcast by the University during the winter of 1926-27. Some of them attained a remarkable proficiency without further instruction. With the aid of correspondence teaching any person may acquire practically all the necessary skill in writing the language.

Advanced courses will be prepared and offered just as soon as a sufficient demand arises.

PERSONNEL MANAGEMENT COURSES

The newest and most active field of endeavor in business organization is that of personnel, with all its ramifications. It is demanding more and more trained workers, and the facilities for securing this training are limited.

In offering the new courses in Personnel Administration the department feels that it will open this field to many who are not now able to secure any training at all. This will apply as much to employers themselves, as to those who aspire to become employment directors for business enterprises.

The following courses have been grouped in two parallel sequences, permitting the student to carry two subjects at the same time, and also to put the courses into their proper order. The first sequence covers the necessary foundations of economic theory which will enable the employer or director to work in accordance with accepted economic procedure. The second sequence contains the courses in psychology and personnel management in their preferred order, with their application particularly in office management.

I

Principles of Economics I
Principles of Economics II
Labor Problems and Trade Unionism

II

General Psychology I
Personnel Administration
Employment and Vocational Psychology
Advanced Personnel Administration
Office Organization and Management

These courses are described on pages 22 and 23 (Economics), 45 (Personnel Administration), 47 and 48 (Psychology) and 51 (Office Organization and Management.)

The student may register for Principles of Economics I and General Psychology I at the same time; as each course is completed it may be followed by the next in its sequence. If the work is done at the rate of three lessons a week (which is not an inordinate amount) both sequences may be completed in about a year. This is a relatively short time for preparing for a vocation.

Students may register for any of the courses separately, regardless of the sequences, if they are able to profit by them in that way. It is proposed to give as wide an opportunity in this respect as may be desired. It is thought, however, that one will not acquire a thoro and proper training without completing practically all of the courses listed.

More detailed information may be had in a special bulletin.

REGULATIONS

ADMISSION

All persons 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 all the information asked for in order that his fitness to pursue the course selected may be determined. It is desired that the student state fully the purpose he has in view in taking the work and give in detail the educational advantages, training, or experience he may have had. The department endeavors to meet the needs of the individual student by advice and suggestions, as well as by formal instructions, but whenever it finds that the courses selected are not for the best interests of the student, it reserves the right to reject the application or to advise change. It also reserves the right to advise discontinuance or change after a course has been started, if the student shows entire unfitness for the work. Whenever a registration is discontinued in this way or rejected the fee will be returned.

AMOUNT OF WORK CARRIED

Not more than two courses may be carried through correspondence at one time.

The maximum number of lessons that will normally be accepted from a student is four per week, regardless of whether one or two courses are being carried. Any variation of this regulation must have the approval of the department.

Correspondence courses are included in the amount of work permitted for students in extension classes. Accordingly students pursuing both kinds of extension study should have their total amount approved by the director of the General Extension Division.

TIME

A student may begin a correspondence course at any time, and will be required to complete the course within one year from the date of enrollment. If the course is not completed within this limit the registration is considered expired. (See Reinstatement below.)

During the summer months the department cannot guarantee that all courses will be given. While instructors are on vacation their work may be carried by a substitute, or it may be temporarily discontinued. In the latter case an extension of time for the completion of a course affected may be allowed.

As a rule the student should endeavor to send in at least one recitation report every week. If it is not possible to do this the department should be notified. Temporary delays are, however, unavoidable in a busy person's work, and no student should become discouraged because of them. Each report should be sent in as completed, and not held until others are completed. This practice will cause delays in their return; and in addition,

the student should endeavor to secure the instructor's corrections and criticisms before proceeding too far with advanced lessons.

REINSTATEMENT

Any student whose registration has expired, or who has failed to complete a course within the prescribed time of one year, through causes not within the control of the University, may be reinstated with the consent of the department on payment of one dollar for each course reinstated. Such reinstatement holds for one year. No reinstatement will be granted after four years from the rate of registration.

TRANSFER OF REGISTRATION

Any student may have the privilege of transferring his registration from one correspondence subject to another by the payment of a fee of one dollar, but no transfer will be allowed after four years from the date of registration. In case reports have been made on the lessons of the original course, a fee of sixty-five cents will be charged for each lesson completed. If the transfer is recommended by the department, no charge will be made.

RETURN OF ENGLISH PAPERS

When the student has finished noting instructor's comments on lesson reports in English, all such papers must be returned for permanent filing in the office of the department. No credits in English may be recorded until the papers are on file. But they may be retained for purposes of review in preparation for the final examination. This refers solely to student's manuscripts, and not to lesson sheets; and it does not apply to papers in high school English.

FEEES

All fees are payable at the time the student files his application for registration. No reduction of fee is made for a combination of courses carried simultaneously. The fee for each course may be found following the description of the course.

POSTAGE

The student prepays postage on all mail sent to the University; mail sent from the University to the student is prepaid by the Correspondence Study Department.

REFUNDS

Two dollars (\$2) of each fee is the non-refundable portion withheld to cover expenses of registration. No fee will be refunded after two months from the date of registration or after the student has completed one half of the course for which he has registered. If an application for instruction is rejected the entire fee is returned. If lessons have been completed before the cancellation of a course, a charge of sixty-five cents will be made for each lesson.

CREDIT

Students who undertake correspondence study work for university credit must state this fact in advance and comply with all requirements of the University, including the prerequisites for each course. 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 unless evidence is given that university entrance requirements can be met. These requirements are usually comprised in a four-year high school course.

Those seeking a university degree must conform to all the requirements exacted by the college or school in which such degree is sought. The bulletin of any college or school may be obtained from the registrar.

A maximum of one half of the required credits for the bachelor of arts degree may be accumulated through correspondence. The work of the earlier part of the course is more likely to be available for correspondence study. The work of the senior year, or the major portion of it, must be done in residence.

Normal students who undertake courses for university credit with the purpose of having the credit transferred to the teachers' college in which they are working for a diploma should make certain by consultation with the proper authorities at the teachers' college that the arrangement to do this is satisfactory and that the course selected fits into their program.

Entrance credit is allowed for courses of high school grade. See Preparatory Courses, page 6.

No credits may be earned by correspondence study to apply on the Master's degree, or any other graduate degree.

Notice of completion with or without credit, as the case may be, is sent by the university registrar to each student who satisfactorily completes a course.

TRANSFER OF CREDITS

Credits obtained through work with this department will be certified to other schools or colleges upon request, but it must be understood that their acceptance by another institution depends wholly upon the regulations of that institution. Students who expect to apply our credits elsewhere should first make sure of the rules of the other school or college.

A "credit" does not mean the same thing in different institutions respectively and hence a transfer of credits usually involves the calculation of credit equivalents. A University of Minnesota credit now means one fifty-minute classroom period per week for a "quarter," or twelve weeks. Formerly it meant the same quantity of classroom work per week for a "semester" of seventeen weeks. Three "quarter credits" are equivalent to two "semester" credits.

Most colleges reckon credits by one or the other of the foregoing methods, but other methods are sometimes used.

It must be understood that the classroom periods indicated above do not include the time required for preparation, which is ordinarily two hours of outside study for each classroom hour.

EXAMINATIONS

All students on completing any course will be given an examination either at the University or, by arrangement, in their home towns under the supervision of an accredited representative of the University. This representative may be a local school superintendent, principal, or other responsible, disinterested person.

Success in the examination is requisite to credit. Failure in the examination means failure in the course, regardless of previous grades.

Deferred examinations.—Examinations should be taken immediately following the completion of the last lesson of the course. They may, however, be deferred at the desire of the student. If taken any time before the expiration of the course registration there is no extra charge; after this expiration there will be the regular reinstatement fee of \$1.

GRADES AND HONOR POINTS

In addition to the recognition, by the use of *credits*, of the *amount* of work done, there is a further recognition of *quality*, through the use of *grades* and *honor points*. Four grades are employed: D (75-81%) is used on work of mediocre merit, which may be counted toward a degree only when averaged with work of higher grades in other courses; C (81-87) indicates the quality of work acceptable for graduation; A (93-100) and B (87-93) are given to work of especial merit.

Honor points are assigned to each grade, as follows: D, none; C, 1 point; B, 2; A, 3. On the basis that grade C is necessary for graduation, a student must earn at least as many honor points as credits. The bachelor of arts degree, for instance, requires 180 credits and 180 honor points. The accumulation of honor points enables the student to reduce the number of credits required, on the following scale; for each *five* honor points in excess of one per credit, the required number of credits is reduced by one. This applies to work done by correspondence.

Work below D in merit is marked E (condition) or F (failure). A condition is a temporary grade, representing a deficiency which may be removed by a subsequent examination. The final grade, however, may not be higher than C; and unless the examination be taken within three months the grade becomes a failure. A course receiving a final grade of F must be repeated before any credit may be given.

STATE TEACHERS' CERTIFICATES

The Department of Public Instruction issues elementary school certificates upon examination or upon the presentation of a diploma earned in a two-year course at a state teachers' college. Correspondence credits are not directly applicable for these certificates but usually may be applied toward a diploma, if arrangements have been made in advance with the teachers' college.

Professional certificates, entitling the holder to teach in high schools, are issued upon examination or upon the presentation of an academic degree from an accredited college, together with credentials showing fifteen

semester credits or twenty-two and a half quarter credits in certain designated educational subjects, earned in a recognized institution. Educational credits received from this department will be accepted directly toward such a certificate when presented by the holder of an academic degree.

In either case correspondence courses may be used as an efficient means of preparing for the state examinations.

RESIDENT STUDENTS

Registration for correspondence courses will not be accepted from resident or extension class students of the University of Minnesota or of any other institution of learning unless specific permission is granted by the institution concerned.

Persons pursuing correspondence courses for credit must discontinue them when they enter upon resident study. Arrangements may be made to hold the courses over until the student is again free to pursue them.

No registration for a correspondence course for the purpose of removing a condition or a failure will be accepted except upon the written consent of the proper authorities in the school concerned.

OTHER EXTENSION ACTIVITIES

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, in the College of Education, in the School of Business, and in the School of Mines.
 2. Courses in business administration, accounting, and finance.
 3. Practical courses in engineering and in industrial subjects.
- B. Correspondence courses.
- C. Extension lectures, singly or in groups, and lyceum lectures, concerts, and entertainments.
- D. The Municipal Reference Bureau, which compiles and furnishes to city officials information pertaining to municipal government and administration.
- E. The Branch of Visual Instruction, through which loan collections of lantern slides and films are furnished to schools and clubs.
- F. Drama Service, through which dramatic clubs and school societies are given advice about the production of amateur theatricals and copies of plays are lent for reading and selection.
- G. Agricultural Extension, including lectures, demonstrations, institutes, and short courses under the direction of the College of Agriculture, Forestry, and Home Economics.

DESCRIPTION OF COURSES

ANTHROPOLOGY

51. Introduction to Anthropology. Origin and development of mankind and the races; racial distribution and immigration; the bearing of anthropology on present-day thought and problems.
Twenty-seven lessons (five credits). Mr. Wallis. \$17.00.

ART EDUCATION

3. Interior Decorating. The course aims to meet the needs of home makers and teachers; to show how to make the home comfortable and artistic. Instruction will consist of written lectures and textbook study. Blue prints and samples of fabrics will be sent with course. Students will draw series of simple plates to illustrate principles. Subjects discussed include: color, walls, floors and their coverings, period and modern furniture, fireplaces, pictures, and accessories. This course is equivalent to Art Education 3, College of Education.
Sixteen lessons (three credits). Mrs. Hanley. \$10.00.

ASTRONOMY

1. Descriptive Astronomy. A descriptive course designed to give accurate general information regarding the solar system and the stellar universe. It emphasizes the basic facts of the physical universe which all intelligent people should know, rather than the technical details of the work of a professional astronomer. Altho not necessary the student will find that a small telescope or even an opera glass, will add greatly to the interest in the subject.
Equivalent to Astronomy II offered in residence.
Twenty-seven lessons (five credits). Mr. Beal. \$17.00.
2. Uranography. A study of the constellations visible from the United States. The course includes an exposition of star magnitudes; use of star maps; identifications of the constellations, brighter stars, variables, doubles, clusters, and nebulae; interpretation of the Milky Way; reading of star folklore; watching the motions of the brighter planets relative to the sun and stars. The course can be begun at any time.
Twelve lessons (extension credit only). Mr. Beal. \$7.50.

BUSINESS COURSES

(For courses in Finance and other Business Subjects, see page 22 (Economics).)

(For courses in Personnel Administration, see page 45.)

(For courses in Secretarial Practice, see page 50.)

1. Business Correspondence. Mastery of materials, letters in general, letters adjusting complaints, reminder letters, recommendation letters, application letters, credit and collection letters, general sales letters, form let-

ters, follow-up letters. The ability to use correct English is prerequisite.

Twenty-four lessons (extension credit only). Mr. Creamer.
\$15.00.

2. **Business Law A—Contracts and Agency.** 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.

The general rules of contracts being fundamental to all work in business law, this course must precede Business Law B, C, and D.

Sixteen lessons (three credits). Mr. Jackman. \$10.00.

3. **Business Law B—Personal Property, Sales, Bailments, Negotiable Instruments.** Negotiable instruments, nature and characteristics, definition; 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 to demand (1) goods of a certain quality, (2) warranty of the purchaser's title. Prerequisite: Course 2.

Sixteen lessons (three credits). Mr. Jackman. \$10.00.

4. **Business Law C—Partnerships, Corporations, and Bankruptcy.** Partnerships: formation of partnerships; articles of co-partnership; methods of terminating partnerships; rights and obligations of partner (a) toward his co-partners, (b) as an agent of the firm, (c) toward the firm's creditors, (d) for an accounting; special partners; limited partnerships.

Joint stock companies; how distinguished from ordinary partnerships; how like ordinary partnerships; statutory requirements.

Corporations: formation of corporations of various classes; 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; solvency and the national bankruptcy act. Prerequisite: Course 2.

Sixteen lessons (three credits). Mr. Jackman. \$10.00.

5. **Business Law D—Real Property, Mortgages.** Classification of property, distinction between real and personal property; estates in land, freehold, life estate, tenancy for a term, at will, at sufferance; estate 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. Prerequisite: Course 2.

Sixteen lessons (three credits). Mr. Jackman. \$10.00.

6. Principles of Accounting. This is a course containing all the fundamental principles of accounting, together with sufficient practice work to show the application of these principles. The emphasis throughout is put upon principle rather than upon the details of method; but the practice material is made to conform to present-day methods as nearly as possible, and the course demonstrates what service accounting should render to business.

Part I treats of the fundamentals of debit and credit, the books of account, standard methods of recording transactions, accruals and adjustments, construction and interpretation of balance sheets and income statements, classification of accounts, the distinction between capital and revenue, and an introduction to partnerships.

Twenty-two lessons (four credits). Mrs. Youngs. \$14.00.

Part II is built up with corporation accounting as its leading feature, but gives further consideration to partnerships, and to certain essential accounting principles, such as valuation, depreciation, capital, and revenue. These general principles will be emphasized and made clear by application to various businesses by means of problems, in which manufacturing establishments will be included.

Twenty-two lessons (four credits). Mrs. Youngs. \$14.00.

7. Elementary Bookkeeping. The aim of this course is to present the groundwork of bookkeeping for the student who does not feel able to complete an extensive course in accounting. The following topics will be covered: the function of accounting, theory of debit and credit, journalizing and posting, account analysis, the use of special types of journals and ledgers, trial balance adjusting and closing the accounts, presentation of the period's results, balance sheet, and profit and loss statements. Sufficient practice material will be given to enable the student to grasp the fundamentals.

Twelve lessons (one-half entrance credit). Mr. Fraine. \$7.50.

Note.—This course is primarily intended to fit students to take up a college course in accountancy, but may be applied for one-half entrance credit (one-quarter unit).

CHILD WELFARE

Offered in co-operation with the Institute of Child Welfare.

1. Child Care and Training. Physical growth, care, and diet of young children. Mental development, personality, and behavior. The management of young children with reference to the establishment of correct habits of behavior. Play, toys, games, stories, and music.

CORRESPONDENCE COURSES

Intended primarily for the parents of young children. Offered to residents of Minnesota without fee. People outside the state may take the course upon payment of a fee of two dollars which is non-refundable.

Sixteen lessons (no credit). Institute of Child Welfare.

2. **Child Development and Training.** A brief study of the physical and mental development of the young child is followed by a discussion of the training of young children. Behavior problems in their various aspects, and the techniques of good and bad management will be considered.

Sixteen lessons (three credits). Mr. Anderson. \$10.00.

3. **Educational Methods for Young Children.** A study of the education of the young child in the home. Stories, music, art, and dramatics, as well as the use of tools, toys, and a variety of occupational materials are discussed. The educational importance of play and of projects initiated and carried out by the children is stressed. Open to those who have completed Course 2.

Sixteen lessons (three credits). Miss Dixon. \$10.00.

ECONOMICS

1. **Principles of Economics, Part I.** This course, with Part II, is designed to give a general understanding of our present industrial order. Special attention is given to descriptive accounts of economic institutions and to a consideration of basic principles underlying their operation.

Part I of the course presents certain fundamental concepts followed by a study of division of labor, of large scale production, and of the corporation as a type of enterprise. The principles governing value follow. This part closes with a discussion of money, banking, prices, crises, and international trade.

Twenty-seven lessons (five credits). Mr. Farmer. \$17.00.

2. **Principles of Economics, Part II.** A continuation of the study of value to discover what measures the reward received by the respective factors of production in wages, interest, rent, and profits. Then follows special problems of labor and labor unions, railways, public utilities, and finally the principles underlying taxation.

Twenty-seven lessons (five credits). Mr. Farmer. \$17.00.

NOTE.—Courses 1 and 2 are equivalent to Economics 6 and 7 as offered in residence.

3. **Banking Practice.** The subject-matter of this course aims to present a thoro understanding of the operations of a modern commercial bank and includes many managerial problems. Some attention will be given to the legal problems arising in dealings between banks and their customers. Beginning with a description 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 discounts, credit departments and how they judge credit; collateral loans; statements of conditions; the object of bank accounting; supervision and examination; central banks of England, France, and Germany, and the federal reserve system of the United States. Prerequisite for credit: Course 1.

Twenty-four lessons (four and one-half credits). Mr. Myers.
\$15.00.

6. Labor Problems and Trade Unionism. Origin of the labor problem; conditions of labor in American industries; structure, aims, policies, and methods of trade and industrial unionism and employers' associations; collective bargaining and shop committees; mediation and arbitration; injunctions; labor legislation. Prerequisite for credit, 20 credits in social science including Economics 1 and 2.

Equivalent to Economics 161 offered in residence.

Sixteen lessons (three credits). Mr. Hansen. \$10.00.

7. Public Finance. Government revenues, expenditures, and debts. This includes a study of the various forms of taxation, of budgetary legislation and control, of war and emergency financing, of the shifting and incidence of taxation, and of fiscal reforms. Prerequisite for credit: Courses 1 and 2.

Twenty-four lessons (four and one-half credits). Mr. Blakey.
\$15.00.

8. Commercial Policies. Theory of international commerce, free trade, reciprocity, protection, and other governmental and organized efforts to affect trade, with special emphasis upon American policies in view of post-war conditions. Prerequisites for credit: Courses 1 and 2. Several texts must be read in addition to those on which the course is based.

Sixteen lessons (three credits). Mr. Blakey. \$10.00.

9. Economic History I. This is a general course in economic history and includes a survey of the development of agriculture, manufacture, transportation, and storage, and the exchange of goods; economic crises; land, capital, management, and labor; the interplay of economic and political forces.

Twenty-four lessons (four and one-half credits). Mrs. Mudgett.
\$15.00.

10. Economic History II. This is a continuation of Course 9, which is a prerequisite to it.

Twenty-four lessons (four and one-half credits). Mrs. Mudgett.
\$15.00.

11. Mechanism of Exchange. An introduction to the study of modern financial institutions; consideration of the nature and functions of money, its types and methods of control; chief emphasis upon the American financial system, including the mechanism of the money market, investment banking, the functions of trust companies, savings institutions and commercial banks, the federal reserve system, and agricultural credit institutions.

This course replaces Money and Banking I and II, as previously given by correspondence. It has been revised to be the equivalent of the residence course given by the School of Business Administration. It will be open for registration on July 1, 1927.

Twenty-seven lessons (five credits). Mr. Myers. \$17.00.

12. Investments. Bonds, mortgages, stocks, and other forms of property in which funds may be invested, with emphasis on the needs of the conservative investor. The criteria of a good investment are carefully considered and tested by applying them to specific issues of governments, corporations, and individuals, including railroads, industrial, timber, and mining securities, and real estate loans. Prerequisite for credit, Mechanism of Exchange and Corporation Finance. (Recommended to practical business men, to whom it is open without prerequisite.)

Sixteen lessons (three credits). Mr. Sugden. \$10.00.

13. Corporation Finance. A study of the organization and financial management of corporations, with reference to corporate securities for purposes of promotion and reorganization and of facilities for marketing them. Prerequisites for credit: Principles of Economics 1 and 2; and 5 credits in Money and Banking.

Sixteen lessons (three credits). Mr. Stehman. \$10.00.

14. Economics of Retailing. A course in retail merchandizing and store management. Lessons consist of discussions of actual problems encountered in retail stores, together with methods of studying and solving the problems. The following general topics covered: store organization, location and equipment; store purchase and control; merchandise classification and layout; store policies as to price, credits, returns and allowances, and delivery; administrative policies as to personnel, and in relation to general business commodities. (A practical course for the active merchant.) Prerequisite for credit: ten credits in economics.

Sixteen lessons (three credits). Mr. Vaile. \$10.00.

15. Retail Store Advertising. A course discussing the economics of advertising from the point of view of the retail store manager. Advertising and retail sales promotion. Advertising media and technique. Prerequisite for credit: ten credits in economics.

Equivalent to Economics 89 offered in residence.

Sixteen lessons (three credits). Mr. Vaile. \$10.00.

NOTE.—Registration will be accepted after August 1, 1927.

EDUCATION

NOTE.—See Courses 1 and 2 under Psychology.

1. Educational Psychology. A survey of fundamental facts of human behavior involved in educational activities. This survey includes the following topics: psychological and educational measurements, habit formation, transfer of training, statistical methods. Courses 1 and 2 in psychology are prerequisite.

This course may be substituted for Ed. 55.

Sixteen lessons (three credits). Mr. White. \$10.00.

3. History of Education to the Reformation. A historical study of the foundation of modern education. The theories and practices of the Hebrews, Greeks, and Romans, and of the Middle Ages and the Renaissance, are considered in the light of their influence upon the present educational situation. The course includes the work offered in residence Course 101. Prerequisite: six credits in psychology. In special cases these prerequisites may be waived.

Twenty-four lessons (four and one-half credits). Miss Alexander.
\$15.00.

4. History of Modern Education. Educational history since the time of the Renaissance. A study of the theory of the great modern educators; the origin, aims, and development of typical secondary and higher schools in various countries; the rise of the modern elementary school with emphasis upon early state systems and reform movements. Equivalent in part to residence Courses 102 and 103. Prerequisite: six credits in psychology.

Twenty-four lessons (four and one-half credits). Miss Alexander.
\$15.00.

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. Prerequisite for credit: Courses 3 and 4.

Twenty-four lessons (four and one-half credits). Mr. Rankin.
\$15.00.

8. Theory of Teaching. An introductory course in educational theory for elementary school teachers. The work includes a study of the principles upon which the present practice of teaching is based, and of the responsibility of the school in providing various forms of training. Other topics are considered briefly, such as types of classroom, exercises, the making of lesson plans, qualifications of teachers, school management. Prerequisite: six credits in psychology. In special cases a student may, by conference with the instructor, waive these prerequisites.

Twenty-four lessons (four and one-half credits). Miss Alexander.
\$15.00.

9. School Organization and Law. An introductory 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. Prerequisite for credit: Courses 3 and 4.

Twenty-seven lessons (five credits). Mr. Rankin. \$17.00.

10. 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. Prerequisite for credit: Courses 3 and 4.

Twenty-seven lessons (five credits). Mr. Rankin. \$17.00.

12. Social Aspects of Education. This course is concerned with the school as an environment which is designed to fit its pupils for their social relations; also it discusses the school in respect to its interaction with other institutions of a similar character and aim. It is a common remark that the school is becoming more and more a social institution, and this course attempts to determine in what respect and in what manner this is true. Prerequisite for credit: Psychology 1 and 2.

This course may be substituted for History of Education 3.

Twenty-seven lessons (five credits). Mr. Rankin. \$17.00.

13. Industrial History. Evolution of arts, industry, tools, processes, and production to 1800; evolution of economic and social conditions; culmination of the industrial revolution in America—resultant agricultural, industrial, economic, and social problems; twentieth century outlook and opportunities: implications for practical education.

Eleven lessons (two credits). Mr. Rankin. \$7.00.

Note.—This course carries credit only in the College of Education. Students desiring credit in the School of Business should apply to the dean of that school.

16. The High School. A comprehensive study of the modern secondary school. The course treats the growth of secondary education, the student body, aims and functions, present status and types of organization, the program of study, extra-curricular activities, classification and guidance, and certain administrative features. Prerequisite: Psychology I and II and five credits in Education.

Equivalent to Ed. Ad. 65.

Sixteen lessons (three credits). Mr. Kefauver. \$10.00.

Note.—Registrations will be accepted after October 1, 1927.

17. Junior High School. A study of the special purposes of this institution and appropriate reorganization to achieve them, including the organization and content of the curriculum, advisory system, social organization (extra-curricular activities), methods of teaching, departmentalization, promotion, staff, etc. Prerequisite: Psychology I and II and five credits in Education.

Equivalent to Ed. Ad. 167-168.

Sixteen lessons (three credits). Mr. Kefauver. \$10.00.

Note.—Registrations will be accepted after October 1, 1927.

25. The Teaching of Related Subjects. Theory, practices, and problems of related instruction; content in related mathematics, drawing, science, hygiene, and safety; group study and unit-course preparation; usable methods and the means of supervision; both incidental and scheduled teaching discussed; acquaintance with texts and supplementary materials; courses designed particularly for shop and related subjects teachers in day, evening, and part-time vocational classes and for those preparing for service in this special field; suggestive for teachers in the more standardized units of the public school system.

Sixteen lessons (three credits). Mr. Smith. \$10.00.

ENGINEERING

1. Shop Mathematics, Part I. This course is for the practical man who desires training in mathematics to solve mechanical and electrical problems and will be found valuable by the teacher who is preparing to teach applied mathematics under the Smith-Hughes Act. It takes up arithmetic from fractions through proportion and contains problems in areas, volumes, weights of materials, screw threads, and gears. It teaches logarithms, the use of the slide rule, and the fundamental elements of machines, such as levers, pulleys, and the inclined plane.

Twenty-four lessons (extension credit only). Mr. Edwards.
\$15.00.

2. Shop Mathematics, Part II. This work follows Part I and takes up algebra, geometry, and trigonometry from a practical shop standpoint. A thoro working knowledge of the formulae is given. Each lesson in both Parts I and II has numerous practical problems to be worked by the student.

Twenty-four lessons (extension credit only). Mr. Edwards.
\$15.00.

- 3.* Mechanical Drawing, Part I. The course includes the use of instruments, lettering, views and sections, conventions, sketching, dimensioning, completed working drawings, and tracing. The course is designed to meet the needs of beginners.

Twenty lessons (extension credit only). Mr. French. \$12.50.

- 4.* Mechanical Drawing, Part II. A continuation of Part I.

Twenty lessons (extension credit only). Mr. French. \$12.50.

5. Elementary Mechanics. A short, practical course in elementary mechanics designed to meet the needs of students who have had limited training in mathematics. Numerical and simple graphical calculations, forces, simple machines, velocity, acceleration, impulse, momentum, work, power, and energy are treated. This course is designed for those who desire an elementary knowledge of the subject, but who are not familiar with calculus. Prerequisite: Courses 1 and 2 or equivalent.

Twenty-four lessons (extension credit only). Mr. Teeter. \$15.00.

* May be taken for one-half entrance credit. It is impossible to quote prices on drawing outfits. The cost will probably be from \$8 to \$12.

6. Technical Mechanics I—Statics and Kinematics. Characteristics of a force, parallelogram law, moments, couples, resultant of a force system, equilibrium of a force system, frictions, centroids, moment of inertia. Motion of a particle, motion of a rigid body. Prerequisite: Mathematics, Course 11.

Twenty-seven lessons (extension credit only). Mr. Teeter. \$17.00.

7. Technical Mechanics II—Dynamics. Force, mass, acceleration, translation and rotation, gyroscope, governors, work, energy, power, conservation of energy, impulse, momentum, loss of kinetic energy, conservation of momentum. Prerequisite: Course 6.

Twenty-seven lessons (extension credit only). Mr. Teeter. \$17.00.

8. Strength of Materials—Elementary. An elementary course on the strength of materials in common use. It treats of properties of materials, stress and strain, elastic limit, ultimate strength, deformation, deflection, principle of moments, moments of inertia, and the general elemental theory of beams, columns, and shafts. This course is especially designed for those students who desire an elementary knowledge of the subject, but who are not familiar with calculus. Prerequisite: Courses 1, 2, and 5.

Sixteen lessons (extension credit only). Mr. Teeter. \$10.00.

9. Strength of Materials—Technical. Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, hollow cylinder, rollers, plates, curved bars, springs, dynamic stresses, true stresses. Prerequisite: Mathematics, Course 11.

Twenty-seven lessons (extension credit only). Mr. Teeter. \$17.00.

10. Hydraulics. Laws of equilibrium of fluids, flow through orifices and over weirs, pressure and flow through tubes and pipes, flow in conduits and rivers, dynamic pressure of water, elementary principles of turbines and pumps. Prerequisite: Mathematics, Course 11.

Twenty-two lessons (extension credit only). Mr. Teeter. \$14.00.

11. Electricity and Magnetism, Part I. An elementary study of magnetism and electricity. Simple laws of magnetism, and the relation of magnetism to direct current electricity are developed. Series and parallel circuits, and combinations of both, simple wiring and armature winding are taken up. A knowledge of arithmetic such as is given by Shop Mathematics I is necessary.

Twenty-four lessons (extension credit only). Mr. Edwards.
\$15.00.

12. Electricity and Magnetism, Part II. This course is a continuation of Part I. It will deal with motors, generators, and instruments.

Twenty-four lessons (extension credit only). Mr. Edwards.
\$15.00.

13. Alternating Currents. This course takes up simple laws of alternating currents and their application to machines; inductance, capacity, and impedance are fully treated.

Twenty lessons (extension credit only). Mr. Edwards. \$12.50.

14. Heating and Ventilating. 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, heat loss due to ventilation, ventilation practice, air conditioning, heating systems—steam and hot water, direct and indirect, use of exhaust steam, warm-air system, fan systems—plenum and exhaust systems, vacuum systems, piping systems, central station heating, and heating accessories.

Sixteen lessons (extension credit only). Mr. Martenis. \$10.00.

16. Boiler Room Practice. The course is intended for the boiler operator. Outline of course: combustion, coal; firing methods; flue-gas analysis; boiler construction; feed water; boiler fittings; power of boilers; care of boilers; pipes and fittings; pipe covering; steam tables.

Sixteen lessons (extension credit only). Mr. Martenis. \$10.00.

17. Engine Room Practice. The course is planned to give an elementary and plain presentation of the subject to operating engineers who are not able to comprehend fully the average textbook on steam engines. Outline of course: principles of energy, motion, steam; classes of steam engines; parts of the steam engine; valves and steam action; valve-setting; governing; reversing gears; indicators and cards; calculating horse-power; pumps, condensers, lubrication; engine troubles.

Twenty-four lessons (extension credit only). Mr. Martenis.
\$15.00.

NOTE.—For those who are in boiler room practice and who may wish to take an examination for a chief engineer's license, Courses 1, 16, and 17 are of the utmost importance.

18. Elements of Machine Design. A short, practical course in machine design. Some elementary machines will be discussed and the laws of mathematics, mechanics, and strength of materials will be applied in each case, leading to the complete design of the particular machine under consideration. Working details and general drawings will be made as the work advances. Prerequisites: Courses 1, 2, 3, 4, 5, and 8.

Twenty-four lessons (extension credit only). Mr. Edwards.
\$15.00.

19. Descriptive Geometry. An elementary course in methods of projection and developments as applied to engineering, drawing, template making, etc. Correlated with analytic geometry. Graphical and algebraic solutions.

Twenty-seven lessons (extension credit only). Mr. Teeter.
\$17.00.

20. 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 selections of materials.

Ten lessons (extension credit only). Fee includes text material.
Mr. Cheyney. \$8.00.

24. Elements of Radio Communication. A brief non-mathematical discussion of magnetism; direct and alternating currents; electromagnetic

waves and their propagation; apparatus and methods used in radio communication. Attention is given to the construction and use of crystal and vacuum tube receiving sets and to radio telegraph and telephone sending sets. The rules and laws covering licenses, wave-lengths, and safety precautions are indicated. This course is especially valuable to students in elementary physics.

Sixteen lessons (extension credit only). Mr. Swenson. \$10.00.

ENGLISH

PREPARATORY COURSES

1. English Composition A. This course, and the three following, are suited to the needs of those persons who do not have a good foundation in English, and hence need training in the correct use of the language. It covers that part of the work in composition usually given in the freshman year at high schools. It gives practice in writing compositions on simple subjects, with special attention to the development of sentence structure and a unified paragraph; special drill to overcome errors in grammar, spelling, punctuation, etc.; training in the use of the dictionary.

Twenty lessons (one entrance credit). Mrs. Patterson. \$12.50.

2. English Composition B. This course is a continuation of the work of the first year, and covers the equivalent of the sophomore work in composition in high schools. Special emphasis is placed on punctuation and letter-writing. Prerequisite: Course 1 or equivalent.

Twenty lessons (one entrance credit). Mrs. Patterson. \$12.50.

3. English Composition C. This course is a continuation of Courses 1 and 2, but it is more advanced and presupposes the ability to do more thoughtful work, as it covers the composition work of the junior year of the high school. Composition forms a large part of the course. In it emphasis is placed on gathering material and organizing it into longer themes than those of the first year. Drill in spelling, punctuation, etc., includes more difficult points than those covered in the first year. Prerequisite: Courses 1 and 2 or equivalent.

Twenty lessons (one entrance credit). Mrs. Patterson. \$12.50.

4. English Composition D. This course is a continuation of Course 3, and corresponds to high school senior English composition. Prerequisite: Courses 1, 2, and 3 or their equivalent.

Twenty lessons (one entrance credit). Mrs. Patterson. \$12.50.

5. English Literature A. The object of this course is to arouse in the student an interest in the reading of good literature and to assist him to a knowledge and appreciation of some of the masterpieces in the various forms of literature. It includes the study of a volume of short stories, a volume of poetry, Shakespeare's *Merchant of Venice*, and Scott's *Ivanhoe*. The reading of an additional volume of each type is required of the student and questions set to assist as well as to test his understanding of the works read. The course corresponds to the literature part of high school freshman English.

Twenty lessons (one entrance credit). Miss Grandy. \$12.50.

6. English Literature B. The aim of this course is similar to that of English Literature A but the material studied is more difficult and the standard of work higher. It corresponds to the literature part of high school sophomore English. The works studied are Poe's *Tales*, Shakespeare's *Julius Caesar*, Dickens' *Tale of Two Cities*, Lowell's *Vision of Sir Launfal*, and Coleridge's *Rime of the Ancient Mariner*. Outside reading from literature of each type is also required. Prerequisite: Course 5 or equivalent.
- Twenty lessons (one entrance credit). Miss Grandy. \$12.50.
7. English Literature C. This is a course in American literature. The works of well-known American authors, including those of recent date, are studied according to type rather than in chronological order. Some knowledge of the authors' lives as well as of their works is required. The course corresponds to the literature half of high school junior English. Prerequisite: Courses 5 and 6 or equivalent.
- Twenty lessons (one entrance credit). Miss Grandy. \$12.50.
8. English Literature D. This course, which corresponds to high school senior English literature, consists of a chronological study of the outstanding writers of English literature, their chief works and the periods in which they lived. It aims to establish standards of appreciation for the student's later reading, and to stimulate him to further reading of good literature. Prerequisite: Courses 5, 6, and 7 or equivalent.
- Twenty lessons (one entrance credit). Miss Grandy. \$12.50.

COLLEGE COURSES

Literature

1. Survey of English Literature I. A general survey of English literature from the earliest times to 1630, with a great 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. Prerequisites for credit: Composition 1.
- Sixteen lessons (three credits). Miss Grandy. \$10.00.
2. Survey of English Literature II. A general survey of English literature from 1630 to 1780. Prerequisite for credit: Composition 1.
- Sixteen lessons (three credits). Miss Grandy. \$10.00.
3. Survey of English Literature III. A general survey of English literature from 1780 to 1900. Prerequisite for credit: Composition 1.
- Sixteen lessons (three credits). Miss Grandy. \$10.00.
- NOTE.—The prerequisite of Composition 1 may be met by taking the composition and survey simultaneously.
4. American Literature I. A survey of American literary development in the seventeenth, eighteenth, and early nineteenth centuries. Extensive readings, largely from Pattee's *Century Readings in American Litera-*

ture. Prerequisite for credit: Composition 1, 2, and 3, and six credits in the Survey of English Literature.

•Equivalent to English 73 offered in residence.

Sixteen lessons (three credits). Mr. Sutcliffe. \$10.00.

5. American Literature II. A continuation of 4. A survey of American literary development from Emerson to the end of the nineteenth century.

Equivalent to English 74 offered in residence.

Sixteen lessons (three credits). Mr. Sutcliffe. \$10.00.

6. 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 George Saintsbury, *The English Novel*. Prerequisite for credit: Composition 1, 2, and 3, and six credits in the Survey of English Literature.

Twenty-four lessons (four and one-half credits). Mr. Sutcliffe. \$15.00.

7. Shakespeare I. Shakespeare's development as a dramatist. A careful study of a selected list of Shakespeare's plays. Prerequisite: Composition 1, 2, and 3, and six credits in the Survey of English Literature.

Equivalent to English 55 offered in residence.

Sixteen lessons (three credits). Mr. Nichols. \$10.00.

8. Shakespeare II. A continuation of Course 7.

Equivalent to English 56 offered in residence.

Sixteen lessons (three credits). Mr. Nichols. \$10.00.

NOTE.—Registration will be accepted for Courses 7 and 8 after August 1, 1927.

Composition

- A. Subfreshman Rhetoric. A course in the simple fundamentals of correct English, intended to give additional drill to high school graduates who need further preparation for college English. This course is required of all college students who are not prepared to carry college work in English successfully. It includes intensive drill on simple grammatical forms, punctuation, sentence structure, and theme writing.

Sixteen lessons (no credit). Mrs. del Plaine. \$10.00.

1. Composition I. Practical training in the art of writing, the principles of structure, and analysis of specimens of good prose. Constant practice in writing papers, mainly expository in character. This course, with the two following, is equivalent to Composition 4-5-6 in the College of Science, Literature, and the Arts. Composition 1, 2, and 3 and six credits in the Survey of English Literature fulfill the freshman English requirement.

Sixteen lessons (three credits). Miss Stevens. \$10.00.

2. Composition II. Continuation of Course 1. Advanced work in composition, with practice in writing exposition, narration, and description.
Sixteen lessons (three credits). Miss Grandy. \$10.00.
3. Composition III. Continuation of Course 2. Advanced work in analysis, with practice in writing exposition and informal argument.
Sixteen lessons (three credits). Mrs. del Plaine. \$10.00.
4. Exposition. Imitative and creative work in the various types of exposition, with especial recognition of the way in which exposition merges into narration and description. Prerequisite for credit: Courses 1, 2, and 3.
Sixteen lessons (three credits). Miss Stevens. \$10.00.
7. Description. Non-technical but thoroughgoing study and application of the principles of descriptive writing. Analysis of specimens and exercises in description. Prerequisite for credit: Courses 1, 2, and 3.
Equivalent to English 11 offered in residence.
Sixteen lessons (three credits). Miss Stevens. \$10.00.
8. Narration. Study of the principles of narrative-writing; point of view, plot, setting, characterization. Exercises, and practice in writing short narratives. Prerequisite for credit: Courses 1, 2, and 3.
Equivalent to English 12 offered in residence.
Sixteen lessons (three credits). Miss Stevens. \$10.00.
9. Versification I. Study of the nature of poetry, and a detailed analysis of English meters and the various English verse forms. Theory accompanied by criticism of poetry and practice in writing verse.
Equivalent to English 86 offered in residence.
Sixteen lessons (three credits). Mr. Nichols. \$10.00.
10. Versification II. A continuation of Course 9.
Equivalent to English 87 offered in residence.
Sixteen lessons (three credits). Mr. Nichols. \$10.00.
11. The Short Story I. Practical training in the art of writing the short story, in its technique and principles, and analysis of assigned specimens. Exercises in plot, setting, and character. Prerequisite for credit: Courses 1, 2, 3, and 8.
Sixteen lessons (three credits). Mrs. Phelan. \$10.00.
12. The Short Story II. A continuation of Course 11.
Sixteen lessons (three credits). Mrs. Phelan. \$10.00.

NOTE.—Registration will be accepted in Courses 11 and 12 after October 1, 1927.

ESPERANTO

1. Beginning Esperanto. Grammar and simple composition. The course aims to give the student sufficient knowledge of elementary Esperanto to enable him after a few months' study to read, write, and speak simple Esperanto. A feature of the course will be an early correspondence with foreign Esperantists.
Sixteen lessons (no credit). Mr. Wendell. \$10.00.

GERMAN

PREPARATORY COURSES

1. German A. Introduction to the elements of German grammar, and simple exercises in composition. Equivalent to the first half year of high school German.
Twenty lessons (one entrance credit). Mr. Burkhard. \$12.50.
2. German B. Continuation of German A. Equivalent to the second half year of high school German.
Twenty lessons (one entrance credit). Mr. Burkhard. \$12.50.
3. German C. Continuation of German B. Equivalent to the third half year of high school German.
Twenty lessons (one entrance credit). Mr. Burkhard. \$12.50.
4. German D. Continuation of German C. Equivalent to the fourth year of high school German.
Twenty lessons (one entrance credit). Mr. Burkhard. \$12.50.

COLLEGE COURSES

1. Beginning German I. Grammar and easy composition. The course aims to give the student a knowledge of the elements of German grammar, the facility to read easy German, and to write simple German sentences.
Twenty-seven lessons (five credits). Mr. Burkhard. \$17.00.
2. Beginning German II. A continuation of Course I.
Twenty-seven lessons (five credits). Mr. Burkhard. \$17.00.
3. Beginning German III. Grammar and composition continued; selected readings in easy prose and verse. Prerequisite: Courses 1 and 2 or equivalent.
Twenty-seven lessons (five credits). Mr. Burkhard. \$17.00.
4. Rapid Reading I. Selections from modern narrative and descriptive prose. Assigned outside readings and reports. Prerequisite: Courses 1, 2, and 3 or equivalent.
Twenty-seven lessons (five credits). Mr. Kroesch. \$17.00.
50. Elementary Composition I. Translation of short English selections. Paraphrasing of simple poems. Free narration. Exercises based on topical grammar review. Open to those who are taking or have taken Course 4 or equivalent.
Sixteen lessons (three credits). Mr. Lussky. \$10.00.
52. Elementary Composition II. Translation and grammar review continued. Both 50 and 52 must be completed before credit is given for 52.
Sixteen lessons (three credits). Mr. Lussky. \$10.00.
63. Drama I. Study of the present-day drama in Germany. Selected plays of Hebbel, Hauptmann, or Sudermann, with assigned readings and reports. Open to those who have completed Courses 1, 2, 3, and 4.
Twenty-four lessons (four and one-half credits). Mr. Davies. \$15.00.

64. Drama II. Study of the German drama of the eighteenth century and through the classic period. Selected plays of Lessing, Goethe, or Schiller, with assigned readings. Prerequisites as in Course 63.
Twenty-four lessons (four and one-half credits). Mr. Davies.
\$15.00.
- 28-29. Chemical German. The reading of works on chemistry. Vocabulary exercises. Both parts must be completed before credit is given. Prerequisite: Course 4 or equivalent.
Part I, sixteen lessons (three credits). Mr. Lussky. \$10.00.
Part II, sixteen lessons (three credits). Mr. Lussky. \$10.00.
31. Medical German I. Readings in medical German. This course is intended primarily for medical students. It aims to give the student a scientific vocabulary and to acquaint him with the style of scientific articles. Prerequisite: Course 4 or equivalent. No credit given until Course 32 is completed.
Sixteen lessons (three credits). Mr. Burkhard. \$10.00.
32. Medical German II. A continuation of Course 31. No credit is given for 31 until 32 is completed.
Sixteen lessons (three credits). Mr. Burkhard. \$10.00.

GREEK

- *1. Beginning Greek I. The declensions and conjugations and the simpler rules of syntax, together with translation of sentences from Greek into idiomatic English and from English into Greek. Courses 1, 2, and 3 must be completed before credit is given for Course 1.
Twenty-seven lessons (five credits). Mr. Savage. \$17.00.
- *2. Beginning Greek II. Course continued; general principles, inflections, word formations, syntax, elementary readings, composition. Prerequisite: Course 1.
Twenty-seven lessons (five credits). Mr. Savage. \$17.00.
- *3. Beginning Greek III. Course continued. Prerequisite: Courses 1 and 2.
Twenty-seven lessons (five credits). Mr. Savage. \$17.00.
4. History—Xenophon's *Anabasis*. Selections from Books, 2, 3, 4; Hadley's *Greek Grammar*; etymology reviewed and syntax studied sufficiently to enable the student to proceed confidently in the translation of the text; the irregular verb. Prerequisite for credit: Courses 1, 2, and 3 or equivalent.
Twenty-seven lessons (five credits). Mr. Savage. \$17.00.
5. History—Herodotus. Selected readings from Herodotus's history; syntax, dialectical forms, the irregular verb; collateral work.
Twenty-seven lessons (five credits). Mr. Savage. \$17.00.
6. Epic Poetry—Elementary Course in Homer. Selections from the *Iliad* or the *Odyssey*; mythology, scansion, dialectical forms. Open to those who have read in Greek prose three books of the *Anabasis*, or the equivalent.
Twenty-seven lessons (five credits). Mr. Savage. \$17.00.

* May be taken for one entrance credit.

51. Philosophy. Plato's *Apology* and selections from other works of Plato or from Xenophon's *Memorabilia*; study of Greek philosophy. Open to those who have had at least two years of Greek. Prerequisite for credit: Courses 4 to 6 or equivalent.
Sixteen lessons (three credits). Mr. Savage. \$10.00.
52. Oratory. Selected readings from Lysias and Demosthenes; study of the principles of Greek rhetoric and Greek oratory.
Sixteen lessons (three credits). Mr. Savage. \$10.00.
53. Dramatic Poetry—Elementary Course in the Drama. Euripides' *Alcestis* or *Medea*; translation, study of mythology and of Greek life. Open to those who have read at least two books of Homer in addition to three books of the *Anabasis*, or the equivalent.
Sixteen lessons (three credits). Mr. Savage. \$ 0.00.

HISTORY

PREPARATORY COURSES

1. American History. This is a course in United States history similar to that taken by third- and fourth-year students in the high school. Since it presupposes a course in the same subject in the grades, the approach is made in a somewhat different manner from that in an elementary course. More emphasis is placed on the relative importance of periods and events, on the causes and relations of events, and upon securing a broader view of our country's history. The supplementary reading is assigned with the notion that it may suggest as well as inform. The following subjects are treated with especial fulness: discovery and exploration, typical colonies and colonial life, passage of control to England, the Revolution, its causes and results, the establishment of the new government, the rise of democracy and of nationalism, slavery and expansion, the Civil War, reconstruction, the era of big business. The course gives one entrance unit in history.
Part A, twenty lessons (one entrance credit). Miss Gold. \$12.50.
Part B, twenty lessons (one entrance credit). Miss Gold. \$12.50.
2. World History. A course corresponding to that taken in the second or third year of high school, including a survey of the development of civilization from prehistoric man to the present time. Part A stresses such topics as oriental, Greek, Roman, and medieval civilizations, the Reformation, rise of national states, colonial rivalry, the French Revolution, Napoleon, and the Industrial Revolution. Part B stresses the development of modern democracy in the various countries of Europe, imperialism in Africa and the Far East, the World War, the world today.
Part A, twenty lessons (one entrance credit). Miss Gold. \$12.50.
Part B, twenty lessons (one entrance credit). Miss Gold. \$12.50.
- NOTE.—Registrations will be accepted after July 1, 1927.

COLLEGE COURSES

1. Ancient History, Part I—Greek. This course includes a brief preliminary survey of Egypt, Babylonia, and the Aegean region, showing their

influence on later civilization, 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 interrelation 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 (four and one-half credits). Mr. Perry.
\$15.00.

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 history to the death of Constantine.

Twenty-four lessons (four and one-half credits). Mr. Perry.
\$15.00.

7. Europe in the Middle Ages (800-1500). A study of eastern European history from the time of Charlemagne to the end of the fifteenth century. Prerequisite: six credits in history.

Equivalent to History 16 offered in residence.

Twenty-four lessons (four and one-half credits). Mr. Perry.
\$15.00.

10. Modern World, Part I (1500-1795). A study of political and social history, primarily of Europe, from the Reformation to 1795.

Equivalent to History 1 offered in residence.

Twenty-seven lessons (five credits). Mr. Perry. \$17.00.

11. Modern World, Part II (1795-1871). The Napoleonic period, the reaction and the unification of Italy and Germany. Prerequisite: Course 10.

Equivalent to History 2 offered in residence.

Twenty-seven lessons (five credits). Mrs. Mudgett. \$17.00.

12. Modern World, Part III (1871-1924). The period of the benevolent bourgeoisie, modern imperialism, international relations, the World War, and the post-war settlement. Prerequisite: Course 11.

Equivalent to History 3 offered in residence.

Twenty-seven lessons (five credits). Mrs. Mudgett. \$17.00.

15. English History, 1066 to Present, Part I—Medieval. A study of English history from the Norman Conquest to the accession of the Tudors. The work consists of a careful study of a narrative text and of a constitutional manual, supplemented by source study and collateral reading. Special emphasis is placed upon the beginnings of popular government as shown in jury trial, the limited monarchy idea, and the growth of the House of Commons.

Equivalent to History 4 offered in residence.

Twenty-four lessons (four and one-half credits). Mrs. Mudgett.
\$15.00.

16. English History, 1066 to Present, Part II—Modern. A continuation of Part I, devoted to a study of English history from 1485 to the close

of the World War. The emphasis is upon the seventeenth-century struggle for political liberty, and upon the reform movements of the nineteenth and twentieth centuries. Prerequisite: Course 15.

Equivalent to History 5 offered in residence.

Twenty-four lessons (four and one-half credits). Mrs. Mudgett.
\$15.00.

- 17.* American History I (1776-1840). Survey of the development of the United States from the Revolution to about 1840, with special reference to the growth of democratic institutions, the influence of the West, and the growing nationalism. Prerequisite: six credits in history.

Equivalent to History 7 offered in residence.

Twenty-seven lessons (five credits). Mr. Perry. \$17.00.

- 18.* American History II (1840-77). Survey of the background of the Civil War, the war and reconstruction, with special reference to slavery, westward expansion, the frontier, the public land questions, and the social, political, and economic systems before and immediately following the war. Prerequisite: six credits in history.

Equivalent to History 8 offered in residence.

Twenty-seven lessons (five credits). Mr. Perry. \$17.00.

- 19.* Recent American History. The national period after 1877. Special emphasis on the social and economic factors. Includes a study of the World War and the post-war readjustment in the United States. Prerequisite: six credits in history.

Equivalent to History 9 offered in residence.

Twenty-seven lessons (five credits). Mr. Perry. \$17.00.

NOTE.—Registrations for the above revised courses in United States History (Courses 17, 18, and 19) will be accepted after October 1, 1927. Students so desiring may in the meantime register for Courses 20 and 21 described below. Registrations for Courses 20 and 21 will not be accepted after October 1, 1927.

- 20.† United States History, Part I. This is the first half of a comprehensive course in American history. About one third of Part I is devoted to the colonial period, the remainder to the Revolution, the formation of the Constitution, and the early years of the nineteenth century (to 1836). The work consists of the study of a 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. Prerequisite for credit: six credits in history or political science.

Twenty-four lessons (four and one-half credits). Mr. Perry.
\$15.00.

- 21.† United States History, Part II. A continuation of Part I, devoted mainly to a study of the period from the beginning of the slavery strug-

* To receive credit for Course 17, a student must complete both 17 and 18. To receive credit for Course 18, a student must complete either 17 and 18 or 18 and 19.

† Both Courses 20 and 21 must be completed before credit is allowed toward a degree.

gle down to 1914, with a brief survey of the part of the United States in the World War.

Twenty-four lessons (four and one-half credits). Mr. Perry.
\$15.00.

ECONOMIC HISTORY

9. Economic History I. See Economics 10.
10. Economic History II. See Economics 10.

HOME ECONOMICS

(For courses in Interior Decorating see Art Education.)

1. Household Management. This course deals with the cost and care of the home. Topics covered: budget making; household accounting; foods and marketing; home ownership; clothing costs; principles of arrangement of furnishings and utensils; social adjustments. A practical course for the home-maker as well as for the college student.
Sixteen lessons (three credits). Miss Kelley. \$10.00.
2. Textiles. The study of woven and knitted fabrics in current use for household purposes, outerwear and underwear; aims to emphasize points about quality of raw material, processes of manufacture, and features of construction and finish as they affect the serviceability and appearance of materials. Tests for quality, applicable to ready-to-wear garments as well as to yard goods. Significance of trade terms used in newspaper and magazine advertising. Access to a compound microscope desirable but not imperative. A fee of \$1.50 for laboratory material is required, payable at time of registration.
Sixteen lessons (three credits). Miss Caplin. \$10.00.

HYGIENE

- 1.* Hygiene of Maternity and Infancy. Prepared by the Division of Child Hygiene of the Minnesota State Board of Health in co-operation with the United States Children's Bureau in work authorized under the Sheppard-Towner Act of November 1921. The first eight lessons take up personal and prenatal hygiene; care of the expectant mother; common complications and how to avoid them; preparation for confinement and after care of mother and child. The remaining lessons deal with the care and feeding of the baby; the well baby; the sick baby; growth, development, training. This course is given in co-operation with federal and state agencies without charge to the student.
Fifteen lessons (no credit). Dr. Boynton. Free.

INTERIOR DECORATING

(See Art Education)

JOURNALISM

1. Reporting I.† Gathering and writing of news for newspapers; study of news values; exercises in journalistic style; analysis of newspapers. Part I takes up the study of news and news values, the requirements

* Offered to residents of Minnesota only.

† No credit will be given until Courses 1, 2, and 3 are completed.

of style in straight news-writing, and the structure of news stories, based upon the study of newspapers.

Sixteen lessons (three credits). Mr. Cason. \$10.00.

2. Reporting II.† Continuation of Part I. Emphasis upon the actual getting and writing of news for newspapers. Assignments will be of a practical nature, the stories to be written for publication.

Sixteen lessons (three credits). Mr. Cason. \$10.00.

3. Reporting III.† Continuation of Part II. The practical getting and writing of news will be continued with emphasis upon the human interest and feature story.

Sixteen lessons (three credits). Mr. Cason. \$10.00.

20. Editorial-Writing I. Study of the style and structure of editorials; practice in writing various types of editorials.

Sixteen lessons (no credit). Mr. Cason. \$10.00.

21. Editorial-Writing II. The writing of editorials is continued with the study of the editorial page, its functions, typography and special problems.

Sixteen lessons (no credit). Mr. Cason. \$10.00.

73. Newspaper and Magazine Articles I. A study in the writing of facts and opinion articles, interviews and expository articles, both serious and feature, for newspapers and magazines. Main emphasis is laid on the journalistic type of article rather than the essay type, which is to say, on the article of fact rather than that of opinion, but lines are not too strictly drawn. A survey of the magazine and Sunday newspaper fields is begun. Prerequisite for credit: one year of reporting.

Sixteen lessons (three credits). Mr. Steward. \$10.00.

74. Newspaper and Magazine Articles II. A continuation of Course I, including a study of typical first-class magazines and newspapers, both of specialized and general interest, including trade publications, and a consideration of the illustration, preparation, and selling of manuscripts.

Sixteen lessons (three credits). Mr. Steward. \$10.00.

LATIN

- ‡1. Beginning Latin I. Inflections; translation of easy Latin prose; the study of elementary syntax; Latin composition. Textbook, D'Ooge, *Elements of Latin*.

Twenty-seven lessons (five credits). Mr. Cram. \$17.00.

- ‡2. Beginning Latin II. A continuation of Course I. Translation of selections from Eutropius; forms; syntax; Latin composition. Textbook: D'Ooge, *Elements of Latin*.

Twenty-seven lessons (five credits). Mr. Cram. \$17.00.

- ‡3. Caesar I. Translation of the Helvetian Campaign (Book I, chs. 1-29) and of the Campaign against the Belgians (Book II entire); syntax;

† No credit will be given until Courses 1, 2, and 3 are completed.

‡ May be taken for one entrance credit.

composition. Textbooks: Beeson and Scott, *New Second Latin Book*, Bennett's *Latin Grammar*, and Bennett's *New Latin Composition*.

Twenty lessons (four credits). Mr. Cram. \$13.50.

- *4. Caesar II. Translations of the Second Expedition into Britain (Book V, chs. 1-23) and of the Manners and Customs of the Gauls and Germans (Book VI, chs. 9-29); syntax; composition. Textbooks: same as in Course 3. Prerequisite: Course 3 or equivalent.

Twenty lessons (four credits). Mr. Cram. \$13.50.

- *5. Cicero I. Translation of the First and Second Oration against Catiline and of selected Letters; syntax; composition; life of Cicero. Textbooks: Kelsey's *Cicero*, Bennett's *Grammar* and *New Latin Composition*. Open to those who have completed two years of preparatory Latin.

Twenty-seven lessons (five credits). Mr. Cram. \$17.00.

- *6. Cicero II. Translation of the Oration for the Manilian Law (the equivalent of two orations), the Archias, and the Marcellus; syntax; composition. Textbooks: same as in Course 5. Prerequisite: Course 5.

Twenty-seven lessons (five credits). Mr. Cram. \$17.00.

- *7. Virgil's *Aeneid* I. 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. Open to those who have completed three years of preparatory Latin.

Twenty-seven lessons (five credits). Mr. Pike. \$17.00.

- *8. Virgil's *Aeneid* II. Books 3, 4, 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*. Open to those who have completed Course 7.

Twenty-seven lessons (five credits). Mr. Pike. \$17.00

9. 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*. Open to those who have completed four years of preparatory Latin.

Twenty-four lessons (four and one-half credits). Mr. Pike. \$15.00.

10. 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 Menacchmi* 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*. Open to those who have completed Course 7.

Twenty-four lessons (four and one-half credits). Mr. Pike. \$15.00.

* May be taken for one entrance credit.

MATHEMATICS†

PREPARATORY COURSES

1. Elementary Algebra A. A course for students who have never studied algebra. The course treats positive and negative numbers; addition, subtraction, multiplication, and division of monomials and polynomials; simple equations in one unknown quantity; elementary special products and factoring; highest common factor and lowest common multiple. Prerequisite: common school arithmetic.

Twenty lessons (one entrance credit). Mr. Edwards. \$12.50.

2. Elementary Algebra B. This course, with Course 1, constitutes one entrance unit in mathematics. The course treats addition, subtraction, multiplication, and division of fractions including complex fractions; equations in one unknown quantity which involve fractions; graphical representation; simultaneous equations of the first degree; square roots and quadratic surds; quadratic equations in one unknown quantity. Prerequisite: Course 1.

Twenty lessons (one entrance credit). Mr. Edwards. \$12.50.

3. Plane Geometry A. The work of this course is elementary geometry, Books I and II. Rectilinear figures and the circle, with the miscellaneous original exercises and some elementary construction problems. Prerequisite: Courses 1 and 2.

Twenty lessons (one entrance credit). Mr. Edwards. \$12.50.

4. Plane Geometry B. This course treats proportion, similar triangles, proportional properties of line segments, proportional properties of chords and secants, trigonometric ratios, areas of polygons, regular polygons and circles. Prerequisite: Course 3.

Twenty lessons (one entrance credit). Mr. Edwards. \$12.50.

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 to give a well-rounded view of the subject by practice in special proofs and original exercises. Prerequisites: Courses 3, 4, or equivalent.

Equivalent to Mathematics and Mechanics 10, in the College of Engineering.

Twenty-four lessons (one entrance credit). Mr. Edwards. \$15.00.

Note.—Courses 2 and 5 satisfy the requirements of the School of Mines and Metallurgy course, Mine Plant 1.

COLLEGE COURSES

- *6. Higher Algebra, Part I. Brief review of Courses 1 and 2, linear equations in one, two, and three unknowns, with solution by determinants, ratio and proportion, variation, quadratic equations in one and two unknowns, graphs, completion of quadratic equations, progressions, equations in quadratic form, binomial theorem. Prerequisite: Courses 1 and 2, or equivalent.

Twenty-seven lessons (five credits). Mr. Teeter. \$17.00.

* May be taken for one entrance credit.

† See also Engineering, Courses 1, 2, 19.

Note.—Courses 5 and 6 meet the extra high school requirements in mathematics of the College of Engineering.

7. Higher Algebra, Part II. A continuation of Part I, including a study of variations, quadratic equations, special higher equations, simultaneous equations of the second degree, maxima and minima of functions, logarithms, theory of equations, solution of numerical higher equations, mathematical induction, combinations, permutations, probability, determinants (of orders above 3) and their applications.

Equivalent to Mathematics and Mechanics 11, in the College of Engineering.

Twenty-seven lessons (five credits). Mr. Teeter. \$17.00.

Note.—Courses 6 and 7 satisfy the requirements of the School of Mines and Metallurgy course, Mine Plant 2 and 3.

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. Prerequisite: Course 6 and logarithms. (Students who did not have logarithms in higher algebra may secure special lessons in this subject.)

Twenty-seven lessons (five credits). Mr. Teeter. \$17.00.

Equivalent to Mathematics and Mechanics 12, in the College of Engineering.

Note.—Course 8 satisfies the requirement of the School of Mines and Metallurgy course, Mine Plant 4.

9. Plane and Solid Analytical Geometry. This course treats systems of co-ordinates, loci, the type forms of the equation of the straight line with application; the circle, central and general conic sections, tangents, diameters, asymptotes, some higher plane curves, parametric loci, polar curves, elements of solid analytic geometry. The fundamental problem of the equation and its locus forms the basis of the course. Prerequisite: Courses 7 and 8.

Twenty-seven lessons (five credits). Mr. Teeter. \$17.00.

Equivalent to Mathematics and Mechanics 13, in the College of Engineering.

NOTE.—Course 9 satisfies the requirement of the School of Mines and Metallurgy course, Mine Plant 5.

Descriptive Geometry. See Engineering 24.

10. Differential Calculus. A first course in differential calculus treating differentiation of algebraic and transcendental functions with attention to the notion of the limit of a function, continuity of a function, and the derivative. Extensive practice in the technique of differentiation by means of exercises and applications to maxima and minima, tangents, normals, curvature, singular points, velocity, and acceleration.

Elementary discussion of Rolle's theorem and the law of the mean, indeterminate forms, and partial differentiation. The course is based upon a textbook with supplementary written lectures and exercises upon many of the topics. Prerequisites: Courses 7, 8, and 9.

Equivalent to Mathematics and Mechanics 24, in the College of Engineering.

Twenty-seven lessons (five credits). Mr. Edwards. \$17.00.

11. Integral Calculus. First course in integral calculus. The integration of various types of functions, the definite integral with applications to areas, surfaces, and volumes of geometric figures, rectification of curves and simple problems of mechanics. Much practice in the technique of integration and the use of tables of integrals, the evaluation of simple double and triple integrals. Prerequisite: Differential Calculus.

Equivalent to Mathematics and Mechanics, 25, in the College of Engineering.

Twenty-seven lessons (five credits). Mr. Edwards. \$17.00.

Note.—Courses 10 and 11 satisfy the requirements of the School of Mines and Metallurgy courses, Mine Plant 6, 7, and 8.

12. Differential Equations. A study of the elementary differential equations with emphasis on applications to geometry, elementary mechanics, physics, and engineering.

Twenty-seven lessons (five credits). Mr. Teeter. \$17.00.

NOTE.—Credit for courses in Mathematics will be granted by the College of Engineering and Architecture upon the satisfactory completion of a comprehensive examination.

MUSIC

1. Harmony, First Quarter. Sixteen lessons (three credits). Miss Malcolm. \$10.00.
2. Harmony, Second Quarter. Sixteen lessons (three credits). Miss Malcolm. \$10.00.
3. Harmony, Third Quarter. Sixteen lessons (three credits). Miss Malcolm. \$10.00.

These courses offer the work of one year of harmony, as given at the University of Minnesota for resident students in the Department of Music. Consists of the study of scales, intervals, chords and their structure, inversion and progression, modulation, suspension, written exercises on given basses, harmonization of melodies, etc.

No credit for any quarter is given by the Department of Music until all three quarters have been successfully completed; but any quarter may be done by correspondence to supplement work done in residence.

Registration accepted only upon approval of previous preparation in music, which must be fully stated in the application.

51. Instrumentation and Orchestration. A practical study of the standard instruments of band and orchestra; their compass, key, particular difficulties, characteristic passages, effective use in combinations of parts, substitution for missing parts. Reading and writing of scores and individual parts. All with reference particularly to the small orchestra and to school organizations. Prerequisite, Music 1, 2, 3, (Harmony) or its equivalent.

Sixteen lessons (three credits). Mr. Jones. \$10.00.

PERSONNEL ADMINISTRATION

1. Personnel Administration. A general survey course covering the organization of personnel work within an organization, and discussing briefly the types of problems confronting the typical personnel department. The major topics considered include the organization of the personnel department, the selection and placement of workers, education and training, promotion and transfer, health and safety, wages and other incentives, joint relations between employers and employees, employee service, and personnel research. Prerequisite for credit, Labor Problems and Trade Unionism, preceded by Principles of Economics 1 and 2.

Equivalent to Business Administration 167.

Sixteen lessons (three credits). Mr. Stead. \$10.00.

2. Advanced Personnel Administration. A course dealing with the instruments and techniques used in carrying on personnel work. The various instruments and procedures used are analyzed and evaluated in connection with such matters as the labor audit, job analysis, selection procedure, labor turnover analysis, rating scales and promotion charts, salary control, training procedure, personal adjustments, and personnel research methods. Prerequisites for credit, Personnel Administration, Course 1.

Equivalent to Business Administration 168.

Sixteen lessons (three credits). Mr. Stead. \$10.00.

NOTE.—For sequence of courses leading to specific training for personnel positions see page..

For necessary courses in Economics, see page 22.

For necessary courses in Psychology, see page 47.

Registrations will be accepted after October 1, 1927.

PHYSICS

PREPARATORY COURSES

1. Elementary Physics A. Weights and measures, simple machines, mechanics of liquids, mechanics of gases, non-parallel forces, elasticity and strength of materials, accelerated motion, force and acceleration, energy and momentum, heat—expansion and transmission—water, ice, and steam, heat engines.

Sixteen lessons (no credits). Mr. Teeter. \$10.00.

CORRESPONDENCE COURSES

2. Elementary Physics B. Magnetism, the beginnings of electricity, battery currents, measuring electricity, induced currents, electric power, alternating current machines; sound; lamps and reflectors, lenses and optical instruments, spectra and color, electric waves, Roentgen rays. Sixteen lessons (no credits). Mr. Teeter. \$10.00.

Note.—These preparatory courses in physics are without laboratory work; hence carry no entrance credit. They do, however, meet the physics requirements of the College of Dentistry and will prepare a student to pass the state teacher's examination in physics for a first grade certificate.

COLLEGE COURSES*

1. Elements of Mechanics and Sound. An elementary university course in the fundamental principles of mechanics and sound. Theoretical course without laboratory work. Prerequisites, Trigonometry and one year of high school physics.
Equivalent to Physics 3 offered in residence.
Sixteen lessons (three credits). Mr. Edwards. \$10.00.
2. Heat. An elementary university course in the general principles of heat, without laboratory work. Prerequisite: Course 1.
Equivalent to Physics 23 offered in residence.
Sixteen lessons (three credits). Mr. Edwards. \$10.00.
3. Optics. An elementary university course in the fundamental principles of light. Prerequisite: Course 1.
Equivalent to Physics 33 offered in residence.
Sixteen lessons (three credits). Mr. Edwards. \$10.00.
4. Magnetism and Electricity. An elementary university course in the principles underlying electrical and magnetic phenomena. Prerequisite: Course 1.
Equivalent to Physics 43 offered in residence.
Sixteen lessons (three credits). Mr. Edwards. \$10.00.

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 to the present problems of national government.
Twenty-seven lessons (five credits). Mr. Walker. \$17.00.
2. Municipal Government. The organization, work, and problems of city governments. The relation of the city to the state and national governments. The legal basis of city government—the city charter.

* Courses in physics carry no pre-professional credit. All applications for college physics are subject to approval by the Department of Physics.

Home rule. Mayor-council, commission, and city manager plans of organization. The organization and powers of the council. Ordinance making. Nomination and election of officials. Civil service. Initiative, referendum and recall. Budgets, revenues, and expenditures, and debt. Prerequisite for credit, Course 1.

Twenty-seven lessons (five credits). Mr. Walker. \$17.00.

- 2A. Municipal Government—Short Course. An abbreviation of the course above, covering its essential features, the problems of city government with particular reference to Minnesota. It is designed primarily for public officials and persons interested in civic problems.

Sixteen lessons (no credit). Mr. Walker. \$10.00.

3. State Government. Colonial origins of the state governments; the transition from colonial to state government; essential features of early state governments; the purpose and theory of the federal system; constitutional basis for state authority and limitations; the state constitution; the legislature and legislation; the governor; the courts; administrative organization and activities; finance, taxation, sources of revenue, and the budget; the civil service; the electorate and elections; expression of public opinion; the relation of the state to its subdivisions; special problems.

Twenty-seven lessons (five credits). Mr. Walker. \$17.00.

4. International Law. A survey of the generally accepted principles of international law. The lessons cover the relations between sovereign states during both peace and war. Attention is paid to the chief problems of the law especially those arising out of the World War. Specific problems are treated by case work. Prerequisite for credit: Course I.

Twenty-four lessons (four and one-half credits). \$15.00.

5. Political Parties. A course dealing with the nature, functions, organization, and methods of political parties and public opinion as a factor in representative government. The lessons cover the methods of nominating public officers, the conduct of election campaigns, the election law of Minnesota, the operation of political parties in the actual control of government. Careful study is made of a number of specific problems of democracy including the direct primary, corrupt practices, boss rule, the spoils system and the civil service, the initiative, referendum and recall, and the short ballot.

Sixteen lessons (three credits). Mr. Walker. \$10.00.

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.

Sixteen lessons (three credits). Mr. White. \$10.00.

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. Prerequisite: Course 1.

Sixteen lessons (three credits). Mr. White. \$10.00.

3. Applied Psychology. A survey of practical applications of psychology. Special topics considered are: methods of selecting employees; history and evaluation of attempts at character analysis; measurement of mental traits; improving efficiency in office and shop; problems of advertising and selling. Prerequisite: Psychology 1 and 2.

Sixteen lessons (three credits). Mr. White. \$10.00.

4. Employment and Vocational Psychology. Psychology of individual differences in intelligence, aptitudes, interests, and training with special reference to vocational guidance and personnel methods in education and industry. Prerequisites for credit: Courses 1 and 2, four additional credits in psychology, education, or a social science.

Sixteen lessons (three credits). Mr. Paterson. \$10.00.

NOTE.—Registrations will be accepted after October 1, 1927.

EDUCATIONAL PSYCHOLOGY

(See Education 1)

ROMANCE LANGUAGES

FRENCH

- *1. Beginning French I. French grammar and reader; modern texts. Twenty-seven lessons (five credits). Mr. Frelin. \$17.00.
- *2. Beginning French II. A continuation of Course 1, which is prerequisite to it. Twenty-seven lessons (five credits). Mr. Frelin. \$17.00.
- *3. Intermediate French I. Review of grammar; composition, reading of representative authors. Prerequisite: Courses 1 and 2 or equivalent. Twenty-seven lessons (five credits). Mr. Frelin. \$17.00.
- *4. Intermediate French II. A continuation of Course 3. Prerequisite: Course 3. Twenty-seven lessons (five credits). Mr. Frelin. \$17.00.
8. Scientific French I. Readings from general works on scientific subjects. Particularly valuable to pre-medical students and others who expect to take up courses in science. Prerequisite: Courses 1, 2, and 3. Sixteen lessons (three credits). Mr. Frelin. \$10.00.
9. Scientific French II. A continuation of Course 8. Sixteen lessons (three credits). Mr. Frelin. \$10.00.
10. Scientific French III. A continuation of Course 9. Sixteen lessons (three credits). Mr. Frelin. \$10.00.
53. Elementary French Composition. This course is designed to train the student in the use of French. It presupposes a knowledge of intermediate French. It consists of translations of passages of connected prose dealing with everyday life in France, such as traveling, shopping, going

* May be taken for one entrance credit.

to the theater, etc. Towards the end of the course, the student is expected to translate short clippings from newspapers. Prerequisite: Courses 1, 2, 3, and 4.

Sixteen lessons (three credits). Mr. Frelin. \$10.00.

59. Advanced French Composition. A continuation of Course 53. It affords practical exercises in prose composition. Prerequisite: Course 53 or equivalent.

Sixteen lessons (three credits). Mr. Frelin. \$10.00.

SPANISH

- *1. Beginning Spanish I. Grammar and reading. In this course stress will be laid upon grammar, accurate translation, and composition. Exercises in phonetic equivalents will be given with the view of acquiring a careful pronunciation.

Twenty-seven lessons (five credits). Mr. Clefthon. \$17.00.

- *2. Beginning Spanish II. A continuation of Course 1.

Twenty-seven lessons (five credits). Mr. Clefthon. \$17.00.

- *3. Intermediate Spanish I. Review of grammar; composition, reading of modern Spanish texts. Prerequisite: Courses 1 and 2 or equivalent.

Twenty-seven lessons (five credits). Mr. Clefthon. \$17.00.

- *4. Intermediate Spanish II. A continuation of Course 3. Prerequisite: Courses 1, 2, and 3.

Twenty-seven lessons (five credits). Mr. Clefthon. \$17.00.

53. Elementary Spanish Composition. Connected prose composition dealing with everyday life in Spain. The aim is the ability to write Spanish. Prerequisite Courses 1, 2, 3, and 4 or equivalent.

Sixteen lessons (three credits). Mr. Arjona. \$10.00.

59. Advanced Spanish Composition. A continuation of Course 53, which is prerequisite.

Sixteen lessons (three credits). Mr. Arjona. \$10.00.

SCANDINAVIAN

NORWEGIAN

- *1. Beginning Norwegian I. Elementary study of the language: grammar, composition, select readings in easy prose and poetry.

Twenty lessons (four credits). Mr. Bothne. \$13.50.

- *2. Beginning Norwegian II. A continuation of Course 1, which is prerequisite.

Twenty lessons (four credits). Mr. Bothne. \$13.50.

- *3. Intermediate Norwegian I. Grammar; composition; elementary history of literature; select works of modern authors. Prerequisite: Courses 1 and 2 or equivalent.

Twenty lessons (four credits). Mr. Bothne. \$13.50.

- *4. Intermediate Norwegian II. A continuation of Course 3.

Twenty lessons (four credits). Mr. Bothne. \$13.50.

* May be taken for one entrance credit.

CORRESPONDENCE COURSES

5. Advanced Norwegian I. The reading of representative prose and poetry.
Prerequisite: Courses 1, 2, 3, and 4 or equivalent.
Twenty-four lessons (four and one-half credits). Mr. Bothne.
\$15.00.
6. Advanced Norwegian II. A continuation of Course 5. Reading in prose and verse.
Twenty-four lessons (four and one-half credits). Mr. Bothne.
\$15.00.

SWEDISH

- *1. Beginning Swedish I. Grammar and composition; select readings in easy prose and verse.
Twenty lessons (four credits). Mr. Stomberg. \$13.50.
- *2. Beginning Swedish II. A continuation of Course 1, which is prerequisite.
Twenty lessons (four credits). Mr. Stomberg. \$13.50.
- *3. Intermediate Swedish I. Grammar; composition; easy reading. Prerequisite: Courses 1 and 2.
Twenty lessons (four credits). Mr. Stomberg. \$13.50.
- *4. Intermediate Swedish II. A continuation of Course 3.
Twenty lessons (four credits). Mr. Stomberg. \$13.50.
107. Swedish Literature I. History of Swedish literature from 1718 to the present time. History of the literature, and study of modern authors, including Selma Lagerlöf, Gerierstam, Strindberg. Prerequisite: Courses 1, 2, 3, 4, and advanced Swedish. No credit is given until Courses 107-108-109 are completed.
Sixteen lessons (three credits). Mr. Stomberg. \$10.00.
108. Swedish Literature II. A continuation of Course 107. Open to advanced students. No credit is given until Courses 107-108-109 are completed.
Sixteen lessons (three credits). Mr. Stomberg. \$10.00.
109. Swedish Literature III. A continuation of Course 108. No credit is given until Courses 107, 108, 109 are completed.
Sixteen lessons (three credits). Mr. Stomberg. \$10.00.

SECRETARIAL STUDIES

These courses are designed to meet the needs of those who have studied the principles of any system of shorthand and can write that system with reasonable speed and a high degree of accuracy; who have also studied the touch system of typewriter operation and can write from correct copy 40 words a minute with 10 errors or less; and who desire to pursue a course in the analysis of secretarial duties and traits required for the successful performance of the secretarial function in a modern business enterprise.

* May be taken for one entrance credit.

PREPARATORY

Secretarial Practice A. The organization of work in shorthand and transcription; abbreviations and contractions; compounding; capitalization; punctuation; divisions and footnote references. Time and motion study in stenographic work. Arrangement of material to be typed on the page, especially letters; customary usage in printed matter; use of the typewriter as a machine to maximum capacity.

Prerequisite to Secretarial Practice (college course) but may be omitted in case the student shows the competency necessary to satisfy the final examination requirement.

Sixteen lessons (no credit). Miss Leonard. \$10.00.

COLLEGE COURSES

1. Secretarial Practice. A summary of secretarial duties, calling attention to advisable traits of character; duties involved in meeting and handling people; titles of address; editorial duties; proofreading; use of U. S. postal service; indexing and filing; telegrams and cablegrams; miscellaneous clerical duties. Prerequisite: Secretarial Practice A (preparatory course) or its equivalent.

Sixteen lessons (three credits). Miss Leonard. \$10.00.

2. Office Organization and Management. A general course dealing with (1) the place of the office in business, (2) functional analysis, (3) personnel, hiring and training, (4) planning, production control, (5) standardization, (6) scientific management. Prerequisite: Secretarial Practice.

Sixteen lessons (three credits). Miss Leonard. \$10.00.

NOTE.—For suggested sequence of courses, see page 12. For courses in Business Correspondence, Business Law, and Accounting, see Business section, page 19.

Registrations will be accepted after October 1, 1927.

SOCIAL SCIENCE

PREPARATORY COURSE

1. Social Science A. This is a course whose primary aim is to give citizens an insight into the world in which they are living—an insight which will enable them to understand the economic, social, and political happenings of everyday existence and through their understanding to live more useful lives. Since present institutions are the outgrowth of past experience, the first few weeks will be spent in an historical survey of man's progress up through the industrial revolution. The remaining three quarters of Part A is devoted to a study of the present economic organization of society. Production, consumption, exchange, and transportation are taken up in turn. Much attention is given to certain fundamental principles which should underlie all business dealings.

Twenty lessons (one entrance credit). Mr. Lundquist. \$12.50.

2. Social Science B. Community Life and Civic Problems. The course aims to give an insight into governmental activities as they affect the life of individuals in everyday contacts. Group life and community problems are first analyzed. A brief survey of industrial society follows, where especial attention is given to work and the worker, exchange, transportation, labor, and capital. Students are finally asked to study the machinery of government as a controlling factor in the township, village, municipality, county, state, and nation, with which political parties and the ballot are concerned. In a good social organization the citizens are given a chance to express themselves when they do their civic duty to their respective communities. The activities emphasized in this course represent the main items in that duty.

Twenty lessons (one entrance credit). Mr. Lundquist. \$12.50.

SOCIOLOGY

1. Introduction to Sociology. A study of the evolution and present organization of human society. The evolution of typical social institutions, such as the family, industry, and the state; the influence of the biological and environmental (both physical and social) factors upon man in his social relationships; an introductory analysis of some of the leading social problems of the time; a study of the methods of social organization and control, especially from the standpoints of tradition, custom, and science. This course is intended to serve (1) as an introduction to other more specialized courses in sociology, (2) as a background for a better understanding of the society in which we live and of its problems.

Twenty-seven lessons (five credits). Mr. Lundquist. \$17.00.

3. Principles of Social Work. A study of the historical background and development of social work; its various divisions and their interrelations; national, state, and local organizations and institutions. Prerequisite: Course 1.

Sixteen lessons (three credits). Mrs. Doyle. \$10.00.

14. 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 county determine the type of rural communities. Problems of sanitation, co-operation, education, religion, recreation, crime, and dependency growing out of these conditions. This course has been thoroly revised.

Twenty-seven lessons (five credits). Mr. Lundquist. \$17.00.

52. Field Work in Rural Sociology. Students who have completed the work in Rural Sociology (Sociology 14) or its equivalent may, with the consent of the instructor, enroll for more advanced work on some selected rural community problem. The work will consist of the application of the survey method to the study of the problem selected. Schedules will be provided through the Correspondence Department. The student will

- collect the data and will be responsible for some preliminary interpretation of this data. The accuracy of the completed schedules, which will be returned to the instructor, and the ability shown in interpreting the data collected will serve as a basis for judging the quality of the work done. One, two, or three hours' credits, according to amount of work done. Mr. Lundquist. \$5.00.
60. Child Welfare. Study of social obligations to the child; development of the child-saving movement in the United States; infant and child mortality, recreation, education; courts, institutions, societies, and other public efforts for the child. Prerequisite: Course 1 or equivalent. Sixteen lessons (three credits). Mrs. Doyle. \$10.00.
101. Social Organization. A study of the foundations of democracy, including the organization and structure of groups, the development of social ideals, the factors producing disorganization and reorganization of institutions, and the methods of promoting an intelligent and lasting democracy. Prerequisite: Course 1 or equivalent. Sixteen lessons (three credits). Mr. Lundquist. \$10.00.
110. Rural Community Organization. This course is intended for those working in the rural community and small towns and considers more technical problems than those discussed in the course in Rural Sociology. The subjects covered include co-operation, organization for health and sanitation, the social work of the church and schools, organized recreation, clubs, social centers, the organization and co-operation of rural social agencies, small town and county organization, social surveys. Should be preceded by Course 14 (Rural Sociology), but may be taken independently by those who have a special interest in the subject. Sixteen lessons (three credits). Mr. Lundquist. \$10.00.
119. The Family. The evolution of the family; its various forms and their relation to other social institutions; the rôle of the family in social evolution; contemporary problems of the family. Prerequisite: four courses in sociology or the equivalent. Sixteen lessons (three credits). Mr. Lundquist. \$10.00.
120. Social Progress. A study of the conditions, causes, and criteria of social progress, with the probable limits thereto. Besides the lessons based on the assigned reading, the student will be expected to prepare a paper, either in fundamental criticism of some work on social progress, or in the nature of an original study based on the critical use of library materials. This course is open only to those who have taken Introduction to Sociology and Social Organization, either by correspondence or in residence. Sixteen lessons (three credits). Mr. Lundquist. \$10.00.

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The Bulletin of the University of Minnesota

The Summer Session Announcement of Courses 1927

First Term June 17 to July 30
Second Term July 30 to September 3



Vol. XXX No. 13 February 19 1927

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

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

1927							1928													
JULY							JANUARY							JULY						
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CALENDAR

SUMMER SESSION 1927

June	17-18	Fri.-Sat.	Registration day, first term
June	20	Monday	First term classes begin
July	4	Monday	Independence Day ; a holiday
July	30	Saturday	First term closes
			Registration for second term closes
August	1	Monday	Second term classes begin
September	3	Saturday	Second term closes

THE SUMMER SESSION

BOARD OF REGENTS

The Hon. Fred B. Snyder, Minneapolis, President of the Board	
Lotus Delta Coffman, Minneapolis - - - - -	<i>Ex officio</i>
The President of the University	
The Hon. Theodore Christianson, St. Paul - - - - -	<i>Ex officio</i>
The Governor of the State	
The Hon. J. M. McConnell, St. Paul - - - - -	<i>Ex officio</i>
Commissioner of Education	
The Hon. John G. Williams - - - - -	Duluth
The Hon. Alice Warren - - - - -	Minneapolis
The Hon. Egil Boeckmann - - - - -	St. Paul
The Hon. Archie D. Wilson - - - - -	Guthrie
The Hon. W. J. Mayo - - - - -	Rochester
The Hon. George H. Partridge - - - - -	Minneapolis
The Hon. J. E. C. Sundberg - - - - -	Kennedy
The Hon. Julius A. Collier - - - - -	Shakopee
The Hon. Bess M. Wilson - - - - -	Redwood Falls

FACULTY

ADMINISTRATION

Lotus D. Coffman, Ph.D., LL.D., President
William Watts Folwell, LL.D., President Emeritus
Frederick J. Kelly, Ph.D., Dean of Administration and Director of the
Summer Session
Irving W. Jones, Ph.B., Associate Director of the Summer Session
Edward M. Freeman, Ph.D., Vice-Director of the Summer Session
Edward E. Nicholson, M.A., Dean of Student Affairs
Anne D. Blitz, M.A., Dean of Women
Frank K. Walter, M.A., M.L.S., University Librarian
Rodney M. West, B.A., Registrar

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

John B. Johnston, Ph.D., Dean

ANIMAL BIOLOGY

William A. Riley, Ph.D., Professor
Harry W. Norris, M.A., Professor, Grinnell College
Ethelbert W. Stafford, M.S., Assistant Professor, Mississippi College of
Agriculture and Mechanic Arts
John A. Cederstrom, Ph.B., Instructor

ASTRONOMY

William O. Beal, Ph.D., Assistant Professor

BOTANY

Josephine Tilden, M.S., Professor
Ernest Dopp, Jr., M.A., Instructor
Ethel M. Mygrant, M.S., Instructor
Esther G. Herrick, B.S., Assistant

ECONOMICS

(See under School of Business Administration)

ENGLISH

Thomas T. Beyer, M.A., Professor, Hamline University
Cecil A. Moore, Ph.D., Professor
Frank M. Rarig, M.A., Professor
Theodore Wedel, Ph.D., Professor, Carleton College
Martin B. Ruud, Ph.D., Associate Professor
Lewis B. Hessler, Ph.D., Assistant Professor
Elizabeth Jackson, Ph.D., Assistant Professor
Wayne L. Morse, M.A., Assistant Professor
Charles W. Nichols, Ph.D., Assistant Professor
Otilie Seybolt, M.A., Assistant Professor

FACULTY

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Emerson Sutcliffe, Ph.D., Assistant Professor
Amy Armstrong, M.A., Instructor
Fred S. Beers, B.A., Instructor
Harold E. Briggs, M.A., Instructor
Bryng Bryngelson, M.A., Instructor, University of Wisconsin
Arthur Christy, M.A., Instructor
John Creamer, B.A., LL.B., Instructor
Frances K. del Plaine, M.A., Instructor
Margaret Gable, M.A., Instructor
Adah Grandy, B.L., Instructor
F. Lincoln Holmes, M.A., Instructor
Winslow H. Loveland, M.A., Instructor
Malcolm MacLean, M.A., Instructor
Harlow C. Richardson, B.A., Instructor
Harold Seering, B.A., Instructor

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Ira S. Allison, Ph.D., Instructor

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James Davies, Ph.D., Assistant Professor
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Charles A. Savage, Ph.D., Professor

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Carl A. Mellby, Ph.D., Professor, St. Olaf's College
Lester B. Shippee, Ph.D., Professor
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George M. Stephenson, Ph.D., Assistant Professor
Stanley Perry, B.A., Instructor
Faith Thompson, Ph.D., Instructor

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Eric W. Allen, B.A., Professor, University of Oregon
Henry E. Birdsong, M.A., Professor, Butler University

LATIN

Ernest Lussky, M.A., Instructor, Concordia College

SUMMER SESSION

LIBRARY TRAINING

Frank K. Walter, M.A., M.L.S., University Librarian
 Clara F. Baldwin, B.A., Director of Libraries, Minnesota Educational Department
 Harriet A. Wood, B.A., Assistant Director of Libraries and Supervisor of School Libraries, Minnesota State Education Department

MATHEMATICS

William L. Hart, Ph.D., Professor
 Dunham Jackson, Ph.D., Professor
 Raymond Brink, Ph.D., Associate Professor
 S. Elizabeth Carlson, Ph.D., Instructor

MUSIC

Earl Killeen, Professor
 Donald Ferguson, M.A., Associate Professor
 William Lindsay, Associate Professor
 George Fairclough, F.A.G.O., M.Mus., Assistant Professor
 Gertrude Hull, Assistant Professor
 Gertrude Reeves, Assistant Professor
 Blanche Kendall, Instructor
 Abe A. Pepinsky, Instructor
 Karl Scheurer, Instructor
 Clyde W. Stephens, Instructor
 Mary Malcolm, B.S., Assistant

PHILOSOPHY

David F. Swenson, B.S., Professor
 Homer H. Dubs, Ph.D., Instructor

PHYSICS

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 Anthony Zeleny, Ph.D., Professor
 Leuallen F. Miller, Ph.D., Associate Professor
 Joseph D. Valasek, Ph.D., Assistant Professor
 J. William Buchta, Ph.D., Instructor
 Iwao Fukushima, M.A., Assistant

POLITICAL SCIENCE

Cephas D. Allin, LL.B., M. A., Professor
 William Anderson, Ph.D., Professor
 Mcrris B. Lambie, Ph.D., Professor
 Jeremiah S. Young, Ph.D., Professor
 Harold Kumm, M.A., S.J.D., Assistant Professor
 Ford P. Hall, B.A., B.C.L., Instructor
 Landreth Harrison, M.A., Instructor
 Harvey Walker, B.A., Assistant

FACULTY

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PSYCHOLOGY

Donald G. Paterson, M.A., Professor
Arthur G. Bills, Ph.D., Assistant Professor
Charles Bird, Ph.D., Assistant Professor
William T. Heron, Ph.D., Assistant Professor
Carlyle Jacobsen, B.A., Instructor
Theos A. Langlie, B.A., Instructor
Mary Shirley, M.A., Instructor

ROMANCE LANGUAGES

Francis B. Barton, Docteur l'Université de Paris, Associate Professor
Edward H. Sirich, Ph.D., Associate Professor
Herbert E. Clefton, Ph.D., Assistant Professor
David R. Blanpied, B.A., Instructor

SCANDINAVIAN

Andrew A. Stomberg, M.S., Professor

SOCIOLOGY

F. Stuart Chapin, Ph.D., Professor
Pitirim A. Sorokin, Dr. of Soc., Professor
Edwin H. Sutherland, Ph.D., Professor
Gustav A. Lundquist, M.A., Assistant Professor
Louis A. Boettiger, Ph.D., Professorial Lecturer, Lawrence College
Joanna C. Colcord, M.S., Professorial Lecturer
Monica Keating Doyle, B.A., Lecturer
Otis D. Duncan, B.A., Instructor
Anne L. Fenlason, B.A., Instructor
Fred Frey, M.A., Instructor

COLLEGE OF ENGINEERING AND ARCHITECTURE

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ARCHITECTURE

Frederick M. Mann, M.S.(Arch.), C.E., Professor
Elmer E. Young, Assistant Professor
Donald C. Heath, B.S.(Arch.), Instructor

CIVIL ENGINEERING

John I. Parcel, B.A., B.S.(C.E.), Professor

DRAWING AND DESCRIPTIVE GEOMETRY

Robert W. French, B.S. (C.E.), Associate Professor
Leon Archibald, B.Sc., Assistant Professor
Henry C. T. Eggers, B.S. in Eng., E.E., Assistant Professor
Robert F. Schuck, B.S. (C.E.), Assistant Professor
Lloyd J. Quaid, B.S.(E.E.), Instructor

MATHEMATICS AND MECHANICS

Hans H. Dalaker, Ph.D., Professor
 William F. Holman, Ph.D., Professor
 Jacob O. Jones, M.C.E., Professor
 George C. Priester, M.S., Associate Professor
 Henry E. Hartig, Ph.D., Assistant Professor
 Carl A. Herrick, M.E., Assistant Professor
 Roderick W. Siler, B.S., Assistant Professor
 Hugh B. Wilcox, M.S.(E.E.), Assistant Professor
 Harry A. Doeringsfeld, C.E., Instructor
 Forrest E. Miller, B.S.(A.E.), Instructor
 Walter R. Warne, Ph.B., B.Pd., Instructor

MECHANICAL ENGINEERING

S. Carl Shipley, B.E., M.E., Professor
 Thomas P. Hughes, Instructor
 William H. Richards, Instructor

COLLEGE OF AGRICULTURE, FORESTRY, AND
HOME ECONOMICS

Edward M. Freeman, Ph.D., Dean

AGRICULTURAL BIOCHEMISTRY

Ross A. Gortner, Ph.D., Professor
 Clyde H. Bailey, Ph.D., Professor
 Leroy S. Palmer, Ph.D., Professor
 John J. Willaman, Ph.D., Associate Professor

AGRICULTURAL ECONOMICS

John D. Black, Ph.D., Professor
 H. Bruce Price, Ph.D., Associate Professor
 Warren C. Waite, Ph.D., Assistant Professor
 Thomas G. Stitts, Ph.D., Instructor
 Martha Epps, B.S., Research Assistant
 Dan C. Dvoracek, B.S., Graduate Student

AGRONOMY AND FARM MANAGEMENT

Herbert K. Hayes, D.Sc., Professor
 Albert C. Army, M.S., Associate Professor
 Howard Bennett Sprague, B.S., Assistant Professor
 Frederick J. Stevenson, M.S., Assistant Professor

DAIRY HUSBANDRY

Ciarence H. Eckles, M.S.A., D.Sc., Professor
 Willes B. Combs, M.A., Professor
 Otto G. Schaefer, M.S., Associate Professor

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Royal N. Chapman, Ph.D., Professor
 Arthur G. Ruggles, M.A., Professor
 Clarence E. Mickel, Ph.D., Assistant Professor

HOME ECONOMICS

Wylle B. McNeal, M.A., Professor
 Clara M. Brown, M.A., Associate Professor
 Harriet Goldstein, Associate Professor
 Marion Weller, B.A., Associate Professor
 Katharine H. McFarland, M.A., Assistant Professor
 Jane M. Leichsenring, Ph.D., Assistant Professor
 Adella Eppel, M.S., Instructor
 Vetta Goldstein, Instructor
 Agnes Kolshorn, M.A., Instructor
 Paulene Nickell, B.S., Instructor
 Julia Beth Whiteside, B.S., Instructor

HOME ECONOMICS EDUCATION

Wylle B. McNeal, M.A., Professor
 Clara M. Brown, M.A., Associate Professor
 Harriet Goldstein, Associate Professor
 Ella J. Rose, B.S., Instructor

HORTICULTURE

William H. Alderman, B.S.A., Professor

PLANT PATHOLOGY AND BOTANY

Elvin C. Stakman, Ph.D., Professor

LAW SCHOOL

Everett Fraser, B.A., LL.B., Dean

Henry J. Fletcher, LL.M., Professor
 James Paige, M.A., LL.M., Professor
 Henry L. McClintock, Ph.D., LL.D., S.J.D., Assistant Professor
 Ralph H. Dwan, B.A., LL.B., S.J.D., Instructor
 Robert Kingsley, M.A., LL.B., Instructor

THE MEDICAL SCHOOL

Elias P. Lyon, Ph.D., M.D., LL.D., Dean

ANATOMY

Clarence M. Jackson, M.S., M.D., LL.D., Professor
 Andrew T. Rasmussen, Ph.D., Professor
 Richard E. Scammon, Ph.D., Professor
 Charles A. Erdmann, Ph.M.G., M.D., Associate Professor
 Shirley P. Miller, Ph.D., Instructor

SUMMER SESSION

BACTERIOLOGY

Winford P. Larson, M.D., Professor
 Robert G. Green, M.A., M.D., Associate Professor
 Halvor O. Halvorson, M.S., Instructor

PATHOLOGY

Elexious T. Bell, B.S., M.D., Professor
 Benjamin J. Clawson, M.D., Ph.D., Associate Professor
 James S. McCartney, Jr., B.A., M.D., Assistant Professor
 Margaret Warwick, B.S., M.D., Assistant Professor
 William A. O'Brien, M.D., Instructor
 Nathaniel H. Lufkin, B.S., M.B., Teaching Fellow
 Leona McGregor, M.D., Teaching Fellow

PHARMACOLOGY

Arthur D. Hirschfelder, B.S., M.D., Professor
 Edgar D. Brown, Ph.D., M.D., Associate Professor
 Raymond N. Bieter, B.S., M.D., Instructor
 Harold N. G. Wright, B.S., Teaching Fellow

PHYSIOLOGY

Frederick H. Scott, Ph.D., M.B., D.Sc., Professor
 Chauncey J. V. Pettibone, Ph.D., Associate Professor
 Esther M. Greisheimer, Ph.D., M.D., Assistant Professor
 Joseph T. King, M.A., M.D., Instructor
 Raymond L. Gregory, M.A., Instructor

PREVENTIVE MEDICINE AND PUBLIC HEALTH

Harold S. Diehl, M.A., M.D., Associate Professor
 Jay A. Myers, Ph.D., M.D., Associate Professor
 R. Wilson Archibald, D.V.M., Assistant Professor
 Ruth E. Boynton, B.S., M.D., Assistant Professor
 James A. Childs, C.E., Assistant Professor
 Ernest S. Mariette, B.S., M.D., Assistant Professor
 Harold A. Whittaker, B.A., Assistant Professor
 Eula B. Butzerin, R.N., B.S., Instructor
 Ruth Houlton, B.A., R.N., Instructor
 Harry DeWitt Lees, M.D., Instructor
 William A. O'Brien, M.D., Instructor
 Helen C. Peck, R.N., Instructor

MEDICINE

Hilding Berglund, M.D., Professor
 Arthur S. Hamilton, B.S., M.D., Professor
 John Butler, M.D., Associate Professor
 George E. Fahr, B.S., M.D., Associate Professor
 Ernest M. Hammes, M.D., Associate Professor
 J. Charnley McKinley, M.D., Ph.D., Associate Professor
 Henry E. Michelson, B.S., M.D., Associate Professor

Angus W. Morrison, B.A., M.D., Associate Professor
 Jay A. Myers, Ph.D., M.D., Associate Professor
 Henry L. Ulrich, B.S., M.D., F.A.C.S., Associate Professor
 Edwin L. Gardner, B.S., M.D., Assistant Professor
 John A. Lepak, B.S., M.D., Assistant Professor
 Chauncey A. McKinlay, B.A., M.D., Assistant Professor
 Grace Medes, Ph.D., Assistant Professor
 Joseph C. Michael, B.S., M.D., Assistant Professor
 Harry Oerting, M.D., Assistant Professor
 Charles B. Wright, B.A., M.D., Assistant Professor
 Henry Wireman Cook, B.A., M.D., Lecturer
 Edward C. Gager, M.D., Instructor
 Richard H. Lindquist, B.S., M.D., Instructor
 George N. Ruhberg, B.S., M.D., Instructor
 Dale D. Turnacliff, B.S., M.D., Instructor
 Richard S. Ahrens, B.S., M.D., Assistant
 Macnider Wetherby, B.S., M.D., Assistant

OBSTETRICS AND GYNECOLOGY

Jennings C. Litzenberg, B.S., M.D., F.A.C.S., Professor
 Lee W. Barry, M.D., Ph.D., Assistant Professor
 Clarence O. Maland, B.S., M.D., Assistant Professor
 Jalmar H. Simons, B.S., M.D., F.A.C.S., Assistant Professor
 James F. Hammond, M.D., C.M., Instructor
 Albert C. Schulze, M.D., Instructor
 Joseph F. Bicek, B.S., M.D., Assistant

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Horace Newhart, B.S., M.D., F.A.C.S., Associate Professor
 Walter E. Camp, M.A., M.D., Assistant Professor
 Howard S. Clark, B.S., M.D., F.A.C.S., Assistant Professor
 John S. Macnie, B.A., M.D., F.A.C.S., Assistant Professor
 William E. Patterson, M.D., Assistant Professor
 Fred J. Pratt, Jr., M.D., Assistant Professor
 John A. Pratt, M.D., F.A.C.S., Assistant Professor

PEDIATRICS

Frederic W. Schlutz, B.A., M.D., Professor
 Edgar J. Huenekens, B.A., M.D., Associate Professor
 Chester A. Stewart, Ph.D., M.D., Assistant Professor
 Edward D. Anderson, B.A., M.D., Instructor
 Woodard L. Colby, B.S., M.D., Instructor
 Hyman S. Lippman, M.D., Ph.D., Instructor
 Cecile M. Moriarty, B.S., M.D., Instructor
 Erling S. Platou, B.S., M.D., Instructor
 W. Ray Shannon, B.S., M.D., Instructor
 David M. Siperstein, M.D., M.A., Instructor
 George K. Hagaman, M.D., Assistant
 Frank G. Hedenstrom, B.S., M.D., Assistant
 Albert V. Stoesser, B.S., M.D., Teaching Fellow

SUMMER SESSION

SURGERY

Alexander R. Colvin, M.D., Associate Professor
 Paul W. Giessler, B.S., M.D., Assistant Professor
 James A. Johnson, M.D., F.A.C.S., Assistant Professor
 Gilbert J. Thomas, M.D., Assistant Professor
 Arthur A. Zierold, M.D., Ph.D., Assistant Professor
 John S. Abbott, B.A., M.D., Instructor
 Orwood J. Campbell, B.S., M.D., Instructor
 Walter A. Fansler, M.A., M.D., Instructor
 James M. Hayes, M.D., M.S., F.A.C.S., Instructor
 Myron O. Henry, B.S., M.D., Instructor
 Walter J. Kremer, M.D., Instructor
 Frank S. McKinney, B.A., M.D., Instructor
 Frederick A. Olson, B.A., M.D., M.S., Instructor
 Edward A. Regnier, B.S., M.D., Instructor
 Emil C. Robitshek, M.D., Instructor
 Owen H. Wagensteen, M.D., Ph.D., Instructor
 Anton G. Wethall, B.S., M.D., Instructor
 Arthur F. Bratrud, B.S., M.D., Assistant

ROENTGENOLOGY

Karl W. Stenstrom, Ph.D., Associate Professor
 Robert G. Allison, M.D., Assistant Professor

COLLEGE OF DENTISTRY

Alfred Owre, D.C.D., M.D., C.M., B.A., Dean

Peter J. Brekhus, B.A., D.D.S., Professor
 Charles A. Griffith, D.D.S., Professor
 William F. Lasby, B.A., D.D.S., Professor
 James M. Walls, D.M.D., Professor
 Amos S. Wells, B.A., D.D.S., Professor
 Carl W. Waldron, M.D., D.D.S., F.A.C.S., Associate Professor

SCHOOL OF CHEMISTRY

Ora M. Leland, B.S., C.E., Dean

Samuel C. Lind, Ph.D., Professor and Director
 Paul H. M.-P. Brinton, Ph.D., Professor
 William H. Hunter, Ph.D., Professor
 Frank H. MacDougall, Ph.D., Professor
 Charles A. Mann, Ph.D., Professor
 M. Cannon Sneed, Ph.D., Professor
 Isaac W. Geiger, Ph.D., Associate Professor
 Everhart P. Harding, Ph.D., Associate Professor
 Lloyd H. Reyerson, Ph.D., Associate Professor
 Ralph E. Montonna, Ph.D., Assistant Professor
 Norville C. Pervier, Ph.D., Assistant Professor

Landon A. Sarver, Ph.D., Assistant Professor
 Lee I. Smith, Ph.D., Assistant Professor
 Gladstone B. Heisig, M.S., M.A., Instructor
 J. Lewis Maynard, B.A., Instructor

COLLEGE OF EDUCATION

Melvin E. Haggerty, Ph.D., Dean

AGRICULTURAL EDUCATION

Ashley V. Storm, Ph.D., Professor
 Albert M. Field, M.S., Associate Professor
 Frank W. Lathrop, Ph.D., Associate Professor

ART EDUCATION

Robert S. Hilpert, B.S., Assistant Professor
 Leah M. Hanley, B.S., Instructor
 Gertrude D. Ross, B.S., Instructor

EDUCATIONAL ADMINISTRATION AND SUPERVISION

Anne Dudley Blitz, M.A., Dean of Women
 Fred Engelhardt, Ph.D., Professor
 Leonard V. Koos, Ph.D., Professor
 Wilford S. Miller, Ph.D., Professor
 Estalline Wilson, Assistant Superintendent of Schools, Toledo, Ohio
 Leo J. Brueckner, Ph.D., Associate Professor
 Frank W. Lathrop, Ph.D., Associate Professor
 Belmont Farley, M.A., Professorial Lecturer
 Wesley E. Peik, M.A., Professorial Lecturer
 J. Orin Powers, Ph.D., Assistant Professor of Education, George Washington University
 George Selke, M.A., Assistant Professor
 Marvin J. Van Wagenen, Ph.D., Assistant Professor
 Grayson N. Kefauver, M.A., Instructor
 Ernest O. Melby, B.A., Instructor

EDUCATIONAL PSYCHOLOGY

Wilford S. Miller, Ph.D., Professor
 John G. Rockwell, B.A., Assistant Professor
 Marvin J. Van Wagenen, Ph.D., Assistant Professor
 Alvin C. Eurich, M.A., Assistant
 Herbert F. Sorenson, M.A., Assistant

HISTORY OF EDUCATION

C. C. Peters, Ph.D., Professor of Educational Sociology, Ohio Wesleyan University
 O. B. Griffin, M.A., Instructor in History of Education, Teachers College, Columbia University

SUMMER SESSION

HOME ECONOMICS EDUCATION

Wylle B. McNeal, M.A., Professor
 Clara M. Brown, M.A., Associate Professor
 Ella J. Rose, B.S., Instructor

PUBLIC SCHOOL MUSIC

Abe Pepinsky, Instructor

SPECIAL EDUCATION

Library Training

Alma Penrose, B.L.S., Instructor

Speech Disorders and Behavior Problems of Children

Smiley Blanton, M.D., Professorial Lecturer in Educational Psychology
 Ruth Green, M.A., Instructor
 Myrtle Holtz, Instructor
 Blythe Schee, Assistant

THEORY AND PRACTICE OF TEACHING

Earl Hudelson, Ph.D., Professor
 August C. Krey, Ph.D., Professor
 Albert M. Field, M.S., Associate Professor
 Rewey Belle Inglis, M.A., Assistant Professor
 Joseph Clefton Brown, M.S., Professorial Lecturer
 Wesley E. Peik, M.A., Professorial Lecturer
 Austin H. Turney, M.A., Acting Principal University High School
 Estalline Wilson, M.A., Assistant Superintendent of Schools, Toledo, Ohio
 May Bryne, B.A., Instructor
 Prudence Cutright, Ph.B., Instructor
 John A. Smith, B.Ed., Instructor
 Claude N. Stokes, M.A., Instructor
 Louis A. Tohill, M.A., Instructor
 Palmer O. Johnson, B.A., B.S., Assistant

TRADE AND INDUSTRIAL EDUCATION

Homer J. Smith, Ph.D., Associate Professor
 M. Reed Bass, B.S., Instructor
 Ralph T. Craigo, B.S., Instructor
 Richard A. McGee, B.S., Instructor

PHYSICAL EDUCATION AND ATHLETICS

PHYSICAL EDUCATION FOR MEN

Clarence W. Spears, M.D., Professor
 Louis J. Cooke, M.D., Associate Professor
 Sherman W. Finger, Ph.B., Associate Professor
 Louis F. Keller, M.A., Associate Professor
 Walter Ray Smith, B.A., Instructor
 Niels Thorpe, Instructor

PHYSICAL EDUCATION FOR WOMEN

Millicent Hosmer, B.A., B.S., Instructor
Margaret McRae, Instructor
Elsie Mott, B.S., Instructor
Helen Skinner, B.S., Instructor
Helen Starr, Instructor
Florence Warnock, Instructor
Emma Waterman, B.A., Instructor

SCHOOL OF BUSINESS ADMINISTRATION

Russell A. Stevenson, Ph.D., Dean

Roy G. Blakey, Ph.D., Professor
Frederic B. Garver, Ph.D., Professor
Alvin H. Hansen, Ph.D., Professor
Harold H. Maynard, Ph.D., Professor of Business Organization, Ohio
State University
Bruce D. Mudgett, Ph.D., Professor
Joseph E. Cummings, Ph.D., Associate Professor
Ernest A. Heilman, Ph.D., Associate Professor
J. Warren Stehman, Ph.D., Associate Professor
Roland S. Vaile, M.A., Associate Professor
Walter R. Myers, Ph.D., Assistant Professor
William H. Stead, Ph.D., Assistant Professor

THE INSTITUTE OF CHILD WELFARE

John E. Anderson, Ph.D., Professor and Director
Donald G. Paterson, M.A., Professor
Richard E. Scammon, Ph.D., Professor
Harold S. Diehl, M.A., M.D., Associate Professor
Ruth E. Boynton, B.S., M.D., Assistant Professor
Edith D. Dixon, B.S., Assistant Professor
Josephine C. Foster, Ph.D., Assistant Professor and Principal of the
Nursery School
Florence L. Goodenough, Ph.D., Research Assistant Professor
Jane M. Leichsenring, Ph.D., Assistant Professor
John G. Rockwell, B.A., Assistant Professor
Smiley Blanton, B.S., M.D., Special Lecturer
Monica Keating Doyle, B.A., Lecturer
Edith Boyd, M.D., Instructor

THE SUMMER SESSION

I. GENERAL INFORMATION

The Summer Session of the University of Minnesota is a regularly established division of the University. Its courses are designed (1) for graduate and undergraduate students who wish to reduce their period of residence at the University by accumulating credits during the summer; (2) for superintendents, principals, supervisors, teachers, and others of professional interests who desire further training in their professions; (3) for persons who seek an opportunity to study for intellectual pleasure; (4) for graduates of accredited high schools who do not meet the special subject-matter requirements to enter some of the colleges and professional schools; (5) for high school graduates who wish to become acquainted with the methods of instruction and the policies and practices in collegiate work before registering in the regular session during the academic year. A full quarter's work is offered in the two terms, making possible a four-quarter year for students who desire it.

LOCATION

The main campus of the University of Minnesota is located on the east bank of the Mississippi River in the city of Minneapolis. The summer courses, with the exception of those in agriculture and in home economics, are given on the Minneapolis campus. The university buildings, libraries, laboratories, observatory, and museums are at the service of the summer students. In addition to the equipment of the University, there are a number of public and semipublic libraries in St. Paul and Minneapolis available for the students' use.

The courses in agriculture and home economics are given on the University Farm campus, one of the beautiful spots of the Twin Cities. The College of Agriculture has its own library, laboratories, museums, gymnasium, tennis courts, and grounds for other sports. It also offers the advantages of the main campus, for it is connected with the latter by an intercampus trolley line which gives a regular free thirty-minute service. The Como-Harriet interurban line between the two cities is only a short distance from the college campus, so that the libraries, art galleries, lecture courses, and recreational facilities in both cities are accessible.

DURATION OF THE SESSION

The Summer Session consists of two terms. The first term, of six weeks, begins Friday, June 17, and closes Saturday, July 30. The second term, of five weeks, begins Saturday, July 30, and closes Saturday, September 3. First term classes begin on Monday, June 20; second term classes, on Monday, August 1.

Students registering in the second term who are teachers and are obliged to return to their schools before the close of the term, may, with the consent of instructors, arrange to complete the work *in absentia*. The

granting of such permission is not obligatory on any instructor, and students desiring this privilege should ascertain well in advance the courses in which the permission will be granted. They may then make a program accordingly.

The procedure is that of removing a grade of incomplete by examination. The student should secure the permission of the instructor at the beginning of the term, to avoid misunderstanding later, and then arrange with the registrar for the proper examination.

GENERAL OFFICES

The office of the director of the Summer Session is in Room 235 on the second floor of the new Administration Building. The offices of the registrar and cashier are on the first floor of the new Administration Building. For the convenience of students registering in agriculture and home economics, branch offices are established on the second floor of the Administration Building, University Farm. Details of procedures to be followed in registering will be given out at these places. The several schools and colleges function in the control of students during the summer just as during any other quarter of the year. Students in one college are free to elect courses in another college, however, on approval of the dean of the college in which the student is registered.

DEGREES

Regular collegiate credit is given for summer session work to qualified students. For a detailed statement of the credit requirements for the various degrees, see the general information bulletin for 1926-27, pages 14-22; and the bulletins of the various schools and colleges of the University for the same year.

The University requires at least one year of residence for any degree; and if the term of residence is only one year, that must be the senior year. In any case two quarters of the senior year must be spent in residence. Work completed in the Summer Session is considered as residence credit.

CREDIT

Credit is administered on the following basis: One quarter credit requires in general 12 lecture or recitation periods (two per week for a summer term) requiring two hours of preparation each; or, 24 periods of laboratory work requiring one-half hour of preparation each; or 36 hours of laboratory work with no preparation. Courses carrying two or more units of credit require corresponding multiples of these amounts.

AMOUNT OF WORK

A maximum of nine credits or two five credit courses, is considered a full program for either term. Registration for a greater number requires special permission from the Students' Work Committee, of the school or college in which the student is registered.

Examinations are held at the last scheduled class hour for each course.

GRADING SYSTEM

There are four passing grades, A, B, C, and D, representing varying degrees of achievement.

There are two grades indicating work of distinctly unsatisfactory quality. These grades are E (condition), which may be removed by examination or other means stipulated by the faculty of the college or school concerned, and F (failure), which may be converted into a higher grade only by a repetition of the work in the course or, in exceptional cases, by examination by permission of the faculty concerned.

The grade I (incomplete), indicates that a student, for reasons satisfactory to the instructor in charge, has been unable to complete the work of the course. This grade is given only when the work already done has been of acceptable quality. Any student receiving this grade will be given an opportunity to complete the said course within the first thirty days of his next quarter in residence, or in case of a student who is not in attendance during other quarters of the year, special arrangements may be made by the registrar if application is made before the end of the summer term.

RECREATION

Recreation is an essential part of any program of study, particularly during the summer months. The University of Minnesota makes a special effort to supply this essential in a very complete, and in some ways, unique manner. A recreational program is definitely planned, definitely directed, definitely supported. It is not left to chance, or the accident of student initiative (altho many matters, of course, may be left to student organization), but follows a well-prepared plan. The associate director of the Summer Session is in complete charge of all recreational activities, arranges their place on daily and weekly programs, and assumes responsibility for their being properly carried on. There is a definite provision for their financial support, so that practically all events are available to students without extra charge, or at most with only nominal incidental expense.

The Twin Cities, Minneapolis and St. Paul, in themselves offer many attractions for the summer visitor. As centers of art, music, and education they are well known, and their libraries, museums, and other institutions are easily accessible. As a center of out-door life they are becoming equally famous. There are several large lakes within their city limits, and the park systems contain numerous other small but attractive bits of water. They are, too, the gateway to the countless resorts on the 10,000 lakes of Minnesota. Many students find it desirable and convenient to spend week-ends at some of these resorts.

Some of the forms of recreation provided are enumerated in the paragraphs below:

Lectures and convocations.—Weekly convocations, addressed by speakers of prominence, are supplemented by a series of almost daily lectures. These are given by faculty members and by invited guests, and cover a large variety of subjects of literary, scientific, professional, historical, or popular interest.

Concerts and recitals.—Every week brings one or more occasions when students may withdraw to the concert hall of the Music Building and enjoy a musical program, or a lecture-recital on a musical or literary theme. These occasions are as much for the pure enjoyment of the moment as for the opportunity to enlarge one's acquaintance with masterpieces. They are free to students, and very popular.

Dramatics.—Performances of legitimate drama have become an outstanding feature of the Summer Session. The Masquers, a university dramatic student organization, functions throughout the summer and demonstrates the success attainable with student actors. In addition there is a regular series of motion picture showings, of the best pictures obtainable. For both of these offerings the very best of stage equipment and facilities are provided.

Socials.—Gatherings of a purely social nature are frequent. These afford opportunity for the development of acquaintanceships among students and faculty members, and the comfortable fraternizing that has come to be a recognized element in summer session life. A regular series of these gatherings is definitely organized and directed, while many others result from student planning.

Excursions.—The many points of historical, industrial, artistic, or purely recreational interest around the Twin Cities are made the objectives of definitely organized and personally conducted excursions. These are arranged for the most advantageous hours, and it is a frequent event of a Saturday afternoon to see a party of perhaps two hundred set out from the campus for a highly enjoyable tour. The cost is usually only the necessary street car fare.

Physical activities.—Especial attention is given to the matter of physical recreation, entirely supplementary to the courses in physical education. The facilities and services offered are many and varied, and may be briefly summarized as follows: three gymnasiums, each with a swimming pool—the main gymnasium for men, the women's gymnasium, the Farm gymnasium for students of agriculture and home economics; Northrop Field, for baseball, track, volley ball, diamond ball; thirty tennis courts open for daily use (these are regularly ruled and lined and provided with nets); instructors and attendants on duty at all times; tennis and golf tournaments; baseball teams in regular series of games; swimming at practically all hours of the day; prizes for winners in contests.

All of these facilities are available for both men and women and with no extra charge except for towel service.

Tennis tickets.—The use of the tennis courts is restricted to those holding tickets. Such tickets will be issued to regularly enrolled students of the Summer Session, without charge, upon application to the Athletic Department, University Armory, and presentation of bursar's receipt for fees. Members of the university faculty and staff, and other non-students, may secure these tickets, good for one term, upon payment of one dollar.

Members' tickets.—Certain recreational events are open only to regular members of the Summer Session, and admission is by signed and numbered

tickets. These tickets are issued, without charge, upon presentation of the bursar's receipt for fees. During registration days tickets will be issued at the registrar's office, on both campuses; at other times at the office of the director of the Summer Session, 235 Administration Building.

MINNESOTA UNION

The Minnesota Union is a men's clubhouse, furnishing social and recreational facilities and operating a soda fountain. There are also a ballroom, reception rooms, reading rooms, and lounging rooms. These rooms and their facilities are open to all men students.

SHEVLIN HALL

Shevlin Hall affords to women students what the Minnesota Union does to men. It contains rest and study rooms, rooms for social gatherings, the offices of the dean of women, and the Housing Bureau.

Shevlin Hall cafeteria will be open during the Summer Session, for both men and women.

For women students on the University Farm campus similar facilities are available in the Home Economics Building.

UNIVERSITY POST-OFFICE

The university post-office, for distribution of mail addressed to the University, is located in the basement of the new Administration Building. The University Farm post-office is in the Administration Building. At the time of registration each student is assigned a post-office box in which he will receive all mail, announcements, and university communications. The mail box should be visited at least once a day. When leaving at the close of a session, students should give the postmaster a forwarding address.

OFFICIAL DAILY BULLETIN

Throughout the year an official daily bulletin is issued, in the *Minnesota Daily*, containing announcements to students and faculty. During the summer it also contains other information, programs of the various recreational activities, and matters of general interest which would ordinarily be found only in a daily student newspaper. The bulletin is delivered to offices and laboratories, and to the post-office box of every student early each morning except Monday. Each student is held responsible for the official notices appearing in the bulletin.

STUDENTS' HEALTH SERVICE

The Students' Health Service conducts a dispensary during the Summer Session on the same basis as during the regular school year, the same staff of physicians, dentists, and nurses being on duty. This dispensary maintains, exclusively for students, clinics in medicine, surgery, dermatology, ophthalmology, oto-laryngology, and dentistry. Hospitalization, whenever necessary for students, is provided in the "private patient" section of the University Hospital. Home calls are not made during the Summer Session.

An unusual opportunity for a complete physical examination is offered by the Students' Health Service to those in attendance at the Summer

Session. An annual physical examination is recognized as the only method of discovering chronic disease processes at a time when they are curable and the wisdom of procuring such annual examinations is being widely recognized by the public. For a few years the University has made an examination service available to students during the Summer Session and each year a larger number of students have taken advantage of this service. No extra charge is made for this service.

For surgical operations, special drugs, dentistry, and hospital board, a charge on a strictly cost basis is made. This service is maintained by the University to help each student to possess a healthy, active body, thereby contributing to his success while in college and in later life; and to reduce to a minimum that prodigious academic and economic loss due to indisposition and illness of students.

THE INTERCAMPUS CAR

For students who are registered for class work on both the Minneapolis campus and the University Farm campus, free transportation on the inter-campus car is provided. Tickets will be issued to students registered in the College of Agriculture, Forestry, and Home Economics at the branch office of the registrar at University Farm; to those registered in other colleges, at the Service Department, 11 Administration Building.

Students who are registered for classes on the Minneapolis campus and who live in the College of Agriculture dormitories will also be given free transportation. Tickets will be issued by the Service Department.

SUMMER EMPLOYMENT

Students are not advised to engage in extra work during the summer; a full program of study during the warm weather should, with reasonable recreation, be a sufficiently heavy load. But for the benefit of those who feel compelled to aid themselves financially while in attendance, the service of the University Employment Bureau is always available. There is considerable demand for services during the summer at good rates of remuneration, and many students are aided in this way. The bureau is on the basement floor of the Administration Building.

TEACHERS' EXAMINATIONS

Examinations for state teacher's certificates will be conducted by the State Department of Education at the University during the Summer Session.

THE UNIVERSITY LIBRARY

The University Library is open to all students of the Summer Session. It includes about 425,000 volumes and many periodicals and pamphlets on all subjects in the university curriculum.

The largest part of the library is housed in the new Library Building on the Minneapolis campus. This is among the latest and best university library buildings in the country. Its spacious reading rooms and a special floor with seminar library groups and discussion rooms for advanced students afford a greater seating capacity than any similar building yet erected. The

SUMMER SESSION

library of the Department of Agriculture, with an excellent collection on agriculture and home economics, is located in the Administration Building at the University Farm. Branch libraries are maintained in a few of the schools and colleges, and there are smaller special collections conveniently grouped in the new Library.

The Library Handbook, copies of which may be had gratis upon application at the library, contains information regarding library hours, rules, and other matters essential to the profitable use of the library.

LIVING 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 from \$9 to \$12 per week. In addition to the cafeterias conducted on the campus by the University, several good restaurants are to be found in the immediate vicinity of the University. Further information concerning room and board may be obtained by addressing Mrs. Catherine McBeath, Shevlin Hall. *It is generally more satisfactory to engage accommodations after arrival than to make reservations in advance.*

SANFORD HALL

Sanford Hall, a residence hall for women, is on the Minneapolis campus. It accommodates 228 students. The building has every modern convenience. All rooms have hot and cold water, and each double room has two closets.

The furniture consists of a cot, dresser, a study table, easy chair, straight chair, and rug for each student. All bedding and the laundry for the same is furnished.

The rates during the Summer Session are as follows, payable at the time of registration:

Board and room when occupying a single room, \$60 for the first term.

Board and room when sharing a double room, \$50 for the first term.

Applications should be sent direct to Sanford Hall, University of Minnesota. No application will be recorded until a deposit fee of \$2 is received. This deposit will hold the room until the day after the opening of the Summer Session, and is refunded when the regular charge is paid.

Sanford Hall will be open for room but not for board during the second term. The rates will be \$20 per single room, and \$15 per person for double room for the term.

UNIVERSITY COTTAGES

The University operates five cottages for the accommodation of men students and five for the accommodation of women students. Room rental for the Summer Session will be \$15 to \$21 for the first term, and \$13 to \$18 for the second term. No facilities for serving meals are operated in these cottages during the summer. For reservations, apply to Mrs. Catherine McBeath, director of housing, enclosing \$2 for reservation. This will be refunded when term charges are paid.

DEPARTMENT OF AGRICULTURE DORMITORIES

Men or women taking regular work during the Summer Session either on the Minneapolis campus or on the Farm campus may obtain rooms in the Department of Agriculture dormitories. The dormitories for women contain a few single rooms; other rooms are intended to accommodate two persons. The rooms are furnished with necessary bedding and hand towels, and the laundering is furnished.

The rates during the summer are as follows: single rooms, \$2.50 per week; other rooms, \$2 per week per occupant.

Rooms will be assigned, during registration, at the Girls' Dormitory. Payment for the first term of the Summer Session must be made to the cashier, University Farm, at the time of assignment. Dormitories will be open Saturday, June 18. These dormitories will not be available for the second term of the Summer Session.

A cafeteria with reasonable charges is maintained on the Farm campus.

BUREAU OF RECOMMENDATIONS

The Bureau of Recommendations of the College of Education is operative during the Summer Session. Students who have done sufficient work at the University of Minnesota to secure academic standing here are eligible to the services of the bureau. The office is located at Room 202 Old Library Building.

CORRESPONDENCE COURSES

The Correspondence Study Department of the General Extension Division affords an opportunity to students who come to the University only for the Summer Session to continue their studies during the remainder of the year, and thus to accumulate additional credit toward their degrees as well as to secure the training which regular study gives. On the other hand, students who are now pursuing correspondence courses have in the Summer Session a chance to complete some of their resident work at a time when many of them are free to do so. All those who are interested and who come to the Summer Session are urged to call at the office of the General Extension Division to become acquainted with its work. Full information concerning correspondence courses may be had at any time by addressing the Correspondence Study Department, General Extension Division, 402 Administration Building.

THE INSTITUTE OF CHILD WELFARE

Because of the great interest manifested in the child of pre-school age, the Institute of Child Welfare, recently organized with the aid of a grant from the Laura Spelman Rockefeller Memorial, is offering a number of courses in the summer quarter. Students, both graduate and undergraduate, can secure a well-rounded program in either term, while students who spend the full quarter can secure an exceptional program in this field.

For further information, see the section on the Institute of Child Welfare, page 110.

INSTITUTE ON HIGHER EDUCATION

A genuine interest among college faculty members has been growing during recent years in the problems of higher education. Experimentation and investigation have been undertaken in certain colleges and universities to develop a body of reliable data concerning such questions as personnel, psychological tests, objective examinations, educational and vocational guidance, optimum class size, unit costs, extra-curriculum life of students, and the like. The University of Minnesota has taken an active part in such experimentation and investigation.

To stimulate this interest an Institute on Higher Education will be conducted at the University of Minnesota during the two weeks from July 5 to July 16. A more detailed description of what will be offered will be found on page 102. A special circular describing the institute will be sent on application to the director of the Summer Session.

COURSES IN JOURNALISM EN TOUR

Courses in journalism, for regular university credit, to be taken while touring Europe, are for the first time made available by the Summer Session. This arrangement is possible through co-operation with the European Journalism Tour, conducted by the chairman of the Department of Journalism. The courses and the conditions under which they may be taken are listed on page 42.

TRAVEL-STUDY COURSE FOR TEACHERS

An opportunity to combine travel with study, for university credit, is offered in the field course in geology, Geology 30su. This course is planned primarily for teachers, many of whom are giving instruction in matters that deal with the geography, history, or industrial life of the great north-western part of this country. No finer opportunity to study this region at first hand could be had than on a directed study-tour; and there are few more attractive sections of the country in which to make such a tour. An additional attraction this year is the convention of the National Educational Association, at Seattle.

The course is described more in detail on page 40 of this bulletin; more complete information may be had in a special bulletin which may be secured from the director of the Summer Session.

INFORMATION

Correspondence with reference to the Summer Session and requests for circulars and additional information may be addressed to the director, Summer Session, or the registrar, University of Minnesota, Minneapolis, Minnesota.

II. ADMISSION AND REGISTRATION

ADMISSION

The courses of the Summer Session are open to all qualified high school graduates. Persons of maturity whose preparation does not meet the entrance requirements, may be admitted as unclassified students on approval of the dean of the college or school concerned. Those who desire college credit for their work, and those who desire advanced standing for college

work done elsewhere, should submit their credentials, consisting of official transcripts of their high school, normal school, or college work.

Students should consult the statements in the respective college bulletins for detailed information concerning admission to a given college. General information may be found in the general information bulletin. Any of these bulletins may be obtained by calling upon or writing to the registrar.

For the convenience of students, certain information is given in the summer session bulletins at the opening of the respective sections of description of courses.

REGISTRATION

In order that the short six weeks' terms may prove of maximum value, and that the work of the courses may not be interfered with by late entrants, students must complete their registration, including the payment of their fees, on the days set aside for registration, or pay a late registration fee.

The regular registration days are:

For the first term, Friday, June 17, 9 a.m. to 4 p.m., and
Saturday, June 18, 9 a.m. to 3 p.m.

For the second term, Saturday, July 30, 9 a.m. to 3 p.m.

The late registration fees are as follows:

For the first term, For those completing the registration on

Monday, June 20.....	\$2.00
Tuesday, June 21.....	3.00
Wednesday, June 22 ..	4.00
Thursday, June 23	5.00

No registrations are allowed for the first term after Thursday, June 23, without the special permission of the dean of the school or college concerned, and the payment of the late registration fee of \$5.

For the second term, For those completing their registration on

Monday, August 1	\$2.00
Tuesday, August 2	3.00
Wednesday, August 3 ..	4.00

No registrations will be accepted later than Wednesday, August 3, without the special approval of the dean of the school or college concerned, and the payment of a fee of \$4.

Candidates for admission to all colleges except Agriculture and Home Economics will register in the Library, first floor. Candidates for admission to the College of Agriculture and Home Economics will register at the University Farm, 205 Administration Building, Farm campus.

Changes in Registration

After a student's registration has been accepted by the registrar any change must be made by petition approved by the Students' Work Committee of the college in which the student is registered. Only in exceptional cases will any change be made after classes have begun.

FEES

The following fees are payable by each full time student at the time of registration and must be paid before registration is complete:

Tuition fee (first or second term of Summer Session).....	\$25.00*
General deposit	2.00

In addition certain laboratory courses carry a fee as indicated in the description of those courses.

Charges for lockers, laboratory breakage, library fines, etc., will be deducted from the \$2 deposit and the balance will be refunded by mail after the close of the session.

For fees for students desiring legal time credit in the Medical School, see page 70.

For fees for students registering for clinical courses in the College of Dentistry, see page 84.

For fees for students registering for music courses, see page 44.

For fees for students registering for the eight weeks' course in civil engineering, see page 53.

For part time students, in courses for which the full time fee is \$25, registering for four credit hours or less, the tuition fee is \$15 for either term.

Refund of Fees

Students cancelling during the first week of either term for unavoidable reasons will be granted a four-fifths refund. After twelve o'clock Saturday noon, June 25, no refunds will be granted for the first term. After Saturday noon, August 6, no refunds will be granted for the second term. All refunds must be approved at window 23, registrar's office.

AUDITORS

Permission to attend classes as auditors may be granted by the dean of the college or school with the consent of the department concerned. The form of registration as auditor shall be the same as of registration for credit, except that "auditor" shall be indicated on both registration sheet and class card. It is expected in general that auditors will be registered in at least one course for credit, but this may be waived in exceptional cases. Fees for auditors are the same as for students registered for credit.

III. GRADUATE WORK

It is possible through work in the Summer Session to fulfill the requirements for the Master's degree and absolve in part the requirements for the degree of doctor of philosophy. Any summer session student who is a graduate of a standard college should register through the Graduate School for his courses in the Summer Session.

This bulletin carries an increased number of courses of advanced character. In general, courses numbered above 100 carry graduate credit. There is sufficient work available each summer to fulfill the course requirement for the major and minor in practically any combination of departments.

* This fee of \$25 includes the regular incidental fee. For regular students in Medicine and Dentistry this fee is charged in addition to tuition.

Graduate students from acceptable colleges may expect to meet the residence and course requirements for the Master's degree in four summer sessions of six weeks or three summer quarters. In the former case, additional work on the thesis will be required in order to make up the equivalent of three quarters.

A full statement of the requirements for advanced degrees may be found in the Graduate School bulletin.

Students should bear in mind the necessity of registering each summer in the Graduate School if they desire their work to be counted for an advanced degree.

IV. DEGREES

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

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

2. *Recommendation of the faculty.*

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

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

4. *Attendance at commencement.*—All candidates for degrees are required to be present at commencement exercises provided that the candidate's work is completed at the end of a quarter when such exercises are held. Commencement exercises will be held July 28, 1927.

A student who fails to attend shall not receive his diploma until the expiration of one year, unless in the meantime he attends commencement exercises or unless excused from such attendance by the dean of the college and the president of the University.

5. *Graduation fee.*—A fee of \$10 is charged for each degree.

V. STATEMENT OF COURSES

The following pages contain announcements of the courses offered in the several colleges and schools of the University. Departmental statements also indicate certain requirements as to entrance and credits. For more detailed statements of these matters, reference should be made to the bulletin of general information and the regular annual bulletin of the college concerned.

Following each course is a statement, in parentheses, of credits, classes of students eligible, prerequisite, days of the week, class hour, and location of the class. Thus (3 cred.; jr., sr., grad.; prereq. 12, 13; MTWThF II; 117F) means that the course carries three credits, is open to juniors, seniors, and graduate students, has for a prerequisite Courses 12 and 13, meets on Monday, Tuesday, Wednesday, Thursday, and Friday, at the second hour, in Room 117, Folwell Hall. Abbreviations for class hours and buildings are interpreted by the following tables:

CLASS HOUR SCHEDULE

	Minneapolis Campus	University Farm
I Hour	8:00- 8:50	7:45- 8:35
II Hour	9:00- 9:50	8:45- 9:35
III Hour	10:00-10:50	9:45-10:35
IV Hour	11:00-11:50	10:45-11:35
V Hour	12:00-12:50	11:45-12:35
VI Hour	1:00- 1:50	1:00- 1:50
VII Hour	2:00- 2:50	2:00- 2:50
VIII Hour	3:00- 3:50	3:00- 3:50
IX Hour	4:00- 4:50	4:00- 4:50
X Hour	5:00- 5:50	5:00- 5:50

Convocation, III hour, Thursdays

(See *Official Daily Bulletin* for announcements.)

KEY TO ABBREVIATIONS USED FOR BUILDINGS

Minneapolis Campus Buildings

A, Armory	Exp, Experimental Engineering Bldg	O, Observatory
AB, Animal Biology	F, Folwell Hall	OL, Old Library
Ad, Administration Bldg	G, Greenhouse	OT, Ore Testing Works
B, School of Business	IA, Institute of Anatomy	P, Pillsbury Hall
BM, U.S. Bureau of Mines Bldg	L, Law Bldg	Ph, Physics Bldg
Bot, Botany Bldg	Lib, New Library Bldg	Phm, Pharmacy Bldg
C, Chemistry Bldg	M, Mines Bldg	Psy, Psychology Bldg
D, Dentistry Bldg	MA, Mechanic Arts Bldg	SBH, State Board of Health Bldg
E, Main Engineering Bldg	ME, Mechanical Engineering Bldg	Sh, Shevlin Hall
Ed, Education Bldg	MGH, Minneapolis General Hospital	SS, Storehouse and Shops
EE, Electrical Engineering Bldg	MH, Millard Hall	UD, University Dispensary (Basement MH)
EMH, Elliot Memorial Hospital	Mu, Music Bldg	UH, University Hospital
		WGM, Women's Gymnasium

University Farm Buildings

Ad, Administration Bldg	FH, Farm House	PP, Botany and Plant Pathology
AE, Agricultural Economics Bldg	Gy, Gymnasium	So, Soils Bldg
Ch, Chemistry Bldg	HE, Home Economics Bldg	St, Stock Pavilion
DH, Dairy Hall	HH, Haecker Hall	Ve, Veterinary Bldg
En, Engineering Bldg	Ho, Home Bldg	WH, Women's Hall
	Hr, Horticulture Bldg	
	Pe, Pendergast Hall	

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

GENERAL INFORMATION

The administrative officers of this college and their offices are as follows:

J. B. Johnston, Dean of the College. 219 Administration Bldg.
J. M. Thomas, Assistant Dean for the Senior College. . . 219 Folwell Hall
W. H. Bussey, Assistant Dean for the Junior College. . . 106 Folwell Bldg.
R. R. Shumway, Assistant Dean for Students' Work. . . . 219 Adm. Bldg.

For general information, for the requirements for admission as regular or as unclassified students, for general rules and regulations, and for the requirements for degrees in the different curricula offered by the college, students should consult one of the administrative officers or the complete bulletin of the College of Science, Literature, and the Arts.

Courses announced in this bulletin as open to "juniors and seniors" or to "juniors, seniors, and graduates" are called "senior college courses." They are open to sophomores under certain conditions. See the complete bulletin of the college, or consult one of the administrative officers.

Some of the numbers given in the statements of prerequisites for courses in this summer session bulletin refer to courses listed in the complete bulletin of the college.

Some of the courses scheduled in this summer session bulletin by the School of Business, the School of Chemistry, the College of Engineering and Architecture, the Medical School, the College of Agriculture, Forestry, and Home Economics, are open to students of the College of Science, Literature, and the Arts under the same conditions that prevail during the regular college year. For information, consult one of the administrative officers of this college.

ANIMAL BIOLOGY

Credit is given for acceptable work done at any accredited marine or freshwater biological station.

FIRST TERM

1su¹ General Zoology. A survey of the animal kingdom, emphasizing the principles of morphology, physiology, embryology, heredity, classification, and evolution of animals. Textbook, lectures, quizzes, and laboratory. (5 cred.; all; no prereq.; MTWThF lect., I, II; lab., III, IV; lab., 101, lect., 211AB.) Mr. Norris.

Histology and Embryology. See Anatomy 14su, page 72.

Human Physiology. See Physiology 4su, page 74.

23su. Introductory Entomology. A study of the morphology and general classification of insects. Methods of collecting and preservation of insects will be considered and each student will be expected to prepare a representative, determined collection. Lectures, laboratory, and field

¹ A laboratory fee of \$1.50 is charged for this course.

- work. (5 cred.; prereq., general zoology or biology; MTWThF VI-IX; 202AB.) Mr. Stafford.
- 125su. Advanced Entomology. Morphology, development, and biology of insects, principles of taxonomy, and more detailed classification of important insect groups. Lectures, laboratory, and field work. (3 cred.; jr., sr., grad.; prereq., an introductory course in entomology or its equivalent; TTh I-III and ar.; 202AB.) Mr. Stafford.
- 144su.¹ Animal Parasites. Origin and biological significance of parasitism; structure, life history, and economic relations of representative animal parasites. Lectures, laboratory, and library work. (3 cred.; jr., sr., grad.; prereq., 15 credits in zoology or its equivalent; MWF I-III and ar.; 208AB.) Mr. Riley.
- 149su.¹ Comparative Anatomy. Anatomy, development, and phylogeny of vertebrates. Lectures and laboratory work. (3 cred.; jr., sr., grad.; prereq., 15 credits in zoology or its equivalent; MWF VI-VIII and ar., 101AB.) Mr. Norris.
- 197su. Problems. Opportunity will be afforded for individual work in comparative anatomy, entomology, or animal parasitology. Conferences, laboratory, and library work, leading to thesis problems. (3 or more credits; jr., sr., grad.; prereq., 20 credits in zoology or its equivalent; ar.; not less than 18 actual hours per week.) Mr. Riley, Mr. Norris, Mr. Stafford.

SECOND TERM

- 2su.¹ General Zoology. A continuation of Course 1su. (5 cred.; all; prereq., 1su or its equivalent; MTWThF, lect., I, IV; lab., II, III; lab. 101, lect. 211AB.) Mr. Norris.
- 126su. Advanced Entomology. A continuation of Course 125su. (3 cred.; prereq., 23 or 125su; MWF VI-VIII and ar.; 202AB.) Mr. Stafford.
- 198su. Problems. In special cases, arrangements may be made for the continuation of problems begun during the first term. (3 cred. or more, not less than 18 actual hours per week.) Mr. Riley, Mr. Norris, Mr. Stafford.

ASTRONOMY

FIRST TERM

- 11su. Descriptive Astronomy. A course of lectures and recitations on the general principles of astronomy, illustrated with lantern slides and by the use of the telescope. (5 cred.; 3d qtr. fr., soph., jr., sr.; no prereq.; MTWFS III-IV; 124F.) Mr. Beal.
- 25su. Stellar Astronomy. Review of present state of knowledge concerning the stars and nebulae. Theories of stellar evolution. (3 cred.; soph., jr., sr.; prereq., 3 cred. in astronomy; MTWThFS II; 124F.) Mr. Beal.
- 165su. Selected Topics in Astronomy. An intensive course open to juniors, seniors, and graduates who will be guided through conferences and criticisms in the study of assigned topics. (3 cred.; jr., sr., grad.; prereq., Math. 51, 3 cred. in astronomy; ar.; 123F.) Mr. Beal.

¹A laboratory fee of \$1.50 is charged for this course.

SECOND TERM

- 11su.¹ Descriptive Astronomy. Same as first term.
 25su. Stellar Astronomy. Same as first term.
 165su. Selected Topics in Astronomy. Same as first term.

BOTANY

FIRST TERM

- 1su.¹ General Botany. A study of a typical plant followed by an intensive study of the morphology and physiology of the parts of the plant. Textbook, quizzes, laboratory, lectures (5 cred.; all.; no prereq.; lect., MTWThFS I, quiz, TTh II; lab. MTWThFS III-IV; lect., 06Bot., lab. 5Bot.) Mr. Dopp, Miss Herrick.
- 2su.¹ General Botany. A survey of the plant kingdom emphasizing the principles of morphology, embryology, classification, and evolution of plants. Textbook, quizzes, lectures and laboratory. (5 cred.; all.; no prereq.; lect., MTWThFS IV; quiz., WF III; lab., MTWThFS I-II; lect., 06Bot., lab., 5Bot.) Mr. Dopp, Miss Herrick.
- 7su.¹ Taxonomy and Classification of the Flowering Plants. A general study of the identification, classification, and relationships of flowering plants. Lecture, laboratory, and field work. (3-5 cred.; no prereq.; MTWThF VI-VII; lect., 06Bot., lab., 7Bot.) Miss Mygrant.
- 12su.² General Morphology of Algae. (3 cred.; all.; prereq., 2; TThS I, II; 110Bot.) Miss Tilden.
- 19su. Teacher's Course in Botany. A course dealing with the aims, principles, and methods of teaching botany in the high school. Discussion of such topics as textbooks, reference books, laboratory manuals, laboratory equipment, methods of conducting field work, the time, place and manner of collecting materials, etc. (5 cred.; prereq., a course in elementary botany or its equivalent; MTWThF I-II; 8Bot.) Miss Mygrant.
- 125, 126su.² Morphology and Taxonomy of Marine Algae. Phaeophyceae. Rhodophyceae. Advanced studies in selected groups. (1-5 cred.; prereq., 15 cred. incl. 12; ar.; 110Bot.) Miss Tilden.
- 150su.² Freshwater Algae. A general survey of freshwater algae based on studies in the field and laboratory. Especially designed for those who, as teachers or research workers, wish to acquire a practical knowledge of the algae. Problems are assigned and reports required. Myxophyceae. Chlorophyceae. (1-10 cred. per qtr.; prereq. 15 cred. incl. 12, or consent of instructor; lect., T III, IV; lab., ar.; 111Bot.) Miss Tilden.
- 210, 218su.² Research Problems in Algae. (1-10 cred.; ar.; 111Bot.) Miss Tilden.
- 236su.² Seminar in Algae. (One hour seminar credit per qtr.; ar.; 111Bot.) Miss Tilden.
- 241su.² A Review of Phycological Literature with Reference to Selected Problems. (1-3 cred. per qtr.; ar.; 111Bot.) Miss Tilden.

¹ A fee of \$1.50 is charged for each laboratory course.

² Summer school students may enter for either term, or for both, in any of the above courses offered. See instructor for arrangement of hours.

SUMMER SESSION

ECONOMICS

For description of courses see School of Business Administration.

FIRST TERM

- 3su. The Mechanism of Exchange.
- 6su. Principles of Economics.
- 24su. Survey of Accounting for Teachers.
- 101su. Advanced General Economics (Value and Distribution).
- 113su. Theory of Statistics.
- 153su. The Trust Problem.
- 155su. Corporation Finance.
- 161su. Labor Problems.
- 166su. Contemporary Economic Problems.
- 172su. Economics of Transportation.
- 176su. Commercial Policies.
- 181asu. Senior Topics Course—Accounting.
- 190su. Public Finance.

SECOND TERM

- 7su. Principles of Economics.
- 85su. Economics of Marketing.
- 87su. Merchandizing.
- 102su. Advanced General Economics (Value and Distribution).
- 107su. Sales Administration.
- 141su. Monetary and Banking Policy.
- 146su. Investments.
- 149su. Business Cycles.

ENGLISH

COURSES IN ENGLISH

FIRST TERM

- 1su. English Survey. Intended for students who have had work in composition equivalent to that of A-B-C, but who have not had the survey of English classics included in that course. This course carries university credit for the first quarter of English 1, 2, 3. (3 cred.; soph., jr., sr.; prereq., 9 cred. in comp.; MTWThFS IV; 311½, 303, 305F.) Miss Armstrong, Mr. Beers, Mr. Creamer.
- 2su. English Survey. A continuation of 1su. This course carries university credit for the second quarter of English 1, 2, 3. (3 cred.; soph., jr., sr.; prereq., 9 cred. in comp.; MTWThFS II; 305F.) Miss Grandy.
- 3su. English Survey. A continuation of 2su. This course carries university credit for the third quarter of English 1, 2, 3. (3 cred.; soph., jr., sr.; prereq., 9 cred. in comp.; MTWThFS I; 311F.) Mr. Richardson.
- 6su. Chaucer. Reading of tales from the Canterbury collection with introduction dealing with the grammar and literary forms of fourteenth-

- century English. (3 cred.; soph., jr., sr.; prereq., A-B-C or equiv.*; Sec. 1, MTWThFS I; 303F; Sec. 2, MTWThF VII and 1 hr. ar.; 306F.) Mr. Loveland, Miss Armstrong.
- 8su. Shakespeare. Shakespeare's development as a poet and dramatist up to *King Lear*. (3 cred.; soph., jr., sr.; prereq.; A-B-C or equiv.*; Sec. 1, MTWThFS II; 306F; Sec. 2, MTWThF VI and 1 hr. ar.; 204F.) Mr. MacLean, Miss Gable.
- 44su. American Literature. Facts and backgrounds of American literature in the nineteenth century. This course carries university credit for the first quarter of English 44-45. (3 cred.; soph., jr., sr.; prereq., A-B-C or equiv.*; MTWThFS IV; 204F.) Mr. Moore.
- 50su. Old English. Old English prose and poetry. The relation to modern English is particularly emphasized. (3 cred.; jr., sr.; prereq., A-B-C or equiv.*; MTWFS III and 1 hr. ar.; 213F.) Mr. Wedel.
- 58su. Nineteenth-Century Prose. The more important prose of the nineteenth century not including fiction. This course carries university credit for the first quarter of English 58-59. (3 cred.; jr., sr.; prereq., A-B-C or equiv.*; MTWThFS II; 303F.) Mr. Loveland.
- 62su. Milton, with some consideration of his contemporaries. (3 cred.; jr., sr.; prereq., A-B-C or equiv.*; MTWThFS I; 205F.) Mr. Hessler.
- 66su. English Novel. First half of the nineteenth century: Jane Austen, Scott, Dickens, Thackeray, Charlotte Brontë, and Trollope. This course carries university credit for the first quarter of English 66-67. (3 cred.; jr., sr.; prereq., A-B-C or equiv.*; MTWThFS IV; 205F.) Mr. Wedel.
- 70su. Elizabethan Drama. Elizabethan dramatic art aside from Shakespeare's: Marlowe, Jonson, Beaumont and Fletcher, Webster, and Massinger. (3 cred.; jr., sr.; prereq., Course 8; MTWFS III and 1 hr. ar.; 204F.) Mr. Hessler.
- 105su. Eighteenth-Century Poetry. From Pope to Burns, with special reference to the rise and growth of romanticism. This course carries university credit for the first quarter of English 105-105. (3 cred.; jr., sr., grad.; prereq., Courses 6 and 8, or either 6 or 8 and one other course numbered above 5; MTWThFS II; 204F.) Mr. Moore.
- 108su. Eighteenth-Century Prose. Special study of fiction and the essay. This course carries university credit for the second quarter of English 107-108. (3 cred.; jr., sr., grad.; prereq., Courses 6 and 8, or either 6 or 8 and one other course numbered above 5; MTWThFS IV; 306F.) Mr. Beyer.
- 110su. Romantic Poets. This course carries university credit for the second quarter of English 109-110. (3 cred.; jr., sr., grad.; prereq., Courses 6 and 8, or either 6 or 8 and one other course numbered above 5; MTWThFS VI; and 1 hr. ar.; 205F.) Miss Jackson.
- 133su. Ballads. The English and Scottish popular ballads. A study of a large number of traditional ballads, English and foreign, and of

* A-B-C, as a prerequisite, has for its equivalent any two quarters of English 1, 2, 3, and 9 credits in composition.

- ballad style and origins. (3 cred.; jr., sr., grad.; prereq., Courses 6 and 8, or either 6 or 8 and one other course numbered above 5; MTWThFS I; 204F.) Mr. Ruud.
- 140su. Advanced Chaucer. The more important of Chaucer's poems aside from *The Canterbury Tales*; the sources and chronology of Chaucer's work. (3 cred.; jr., sr., grad.; prereq., 6, and one other course numbered above 5; MTWFS III and 1 hr. ar.; 205F.) Mr. Ruud.
- 151su. Recent Poetry. Poetry in England and America since the death of Queen Victoria. The main tradition and tendencies now prevailing. (3 cred.; jr., sr., grad.; prereq., Courses 6 and 8, or either 6 or 8 and one other course numbered above 5; MTWThFS I; 306F.) Miss Jackson.

SECOND TERM

- 2su. English Survey. See First Term, Course 2su. (3 cred.; soph., jr., sr.; prereq., 9 cred. in comp.; MTWThFS II; 305F.) Mr. Christy.
- 3su. English Survey. See First Term, Course 3su. (3 cred.; soph., jr., sr.; prereq., 9 cred. in comp.; MTWThFS I; 305F.) Mr. Briggs.
- 8su. Shakespeare. Shakespeare's development as a poet and dramatist up to *King Lear*. (3 cred.; soph., jr., sr.; prereq., A-B-C or equiv.*; MTWThFS II; 205F.) Mrs. del Plaine.
- 45su. American Literature. This course carries university credit for the second quarter of English 44-45. (3 cred.; soph., jr., sr.; prereq., A-B-C or equiv.*; MTWThFS IV; 303F.) Mr. Nichols.
- 59su. Nineteenth-Century Prose. A continuation of 58su. This course carries university credit for the second quarter of English 58-59. (3 cred.; soph., jr., sr.; prereq., A-B-C or equiv.*; MTWThFS II; 303F.) Mr. Sutcliffe.
- 67su. English Novel. A continuation of 66su. Eliot, Meredith, Hardy, Stevenson, Conrad, Galsworthy. (3 cred.; jr., sr.; prereq., A-B-C or equiv.*; MTWThFS I; 303F.) Mr. Sutcliffe.
- 109su. Romantic Poets. This course carries university credit for the first quarter of English 109-110. (3 cred.; jr., sr., grad.; prereq., Courses 6 and 8, or either 6 or 8 and one other course numbered above 5; MTWFS III and 1 hr. ar.; 303F.) Mr. Nichols.

COURSES IN COMPOSITION

FIRST TERM

- Asu. Freshman English.¹ The study of the fundamental principles of composition; training in the art of writing; an historical survey of the classics of English literature. This course carries university credit for the first quarter of English A-B-C. (5 cred.; all; no prereq.; MTWThFS IV and MTWThF VII; Sec. 1, 303F; Sec. 2, 305F.) Mr. Beers, Mr. Creamer.

* A-B-C, as a prerequisite, has for its equivalent any two quarters of English 1, 2, 3, and 9 credits in composition.

¹Registration for this course is provisional. In order that a student may continue in the course, he must pass certain tests in elementary English that will be given on the first day of the term.

- Bsu. Freshman English. A continuation of Asu. This course carries university credit for the second quarter of English A-B-C. (5 cred.; all; prereq., Eng. A; MTWThFS II and MTWThF VI; 305F.) Miss Grandy.
- Csu. Freshman English. A continuation of Bsu. This course carries university credit for the third quarter of English A-B-C. (5 cred.; all; prereq., Eng. A, B; MTWThFS I and MTWThF VI; 311F.) Mr. Richardson.
- 4su. Composition for Technical Students. Practical training in the art of writing; the principles of structure, and analysis of specimens of good prose. This course carries university credit for the first quarter of Composition 4-5-6, or of Composition 1-2-3 of preceding years. (3 cred.; all; no prereq.; MTWThF VII and 1 hr. ar.; Sec. 1, 303F; Sec. 2, 305F.) Mr. Beers, Mr. Creamer.
- 5su. Composition for Technical Students. A continuation of 4su. This course carries university credit for the second quarter of Composition 4-5-6. (3 cred.; all; prereq., Comp. 4; MTWThF VI and 1 hr. ar.; 305F.) Miss Grandy.
- 6su. Composition for Technical Students. A continuation of 5su. This course carries university credit for the third quarter of Composition 4-5-6. (3 cred.; all; prereq., Comp. 4, 5; MTWThF VI and 1 hr. ar.; 311F.) Mr. Richardson.
- 11su. Description. This course carries university credit for the first quarter of Composition 11-12. (3 cred.; soph., jr., sr.; prereq., English A-B-C or Comp. 4-5-6. MTWThFS IV; 311F.) Mr. MacLean.
- 20su. Informal Exposition. Description and narration as methods of exposition: the informal essay. (3 cred.; soph., jr., sr.; prereq., 11-12 or 18-19; MTWThF VII and 1 hr. ar.; 306F.) Miss Gable.
- 113su. Essay Writing. The informal essay. This course carries university credit for the third quarter of Composition 111-112-113. (3 cred.; jr., sr., grad.; prereq., Comp. 11-12 or 18-19 and 20; MTWThFS III and 1 hr. ar.; 306F.) Mr. Beyer.

SECOND TERM

- Bsu. Freshman English. See First Term, Course Bsu. (5 cred.; all; prereq., English A; MTWThFS II and MTWThFS IV; 305F.) Mr. Christy.
- Csu. Freshman English. See First Term, Course Csu. (5 cred.; all; prereq., English A, B; MTWThFS I and MTWThFS III, and 1 hr. ar.; 305F.) Mr. Briggs.
- 5su. Composition for Technical Students. See First Term, Course 5su. (3 cred.; all; prereq., Comp. 4; MTWTh IV; 305F.) Mr. Christy.
- 6su. Composition for Technical Students. See First Term, Course 6su. A continuation of 5su. (3 cred.; all; prereq., Comp. 4, 5; MTWThFS III and 1 hr. ar.; 305F.) Mr. Briggs.
- 12su. Narration. Continuation of 11su. This course carries university credit for the second quarter of Composition 11-12. (3 cred.; soph., jr., sr.; prereq., English A-B-C or Comp. 4-5-6; MTWThFS III and 1 hr. ar.; 205F.) Mrs. del Plaine.

COURSES IN SPEECH
FIRST TERM

Voice and Speech Correction. A special course required of all students registered in the fundamentals course. A conference and discussion group for the purpose of considering the voice and body problems of the beginning student in speech. (No cred.; all; no prereq.; TTh IX; 301F.)

41su.¹ Fundamentals of Speech. Elements of the speech problem and of effective public speaking. This course carries university credit for the first quarter of Public Speaking 41-42-43. (3 cred.; soph., jr., sr.; prereq., Eng. A-B-C, or Comp. 1-2-3 or 4-5-6; Sec. 1, MTWThFS I; 301F; Sec. 2, MTWThFS VI; 212F.) Sec. 1, Mr. Bryngelson; Sec. 2, Mr. Morse.

42su.¹ Fundamentals of Speech. A continuation of 41su. This course carries university credit for the second quarter of Public Speaking 41-42-43. (3 cred.; soph., jr., sr.; prereq., Eng. A-B-C, or Comp. 1-2-3 or 4-5-6, and 41; MTWThFS II; 301F.) Mr. Holmes.

55su.¹ Debate and Argumentation. Short course for teachers. Theory and practice of argumentation. Phrasing debatable propositions; analysis, evidence, reasoning. Practice debating. Problems of coaching. Sources of materials. This course carries university credit for the first quarter of Public Speaking 55-56-57. (3 cred.; jr., sr.; prereq., 41-42-43 or 45-46; MTWThFS II; 308F.) Mr. Morse.

61su.¹ Speech Correction. An introduction to the correction of speech disorders. Speech defects as symptoms of maladjustment and organic malformations. Case histories. The vocal mechanism. Examination of the literature of the field. (3 cred.; jr., sr.; no prereq.; MTWThFS IV; 308F.) Mr. Bryngelson.

70su.¹ Teachers' Problems. Primarily for College of Education students. Not open to Science, Literature, and the Arts students except by petition. Theoretical and practical aspects of the teaching of courses in fundamentals of speech, debate and argumentation, interpretative reading, dramatic production. Class discussions, reports, outlines of courses. (3 cred.; prereq., 41-42-43 or 45-46; MTWThFS III and I hr. ar.; 308F.) Mr. Holmes.

81su.¹ Interpretative Reading. The interpretation and oral reading of the various forms of literature, such as prose narrative, lyric and narrative poetry, the essay, and the drama. This course carries university credit for the first quarter of Public Speaking 81-82-83. (3 cred.; jr., sr.; prereq., 41-42-43 or 45-46; MTWThFS I; 308F.) Mr. Rarig.

91su.¹ Play Production. Putting on the school play. Short course for teachers. Examination of plays, casting, coaching, movement, grouping, principles of stage color and design in costuming and setting; stage management, lighting, mechanics, make-up. This course carries univer-

¹All students in public speaking are required to attend the course in Voice and Speech Correction which is listed just preceding Course 41su.

sity credit for the first quarter of Public Speaking 91-92-93. (3 cred.; jr., sr.; prereq., Eng. 8, Pub. Sp. 81-82-83; MTWThF VII and 1 hr. ar.; 19Mu.) Mrs. Seybolt.

107su.¹ Seminar in Great Orators. A critical study of the great English and American orators. One historical period each year. For the summer of 1927 the American orators of the Revolutionary period. (3 cred.; jr., sr.; prereq., 81-82-83 or 55-56-57; MTWThF VI; 308F.) Mr. Rarig.

SECOND TERM

41su.¹ Fundamentals of Speech. Elements of the speech problem and of effective public speaking. This course carries university credit for the first quarter of Public Speaking 41-42-43. (3 cred.; soph., jr., sr.; prereq., Eng. A-B-C, or Comp. 1-2-3 or 4-5-6; MTWThFS II; 308F.) Mr. Seering.

42su.¹ Fundamentals of Speech. A continuation of 41su. This course carries university credit for the second quarter of Public Speaking 41-42-43. (3 cred.; soph., jr., sr.; prereq., Eng. A-B-C, or Comp. 1-2-3 or 4-5-6, and 41; MTWThFS IV; 301F.) Mr. Seering.

43su.¹ Public Speaking. A continuation of 42su. This course carries university credit for the third quarter of Public Speaking 41-42-43. (3 cred.; soph., jr., sr.; prereq., Eng. A-B-C, or Comp. 1-2-3 or 4-5-6, and 42; MTWThFS I; 308F.) Mr. Holmes.

51su.¹ Advanced Public Speaking. Preparation and delivery of speeches on public questions. Methods of outlining and of reasoning. Elementary research; emphasis on methods of handling material before an audience. Technique of voice and body. (3 cred.; jr., sr.; prereq., Pub. Sp. 41-42-43 or 45-46; MTWThFS IV; 308F.) Mr. Holmes.

GEOGRAPHY

FIRST TERM

51su. Human Geography. A study of the factors of the physical environment and their effect on human activities. (5 cred.; jr., sr.; no prereq.; MTWThF I-II; 103OL.) Mr. Davis and assistant.

61su. Geography of Commercial Production. The principal commodities of world trade, with reference to areas of origin and consumption and the geographic elements in their production. (3 cred.; jr., sr.; no prereq.; MTWFS III; 103OL.) Mr. Hartshorne and assistant.

62su. Trade Routes and Trade Centers. Major land and ocean routes, the natures of the traffic, ports and interior trade centers, their location and significance. (3 cred.; jr., sr.; prereq., 61 or equiv.; MTWThF IV; 103OL.) Mr. Hartshorne and assistant.

141su. Field Course in Geography. (2 cred.; jr., sr., grad.; permission of instructor necessary; time to be arranged.) Mr. Davis, Mr. Hartshorne.

¹All students in public speaking are required to attend the course in Voice and Speech Correction which is listed just preceding Course 41su.

GEOLOGY

FIRST TERM

1su. General Geology. An introductory study of earth materials and processes. Lectures with a limited amount of laboratory work and field excursions. (5 cred.; all; no prereq.; TWThFS I-II; 110P.) Mr. Stauffer.

The following course in geology is available to members of a study-travel tour party, organized under the direction of the Summer Session, traveling from St. Paul to Seattle. This tour is organized primarily for teachers, who may wish to combine a journey to the convention of the National Education Association with a study of the geographic and natural history features of the great Northwest.

The party will be limited to 30, whose applications are to be approved by the Department of Geology. Registrations must be completed on or before May 16. Applications should be addressed to the director of the Summer Session. The fee for the course is \$25, payable when registration is completed. The entire cost of the tour will be about \$300. Further details may be had in a special bulletin, upon application.

30su. Field Course in Geology. A three weeks' lecture-travel course, June 13 to July 2, inclusive, between St. Paul and Seattle, with field studies in Yellowstone National Park, the Rocky Mountains, the Columbia Plateau, the Cascade Mountains (including Mt. Ranier National Park), and the Puget Sound region. Primarily cultural, but may be used as preparation for professional examinations in physiography and geology. (3 to 5 cred., according to preparation in geology; open to all; no prerequisites; en tour.) Mr. Allison.

GERMAN

FIRST TERM

- 1su. Beginning A. Pronunciation, conversation, grammar, and composition; selected readings in easy prose and verse. (5 cred.; all; no prereq.; MTWThF I-II; 207F.) Mr. Burkhard.
- 3su. Beginning C. Selected texts from modern writers. (5 cred.; all; prereq., 2 or equiv.; MTWThF I-II; 209F.) Mr. Dehorn.
- 4su. Rapid Reading. Modern narrative prose. (5 cred.; all; prereq., 3 or equiv.; MTWFS III and MTWThF IV; 209F.) Mr. Schlenker.
- 62su. Nineteenth-Century Prose. Narrative readings from modern novelists. (3 cred.; jr., sr.; prereq., 4 or 8 or equiv.; MTWFS III; S IV; 209½.) Mr. Dehorn.
- 125su. Literary Problems. Goethe's *Faust* I and II. (3 cred.; sr., grad.; prereq., 14 sr. col. German cred.; ar.; ar.) Mr. Schlenker.
- 152su. Novelle. Storm, Heyse, Keller, and others. (3 cred.; sr., grad.; prereq., 14 or sr. col. German cred.; ar.; ar.) Mr. Burkhard.

SECOND TERM

- 2su. Beginning B. Continuation of German I. (5 cred.; all; prereq., 1 or equiv.; MTWThF I-II; 209½F.) Mr. Davies.

- 163su. German and English Literary Relations in the Eighteenth Century. (3 cred.; sr., grad.; prereq., 14 sr. col. German cred.; ar.; ar.) Mr. Davies.

GREEK

FIRST TERM

COURSES FOR WHICH NO KNOWLEDGE OF GREEK IS REQUIRED

- 42su. Greek Sculpture. Development of Greek sculpture from its beginnings will be traced; famous statues, friezes, reliefs, and monuments will be shown and described; personalities of the great sculptors and their special contributions to art will be considered. (2 cred.; soph., jr., sr.; no prereq.; MTWTh II; 114F.) Mr. Savage.
- 44su. Greek Literature and Life. Lectures, textbook work, illustrative and assigned readings. The character and influence of Greek culture, especially in literature, philosophy, and art, will be discussed; the whole course will be richly illustrated with the stereopticon. (2 cred.; soph., jr., sr.; no prereq.; MTWF III; 114F.) Mr. Savage.
- 45su. Greek Mythology. Lectures, readings, and textbook work dealing with the legends which appear in the literature and art of ancient Greece; stereopticon illustrations. The myth will be presented and interpreted; its origin, evolution, and influence will be discussed. (2 cred.; soph., jr., sr.; MTWThF IV; 114F.) Mr. Savage.

HISTORY

FIRST TERM

- 2su. Modern World, 1795-1870. Survey of the leading political, social, and economic phases of the period, stressing those most influential in producing the modern world. (5 cred.; fr., soph., jr., sr.; no prereq.; MTWThF IV-V; 112OL.) Miss Thompson.
- 7su. United States, 1776-1844. Survey of the various factors of the history of the United States during the first portion of the national period. (5 cred.; soph., jr., sr.; no prereq.; MTWThF VI-VII; 221OL.) Mr. Perry.
- 15su. Recent American History. A survey of the period following Reconstruction. (3 cred.; soph., jr., sr.; no prereq.; MTWThFS II; 221OL.) Mr. Shippee.
- 25su. Introduction to World Politics. A survey of the European history of recent years. (3 cred.; soph., jr., sr.; prereq., 1-2 or 2-3; MTWThFS II; 111OL.) Mr. Mellby.
- 120su. Medieval Civilization. A study of the social and intellectual development of Europe from the period of the German migrations to the end of the thirteenth century. (3 cred.; jr., sr., grad.; prereq., 15 cred.; MTWFS III; 112OL.) Mr. Krey.
- 140su.¹ History of European Thought in the Nineteenth Century. (3 cred.; jr., sr., grad.; prereq., 15 cred.; MTWThFS IV; 111OL.) Mr. Mellby.

¹ Students who took History 140su in 1926 may also receive credit for this course.

SUMMER SESSION

- 142su. The American West after 1815. (3 cred.; jr., sr., grad.; prereq., 15 cred.; MTWThFS I; 221OL.) Mr. Shippee.
- 211su. Problems in Teaching of Social Studies. See Ed. 205. Mr. Krey.
- 220su. Research in Selected Historical Fields. (Cred. ar.; grad.; prereq., consent of instructor in particular field.) Mr. Krey, Mr. Mellby, Mr. Shippee, Miss Thompson.

SECOND TERM

- 27su. The Reformation. (3 cred.; soph., jr., sr.; prereq., 10 cred.; MTWThFS III; 112OL.) Mr. Lucas.
- 10asu. England, 1485-1688. (3 cred.; fr., soph., jr., sr.; no prereq.; MTWThFS II; 111OL.) Mr. Violette.
- 110su. England and the British Empire. (3 cred.; jr., sr., grad.; prereq., 15 cred.; MTWThFS IV; 111OL.) Mr. Violette.
- 112su. American Immigration. History of immigration into the United States. (3 cred.; jr., sr., grad.; prereq., 15 cred.; MTWThFS I; 112OL.) Mr. Stephenson.
- 130su. Economic and Social History of the Middle Ages. (3 cred.; jr., sr., grad.; prereq., 15 cred.; MTWThFS IV; 112OL.) Mr. Lucas.
- 143su. Political Parties in the United States. (3 cred.; jr., sr., grad.; prereq.; 15 cred., MTWThFS II; 112OL.) Mr. Stephenson.
- 220su. Research in Selected Historical Fields. (Cred. ar.; prereq., consent of instructor in particular field; grad.; ar.) Mr. Violette, Mr. Lucas, Mr. Stephenson.

JOURNALISM

The courses in journalism are available only to members enrolled in the European Journalism Tour. Registration is to be in the usual way for summer session courses. Persons enrolling for credit should send a statement of their qualifications to the chairman of the Department of Journalism. Enrolment as auditor is permitted in Course 111su, but not in Course 73su. Only one course may be taken for credit. All registrations must have the approval of the chairman of the Department of Journalism.

The fee for either course is \$15, whether taken for credit or not. For persons enrolled in Course 73su and auditing Course 111su the fee is \$25. Checks should be made for the exact amount, payable to the University of Minnesota.

For further details regarding the journalism tour program and for class enrolment forms address the chairman, Department of Journalism, 1 Folwell Hall, University of Minnesota, Minneapolis.

- 73su. Special Feature Articles. Lectures and practice in gathering, organizing, and preparing material for special magazine and newspaper articles. The work of each student is thoroly analyzed and criticised in individual conferences. (3 cred.; jr., sr.; prereq., Journalism 51 or equivalent;* en tour.) Mr. Birdsong, Mr. Johnson.
- 111su. Foreign News Sources. A comparison of American journalism with that of other countries. The course also includes an intensive study of

* The equivalent consists of courses in reporting and desk work in a recognized school or department of journalism or reportorial experience on a newspaper.

foreign news sources. (3 cred.; jr., sr., grad.; prereq., Journalism 51 or equivalent;* en tour.) Mr. Allen, Mr. Johnson.

LATIN

FIRST TERM

- 73su. Grammar and Composition. (3 cred.; jr., sr.; prereq., any one of 51, 52, 53, or equiv. (with credit); without credit consult instructor; MTWThFS I; 109F.) Mr. Lussky.
- 146su. Cicero's Tusculan Disputations. A study of Cicero's views of the soul after death. (3 cred.; jr., sr.; prereq., any two of 51, 52, 53, or equiv., or six years of Latin (with credit); without credit consult instructor; MTWThFS II; 109F.) Mr. Lussky.

LIBRARY TRAINING

FIRST TERM

- 103su. Library Administration. Economics and finance for small libraries. Labor saving methods and equipment. Relations to state, and community regulations and legislation. (2 cred.; MTWTh I; 5Lib.) Miss Baldwin.
- 107su. Book Selection. General principles with emphasis on adult users and special classes of readers. (3 cred.; MTWThFS III; 5Lib.) Miss Wood.
- 108su. Reference. Selection and use of typical reference material sections, problems, discussions. (3 cred.; MTWThFS IV; 5Lib.) Mr. Walter.

MATHEMATICS

FIRST TERM

- 5su. Higher Algebra. A review and a collegiate treatment of the topics of elementary algebra for those who have had one year of elementary algebra. Not open for credit to those who presented higher algebra for entrance. (5 cred.; all; prereq., 1 yr. elementary algebra; MTWThF VI-VII; 105F.)
- 6su. Trigonometry. Logarithms and plane trigonometry. (5 cred.; all; prereq., 5 or prep. higher algebra; MTWThF I-II; 102F.)
- 7su. College Algebra. Quadratic equations; graphical representation; progressions; mathematical induction; binomial theorem; permutations; combinations; probability; determinants; theory of equations. (5 cred.; all; prereq., 5 or prep. higher algebra; MTWF III-IV and Th IV-V; 105F.) Miss Carlson.
- 30su. Analytic Geometry. See College of Engineering, page 56.
- 50su. Calculus I. Differential calculus. (5 cred.; jr., sr.; prereq., 30; MTWThF I-II; 105F.) Mr. Hart, Miss Carlson.
- 51su. Calculus II. Differential calculus. See College of Engineering, page 56.

* The equivalent consists of courses in reporting and desk work in a recognized school or department of journalism or reportorial experience on a newspaper.

- 72su. History of Ancient and Modern Mathematics. An account of the origin and development of the fundamental notions of mathematics from the earliest times, and of the modification and enlargement of their significance in the light of modern research. (3 cred.; jr., sr.; prereq., 50; MTWThFS IV; 104F.) Mr. Jackson.
- 106su. Differential Equations. (3 cred.; jr., sr., grad.; prereq., 51; MTWThFS II; 104F.) Mr. Hart.
- 118su. Vector Analysis. (3 cred.; jr., sr., grad.; prereq., 51; MTWThFS III; 104F.) Mr. Jackson.
- 165su. Selected Topics in Advanced Mathematics. An intensive course open to advanced graduate students who will be guided through conferences in the study of assigned topics. (Cred. ar.*; grad.; prereq., 108 or 123, and the consent of the instructor; ar.) Mr. Hart, Mr. Jackson.

SECOND TERM

- 6su. Trigonometry. Logarithms and plane trigonometry. (5 cred.; all; prereq., 5 or prep. higher algebra; MTWThF III-IV; 104F.)
- 30su. Analytic Geometry. Given in the College of Engineering. See page 56.
- 51su. Calculus II. Integral calculus. (5 cred.; jr., sr.; prereq., 50; MTWThF I-II; 105F.) Mr. Brink.
- 110su. Selected Topics in Advanced Mathematics. An intensive course open to juniors, seniors, and graduates, who will be guided through conferences in the study of assigned topics. (Cred. ar.*; jr., sr., grad.; prereq., 51; ar.) Mr. Brink.

MUSIC

FEES

The courses below, for which no special fee is indicated, may be taken by summer session students on payment of the regular summer session fee. Students who pay as much as \$36 per term for special music fees may enroll for other courses in any department of the Summer Session, for an additional fee of \$14 per term, making a total of \$50 for general and special fees. All students who register for either the general courses or the special courses must pay the \$2 deposit.

Credits for courses in music earned by a freshman or sophomore of the College of Science, Literature, and the Arts are withheld until the student's junior year unless he is regularly taking the music curriculum.

FIRST TERM

- 1su. Harmony. The study of chords, their construction, relations, and progressions. Written exercises on bases, the harmonization of given melodies. (3 cred.; no prereq.; MWF VI-VII; 103Mu.) Miss Malcolm.
- 3su. Harmony. A continuation of Harmony 2, which offers the work of the third quarter of the regular year. (3 cred.; prereq., 1-2; MWF III-IV; 103Mu.) Miss Malcolm.

* The number of credits is 3 or more according to the amount of work done.

- 9su. Ear Training. A continuation of Ear Training 8, which offers the work of the third quarter of the regular year. (1 cred.; prereq., 7-8; Th I-II; Mu.) Miss Kendall.
- 13su. Class Instrument Teaching. Primarily for College of Education students. Not open to S., L., and A. students. See College of Education, page 96.
- 39su. Piano. Open to those who have mastered technical difficulties of the degree of Czerny's *School of Velocity* and the easier Hadyn and Mozart sonatas. Two lessons a week. Fee, \$36. (2 cred.; ar.; Mu.) Mr. Ferguson, Mr. Lindsay, Miss Reeves, Miss Kendall, Mr. Stephens.
- 42su. Orchestra. Laboratory for the study of orchestral literature, symphonic and miscellaneous. Orchestra will assist in campus functions and enter with the student body in the maintenance of a true campus spirit. Applicants will bring their own instruments. (1 cred.; M IX-X; MuAud.) Mr. Pepinsky.
- 45su. Chorus. Choral Singing. Open to all university students. (1 cred.; TTh IX; Mu.) Mr. Killeen.
- 49su. Historical Appreciation of Music. An outline of the development of musical thought with emphasis on the history and significance of classical and contemporary forms. Extensively illustrated. (3 cred.; no prereq.; MWF VIII; Mu.) Mr. Ferguson.
- 51su. Violin. Open to students who are qualified to play the first ten of Kreutzer's *Forty Etudes*, and the easier Handel and Mozart sonatas. Two lessons a week. Fee, \$36. (2 cred.; ar.; Mu.) Mr. Scheurer.
- 63su. Voice. Thoro training in relaxation and breath control, the foundation of tone production. Advantages offered to advanced singers in study of the best vocal literature, songs, oratorio, and opera. Two lessons a week. Fee, \$36. (2 cred.; ar.; Mu.) Mr. Killeen, Miss Hull.
- 75su. Public School Music for the Grades. Primarily for College of Education students. Not open to S., L., and A. students. See College of Education, page 97.
- 78su. Public School Music for High Schools. Primarily for College of Education students. Not open to S., L., and A. students. See College of Education, page 97.
- 88su. Normal Piano. A continuation of Normal Piano 87, which offers the work of the third quarter of the regular year. (2 cred.; prereq., 86-87; TTh VII-VIII; Mu.) Miss Reeves.
- 93su. Normal Course for Teaching of Voice. A lecture course in which principles of teaching, breathing, voice placing, and development of vocal technique are discussed. (2 cred.; TTh VII-VIII; Mu.) Mr. Killeen.
- 94su. Ensemble Playing, Sight Reading, and Accompanying. Study of chamber music literature, for various combinations of instruments. Simple sonata literature used for sight reading and accompanying, after which the more serious ensemble literature will be reviewed. (2 cred.; TTh VI-VII; 3Mu.) Mr. Pepinsky.

SUMMER SESSION

- 100su. Organ. Open to students who play piano music of an intermediate grade. Two lessons a week. Fee, \$36. (2 cred.; ar.; Mu.) Mr. Fairclough.

SECOND TERM

Piano, voice, violin, and organ, if registration warrants.

PHILOSOPHY

FIRST TERM

- 2su. Logic. The nature of knowledge, the laws of reasoning, the principles and methods of scientific inquiry. (3 cred.; soph., jr., sr.; no prereq.; MTWThFS II; 322F.) Mr. Dubs.
- 51su. Modern Philosophy. A sketch of the development of philosophy from the Renaissance to the present. (3 cred.; jr., sr.; prereq., 10 cred. in phil. or 15 cred. in phil. and soc. sci.; MTWThFS IV; 322F.) Mr. Dubs.
- 102su. Philosophy of Religion. An account of different attitudes toward life, esthetic, ethical, and religious, in the effort to throw light on the nature of religion. Includes a study of the relations between science and religion, with reference to current controversial topics. (3 cred.; jr., sr., grad.; prereq., 10 cred. in phil. or psy.; MTWThFS I; 322F.) Mr. Swenson.

SECOND TERM

- 1su. Problems of Philosophy. An introductory survey of some important problems of philosophy, through a reading of some of the easier philosophic classics. (3 cred.; soph., jr., sr.; no prereq.; MTWFS III; 322F.) Mr. Dubs.
- 100su. History of Religion. A comparative survey of primitive, national, and advanced religions, together with a study of the development of religion. (3 cred.; jr., sr., grad.; prereq., 10 cred.; MTWFS III; 322F.) Mr. Dubs.

PHYSICS

FIRST TERM

- 3su. Elements of Mechanics. Mechanics of solids, liquids, and wave motion. Study of the simple fundamental principles. The first part of the General Course 3, 23, 33, 43. Course 4 should be taken in conjunction with this course. Part of the required work in physics in the pre-medical and engineering courses. (3 cred.; all; prereq., Math. 4 or 6; lect., MWF I, II; quiz., S I; 16Ph.) Mr. Buchta.
- 4su.¹ Mechanics Laboratory Practice. Measurements in the mechanics of solids, liquids, and wave motion. The laboratory part supplementing Course 3. (1 cred.; all; prereq., 3 or reg. in 3; TTh I, II; 16Ph.) Mr. Buchta.
- 23su. Heat. A study of the principles underlying heat phenomena. Course 24 should be taken in conjunction with this course. This course is a part of the required work in physics in the pre-medical and engineer-

¹ A laboratory fee of \$1.50 is charged for this course.

- ing courses. (3 cred.; all; prereq., 3; lect., TThS I, II; quiz, M I; 16Ph.) Mr. Miller.
- 24su.¹ Heat Laboratory. The laboratory part supplementing Course 23. Two two-hour sessions in the laboratory a week. (1 cred.; all; WF I, II; 23Ph.) Mr. Miller.
- 110su. Thesis. (No cred.; ar.) Mr. Erikson, Mr. Miller, Mr. Buchta.
- 124su. Pyrometry and Heat. An experimental study of pyrometry, heat quantity, heat transfer, hygrometry, and gas liquefaction. One lecture, two three-hour sessions in the laboratory a week. (3 cred.; jr., sr., grad.; prereq., 12 cred. in physics; MWF VI-IX; 23Ph.) Mr. Miller.
- 127su. Modern Physics. An introductory survey of the problems of modern physics. Theories of atomic structure, and series in optical spectra, photo-electric effect, and other applications of the quantum theory. An introduction to the special theory of relativity. Three two-hour lectures a week. (3 cred.; jr., sr., grad.; prereq., 12 cred. in physics, Math. 51; MWF III-IV; 16Ph.) Mr. Buchta.
- 148su.¹ Radioactivity and X-Rays. The various theories and methods of investigation. (3 cred.; jr., sr., grad.; prereq., 12 cred. in phys.; ar.) Mr. Erikson.
- 150su. Conduction through Gases. An experimental course devoted to ionization and mobility measurements. (3 cred.; jr., sr., grad.; prereq., 12 cred. in phys.; MWF VI-IX.) Mr. Erikson.

SECOND TERM

- 33su. Optics. A study of the principles underlying optical instruments and light phenomena. Course 34 should be taken in conjunction with this course. (3 cred.; all; prereq., 3; lect., TThS I, II; quiz, M I; 16Ph.) Mr. Valasek.
- 34su.¹ Optics Laboratory. The laboratory part supplementing Course 33. Two two-hour sessions in the laboratory a week. (1 cred.; all; WF I, II; 16Ph.) Mr. Valasek.
- 43su. Electricity. A study of the principles underlying magnetic and electrical phenomena. Course 44 should be taken in conjunction with this course. This course is a part of the required work in physics in the pre-medical and engineering courses. (3 cred.; all; prereq., 3; lect., MWF I, II; quiz, S I; 32Ph.) Mr. Zeleny.
- 44su.¹ Electrical Laboratory. The laboratory part supplementing Course 43. Two two-hour sessions in laboratory a week. (1 cred.; all; prereq., 3, 43, or reg. in 43; TTh I, II; 32Ph.) Mr. Zeleny.
- 111su. Thesis. (No cred.; ar.) Mr. Zeleny, Mr. Valasek.
- 132su. Applied Optics. Special experimental work in spectrometry, optical instruments, photometry, absorption, polarized light. Three three-hour periods in the laboratory a week. (3 cred.; jr., sr., grad.; prereq., Courses 33 and 34; MWF VI-IX; 3Ph.) Mr. Valasek.
- 144su.¹ Electrical Measurements. Devoted mainly to the study of potentiometer methods, capacity, inductance, resistance, magnetic flux. (3 cred.; jr., sr., grad.; prereq., 12 cred. in phys.; MWF VI-IX; 32Ph.) Mr. Zeleny.

¹ A laboratory fee of \$1.50 is charged for this course.

POLITICAL SCIENCE

FIRST TERM

- 1su. American Government. Origin and nature of the American governmental system; organization and actual workings of the national government today. (4 cred.; soph., jr., sr., and fr. with 10 cred. in econ. or history; no prereq.; TWThF I-II; 211OL.) Mr. Anderson.
- 2su. State Government. A comparative study of American state governments. The adoption and amendment of constitutions; organization, powers, and methods of the three departments; problems of administrative organization. (4 cred.; soph., jr., sr., and fr. with 10 cred. in hist.; prereq. 1; MTWF III and TWThF IV; 211OL.) Mr. Lambie.
- 3su. Comparative European Government. The governments and politics of the great European powers today. (4 cred.; soph., jr., sr.; prereq. 1; TWThF, VI-VII; 209OL.) Mr. Harrison.
- 102su. Political Parties. The nature, function, organization, and methods of political parties; legal control of parties and elections; public opinion as a factor in popular government. (2 cred.; jr., sr., grad.; prereq., 20 cred. in social sciences; TWThF IV; 209OL.) Mr. Anderson.
- 105su. Colonization. The economic and political factors in colonization; forms of government, commercial policies, and mandates. (2 cred.; jr., sr., grad.; prereq., 20 cred. in social sciences; MTWF III; 221OL.) Mr. Harrison.
- 131su. Principles of Public Administration. Source of the administrative aspects of the problems of social control: the formulation of policy, the organization of administration, and control over administration. (2 cred.; jr., sr., grad.; prereq. 20 cred. in soc. sci., inc. 10 cred. in pol. sci.; TWThF I; 209OL.) Mr. Lambie.
- 141su. Problems in State Government and Constitutional Law. A selected group of current problems in state government will be studied intensively in their constitutional and political aspects. (2 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.; TWThF IV; 221OL.) Mr. Kumm.
- 159su. Law of Public Utilities. The rise and development of the law of public service companies; the rights and duties of such companies; present methods of control. (2 cred.; jr., sr., grad.; prereq., 15 cred. in pol. sci. or econ.; TWThF II; 209OL.) Mr. Kumm.

SECOND TERM

- 1su. American Government. See description above. (4 cred.; soph., jr., sr., and fr. with 10 cred. in econ. or hist.; no prereq.; TWThF I-II; 211OL.) Mr. Young.
- 15su. Introduction to Political Science. Introductory presentation of the problems of government. The nature of the state, and the forms and functions of government, the principles of politics. (4 cred.; soph., jr., sr.; prereq. 1 or 2; MTWF III and TWThF IV; 211OL.) Mr. Hall.
- 151su. Constitutional Law. Separation of powers; relationship of states to national government; fundamental rights and immunities of citizens. (2 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.; TWThF I; 209OL.) Mr. Hall.

- 157su. Recent Social Legislation. Governmental powers and methods used for social legislation; peace and security from crime; safety and health; public morals. (2 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or approval of instructor; TWThF IV; 209OL.) Mr. Young.
- 161su. Comparative Federal Government. Ancient and modern federal unions. (3 cred.; sr., grad.; prereq., 20 cred.; TWThF III; 209OL.) Mr. Allin.
- 166su. Government of the British Empire. Organization, working and international status of the British and Dominion governments. (3 cred.; jr., sr., grad.; prereq., 15 cred. or History 109; TWThF II; 209OL.) Mr. Allin.

PSYCHOLOGY

FIRST TERM

- 1su, 2su. General Psychology. The fundamental facts and laws of mental life with emphasis upon the results of experimental methods of investigation. Lectures, recitation, and demonstrations. (6 cred.; soph., jr., sr.; no prereq.; lect., MTWThFS V; OL.Aud.; Sec. 1, MTWThF I; 109Psy; Sec. 2, MTWThF II; 115Psy; Sec. 3, MTWThF III; 115Psy; Sec. 4, MTWThF IV; 115Psy.) Mr. Bird, Mr. Heron, Mr. Langlie.
- 4su, 5su. Introductory Laboratory Psychology. Simple experiments providing illustrative material and training in the methods of laboratory psychology. (4 cred.; soph., jr., sr.; with or after elementary psychology; MTWThF VII, VIII, IX, and S III; 211Psy.) Miss Shirley.
- 104su. Psychology of Learning. A study of the literature and experiments in the field of memory and habit formation. Lectures, readings, and reports. (3 cred.; jr., sr., grad.; prereq., elementary psychology; MTWThFS II; 109Psy.) Mr. Heron.
- 107su. Vocational and Employment Psychology. Psychology of individual differences in intelligence, aptitudes, interests, and training with special reference to vocational guidance and personnel methods in education and industry. (3 cred.; jr., sr., grad.; prereq., elementary psychology; MTWThFS I; 115Psy.) Mr. Paterson.
- 109su. Psychology of Individual Differences. Experimental and statistical study of influence of sex, race, immediate ancestry, environment, and maturity, in causation of individual differences in mental traits. (3 cred.; jr., sr., grad.; prereq., elementary psychology; MTWThFS IV; 109Psy.) Mr. Paterson.
- 111su. Research Problems in Applied Psychology. Permission of the instructor to elect this course must be secured. (2 cred.; jr., sr., grad.; permission of instructor required; prereq., advanced preparation; ar.; ar.) Mr. Paterson.
- 131su. Research Problems in General or Experimental Psychology. For students qualified for research work in experimental problems in general psychology through intensive work in the literature of the subject. Students will be guided through conferences, the hours to be arranged. (2 cred.; jr., sr., grad.; permission of instructor required; prereq., advanced preparation; ar.; ar.) Mr. Bird, Mr. Heron.

SUMMER SESSION

SECOND TERM

- 1su, 2su. General Psychology. (See 1su, 2su above.) (6 cred.; soph., jr. sr.; no prereq.; Sec. 1, MTWThFS I-II; Sec. 2, MTWThFS III-IV.) Mr. Bills, Mr. Jacobsen.

ROMANCE LANGUAGES

FIRST TERM

COURSES IN FRENCH

- 1su. Beginning French. (4 cred.; all; no prereq.; MTWF III and TWThF IV; 201F.) Mr. Clefton.
- 3su. Intermediate French. Reading of representative modern authors; review grammar, composition. Equivalent either to Fr. 3 or Fr. 4. (4 cred.; all; prereq., 1-2; TWThF I and II; 202F.) Mr. Barton, Mr. Sirich.
- 50su., 53su. French Conversation and Composition. (2 cred.; all; prereq., 4; TWThF V; 201F.) Mr. Sirich.
- 106su. French Syntax. Discussion of characteristic problems of French syntax. Designed especially for teachers. (2 cred.; jr., sr., grad.; prereq., 59-60-61 or permission of instructor; TWThF II; 203F.) Mr. Barton.
- 126su. Beginnings of Eighteenth Century Philosophic Movement; Bayle, Fontenelle, Montesquieu, and Diderot. (2 cred.; jr., sr., grad.; prereq., 21-22-23 or permission of instructor; TWThF IV; 203F.) Mr. Sirich.
- 160su. French Drama 1850-1890; Scribe, Dumas, Augier, Zola, Sardou, Becque. (2 cred.; jr., sr., grad.; prereq., 21-22-23 or permission of instructor; MTWF III; 202F.) Mr. Barton.
- 166su. Leconte de Lisle and His Group: Heredia, Sully, Prudhomme, Coppée, etc. (2 cred.; jr., sr., grad.; prereq., 21-22-23; or permission of instructor; TWThF I; 203F.) Mr. Clefton.

COURSES IN SPANISH

- 1su. Beginning Spanish. (5 cred.; all; no prereq.; MTWFS III and MTWThF IV; 227F.) Mr. Blanpied.

SECOND TERM

COURSES IN FRENCH

- 127su. The French Salons in the Eighteenth Century. (4 cred.; jr., sr., grad.; prereq., 21-22-23 or permission of instructor; MTWF III and MTWThF IV; 203F.) Mr. Sirich.
- 169su. Anatole France. (2 cred.; jr., sr., grad.; prereq., 21-22-23 or permission of instructor; TWThF II; 203F.) Mr. Sirich.

SCANDINAVIAN

- 7su. Beginning Swedish. Grammar, composition, conversation, reading of selected prose texts. (5 cred.; all; no prereq.; MTWThF I-II; 206F.) Mr. Stomberg.
- 45su. Scandinavian Mythology. Lectures, textbook, and collateral reading. Knowledge of the Scandinavian languages not required. (3 cred.;

soph., jr., sr., grad.; prereq., none; MTWThFS IV; 206F.) Mr. Stomberg.

- 107su. Modern Swedish Literature. The Swedish novel. Study of a selected list of Swedish authors. (3 cred.; jr., sr., grad.; prereq., 10-11; MTWThF VI; one additional hour ar.; 206F.) Mr. Stomberg.

SOCIOLOGY

FIRST TERM

- 1su. Introduction to Sociology. A study of the origin and development of human society; various agencies which have determined the type of social life; social organization, institutions, and progress; bearings of sociology upon other social sciences and arts. (3 cred.; soph., jr., sr., and 3d qtr. fr.; no prereq.; MTWThFS I, II; 3F.) Mr. Duncan.
- 6su. Modern Social Reform Movements. A survey of attempts to overcome certain social maladjustments; child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection in infancy and youth, public recreation, etc. (3 cred.; soph., jr., sr.; prereq., Soc. I; MTWThFS IV; 5F.) Mr. Lundquist.
- 14su. Rural Sociology. The background and evolution of country life; rural conveniences, communication, co-operation; rural social institutions, especially the family, school, church, and social center; rural leadership, surveys, organization, social agencies. (3 cred.; soph., jr., sr.; prereq., Soc. I; MTWThFS III; 5F.) Mr. Frey.
- 52su. Elementary Case Work. The methods of case work as applied to the treatment of the socially inadequate. (3 cred.; jr., sr.; prereq., 51, 90, or simultaneously; MTWThFS I; 5F.) Miss Colcord.
- 53su. Elements of Criminology. The development of the general concept of crime and criminals; historical methods of dealing with criminals; the types of criminals, causes of crime; social control of crime; treatment of the criminal; agencies for the prevention of crime. (3 cred.; jr., sr.; prereq., same as for 51; MTWThFS III; 3F.) Mr. Sorokin.
- 60su. Child Welfare. Study of social obligations to the child; development of the child saving movement in the United States; infant and child mortality, recreation, education; courts, institutions, societies, and other public efforts for the child. (3 cred.; jr., sr.; prereq., 51 and 52; MTWThFS I; 6F.) Mrs. Doyle.
- 90su. Elementary Field Work. Designed to give first-hand knowledge of the conditions out of which dependency develops, by field work with a social service agency. (2 cred.; jr., sr.; prereq., Soc. 51; ar.) Mrs. Fenlason.
- 91su. Elementary Field Work. Designed for students who have taken 90 and aiming to give practice in the methods of treatment outlined in Course 52. (2 cred.; jr., sr.; prereq., 51 and 90; ar.) Mrs. Fenlason.
- 92su. Elementary Field Work. Field work on special research problems, principally in the field of child welfare, depending upon the proficiency attained in 90 and 91. (2 cred.; jr., sr.; prereq., 51, 90, 91; ar.) Mrs. Fenlason.

- 100su. Social Psychology. The social attitudes; their development and modification under social pressures; the interactions of individuals and groups. (3 cred.; jr., sr., grad.; prereq., Soc. 1, Psy. 1-2, and 11 cred. in soc. sci., ed., phil., and psy.; MTWThFS I; 15F.) Mr. Chapin.
- 114su. Rural Social Institutions. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. For advanced students. Lectures, discussions, reports. (3 cred.; jr., sr., grad.; prereq., same as for 101; MTWFS III; 6F.) Mr. Lundquist.
- 153-154-155su. Advanced Field Work. May be taken in specialized fields. Open to students wishing to strengthen their experience in case work. (3 cred.; jr., sr., grad.; prereq., 90, 91; ar.)
- 160su. Population Problems. A course designed to indicate the significance of population movements; to interpret population statistics and the social problems arising from population movements. (3 cred.; jr., sr., grad.; prereq., same as 101; MTWThFS IV; 6F.) Mr. Sorokin.
- 167su. Social Evolution. An analysis of theories of social evolution; a consideration of such processes of social change as, invention, selective cultural accumulation, and diffusion. (3 cred.; jr., sr., grad.; prereq., same as for 101; MTWThFS II; 5F.) Mr. Chapin.
- 200su. Research Seminar. Research on special problems. Open only to graduates on approval of instructors. Offers the opportunity for investigation of special problems under supervision. Credit will be assigned according to the amount and quality of work done. (Grad.; ar.) Staff.
- 221-222-223su. Graduate Field Work. (Ar.)

SECOND TERM

- 1su. Same as course given first term. (I; 3F.) Mr. Lundquist.
- 6su. Same as course given first term. (IV; 3F.) Mr. Sutherland.
- 14su. Same as course given first term. (III; 3F.) Mr. Lundquist.
- 101su. Social Organization. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; purposive social organization. (3 cred.; jr., sr., grad.; prereq., 4 courses in soc., or Soc. 1, and 15 cred. in soc. sci., ed., phil., or psy.; MTWThFS I; 6F.) Mr. Boettiger.
- 120su. Social Progress. A study of the basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. (3 cred.; jr., sr., grad.; prereq., same as for 101; MTWThFS II; 6F.) Mr. Boettiger.
- 153-154-155su. Same as first term. (Ar.)
- 161su. Crime and Punishment As Social Conflict. The nature of conflict processes; law as the resultant of a conflict of interests; time as an adjustment to conflict situations in mental and social life; punishment as an expression of conflict tendencies. (3 cred.; jr., sr., grad.; prereq., same as for 101; MTWFS III; 6F.) Mr. Sutherland.
- 200su. Research Seminar. Same as first term. Staff.
- 221-222-223su. Graduate Field Work. (Ar.)

COLLEGE OF ENGINEERING AND ARCHITECTURE

ARCHITECTURE

FIRST TERM

- 11su. History and Appreciation of Architecture, Furniture, and Decoration. Study of character and development in the greater historic periods. Illustrated lectures, library research. (2 cred.; no prereq.; TWThF, hour to be arranged with the class; 320E.) Mr. Mann.
- 21-22-23su. Beginning Freehand Drawing. Perspective sketching. Drawing in pencil and charcoal. (2-cred.; no prereq. for 21; 22 and 23 are continuations for arch. students; MTWTh II-IV or VI-VII; 417E.) Mr. Young.
- 24-25-26su. Intermediate Freehand Drawing in Water Color and Other Media. Sketching out of doors. (2 cred.; prereq. for 24, evidence of intermediate ability; 25 and 26 are continuations for arch. students; MTWTh II-IV or VI-VIII; 417E.) Mr. Young.
- 27-28-29su. Advanced Freehand Drawing. Still life, antique, head from life and sketching out of doors. (2 cred.; prereq. for 27, evidence of advanced ability; 28 and 29 are continuations for arch. students; MTWTh II-IV or VI-VIII; 417E.) Mr. Young.
- 31su. Elements of Architecture. Exercises in instrumental drawing and architectural lettering. Theory and practice of wash rendering. Library research. (5 cred.; fr. arch.; no prereq.; MTWThF I-IV; 317E.) Mr. Heath.
- 32su. Elements of Architecture. Original problems in the architectural treatment of walls, floors, windows, and moldings. Lectures and library research. (5 cred.; fr. arch.; prereq., 31; MTWThF I-IV; 317E.) Mr. Heath.
- 33su. Elements of Architecture. Study of the elements, forms, and principles of architecture. Original problems in their use in elementary architectural design. Lectures and library research. (5 cred.; fr. arch., prereq., 32; MTWThF I-IV; 317E.) Mr. Heath.
- 34-35-36su. Architectural Design, Grade I. Long and short problems done under individual criticism dealing in general with the elements of plan and elevation. Sketch problems dealing with the simple compositions. Summer credit limited to two credit hours. (2 cred.; prereq., Arch. 33; MTWThFS I-IV; 317E.) Mr. Heath.

CIVIL ENGINEERING

STRUCTURAL ENGINEERING

FIRST TERM

- 131su.¹ Bridge Analysis. Stresses in simple span railway bridge trusses of the larger type. Baltimore, Petit, Whipple, and "K" trusses. Eight weeks. (3 cred.; sr. C.E.; prereq., C.E. 33; ar.; 227E.) Mr. Parcel.

¹ Eight weeks, June 16 to August 11, 1927. The registration fee for the eight weeks required for these courses is \$30. In addition the student will make the usual deposit of \$5.

- 132su.¹ Bridge Design. Design and detail drawing of railway plate girder viaduct. Eight weeks. (3 cred.; sr. C.E.; prereq., C.E. 131; ar.; 227E.) Mr. Parcel.
- 134su. Statically Indeterminate Structures. General theory deflections and statically indeterminate stresses and their application to continuous girder, frames, swinging bridges, and redundant members. Eight weeks. (3 cred.; sr. C.E.; prereq., C.E. 132; ar.; 227E.) Mr. Parcel.

DRAWING AND DESCRIPTIVE GEOMETRY

FIRST TERM

- 1su. Engineering Drawing. The elements of drafting including an introductory course in the methods of representation and constructive geometry. Graphs and formulas. Sketching, lettering, working drawings, conventions, standards, tracing, and blue printing. (3 cred.; all; prereq., solid geom.; 2 lect., 16 hrs. lab.; ar.; 101E.) Mr. Quaid.
- 2su. Engineering Drawing. A continuation of Course 1. (3 cred.; all; prereq., Dr. 1; 2 lect., 16 hrs. lab.; ar.; 101E.) Mr. Quaid.
- 3su. Descriptive Geometry. An elementary course in the methods of representation, correlated in part with analytical geometry. Graphical and algebraic solutions. Lectures, demonstrations, and drawing room exercises. (3 cred.; prereq., Dr. 2, Math. 12; lect., TWThF I; 205E; lab., 14 hrs.; ar.; 101E.) Mr. Schuck.
- 4-5-6su. Engineering Drawing and Descriptive Geometry. The elements of drafting. Descriptive geometry including graphical methods of representation, correlated in part with analytical geometry. Required of freshmen in chemistry and chemical engineering who satisfy the entrance requirements in mathematics. (2 cred. each; prereq., sol. geom.; ar.; 201E.) Mr. Schuck, Mr. Quaid.
- 7-8su. Engineering Drawing and Descriptive Geometry. (Chem. and Chem. E.) (3 cred. per qtr.; prereq., solid geometry.) Mr. Schuck, Mr. Quaid.
- 10su. Solid Geometry. Lines and planes in space; dihedral and polyhedral angles; polyhedrons, surfaces, cylinders, cones, spheres. Numerical exercises in area, volumes, weights. Entrance credit for the College of Engineering and Architecture. (3 cred.; prereq., plane geometry, open also to teachers; 5 hrs. per week; MTWThF I; 203E.) Mr. Quaid.
- 21su. Drafting. (C.E.) Drawing of structures and machines. Details, assembly, and construction drawings. The solution of problems of simple structures. The application of descriptive geometry to drafting room problems. (2 cred.; soph. C.E.; prereq., Dr. 3; 12 hrs.; ar.; 201E.) Mr. French.

¹ Eight weeks, June 16 to August 11, 1927. The registration fee for the eight weeks required for these courses is \$30. In addition the student will make the usual deposit of \$5.

- 22su. Drafting. (C.E.) Continuation of Course 21. Drafting problems in concrete, highway, and topographical work as met by the civil engineering draftsman in practice. Intersections, developments, and other practical geometric problems. (2 cred.; soph. C.E.; prereq., Dr. 21; 12 hrs.; ar.; 201E.) Mr. French.
- 23su. Drafting. (C.E.) A continuation of Course 22. (2 cred.; soph. C.E.; prereq., Dr. 22; 12 hrs.; ar.; 201E.) Mr. French.
- 26su. Drafting. (E.E.) The application of descriptive geometry to drafting room problems, sheet metal work, belting, conveyors, and connections. Working drawings and tracing. (2 cred.; soph. E.E.; prereq., Dr. 3; 12 hrs.; ar.; 201E.) Mr. French.
- 27su. Drafting. (E.E.) The application of elementary formulas in the proportioning of simple machine parts. Outline and assembly drawings, electrical conventions, circuit diagrams, the development of simple formulas, and graphical methods. (2 cred.; soph. E.E.; prereq., Dr. 26; 12 hrs.; ar.; 201E.) Mr. French.
- 28su. Drafting. (M.E.) The application of descriptive geometry to drafting room problems. Sheet metal work, belting, conveyors, and connections. Working drawings and tracing. (2 cred.; soph. M.E.; prereq., Dr. 3; 12 hrs.; ar.; 201E.) Mr. French.
- 29su. Drafting. (M.E.) The application of elementary formulas in the proportioning of simple machine parts. Outline and assembly drawings, structural drafting, the development of simple formulas, and graphical methods. (2 cred.; soph. M.E.; prereq., Dr. 28; 12 hrs.; ar.; 201E.) Mr. French.
- 44su. Lettering. Practical course in plain lettering. (1 cred.; open to teachers, also to engineering students; no prereq.; 2 hrs. per week; ar.; 101E.) Mr. Quaid.
- 50su. Diagrams and Charts. Elementary course dealing with the construction of simple diagrams, charts, and graphs. (2 cred.; open to teachers, also to engineering students; prereq. registration in 44; 4 hrs. per week; ar.; 101E.) Mr. Schuck.
- 66su. Mechanical Drawing. A special course designed to meet the needs of teachers in secondary schools and colleges. Theory and practice. (3 cred.; 2 lectures, 6 hrs. lab.; ar.; 201E.) Mr. French.

SECOND TERM

- 3su. Descriptive Geometry. See statement for first term. Hours arranged Mr. Eggers.
- 6su. Descriptive Geometry. (Chem. and Chem.E.) See statement for first term. Mr. Eggers.
- 8su. Drawing and Descriptive Geometry. (Chem. and Chem.E.) See statement for first term. Mr. Eggers.
- 21su. Drafting. (C.E.) See statement for first term. Mr. Archibald.
- 22su. Drafting. (C.E.) See statement for first term. Mr. Archibald.
- 23su. Drafting. (C.E.) See statement for first term. Mr. Archibald.
- 26su. Drafting. (E.E.) See statement for first term. Mr. Archibald.

- 27su. Drafting. (E.E.) See statement for first term. Mr. Eggers.
 28su. Drafting. (M.E.) See statement for first term. Mr. Archibald.
 29su. Drafting. (M.E.) See statement for first term. Mr. Eggers.
 41-42-43su. Technical Drawing. See statement for first term. Mr. Archibald.

MATHEMATICS AND MECHANICS

FIRST TERM

- 9su. Higher Algebra. (High school.) Fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, complex quantities, quadratic equations, numerical exercises. (No cred.; no prereq.) Mr. Miller.
- 10su. Solid Geometry. (See Drawing and Descriptive Geometry, page 54.)
- 11su. College Algebra. (See Mathematics, College of Science, Literature, and the Arts.)
- 12su. Trigonometry. Rectangular co-ordinates, angles, trigonometric functions, solution of plane right triangles, reduction formulas, fundamental relations, addition formulas, double angles, half angles, identities and equations, inverse functions, oblique triangles, De Moivre's theorem, spherical right triangles. (5 cred.; fr. eng., arch., chem.; prereq., 11; MTWF III, IV; Th IV, V; 106E.) Mr. Jones.
- 13su. Analytical Geometry. Co-ordinate systems, equation, locus, straight line, second degree equations, polar co-ordinates, parametric equations, derivatives, tangents, normals, conic sections, rotation of axes, empirical equations. Space co-ordinates, plane, line, quadric surfaces, cylinders, space curves, tangent lines, planes. (5 cred.; fr. eng., arch., chem.; prereq., 12; MTWF III, IV; Th IV, V; Sec. 1, 136E; Sec. 2, 104E.) Mr. Herrick, Mr. Siler.
- 25su. Integral Calculus. Standard elementary forms, definite integral, rational fractions, integration by substitution, integration by parts, reduction formulas, integration a process of summation, successive and partial integrations, elementary ordinary differential equations. (5 cred.; soph. eng.; prereq. 24; MTWF III, IV; Th IV, V; 215E.) Mr. Dalaker.
- 26su. Technical Mechanics. *Statics and Kinematics*. Characteristics of a force, parallelogram law, moments, couples resultant of a force system, equilibrium of a force system, friction, centroids, moment of inertia. Motion of particle, motion of a rigid body. (5 cred.; soph. eng.; prereq., 25; Sec. 1, MTWThF I, II; 106E.; Sec. 2, MTWF III, IV; Th IV, V; 203E.) Mr. Holman, Mr. Doeringsfeld.
- 128su. Strength of Materials. Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, hollow cylinder, rollers, plates, curved bars, springs, dynamic stresses, true stresses. (5 cred.; jr. eng.; prereq., M.&M. 26; MTWF III-IV; Th IV-V; 215E.) Mr. Priester.

SECOND TERM

- 13su. Analytical Geometry. See statement for first term. (5 cred.; fr. eng., arch., chem.; prereq., 12; MTWThF III-IV; 136E.) Mr. Warne.

26su. Technical Mechanics. *Statics and Kinematics*. See statement for first term. (5 cred.; soph. eng.; prereq., 25; MTWThF III-IV; Sec. 1, 203E; Sec. 2, 215E.) Mr. Hartig, Mr. Herrick.

127su. Technical Mechanics. *Dynamics*. See statement for first term. (5 cred.; jr. eng.; prereq., 26; MTWThF I-II; 203E.) Mr. Wilcox.

MECHANICAL ENGINEERING

FIRST TERM

WOODWORKING COURSES

11su.¹ Pattern Shop Practice for Engineering Students and Others. Construction and demonstration of various types of patterns used in the production of castings. Study of shop drawings, materials used, operation of woodworking tools and machinery. Inspection trips and reports. (2 cred.; fr. eng.; no prereq.; M I-IX; TWF I-IV; Th I-II; ME.) Mr. Richards.

Special Courses for Teachers

1su.¹ Machine Woodworking. Operation and setting up of woodworking machinery; care and manipulation of adjustable parts. Layout and plan of equipment and course for high school or junior college, including problems in cabinet making and wood construction. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Richards.

4su.¹ Wood Turning. Operation and adjustment of the lathe; care and manipulation of wood turning hand tools. Turning between centers, face plate, and chuck work. Plan and arrangement of projects suitable for a high school course. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Richards.

5su.¹ Wood Finishing. Preparatory treatment of wood surfaces, color mixing, application of oil and acid stains, shellacking, varnishing, enameling, rubbing, and finishing. Polychrome projects, layout, building up of design, application and blending of colors. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Richards.

6su.¹ Pattern Practices. Pattern layout. Partings, draft, shrinkage and finish allowance. Building and assembly of materials. Core prints and core boxes, color symbols. The relation of pattern and foundry practice. Industrial problems and methods, lectures and notes. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Richards.

20su.¹ Furniture Making. Details of designs and construction. Doweling, mortise and tenon work. Bending and setting of shapers. Value and materials used in built-up work. Laying of veneer. Layout of a course in high school furniture making. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Richards.

¹ A laboratory fee of \$1.50 is charged for this course.

FORGE PRACTICE

- 13su. Forge Practice for Engineering Students. Forging and welding wrought iron and steel; hardening, tempering, and annealing steel. Inspection trips and reports. (2 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Hughes.

Special Courses for Teachers

- 8su. Soldering, Brazing, and Welding. Steel and iron welding, brazing, and cutting practice with the acetylene torch. Soft and hard soldering. Aluminum puddling. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Hughes.
- 9su. Heat Treatment. Theory and practice of hardening and annealing. Carburization. Alloyed and carbon steels. Pyrometer care and control. Commercial values and applications. Inspection trips. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Hughes.
- 10su. Art Work in Forging. Principals of design, and practice in ornamental forging as applied to household art. Lamps, fire tools, screens, and similar devices. Layout of high school forge shop; equipment; courses and sequence of exercises. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Hughes.

MACHINE SHOP WORK

- 14su.¹ Machine Shop Practice for Mechanical Engineering Students. Care and operation of machine tools. Bench work, lathe, planer, shaper, and drill press work including screw thread cutting, taper turning, gear cutting, precision grinding, etc. 12 lectures, shop inspection trips. (4 cred.; soph. mech.; no prereq.; M I-IX; TWFS I-IV; Th I-II; M.E.) Mr. Shipley.
- 15su.¹ Advanced Machine Shop Practice for Mechanical Engineering Students. Machine shop production methods and manufacturing principles. Practice in the manufacturing of a small gasoline marine motor on production basis; also heat treatment, welding, and brazing. (4 cred.; soph. mech.; prereq., 14; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Shipley.
- 16su.¹ Elementary Machine Shop for Electrical Engineering Students. Bench work, lathe, planer, shaper, drill press, and milling machine operation. (2 cred.; soph. elec.; no prereq.; M I-IX; TWFS; I-IV; Th I-II; M.E.) Mr. Shipley.
- 17su. Machine Shop Practice. (Chemists and chemical engineers.) (2 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; M.E.) Mr. Rogers.
- 111su. Tool Construction. The planning and making of tools, jigs, fixtures, sheet metal stamping, forming and drawing dies for manufacturing of interchangeable parts. This course is open to engineering students, teachers, and others qualified. (4 cred.; all; prereq., 7 or 14; ar.; M.E.) Mr. Shipley.

¹ A laboratory fee of \$1.50 is charged for this course.

Special Courses for Teachers

- 2su. Bench Work. Bench and vise work in metal chipping, filing, scraping, fitting, polishing, and layout practice; planning of courses of study for school work. (2 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; M.E.) Mr. Shipley.
- 3su.¹ Elementary Machine Shop Practice. Lathe, shaper, planer, and drill press manipulation; the grinding, care, and kinds of cutting tools. Layout of courses and exercises for high school courses. This course can be arranged to include part of 2su. (2-4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Shipley.
- 7su.¹ Advanced Machine Shop. Advanced lathe work, milling machine operation. Production work. Gear calculation, and cutting. Precision grinding. Layout of typical course. (2 to 4 cred.; prereq., 3; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Shipley.

SECOND TERM

WOODWORKING COURSES

- 11su.¹ Pattern Shop Practice for Engineering Students and Others. See statement for first term. (2 cred.; fr. eng.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Richards.

Special Courses for Teachers

- 1su.¹ Machine Woodworking. See statement for first term. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Richards.
- 4su.¹ Wood Turning. See statement for first term. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Richards.
- 5su.¹ Wood Finishing. See statement for first term. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Richards.
- 6su.¹ Pattern Practice. See statement for first term. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Richards.
- 20su.¹ Furniture Making. See statement for first term. (2 to 4 cred.; no prereq.; M I-IX; TWFS I-IV; Th I-II; ME.) Mr. Richards.

¹ A laboratory fee of \$1.50 is charged for this course.

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

GENERAL INFORMATION

Through the Summer Session the field plots, orchards, livestock libraries, laboratories, museums, shops, machinery, classrooms, instruction, and other facilities used by students during the regular college year are made available to those who attend during the summer months.

The work offered in agriculture and home economics 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.

GRADUATE STUDY

Opportunity is offered in several divisions for graduate study either for the first six-week term of the Summer Session or for the entire session of eleven weeks. In some divisions both course and thesis work may be carried for the entire quarter. In a number of other divisions thesis work only may be pursued through the summer quarter. Students intending to register for any phase of graduate work and who expect to obtain credit in the Graduate School should make arrangements through the proper committees and with the dean of the Graduate School. Information concerning graduate work during the summer, in any division, may be obtained from the head of the division. Thesis and problem work is correlated in most divisions with the work in the Experiment Station and the facilities offered during the summer are in most divisions especially attractive on account of the field work possible only at that time.

ADMISSION

The undergraduate 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.

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the school course, one additional school year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

For details of admission requirements and definition of "unit" see the bulletin of general information.

CONSOLIDATED SCHOOL PRINCIPALS

In small schools the superintendent or principal may act as special teacher of agriculture by fulfilling the requirements established by the State

Board. These include the regular qualifications for a teacher of agriculture and also the qualifications for superintendent or principal.

The Summer Session of the University offers opportunity to take courses preparatory for the fulfillment of these requirements.

AGRICULTURAL BIOCHEMISTRY

FIRST TERM

- 3-4su. Types of Carbon Compounds. An elementary study of the different groups of carbon compounds, with special reference to their relationships and their occurrence in plant and animal materials used as food. (6 cred.; soph., jr., sr.; prereq., 1 yr. chem.; MTWThFS I, II; 201Ch.)
- 203asu.¹ 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. (1½ or 2½ cred.; grad.; ar.) Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman.

SECOND TERM

- 203bsu.¹ Research Problems. Second part of Course 203asu. (1½ or 2½ cred.; grad.; prereq., 203a; ar.) Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman.

AGRICULTURAL ECONOMICS²

FIRST TERM

- Ag. Econ. 140su. Principles of Marketing. An expansion of the principles of production and price economics in terms of marketing activity. (3 cred.; jr., sr., grad.; MTWThFS I; 204ODH.) Mr. Waite, Miss Epps.
- Ag. Econ. 206su. Agricultural Policy. An analysis of the problems of the political economy of agriculture. (3 cred.; grad.; MTWThFS IV; 204ODH.) Mr. Black, Mr. Dvoracek.
- Ag. Econ. 210su. Seminar in Agricultural Production Economics. Problems of agricultural production analyzed in terms of the principles of production economics. (3 cred.; grad.; MTWThFS III; 204ODH.) Mr. Black, Mr. Dvoracek.
- Ag. Econ. 220su. Seminar in Economics of Consumption. Intended especially for students in the fields of home economics and marketing. An approach to the market from the buyer's side. (3 cred.; grad.; MWF VI, VII; 204ODH.) Mr. Waite, Miss Epps.
- Ag. Econ. 237su. Methods of Price Analysis. A survey of the types of research projects in the field of prices and of methods of investigating them. (3 cred.; grad.; MTWThFS II; 204ODH.) Mr. Waite, Miss Epps.

¹ A laboratory fee of \$1.50 is charged for this course.

² See also courses under School of Business Administration, p. 107.

SECOND TERM

- Ag. Econ. 190su. Agricultural Statistics. Elementary statistical method presented in terms of the research problems of agriculture. (3 cred.; jr., sr., grad.; MTWThFS I; 204ODH.) Mr. Black, Mr. Stitts, Miss Epps.
- Ag. Econ. 217su. Research Methods in Production Economics. A survey of the types of research projects in the field of agricultural production economics and of methods of investigating them. (3 cred.; grad.; TTh, and one other period to be arranged, VI, VII; 204ODH.) Mr. Black, Mr. Dvoracek.
- Ag. Econ. 230su. Seminar in Prices of Farm Products. Price analysis especially from the viewpoint of their relation to production. (3 cred.; grad.; MWF VI, VII; 204ODH.) Mr. Waite, Miss Epps.
- Ag. Econ. 243su. Seminar in the Marketing of Dairy Products. (3 cred.; grad.; MTWThFS III; 204ODH.) Mr. Price, Mr. Stitts.
- Ag. Econ. 244su. Central Marketing Organization. An analysis of the problems of the various federated and centralized types of marketing organization. (3 cred.; grad; MTWThFS IV; 204ODH.) Mr. Price, Mr. Dvoracek.

AGRONOMY AND FARM MANAGEMENT

FARM CROPS

FIRST TERM

- 124su. Advanced Farm Crops. This course includes a survey of modern farm practices and emphasizes the application of recent discoveries in plant science to crop production problems. It is especially designed to meet the needs of instructors in Smith-Hughes schools. (3 cred.; sr., grad.; prereq., 121, 122, 123, or equiv.; MTWThF VII; MWF VIII; 2Ad.) Mr. Army, Mr. Sprague.
- 218su. The Classification and History of Crop Plants. Assignments, discussions, and laboratory work covering (a) a study of crop plants and related wild forms with their distribution, followed by (b) a study of the characteristics of species and varieties of crop plants which are useful in identification and systematic classification. The materials necessary to make the classification are available. (3 cred.; sr., grad.; prereq., Bot. 4, 5, 6; Agron. and Farm Mgt. 121, 122, 123; MWF I, II; 2Ad.) Mr. Army, Mr. Sprague.

PLANT BREEDING

FIRST TERM

- 201su. Research in Plant Breeding. Special problems in plant breeding technique, inheritance of plant characters, and cytological studies in relation to plant genetics. May be taken as major or minor work. (3 cred.; grad.; prereq., Agron. and Farm Mgt. 131, 132; ar.; 4Ad.) Mr. Hayes, Mr. Stevenson.
- 219su. Laboratory in Plant Breeding Methods. Supplementing 211f. Practice in field laboratory technique, methods of controlling pollination and handling of plant cultures. (3 cred.; grad.; prereq., Agron. and Farm Mgt. 131, 132; ar.) Mr. Stevenson.

DAIRY HUSBANDRY

FIRST TERM

- 114su. Problems in Dairy Husbandry. A study of special problems in dairy feeding, selection, and management for the teacher and extension worker. (3 cred.; prereq., 1, 101, one year's experience as high school teacher, county agent, or extension specialist; MTWThFS I; 100HH.) Mr. Schaefer.
- 208su. Research in Dairy Husbandry. Facilities offered for study and investigation of subjects pertaining to dairy cattle. Students are allowed to assist at times with investigations under way in the experiment station. Arranged to meet the needs of individual students. Open in Summer Session only to students who have had preliminary graduate work. Mr. Eckles.
- 209su. Research in Dairy Products. Opportunity and facilities are offered for study and investigation of problems concerning common dairy products. The work is arranged to meet the needs of the individual student. Open in Summer Session only to students who have had preliminary graduate work. Mr. Combs.

SECOND TERM

- 210su. Research in Dairy Husbandry. Continuation of 208su. Mr. Eckles.
- 211su. Research in Dairy Products. Continuation of 209su. Mr. Combs.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

FIRST TERM

- 197su. Introduction to Research. Preparation for investigational work in lines of entomology and parasitology. Advanced laboratory, field, and library work; training in the preparation of bibliographies and manuscripts; special problems. The following lines of work are open:
 Systematic Entomology. Mr. Mickel.
 General Economic Entomology. Mr. Ruggles.
 Insect Ecology. Mr. Chapman.
 (2½ or more cred.; sr.; prereq., 37-38-39 or 44, 45, and other prescribed work; ar.)

Research. Ample opportunity for research work in various phases of entomology and parasitology will be afforded properly qualified students. This work will be individual and it is advised that students planning to undertake special problems correspond with the division relative to methods of collection and preparation of material.

HOME ECONOMICS

FIRST TERM

- H.E. 3su.¹ Textiles. Designed to train consumers of fabrics. Involves study of textile fibers, their structure, properties, and chemical reactions; structure of fabrics; art and economic consideration on selection of

¹ A laboratory fee of \$1.50 is charged for this course.

- clothing and household furnishings. (3 cred.; no prereq.; MTWThFS I, II; 307, 311HE.) (Limited to 24.) Miss Weller.
- H.E. 11su.¹ Garment Making. Involves selection of suitable fabrics, designing, practice in reading and adapting commercial patterns, cutting; use and care of sewing machine; construction of garments. (3 cred.; no prereq.; MTWFS I, II, and 2 hrs. ar.: 304HE.) (Limited to 24.) Miss Eppel.
- H.E. 17su.¹ Advanced Clothing Construction. Problems in costume modeling and construction of garments. (3 cred.; jr., sr.: prereq., 13, 53; MTWThF VI, VII, and 2 hrs. ar.: 305HE.) (Limited to 20.) Miss Eppel.
- H.E. 20su.¹ Economic Aspects of the Food Supply. Food problems of the consumer. A study of the quality and cost of foods on the market. Laboratory and field work. (2 cred.; no prereq.: MTThF VI, VII; 203-207HE.) Miss Kolshorn.
- H.E. 22su.¹ Foods Management. Determination and study of the management factors involved in the food problems of the homemaker. (3 cred.; soph., jr., sr.; prereq., 21 or equivalent, Physiol. 4; MTWThFS I, II; 207HE.) (Limited to 20.) Miss Kolshorn.
- H.E. 34su. Home Management: Operation and Maintenance, Lectures. Discussion of the management responsibilities of the homemaker with emphasis on household accounts. (3 cred.; jr., sr.: prereq., 22 (5 cred.), Econ. 5; MTWThFS VIII; 106HE.) Miss Whiteside.
- H.E. 35su. Home Management: Operation and Maintenance, Laboratory. Six weeks actual residence and experience in a home management house with various household management problems including the care and training of a child of pre-school age. (6 cred.; jr., sr.: prereq., 22.) Miss Nickell, Miss Whiteside.
- H.E. 52su. Art History and Appreciation. The historical development of art, architecture, decoration, furniture, and costumes, studied with special emphasis on design and influence upon modern styles. (3 cred.; soph.,² jr., sr.; prereq., 50, 51; MTWThFS I; 313HE.) Miss Harriet Goldstein.
- H.E. 53su.¹ Advanced Design. Problems in design for house furnishings and for costume, including dress modeling. (3 cred.; soph., jr., sr.: prereq., 50 and 51, or 56; MTWFS III, IV, and 2 hrs. ar.: 114HE.) Miss Vetta Goldstein.
- H.E. 57su.¹ Batik and Other Crafts. Principles of design and color harmony applied to batik and such other crafts as leather, tooling, tie dyeing, and lamp shade making. Articles are planned to relate to definite dress and home furnishing problems. (3 cred.; jr., sr.: prereq., 3, 53 or parallel; MTWThFS I, II; 114HE.) Miss Vetta Goldstein.
- H.E. 61su. Large Quantity Cookery and Marketing. Application of principles of cookery to large quantity preparation; planning of meals for dining hall and cafeteria; calculation of cost and calories in standard

¹ A laboratory fee of \$1.50 is charged for this course.

² Open to sophomores only in their third quarter.

- servings; study of problems involved in purchase of institution supplies. (4 cred.; jr., sr.; prereq., 22; lect., MTh II; lab., MTWFS I, II, III; 313HE.) Miss Katharine McFarland.
- H.E. 103su.¹ Nutrition of the Family. The fundamental principles of human nutrition as applied to the feeding of individuals and groups under conditions of health and under such pathological conditions as are chiefly dependent on dietetic treatment. (3 cred.; sr., grad.; prereq., 108, 104 parallel; MWF VII, VIII; 313HE.) Miss Leichsenring.
- H.E. 104su. Field Work in Nutrition. Laboratory, case and group work in problems of feeding. (2 cred.; sr., grad.; prereq., 108, 103 parallel. Students specializing in dietetics should register for Course 156, Special Field Work; 3 cred. listed in the Medical School bulletin instead of H.E. 104; lect., TTh VII; lab., 5 hrs. ar.; 313HE.) Miss Leichsenring.
- H.E. 123su. Clothing Economics. General consideration of economic function of women with reference to clothing and textiles in the home and in industry; study of clothing budget, hygiene, and standardization of dress. (2 cred.; jr., sr.; prereq., 13, Econ. 5; MTWF V; 313HE.) Miss Weller.
- H.E. 136su. Budget Problems. An intensive study of problems relating to individual and family budgets. Readings, discussions, and field work. (3 cred.; sr., grad.; prereq., 34 and 35 or equivalent, Econ. 5, Econ. 126 desirable; MWF I, II; 106HE.) Miss Nickell.
- H.E. 205su. Home Economics Seminar. A critical study of selected topics, and recent advances in home economics involving outside readings, oral and written reports. (2 cred.; hrs. and days ar.) Miss McNeal, Miss Clara Brown, Miss Weller, Miss Leichsenring, Miss Kolshorn.

HOME ECONOMICS EDUCATION

FIRST TERM

UNDERGRADUATE COURSES

- H.E.Ed.42su.² Special Methods of Teaching Home Economics. Curricula, equipment, methods of teaching for home economics. (5 cred.; jr., sr.; prereq., 13, 22, Psy. 1 and 2, Agr. Ed. 11 or Ed. Psy. 55; MTWThF VII, VIII; 213HE.) Miss Rose.

GRADUATE COURSES

- H.E. Ed. 141su. Home Economics Problems in Vocational Education. The place and development of home economics in the vocational education program. Study of problems of the day, evening, and part time schools. (2 cred.; sr.; prereq., 42; MTThF V; 213HE.) Miss Brown.
- H.E. Ed. 142su. Educational Measurement in Home Economics. Survey of accomplishment in this field; evaluation and construction of objective tests. (2 cred.; sr.; prereq., 42, Ed. Psy. 55; MWFS III; 213HE.) Miss Brown.

¹ A laboratory fee of \$1.50 is charged for this course.

² Prerequisites waived for teachers of home economics.

- H.E. Ed. 143su.¹ Organization and Method for Related Art Teaching. Content of related art courses and methods of teaching art principles as applied to familiar objects and processes. (3 cred.; sr.; prereq., 42 or parallel, 53, 131 or parallel; MTWThFS IV; 213HE.) Miss Harriet Goldstein.
- H.E. Ed. 242su. Home Economics Education Seminar. Current problems in home economics education will be studied. (Required of all candidates majoring in home economics education.) (1 cred.; grad. students only; hrs. and days ar.) Miss McNeal, Miss Brown.

HORTICULTURE

FIRST AND SECOND TERMS

- 190-191su. Special Problems. A study of problems based upon work given in preceding horticultural courses. (3 cred.; jr., sr., grad.; ar.) Mr. Alderman and staff.

PLANT PATHOLOGY AND BOTANY

FIRST AND SECOND TERMS

- 206su. Special Problems. This is a course primarily for graduate students. Special assignment of work in laboratory and field problems in pathological research. Mr. Stakman.

¹ Prerequisites waived for teachers of home economics.

THE LAW SCHOOL

A number of courses will be offered by the Law School faculty for the summer quarter, June 20 to September 3, 1927. The quarter will be divided into two terms, the first from June 20 to July 30, and the second from August 1 to September 3. Students may attend either or both terms. Each course listed has four lectures each week and carries two quarter credits. The maximum number of credits which may be earned each term is six, twelve for the quarter. All classes will be held in the forenoon Monday to Friday, inclusive.

The summer work in law is designed to enable students to lighten the burden of the regular academic year, or to supplement the course which is required for the first law degree. As the work in the Law School is organized on a year basis, and several third year subjects required for the first law degree are given only in the regular academic year and extend throughout the year, attendance during the summer quarter will not dispense with the necessity of attendance for three academic years. But credits obtained in the summer quarter may be applied toward the first law degree and surplus credits earned during the third academic year may be applied toward the degree of master of laws. Attendance for two summer quarters enables a student to complete in his third year all the class work required for the Master's degree, and this degree will be conferred upon completion of a satisfactory thesis.

No work is offered for beginning students. All students who have had one year of law are eligible for the subjects listed and can study them profitably. Regular entrance requirements will not be enforced during the summer quarter. The only prerequisite is the completion of one year of law study in this or another law school.

The tuition is \$50 for the quarter, \$25 for either term.¹

COURSES

FIRST TERM

Labor Law. Legality of combinations; legality of means used, including picketing and peaceful persuasion; legality of ends pursued; lockouts; boycotts; corporate rights and liabilities of labor unions; injunctions; compulsory arbitration and industrial courts. Sayre, *Cases on Labor Law*. (MTWTh 8:00-9:00.) Mr. McClintock.

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. Holbrook and Aigler, *Cases on Bankruptcy*. (TWThF 9:00-10:00.) Mr. Fletcher.

¹ These fees include the regular incidental fee. In addition a general deposit of \$5 is charged, part of which is returned.

Equity III. Equitable Remedies. Bills of interpleader; bills of peace; cancellation and surrender of contracts; cloud upon title; reformation and rescission for mistake; varieties of mistake and their legal consequences. Ames, *Cases on Equitable Jurisdiction*, Vol. 2. (MTWTh 10:00-11:00.) Mr. McClintock.

Taxation. Nature of taxes; power to tax; limitation on the taxing power; purposes for which taxes may be laid; listing and assessment; collection of tax; taxation of business and privilege; special assessments. Goodnow, *Cases on Taxation*. (TWThF 11:00-12:00.) Mr. Fletcher.

SECOND TERM

Carriers. The carrier's undertaking; the obligation of the shipper; exceptional liability of common carrier; the carrier's duty to serve. Textbook to be announced. (MTWTh 8:00-9:00.) Mr. Dwan.

Persons. 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*. (TWThF 9:00-10:00.) Mr. Paige.

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. Tooke, *Cases on Municipal Corporations*. (MTWTh 10:00-11:00.) Mr. Kingsley.

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*. (TWThF 11:00-12:00.) Mr. Paige.

THE MEDICAL SCHOOL

GENERAL INFORMATION

THE SUMMER QUARTER—TERMS

The first term of the summer quarter will extend from June 17 (classes begin June 20) to July 30; the second, from August 1 to September 3. Students may attend either or both terms.

GENERAL

Any of the courses offered by the departments of the Medical School are open to any student in the Summer Session, who has the necessary prerequisites.

CLINICAL YEARS

The Medical School offers full regular programs for the first quarter of the junior year, and the second quarter of the senior year. In order to receive legal time credit toward the degree of doctor of medicine or bachelor of medicine in this institution, students must be matriculated in the Medical School; see the annual bulletin of the Medical School for requirements for admission and registrations governing advanced standing. Medical students from other schools who desire to enter for the summer only may do so as unclassified students, receiving subject credit only. If such students desire legal time credit toward a medical degree, they should arrange same with the institution from which they intend to take such degree. No obligation to accept such students into regular classes at this school may be attached to unclassified registration. Such students from other medical schools may take one of the programs listed below or, provided there is room in the classes, make up a special program from the courses offered.

Students from other institutions should consult the Medical School bulletin to make sure in what degree the courses listed fulfill their respective needs. They should consult their own department heads as to the equivalence of courses offered at the University of Minnesota to those required in the medical school where they expect credit.

PROGRAMS FOR CLINICAL YEARS

The following are the required courses to be offered in the clinical years.

Fifth Year (Junior Medical)

The first quarter courses of the fifth year (junior medical) will be given in the summer of 1927. These courses are as follows: Medicine 23su, 25su, 26su, 28su, 29su, 34su, 42su. Obstetrics 23su, 24su, and 28su. Pediatrics 23su and 24su. Pharmacology 105su and 108su. Surgery 21su and 27su. Electives if desired. See departmental statements for hours and credits.

Sixth Year (Senior Medical)

The program for the summer quarter will consist of the following courses. For description and schedules see departmental statements.

SUMMER SESSION

Division A

Obs. 22su, Obs. 25su, Med. 30su, Path. 109su, Med. 33su, Med. 47su,
P.M.&P.H. 101su, Surg. 41su.

Division B

Med. 30su, Obs. 22su, Obs. 25su, Obs. 26su, Obs. 27su, Obs. 29su, Ped.
26su, Ped. 27su, Ped. 28su, Ped. 29su, O.&O. 23su, 24su, 25su.

Division D

Obs. 25su, Med. 27su, Med. 30su, Surg. 28su, 29su, 47su, Path. 109su.

Under the curriculum senior students are assigned to a particular clerkship and to particular dispensary clinics each quarter, for which see special schedule. Qualified students from other schools may elect clerkships and other clinics offered to the extent of the capacity of these courses.

LABORATORY YEARS

No regular programs for freshman or sophomore medical students are offered, but many of the courses of these years will be given (see departmental statements for description of courses, program of hours, and laboratory fees). These courses may be taken by properly prepared students from other institutions as unclassified students, without matriculation. But students who desire to secure time credit toward the degree of doctor or bachelor of medicine in this school must matriculate in the regular way (see requirements in the annual bulletin of the Medical School).

OPPORTUNITIES FOR PRACTITIONERS

All the summer courses offered are open to physicians, who will be registered as special students. Attention is also called to short courses offered from time to time throughout the year under the Extension Division. These courses are exclusively for practitioners and are largely practical in nature. Circulars will be sent on request.

The regular clinics in the University Hospital and Dispensary, the Minneapolis General Hospital, and the Ancker Hospital, St. Paul, will go on as usual during the summer quarter, and will be open to visiting physicians.

FEES

The tuition fee for a full summer quarter is \$60 for residents of Minnesota, and \$70 for non-residents. Less than a full program may be paid for on a clock hour basis, namely \$2.50 (non-residents, \$3) for each weekly clock hour of scheduled work per quarter. In addition each student will pay the incidental fee of \$5, and a deposit of \$10. Term fees are one half the quarter fees. Laboratory fees are not required under this plan. The schedule of total fees will therefore be:

	Quarter	Term
Tuition fee	\$60.00 (\$70.00)	\$30.00 (\$35.00)
Incidental fee	5.00	2.50
Deposit	10.00	10.00
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	\$75.00 (\$85.00)	\$42.50 (\$47.50)

Fees must be paid on the above basis by all who elect the program of clinical subjects in the junior and senior medical years; and by all who desire time credit on the medical course.

Students who do not desire to register for time credit nor for a program of clinical subjects may pay on the above basis; or they may at their option pay the regular summer session fee of \$25 per term, plus the laboratory fees in courses requiring them, and the deposit fee of \$10.

ELECTIVES

Various electives will be offered in the laboratory and clinical departments. See departmental statements in this bulletin and also special summer quarter programs of the Medical School (to be published later) for details.

NURSING STUDENTS

No beginning students can be received in the summer quarter. For the regular courses, requirements, etc., see the bulletin of the School of Nursing.

FEEES FOR STUDENTS IN THE SCHOOL OF NURSING

For students in the School of Nursing, whose work in the Summer Session is entirely in the hospitals, or in field service not involving instruction by members of the staff who are paid from the summer session budget, there will be no tuition fee. For students who take regular class work on the campus which is in charge of members of the staff who are paid from the summer session budget, a tuition fee at the rate of \$1 per clock hour for the courses pursued shall be charged.

PUBLIC HEALTH NURSING

See Department of Preventive Medicine and Public Health in this bulletin.

COURSES IN MEDICAL TECHNOLOGY

The demand for clinical and laboratory technicians, trained in the principles and technique of the medical sciences is increasing. The vocation is one that offers satisfactory objectives, a large measure of usefulness, and fair compensation.

A special circular on courses for medical technicians will be sent upon request.

Excellent courses for medical technicians are offered in the summer quarter. See departmental statements.

COURSES FOR DENTAL STUDENTS

For appropriate courses in the laboratory sciences, dental students should consult the departmental statements which follow. For dental clinical courses see page 84.

ANATOMY

FIRST TERM

- 5su. Gross Human Anatomy. Dissection of abdomen and lower extremity. Disarticulated skeletons issued for study of osteology. (9 cred.; 3d yr. med.; prereq., An. Biol. 1-2; MTWThFS I, II, III, IV; TTh VI, VI, VIII; 304,306IA.) Laboratory fee, \$7.50. Class limited to 48. Dr. Erdmann and assistants.

- 9-10su. Systematic Anatomy. Human osteology and splanchnology, with dissection of the pig fetus. (10 cred.; 1st yr. dent.; prereq., An. Biol. 1-2; MTWThFS I, II, III, IV; MWF VI, VII, VIII; 313, 301IA.) Laboratory fee, \$7.50. Class limited to 30. Dr. Miller and assistant.
- 14su. Histology and Embryology. Minute structure and development of the tissues and organs, with special emphasis upon the oral region and digestive tract. (8 cred.; 2d yr. dent.; prereq., An. Biol. 1-2, Anat. 9-10-11; MTWThFS I, II, III, IV; 102,213IA.) Laboratory fee, \$5. Dr. Jackson and assistants.
- 103su. Human Histology. Minute structure of the various tissues and organs. (9 cred.; 3d yr. med.; prereq., An. Biol. 1-2, Anat. 5-6-7; MTWThFS I, II, III, IV; MWF VI; 102,214IA.) Laboratory fee, \$7.50. Dr. Jackson and assistants.
- 133su. Anatomy of the Fetus and Child. A survey of prenatal and postnatal development. (2 cred.; prereq., Anat. 103; hrs. ar.) Mr. Scammon.
- 156su. Advanced Anatomy. Individual problems in gross anatomy, histology, embryology, or neurology. Includes advanced work for clinical graduate students. Permission by instructor required. Laboratory fee, \$1 per credit. Credits and hours arranged. Dr. Jackson or Mr. Scammon.
- 163su. Seminar in Human Growth. Permission by Mr. Scammon required. Credit and hours arranged.
- 204su. Research in Anatomy. Research work in gross or microscopic anatomy, histology, embryology, or neurology. Permission by instructor required. Credits and hours arranged. Dr. Jackson or Mr. Scammon.

SECOND TERM

- 6su. Gross Human Anatomy. Dissection of head, neck, thorax, and upper extremity. Continuation of 5su. (MTWThFS I, II, III, IV; TTh VI, VII, VIII, IX; 304,306IA.) Laboratory fee, \$7.50. Class limited to 48. Dr. Fowler and assistants.
- 11su. Anatomy of the Head and Neck. Human dissection. (First yr. dent. and others; prereq., Anat. 9-10; MTWThFS I, II, III, IV; 304, 308IA.) Laboratory fee, \$4. Class limited to 30. Dr. Miller and assistant.
- 111su. Human Neurology. Morphology of the central nervous system and sense organs. (6 cred.; 4th yr. med. and others; prereq., Anat. 103, 107; MTWThF I, II, III, IV; S I, II; 102,213IA.) Laboratory fee, \$5. Mr. Rasmussen and assistant.
- 156su. Advanced Anatomy. (See under First Term, Course 156.) Permission by Mr. Rasmussen required. Credits and hours arranged.
- 204su. Research in Anatomy. (See under First Term, Course 204.) Permission by Mr. Rasmussen required. Credit and hours arranged.

BACTERIOLOGY

FIRST TERM

- 51su. General Bacteriology. Culture media; methods of staining and identification; principles of sterilization and disinfection; examination of air, water, milk; relation of bacteriology to the industries. (5 cred.; prereq., general chemistry and biology; MTWThF VI, VII, VIII; 214,201MH.) Laboratory fee, \$1.50. Mr. Halvorson.
- 114su. The Higher Bacteria. Study of morphology, cultivation, and classification of actinomycetes, yeasts, and molds. (3 cred.; prereq., general bacteriology; MTWF II, III; 201MH.) Laboratory fee, \$1.50. Mr. Halvorson.
- 150su. Advanced Bacteriology. Opportunity of working out special problems. (Prereq., General Bacteriology; cred. and hr. ar.) Laboratory fee, \$1 per credit. Dr. Larson.
- 201su. Research in Bacteriology. Graduate students of the necessary preliminary training may elect research, either as major or minor, in bacteriology. (Permission required. Arrange hours and credits. 201MH.) Dr. Larson.

SECOND TERM

- 101su. Special Bacteriology. The pathogenic bacteria, especially in relation to definite diseases; principles of infection and immunity. (4 cred.; 4th yr. med. and others; prereq., general bacteriology; MTWThF VI, VII, VIII; 201, 214MH.) Laboratory fee, \$1.50. Dr. Green.
- 116su. Immunity. Laws of hemolysis. Quantitative relationship between antigen and antibody. Wasserman reaction. Opsonins. Vaccines. Precipitin reaction. Blood-grouping. Abderhalden reaction. Anaphylaxis. (3 cred.; prereq., general bacteriology; MTThF II, III; 201MH.) Laboratory fee, \$1.50. Dr. Green.

PATHOLOGY

BOTH TERMS

- 101su. General Pathology. Circulatory disturbances, degenerations, inflammation, tuberculosis, syphilis, tumors, neuropathology. (9 cred.; prereq., histology, anatomy, embryology, biochemistry; MTWThF I, II, III; 104IA.) Dr. Bell, Dr. McCartney, Dr. Lufkin, Dr. McGregor.
- 104su. Autopsies. Post-mortem technique; examination of fresh organs, etc. (Prereq., 101; hr. and cred. ar.; 110IA.) Dr. Bell, Dr. Clawson, Dr. McCartney, Dr. O'Brien.
- 106su. Pathologic Technic. Methods of preparation of microscopic and gross specimens. Limited to three students. (Hrs. and cred. ar.; 112IA.) Laboratory fee, \$1 per credit. Staff.
- 109su. Clinical Pathological Conference. Presentation of clinical data on selected cases and of the pathological specimens from the same, with discussions of etiology and diagnosis. Required in clerkship period. Elective for others. (11 hrs. cred.; F 4:00-4:50; 104IA.) Staff.
- 116su. Tumor Clinic. (1 cred.; 22 hrs.; prereq., Pathology 102; T 3:00-5:00, UH.) Dr. Bell, Dr. McCartney.

201su. Research. Students, of the necessary preliminary training, may elect research, either as major or minor in pathology. Permission required. (Hr. and cred. ar.) Dr. Bell, Dr. Clawson, Dr. McCartney, Dr. Warwick.

Note: All courses may be taken either or both terms except 101, which must be taken both terms for credit.

PHARMACOLOGY

FIRST AND SECOND TERMS

- 1su. Elementary Pharmacology. A brief study of drugs for nurses and others. (3 cred.; 33 hrs.; prereq., physiology; hrs. to be ar.) Dr. Wright.
- 4su. Pharmacology. The history, origin, nature, pharmacal preparations, and use of drugs. (4 cred.; 44 hrs.; limited to 2d yr. dental students; prereq., physiology; TF 2:00-3:00 p.m., W 2:00-4:00 p.m.; 322MH.) Dr. Brown, Dr. Bieter.
- 6su. Experimental Pharmacology. For dental students. (1 cred.; 22 hrs.; ar.) Dr. Brown, Dr. Bieter.
- 102su. Experimental Pharmacology. Laboratory portion only. Exercises illustrating the preparation and action of medicines. Laboratory fee, \$3. (3 cred.; 66 hrs.; limited to 4th yr. med.; prereq., physiology; TTh 3:00-6:00 p.m.; 322MH.) Dr. Hirschfelder, Dr. Brown, Dr. Bieter.
- 105su. General Pharmacology. Same as Course 102 in continuation. (22 hrs.; limited to 5th yr. med.; prereq., physiology; TThS III first term; T III second term.) Dr. Hirschfelder, Dr. Brown, Dr. Bieter.
- 108su. Prescription Writing. The principles of prescription writing. (5th yr.; 11 hrs.; ThS III second term.) Dr. Brown.
- 109su. Pharmacological Problems. Experimental study of special topics in pharmacology, with a review of the literature. Laboratory fee of \$1 per credit. (3 cred. or ar.; prereq., physiology; 3:00-6:00 p.m. or hrs. ar.) Dr. Hirschfelder, Dr. Bieter, Dr. Brown.
- 203su. Research in Pharmacology. (Open to graduate and advanced students, hrs. and cred. ar.) Dr. Hirschfelder, Dr. Bieter, Dr. Brown.

PHYSIOLOGY

FIRST TERM

- 4su. Human Physiology. A brief course for academic and home economics students. Lectures and laboratory work. (5 cred.; prereq., high school or college biology and chemistry; lect., MTWThF IV; rec. and dem., MWF II, III; lab.,¹ T I, II, III; Th I, II, V; 214,301MH.) Laboratory fee, \$1.50. Dr. King and assistant.
- 58-59su. Human Physiology. An intermediate course for academic, dental, and physical education students, and others. (8 cred.; prereq., general chemistry and anatomy or zoology; lect., MTWThF IV; rec. and dem.,

¹ Students who find it more convenient may arrange to do part of their laboratory work in the afternoon.

- MWF II, III; lab.,¹ T I, II, III; Th I, II, V; TTh or ar. VI, VII, VIII; 214MH.) Laboratory fee, \$3. Dr. King and assistant.
- 100su. Physiologic Chemistry. Metabolism of carbohydrates, fats, and proteins in health and disease. (5 cred.; prereq., organic chemistry and physics; lect., MTWThF I; 214MH.; lab., MTWF II, III, IV; Th II, IV, V; 310MH.) Laboratory fee, \$5. Lectures only; 3 cred. may be registered for as 100xsu. Laboratory only as 100ysu. Dr. Pettibone, Mr. Gregory and assistants.
- 103su. Physiology of Muscle, Nerve, Blood, Circulation, Respiration, Digestion. (9 cred.; 4th yr. med. and others; prereq., organic chemistry and animal biology; lect. and rec. MTWThFS I-II; lab., MTWF III-IV; Th IV-V; 301, 315MH.) Laboratory fee, \$5. Lectures only, 5 cred. may be registered for as 103xsu. Dr. Scott and assistant.
- 113su. Problems in Physiology. Arranged by instructor with qualified students. Each student will be assigned a topic for special laboratory study, leading in some cases to original investigation. Conferences and reading. May be taken one or more terms. (3 cred. or ar.; prereq., Courses 103, 104, or equivalent; 310MH.) Laboratory fee, \$1 per credit. Dr. Scott.
- 153su. Problems in Physiologic Chemistry. Arranged by instructor with qualified students for special work. May be taken one or more terms. (3 cred. or ar.; prereq., Course 100-101; 2:30-5:30; TTh or ar.; 310MH.) Laboratory fee, \$1 per credit. Dr. Pettibone or Mr. Gregory.
- 203su. Research in Physiology. Hours and credits arranged. Dr. Scott.
- 205su. Research in Physiologic Chemistry. Hours and credits arranged. Dr. Pettibone.

SECOND TERM

- 101su. Physiologic Chemistry. Continuation of Course 100su. (5 cred.; prereq., organic chemistry and physics; lect., MTWThF I; 214MH.; lab., MTWF II, III, IV; Th I, II, IV, V; 310MH.) Laboratory fee, \$5. Lectures only, 3 cred., may be registered for as 101xsu. Laboratory only as 101ysu. Mr. Gregory and assistant.
- 104su. Physiology of the Nervous System and Special Senses, Metabolism, Nutrition, and Excretion. (7 cred.; 4th yr. med. and others; prereq., Course 103 or organic chemistry and neurology; MTWThFS; lect., I; rec. and lab., II, III, IV; 301, 315MH.) Laboratory fee, \$5. Lectures only, 5 cred. may be registered for as 104xsu. Dr. Greisheimer and assistant.
- 113su. Problems in Physiology. Continued as in first term. Dr. Greisheimer.
- 153su. Problems in Physiologic Chemistry. Same as 153su., first term, given above. Mr. Gregory.
- 203su. Research. Continued as in first term. Dr. Greisheimer.

¹ Students who find it more convenient may arrange to do part of their laboratory work in the afternoon.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

FIRST TERM

- 50su. Public and Personal Health. Discusses the causes of disease and of physical defects and presents the fundamental principles and working methods of health conservation and disease prevention. Lectures, demonstrations, discussions, inspection trips, and directed readings. (3 cred.; 48 hrs.; jr., sr., Arts and Ed.; MTWThFS VI; 129MH.) Dr. O'Brien.
- 53su. Elements of Preventive Medicine. Susceptibility, resistance, and immunity to disease; methods of spread and the prevention of communicable and degenerative diseases; importance of heredity and environment; proper types and protection of food, water, and milk. (3 cred.; prereq., Bacteriology 1, Physiology 4 or equiv.; MTWThFS II; 214MH.) Dr. Lees.
- 58su. Maternal and Child Hygiene. Maternal welfare program; importance of breast feeding; origin and conduct, infant welfare clinics in cities and rural communities; consideration of child of pre-school and school age as to malnutrition, physical defects, cardiac and nervous disorders. (2 cred.; 18 hrs.; prereq., 50, 52, or 53; jr., sr.; MTWTh I; 116MH.) Dr. Boynton.
- 60su. The Tuberculosis Problem. History of tuberculosis movement and campaign in the United States. Early diagnosis and sanatorium treatment. Tuberculosis in children. The psychology of tuberculosis; supervision of returned sanatoria patients. State program for the eradication of tuberculosis; legislation. (2 cred.; 12 hrs.; jr., sr.; prereq., 50, 52, or 53; MTWF IV; minimum 12 students to hold course; 104IA.) Dr. Myers.
- 62su. Principles of Public Health Nursing. Development, principles, technique of public health nursing; methods of co-operative endeavor with social agencies; health teaching as an essential factor in promotion of individual, family, and community well-being. Special fields are presented. (3 cred.; public health nurses; prereq., 53 or equiv.; MTWThFS III; 129MH.) Miss Butzerin.
- 64su. Field Practice in Infant Welfare Nursing. For public health nurses. Class instruction, observation, and supervised practice in home visiting in the interest of breast feeding and well baby care; in conducting well baby clinics and behavior clinics for pre-school children; in understanding family problems affecting children. (3 cred.; prereq., 62; ar.; 101B MH.) Miss Butzerin, Miss Peck.
- 65su. Field Practice in School Nursing. For public health nurses. Routine inspections with the school nurse; assistance at medical examinations; general sanitary inspections; home visits; visits to special classes as sight saving, defective speech and hearing, subnormal, open air, and tuberculosis school. (2 cred.; prereq., 62; ar.; 101B MH.) Miss Butzerin.
- 66su. Field Practice in County Nursing. For public health nurses. Student nurse observes and assists nurse on rounds in county, in routine physical inspection of school children, home calls, health talks and classes in

- home nursing, organizing, advertising, and conducting of the rural clinic. (2 cred.; prereq., 62; ar.; 101B MH.) Miss Butzerin.
- 67su. Field Practice in a Tuberculosis Sanatorium. For public health nurses. Observation and practical care of pulmonary, osseous, laryngeal tuberculosis; tuberculosis enteritis; general sanatorium treatment; special treatment; exercise; laboratory; occupational therapy and the reading of literature on tuberculosis. (2 cred.; prereq., 60 and 62; ar.; 101B MH.) Dr. Mariette.
- 68su. Field Practice in Visiting Nursing. For public health nurses. Lectures, demonstrations, supervision, and field practice in bedside care of general and maternity patients; communicable disease, tuberculosis and mental cases with special emphasis upon recognition of social problems, co-operation with social agencies and accurate record keeping. (5 cred.; prereq., 62; ar.; 101B MH.) Miss Butzerin, Miss Houlton.
- 69su. School Health Work. Discussion will include: (1) school nursing program, main objectives, scope, and analysis of duties; (2) the teaching of hygiene in the grades including subject-matter, arrangement, and presentation. (1 cred.; prereq., 62 or experience in school nursing; TTh VI; 116MH.) Miss Butzerin.
- 80su. Child Health and Educational Hygiene. Intended for teachers interested in health education. Consideration of hygiene of physical and mental growth, health supervision of school children, teaching of health subjects, and sanitation of the school plant. (3 cred.; jr., sr.; prereq., 50 or 52 or 53 or equiv.; MTWThFS I; 101B MH.) Dr. Diehl and others.
- 101su. Public Health Administrative and Field Work. Demonstrations of health agencies at work; boards of health, laboratories, filtration, pasteurization, and garbage disposal plants. Presentation of actual health problems. Groups of 10 to 15 medical students for 6 weeks. (18 hrs.; sr. med.; prereq., 100; T; see clerkship schedule; 101B MH.) Staff.
- 200su. Research. Opportunities will be offered by the University and by the various co-ordinated organizations for qualified students to pursue research work. (Cred. ar.; grad.; ar.; 101B MH.) Staff.

SECOND TERM

- 64su. Field Practice in Infant Welfare Nursing. Same as first term.
- 65su. Field Practice in School Nursing. Same as first term.
- 66su. Field Practice in County Nursing. Same as first term.
- 68su. Field Practice in Visiting Nursing. Continuation of first term.
- 101su. Public Health Administrative and Field Work. Same as first term.

MEDICINE

FIRST AND SECOND TERMS

Required Courses

- 23su. The Principles and Practice of Medicine, exclusive of neurology and dermatology. Reading and recitations. (22 hrs.; 5th yr.; ThS 9:00-9:50; 129MH.)

- 25su. Physical Diagnosis and Therapy. Conducted with sections in the following dispensary clinics: (a) general medicine; (b) cardiac and vascular diseases; (c) respiratory diseases and tuberculosis; (d) food; (e) gastro-intestinal. (44 hrs.; 5th yr.; Sec. a, MTh; Sec. b, WS; Sec. c, TF; 12:30-3:00; UD.) Dr. G. Fahr, Dr. Myers, Dr. C. B. Wright, Dr. Wetherby, and others.
- 26su. Clinical Chemistry and Microscopy. Methods of laboratory examination for diagnostic purposes. (83 hrs.; Div. A, juniors; prereq., pathology and physiologic chemistry; MWF 3:00-5:30; 129,301MH.) Dr. Berglund and Dr. Medes.
- 27su. Physical Diagnosis and Therapy. Conducted with sections in the following dispensary clinics: (a) general medicine; (b) cardiac and vascular diseases; (c) respiratory diseases and tuberculosis; (d) food; (e) gastro-intestinal. (66 hrs.; 6th year; daily 6 weeks for each student; UD.) See special schedule. Dr. G. Fahr, Dr. Myers, Dr. C. B. Wright, Dr. Wetherby, and staff.
- 29su. Clinic in Medicine. (11 hrs.; Div. A junior; T 8:00-8:50; UH.) Dr. Berglund and others.
- 30su. Clinic in Medicine. Sixth year, Divisions A, B, D. (22 hrs.; TTh 8:00-8:50; UH.) Dr. Berglund, Dr. G. Fahr, and others.
- 33su. Clinical Clerkship. The personal observation of patients in hospital; taking and recording of case histories; making of provisional diagnosis, and study of treatment. One section at a time spends three weeks in residence at the Glen Lake Sanatorium. Sixth year, sections of Division A. See special schedule. (275 hrs.; 25 hours a week approximately as follows: daily 9:00-12:00; 4 hours or more per week in the afternoon.) Dr. Berglund, Dr. Gardner, Dr. Myers, Dr. Richards, and others.
- 33xsu. Clinical Clerkship. Part of 33su at Minneapolis General Hospital. Dr. Ulrich, Dr. Lindquist, and staff.
- 34su. Section Clinics in Medicine. Division A, fifth year. (17 hrs.; Secs. 1 and 2 M; Secs. 3 and 4 F; 8:30-10:00; Ancker Hosp.) Dr. Lepak, Dr. Oerting.

Elective Courses

- 60su.¹ Externship in Medicine. Extension of clerkship. One to four students. (Prereq., Med. 33; ar.) Dr. Berglund and others.
- 61su.¹ Externship in Medicine at Minneapolis General Hospital. History taking, physical examination, and laboratory diagnosis. (Srs.; daily 9:00-12:00.) Dr. Ulrich and staff.
- 102su. The Respiratory Organs in Health and Disease. For students who desire training in preparation of scientific papers for publication. The student selects a problem pertaining to some part of the respiratory tract, which he pursues independently or in collaboration with instructor. Limited to 5 students. (Hrs. and cred. ar.; 5th and 6th yr.; 101B MH.) Dr. Myers.

¹ Permission of instructor.

DIVISION OF NERVOUS AND MENTAL DISEASES

Required Courses

- 42su. Clinics in Nervous and Mental Diseases. Division A, fifth year. (17 hrs.; Sec. 4, W 8:30-10:00; Sec. 2, F 8:30-10:00; Ancker Hosp.) Dr. Hammes, Dr. Ruhberg.
- 42xsu. Clinics in Nervous and Mental Diseases. Division A, fifth year. (17 hrs.; Sec. 3, W 8:30-10:00; Sec. 1, F 8:30-10:00; Minneapolis General Hospital.) Dr. Morrison, Dr. Michael, Dr. Ahrens.
- 43su. Nervous and Mental Diseases. Observation and study of cases in the University Dispensary; required of clerks in nervous and mental service at University Hospital. Credit included in clerkship, Medicine 33. Dr. J. C. McKinley, Dr. Michael.

Elective Courses

- 85su.¹ Externship in Nervous and Mental Diseases. (Hr. and cred. ar.; prereq., Med. 33; UH.) Dr. Hamilton and staff.
- 124su.¹ Advanced Neuropathology. Individual gross and microscopic studies on existing preparations in neuropathology. Limited to 2 students. (Cred. and hrs. arranged; prereq., Path., 102; 138MH.) Dr. J. C. McKinley.
- 125su.¹ Problems in Neuropathology. The student will be assigned a topic for special study. Limited to 2 students. (Cred. and hrs. ar.; prereq., Path. 102; 138MH.) Dr. J. C. McKinley.

DIVISION OF DERMATOLOGY

Required Courses

- 47su. Physical Diagnosis and Therapy. Observation and study of cases in the University Dispensary and Minneapolis General Hospital; a part of required clinics. (40 hrs. cred.; see special schedule, sections of sr. class; daily 1:00-3:00.) Dr. Michelson, Dr. Butler, and others.

Elective Courses

- 91su. Night Clinic in Dermatology and Syphilis. Limited to 6 students. (33 hrs.; MTh 7:00-8:30; UD.) Dr. Turnacliff.
- 150su. Histopathology of the Skin. Clinic and pathologic phases will be exemplified. Same as Path. 115. (11 hrs.; prereq., Path. 102; T. 2:30-3:20; 108IA.) Dr. Gager.

OBSTETRICS AND GYNECOLOGY

FIRST AND SECOND TERMS

Required Courses

- 22su. Operative Obstetrics. A study of operative obstetrics. Prerequisites: Courses 51 and 52. (11 hrs.; M 3:00-3:50; 104IA.) Dr. Swanson.
- 23-24su. Gynecology. A study of diseases of women. (33 hrs.; jr.; TThS 9:00-9:50; 104IA.) Dr. Barry.

¹ Permission of instructor.

- 25su. Obstetrics and Gynecology. Lectures, class clinics, and case analysis of the pathology of obstetrics and gynecology. (22 hrs.; sr.; WF 3:00-3:50; Hosp. lect. room.) Dr. Litzenberg.
- 26su. Clinical Clerkship in Obstetrics and Gynecology. The study and care of assigned patients in the University Hospital, out-patient service, and Salvation Army Home; manikin practice, case histories, physical and laboratory examinations; parturition and bedside clinics, and operations. (66 hrs.; prereq., Courses 20, 21, 22, 23, and 24; sections of Div. B, sr.; daily 9:00-10:30; UH.) Hospital staff.
- 26asu. Clinical Clerkship in Obstetrics and Gynecology. Part of Course 26su, but given at the Minneapolis General Hospital; daily 9:15-12:00. Hospital staff.
- 27su. Clinic in Obstetrics and Gynecology. History taking, physical examinations, diagnosis, demonstrations, and clinics. (24 hrs.; sr.; prereq., Courses 20, 21, 22, and 23. Sections of sr. See special schedule. Daily 10:30-12:00; UD.) Dispensary staff.
- 28su. Clinic in Obstetrics and Gynecology. A part of required section clinics. (17 hrs.; jr.; Sec. 3, M 8:30-10:00; Minneapolis Gen. Hosp.) Hospital staff.
- 28xsu. Same as 28su for Sec. 1. (W 8:30-10:00.)
- 28ysu. Clinic in Obstetrics and Gynecology. The same as 28su. (Sec. 4, M 8:30-10:00; Ancker Hosp., St. Paul.) Dr. Hammond, Dr. Schulze.
- 28zsu. Same as for Sec. 2. (W 8:30-10:00.)
- 29su. Clinic in Obstetrics and Gynecology. Clinics in dispensary of Minneapolis General Hospital. (12 hrs.; 6th yr. med.; see clerkship schedule; MWF 12:30-2:00.) Dr. Proshok.

Elective Courses

- 50su. Gynecologic Clinic. Diagnosis and treatment of diseases of women. Limited to 4 students. (17 hrs.; TTh 1:30-3:00; Wilder Dispensary, St. Paul.) Dr. Barry.
- 51su. Gynecologic Clinic. Diagnostic and Operative Clinic in Diseases of Women. (16 hrs.; F 8:30-9:45; Ancker Hosp., St. Paul.) Dr. Hammond.
- 52su. Obstetrics Clinic. Bedside clinic, diagnosis and treatment of obstetric conditions. (16 hrs.; F 8:45-10:05; Ancker Hosp., St. Paul.) Dr. Barry.
- 53su. Clinic in Obstetrics and Gynecology. Limited to six students. (25 hrs.; TThS 12:30-3:00; Minneapolis Gen. Hosp. Dispensary.) Dispensary staff.
- 55su. Prenatal Clinics. Antepartum care of pregnant women at the various prenatal stations in Minneapolis and Wilder Dispensary, St. Paul. Limited to one student at each station. (11 hrs.; Wells Memorial, M 9:15, Dr. Simmons; Emanuel Cohen Community Center, T 9:45, Dr. Maland; South Town, T 1:30, Dr. Hiebert.)
- 58su. Gynecologic Clinic. Bedside clinic. (16 hrs.; F 10:15-11:45; Ancker Hosp., St. Paul.) Dr. Hammond.

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

FIRST AND SECOND TERMS

Required Courses

- 23su. Clinic in Diseases of the Eye. Methods of examination, diagnosis, and treatment. (30 hrs.; srs., see clerkship schedule; MTWThFS 1:00-3:00; UD.) Dr. Clark, Dr. Macnie, and associates.
- 24su. Clinic in Diseases of the Ear. Methods of examination, diagnosis, and treatment. (30 hrs.; srs., see clerkship schedule; MTWThFS 1:00-3:00; UD.) Dr. Newhart, Dr. Camp, and associates.
- 25su. Clinic in Diseases of the Nose and Throat. Methods of examination, diagnosis, and treatment. (30 hrs.; srs., see clerkship schedule; MTWThFS 1:00-3:00; UD.) Dr. Patterson, Dr. F. J. Pratt, Dr. J. A. Pratt, and associates.

Elective Courses

- 121su. Operative Clinic; Ophthalmic. (11 hrs.; srs.; F 9:00-10:00; UH.) Dr. Macnie.
- 121asu. Operative Clinic; Otology and Laryngology. (11 hrs.; srs.; T 8:30-9:30; UH.) Dr. Patterson.

PEDIATRICS

FIRST AND SECOND TERMS

Required Courses

- 23su. Clinic in Pediatrics. A part of course in required clinics. (17 hrs.; 5th yr.; Sec. 3 of junior class; W 10:00-11:30; Minneapolis Gen. Hosp.) Dr. Huenekens and others.
- 23xsu. Same as 23su. (Sec. 5, F 10:00-11:30.)
- 23ysu. Same as 23su. (Sec. 4 of junior class; W 10:00-11:30; Ancker Hospital.) Dr. Hagaman.
- 23zsu. Same as 23ysu. (Sec. 2, F 10:00-11:30.)
- 24su. Clinic in Contagious Diseases. A part of course in required clinics. (17 hrs.; 5th yr.; Sec. 3 of junior class; M 10:00-11:30; Minneapolis Gen. Hosp.) Dr. Platou.
- 24xsu. Same as 24su. (Sec. 1, W 10:00-11:30.)
- 24ysu. Same as 24su. (Sec. 4 of junior class; M 10:00-11:30; Ancker Hosp.) Dr. Hedenstrom.
- 24zsu. Same as 24ysu. (Sec. 2, W 10:00-11:30.)
- 26su. Out-Patient Pediatric Clinic. Practical study of the diseases of children in the out-patient service. (25 hrs. per student; 6th yr.; sections of senior class; MTWThFS 10:30-12:00; see special schedule; UD.) Dr. C. A. Stewart and others.
- 26xsu. Same as 26su. (25 hrs. cred. per student; MWThFS 1:00-3:00; Minneapolis Gen. Hosp.) Dr. Siperstein and others.
- 27su. Clinical Clerkship in Pediatrics. Each student is assigned three weeks at each hospital. See special schedule. Students not in regular course may elect clerkship at either hospital for special periods by arrangement with the department. The observation and study of patients in

University Hospital; case histories; physical examinations and provisional diagnosis; treatment. (65 hrs.; 6th yr.; Division B of senior class; MTWThFS 9:00-10:30; UH.) Dr. Schlutz and others.

27xsu. Part of 27su. (Daily 9:15-11:45; Minneapolis Gen. Hosp.) Dr. Huenekens, Dr. Moriarty, and others.

28su. Infant Welfare Clinic. (6 hrs.; 6th yr.; sections of senior class; TTh 1:30-2:30; 19MH.) Dr. Lippman.

29su. Clinic in Pediatrics. Selected cases from the University Pediatric Dispensary. Complete resumé of cases including history, physical and laboratory findings, general discussion, diagnosis and treatment. Required of Division B of senior class; elective for others as No. 102. (17 hrs.; 5th and 6th yrs.; Th 3:00-4:30; UH amphitheater.) Dr. Schlutz and others.

Elective Courses

FIRST TERM

55gsu. Infant Feeding and Diseases of the Newborn Clinic. Four to eight students. (11 hrs.; 5th and 6th yrs.; Th 3:00-5:00; Salvation Army Women's Home and Hospital, 1471 Como Ave., St. Paul.) Dr. Shannon.

BOTH TERMS

53su. Contagious Diseases. Two to six students. (11 hrs.; 5th and 6th yrs.; F 9:00-10:00; Ancker Hosp.) Dr. Hedenstrom.

54su. Pediatric Clinic. Out-Patient Department. One or two students. (Cred. ar.; 6th yr.; MTWThFS 10:30-12:00; UD.) Dr. C. A. Stewart, and others.

55asu. Infant Feeding Clinic. Two to six students. (11 hrs.; 5th and 6th yrs.; W 10:00-11:00; Minneapolis Gen. Hosp.) Dr. Anderson.

55bsu. Infant Feeding Clinic. Two to six students. (11 hrs.; 5th and 6th yrs.; M 2:00-3:00; South Town Children's Clinic.) Dr. Siperstein.

55csu. Same as above. (T.)

55dsu. Same as above. (Th.)

55esu. Infant Feeding Clinic. Two to six students. (11 hrs.; 5th and 6th yrs.; M 10:30-11:30; Pillsbury Settlement House.) Dr. Stoesser.

55fsu. Same as above. (Th.)

59su. General Pediatrics Including Skin Diseases. Two to eight students. (66 hrs.; 5th and 6th yrs.; TThS 1:00-3:00; Wilder Dispensary, Miller Hosp.) By arrangement students may take this course only one or two days a week with corresponding credit. Dr. Colby, and others.

62su. Rare and Unusual Diseases of Infancy and Childhood. A lecture course. Five to ten students. (11 hrs.; 5th and 6th yrs.; 11:30 or ar.) Dr. C. A. Stewart.

101su. Intubation. Two to four students. (Cred. and hrs. ar.) Dr. Platou.

102su. Class Clinic in Pediatrics. Same as Ped. 29 required of Div. B srs., elective for others. (17 hrs.; 5th and 6th yrs.; Th 3:00-4:30; UH amphitheater.) Dr. Schlutz.

200su. Advanced Study in Diseases of Infants and Children. (Cred. and hrs. ar.) Dr. Schlutz.

206su. Research in Pediatrics. (Ar.; 12IMH.) Dr. Schlutz, Dr. C. A. Stewart.

SURGERY

FIRST AND SECOND TERMS

Required Courses

- 21su. Principles of Surgery. (22 hrs. cred.; ThS 11:00-11:50; UH.) Dr. Wangenstein.
- 27su. Diagnostic and Operative Clinics. Sections 1 and 2 of Div. A, fifth year class; part of required clinics. (17 hours; M 10:00-11:30; Ancker Hospital.) Dr. Abbott.
- 27xsu. Same as 27su. for Secs. 3 and 4 (F 10:00-11:30.) Dr. Colvin.
- 28su. Clinical Clerkship. Personal study of assigned patients; case histories; laboratory examinations; provisional diagnoses with suggestions as to therapy; attendance at operations and observation of post-operative management. Practical instruction in anesthesia. (200 hrs.; sr. class, sections of Div. D; prereq., Surgery 21 and 23; MTWThFS 9:00-12:00; UH.) Dr. Campbell, Dr. Wangenstein.
- 28xsu. Same as 28su. (Minneapolis Gen. Hosp.) Dr. Zierold, Dr. Regnier.
- 29su. Minor Surgery Clinics. Sections of class assigned daily to the Out-Patient Department; a part of required clinics. (30 hrs.; sr.; daily 1:00-3:00; see special schedule; Disp., MH.) Dr. McKinney, Dr. Hayes, Dr. Bratrud.
- 41su. Orthopedic Clinic. In the Out-Patient Department; a part of required section clinics. (12 hrs.; sr.; MF 1:00-2:30; see special schedule; Disp., MH.) Dr. Giessler, Dr. Henry.
- 47su. Genito-Urinary Clinics. In the Out-Patient Department; a part of required section clinics. (20 hrs.; sr.; daily 1:00-2:30; see special schedule; Disp., MH.) Dr. Wright, Dr. Kremer, Dr. Wethall.

Elective Courses

- 54su. Proctology; Assistantship in Proctology. A clinical course conducted in the Out-Patient Department. Two to four students. (33 hrs.; jr., sr.; MWF 10:30-11:30; Disp., MH.) Dr. Fansler.
- 56asu. Bedside, Diagnostic, and Operative Clinic. (12 hrs.; jr., sr.; W 10:30-12:00; Minneapolis Gen. Hosp.) Dr. Zierold, Dr. Regnier, Dr. Robitshek, Dr. Olson.
- 59su. Urologic Clinic. Two to four students. (50 hrs.; jr., sr.; MWF 1:00-2:30; Disp., MH.) Dr. Wethall.
- 59xsu. Same as 59su. (TThS 1:00-2:30.) Dr. Kremer.
- 61su. Orthopedic Clinic. Two to four students. (33 hrs.; jr., sr.; MF 1:00-2:30; Disp., MH.) Dr. Giessler, Dr. Henry.
- 64su. Night Clinic in Urology (Venereal Diseases). (33 hrs.; jr., sr., grad.; MTh 7:00-8:30 p.m.; Disp., MH.) Dr. Wethall.

ROENTGENOLOGY

- Hosp. 80su. Plate Reading. Four students a day. (MTWThF I-III.) Dr. Allison.
- Hosp. 82su. X-Ray Therapy. Not more than three students a day. (MWF 9:00-10:00, or ar.) Dr. Stenstrom.

COLLEGE OF DENTISTRY

Courses will be offered in the Department of Dentistry as follows:

Clinical Practice. Clinical work will be offered in each of the following divisions: Crown and Bridge Work, Oral Diagnosis, Operative Dentistry, Orthodontia, Prosthetic Dentistry, Oral Surgery, and Oral Hygiene and Pathology. (Jr., sr., grad.; MTWThF 9:00-12:00 a.m., 2:00-5:00 p.m.) Dr. Brekhus, Dr. Griffith, Dr. Lasby, Dr. Walls, Dr. Wells, Dr. Waldron, and associates.

Technique courses will be offered in those departments in which a sufficient number of students petition for the work.

Fees: full time, \$40; half time, \$20, for each term. In addition each student pays an incidental fee of \$2.50, and a general deposit of \$5.¹

Courses in contributing departments are announced elsewhere in this bulletin. See particularly Anatomy, Bacteriology and Immunology, Chemistry, Pathology, Pharmacology, Physiology, and Metallography.

¹ Students registering for half time in dentistry and for part time in other departments will not be required to duplicate the incidental fee.

SCHOOL OF CHEMISTRY

INORGANIC CHEMISTRY

FIRST TERM

- 1su.¹ General Inorganic Chemistry. A study of the general laws of chemistry and of the non-metals and their compounds. (4 cred.; no prereq.; lect., MTWThFS II; 325C; lab., MTWTh VI-VII; 210C.) Mr. Pervier.
- 4su.¹ General Inorganic Chemistry. A study of the general laws of chemistry and of the non-metals and their compounds. (4 cred.; prereq., high school chemistry; lect., MTWThFS II; 225C; lab., MTWTh VI-VII; 210C.) Mr. Reyerson.
- 6su.¹ General Inorganic Chemistry. Includes a study of general laws of chemistry and of non-metals and their compounds. (5 cred.; no prereq.; lect., MTWThFS II; 325C; lab., MTWThF VI-VII; and TTh VIII; 210C.) Mr. Pervier.
- 9su.¹ General Inorganic Chemistry. A study of the general laws of chemistry and of non-metals and their compounds. (5 cred.; prereq., high school chemistry; lect., MTWThFS II; 225C; lab., MTWThF VI-VII; TTh VIII; 210C.) Mr. Reyerson.
- 11su.¹ Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solutions, ionization, chemical and physical equilibrium, oxidation, and reduction, etc. (4 cred.; prereq., 3 or 5; lect., MTWThFS II; 111C; lab., MTWTh VI-VII; 290C.) Mr. Sneed.
- 12su.¹ Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solutions, ionization, chemical and physical equilibrium, oxidation, and reduction, etc. (5 cred.; prereq., 8 or 10; lect., MTWThFS II; 111C; lab., MTWThF VI-VII; TTh VIII; 290C.) Mr. Sneed.
- 19su. Teachers' Course. Consideration of the fundamental principles of chemistry with particular reference to the teaching of chemistry in high school. Discussion of such topics as training of the teacher, laboratory equipment, etc. (3 cred.; prereq., 13; lect., MTWThFS IV; 315C.) Mr. Geiger.
- 102su.¹ Advanced Qualitative Analysis. This course includes an analysis of minerals, alloys, paints, and the methods of detecting some of the rarer elements. (2 or 3 cred.; prereq., 21; hrs. to be ar.) Mr. Sneed.
- 304su. Research in General Inorganic Chemistry. (Cred. and hrs. to be ar.) Mr. Sneed.

SECOND TERM

- 2su.¹ General Inorganic Chemistry. A continuation of 1su. (4 cred.; prereq., 1; lect., MTWThFS II; 325C; lab., MTWTh VI-VII; 210C.) Mr. Maynard.

¹ A laboratory fee of \$1.50 is charged for this course.

- 5su.¹ General Inorganic Chemistry. A continuation of 4su. (4 cred.; prereq., 4; lect., MTWThFS II; 225C; lab., MTWTh VI-VII; 210C.) Mr. Heisig.
- 7su.¹ General Inorganic Chemistry. A continuation of 6su. (5 cred.; prereq., 6; lect., MTWThFS II; 325C; lab., MTWThF VI-VII; TTh VIII; 210C.) Mr. Maynard.
- 10su.¹ General Inorganic Chemistry. A continuation of 9su. (5 cred.; prereq., 9; lect., MTWThFS II; 225C; lab., MTWThF VI-VII; TTh VIII; 210C.) Mr. Heisig.

ANALYTICAL CHEMISTRY

FIRST TERM

- 1su.¹ Quantitative Analysis (Gravimetric). Introductory course covering the general principles and methods of quantitative analysis. Typical problems are assigned and attention given to proper laboratory practice. (5 cred.; prereq., 13; lect. or rec., TW V, VI; 315C; lab., MThF V-VIII; TW VII-VIII; 310C.) Mr. Geiger.
- 7su.¹ Quantitative Analysis. (Primarily for pre-medical students and teachers.) An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. (4 cred.; prereq., qual. anal.; lect. or rec., TW V, VI; 215C; lab., MThF V-VIII; TW VII-VIII; 310C.) Mr. Sarver.
- 123-124su.¹ Advanced Analytical Chemistry. A systematic survey by general lectures with typical procedures selected for laboratory practice. Drill in application of modern chemical theory to analytical problems. Offered first term only, but either course may be taken. (3 cred. each; prereq., Anal. Chem. 1 and 2 lect. or rec., M V, VI (for 123); Th V, VI (for 124); lab., TWF V-VIII.) Mr. Sarver.
- 324su. Research in Analytical Chemistry. (Cred. and hrs. to be ar.) Mr. Brinton, Mr. Geiger.

ORGANIC CHEMISTRY

FIRST TERM

- 6su.¹ Elementary Organic Chemistry. Discussion of important compounds of aliphatic and aromatic series, and preparation of typical substances. This course is primarily for students in professional schools and is not equivalent to Course 51 for students registered in the School of Chemistry. (4 cred.; prereq., 11 or 12; lect., MTWThF I; 325C; rec., TTh II; 215C; lab., MWF II-IV; T III-IV; 390C.) Mr. Hunter.
- 101su. Advanced Organic Chemistry. An introduction to the literature of organic chemistry. Structure and reaction mechanisms. May be accompanied by appropriate laboratory work in 139su. (3 cred.; prereq., 53; MTWThF IV; 325C.) Mr. Hunter.

¹A laboratory fee of \$1.50 is charged for this course.

- 139su.¹ Advanced Organic Chemistry Laboratory Work. Difficult preparations and problems. It is intended primarily to supplement the students' knowledge of the methods of organic chemistry. Students may also register for this course who desire appropriate laboratory work for other advanced courses. (2 to 5 cred.; prereq., 53; hrs. to be ar.) Mr. Hunter.
- 334su. Research in Organic Chemistry. (4 or 5 cred.; hrs. to be ar.) Mr. Hunter.

SECOND TERM

- 32su.¹ Elementary Organic Chemistry. A continuation of 31su. (4 cred.; prereq., 11 or 12 and 31; lect., MTWThF I; 325C; rec. TTh II; 215C; lab., MWF II-IV; T III-IV; 390C.) Mr. Smith.

PHYSICAL CHEMISTRY

FIRST TERM

- 107su.² Physical Chemistry. A general survey of the subject. Six lectures and three recitations. Laboratory work nine or sixteen hours per week. (4½, 6, or 7½ cred., depending on amount of lab.; prereq., 140-141su or 102w; lect., MTWThFS II; 115C; rec., MWF III; 115C; lab., MT VI-IX, or MTWTh VI-IX; 117C.) Mr. MacDougall.
- 129su.¹ Principles of Colloid Chemistry. Fundamental principles of the subject with special emphasis on recent advances in this line. Accompanied by six hours of work in the laboratory. (3 cred.; prereq., 8 cred. in phys. chem.; lect., MWF VII; 115C; lab., ar.) Mr. Reyerson.
- 179su. Structure of the Atom. Elementary course to introduce Rutherford-Bohr atom, isotopes, radioactive changes; and their relation to the Periodic System. (2 cred.; prereq., Gen. Chem.; ar.) Mr. Lind.
- 304su. Research in Physical Chemistry. (Cred. and hrs. to be ar.) Mr. Lind, Mr. MacDougall, Mr. Reyerson.

TECHNOLOGICAL CHEMISTRY

FIRST TERM

- 105su.¹ Technical Gas and Fuel Analysis. (3 cred.; jr., sr., grad.; prereq., 20-21; lect. or rec., MW V; 115C; lab., MTWTh VI-VIII; 10C.) Mr. Harding.
- 106su.¹ Petroleum and Petroleum Products. (3 cred.; jr., sr., grad.; prereq., 20-21; lect. or rec., TTh V; 115C; lab., MTWTh VI-VIII; 10C.) Mr. Harding.
- 107su.¹ General Technical Analysis. Analysis of various industrial products including foods and food materials. (3 cred.; jr., sr., grad.; prereq., 20-21; lect. or rec., F V, VI; 215C; lab., MTWTh VI-VIII; 10C.) Mr. Harding.
- 304su. Research in Technological Chemistry. (Cred. and hrs. to be ar.) Mr. Harding.

¹ A laboratory fee of \$1.50 is charged for this course.

² This course is equivalent to the second half of 102w, and 103w, which are offered during the academic year.

CHEMICAL ENGINEERING

FIRST TERM

- 101su. Unit Processes. Principles and materials of construction, operation and uses of chemical machinery. Lectures and recitations. Laboratory work in operating and testing. Visits to chemical plants. (4 cred.; prereq., 20, 21, and 36; hrs. to be ar.) Mr. Mann.
- 102su. Unit Process Problems. Combustion, gas absorption, drying, distillation, heat transfer and evaporation, fluid flow and filtration, and the general chemical processes. (3 cred.; prereq., 101; hrs. to be ar.) Mr. Montonna.
- 151su.¹ Chemical Manufacture. (Inorganic.) Manufacture of technical products on a scale large enough to afford data for the determination of costs of manufacture. Use of semiplant scale equipment, and technical trade journals. Part of the summer practice required of juniors in Chemical Engineering during the summer between the third and fourth years; must be accompanied by Course 152su. (3 cred.; prereq., 101; MTWThF I-IX; S I-IV; 90C.) Mr. Mann.
- 152su.¹ Chemical Manufacture. (Organic.) Similar to Course 151su, but in the organic field. Part of the summer practice required of juniors in Chemical Engineering during the summer between the third and fourth years; must be accompanied by Course 151su. (3 cred.; prereq., 101; MTWThF I-IX; S I-IV; 90C.) Mr. Montonna.
- 374su. Research in Chemical Engineering. (Cred. and hrs. to be ar.) Mr. Mann, Mr. Montonna.

¹A laboratory fee of \$1.50 is charged for this course.

THE COLLEGE OF EDUCATION

Courses in the College of Education presuppose completion of junior college requirements in the University of Minnesota or the equivalent in colleges of similar grade, elsewhere. Graduation from the advanced course of Minnesota state teachers colleges is accepted as equivalent. Students with this training may be admitted to any courses for which they have satisfied the prerequisites as stated under each course. For all general matters, relating to admission, advanced standing, credits, honor points, curricula, and requirements for graduation, students should consult the regular bulletin of the College of Education, Part I. Students expecting to become candidates for a degree should seek as early as possible the advice of the major department concerned in order to learn the requirements of the special curriculum they will need to complete.

AGRICULTURAL EDUCATION

FIRST TERM

82su.¹ Agricultural Extension Field Work. Actual field practice in extension work on part salary in addition to credits. Number admitted to course limited by positions available. Usually will cover summer quarter, may extend into fall quarter. (3 to 10 cred.; prereq., 81; ar.) Mr. Storm.

144su. Course Organization and Instruction for the Individual in Vocational Agriculture. Subject-matter content for the individual should be based on farm activities. Individuals should progress according to abilities and needs. Accepting these principles, this course includes selection and organization of content, administration, and teaching technique. (3 cred.; prereq., Ag.Ed. 131, 151; MTWThFS; 202Ad(F).) Mr. Lathrop.

224su. Graduate Problems. Making investigations, gathering data, and formulating plans regarding agricultural education. (Ar.; ar.) Mr. Storm, Mr. Field.

242su. Organization and Administration of Teacher Training for Vocational Agriculture. Development of teacher training institutions, agricultural college curricula, professional needs of high school teachers, professional courses and their content, equipment, itinerant teacher training, practice teaching, teacher evaluation. (3 cred.; MTWThFS; 202Ad(F).) Mr. Storm, Mr. Field.

ART EDUCATION

FIRST TERM

FINE ARTS

1su-(2su). Fundamental Principles of Design. Elementary problems involving space breaking with parallel lines; emphasis on value relations; application to problems developed in the handicrafts. The decorative use of nature material. Inspiration from nature, not imitation of nature

¹ Broad curriculum approved by the Agricultural Education Division and a position approved by the Agricultural Extension Division are also prerequisites to this course.

- forms. (2 cred.; no prereq.; 1su., Sec. 1, lect., MWF II; lab., MWF I; 402F; 1su. or 2su., Sec. 2, lect. MWF III; lab., MWF IV; 404F.) Mrs. Hanley.
- 4su, 5su, 6su. Still Life. Drawings from objects in charcoal and pencil. Emphasis on value relations, form, and perspective. (1 cred. each; no prereq.; 4su. or 6su., Sec. 1, MWF I, II; F.; 5su., Sec. 2, TThS III, IV; F.) Sec. 1, Mr. Hilpert; sec. 2, Mrs. Hanley.
- 7su, 8su, 9su. Sketch. From the posed figure in charcoal and pencil, with emphasis on action, form, and value relations. (1 cred. each; no prereq.; 7su. or 8su., Sec. 1, TThS I, II; Sec. 2, TThS II, III; 402F; 9su., Sec. 3, TThS I, II.) Secs. 1 and 2, 402F: Mr. Hilpert; sec. 3, Mrs. Hanley.
- 55su. Fundamental Art Principles. A course for grade teachers and high school teachers of subjects other than art, to show the bearing of art on their work and the relation of art to daily life. Recommended for manual art teachers. (1 cred.; no prereq.; TThS IV; 404F.) Mr. Hilpert.
- 86su, 87su, 88su. Practice Teaching in Art. (1 cred. each; prereq., 9 cred. in design, 9 cred. in drawing, 6 cred. in handicrafts; ar.; F.) Mr. Hilpert.

CRAFTS

Departmental approval of registration is required for crafts.

Register at table marked Art Education for the following courses:

- Art Ed. 33su. Bookbinding. Sequence of problems from the simplest construction to the book sewed on tapes, raised cords, and sunken cords. Problems with reference to grades, high schools, and occupational therapy. Each section limited to 20. (2 cred.; no prereq.; Sec. 1, lect., TTh VI; lab., VII-VIII; 404F; Sec. 2, lect., TTh VII; lab., VIII, IX; 404F.) Miss Ross.
- Art. Ed. 40su. Advanced Weaving. Table and foot power looms. Sequence of problems from the simplest hand loom to the threading and use of four harness foot power loom. (2 cred.; prereq., 38 or equiv.; limited to 10 students; MWF lect. VI; lab., VII, VIII; 401F.) Miss Ross.
- Art Ed. 44su. Application of Design to Fabrics. By means of block printing, stenciling, batik, and other dyeing processes. (2 cred.; no prereq.; MWF III, IV; 402F.) Mr. Hilpert.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

FIRST TERM

- 65su. The High School. For high school teachers in training. Recent growth in secondary education; types of reorganization; types of programs of study; types of high schools; plant; costs; standardization. (3 cred.; jr., sr.; prereq., Ed. 55; MTWThFS II; 210OL.) Mr. Kefauver.
- 113su. High School Curriculum. A study of methods of curriculum making, types of programs of study, curricula, subjects of study, constants, variables, electives, distribution of subject-matter by years and units.

- (2 cred.; jr., sr., grad.; prereq., 1, 3; TWThF VIII; 210OL.) Mr. Koos.
- 115a-bsu. Practice in Supervision. Problems and practice in the supervision of instruction in the elementary schools of Minneapolis and St. Paul. Students must have at least two consecutive hours free each morning. (2 cred.; sr., grad.; prereq., consent of instructor; MTWF VII, ar.; 3 cred.; MTWThFS I; ar.) Mr. Brueckner, Mr. Peik.
- 119su. Elementary School Curriculum. A study of the scientific principles underlying curriculum making. Consideration will be given to a study of the results of scientific investigation in the various fields of the elementary school curriculum both as to content and organization. (3 cred.; sr., grad.; prereq., Ed. 1, 3; MTWThFS I; 204Ed.) Mr. Lathrop.
- 121su. Educational Advising of Women and Girls. A course designed to acquaint students with the problems of educational advising of girls and young women, particularly those of high school age. Students admitted to the course through conference with instructor. (3 cred.; jr., sr., grad.; prereq., 15 cred. in ed. and psy.; ar. 112Ed.) Miss Blitz.
- 124su. Educational Administration. The present status and tendencies in the organization and administration of state and city school systems with interpretations. (3 cred.; sr., grad.; prereq., 10 hrs. in ed.; MTWThFS IV; 210OL.) Mr. Selke.
- 125su. Educational Administration. For superintendents and principals. Detailed study of the principles and practice of city school administration. (3 cred.; sr., grad.; prereq., 55, 116, 124; MTWThFS IV; 205Ed.) Mr. Melby.
- 126su. Educational Administration. This course deals with school plant management and planning. It also treats of the various publicity methods used in keeping school boards and public informed on matters pertaining to the public schools. (2 cred.; sr., grad.; prereq., Ed. 124-125; MTWF VI; 210OL.) Mr. Engelhardt.
- 129su. Educational Publicity Materials. Analysis of current and desirable practices in educational publicity. Planning in detail a publicity program and current publicity materials for a public school system. (3 cred.; jr., sr., grad.; prereq., Ed. 124-125; MTWThFS I; 206Ed.) Mr. Farley.
- 130su. Educational Publicity Agencies. Relationship of superintendent to community agencies directly or indirectly interested in public education. Problems of personal contacts, public speaking, parent-teacher and similar organizations, board meetings as a publicity agency. (3 cred.; jr., sr., grad.; prereq., Ed. 124-125; MTWThFS II; 206Ed.) Mr. Farley.
- 133su. Guidance in Secondary Schools. Emphasizes practices in educational and vocational guidance in junior and senior high schools, considering such phases as giving information about vocations, utilizing test results and school marks, and organizing the staff for guidance. (3 cred.; prereq., 10 hrs. in ed. incl. Ed. Psy. 55; MTWThFS V; 202Ed.) Mr. Kefauver.

- 157su. Administration and Supervision of Rural Schools. Problems of organization, curriculum, finance; function of supervision of one-room and consolidated schools. (3 cred.; jr., sr., grad.; MTWThFS I; 112Ed.) Mr. Selke.
- 160su. Principles of Supervision. An analysis of the functions and duties of a supervisor as related to the improvement of instruction; specific supervisory technique; objective analysis of classroom activity; concrete application of present-day problems; case studies. (2 cred.; sr., grad.; prereq., Ed. 15 or equiv.; MTWF VI; 204Ed.) Mr. Brueckner.
- 161asu.¹ Supervision: Uses of Educational Tests in Improving Instruction. Objective evaluation of the results of teaching; classification of pupils on basis of educational tests; diagnosis of pupil difficulty; remedial work; tests as aids to teaching. (3 cred.; sr., grad.; prereq., Ed. 15 or equiv.; MTWThFS II; 111Ed.) Mr. Melby.
- 161bsu. Elementary School Supervision. The adjustment of the curriculum to the abilities of pupils in the elementary school; methods of classifying pupils according to achievement and intelligence. (3 cred.; prereq., Ed. 15 or equiv.; MTWThFS V; 210OL.) Mr. Peik.
- 162su. Supervision of English in the Elementary Schools. Improvement of instruction in oral and silent reading; the results of scientific investigation in reading; use of standardized and informal tests; remedial work; some consideration of spelling and writing. (3 cred.; prereq., Ed. 15 or equiv.; MTWThFS V; 206Ed.) Miss Wilson.
- 164su. High School Administration. A study of the high school principalship, elimination from school, secondary vocational education, the marking system, record forms, classification of students, schedule of recitations, high school library, social organization and extra-curricular activities, community relationships, teaching schedule, building costs. (3 cred.; prereq., MTWThFS II; 113Ed.) Mr. Powers.
- 167su. Junior High School. A study of the special purposes of this institution and the appropriate reorganization to achieve them; the history of the movement. (3 cred.; sr., grad.; prereq., Ed. 1, 3; MTWThFS I; 113Ed.) Mr. Powers.
- 175su. City School Finance. Analysis of unit costs on various bases; comparative cost accounting systems, budgets, financial records, and reports. (2 cred.; sr., grad.; prereq., Ed. 124-125; MTWF IV; 206OL.) Mr. Engelhardt.
- 180su. The Junior College. This institution as an upward extension of the secondary school. The forces giving rise to the movement, special purposes, sources of student body, financial responsibilities involved, curriculum, faculty, relationships to schools below and above. (2 cred.; prereq., 10 hrs. in ed.; TWThF VII; 222OL.) Mr. Koos.
- 206su. Seminar in Educational Administration. (2 cred.; grad.; prereq., Ed. 124-125-126, 160-161-162; MTWF V; 206OL.) Mr. Engelhardt.
- 220su. Seminar in Secondary School Problems. (2 cred.; grad.; prereq., consent of instructor; TWThF VI; 222OL.) Mr. Koos.

¹ A laboratory fee of \$1.50 is charged for this course.

225su. Seminar in Elementary School Problems. (2 cred.; grad.; prereq., consent of instructor; MTWF VIII; 222OL.) Mr. Brueckner.

SECOND TERM

- 65su. The High School. For high school teachers in training. Recent growth in secondary education; types of reorganization; types of programs of study; types of high schools; plant; costs; standardization. (3 cred.; jr., sr.; prereq., Ed. 55; MTWThFS II; 210OL.) Mr. Kefauver.
- 119su. Elementary School Curriculum. A study of the scientific principles underlying curriculum making. Consideration will be given to a study of the results of scientific investigation in the various fields of the elementary school curriculum both as to content and organization. (3 cred.; sr., grad., prereq., Ed. 1, 3; MTWThFS V; 222OL.) Mr. Peik.
- 124su. Educational Administration. The present status and tendencies in the organization and administration of state and city school systems with interpretations. (2 cred.; sr., grad.; prereq., 10 hrs. in ed.; TWThF V; 210OL.) Mr. Engelhardt.
- 125su. Educational Administration. For superintendents and principals. Detailed study of the principles and practice of city school administration. (2 cred.; sr., grad.; prereq., 55, 116, 124; TWThF VI, 210OL.) Mr. Engelhardt.
- 126su. Educational Administration. This course deals with school plant management and planning. It also treats of the various publicity methods used in keeping school boards and public informed on matters pertaining to the public schools. (2 cred.; sr., grad.; prereq., Ed. 124-125; TWThF VII; 210OL.) Mr. Engelhardt.
- 162su. Supervision of English in the Elementary Schools. Improvement of instruction in oral and silent reading; the results of scientific investigation in reading; use of standardized and informal tests; remedial work; some consideration of spelling and writing. (3 cred.; prereq., Ed. 15 or equiv.; MTWThFS I; 210OL.) Mr. Selke.
- 169su. Extra-Curricular Activities. Types of activities in junior and senior high schools; aims and values; practices in organizing, administering, and supervising; methods of evaluation. (2 cred.; prereq., 10 hrs. in ed. including Ed. Psy. 55; MTWF III; 210OL.) Mr. Kefauver.

EDUCATIONAL PSYCHOLOGY

FIRST TERM

- 55su. Educational Psychology. A survey of fundamental facts of human behavior involved in educational activities. Open to juniors and seniors. (3 cred.; jr., sr.; prereq., 6 cred. in psy.; MTWThFS I; Law Aud.) Mr. Miller.
- 55asu. Educational Psychology. As above. (2½ cred.; jr., sr.; prereq., 6 cred. in psy.; MTWThF VI; 204Ed.) Mr. Eurich.
- 111su.¹ Educational Diagnosis. The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use,

¹ A laboratory fee of \$1.50 is charged for this course.

- analysis of results obtained, and programs of remedial educational procedure based on the results of the tests. (3 cred.; jr., sr.; prereq., Ed. 55 or equiv.; MTWThFS II; Psy. Lab.) Mr. Van Wagenen.
- 116su.² Statistical Methods in Education. A study of statistical methods as applied to educational investigation. This course is ordinarily required of all candidates for advanced degrees. (3 cred.; sr., grad.; prereq., Ed. 55; MTWThFS V; 204Ed.) Mr. Eurich.
- 117su. Advanced Statistical Methods in Education. A survey of statistical studies in education with special reference to the methods employed and the reliability of the results obtained. (3 cred.; sr., grad.; prereq., Ed. 126; MTWThFS I; Psy.) Mr. Van Wagenen.
- 134su.¹ Mental Tests. Study of mental variation in children, its nature, degrees, causes, and effects. A laboratory course in the study of individual differences by means of mental tests. A critical study of group tests. Methods of treating superior and subnormal children in schools. (2 cred.; jr., sr., grad.; prereq., Ed. 55; Sec. 1, MTWF II, III; Sec. 2, MTWF III-IV; Law Aud.) Mr. Miller, Mr. Sorenson.
- *144su.¹ Individual Mental Examination. For teachers of subnormal children. Demonstration and practice in mental diagnosis. Careful study will be made of different groups and systems of mental tests, and other clinical methods with discussion of general theory involved. (3 cred.; jr., sr., grad.; prereq., Ed. 55 or equiv.; ar. VIII-IX; 301Psy.) Mr. Sorenson.
- 149su.¹ Psycho-Educational Clinic. Conducted in co-operation with the Department of Sociology and the Medical School clinics in pediatrics and nervous and mental diseases. Students will receive systematic instruction in giving psychological examinations and in scientific interpretation of data. (3 cred.; jr., sr., grad.; prereq., Ed. 134-135-136 or equiv.; VI-VII; ar.) Mr. Rockwell.
- 153su. Research Problems. Intended for properly prepared students who desire to pursue special investigation in the field of educational psychology. (1 cred.; sr., grad.; prereq., consent of instructor; ar.) Mr. Miller.
- 191su. Systematic Educational Psychology. Advanced course covering the field of psychology as related to education. Open to seniors and graduate students. Not open to students who receive credit for Educational Psychology 106-107-108. (3 cred.; sr., grad.; prereq., 12 cred. in psy. and ed. psy.; MTWThFS II; 301Psy.) Mr. Rockwell.
- 192su. Psychology of Behavior Problems in Children. Survey of the field. Polyphase nature of the causative factors. Conditioning factors in the environment. Psychological and psychiatric interpretations. Presentation of clinic studies. (3 cred.; prereq., Ed. Psy. 55 or equiv.; MTWThFS IV; OLAud.) Dr. Blanton.

* Both 143 and 144 must be completed before credit is given.

¹ A laboratory fee of \$1.50 is charged for this course.

² A laboratory fee of \$1.00 is charged for this course.

SECOND TERM

- 55su. Educational Psychology. (For course description, see First Term, Course 55.) (3 cred.; jr., sr.; prereq., 6 cred. in psy.; MTWThFS I; 204Ed.) Mr. Eurich.
- 108su. Advanced Educational Psychology. A study of recent literature in educational psychology. (3 cred.; jr., sr., grad.; prereq., Ed. 55 or equiv.; MTWThFS I; 301Psy.) Mr. Miller.
- 111su.¹ Educational Diagnosis. For course description, see first term. (3 cred.; jr., sr.; prereq., Ed. 55 or equiv.; MTWThFS IV; 301Psy.) Mr. Van Wagenen.
- 113-114su. Psychology of Elementary School Subjects. A discussion of the research studies in the field of the psychology of elementary school subjects. (3 cred.; jr., sr., grad.; prereq., 10 cred. in psy. and ed.; MTWThFS II; Psy.) Mr. Van Wagenen.
- 116su.² Elementary Educational Statistics. For course description, see first term. (3 cred.; sr., grad.; prereq., Ed. 55; MTWThFS II; 204 Ed.) Mr. Eurich.
- 134su.¹ Mental Tests. For course description, see first term. (2 cred.; jr., sr., grad.; prereq., 55 or equiv.; MTWF II, III; 109Psy.) Mr. Miller.
- *143su.¹ Individual Mental Examination. For course description, see first term, Course 144. (3 cred.; jr., sr., grad.; prereq., Ed. 55 or equiv.; ar.; 301Psy.) Mr. Rockwell.
- 154su. Research Problems. For course description, see first term, Course 153. (1 cred.; sr., grad.; prereq., consent of instructor; ar.) Mr. Miller.
- 184su. Mental Deficiency. Survey of mental deficiency in children and adults. Physical traits including study of brain defects, causes and heredity; psychology of mental deficiency; social problems of feeble-mindedness. (3 cred.; sr., grad.; prereq., Ed. 55 or equiv.; MTWThFS V; 115Psy.) Mr. Rockwell.

HISTORY OF EDUCATION

FIRST TERM

- 3su. Educational Sociology. A study of education as a means of solving social problems and directing the evolution of institutions. (3 cred.; jr., sr.; prereq., 6 cred. in psy.; MTWThFS I; 210OL.) Mr. Peters.
- 101su. Foundations of Modern Education. Historical analysis and interpretation of the more important elements in modern education derived from the Hebrews, Greeks, Romans, Middle Ages, and Renaissance. (3 cred.; jr., sr., grad.; prereq., 6 cred. in psy. and 6 cred. in hist.; MTWThFS V; 113Ed.) Mr. Griffin.

* Both 143 and 144 must be completed before credit is given.

¹ A laboratory fee of \$1.50 is charged for this course.

² A laboratory fee of \$1.00 is charged for this course.

- 103su. History of Modern Elementary Education. The institutions, theories, and problems of modern elementary education in the light of their history. Emphasis upon the rise of state systems and upon the history of modern educational reform. (3 cred.; jr., sr., grad.; prereq., 6 cred. in psy. and 6 cred. in hist.; MTWThFS IV; 113Ed.) Mr. Griffin.
- 104su. Education for Citizenship. Theory underlying curriculum construction for training in citizenship. Analysis of educational objectives, methods of teaching. (3 cred.; jr., sr., grad.; prereq., 6 cred. in psy.; MTWThFS II; 205Ed.) Mr. Peters.

SECOND TERM

- 3su. Educational Sociology. For course description, see first term. (3 cred.; jr., sr.; prereq., 6 cred. in psy.; MTWThFS IV; 210OL.) Mr. Peters.

HOME ECONOMICS EDUCATION

FIRST TERM

UNDERGRADUATE COURSES

- H.E. Ed. 42su.¹ Special Methods of Teaching Home Economics. Curricula, equipment, methods of teaching for home economics. (5 cred.; jr., sr.; prereq., 13, 22, Psy. 1 and 2, Agr. Ed. 11 or Ed. Psy. 55; MTWThF VII, VIII; 213HE.) Miss Rose.

GRADUATE COURSES

- H.E. Ed. 141su. Home Economics Problems in Vocational Education. The place and development of home economics in the vocational education program. Study of problems of the day, evening, and part time schools. (2 cred.; sr.; prereq., 42; MTThF V; 213HE.) Miss Brown.
- H.E. Ed. 142su. Educational Measurement in Home Economics. Survey of accomplishment in this field; evaluation and construction of objective tests. (2 cred.; sr.; prereq., 42, Ed. Psy. 55; MWFS III; 213HE.) Miss Brown.
- H.E. Ed. 143su.¹ Organization and Method for Related Art Teaching. Content of related art courses and methods of teaching art principles as applied to familiar objects and processes. (3 cred.; sr.; prereq., 42 or parallel, 53, 131 or parallel; MTWThFS IV; 213HE.) Miss Harriet Goldstein.
- H.E. Ed. 242su. Home Economics Education Seminar. Current problems in home economics education will be studied. (Required of all candidates majoring in home economics education.) (1 cred.; grad. students only; hrs. and days ar.) Miss McNeal, Miss Brown.

PUBLIC SCHOOL MUSIC

FIRST TERM

- 13su.² Class Instrument Teaching. Three classes, string, wood winds, and brass and percussion. Students may enter any or all classes. The

¹ Prerequisites waived for teachers of home economics.

² The three subjects may be taken concurrently.

- course will contain drills, methods, and material for use in class instrument teaching in the public schools. (1 cred. each; strings, TS II; wood winds, TS III; brass, TS IV; 4Mu.) Mr. Pepinsky.
- 42su. Orchestra. Study of standard orchestral literature and accompaniment of vocal and instrumental soloists. (1 cred.; prereq., consult instructor; M IX, X; MuAud.)
- 64su. Orchestra Conducting. Theory and practice of general principles of conducting. Technique of baton and elements of interpretation. (2 cred.; jr., sr.; prereq., consult instructor; lab. TTh I; lect. S I; 4Mu.) (Observe summer school orchestra.) Mr. Pepinsky.
- 75su. Public School Music for the Grades. Grade methods in music. (3 cred.; jr., sr.; no prereq.; MWF I-II; Mu.)
- 78su. Public School Music for High Schools. High school methods. (3 cred.; jr., sr.; prereq., 75; MWF III-IV; Mu.)
- 94su. Ensemble. Chamber music, duos, trios, and quartets and other larger combinations for strings and wind instruments. For students of piano, violin, organ, etc. Sight reading, accompanying, and ensemble playing. (2 cred.; jr., sr.; prereq., consult instructor; TTh VI, VII; 3Mu.) Mr. Pepinsky.

SPECIAL EDUCATION

FIRST TERM

LIBRARY TRAINING

- 7su. School Library. Organization and Administration. Instruction in making and using simple library records, keeping books in order and repair, with practice in preparing books for the shelves, mending, etc. (3 cred.; jr., sr.; MTWThFS I; 3Lib.) Miss Penrose.
- 9su. Book Selection for the High School Library. Aims to give practical acquaintance with a variety of literature for adolescents. (3 cred.; jr., sr.; MTWThFS II; 3Lib.) Miss Penrose.

For additional courses in library training see page 43.

SPEECH DISORDERS AND BEHAVIOR PROBLEMS OF CHILDREN

- 141su. Phonetic Disorders of Speech. The discussion of the English sounds and how they are made; discussion of the cause and treatment of lispings and the oral inactivities; discussion of delayed speech and its treatment. (2½ cred.; MTWFS III; 204Ed.) Mr. Blanton, Miss Green.
- 142su.¹ Advanced Course in the Correction of Speech Disorders. A lecture demonstration course in which various types of speech disorders will be presented. The cause and treatment of these cases will be discussed by the instructor and the class. (1½ cred.; prereq., Ed. 133 and 141 or equiv.; MTWThF I; John Marshall High School.) Mr. Blanton, Miss Green.
- 146su.¹ Speech Clinic—Practice and the Diagnosis of the Various Disorders of Speech. A study of the methods of treatment of speech disorders by means of physical re-education, training in rhythmic co-ordinations,

¹ A laboratory fee of \$1.50 is charged for this course.

posture work, corrective gymnastics, corrective phonetics, and emotional re-education. (1½ cred.; MTWThF VI-VII; John Marshall High School.) Mr. Blanton, Miss Green, Miss Holtz.

- 147su.**¹ Advanced Speech Clinic. This clinic is for teachers who have had the beginning course in former years. They will have special work. (1½ cred.; MTWThF VI-VII; John Marshall High School.) Mr. Blanton, Miss Green, Miss Holtz.
- 192su.** Behavior Problems in Children. For course description see under Educational Psychology. (3 cred.; prereq., Ed. Psy. 55 or equiv.; MTWThFS IV; OLAud.) Mr. Blanton.

THEORY AND PRACTICE OF TEACHING

FIRST TERM

- 14su.** Teaching Junior High School Mathematics. For students prepared to teach mathematics in the junior high school. Discussion of the course of study and methods of presentation. (2 cred.; jr., sr.; prereq., Ed. 15; TWThF IV; 206Ed.) Mr. Stokes.
- 15su.**² Technique of High School Instruction. Types of classroom exercises; preparation of teaching plans; hygiene of instruction; methods of treating individual differences; classroom management; professional ethics of teaching; supervised study; marking system; observation of high school work. (3 cred.; prereq., Ed. 55; MTWThFS V; 205Ed.) Mr. Field.
- 16su.** Practice Teaching. Teaching under supervision in the Minneapolis city schools, in regular academic secondary school subjects. Limited to students who have been registered for practice teaching or special methods during some preceding regular quarter in this college. (3 or 5 cred.; sr., grad.; prereq., Ed. 15 and Special Methods Course; ar.) Mr. Turney.
- 17su.** Practice Teaching. A practice course in teaching subnormal children. Students will have opportunity to observe work with the special classes, and to teach under direction of the instructor. Conducted in co-operation with the public schools of Minneapolis and St. Paul. (2½ cred.; jr., sr.; MTWFS II, III, IV; ar.) Miss Bryne.
- 21asu.** Teachers' Course in English Composition. (2 cred.; jr., sr.; prereq., Ed. 15; TWThF VI; 206Ed.) Miss Inglis.
- 21bsu.** Teachers' Course in English Literature. (2 cred.; jr., sr.; prereq., Ed. 15; TWThF VII; 206Ed.) Miss Inglis.
- 37su.** Social Science for Senior High Schools. Selection and organization of content, preparation and presentation of data, and methods of teaching. Required of all students whose major is social science. (2 cred.; jr., sr.; prereq. in each of the following: pol. sci., econ., sociol., either American History or Modern European History and Ed. 15; MTWF VII; ar.; 205Ed.) Mr. Tohill.

¹ A laboratory fee of \$1.50 is charged for this course.

² A laboratory fee of \$1.00 is charged for this course.

- 38su. *Methods and Problems in Secondary School Science.* Organization and methods of secondary school sciences. Attention to general science, lesson planning, methods of presentation, assignments, measuring achievement. Open to students preparing to teach natural science. Required for practice teaching in science. (3 cred.; jr., sr.; prereq., consult instr.; MWF VIII-IX; 8Ed.) Mr. Smith.
- 43su. *The Teaching of English in the Elementary School.* A consideration of the materials and the means for improving instruction in spelling, language, and reading processes; emphasis on silent reading technique in Grades 1-6. (3 cred.; jr., sr.; MTWThFS IV; 204Ed.) Miss Wilson.
- 45su. *The Teaching of Geography and History in the Elementary School.* The aims and purposes controlling instruction in geography and history in the elementary school; tendencies toward standardization, special emphasis on problem studies. (3 cred.; jr., sr.; MTWThFS II; 204Ed.) Miss Cutright.
- 54su. *Teaching Secondary School Mathematics.* For students preparing to become teachers of secondary school mathematics. Lectures, readings, discussions, methods of presenting courses of study in general mathematics, algebra, and geometry. (4 cred.; jr., sr.; prereq., Ed. 15, Math. 50; TWThF VIII, IX; 206Ed.) Mr. Stokes.
- 56su. *Teachers' Course in History.* Deals chiefly with the practical problems of teaching history and government in the secondary schools. (2 cred.; jr., sr.; prereq., Ed. 15, 18 cred. in hist. including one intensive course; MTWF VI; 202Ed.) Mr. Tohill.
- 110su. *Educational Diagnosis in Secondary Education.* The application of educational measurements to the solution of the problems of high school instruction. Analysis of the specific learning processes involved in the various high school subjects; a critical survey of the means of diagnosing and alleviating high school pupils' learning difficulties; the use of educational measurements in improving high school teaching. (2 cred.; sr., grad.; prereq., Ed. Psy. 55; MTWF I; 205Ed.) Mr. Hudelson, Mr. Johnson.
- 148su. *Teachers' and Supervisors' Course in Arithmetic for the Lower Grades.* This course emphasizes the history of arithmetic as related to present practices and methods of teaching in the lower grades. Such topics as motivation, games, projects, drill, and the selection and solution of problems are considered in detail. (1 cred.; jr., sr., grad.; prereq., 15 cred. in ed.; FS III; 111Ed.) Mr. Brown.
- 150su. *Teaching and Administration in Teachers' Colleges.* In this course emphasis is placed on the historical development, the present status, and the prospects of future development. An intensive study is made of curricula, departmental organization, and practice teaching. Emphasis is placed also on the supervision of instruction. (1 cred.; jr., sr., grad.; prereq., 15 cred. in ed.; FS IV; 111Ed.) Mr. Brown.

- 181su. Technique of Elementary School Instruction. Advanced course for teachers with experience in fundamental methods of teaching elementary school subjects. (3 cred.; jr., sr.; prereq., Ed. 55; MTWThFS I; 202Ed.) Miss Cutright.
- 193su. Foundations of Secondary School Methods. A study of the investigations which form the bases of the technique of high school instruction and the application of their results to high school subject-matter and to high school classroom procedure. (2 cred.; sr., grad.; prereq., Ed. 15; MTWF III; 205Ed.) Mr. Hudelson, Mr. Johnson.
- 195su. Problems of High School English Teaching. An intensive study of various means of adapting subject content to high school pupils. (3 cred.; sr., grad.; prereq., Ed. 15 and 21; MTWThFS IV; 202Ed.) Mr. Hudelson, Mr. Johnson.
- 201su. Teaching of History and Social Studies. (Open to graduates and teachers; ar.; MTWThFS II; 101Ed.) Mr. Krey.
- 222su. Research Problems in Secondary School Methods. (2 cred.; grad.; prereq., Ed. 15 and 113; MTWF VI; 205Ed.) Mr. Hudelson.
- 230su. Seminar: Research Problems in Normal School Teaching and Administration. (1 cred.; prereq., consent of instructor; FS VII-VIII; 111Ed.) Mr. Brown.

SECOND TERM

- 15su.¹ Technique of High School Instruction. For course description, see first term. (3 cred.; prereq., 55; MTWThFS IV; 204Ed.) Mr. Field.
- 149su. Teachers' and Supervisors' Course in Arithmetic for the Intermediate and Upper Grades and for Junior High School Teaching. This course emphasizes the history of arithmetic as related to present practices and methods of teaching in the intermediate and upper grades and in the junior high school. Special emphasis is placed upon such topics as motivation, projects, the selection and solution of problems, and the mathematics of the junior high school. All topics included in the intermediate and upper grades are considered. (3 cred.; jr., sr., grad.; prereq., 15 cred. in ed; TW VI-VII; ThF VI; 113Ed.) Mr. Brown.
- 150su. Teaching and Administration in Teachers' Colleges. In this course emphasis is placed on the historical development, the present status, and the prospects of future development. An intensive study is made of curricula, departmental organization, and practice teaching. Emphasis is placed also on the supervision of instruction. (3 cred.; jr., sr., grad.; prereq., 15 cred. in ed.; TW VIII; ThF VII-VIII; 113Ed.) Mr. Brown.
- 181su. Technique of Elementary School Instruction. A course in fundamental and special methods of teaching elementary school subjects. (3 cred.; jr., sr., grad.; prereq., 9 cred. in ed., including Ed. Psy. 55; MTWThFS IV; 222 OL.) Mr. Peik.

¹ A laboratory fee of \$1.00 is charged for this course.

TRADE AND INDUSTRIAL EDUCATION

FIRST TERM

- Ind. 115su.¹ Special Class Woodwork. For teachers of art, subnormal, and primary work. (Women only.) Lectures, demonstrations, and shop-work. Flat piece work, toys, models, etc. Special attention to finishing. (2 cred.; no prereq.; TWThF III, IV; 24Ed.) Mr. McGee.
- Ind. 25su. Literature of Industrial Education. Acquaintance and methods of use. Sources and classification. Reference facilities. Reviews of study reports. Planning of research projects. (2 cred.; no prereq.; TWThF II; 222OL.) Mr. Smith.
- Ind. 30su. Graphic Presentation. Typical methods of graphic representation of data. Simple educational materials used for drill in the interpretation and statement of facts and conditions. Selection of appropriate types of graphs. Execution, with pencil. (2 cred.; no prereq.; TWThF IV; 222OL.) Mr. Smith.
- Ind. 40su. Analysis. Types and uses of analysis. Survey of available reports. Individual work upon chosen occupations. (2 cred.; no prereq.; TWThF I; 115Ed.) Mr. McGee.
- Ind. 110su. Guidance in the Schools. History of the movement. Typical public school means and methods. Justification, literature, devices. The junior wage earning situation; attendance and child labor laws. Placement and follow-up plans. Procedures, appropriate for various school units and groups. (2 cred.; prereq., Ed. Psy. 55; TWThF I; 222OL.) Mr. Smith.
- Ind. 170su. Administration of Vocational Education (Day Schools). National, state, and local organization and support. Types of schools; buildings and equipment; promotion; staff organization; improvement of courses and methods, relationships. Relation to part time and evening schools. (2 cred.; jr., sr., grad.; no prereq.; TWThF II; 115Ed.) Mr. Craigo.
- Ind. 172su. Administration of Vocational Education (Part Time Classes). History of the movement; social and economic justification. Organization and laws. Groups and offerings; methods and staff improvement. Typical schools and comparative state policies. Contracts and co-ordination. (2 cred.; jr., sr., grad.; prereq., 170; TWThF III; 222OL.) Mr. Bass.

Content courses of wide variety in shop and drawing are offered in the University. Students are referred to the engineering sections of this bulletin, where offerings will be found in mechanical and architectural drawing, bench woodwork and cabinet making, wood finishing, pattern making, machine shop practice, and forging. The shops will be open both morning and afternoon on Mondays, but mornings only during the remainder of the week including Saturday. It is desired to keep schedules flexible and instructors should be consulted in cases of program conflict so that special arrangements may be made. Mr. McGee's course (Ind. 115su.)

¹ A laboratory fee of \$1.50 is charged for this course.

will enroll women only; men desiring instruction in woodwork of any kind will consult with Mr. Richards in the Mechanical Engineering Building.

Certain other courses, such as auto mechanics, printing, carpentry, electrical construction, and sheet metal work will be made available at Dunwoody Institute if there is sufficient, unified demand. Such instruction will be limited to one eight-hour day each week (Mondays), which arrangement will permit enrolment for 48 hours or 2 credits in a selected subject.

A copy of the special four-year curriculum in Industrial Education (B.S. degree) will be sent, upon request, by the Department of Industrial Education, 218 Old Library Building. This should be used in selecting required and elective courses offered in other departments of the University. Correspondence about credit evaluation should be addressed to the adviser, Mr. Homer J. Smith, at the place named above.

SECOND TERM

Ind.11su.¹ (Repeated.) See description for first term. (2 cred.; no prereq.; TWThF II and III; 24Ed.) Mr. McGee.

Ind.20su. Industrial History. Lectures and textbook work. Evolution of arts, industry, tools, processes, and production. Economic and social conditions; resultant industrial and allied problems. Implications for vocational education. (2 cred.; no prereq.; TWThF I; 115Ed.) Mr. McGee.

Shopwork and Drawing. Courses in woodwork only will be given in the College of Engineering. See statement in this bulletin, page 57. Consult Mr. Richards and Mr. Smith.

PROBLEMS IN COLLEGE EDUCATION

An Institute on the Problems of College Education will be conducted from July 5 to July 15, 1927. The program of the institute will be arranged about three main problems as follows:

- (1) College student personnel
- (2) College curricula and instruction
- (3) College administration and organization, including college recording, educational finances and control, selection and improvement of faculty, etc.

Graduate students and college instructors will find it possible to secure graduate credit. The meetings of the institute, however, will be open to all who are interested in the study of these problems, without regard to the question of credit. In addition to the faculty and administrative officers of the University of Minnesota there will be lectures by specialists in higher education who have been invited to assist. Detailed announcements concerning the institute will be forwarded upon request.

¹ A laboratory fee of \$1.50 is charged for this course.

PHYSICAL EDUCATION AND ATHLETICS

PHYSICAL EDUCATION FOR MEN

Credit for courses taken in the Summer Session will be given toward a regular teacher's certificate in Physical Education where the courses are included in the physical education major.

The gymnasium, tennis courts, baseball diamonds, and running track will be available to students in the Summer Session.

Courses 1su, 2su, 9su, and 10su in the Department of Physical Education for Women are also open to men.

FIRST TERM

- A. General Exercise. Volley ball, baseball, handball, playground ball, basketball, tennis, golf, horseshoes, gymnastic games. No registration required. Open to students and faculty. (No cred.; no prereq., all; MTWThF IX; A.) Mr. Smith.
- B. General Swimming. No instruction. No registration required. (No cred.; no prereq.; all; MTWThF; Sec. 1, V; Sec. 2, IX; Sec. 3, X; A.) Mr. Thorpe.
- 13su. Elementary Swimming. Individual instruction for those who cannot swim. (No cred.; no prereq.; all; MTWThF IV; A.) Mr. Thorpe.
- 14su. Intermediate Swimming. Individual instruction given. (No cred.; no prereq.; all; MTWThF VII; A.) Mr. Thorpe.
- 15su. Advanced Swimming. For teachers and coaches. Instruction in form and speed swimming, diving, plunging, water sports, life saving. By special arrangement with instructor credit for Physical Education 10 can be received for this course. (1 cred.; no prereq.; soph., jr., sr.; MTWThF VIII; A.) Mr. Thorpe.
- 19su. Elementary Gymnastics. Tactics, free exercise, tumbling, and apparatus work, suitable for upper grades and high schools, in the school-room and the gymnasium. (1 cred.; no prereq.; jr., sr.; MTWThF VIII; A.) Mr. Keller.
- 24su. Technique of Gymnastic Teaching. Lectures and quizzes on terminology and methods of teaching. (2 cred.; no prereq.; jr., sr.; TWThF VI; A.) Mr. Keller.
- 28su. Physical Examination and Normal Diagnosis. Methods of inspection to determine deviations from the normal, including posture, musculature, skin, genitals, and feet; tests of hearing and vision; inspection of nose, throat, and teeth; examination of heart and lungs; methods of taking principal measurements, such as height, weight, girth, strength tests, etc. (1 cred.; TWTh VI.) Dr. Cooke.
- 29su. Orthopedic and Remedial Gymnastics. Lectures on the theories governing the correction of defects of form, posture, etc. Practice in handling classes and in executing the various movements. (1 cred.; no prereq.; all; M I; TS III; A.) Dr. Cooke.

- 30su. Athletic Training and First Aid. Principles governing conditioning of men for various sports; diet, sleep, exercise, bathing, massage. Over-training; its cause, diagnosis, prevention, and cure. Prevention, first aid treatment, and care of common injuries of the athletic field and gymnasium. (1 cred.; no prereq.; jr., sr.; WFS I; A.) Dr. Cooke, Dr. Spears.
- 35su. Athletic Organization and Administration. Discussion of place of athletics in physical education program; organization for athletic control; schedule making; construction and maintenance of athletic fields; purchase and care of equipment; eligibility problems; management of contests; financial accounting; insignia; awards. (1 cred.; no prereq.; jr., sr.; TTh V; A.) Mr. Finger.
- 37su. Football. Lectures on history, rules and theory, strategy and generalship, styles of attack and defense, methods of organizing practice and handling men, development of team spirit, officiating. Demonstrations and practice in the technique of position, play, and mechanics of football fundamentals. (3 cred.; no prereq.; sr.; MWF II, III; A.) Dr. Spears, Mr. Finger.
- 38su. Basket-Ball. Lectures on rules, styles of offense and defense, the conditioning and handling of a team. Practice in fundamentals of footwork, passing, dribbling, goal throwing, etc. (2 cred.; no prereq.; sr.; TTh I, II; S II; A.) Dr. Cooke, Mr. Keller.
- 39su. Track Athletics. Instruction and practice in the standard track and field events. Lectures on conduct of meets, rules of competition, officiating, track strategy, regulation of practice, and preparing contestants for competition. (2 cred.; no prereq.; sr.; MTWThF IV; A.) Mr. Finger.
- 42su. Baseball. Theoretical consideration of, and actual practice in, batting, base running, and methods of playing each position. Special attention to "inside baseball" and the development of team play. (2 cred.; no prereq.; sr.; MTWThF VII; A.) Mr. Keller.

SECOND TERM

- A. General Exercise. See Course A above. (No cred.; all; MTWThF IX; A.)

DEPARTMENT OF PHYSICAL EDUCATION FOR WOMEN

Courses 1, 2, 9, 10 are open also to men.

For hours when the swimming pool will be open for incidental use see Course 30.

The playground at Van Cleve Park, Fifteenth Avenue S.E. and Como Avenue, will be used for demonstration and practice purposes in connection with Course 2.

Except for courses in which shower bath fees are charged, students may procure shower bath tickets from the matron at 10 cents apiece or at the rate of twelve for one dollar.

Certain courses carry credit toward the teacher's certificate in physical education. See Courses 2, 3, 4, and 35.

FIRST TERM

- 1su. Teachers' Course in Physical Education for Schools. Open also to men. The technique is planned to help both those who are, and those who are not, accustomed to some other method. The practical part of the course will include innovations in content and methods of teaching gymnastics. (2 cred.; no prereq.; MTWFS III-IV; 201,153WGm.) Miss Waterman.
- 2su. Teachers' Course in Play. Open also to men. Brief consideration of the nature and function of play, and adaptation to various groups of children; folk dances, technique, rules and practice of games for boys and girls of Grades I-VI and girls of junior high school age; observation and practice teaching on playground. This course carries university credit for Physical Education 43-44-45 if preceded by specified prerequisites. Portion covering practical work in folk dances and games may be taken alone for $\frac{1}{2}$ of one credit. (3 cred.; no prereq.; lect., MTWFS I; games and folk dancing, MTWFS II; practice teaching, MTWThF VII; 201,151WGm.) Miss Warnock.
- 3su. Interpretive Dancing. An art and a phase of physical education designed to develop a sense of beauty and body control through rhythmic movements prompted by the imagination. Open to all women for recreation. If preceded by specified prerequisites it carries university credit for Physical Education 13 or 66. (1 cred.; no prereq.; MTWFS III; 153WGm.) Miss Skinner.
- 4su. Technique and Teaching of Basket-Ball. Lectures on rules, technique of play, and methods of teaching. Practice in fundamentals of the game. (1 cred.; no prereq.; lect., TS III; lab., TS IV; 151WGm.) Miss Mott.
- 5su. Technique and Teaching of Baseball and Soccer. Lectures on rules, technique of play, and methods of teaching. Practice in fundamentals of the game. (1 cred.; no prereq.; lect., MW VI; lab., TF VI; 201,151WGm.) Miss Mott.
- 6su. Tennis for Beginners. Class instruction in rules and fundamental technique. (No cred.; no prereq.; Sec. 1, TThS I; Sec. 2, MWF VIII; 151WGm.) Miss Waterman, Miss Starr.
- 7su. Tennis, Intermediate. Class and individual instruction based on knowledge of rules and fundamental technique. (No cred.; no prereq.; Sec. 1, TThS II; Sec. 2, MWF VII; 151WGm.) Miss Waterman, Miss Starr.
- 8su. Golf for Beginners. Sections limited to 20. (No cred.; no prereq.; Sec. 1, TS I; Sec. 2, TS II; Sec. 3, TS III.) Miss MacRae.
- 9su. Community Recreation. Open also to men. A comprehensive survey of the field of leisure time activities for adults as well as children. Organization and administration of program of recreation for all ages in cities, towns, rural districts. (1 cred.; no prereq.; WF IV; 201WGm.) Miss Hosmer.

- 10su. Girls' Athletic Associations. Open also to men. Development and administration of athletic programs for girls and women, the point system, participation by all, the policies of the Women's Division of the National Amateur Athletic Federation. (1 cred.; no prereq.; WF III; 201WGm.) Miss Hosmer.
- 30su. General Swimming. No registration necessary. (No cred.; no prereq.; MWF 12:00 to 12:30; MWF 1:30 to 2:00; 51WGm.) Miss Mott, Miss Skinner.
- 31su. Elementary Swimming. Intensive course to pass off swimming requirement of the department. Class instruction given. Shower bath fee, \$1. Sections limited to 25. (No cred.; prereq., phys. exam.; Sec. 1, MTh IV; Sec. 2, TF IV; 51WGm.) Miss Starr.
- 32su. Elementary Swimming. Class instruction given. Shower bath fee, \$1.50. Sections limited to 25. (No cred.; prereq., phys. exam.; Sec. 1, MWF III; Sec. 2, MWF 11:30; Sec. 3, MWF VII; Sec. 4, MWF 2:30; 51WGm.) Miss Mott, Miss Skinner, Miss Starr.
- 33su. Intermediate Swimming. Class instruction given. Shower bath fee, \$1. (No cred.; prereq., swim. exam., phys. exam.; TTh 2:30; 51WGm.) Miss Starr.
- 34su. Advanced Swimming. Class instruction given. Shower bath fee, \$1. (No cred.; prereq., swim. exam., phys. exam.; TTh VII; 51WGm.) Miss Mott.
- 35su. Technique of Swimming Strokes. Technique of swimming, diving, and life saving. Two hours theory, three hours practice. Shower bath fee, \$2. (1 cred.; prereq., swim. exam., phys. exam.; MTWThF VI; may be substituted for P.E.56w, Swimming with Technique; if a sufficient number, 6 students, are interested in completing P.E.56w-57s, Swimming with Technique, they will be registered for three additional hours for that purpose; 1:30 W, practice; MW VII theory; 201, 51WGm.)

SECOND TERM

- 6su. Tennis for Beginners. (TThS II.) Miss Mott.
- 8su. Golf for Beginners. (TThS III.) Miss Mott.
- 30su. General Swimming. (MWF V.) Miss Mott.
- 32su. Elementary Swimming. (MWF IV.) Miss Mott.
- 33su. Intermediate Swimming. (MWF VII.) Miss Mott.

THE SCHOOL OF BUSINESS ADMINISTRATION

GENERAL INFORMATION

ADMISSION TO THE SCHOOL OF BUSINESS ADMINISTRATION

For admission to the School of Business Administration a student must have satisfied the requirements of one of the two-year pre-business courses, either in the College of Science, Literature, and the Arts, the College of Agriculture, Forestry, and Home Economics, or the College of Engineering. However, students entering from other colleges and universities of recognized standing may be admitted if deficient in such subjects as accounting, psychology, or statistics, provided (1) that this deficiency is removed during the first year in the School of Business, and (2) that a minimum of 90 credits, with one honor point per credit, is granted by the university examiner for the work done elsewhere.

SPECIAL STUDENTS

A limited number of high school graduates who have reached the age of twenty-four and can furnish evidence to the effect that they have had successful business experience in an executive capacity may be admitted as special students. If later they decide to become candidates for a degree they must complete the requirements of the pre-business course.

STUDENTS IN OTHER SCHOOLS OR COLLEGES OF THE UNIVERSITY

Regularly enrolled students in other schools or colleges of the University may be admitted to such courses in the School of Business Administration as are authorized by the faculties of the School of Business Administration and the school or college concerned. Such students are urged to select their business subjects in accordance with a definite plan, and as far as possible to complete a systematic course of business study.

FIRST TERM

- 3su. The Mechanism of Exchange. Elementary course in money and banking. Study of financial institutions, their functions, and their place in the economic organization. (3 cred.; no prereq.; MTWFS III, and Th ar.; 6B.) Mr. Myers.
- 6su. Principles of Economics (elementary course). Principles that underlie the present industrial order with reference to production and consumption. Application of these principles to corporations and trusts, with a brief study of money and banking. (3 cred.; no prereq.; soph., jr., sr.; MTWThFS Sec. 1, II; Sec. 2, IV; 6B.) Mr. Stead.
- 24su. Survey of Accounting for Teachers. Designed particularly for the needs of commercial teachers and graduate students who wish a knowledge of the underlying principles of accounting without undue attention to routine matters. The purposes, possibilities, and principal features of accounting will be presented. A knowledge of bookkeeping is not required and special aid will be given to those who desire to learn the bookkeeping process. (3 cred.; no prereq.; MTWThFS II; 302B.) Mr. Heilman.

- 101su. Advanced General Economics. (Value and Distribution). An advanced course in economic theory, prices and costs; the value theory. For the Summer Session this course is the equivalent of Course 103. (3 cred.; prereq., 4 or 6-7; jr., sr., grad.; MTWFS III; Th ar.; 202B.) Mr. Mudgett.
- 113su. Theory of Statistics. The calculation and use of various constants of importance in the analysis of statistical data; averages, measures of dispersion and of correlation, partial correlation; and the theory of errors. Index numbers and analysis of time series. (3 cred.; jr., sr., grad.; prereq., 14; MTWThFS IV; 102B.) Mr. Mudgett.
- 153su. The Trust Problem. A discussion of the conditions in modern industrial society which have brought about the development of industrial combinations. Motives for combination. Their sources of power and elements of weakness. Social advantages and evils of trusts. Attempts at state and federal regulation. Elements of an intelligent future policy toward industrial combination. (3 cred.; prereq., 4 or 6-7; jr., sr., grad.; MTWFS III and 1 hr. ar.; 102B.) Mr. Cummings.
- 155su. Corporation Finance. The organizing, financing, and managing of corporations. A study of corporate securities for purposes of promotion and reorganization and of facilities for marketing them. (3 cred.; prereq., 4 or 6-7; jr., sr., grad.; MTWThFS IV; 202B.) Mr. Myers.
- 161su. Labor Problems. A discussion of employment; hours; wages; extent and strongholds of unionism; open and closed shops; collective bargaining; industrial unrest; government regulation of labor disputes. (3 cred.; prereq., 4 or 6-7; jr., sr., grad.; MTWThFS II; 102B.) Mr. Hansen.
- 166su. Contemporary Economic Problems. A course giving a general survey of current economic problems such as: price stabilization, business cycle, reparations and war indemnities, distribution of wealth and income, population and immigration problems. (3 cred.; jr., sr., grad.; prereq., 4 or 6-7; MTWThFS I; 202B.) Mr. Hansen.
- 172su. Economics of Transportation. A general course in transportation. Rate theory and practice, principles of governmental regulations, etc. (3 cred.; prereq., 4 or 6-7; jr., sr., grad.; MTWThFS IV; 209B.) Mr. Cummings.
- 176su. Commercial Policies. Theory of international commerce; protective tariffs; free trade, reciprocity, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign policies, and other governmental and organized efforts to affect trade. American problems emphasized. (3 cred.; prereq., 4 or 6-7; jr., sr., grad.; MTWThFS II; 202B.) Mr. Blakey.
- 181asu. Senior Topics Course—Accounting. A study of the accounting problems of certain business, particularly in the field of public utilities and government. Open to students who have had some work in accounting in advance of Accounting 25 and 26, and who wish to do more advanced work in the field. Individual problems will be assigned to each student. (3 cred.; jr., sr., grad.; prereq., 11 hrs. in accounting; MTWThFS I; 302B.) Mr. Heilman.

190su. Public Finance. Government revenues, expenditures and debts, including a study of the principles and various forms of taxation, budgetary legislation and control, war and emergency financiering, the shifting and incidence of taxes and fiscal reforms. (3 cred.; jr., sr., grad.; prereq., 4 or 6-7; MTWThFS I; 102B.) Mr. Blakey.

SECOND TERM

7su. Principles of Economics. A continuation of Course 6su. (3 cred.; prereq., 6; soph., jr., sr.; MTWThFS II; 202B.) Mr. Garver.

85su. Economics of Marketing. A general course dealing with (1) the market functions, (2) the organization of marketing enterprises, (3) measures of efficiency in marketing, (4) the manager's administration of marketing. (3 cred.; soph., jr., sr.; prereq., 4 or 6-7; MTWFS III, and 1 hr. ar.; 202B.) Mr. Vaile.

87su. Merchandising. Deals with the problems of the organization and management of retail establishments. Such topics as store location; store organization; buying; receiving; stock keeping; inventories; sales systems; store policies; stock control; personnel problems. (3 cred.; prereq., 4 or 6-7, 85; jr., sr., grad.; MTWThFS IV; 102B.) Mr. Maynard.

102su. Advanced General Economics. A continuation of Course 101su. Rent, wages, and profits. For the Summer Session this course is the equivalent of Course 104. (3 cred.; prereq., 101; jr., sr., grad.; MTWThFS I; 202B.) Mr. Garver.

107su. Sales Administration. Considers the principal problems of sales administration, such as sales organization, sales policies, selecting and training salesmen, laying out of territories, determination of quotas, compensation of salesmen, stimulation and supervision of salesmen, sales planning, sales research, and sales strategy. (3 cred.; prereq., 4 or 6-7, 85; jr., sr., grad.; MTWFS III, and 1 hr. ar.; 102B.) Mr. Maynard.

141su. Monetary and Banking Policy. Advanced course in money and banking. Public policies relative to the banking organization, efficiency and safety of financial operations, stabilization of the price level, prevention of undue financial concentration, subsidizing certain economic groups. (3 cred.; prereq., 3, and 4 or 6-7; jr., sr., grad.; MTWFS III and 1 hr. ar.; 209B.) Mr. Stehman.

146su. Investments. Bonds, mortgages, endowments, annuities, stocks, and other forms of property in which funds may be invested or risked, with particular emphasis on the needs of the conservative investor. The criteria of a good investment are carefully considered and tested by applying them to specific issues of governments, corporations, and individuals, including railroad, industrial, timber, and mining securities, and real estate loans. (3 cred.; prereq., 4 or 6-7; jr., sr., grad.; MTWThFS IV; 202B.) Mr. Stehman.

149su. Business Cycles. American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression, and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. (3 cred.; prereq., 4 or 6-7; jr., sr., grad.; MTWThFS II; 102B.) Mr. Vaile.

THE INSTITUTE OF CHILD WELFARE

The Institute of Child Welfare was organized in July, 1925, with the aid of a grant from the Laura Spelman Rockefeller Memorial of New York City. The purposes of the institute are: the study of the development of the young child from as many aspects as possible, the training of future workers in the field of child welfare, and the bringing to the people of the state through its teaching and extension services the information accumulated in its own and other research centers. Co-operating with the institute in its research and extension program are a number of university departments: Anatomy, Education, Home Economics, Nervous and Mental Diseases, Pediatrics, Psychology, Public Health Nursing, Sociology, and the General Extension and Agricultural Extension Divisions. As part of its program, the institute maintains a nursery school for children between two and five years of age which will be in operation during the first term of the summer quarter, and which, under certain limitations, will be open for observation by appointment. Because of the interest in this field, the institute is offering a full program of courses in the summer quarter for those seeking either undergraduate or graduate credit. A student in either term or both terms combined can secure a well-rounded program. The courses which follow are accepted for credit in the College of Science, Literature, and the Arts, the College of Education, and the College of Agriculture, Forestry, and Home Economics, and in the Graduate School when so indicated.

FIRST TERM

- 40su. Child Training. A brief study of the physical and mental development of the child is followed by a discussion of the problems of training young children. Emphasis is placed on the pre-school child. Lectures, observations in the nursery school, and reports. Limited to 40. (3 cred.; jr., sr.; prereq., Psy. 1-2; MTWF VII, and two hours observation as ar.; 102F.) Mr. Anderson.
- 60su. Nursery School and Parental Education Movement. The purpose of this course is to orient the student with reference to the development of the nursery school and the movement for parental education. Consideration will be given to other movements such as the kindergarten and the Montessori school and to the physical and mental hygiene movement in relation to the pre-school period. (2 cred.; jr., sr.; prereq., 6 cred. in psy. and 5 cred. in soc. sci.; MTWTh IV; 102F.) Miss Dixon.
- 50su.¹ Nursery School Methods. A consideration of the materials and methods utilized in the training of small children as individuals and in groups. Special attention will be paid to the home. The Nursery School will be used for illustration and observation. Lectures, dis-

¹ Course 51eu. in the second term, a continuation of this course, must be taken in order to secure credit.

- cussions, and reports. (3 cred.; jr., sr.; prereq., 6 cred. in psy. or ed. and C.W. 60f; MTWThF VI and further hours as ar.; 104F.) Mrs. Foster.
- 120su. Health Care of the Young Child. A course in the physical care, illnesses, prevention of disease, and health problems of the young child. Primarily for nursery school teachers and others who have charge of groups of children and for workers in parental education. Opportunities for observations in the nursery and in clinics will be offered. With co-operation of Pediatrics Department. (2 cred.; sr., grad.; open to graduate students by permission and to seniors in curriculum in nursery school education; hrs. ar.) Dr. Boyd.
- 130su. The Development of the Young Child. An advanced course dealing with the development of the pre-school child from the anatomical, physiological, psychological, educational, and social aspects. Lectures, readings in the experimental literature, and reports. (3 cred.; sr., grad.; prereq., 12 cred. in psy. or equiv., and permission of instructor; MTWThFS I; 104F.) Mr. Anderson.
- 233su. Research in Development of the Young Child. (Cred. and hrs. as ar.; grad. students only.) Mr. Anderson.

SECOND TERM

- 51su. Nursery School Methods. A consideration of the materials and method utilized in the training of young children as individuals and in groups. Special attention will be paid to the home. The Nursery School will be used for illustration and observation. Lectures, discussions, and reports. (3 cred.; jr., sr.; a continuation of Course 50su offered in the first term; both terms must be taken to secure credit; MTWThFS IV; 105F.) Miss Dixon.
- 133-134su. Observational and Experimental Methods with the Young Child. A study of the various methods and techniques such as growth records, mental tests, ratings, controlled observations, etc., used in the experimental study of the young child. Practical exercises and problems on institute records and data will be given. (4 cred.; sr., grad.; prereq., 10 cred. in psy. or ed. psy., including one laboratory course, or the equivalent, permission of instructor; MTWTh I, MTW VI-VIII; 201CWI, 104F.) Miss Goodenough.
- 170su. Parental Education in Child Care and Training. A consideration of the content and methods used in courses and study groups for parents in the care and training of young children. Lectures, discussions, and reports. (3 cred.; sr., grad.; prereq., C.W. 52-53-54, or H.E. 34-35 and 44, or 15 cred. in ed. or psy., or sociol., or prev. med.; MTWThFS II; 104F.) Miss Dixon.
- 234su. Research in the Development of the Young Child. (Cred. and hrs. as ar.; grad. students only.) Miss Goodenough.

Other courses offered during the summer school which in whole or in part concern the pre-school child and which may be appropriately combined by interested students with the courses listed above are as follows:

SUMMER SESSION

- Anat.133su. Anatomy of the Fetus and Child. Mr. Scammon.
Anat.163su. Seminar in Human Growth. Mr. Scammon.
Ed.141su. Phonetic Disorders of Speech. Dr. Blanton.
Ed.Psy.192su. Behavior Problems in Children. Dr. Blanton.
H.E.103su. Nutrition of the Family. Miss Leichsenring.
Prev.Med.58su. Maternal and Child Hygiene. Dr. Boynton.
Prev.Med.80su. Child Health and Educational Hygiene. Dr. Diehl.
149su. Psycho-Educational Clinic. Mr. Rockwell.
Psy.109su. Individual Differences. Mr. Paterson.
Soc.60su. Child Welfare. Mrs. Doyle.

Special attention is called to Anatomy 133su offered by Mr. Scammon which is open to graduate students by permission of the instructor. Full descriptions of the above courses with a statement of the prerequisites are to be found in the departmental announcements in this bulletin.

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